
Complex Environmental Modifications

The American Occupational Therapy Association (AOTA) asserts that the evaluation and provision of complex adaptations and modifications to environments where people complete daily life occupations is within the scope of occupational therapy practice. Occupational therapists and occupational therapy assistants¹ routinely work with individuals and populations who are at risk for limitations in occupational performance and participation as a result of obstacles within their home, work, school, or community environments.

AOTA further asserts that occupational therapy practitioners,² by virtue of their academic training, knowledge, and expertise, can provide solutions to challenges affecting occupational performance and participation in daily life activities of all types that affect individuals across the life course. Furthermore, occupational therapy practitioners are distinctly qualified to be members of interdisciplinary teams composed of professionals in fields such as architecture, construction, city planning, and disability services. Occupational therapy practitioners offer both high- and low-technology equipment options and suggestions for structural alterations, modifications, and space enhancements that provide clients across the life course with access, safety, and efficiency in function.

This document provides a description of complex environmental modifications (CEMs) and highlights the role of occupational therapy practitioners as providers of service within this area. It is intended for internal and external audiences and to inform consumers, health care providers, educators, payers, referral sources, and policymakers about the distinctive skill set and contributions that occupational therapy brings to CEMs. Occupational therapy practitioners recognize the influence of environments (physical and social) and contexts (cultural, personal, temporal, and virtual) on human performance and occupational participation (AOTA, 2014b); this paper focuses primarily on the physical environment.

Complex Environmental Modifications

CEMs are alterations, modifications, or creations of new spaces to meet the needs of an individual, family, group, or community to preserve or facilitate optimal participation in daily life. CEM interventions can include, but are not limited to, a combination of structural changes, assistive technologies (AT), and services. CEMs are differentiated from services in which more basic, simpler, low-tech solutions are adequate to improve function. Examples of more basic solutions may include a tub transfer bench, rug removal, and adapted door knobs.

In addition to the recognition that the modifications to environments can be complex (e.g., installation of home automation systems) is the understanding that the environment itself may offer complex challenges. For example, a complex modification is to create a fully accessible kitchen in a home that not only was built

¹Occupational therapists are responsible for all aspects of occupational therapy service delivery and are accountable for the safety and effectiveness of the occupational therapy service delivery process. Occupational therapy assistants deliver occupational therapy services under the supervision of and in partnership with an occupational therapist (AOTA, 2014a).

²When the term *occupational therapy practitioner* is used in this document, it refers to both occupational therapists and occupational therapy assistants (AOTA, 2006).

in the 1800s but also, because of its historical designation, requires the modifications to meet the guidelines set forth by the town's historic commission.³

Role of Occupational Therapy in Complex Environmental Modifications

As interdisciplinary team members, occupational therapy practitioners working in this area provide expertise in the core knowledge of human function and occupational participation, AT, and specialized products. In addition, occupational therapy practitioners bring a distinct perspective through their knowledge of human development, the impact of physical and cognitive changes through the life course, and knowledge of community resources. With advanced study, occupational therapy practitioners enhance their knowledge in the areas of construction, architecture, structural design, and legislative guidelines.

The occupational therapy perspective in the area of CEMs combines an understanding of the impact of the environment⁴ and context⁵ on a person's occupational performance.⁶ Occupational therapists conduct evaluations and provide consultation, and practitioners provide intervention, training, education, and advocacy to individuals and groups, caregivers, and employers to remove environmental barriers and support occupational performance.

The occupational therapy process involves completion of a comprehensive, client-focused evaluation of the person and the environment and the process of engagement from the perspective of occupational participation. On the basis of the results of the evaluation and in conjunction with the client, the occupational therapist identifies and recommends environmental modifications and AT with a focus on the outcomes of client safety, satisfaction, and participation in desired daily occupations. In addition, the occupational therapy practitioner may manage funding and installation of technologies and modifications as well as the training of clients in their use. Details of the occupational therapy process relevant to CEMs include

- *Evaluation*: Information gathering about the client's occupational performance within his or her physical and social environments and contexts to determine the impact of client factors,⁷ performance skills,⁸ performance patterns,⁹ and occupational participation;
- *Intervention*: Eliminating environmental barriers via a combination of environmental modifications, AT, specialized products, and resources; matching the complex environmental modification or AT with the client's current level of executive functioning to ensure successful occupational performance; and
- *Outcomes*: The results of the interventions, including increased performance, increased ease of use and adaptation of the environment or AT, decreased caregiver burden, and increased participation in daily

³Historic homes also engage another level of regulatory standards that are not within the scope of this document to address.

⁴"The term *environment* refers to the external physical and social conditions that surround the client and in which the client's daily life occupations occur" (AOTA, 2014b, p. S28). *Physical environment* refers to the "natural . . . and built . . . surroundings in which daily life occupations occur" (p. S8). The *social environment* is constructed by the "presence of, relationships with, and expectations of persons, groups, and populations with whom clients have contact" (p. S9).

⁵The term *context* refers to a variety of interrelated conditions that are within and surrounding the client that influence performance, including cultural, personal, temporal, and virtual contexts (AOTA, 2014b, p. S9).

⁶*Occupational performance* is the act of doing and accomplishing a selected action (performance skill), activity, or occupation (Fisher, 2009; Fisher & Griswold, 2014; Kielhofner, 2008) that results from the dynamic transaction among the client, the context and environment, and the activity (AOTA, 2014b, p. S43).

⁷*Client factors* are specific capacities, characteristics, or beliefs that reside within the individual and that influence performance in occupations (AOTA, 2014b).

⁸*Performance skills* are goal-directed actions that are observable as small units of engagement in daily life occupations. They are learned and developed over time and are situated in specific contexts and environments (Fisher & Griswold, 2014).

⁹*Performance patterns* are the habits, routines, roles, and rituals used in the process of engaging in occupations or activities that can support or hinder occupational performance (AOTA, 2014b).

life (Dooley & Hinojosa, 2004; Graff et al., 2006; Hendriks et al., 2008; Heywood, 2005; Mann, Ottenbacher, Fraas, Tomita, & Granger, 1999; Petersson, Kottorp, Bergstrom, & Lilja, 2009).

Examples of services provided by occupational therapy practitioners in the area of CEMs include

- Interventions that require knowledge of AT, environmental modifications, and community resources to ensure that the solutions will meet the client's immediate and future needs;
- Modifications that expand beyond consumer-grade and marketed adaptations such as grab bars, ramps, and AT found at retail and medical equipment stores;
- Modifications for clients with significant changes in function due to injury or disability or those with progressive or chronic conditions such as diabetes, asthma, and obesity;
- Consultation on projects requiring additional knowledge and experience such as remodeling and construction of new homes, work environments, and community spaces, including plan review;
- Consultation on projects that include a general contractor, designer, or architect or modifications requiring building permits; and
- Advocacy for the needs of clients requiring modifications to home and community environments through interfacing with government agencies, payment sources, and community planners.

Client-centered environmental modification interventions provided by an occupational therapy practitioner reduce functional challenges in performing daily living activities, minimize environmental barriers, and enhance perceived quality of life (Szanton et al., 2011). Evidence supports occupational therapy interventions to reduce falls (Campbell et al., 2005; Clemson et al., 2004; Davison, Bond, Dawson, Steen, & Kenny, 2005; Nikolaus & Bach, 2003), promote increased participation in activities of daily living (ADLs); Fänge & Iwarsson, 2005; Gitlin, Miller, & Boyce, 1999; Gitlin et al., 2006; Graff et al., 2006; Petersson et al., 2009; Stark, 2004; Stark, Landsbaum, Palmer, Somerville, & Morris, 2009), increase satisfaction in occupational performance (Graff, Vernooij-Dassen, Hoefnagels, Dekker, & de Witte, 2003; Petersson, Lilja, Hammel, & Kottorp, 2008; Stark et al., 2009), and promote safe performance of caregiving (Dooley & Hinojosa, 2004). Furthermore, occupational therapy interventions directed at the caregiver reduced decline in self-care of family members (Gitlin, Corcoran, Winter, Boyce, & Hauck, 2001), thus decreasing cost of care and delaying institutionalization (Wilson, Mitchell, Kemp, Adkins, & Mann, 2009), as well as increased perceived quality of life (Szanton et al., 2011).

Significance to Society

In 2001, the World Health Organization (WHO), in the *International Classification of Functioning, Disability and Health (ICF)*, described the ability of individuals to participate in life situations as a core component of addressing health and disability. According to the *ICF*, life situations in which participation occurs are identified as learning and applying knowledge; performing general tasks and demands; communication; mobility; self-care; domestic life; interpersonal interactions and relationships; and major life areas, including work, school, community, and social and civic life (Law, 2002; WHO, 2001). These areas of daily living and the view of the human as an occupational being whose level of ability is not a reflection of infirmity but of participation is found throughout the occupational therapy literature and is a grounding tenet of the *Occupational Therapy Practice Framework* (AOTA, 2010a, 2014b; Wood et al., 2000).

Addressing concerns related to participation is the driving force behind the occupational therapy profession's focus on creating spaces for living, working, playing, sleeping, learning, addressing self-care needs, and being involved in the community that are accessible and provide ample opportunities for the level of participation desired by each individual. Occupational therapy practitioners provide services and recommend products to enable consumers and caregivers to live as independently and safely as possible while considering functional limitations and progressive issues of illness, disability, or age-related decline

(AOTA, 2014b; Siebert, Smallfield, & Stark, 2014). Occupational therapy services are provided across the spectrum of ages and settings, as well as during transition from one setting to another. There is a demand for services to be provided to consumers not only to assist with maintaining health and wellness but also to allow for successful aging in place and community participation. CEMs are one means of removing barriers to daily functioning and maintaining independence and quality of life for both consumers and their caregivers.

In addition, supporting older adults and persons with disabilities who wish to live independently and participate in their chosen communities (Bayer & Harper, 2000; Houser, Fox-Grage, & Ujvari, 2012; Lipman, 2012; Redfoot & Houser, 2010) is believed not only to enhance quality of life but also to contain health care costs. Occupational therapy practitioners consulting with clients, their caregivers, builders, designers, and other involved professionals can ensure the most appropriate, evidence-based, safe, and accessible residential design; choice of specialized products; and ergonomically appropriate installation from the design and building team.

Practitioner Qualifications, Professional Development, and Ethical Considerations

Occupational therapy practitioners providing CEMs must assess their own competency and ensure that they are able to safely and effectively recommend, obtain, and install appropriate modifications. To this end, occupational therapy practitioners must adhere to the *Occupational Therapy Code of Ethics (2015)* (AOTA, 2015) and the *Standards of Practice for Occupational Therapy* (AOTA, 2010b) and must abide by federal and state regulations to ensure their competencies as practitioners and the well-being of their clients.

Occupational therapy practitioners choosing to pursue CEM as an area of practice can gain advanced experience through mentoring opportunities, continuing education courses, and review of national and international professional publications on this topic. To address the complex needs and challenges facing clients, additional occupational therapy knowledge and training are needed in the following areas: environmental or functional evaluations, accessible building guidelines, universal design, AT and architectural products and their installation, ergonomic design, and advocacy.

Summary

The goal of occupational therapy is to promote health, well-being, and participation in life through engagement in occupation (AOTA, 2014b). Occupational therapy practitioners bring a distinct skill set to CEMs, addressing needs through a holistic and client-centered approach and providing environmental interventions that facilitate client safety, independence, and participation in daily life occupations within an environment. This skill set supports interprofessional collaboration for best client outcomes. Design, construction, architectural, city planning, and disability providers are increasingly aware of the benefits of working with occupational therapy practitioners. In addition, consumers are seeking the services of occupational therapy practitioners in building and renovating environments to increase accessibility, participation, independence, and safety.

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