5-10-2024

# Bridging the Gap: Addressing Systemic Factors in Assistive Technology Provision Through Resource Creation and Stakeholder Engagement

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# BRIDGING THE GAP: ADDRESSING SYSTEMIC FACTORS IN ASSISTIVE TECHNOLOGY PROVISION THROUGH RESOURCE CREATION AND STAKEHOLDER ENGAGEMENT

by

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A Capstone Project Presented to the

FACULTY OF OCCUPATIONAL THERAPY

GEORGIA STATE UNIVERSITY

In Partial Fulfillment of the

Requirements for the Degree

OCCUPATIONAL THERAPY DOCTORATE

April 2024

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|---|---|
| **Student's Name** | Isabel Atkinson |
| **Degree Sought** | Occupational Therapy Doctorate (OTD) |
| **Department** | Occupational Therapy |
| **Program** | Occupational Therapy Doctorate (OTD) |

We, the undersigned, recommend that the Capstone Final Paper completed by the student listed above, in partial fulfillment of the degree requirements, be accepted by the Georgia State University.

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**Acknowledgement**

I express my sincerest gratitude to my site mentor, Bryan Clever, for his guidance on this project. I could not have completed this project without the continued support and encouragement of my supervisor, Dr. Emily Buchman, and the rest of the Georgia State University Occupational Therapy Department faculty. Special thanks to the participants for their contributions. A heartfelt thanks is extended to my friends and family for their relentless support.

## Abstract

This Doctoral Capstone Experience (DCE) delves into the intricate dynamics of assistive technology (AT) provision, aiming to address existing deficiencies in the system and enhance outcomes for AT users. The project is centered on a nonprofit organization, Friends of Disabled Adults and Children, Inc. (FODAC), located in Tucker, GA, which specializes in repurposing and redistributing donated AT and durable medical equipment (DME) to individuals in need. Through an exploratory journey, the study identifies systemic obstacles within the AT delivery system, recognizing the complex interplay of stakeholders, settings, and institutions. Utilizing insights from literature and stakeholder engagement, the project evolves to develop resources aimed at improving the intake and referral process at FODAC. These resources include an Equipment Recommendation Checklist and a Wheelchair Accessory Evaluation Form, designed to streamline the process of obtaining AT for clients. Implementation efforts focus on integrating these resources within rehabilitative settings guided by insights from therapists that refer patients to FODAC. While facing challenges such as bureaucratic hurdles and operational constraints, the project underscores the importance of systemic thinking into effecting positive change within the AT ecosystem. The study's outcomes contribute to a deeper understanding of AT provision at a systemic level and offer practical strategies to enhance the matching process between AT users and available equipment. Ultimately, the project aims to empower stakeholders and improve quality of life for individuals with functional and mobility impairments through more effective AT provision.

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## Summary

Assistive technology (AT) plays a crucial role in enhancing the quality of life for individuals with functional and mobility impairments. However, deficiencies in the AT provision process often result in barriers to access for those in need. This Doctoral Capstone Experience (DCE) sought to address this issue by investigating the systemic factors influencing AT provision and developing strategies to improve outcomes for AT users. The research question guiding this endeavor was: How do deficiencies in the provision of AT impact the various stakeholders involved, and what strategies can be implemented to create more favorable outcomes for AT users?

This project aims to deepen understanding of the systemic factors impacting AT provision, particularly within organizations like FODAC. By implementing targeted interventions at FODAC and collaborating healthcare facilities, it seeks to develop effective strategies to improve the accessibility and quality of AT services within the constraints of limited resources.

Critical gaps and challenges within FODAC's processes emerged from the findings of a rigorous needs assessment. These findings reiterate a need to address systemic obstacles within the broader AT provision ecosystem. Despite the organization's robust inventory of equipment, staffing shortages hinder its capacity to deliver tailored services to clients. Limited finances further exacerbate these challenges, underscoring the imperative to optimize resource allocation and operational efficiency.

In response to these identified needs, the overarching goal of the DCE is to deepen understanding of the systemic factors that influence AT provision and to devise strategies to mitigate these obstacles. By leveraging insights gleaned from the needs assessment phase, the project aims to implement targeted interventions within FODAC's operations and collaborating healthcare facilities. Through a multifaceted approach encompassing stakeholder engagement, process optimization, and resource allocation, the DCE seeks to enhance the quality and accessibility of AT services.

The specific aims of the project included conducting a comprehensive literature review to identify existing deficiencies and knowledge gaps in AT provision, engaging with stakeholders to gather insights and feedback, and developing and implementing resources to address identified challenges. Outputs of the project included the Equipment Recommendation Checklist and Wheelchair Accessory Evaluation Form, designed to streamline workflows and improve communication between therapists and AT providers such as FODAC.

The significance of this project lies in its potential to improve access to essential equipment for individuals with functional impairments, thereby promoting greater independence and participation in daily activities. In the short term, the project aims to enhance the efficiency of the AT provision at FODAC and within rehabilitative settings. In the long term, it has the potential to inform systemic changes in AT provision practices, leading to more favorable outcomes for AT users across diverse healthcare settings.

# CHAPTER 1

## Literature Review

### Introduction

It is a common misconception that technology is innately complex and cutting-edge. The definition of the word is actually deceptively simple, defined by Merriam-Webster as a tool that is developed or utilized to make things happen (AOTA, 2016). Expanding on this concept, assistive technology describes "any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities" (WHO-UNICEF, 2022). Whether the technology in question is simple or complex, it is the process and purpose of its implementation that causes the technology to become assistive in nature (AOTA, 2016). The Global Report on Assistive Technology (2022) authored by the World Health Organization (WHO) and United Nations Children's Fund (UNICEF), places additional emphasis on the purpose of AT as promoting functioning and independence and enhancing participation and inclusion in all domains of life.

The category of AT serves as an umbrella term, encompassing several varied types of assistive products, including physical aids such as mobility equipment or hearing aids, digital tools such as software or technology to facilitate communication or information access, and adaptations to a physical environment like portable ramps and grab bars (WHO-UNICEF, 2022). AT users may experience temporary and/or permanent functional impairments or activity limitations. Across the globe, users of AT encompass a diverse array of demographic factors including age, health condition, socioeconomic status, and more. While the level of need and access vary greatly among countries, the deficiency in adequate access and provision is prevalent

worldwide, emphasizing the imperative of advocating for universal access (WHO-UNICEF, 2022).

Current estimates suggest that approximately one billion individuals require assistive technology, predominantly aging adults and persons with disabilities (WHO, 2016; WHO-UNICEF, 2022). This figure is projected to rise substantially in the coming decades due to advancements in medical care that have increased survival rates and extended life expectancy (Thyberg et al., 2001; WHO-UNICEF, 2022). However, despite the substantial need for AT worldwide, only about 10% of those who could benefit from it have adequate access. This lack of access is attributed to various barriers, including insufficient funding sources, lack of education and awareness, limited availability of suitable devices, and shortages of trained personnel (WHO, 2016; WHO-UNICEF, 2022).

For the people included in this statistic, AT is fundamental to participation in meaningful life activities. This widespread lack of access has negative implications for quality of life. Many who advocate universal access to AT conceptualize it as fundamentally a human rights issue. This is reflected by several publications and initiatives put forth by international movements and organizations. In 2006, the United Nations *Convention on the Rights of Persons with Disabilities* was adopted, of which several articles mention assistive technology as a means of exercising human rights. As of 2020, it had been ratified by 181 of the world's 197 independent states, obligating them to legally protect the rights of people with disabilities (WHO-UNICEF, 2022). The *Universal Declaration of Human Rights*, a document adopted by the UN General Assembly, emphasizes the universal entitlement to healthcare and social services that ensure a high quality of life and wellness. For many individuals, AT is the way to achieve these standards of living and thus is a human right in itself (WHO-UNICEF, 2022).

Across the literature and related fields of study, frameworks for understanding the role, purpose, and significance of assistive technology place a recurring emphasis on the interaction between an individual, their context, and their environment. Some use the term AT to describe products that are utilized by people with temporary or permanent functional difficulties to improve their functional ability; however, the International Classification of Functioning, Disability, and Health (ICF) offers a shift in this perspective, positing that functional difficulties are not innate to the individual, but rather that they are the byproduct of physical, cognitive, or social barriers in a person's environment that restrict accessibility (WHO-UNICEF, 2022). The WHO offers the 5P people-centered model to conceptualize the AT system, positing four characteristics of the system—the *products* available, the design and implementation of *provision*, the capacity of the *personnel*, and how these elements are shaped by *policy*—to understand the types and severity of barriers affecting the *people* seeking access to AT (WHO-UNICEF, 2022).

AT provision is a person-centered practice (AOTA, 2016). The general fundamentals of the aforementioned approaches recognize that no two situations or AT solutions are the same and thus seek to identify all of the unique factors that are vital to take into consideration to achieve the best outcome for the AT user (WHO-UNICEF, 2022). The holistic approaches demonstrated by these frameworks mirror many of the foundational principles of occupational therapy (OT) as a discipline (AOTA, 2016). Contextualizing the essential elements within the domain of OT practice allows for understanding the AT provision process within a person-centered, holistic structure of evaluation, intervention, and outcome measurement.

Occupations are the activities of daily living that give meaning or purpose. Occupational engagement is essential to an individual's health, participation, and well-being. Occupational

therapists (OTs) are taught to approach intervention by considering the interaction between the client's performance skills, performance patterns, contexts, and environment (AOTA, 2016). OTs are employed across countless areas of practice, with implementation of an AT solution existing as an option for intervention within nearly every setting. OTs "possess a professional reasoning and theoretical foundation that is uniquely grounded in occupation" (AOTA, 2016, p. 2) and are uniquely qualified to prescribe AT (De Witte, et al., 2018).

Theoretical models that inform OT practice emphasize the dynamic nature of interactions between the client, the occupation, the environment and relevant contextual factors (AOTA, 2016). One such theoretical model, the Human Activity Assistive Technology Model, conceptualizes AT as a component of equal importance as its counterparts: human, the activity, and contextual factors. This reflects the level of significance some users assign to their AT, regarding it as an extension of their self, integral to their occupational participation and interaction with their environment. The theory offers the concept of an *assistive technology system* for consideration in practical application of AT as an intervention (Giesbrecht, 2013). An *assistive technology system* is "the culmination of a human performing a functional activity using an assistive device within a given context" (Giesbrecht, 2013, p. 231). This concept is demonstrative of the inherently individualized nature of AT provision, validating the necessity of the client-centric, holistic approach.

Gowran et al. (2020) seamlessly encompass all of these themes in "Wheelchair and Seating Assistive Technology Provision: A Gateway to Freedom," a mixed-methods study that utilized a human rights perspective to examine the process of wheelchair seating and provision and the interconnectedness between satisfaction, performance, and participation. Like many related studies, Gowran et al. (2020) identify the numerous barriers experienced by people

navigating the system of wheelchair provision. However, this study posits that all of the time and energy lost due to these barriers negatively impacts "occupational performance, equality of opportunity, and community mobility" (Gowran et al., 2020, p. 370). Wheelchair seating and AT provision is not only a basic human right; it is a pre-requisite for survival. In accordance with the HAAT conceptual model, embodiment—the mobility device being considered integral to a person's physical being—emerged as one of the prominent themes. Despite the obstacles encountered along the way, participants reported that the positive outcomes of the process, such as acquiring an appropriately-fitting device, outweighed the negatives (Gowran, et al. 2020).

Across the world, there are barriers that stem from within existing AT systems, posing obstacles to accessibility and equitable distribution. This review investigates these barriers and their implications for health and quality of life. Friends of Disabled Adults and Children, Inc. (FODAC) is an organization that recognizes this overall lack of access in society, and its mission reflects small-scale effort to counteract some of these systemic challenges. However, from its place situated within a flawed system, these large-scale barriers inevitably lead to operational issues in its day-to-day activities. This examination of the literature aims to shed light on the factors contributing to and perpetuating these obstacles, placing them within the broader societal context to underscore their systemic nature. Ultimately, this project seeks to address these barriers within FODAC by leveraging existing resources and fostering meaningful connections among stakeholders already involved in the process.

**Categorization of AT**

Within the healthcare field, much AT falls into the category of durable medical equipment (DME). The category of DME encompasses certain assistive products that meet the criteria for reimbursement under Medicare Part B as designated by the Centers for Medicare and

Medicaid (CMS). Items considered DME must be able to withstand regular use, used for a medical reason, and used in the home. Examples of items include canes, rolling walkers, commodes, wheelchairs, nebulizers, and hospital beds (CMS, 2023). Medicare policies set the benchmark for numerous private insurance plans, thereby shaping the widespread adoption of the term to describe items within this category beyond Medicare-specific contexts (CMS, 2023; Wang et al., 2021).

There are some assistive products that share commonalities with DME but are not included under Medicare, and these items are commonly grouped into this category by individuals unfamiliar with the explicit criteria. However, these items are regarded by Medicare as serving a non-medical function. Hence, they do not qualify as DME and are not covered, even if they are essential for individuals undergoing medical treatment and rehabilitation. Dressing aids, reachers, shower chairs, grab bars, and portable ramps are examples of these types of items—simple devices that facilitate participation in activities of daily living (ADLs) and safety in the home (CMS, 2023; Wang et al., 2021; Winkler et al., 2010). Other assistive products can help people who experience a sudden or gradual decline in functional independence, from simple devices like pill organizers and adapted utensils, to complex devices, such as switch-controlled electronics or smart-home technology (AOTA, 2016; CMS, 2023; Warner & Tipping, 2022).

Mobility devices are included within the Medicare designation of DME (CMS, 2023; Cohen & Perling, 2015). Medicare aims to provide the most cost-effective solution, and the type of device for which an individual qualifies is determined by a step-by-step assessment of their mobility needs designed to rule out devices along a continuum. Devices progress in price and complexity—gait aids, simple manual wheelchairs (MWC), complex MWC, scooters, noncomplex power wheelchairs (PWC), and complex PWC (Cuppett et al., 2022; Ouzts, 2011;

Petito, 2011). MWCs covered range from standard weight (K1) to ultra-lightweight rigid frame wheelchairs (K5) (Ouzts, 2011). PWCs are split into groups based on level of customization and function. Group 1 PWCs are basic and intended for limited indoor use. Group 2 devices tend to be basic as well but can be minimally customized, including one power seat function. Group 3 PWC are often highly customized with multiple supportive accessories and power seat functions. Group 4 are similar to Group 3 but also include a power standing option. Group 5 PWCs are sized for people under 125 pounds (Cuppett et al., 2022).

Highly customized mobility aids fall into the category of complex rehabilitation technology (CRT), which includes "individually configured manual and power wheelchair systems, adaptive seating systems, and other mobility technologies that require evaluation, fitting, configuration, adjustment, or programming to meet individual needs… (They are) most often considered for individuals with neurological conditions and injuries and congenital diseases" (Petito, 2011, p. 8). The CRT designation includes tilt-in-space, high-strength lightweight (K4) and the ultra-lightweight K5 MWCs as well as PWCs in Groups 3, 4, and 5. (Cuppett et al., 2022; Ouzts, 2011; Petito, 2011).

**Barriers**

Attempting to acquire equipment through insurance is a daunting process which presents the user with many obstacles. Medicare requires items to be considered medically necessary, which grants them grounds to deny coverage of bathing and toileting equipment, such as shower chairs, raised toilet seats, and grab bars, which are classified as convenience items (Winkler et al., 2010). Additionally, assistive devices must be deemed only necessary for use within the home (Petito, 2011; Winkler et al., 2010), allowing them to deny equipment that would be used for community navigation. For example, a client who can propel a MWC but fatigues quickly

would benefit greatly from a scooter or PWC to navigate longer distances. However, due to the client's ability to navigate a MWC for a short, household distance, they might be denied coverage of the electric-powered device. This policy disregards any secondary impacts on occupational engagement outside of the home, leading to social isolation and decreased community participation (Winkler et al., 2010).

Wheelchair evaluation and provision is an arduous process riddled with obstacles at every stage. To begin the process, the wheelchair user must undergo a thorough evaluation to designate an appropriate seating solution (Cuppett et al., 2022; Ouzts, 2011; Petito, 2011). The assessment tests for various factors, such as trunk control, activity tolerance, and propulsion speed. Information is collected about the client's home environment, since the mobility device must be able to be used within the client's home. The mobility device must be demonstrated to contribute to an improved ability to perform activities of daily living (ADLs). Clients are first assessed for MWCs, ranging from K1 to K5 (Ouzts, 2011). If none of these are an appropriate fit for the client, then they are assessed for a power scooter (Cuppett et al., 2022; Ouzts, 2011). They must be able to independently transfer to and from the device, maintain posture, and safely control the scooter; if they are unable to meet these criteria, then they can qualify for a PWC (Ouzts, 2011).

This process is complicated even further by required participation from several different professionals. The evaluation must be performed by a licensed/certified medical professional such as an occupational or physical therapist (PT) (Ouzts, 2011; Petito, 2011), and an assistive technology professional (ATP) associated with the equipment provider must also be present or on-site in order to select the specific appropriate equipment for the patient based on assessment outcomes (Petito, 2011). The medical professional that conducts the assessment must write a letter of medical necessity that validates the patient's need for equipment and justifies why the

lower-cost equipment is not appropriate (Ouzts, 2011). Physician approval and extensive medical documentation, such as chart notes and additional paperwork, might also be required (West, 2012). With the complexity of the process and Medicare's focus on cost-effective solutions, there are several bases upon which a wheelchair user might be denied a more complex or costly wheelchair. For example, patients with certain diagnoses or patients who are not full-time wheelchair users might receive a denial based on a lack of medical necessity. Other denials might be caused by technicalities in the process, such as missed deadlines or exceeded timeframes. Additionally, a wheelchair might receive partial approval but be denied for certain supportive features due to a lacking code, quote, or documentation (West, 2012).

Across the literature, time spent waiting at every stage of the AT provision process is cited as one of the most common and most frustrating barriers (Cuppett et al., 2022; Dicianno et al., 2018; Gowran et al., 2020; Wallace, 2011; West, 2012). Users have to wait for the initial evaluation, to gain approval for the device, to acquire the device, to gain approval for any necessary repairs, and to get it back after sending it in for repairs (Cuppett et al., 2022; Dicianno et al., 2018). Waiting for insurance approvals or denials is routinely documented as the longest step in the process, with users citing wait times of several months (Cuppett et al., 2022). Due to this, the medical professionals authoring the letters of medical necessity have to be especially thorough in order to avoid denials (West, 2012).

In addition to wheelchair users, clients seeking simple AT such as DME or ADL aids also encounter hassles when dealing with insurance. Within the literature, some researchers hypothesized that having insurance coverage would act as a facilitator to acquisition of simple AT. However, in examination of AT reuse and reutilization programs, many found that this was not the case (Cohen & Perling, 2015; Martinez et al., 2020). These types of programs and

nonprofit organizations exist to help fill the gaps in AT provision by offering alternative venues for people to access AT. Surveys of clients from these programs reflect that many people among these programs' clientele have either private or federal insurance such as Medicare or Medicaid (Cohen & Perling, 2015; Martinez et al., 2020). This fact indicates that having insurance coverage is not enough to ensure access to needed assistive products. Martinez et al. (2020) reports that bathroom equipment and personal hygiene/incontinence supplies are among the items most frequently requested at their clinic. These items are not covered by Medicare, which could help to explain the large percentage of insured clients they see. However, Martinez et al. (2020) posit that this is not the only explanation for the high number of insured individuals seeking their service, suggesting alternative reasons that connect the high percentage to systemic factors, such as inability to cover a co-pay, substantial waiting times for insurance approval, and difficulty navigating the system.

Some people utilize AT reuse programs and services for the logistical reason of not being able to wait for insurance approval (Cohen & Perling, 2015; Martinez et al., 2020). Time spent waiting for approval for DME insurance reimbursement is substantially shorter than the wait for mobility equipment. However, those waiting for DME can still experience significant waiting times (Wang et al., 2021), and many people need this equipment in order to safely return to their homes after injury or accident. Other individuals face financial challenges. Medicare recipients are expected to meet their deductible before Medicare begins coverage, and then they are still responsible for a co-pay of 20% of the cost of the device (Cohen & Perling, 2015; Wang et al., 2021). For many, this is a prohibitive barrier and is cited as a frequent reason for seeking out services from the reuse programs (Cohen & Perling, 2015; Martinez et al., 2020; Walker et al., 2012).

Other clients sought out the services of AT reuse programs to avoid contending with insurance altogether for reasons such as inability to determine how to obtain the device through insurance or excess difficulty encountered in attempts to navigate the system (Cohen & Perling, 2015; Martinez et al., 2020). In our modern-day healthcare climate, patients are largely expected to be their own advocates, but many are unaware of the full extent of their coverage for mobility devices (Cohen & Perling, 2015; Martinez et al., 2020). Sometimes after a denial, a patient is left unknowing how to interpret their denial letter or how to proceed to the next step (West, 2012). Conceptually, insurance is supposed to enable access to essential services, but in reality, it acts as a series of roadblocks on the path to AT acquisition.

Though it does not present itself as an obvious barrier, a general lack of awareness and education prevents many people from access. De Witte et al. (2018) authored a position paper advocating for an international framework for AT provision which delineates all of the elements they assert are vital in order to ensure universal availability and accessibility of AT. They assert that "to be able to benefit from any AT solution, people must know of its existence" (De Witte et al., 2018, p. 469). A survey of AT providers reported "lack of client knowledge that technology exists or how to access or use it (and) lack of provider knowledge about technology and the provision process" as among primary barriers to AT access (Dicianno et al., 2019). Information must be made available to all individuals within the process—AT users as well as the professionals involved (De Witte et al., 2018).

A person has to possess a large quantity of knowledge for successful navigation through the steps in the process of AT acquisition. They must identify their unmet needs, locate available and appropriate equipment, and figure out how to acquire the equipment. Many patients would feel more informed and would benefit if a healthcare provider could help them to navigate the

process. There are trained professionals working within the systems of healthcare or AT provision that would be able to help fill this knowledge gap. However, the AT service delivery system is fractured. Often the experts in each stage are limited in the number of people they are able to serve or depth of information they can provide, leaving many individuals not knowing who to ask for help. These professionals strive to deliver high quality, patient-centered care but are often restricted in the amount of time and effort they are able to give to any individual patient due to limiting factors such as productivity standards (Falvey et al., 2019). Falvey et al. (2019) conducted a cross-sectional survey of acute care PTs that examined their experience during and after patient discharge. Although 90% of respondents indicated that they routinely participate in discharge planning through written recommendation of a discharge location and DME, the vast majority did not participate in any aspect of follow-up care. Respondents agreed that follow-up communication with patients or with other therapists in continued care settings would not be considered productive time, though it has been demonstrated to lead to favorable patient outcomes (Falvey et al., 2019).

**The Systemic Nature of AT**

Many of the systemic barriers to AT provision would be inherently eliminated if all of the disjointed parts were integrated into a cohesive, productive system that served the public. However, there is no single institution that funds, regulates, or maintains a system that truly serves the best interest of AT users. De Witte et al. (2018) present an analysis of AT service delivery in several countries, delineating seven steps that consistently delivered functional outcomes. The steps include: initial contact, assessment, selection of appropriate type of AT, selection of specific device, authorization for funding, delivery, and management/follow-up.

However, their findings indicated that all the steps are rarely utilized, leading to inadequate service in many cases (De Witte et al., 2018).

It is easy to understand how the AT system overall lacks cohesion, uniformity, or efficiency given the numerous sectors involved—the government, the healthcare system, private equipment companies, insurance companies, charities, non-profit organizations (De Witte et al., 2018; Holloway et al., 2021). Additionally, the healthcare system includes individual facilities that might be involved in a single person's medical care or recovery, such as hospitals, inpatient or outpatient rehabilitation clinics, skilled nursing facilities, or home health care services. Many of these, as well as the other individual sectors, are set up in a way to prioritize their own internal goals, which is not conducive to effective and efficient collaboration with the other sectors (Falvey, et al., 2019). Each of these institutions employ representative stakeholders who participate in the AT system. However, countless obstacles, both internal and external, impede the sharing of knowledge and resources within the system, limiting the impact that a single stakeholder or institution is able to make.

The quantity of assistive products and related services has seen exponential growth in recent years (De Witte et al., 2018). However, much of the latest technological research and development has focused on high-end, high-tech solutions which do not address the unmet needs of the majority (WHO-UNICEF, 2022). Medical advancements have increased survival rates and extended life expectancy (Thyberg et al., 2001; WHO-UNICEF, 2022), resulting in an increased need for DME, supportive seating systems, and other AT that enables functional independence (Ordway et al., 2018). The functional difficulties that individuals experience as a result of societal barriers are exacerbated by lack of adequate health coverage, social services, and access

to technology. Globally, the largest need for AT exists for simple technologies (WHO-UNICEF, 2022).

Much of the literature that theorizes around what is needed to achieve universal AT access takes a systemic approach. In these frameworks, AT is embedded within the infrastructure of society (Holloway et al., 2021, p. 568), taking advantage of the systems already in place. These theories emphasize increased communication, collaboration, and cooperation between all stakeholders and institutions (Bühler & Barbera, 2011; De Witte et al., 2018; Holloway et al., 2021). While infeasible on a universal scale, these approaches offer inspiration for formation of tangible solutions. Creating new ways to improve communication, increase cooperation, and share resources, knowledge, and expertise within the currently inefficient, fragmented system would result in numerous favorable outcomes, from improved user experience to cost efficiency (De Witte et al., 2018; Holloway et al., 2021).

Much of the AT provision process falls within or adjacent to the healthcare system. In the United States and many countries around the world, the healthcare system presents itself as an ideal locale for integration of resources that aid people in AT acquisition. Healthcare exists as a fragmented institution, and the resources and knowledge that do exist to support AT provision are often under-utilized, used inefficiently, or lost in translation due to this fragmentation (WHO, 2016). However, healthcare systems offer a perfect setting for innovation because they are "complex, adaptive… socially constructed systems" (Holloway et al., 2021, p. 569). It presents an opportunity for individuals to initiate small-scale change from wherever they are in the healthcare system, capitalizing on the resources available to forge new pathways to increase overall access to these technologies. (Holloway et al., 2021).

**Making Connections and Creating New Pathways**

The concept of streamlining AT services emerges as a common theme throughout the literature and offers a conceptual solution for increasing efficiency within a single institution. A group at the Cincinnati Children's Hospital Medical Center (CCHMC) developed a process for simplifying their processes surrounding DME provision. After taking a systemic approach to identify the parts of the process that needed improvement, they consolidated roles, delegated tasks, and standardized documentation and the ordering process (Wang et al., 2021). While it might take an upfront investment in changing the institutional infrastructure, personnel responsibilities, or other foundational elements, streamlining care and delivery of services can lead to more efficient workplace operations and more effective patient care (Longrois et al., 2018). Through streamlining their DME provision process, the CCHMC put trust in the expertise of their knowledgeable staff members, created more efficient communication throughout the workplace, and significantly reduced the amount of time for processing and delivery of DME to patients (Wang et al., 2021).

Some community and nonprofit organizations act as key stakeholders in non-traditional pathways of AT provision. Many of these exist in the form of AT reuse and reutilization programs, which demonstrate another method of creating pathways within the existing system to increase access to assistive products. A survey of Australian organizations dedicated to providing disability and mobility aids found that they typically emerged in response to a societal need or lack of existing services, operating with "a clear social agenda of direct support for individuals at risk of poor outcomes" (Muenchberger et al., 2015, p. 859). These organizations do not have to "conform to a health sector agenda" (Muenchberger et al., 2015, p. 859). For instance, they do not have to receive physician approval or contend with health insurance (Cohen & Perling, 2015;

Martinez et al., 2020). Rather, they are able to directly respond to the unmet needs of the community.

Some AT reuse programs utilize connections between healthcare facilities and community organizations, such as the Snoqualmie Valley Hospital Home Equipment Loan Program (HELP) Center. The HELP Center was formed in 2013 when a hospital and a senior center reached out to form a partnership with a nonprofit organization, enabling an open flow of resources. Through the partnership, they were able to share in resources such as initial inventory of DME to distribute, increased space for storage of equipment, the ability to reach a wider clientele, and multiple locations at which to accept community donations. By forging this connection between individual stakeholders already involved in the process of AT provision, they were able to make an even greater impact. (Lord & Sheehan, 2015; Ordway et al., 2018).

AT reutilization programs are able to address needs that are unable or unlikely to be met elsewhere. Reuse programs are able to provide products that are not covered by Medicare or many private insurances, such as personal care, toileting, hygiene, and incontinence items. Much of the time, they are able to provide items for free or low-cost (Cohen & Perling, 2015; Martinez et al., 2020). Increasing availability and dissemination of AT improves the safety, independence and confidence of people with disabilities or aging adults. It leads to increased rates of aging in place and decreased caregiver burden (Cohen & Perling, 2015; Warner & Tipping, 2022).

Programs that provide wheelchairs and other mobility equipment are able to fill additional community needs. Individuals who are insured are typically only eligible to receive one mobility device every five years (Lord & Sheehan, 2015). On top of that, if an individual needs repairs or modifications to their device, they are forced to endure long waiting times without appropriate seating support (Cuppett et al., 2022; Dicianno et al., 2018). Programs that

exist to fill this need allow for individuals to receive backup or secondary seating systems (Cohen & Perling, 2015; Lord & Sheehan, 2015, Walker et al., 2012). They also serve as a valuable resource for pediatric populations who outgrow their seating systems at a more rapid rate, allowing them to receive chairs more frequently than every five years (Cohen & Perling, 2015; Lau et al, 2008; Li Pi Shan et al., 2012).

**Conclusion**

The AT system is dynamic, complicated, and multifaceted. Though it operates between many institutions, it lacks efficiency and cohesion. Contending with insurance, inordinate waiting times, lack of education and awareness, and general fragmentation of the system create innumerable obstacles that a person can face when navigating the AT provision process, regardless of the type of AT being sought. However, there is always more that can be done from inside and outside of the system. Understanding AT from a systemic perspective is valuable for grasping its interconnected nature. The interaction between institutions and systemic factors that contribute to widespread barriers provides a broader view, aiding in comprehending the interconnectedness of individual stakeholders and the specific challenges they encounter. Although universal coordination and cooperation between sectors is unrealistic, individual stakeholders within the system have succeeded and continue succeed in making small-scale efforts that result in positive change.

# CHAPTER 2

## Needs Assessment

The provision of AT and adaptive equipment plays a crucial role in enhancing the quality of life and independence of individuals with disabilities. Despite its importance, there are significant barriers within the healthcare system that hinder access to these essential tools. Friends of Disabled Adults and Children, Inc. (FODAC) is an organization dedicated to addressing some of these barriers by repurposing and redistributing donated AT to individuals in need. However, the systemic issues previously identified manifest within the inner workings of the organization. There are gaps and challenges within FODAC's processes and services that, if addressed, would allow the organization to better meet the needs of its clients.

This Doctoral Capstone Experience (DCE) seeks to enhance understanding of the AT system both systematically and on a smaller scale. It aims to contextualize the identified areas of need of FODAC clients within a broader systemic framework, shedding light on how societal barriers impact specific obstacles that they face. Employing a systemic approach, this study will explore the dynamic interplay between various sectors and stakeholders within the AT provision system and assess the potential for implementing small-scale initiatives within the existing systemic infrastructure to address needs and deficits.

AT reuse and reutilization programs fill a significant need within the community that they serve, allowing people to acquire equipment that would otherwise be inaccessible (Cohen & Perling, 2015; Lord & Sheehan, 2015; Martinez et al., 2020; Ordway et al., 2018). However, FODAC, like many of these organizations, is only able to operate within the limits dictated by their resources, finances, and labor force. FODAC is not equally affected by all of these factors.

They have many resources in terms of equipment inventory and storage space. As with most nonprofits, finances are not abundant. They depend on grants, sponsors, fundraisers, community donations, and revenue from their on-site thrift store. They also accept many different types of donated items. Used medical and mobility equipment is cleaned, fixed, and organized to be redistributed to clients seeking AT. Donated clothes, furniture, and other items are directed to the thrift store. While they are able to maintain a steady inflow and outflow of AT distributed to their clients, they operate with a limited work force. Employees each serve a vital function, but many of the organization's daily operations are accomplished with the help of volunteers.

Conversations with FODAC staff elicited information regarding the organization's largest areas of need, highlighting gaps within the process of matching clients with appropriate equipment. FODAC has an extensive supply of DME, ADL equipment, mobility equipment, and much more. With the appropriate expertise and initiative, an inventory of this magnitude has the potential to deliver personalized, tailored AT solutions to its clients. However, FODAC does not have the necessary number of personnel to be able to deliver this caliber of service to their clients. FODAC's staff size limits their capacity for client outreach, intake, and assessment.

Clients come to FODAC through several venues. Some hear of the organization through word of mouth, some find it through a deliberate search for services or equipment, and some are referred through a third party, such as a healthcare provider. However, the client or their family is responsible for contacting FODAC on their own behalf. When requesting the equipment, few are well-informed enough to make specific or detailed requests. Additionally, the client intake form is very brief and does not collect much data, requesting only the client's height and weight in order to match them with equipment. The lack of comprehensive client information gathered

leads to deficiencies in two primary areas. These areas present potential opportunities for enhancing the equipment matching process for clients requiring these types of equipment.

The first area of weakness affects a significant portion of FODAC clients—those who come requesting a wheelchair or other mobility device. FODAC's inventory includes various types of wheelchair frames as well as a well-organized library of wheelchair parts and accessories. With the collection of a few pieces of basic information and the capacity to conduct a brief assessment, clients would be able to receive a highly-customized, supportive seating system. The second area with potential for improvement also involves a high percentage of FODAC clients. Whether it is a wheelchair or another type of AT, many people request only a single item, unaware of the plethora of additional types of DME and ADL equipment within the organization's stock. If clients were asked a few additional questions, such as tasks that cause them difficulty, they could be matched with additional items to fix unmet needs that they were unaware could be addressed with AT.

AT serves to improve or maintain a person's functional abilities and to promote independence and participation in their daily activities. Ideal circumstances for AT provision involve a client-centered process which includes assessment of not only the client but also their context and environment (AOTA, 2016; WHO-UNICEF, 2022). By including these two areas of unsolicited information within FODAC's equipment-matching process, it is hypothesized that the collection of a small quantity of client information could substantially enhance the quality of service provided. Social, environmental, and health-related client factors all contribute to a fuller understanding of the client's level of independence and participation in their occupations (AOTA, 2016).

The areas of deficit in FODAC's intake process primarily involve the distribution of specific types of assistive products—customized wheelchairs and simple AT like DME and ADL equipment. The literature reflects that these areas are connected to larger, systemic issues withinAT provision (De Witte et al., 2018; Holloway et al., 2021). Initial stages of the needs assessment for this project revealed that FODAC's resources and operational capacities limited the ability to implement interventions within the organizational infrastructure. Therefore, the project's focus shifted toward an external approach, delving into the broader systemic landscape of AT provision to connect with healthcare settings likely to interact with FODAC clients. These settings could be integral to acquiring contextual information about clients that could prove vital to optimizing the equipment-matching process within FODAC.

To this end, an analysis of procedures in the acute care setting facilitated a broader scope of the AT provision process. Patients that are treated in this setting are commonly in need of DME and ADL equipment following hospital discharge (Falvey et al., 2019; Loria, 2022). However, the literature details various obstacles encountered by both insured and uninsured individuals. Many insured individuals sought equipment that was not covered by insurance, some required it more quickly than insurance would provide, or some were unable to afford the copay. All of these challenges were cited across sources as reasons that people sought equipment from AT reutilization clinics, which also served people without insurance (Cohen & Perling, 2015; Martinez et al., 2020). Many seeking this equipment needed it for home use, either older adults utilizing it for safety and independence or individuals using it to facilitate their recovery from surgery or injury following hospital discharge (Falvey, et al., 2019; Warner & Tipping, 2022). Acute care OTs and PTs are well-positioned to provide supplemental information regarding their patients' equipment needs (Falvey et al., 2019). Therefore, the DCE sought the expertise of this

therapist population to survey their views regarding overall ease of access of this equipment and barriers that might prevent access as it applied to both their own patients as well as the broader population.

The literature also heavily documented the barriers encountered when navigating the process of obtaining a wheelchair through insurance reimbursement. Though the specifics varied, individuals spent a significant amount of time waiting at each stage (Cuppett et al., 2022; Dicianno et al., 2018). At wheelchair loan clinics or reuse programs, clients often sought a secondary chair as a backup or while waiting for initial delivery or repairs to their primary chair (Cohen & Perling, 2015; Lord & Sheehan, 2015; Walker et al., 2012). This evidence in the literature suggested that this population, individuals being evaluated for an insurance-reimbursed wheelchair, could be a population that could greatly benefit from increased access to customized wheelchairs through FODAC. Therapists who evaluate this population are well-acquainted with the hurdles encountered throughout the wheelchair provision process (Ouzts, 2011; Petito, 2011; West, 2012). Hence, this study aimed to engage with these therapists to determine if they identified these lengthy waiting times as a prevalent barrier affecting both their patients and the population at large.

Through convenience sampling, participants were sought out who had experience working either within an acute care setting or conducting assessments to prescribe wheelchairs to be reimbursed through insurance. Participants were contacted via email with a message that included a brief description of the DCE and a link to a Qualtrics survey based on their respective group. Respondents provided informed consent prior to starting the survey and responses remained anonymous.

The first group consisted of eight OTs and PTs who currently worked or had prior experience working in acute care units of a hospital. The survey asked participants questions regarding their experience in prescribing equipment to their patients and their awareness of systemic barriers that impact equipment accessibility. All of the respondents indicated that they routinely recommended DME and ADL equipment to their patients at discharge for use at home and affirmed that their patients could benefit from increased education and access to AT. All of the participants indicated that they "strongly agree" or "somewhat agree" that the populations that they serve are affected by systemic barriers such as dealing with insurance, lack of information, and difficulty finding resources.

The second group surveyed for data collection and needs assessment included therapists who currently or previously performed wheelchair evaluations for their patients. Participants included two OTs in an outpatient rehab clinic who perform wheelchair evaluations and a retired PT with extensive experience working in a seating and mobility clinic. All of the respondents affirmed their awareness of the numerous challenges patients contend with regularly throughout the wheelchair provision process, including contending with insurance, enduring lengthy waiting times, and being without a supportive seating system during the waiting times. All of the participants strongly agreed that these waiting times adversely impact a person's ability to engage in their ADLs and that these barriers impact the patients that they treat.

These survey results illustrate that individual stakeholders are aware of these issues in a systemic context and feel that their patients are negatively impacted. This DCE aims to deepen understanding of the AT system, both systematically and at a local level. It will analyze the areas of need among FODAC clients within a broader systemic context, revealing how societal barriers affect specific obstacles they face. The study will examine the AT provision processes of

FODAC and other stakeholders, such as local healthcare facilities. Using a systemic approach, it will explore how different sectors of the AT system interact and assess opportunities for implementing small-scale initiatives within the existing infrastructure to address needs and deficits.

# CHAPTER 3

## Capstone Experience Protocol

### Introduction

*Site Description*

Friends of Disabled Adults and Children, Inc. (FODAC) is a nonprofit organization located in Tucker, GA, dedicated to enhancing the quality of life for mobility-impaired individuals since its establishment in 1986. FODAC operates from a 64,800 sq. ft. warehouse and serves clients primarily in the metro-Atlanta area, extending its reach to 92 counties within Georgia and 11 states outside of Georgia. FODAC's mission is to repurpose and distribute donated assistive technology (AT) and durable medical equipment (DME) to individuals in need, offering these essential tools for free or low-cost. Their inventory includes a wide range of mobility devices, mobility aids, safety equipment, and aids for activities of daily living (ADLs). (Friends of Disabled Adults and Children, Inc., n.d.)

*Project Evolution*

This DCE commenced with a broad objective of enhancing the process of matching clients with equipment at FODAC. Initially, the project set off with a handful of abstract concepts, lacking a definitive plan, and remained open to being shaped by discoveries made along the journey. Initial stages involved learning about FODAC's needs and situating these deficiencies in relation to the organization's resources and operational capacities. Several solutions were proposed for implementation at FODAC to target their areas of largest need. However, these ideas encountered roadblocks, prompting a shift toward exploring external avenues. Consequently, the project delved into the broader landscape of AT provision, where

engagements with healthcare environments unveiled the deeply entrenched systemic challenges. These unforeseen obstacles encountered during interactions with healthcare entities continually informed the literature search and guided the trajectory of the project. Concurrently, insights gained from the literature facilitated a deeper understanding of the intricate dynamics among individual stakeholders, settings, and institutions within the AT ecosystem. Evidence from the literature offered a pragmatic view, revealing the impracticality of pursuing certain avenues for resource implementation and highlighting the pervasive systemic barriers. As the project evolved into an exploratory journey, its objectives expanded beyond solely addressing FODAC's challenges. They expanded to encompass a broader aim of comprehending obstacles encountered both at FODAC and within healthcare settings as integral components of the larger AT ecosystem, thereby deepening the understanding of its systemic nature. The DCE employed systemic thinking to effect small-scale positive change from within, navigating through barriers to create feasible, sustainable, and impactful solutions.

## Methodology

### *Establishing Initial Parameters*

The project's planning phase refined the parameters that would direct the search for suitable sites to support the development and implementation of simple interventions to optimize the equipment-matching process. Initially, consideration was given to FODAC as a potential implementation site, aiming to create a resource that could be seamlessly integrated into current operations. For example, enhancing the organization's website could greatly benefit clients. A comprehensive list of available DME would assist clients in requesting equipment, and a catalog of wheelchair accessories and customization options could be invaluable for those referring

individuals to FODAC for wheelchair assistance. However, the current underutilization of the website and management's reluctance toward proposed changes suggested bureaucratic hurdles in pursuing this avenue.

Other exploratory avenues investigated the feasibility of integrating a brief client assessment into the current intake process to gather contextual information about the client in order to better match them with more appropriate equipment. For example, augmenting the client intake form with a few targeted questions to gather information, such as existing equipment and daily challenges could assist FODAC staff in recommending supplementary DME that could enhance the client's quality of life. Additional information gathered about patients seeking mobility equipment could lead to more supportive seating solutions. For example, a preliminary assessment of the patient's motor skills and inquiries about equipment usage plans could facilitate selecting the appropriate wheelchair frame, while basic body measurements could ensure proper chair dimensions. However, due to anticipated resistance to these proposed modifications, further exploration was not pursued.

It became evident that implementing foundational changes to the organization's operations or labor responsibilities would not be feasible. Subsequent efforts then focused on exploring whether FODAC had any mechanisms in place for outreach to stakeholders that refer patients. FODAC lacks any existing infrastructure for outreach to stakeholders who refer individuals to the organization, and they only gather this information through the client intake form. Although the form includes a space for clients to indicate their referrer, responses to this optional prompt are often vague, and this information is not utilized systematically after it is collected. Given the absence of established relationships or communication channels for the

DCE to pursue, it was decided to redirect the focus of the search outside of the organization for resource development and implementation.

Since its inception, the goal of this DCE was to implement a simple, targeted solution that would enable stakeholders involved in the equipment provision process to apply their expertise or knowledge with minimal additional time or effort. Initially, this objective was broad and conceptual before any specific details or parameters were established, and it was unclear whether these stakeholders would primarily consist of FODAC staff, healthcare professionals, or individuals in other roles. However, as the project evolved to reveal guiding insights such as FODAC's limited capacity to lend support for project development, it became apparent that the products generated by the DCE would need to be designed to be seamlessly integrated into the existing intake process without introducing unnecessary complexity.

**Implementation Plan**

In order to mesh within FODAC's existing organizational operations, it was determined that any proposed solution must rely on stakeholders external to FODAC. Based on the two main areas for improvement identified as part of the needs assessment, it was decided to focus on the types of healthcare professionals that work with the relevant populations. Clinicians are limited in terms of time and effort, so any interventions needed to be easily integrated into their processes by which they recommend and prescribe equipment to patients. The resources described below were developed for efficient clinical use andto capitalize on processes already undertaken by therapists, such as recommending DME to acute care patients upon discharge or conducting a comprehensive wheelchair evaluation for patients acquiring a wheelchair through insurance. Despite necessitating a minimal time investment for clinical use, the development of

resources aimed to appeal to therapists who strived to offer excellent patient care. To these individuals, it was hypothesized that the minor effort required to utilize these resources would be justified by the substantial and impactful results they would yield. Using these resources would better enable therapists in assisting their patients in accessing equipment to enhance their occupational engagement and, ideally, elevate their overall quality of life beyond direct therapy interventions.

Though successful implementation relies on stakeholders who are dedicated to providing high-quality patient care, when situated within appropriate healthcare settings, these resources have the potential to evolve into invaluable tools. OTs and PTs innately gather information about a patient's contextual factors as a part of treatment, and these tools capitalize on that wealth of knowledge to optimize FODAC's equipment matching process. For feasibility purposes, the chosen site had to be carefully evaluated based on its infrastructure and operational capabilities. Additionally, site selection required the therapists to perceive any added workload from the project outcomes as a valuable asset to foster long-term utilization of the resource. With these considerations in mind, the search commenced for an acute care rehab unit and a setting where therapists routinely conducted wheelchair evaluations.

## Description of Resources

### *Equipment Recommendation Checklist*

Through FODAC's current system, clients are responsible for contacting the organization and requesting their own equipment. However, many only request a single item and are unaware of the full range of items available including additional equipment that could benefit them. A patient's rehab team is uniquely qualified to fill this knowledge gap, with the OT or PT making

equipment recommendations directly to the patient or case manager in many cases. This DCE aims to create a concise flyer that the therapist can keep on hand and utilize at their discretion when discharging patients. When they are treating a patient that they believe would benefit from this direct communication of equipment recommendations, the therapist can fill this out and deliver a physical copy for the patient to take with them at discharge. The form includes FODAC's location and contact information, simple instructions for how to request equipment, important information, a checklist of DME that FODAC routinely has in stock, and a space for therapists to write in additional recommended items or notes/instructions to the patient. The anticipated outcome was that conveying this information concisely and directly to the patient would help to simplify the process of requesting equipment from FODAC.

*Wheelchair Accessory Evaluation Form*

Patients undergoing evaluations for insurance-covered wheelchairs have to endure prolonged waiting times at every stage of the equipment procurement process. The supportive seating system they will eventually receive is designed to ensure physical comfort, prevent pain and injury, and promote engagement in their daily tasks and activities (Gowran et al., 2020; WHO-UNICEF, 2022). Therefore, it is contraindicated in terms of their physical health and wellbeing to be left without adequate seating support for such a long duration of time. This project aims to target this specific gap by establishing a venue to supply wheelchair users with a secondary, customized piece of equipment.

The comprehensive wheelchair assessment required by insurance companies collects information such as wheelchair frame type, dimensions, and any features or accessories needed to ensure appropriate support. FODAC has a large, well-organized library of wheelchair frames and complex rehab technology (CRT) accessories that can be assembled to create a customized

wheelchair. By creating a simple channel for the evaluating therapist to communicate the necessary information to FODAC, the wheelchair user will be able to receive a low-cost wheelchair within a shorter time frame. This wheelchair will provide them with adequate seating support during the long wait times for initial procurement of their personal device and will serve as a backup chair in case they need to send their primary chair for repairs. The two-page, interactive PDF is designed so that the therapist can quickly and concisely input information following completion of a patient's comprehensive wheelchair evaluation. The therapist can easily convey any essential information regarding dimensions, frame type, and several categories of accessories, spanning head support, lateral trunk/leg supports, safety belts, type of seat cushion, etc. There is an additional space for the therapist to include any notes and contact information for follow-up communication. The PDF is hosted online, accessible to anyone with the link, allowing for easy circulation and savable to any device.

# Chapter 4

## Outcomes of Resource Development and Implementation Efforts

### Equipment Recommendation Checklist

*Site Search*

Some of the therapists who participated in the needs assessment surveys also helped to guide the project's secondary phases. Alongside the survey link and project description that they received in the initial email, the message also extended an invitation to therapists interested in further learning about or engaging with the project. Participants that agreed to informal interviews lent valuable information that helped to guide the trajectory of the project. Conversations with practicing clinicians highlighted the information that was essential to collect about each respective site to determine the qualities important for successful implementation. They gave their impressions of the project idea, suggested areas of improvement, provided insights into their respective site's daily operations and discharge, and speculated into the hypothetical implementation of the resource, positing potential barriers that might impede implementation or clinical use. Even the sites that ultimately turned out to be infeasible for resource implementation delivered valuable information through the correspondence with healthcare professionals, including uncovering potential challenges that the DCE might encounter at future sites.

All participants throughout the project gave positive feedback on the project idea and offered helpful suggestions on content and formatting. However, therapists at the first hospital that was contacted expressed hesitations at the suitability of their site for resource

implementation. A large percentage of their patients were typically successful in obtaining equipment through insurance, and the therapists felt that there might be another population that would be better served by this project. The perceived complexity of integrating the DME checklist into discharge procedures presented an additional hurdle at this hospital, citing the involvement of multiple stakeholders in the process. Therapists would recommend specific pieces of equipment but the task of facilitating device acquisition fell to the social work and case management team. Therefore, successful implementation of this device would have required a deeper integration into the overall discharge procedures, presenting a more complicated task for the therapist to take on. Since it did not seem feasible for the resource to be able to be implemented seamlessly into discharge procedures at this hospital, the search continued elsewhere.

The following hospital that was contacted specialized in treating children with complex conditions. Whereas the staff at this hospital were more enthusiastic about potentially utilizing the resource in practice, this site brought into consideration additional factors that were important in finding the optimal implementation site. This hospital's greatest needs in terms of DME and ADL equipment were often highly specific equipment. However, since most of these items were available at FODAC only in limited stock, streamlining their processes would not be viable. Additionally, this patient population with specialized needs did not make sense as an intended audience for this resource. However, therapists at both sites provided valuable insights into patient populations that they believed would benefit most from the resource, with orthopedic units emerging as a consensus. Orthopedic rehabilitation in acute care focuses on patients recovering from injuries or surgeries who typically return home swiftly after treatment. Because

rapid access to DME facilitates this discharge process, this resource would be especially well suited for this population.

*Search Results*

The final hospital that was contacted showed great receptiveness to collaboration. Two OTs engaged in interviews, offered feedback on resource development, and shared thoughts for implementation. The OTs felt that this resource could be especially helpful to this hospital, which serves many uninsured patients and frequently refers patients to FODAC for equipment. The lack of necessary equipment can sometimes hinder or complicate a discharge process. For instance, if a patient post-hip surgery does not own or have a way to acquire a tub transfer bench, the case manager will flag it as a potential barrier for discharge. The OTs highlighted systemic barriers faced by some of their patients that make it difficult to secure equipment. For instance, individuals who lack personal transportation or rely on public transportation encounter difficulty in traveling to FODAC or transporting the equipment. Though they acknowledged that a more holistic system was needed to fully solve the issue, they believed that this resource could provide a good first step in encouraging increased follow-through from patients. It would save them the effort of locating FODAC's contact information online, provide them with the essential information about the application process, and advise them on the equipment to request.

Therapists approved a list of commonly requested items from FODAC and affirmed that they routinely recommend most of the items to their patients. They also provided valuable feedback on additional information to include, emphasizing simple content and a straightforward format. The draft was then shared with them via email for feedback. Both participating therapists agreed that an orthopedic setting makes the most sense for primary implementation of this resource. However, this particular hospital serves a diverse patient population, and the

rehabilitation team switches between units every six weeks. Neither of the participating therapists was assigned to the orthopedic unit at the time of correspondence. They both were unsure of the usability of the resource for their current units, the intensive care unit and the sub-acute rehabilitation facility. However, they agreed to keep it in mind as they discharged the patients on their current unit to evaluate its feasibility over different settings. Levels of correspondence decreased over the course of the project, leaving uncertainty regarding whether they had the opportunity to utilize it in practice.

One of the therapists expressed optimistic and forward-thinking ideas that inspired potential future directions for the project as well as highlighted the importance of considering this issue from a systemic viewpoint. This idea was not pursued beyond the hypothetical due to the time constraints that limited the scope of this project. However, it offered unique insight into the potential of individuals working within a healthcare system to leverage their position to innovate small-scale initiatives toward systemic solutions. She proposed an idea that would take advantage of the hospital's placement within a comprehensive healthcare system, reaching the patient at various stages of the healthcare journey in order to increase likelihood of success of the resource's ultimate goal. For example, many patients treated within the orthopedic sector of the acute care unit received preceding medical appointments and surgeries at the same hospital. These patients might then continue visiting the orthopedic medical office for follow-up appointments, and many might also continue with physical therapy at the facility's outpatient rehabilitation therapy clinic. The therapist proposed the implementation of additional resources and reminders at the medical clinic and outpatient therapy clinic to provide further encouragement for patient follow-through and to emphasize both the value of AT and of FODAC as a resource. The therapist hoped that implementing additional targeted solutions at the patients'

subsequent medical encounters could help to counteract some of the specific barriers faced by patients without insurance and transportation.

## Wheelchair Accessory Evaluation Form

### *Site Search*

Like the Equipment Recommendation Checklist, the search for a site for implementation of the Wheelchair Accessory Evaluation Form presented its own challenges. This site search was guided by the plan of reaching out to therapists who had experience in performing wheelchair assessments. However, throughout the search, the most substantial challenges came with narrowing down the suitable implementation site and patient population. The first thought was to approach wheelchair seating and positioning clinics, which specialize in evaluating and prescribing mobility equipment for patients. An initial search identified two of these specialized clinics within the Atlanta area, both of which were affiliated with larger hospital systems or healthcare facilities. Unfortunately, even though it still appeared in the list of results delivered by an internet search engine, one of these clinics had recently ceased operations. However, a PT who had previously worked at the now-closed clinic was contacted and obliged for an interview. Though she had retired when the clinic closed its doors, she contributed valuable insights from her career and experience to inform early search efforts.

This PT outlined the circumstances leading to the clinic's closure. During its operation, the clinic served both inpatient and outpatient populations. The inpatient population was comprised of people being treated within the hospital's inpatient rehab unit at the time of their evaluation. These patients had often experienced acute injuries such as brain injury, stroke, or

spinal cord injury. Fitting them with appropriate equipment played a crucial role in their recovery, as the wheelchair would be utilized during therapy sessions in order to learn how to integrate the equipment into their daily activities.

The clinic also served an outpatient population. Typically, these patients had not sustained recent, acute injuries or medical conditions and were not undergoing intensive rehab. More often, these patients were long-time wheelchair users with a history of deficits in their physical mobility due to aging, degenerative conditions, or developmental disabilities such as cerebral palsy or spina bifida. Patients would schedule appointments to visit the clinic to be evaluated for new or upgraded equipment to better support them in their daily lives. Unfortunately, the clinic closed due to the outpatient side not proving profitable for the larger hospital system. Subsequently, inpatient evaluations were assimilated into the hospital's broader inpatient rehab unit. The retired PT provided contact information for one of her former colleagues who had since transitioned to working fully from within the hospital's inpatient unit. This inpatient PT was contacted and agreed to an interview.

When the search began to consider different types of settings, another factor presented itself as an important consideration when evaluating potential sites for implementation—the number of clients that the resources would be serving. Whereas the Equipment Recommendation Checklist was designed to streamline services and increase output of AT to more clients, the intent of the Wheelchair Accessory Evaluation Form was to enhance the quality of a specific service provided to clients. If FODAC saw an increase in the amount of DME and ADL equipment requested, they would easily be able to implement this into their current operations for equipment distribution. However, the assembly of highly-customized wheelchairs is a more intensive service, and because of this, it is important to maintain a similar influx and demand for

services. Inpatient rehabilitation units provide intensive therapy for an extended period of time and tend to treat patients on a smaller scale. For this reason, the DCE explored the possibility of establishing a relationship with this hospital's inpatient rehab unit. FODAC currently maintains functioning relationships with a few healthcare facilities around Atlanta in which clinicians communicate their patient's equipment needs, and in return, their patients receive specific and customized medical and mobility equipment. Inspired by those productive partnerships, this project sought to explore establishing similar avenues. The connection made with this inpatient unit presented an opportunity to explore the potential of this setting for an implementation site.

Initially it was uncertain whether this resource would be beneficial, given that the rehab unit already had a comprehensive process for wheelchair evaluation and provision. In the interview, the PT described the unit's current operational procedures to attempt to identify any potential gaps that could be addressed by this resource. Many of the patients receiving treatment on the unit are new wheelchair users, so the rehab team emphasizes the importance of utilizing wheelchairs during their time on the unit to enhance mobility and engagement in daily activities. Due to this, it is crucial that the unit reliably receives the custom-fitted wheelchairs within a short timeframe. To meet this need, they collaborate with one particular company that manufacturers all of the equipment. These companies offer loaner chairs for patients to use during the waiting period. Additionally, the unit maintains a stock of wheelchairs on-site that the patient can use if the manufacturer is unable to provide one suitable for the patient.

The PT considered that establishing a relationship with FODAC might allow them to have a third option to obtain a wheelchair in situations where a loaner chair was unavailable. The rehab unit worked with one manufacturer in particular due to their higher availability of loaner chairs, and offering another alternative might allow the unit to reduce dependence on this one

company and open the possibility of working with additional providers. However, it ultimately became clear that there were too many obstacles in place for this to be a viable option. If FODAC were to assemble chairs for the patients on the unit, it would need to be completed within a very short timeframe for the patient to use during treatment. They would also need for it to be delivered to the hospital, but FODAC does not have a means to deliver equipment. For both of these reasons, it was decided that this partnership would be infeasible given FODAC's current operational capabilities. Consequently, it was decided that an outpatient population might be a more suitable fit for this project, as it would entail less urgent turnaround times.

The search then turned to the second wheelchair seating and positioning clinic as a potential site for implementation. Like the clinic that recently closed, this clinic served both inpatient and outpatient populations. They provided supportive seating systems for hospital patients that had sustained spinal cord injuries, brain injuries, and other conditions. They also provided evaluations and fittings for community members who were in need of upgraded equipment. However, it was discovered that this site had a waiting list for outpatient evaluations with patients reporting difficulty in scheduling appointments, indicating a high demand for services. Because this is obviously a population in need of adequate seating support, this resource would likely be useful for the outpatient population at this clinic. However, due to the elevated amount of patient traffic at this clinic, the demand for services at this clinic might prove too high for FODAC's capacities. Because the resource is still in its initial stage of development, as a cautionary measure, the search then redirected to find a clinic with a lower amount of traffic.

*Search Results*

The search parameters broadened to include outpatient clinics that provided wheelchair seating and provision services but did not exclusively specialize in them. A therapist was

contacted from a clinic that primarily provided outpatient services for people with neurological conditions but had two OTs on staff that performed wheelchair evaluations on an as-needed basis. One of the therapists agreed to an interview. Through conversation with this OT, it came to light that the clinic previously used to provide more frequent wheelchair evaluations. Demand had decreased in recent years, but they still offered these evaluations as a service. This clinic seemed to have many qualities of a well-fitting location. It had a much lower demand from patients seeking wheelchair evaluations, meaning that this patient load would fall within a range more manageable level for FODAC's operating capacities, and the therapist demonstrated enthusiasm for the project. Thus, the site was chosen to attempt implementation into clinical practice.

The primary intended use of this resource was to provide a means for obtaining a well-fitting, supportive backup or secondary chair for patients seeking a wheelchair evaluation. However, the OT at this clinic proposed a secondary potential use for the resource that she could envision being utilized at her clinic. While some people come specifically seeking wheelchair evaluations, most of the patient population treated at this clinic come for general outpatient therapy services. Sometimes, these patients coming for general therapy are wheelchair users, but they come to the clinic using equipment that is ill-suited and does not provide adequate support. Even though these patients are not there seeking wheelchair evaluation services, these two OTs, through their clinical judgment, recognize the inadequacy of the patient's current equipment. She posited that with the addition of this resource, they would be able to perform an abbreviated assessment of these patients in order to recommend them a chair from FODAC. The OT concurred that it would be advantageous for the clinic to have this Wheelchair Accessory

Evaluation Form readily available in either of these cases of patients with inappropriate seating systems.

The therapists assisted greatly in the development of the resource. A list of accessories and customization options was compiled based on the library of CRT parts and accessories at FODAC. The therapists provided feedback on the list to enhance cohesion and consolidation. A draft of the interactive PDF was developed, and the therapists offered minor suggestions on formatting. They approved it as an intuitive and user-friendly resource that they could foresee using in the future when suitable opportunities arise. Although the therapists did not have the chance to incorporate this resource into practice within the timeframe allotted for the DCE, their contributions were invaluable in refining the product. Additionally, since the resource was developed with their clinic in mind, it suggested a high probability of integration into future practice.

# Chapter 5

## Discussion

### *Important Results and Outputs in Context of the Research Question*

The development and implementation efforts of the Equipment Recommendation Checklist and the Wheelchair Accessory Evaluation Form have provided valuable insights into the challenges and opportunities within the AT provision process. Despite encountering initial hurdles and limitations, the project successfully identified potential sites for resource implementation and engaged with healthcare professionals to gather feedback and refine the resources. Both resources aim to address gaps in the current AT provision process by facilitating smoother transitions for patients in need of mobility equipment. The Equipment Recommendation Checklist streamlines the discahrge process by empowering therapists to directly communicate equipment recommendations to patients, thereby increasing awareness of DME options and potentially reducing barriers to access. Similarly, the Wheelchair Accessory Evaluation Form seeks to improve the efficiency of wheelchair evaluations and procurement by providing therapists with a standardized tool to communicate patient needs to AT providers like FODAC.

### *Relevance to OT*

The project's focus on enhancing the AT provision process aligns closely with the core principles of OT. By emphasizing the importance of patient-centered care and functional independence, the developed resources aim to empower individuals with functional and mobility impairments to participate fully in meaningful activities and daily routines. Furthermore, the collaboration with healthcare professionals underscores the interdisciplinary nature of OT

practice, highlighting the importance of teamwork and communication in achieving positive outcomes for clients.

*Impacts*

In the short term, the implementation of Equipment Recommendation Checklist and the Wheelchair Accessory Evaluation Form has the potential to streamline workflows within healthcare settings, leading to more efficient equipment procurement processes and improved patient outcomes. By providing therapists with readily accessible tools to communicate equipment needs, the resources may help reduce delays in discharge planning and increase patient satisfaction. In the medium term, the resources could lead to improved coordination between healthcare facilities and FODAC, fostering stronger partnerships and better access to essential equipment for patients in need. Additionally, the successful integration of the resources into clinical practice may serve as a model for other healthcare settings, paving the way for broader adoption and impact. In the long term, the project has the potential to contribute to systemic improvements in AT provision, ultimately enhancing the quality of life for those in need of AT. By addressing barriers to access and promoting greater awareness of available resources, the project lays the groundwork for more inclusive and supportive healthcare systems.

## Limitations

Despite the progress made in resource development and implementation, several limitations should be acknowledged. First, the project's scope was limited by time constraints, preventing deeper exploration of potential implementation sites and broader stakeholder engagement. Additionally, the project primarily focused on acute care and outpatient therapy settings, potentially overlooking other relevant contexts where similar challenges exist.

Furthermore, the sustainability of the implemented resources may depend on continued support and buy-in from key stakeholders, including healthcare professionals and organizational leadership. Without ongoing commitment and investment, the resources may struggle to achieve lasting impact or widespread adoption.

**Sustainability Plan**

To enhance long-term sustainability beyond the DCE's timeframe, project development took factors into consideration that would contribute to the long-term use of these resources. A key focus was ensuring that interventions remained efficient in terms of time, energy, and cost requirements for their maintenance. From its onset, the project aimed to operate entirely without a budget, in line with the top priority of ensuring the cost effiency of the implemented solution's functionality. With a focus on optimizing time and energy efficiency, the project aimed to seamlessly integrate the resources into existing processes. Given FODAC's limited resources and operational capacity, the search for implementation sites prioritized minimizing any additional strain on the organization. While relying on ongoing support from therapists, both resource development processes prioritized minimizing additional workload by seamlessly integrating into established processes within each implementation site. Collaborating with therapists who believe in the resource's overarching purpose will contribute to its longevity in clinical use

To ensure the extended sustainability of the implemented resources, ongoing collaboration and communication with stakeholders will be essential. This includes regular feedback loops to gather input from end-users and address any challenges or barriers that arise. Additionally, efforts should be made to integrate the resource into existing workflows and protocols, embedding them as standard practices within healthcare settings. Furthermore,

exploring opportunities for funding and resource allocation to support the ongoing maintenance and refinement of the resources will be crucial. This may involve seeking grants or partnerships with philanthropic organizations to sustain the project beyond its initial phase.

## Conclusion

In conclusion, the development and implementation of the Equipment Recommendation Checklist and Wheelchair Accessory Evaluation Form represent significant strides toward improving the AT provision process for individuals with functional and mobility impairments. While challenges and limitations remain, the project has laid a foundation for future initiatives aimed at enhancing access to essential equipment and promoting greater independence and participation for people with disabilities. By leveraging interdisciplinary collaboration and innovative solutions, this DCE exemplifies the transformative potential of OT in addressing complex healthcare challenges.

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# Appendix

## Learning Objectives

1. The student will conduct a needs assessment to target an area of need at FODAC that can be feasibly addressed by this DCE
    a. The student will gain a greater understanding of the primary areas of need at FODAC
    b. The student will increase their knowledge of the specific barriers surrounding the process of DME recommendation/provision
    c. The student will increase their knowledge on the most common barriers within the provision process of customized/complex wheelchairs
2. The student will develop an understanding of the barriers that exist within AT provision and how they intersect with the healthcare institution at a systemic level
    **a.** The student will gain an understanding of the most common and widespread barriers that exist within AT provision
    **b.** The student will gain a greater understanding of how these gaps manifest within various healthcare settings
3. The student will conduct a search to determine sites or settings that are well-suited and willing to collaborate with the DCE
    **a.** The student will determine the parameters of the search based on the operating capacity and resources available at FODAC

   **b.** The student will increase their knowledge of the process of DME provision at hospitals to determine the optimal characteristics of a site that would facilitate sustainable and efficient implementation of the resource created by the DCE
   **c.** The student will increase their knowledge of sites that perform wheelchair evaluations to determine the optimal qualities of a site that could foster a beneficial and sustainable relationship with FODAC

**4.** Based on information gained through collaboration with the cooperating healthcare sites, the student will create resources to help fill the gaps in AT provision at the sites and address the identified areas of need at FODAC
   **a.** The student will create a resource to improve the aftercare of patients discharging from acute care settings that helps to facilitate receipt of needed DME from FODAC inventory
   **b.** The student will create a resource for healthcare professionals who perform wheelchair evaluations that easily allows for them to provide the necessary information to FODAC

**5.** The student will collaborate with the healthcare professionals at the cooperating sites explore the process of integrating the resources into clinical use
   **a.** The student will gain a greater understanding of the therapist's role in the implementation process
   **b.** The student will gain a greater understanding of the patient's role and response in the implementation process

**Supervision Plan**

Scheduled meetings:

The student and the site mentor will meet regularly throughout the 15-week period. These meetings will serve as check-ins to evaluate the progress of the project; they will also serve as a space where the student might ask for advice on how to overcome a barrier or help brainstorming if the project experiences a lull. At a minimum, these meetings will be 20-30 minutes long and take place every two weeks. They will ideally happen in-person and on-site at FODAC but may also be conducted via video call or phone call if circumstances require. The student will initiate the meetings and send reminders to the site mentor. Additional meetings may be held on the alternate weeks if the student or site mentor deems necessary as the project progresses.

Communication methods:

The student and site mentor will communicate via various means, including in-person conversation, texting, emailing, and phone or video calls. The student assumes primary responsibility for keeping the site mentor sufficiently informed of relevant updates and information throughout the duration of the project.

Specific requirements of the project:

The student is to produce a capstone project that is in line with the curricular design of the doctoral program. This includes a 14-week capstone experience for a minimum of 560 hours, which is to occur after the student has completed all required coursework, fieldwork experiences, and the project's preparatory activities.

Resolution of disputes or conflict:

The student is expected to handle any disputes with professionalism and mutual respect between all involved parties. The student will initiate a meeting with the site mentor to acknowledge the problem area and discuss potential solutions. If the situation necessitates, the capstone coordinator or any other involved parties will be notified of the issue and invited to collaborate toward a mutually-agreed upon decision.

Expertise of site mentor:

- Insight from involvement in multiple settings throughout the field of assistive technology
- Knowledge of equipment and services provided by FODAC
- Skill in determining appropriate customizations of equipment based on client's abilities or physical characteristics
- Established rapport with FODAC staff

Roles and responsibilities of student:

- Complete all of the prerequisite courses associated with the capstone experience, including preparatory activities and assignments
- Complete the 14-week capstone totaling 560 hours, ensuring missed hours are accounted for within in an appropriate timeframe
- Follow guidelines and expectations set by the capstone site and site mentor
- Utilize good time management skills by adhering to the deadlines agreed upon in the timeline for completion of the deliverables and the final product

- Demonstrate professionalism in all areas, including but not limited to communication with site mentor and all stakeholders, behavior demonstrated at capstone site, and conduct in the mid-term and final evaluations
- Maintain updated status of time log to document hours completed

Roles and responsibilities of site mentor:

- Help to orient student to the capstone site, staff, and procedures
- Serve as guide to help navigate barriers that might arise at the capstone site
- Attend and participate in regularly-scheduled meetings to monitor student progress
- Provide guidance as necessary in order for student to complete learning objectives
- Provide guidance and feedback for development and dissemination of project deliverables
- Participate in necessary communication exchanges with capstone coordinator, faculty mentor, and/or study participants
- Complete mid-term and final evaluation of student progress

Follows OTD program curricular design:

1. Foundational Knowledge – Reflects broad areas of study (i.e. social, behavioral, biological and physical sciences, education and contemporary society) which serve as foundations to the basic premises of occupational therapy
2. Understanding the Rich Complexities of Occupation (Individual, Family, Community, Society) – Addresses the reciprocal influence of lifespan development on areas of occupation and the health & wellness/illness continua. Focus is given to understanding

the interdependent relationship between one's ability or inability to engage in occupation, and participation in life.

3. Using Occupation as a Basis of Assessment and Intervention: – Focuses on the influence of factors such as: performance skills, performance patterns, context, activity demands and client factors on occupational performance. At this stage, previously constructed knowledge is organized and applied to occupational therapy assessment and interventions throughout the life span. Influence of technology on occupational assessment and intervention are also applied.
4. Investigating Occupation by Integrating Science and Therapy – Focuses on developing research and scholarship skills as well as clinical reasoning skills to practice as an evidence-based therapist.
5. Applying Knowledge to Practice – Applies problem solving skills to assorted clinical contexts for the application of knowledge and skills in diversified environments
6. Advocacy, Leadership and Cultural Competency – Instills acceptance of self as a professional with recognition of concomitant responsibilities, duties and rewards. Integrates the end process of the development of a professional and the beginning of professional development as a culturally competent occupational therapist who can advocate for and lead the profession.