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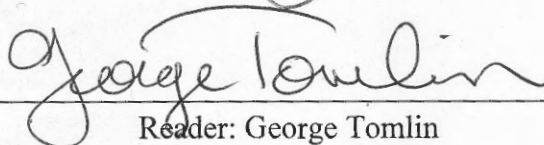
Current Trends in Occupational Therapy Treatment for People with Stroke

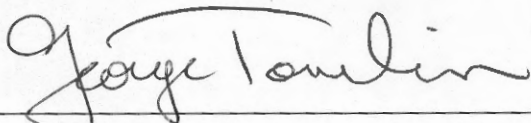
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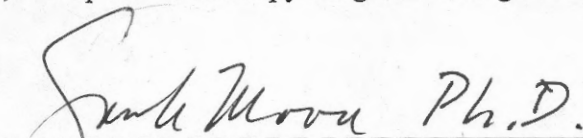
This research, submitted by Kathy Welters, has been approved and accepted in partial fulfillment of the requirements for the degree of Master of Science in Occupational Therapy from the University of Puget Sound.

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## Abstract

The purpose of this study was to describe typical practice in stroke rehabilitation based on self-reports of currently practicing occupational therapists and to determine if research evidence is a factor in treatment decisions. Two hundred and fifty surveys were sent to occupational therapists who were members of the Physical Disabilities Special Interest Section of the American Occupational Therapy Association and 76 completed surveys were returned. The findings indicated that most ADL were addressed commonly with clients post-stroke and that occupation-based methods were used more often than more traditional remediation approaches. Also, there were several treatment methods which therapists commonly used for each impairment often seen following stroke. Clinical experience guided treatment decisions more often than research evidence. This study begins to clarify the complexity of stroke rehabilitation by linking the interventions that are used most often by occupational therapists with specific impairments often seen following stroke.

### Current Trends in Occupational Therapy Treatment for People with Stroke

According to the Centers for Disease Control and Prevention (CDC) (2010), in 2006 stroke was the third leading causing of death and the number one cause of disability in the U.S. It is estimated that 550,000 strokes occur each year and that there are 3 million stroke survivors in the U.S. today (Bartels, 2010). The majority of cerebrovascular accidents (CVAs) occur in people over the age of 65 (Woodson, 2008). As the “baby boomer” generation grows older and there are more people at the age where strokes are more likely to occur, it is expected that the incidence of stroke will increase (Woodson, 2008). The amount and type of impairment that occurs due to a CVA varies depending on where the stroke occurs in the brain and the severity of the damage. There may be deficits in movement, speech, cognition, sensation, vision, and perception (Chang & Hasselkus, 1998). In general, a right CVA (RCVA) may result in left hemiplegia or hemiparesis, difficulties with visuospatial memory, neglect of the left side of the body, poor judgment, and impulsivity, while a left CVA (LCVA) may cause right hemiplegia or hemiparesis, aphasia, and apraxia (Bartels, 2010).

Occupational therapists play a large role in helping people recover after having a stroke. Occupational therapists working in physical disability settings see patients with CVA more often than those with any other diagnosis (Woodson, 2008). Given the variability in stroke sequelae, occupational therapists need to have a wide repertoire of techniques to help each client. According to Ma and Trombly (2002), treatment techniques may include using occupational tasks to help improve cognitive abilities, teaching adaptations to meaningful activities to keep the client involved, and using task-specific movement to help with range of motion and motor control. The role of occupational therapists in CVA rehabilitation is particularly important because they focus on functional outcomes and getting clients back to doing everyday activities

as independently as possible (Brodie, Holm, & Tomlin, 1994). While occupational therapists are aware of the basic differences in impairments after CVA, it is important for them to be familiar with the latest evidence for treatment approaches so that they provide client care with the best possible outcomes.

In order to stay current with the most effective treatment approaches in stroke rehabilitation, occupational therapists need to critically appraise the research evidence. The concept of evidence-based practice is relatively new to the field of occupational therapy. When Margo Holm challenged occupational therapists to become evidence-based practitioners in her Eleanor Clarke Slagle lecture in 2000, there was a push towards using evidence to guide clinical practice. In that lecture Holm (2000) asserted that the occupational therapy profession was being driven to justify what, why, and how occupational therapy improves functional outcomes of clients. This concept of evidence-based practice needs to be applied to every population that occupational therapists encounter, including clients who have had a stroke.

While there are numerous studies about stroke rehabilitation in the occupational therapy literature, they often focus on one specific impairment commonly seen after stroke, such as unilateral neglect (Lin, 1996), communication difficulties (Borod et al., 2000), or visual-perceptual impairments (York & Cermak, 1995). More studies that describe the techniques that occupational therapists use to treat the many impairments seen following a stroke and whether treatments are based on current research evidence are needed in order help determine the best approaches for rehabilitation after CVA.

### **Background and Significance**

Many descriptive studies of stroke rehabilitation and occupational therapy have been conducted in the last decade (Landi et al., 2006; Latham et al., 2006; Lavelle & Tomlin, 2001;

Ma & Trombly, 2002; Phipps & Richardson, 2007; Smallfield & Karges, 2009; Steultjens et al., 2003; Trombly & Ma, 2002). While the findings have been important, none have described how impairments impact the occupational therapist's selection of intervention strategies. Some studies have investigated well-defined impairments following a CVA that may be more common with an infarct in one hemisphere over the other, but none have explored whether or not treatments were chosen based on the current available research evidence (Borod et al., 2000; Lin, 1996; York & Cermak, 1995).

Brodie et al. (1994) carried out a retrospective descriptive study exploring factors that may affect outcomes in stroke rehabilitation. They found that occupational therapists were spending more time working on remediation of the underlying impairments rather than focusing on how the disability was interfering with daily activities (Brodie et al., 1994). While this study examined intervention techniques used by occupational therapists, its retrospective design made it difficult to determine the exact factors that correlated with better discharge outcomes.

Ballinger, Ashburn, Low, and Roderick (1999) conducted a pilot study investigating the treatment strategies of occupational therapists for clients with stroke. Occupational therapists recorded the interventions they used with the clients in a day hospital. Variables such as treatment time, types of intervention, and frequency of intervention were considered. While the study focused on how often interventions were used, the conclusion was made that stroke rehabilitation is too complex for frequency of interventions to be enough to fully describe it.

Ballinger et al. (1999) made a valuable contribution but did not expound on the specific treatments used by occupational therapists based on the impairments seen or on why they chose certain interventions.

Landi et al. (2006) conducted a quasi-experimental study focused on activities of daily living (ADL) of fifty patients on a post-acute rehabilitation unit of a hospital receiving occupational therapy over an eight week period. All participants started treatment with a moderate to severe impairment in ADL. Treatment was focused on improving independence in tasks such as toilet use, feeding, dressing, grooming, and mobility. Interventions included training in functional mobility, neuromuscular re-education, muscle tone management, and contracture prevention (Landi et al., 2006). This study revealed improvement in several ADL following eight weeks of occupational therapy and provided support for the use of occupational therapy in stroke rehabilitation; however, it did not address specific treatments used or whether treatments were varied based on the type of impairments that were initially seen.

Several recent descriptive studies specifically explored occupational therapy interventions and outcomes in stroke rehabilitation. Latham et al. (2006) collected data on clients with stroke at six hospitals around the U.S. The data evaluated included length of stay in the hospital, the number of days and number of times per day occupational therapy was provided, and total time spent on specific activities during occupational therapy sessions (Latham et al., 2006). They concluded that a variety of interventions were used by occupational therapists to help with each activity (i.e., dressing, grooming, eating, toileting). The intervention that was used the most was neuromuscular education, which included balance training and motor learning. This study provided a clearer picture of occupational therapy interventions, but it did not indicate how the clients fared after these treatments or how the treatments were varied depending on the pattern of impairments for individual clients. It reinforced the idea that occupational therapists must have many tools at their disposal to provide treatment for clients with stroke, but did not indicate which tools the therapists used based on the types of impairments seen.

Smallfield and Karges (2009) asserted that the research describing specific strategies that occupational therapists use during inpatient stroke rehabilitation was limited and thus focused their study on intervention. They specifically investigated how often occupational therapists concentrated on prefunctional versus functional activity with clients. Prefunctional activities were those that did not directly focus on areas of occupation but dealt more with body structures and functions. Smallfield and Karges (2009) found that about half of all occupational therapy sessions addressed ADL, but prefunctional activities were done in almost two-thirds of the sessions. This study showed that occupational therapists did not use functional, meaningful activities more than any other intervention during treatment sessions. An important limitation in this study was that their sample came from one hospital, which makes it difficult to generalize. Also, the way therapists documented their interventions varied, making some difficult to categorize.

Lavelle and Tomlin (2001) conducted a retrospective study at an on-campus student occupational therapy clinic to determine whether people with stroke could still benefit from occupational therapy after the acute phase of rehabilitation. They found that the majority of clients made some progress toward their goals and that there was no significant difference in progress between clients with a LCVA or RCVA. This study was limited by inconsistent terminology in goals and different occupational therapy students providing treatment to each client. The lack of experience of the occupational therapy students may also have affected the results. Also, since it was conducted at one on-campus clinic, the results may lack generalizability to other rehabilitation facilities. Krzyminski (2005) did a follow-up study at the same on-campus clinic with similar results.

Phipps and Richardson (2007) studied occupation-based outcomes using the Canadian Occupational Performance Measure (COPM) with clients with stroke or traumatic brain injury. They found an overall increase in perceived performance and satisfaction of clients after occupational therapy. This study showed the importance of having client-centered and occupation-based interventions in occupational therapy, but did not go into detail about the types of interventions used based on the results of the COPM. While this study found information that can be very helpful for occupational therapists, it was limited by the retrospective design and lack of control over occupational therapy treatments. The studies conducted by Latham et al. (2006), Smallfield and Karges (2009), Lavelle and Tomlin (2001), Krzyminski (2005), and Phipps and Richardson (2007) add important information about overall interventions used by occupational therapists to improve outcomes in people who have had a stroke, but none explore why certain interventions are chosen and whether decisions are made based on current research evidence.

Recent studies have clarified the interventions used by occupational therapists, but whether or not the interventions match the current research evidence is still unclear. Several literature reviews have been performed in recent years in order to describe best practice for occupational therapy in stroke rehabilitation. Steultjens et al. (2003) did a systematic review of literature in order to determine whether occupational therapy interventions were effective in improving outcomes for clients with CVA. They found that occupational therapy improved performance in ADL, IADL, and social participation. The main limitation of this study was that different strategies were used at each facility or within each study investigated. Steultjens et al. concluded that occupational therapy was helpful within a multidisciplinary team and that more evidence was needed to determine best practice for occupational therapy in stroke rehabilitation.



Trombly and Ma (2002) conducted an evidence-based literature review specifically exploring role, task, and activity performance of clients with stroke receiving occupational therapy. Their search revealed that participation in occupational therapy after stroke increased performance in ADL and IADL. The authors recommended that occupational therapists use meaningful activities in familiar environments and use adaptations when necessary in order to ensure that clients with stroke have the best possible outcome (Trombly & Ma, 2002). One main limitation of this study was that each piece of literature that was reviewed used different terminology when describing interventions, so it was unclear which aspects of treatment were essential for improving performance. Furthermore, this study did not clarify which interventions worked best depending on the particular pattern of impairments seen in each individual with CVA. In the second part of this literature review, Ma and Trombly (2002) focused on the impact of occupational therapy on impairments after a stroke. The studies explored different aspects of rehabilitation after CVA, including cognition, visual-perception, range of motion, endurance, and coordination (Ma & Trombly, 2002). The lack of studies describing specific interventions used after stroke made it difficult to make recommendations for best practice in occupational therapy. However, Ma and Trombly (2002) concluded “that treatments used by occupational therapists to remediate impairments after stroke are, in general, effective, especially those involving activity or occupation to effect the change” (p. 272). Now this information needs to be expanded to incorporate the rationale behind occupational therapists’ choice of interventions, particularly if they choose their treatment methods based on current research evidence.

While it is understood that occupational therapy helps in showing improvements in those who have had a CVA, the specific treatment methods that are most helpful to this population are still unclear. It is important to understand what occupational therapists do to provide the best

therapy based on the pattern of impairments and whether interventions are chosen based on current research evidence. The purpose of this study, therefore, was to describe, based on the self-report of currently practicing occupational therapists, typical practice when working with clients who have had a CVA. Also of interest in this study were the sources occupational therapists use to justify their interventions.

## **Method**

### **Research Design**

The primary purpose of this study was to determine typical treatment methods used by occupational therapists with people who are recovering from a stroke and to determine the perceived level of evidence used for typical methods. In order to get as much information from as wide an area as possible, and since occupational therapists all over the U.S. commonly work with clients who have had a stroke, a survey was chosen as the most appropriate way to collect data for this purpose.

### **Participants**

The population of interest for this study was all current practicing occupational therapists in the U.S. who work with people who have had a stroke. Since reaching everyone in this population was not feasible, the accessible population of current members of the American Occupational Therapy Association (AOTA) was used. A systematic random sampling of the Physical Disabilities Special Interest Section of the AOTA was taken. This special interest section was chosen because there was a greater likelihood that occupational therapists in this group would be working with people who have had a stroke than in other special interest groups. Currently practicing occupational therapists who had worked with someone recovering from a stroke in the last year met the inclusion criteria.

**Instrumentation**

A survey was created in order to reach a wide sampling of occupational therapists and collect current information that could be used in statistical analysis. The survey included sections on demographics, current practice and specific interventions used with clients recovering from stroke, and use of evidence to guide clinical practice. The demographics and current practice sections included information about years of experience as an occupational therapist, educational degree, region of practice, practice setting, and amount of direct care time working with clients with stroke. The intervention section consisted of questions about time spent working on occupational performance activities as well as time spent remediating specific impairments. Also addressed were the treatment methods the therapist deemed appropriate for each impairment and what evidence was used to justify the treatment method. The final section of the survey provided space for comments so that the respondents could elaborate on any answers. The survey included a combination of question types including close-ended with ordered choices, partially close-ended, and open-ended. A copy of the survey is included in the Appendix.

**Procedure**

After approval from the university Institutional Review Board, a pilot survey was given to six occupational therapists who work with clients who have had a stroke. They were university clinical instructors and professors. The content of the survey, clarity of questions, and estimated time for survey completion was judged by those receiving the pilot survey. Based on the input of this pilot survey, a major revision was completed and a second pilot survey was conducted by two university professors who were familiar with stroke rehabilitation and a clinician currently working with clients post-stroke. The final survey was mailed to 250

occupational therapists who were members of the AOTA Physical Disabilities Special Interest Section. The mailing was sent out in February 2011 via first class mail. It included a cover letter explaining the purpose of the study, the survey itself, and a pre-addressed and stamped return envelope. There was no identifying information on the survey itself and the return envelopes were coded in order to track respondents rather than using identifying information such as names or addresses. When the surveys were returned, they were immediately separated from the envelopes in order to maintain confidentiality and prevent any possible bias by the researcher. After three weeks, a second survey was mailed to the non-respondents.

### **Data Analysis**

Data were recorded and analyzed using the Statistical Package for the Social Sciences (SPSS). Items on the survey were analyzed by calculating the percentage of occupational therapists responding to each answer option. Descriptive statistics were used to report data in the form of central tendency and variability, as appropriate. Correlations and cross tabulations were done to determine if there were relationships or differences between groups.

## **Results**

### **Demographics of respondents**

A total of 107 surveys were returned. Thirty-one of these indicated that they had not worked with clients with stroke in the last year and thus did not meet the inclusion criteria for the study. When subtracted from the original 250 surveys mailed out, the new sample size became 219. This left 76 respondents out of the 219 surveys, which was a response rate of 34.7%. Since only ten of the 76 respondents were from the second mailing, a cross tabulation to determine differences between the two mailings was not completed. The number of years as a practicing occupational therapist ranged from 1 to 40 with a mean of 14.5 years ( $SD = 11.5$ ). Sixty percent

of the respondents entered the profession with a bachelor's degree, the other 40% with a master's degree. There were respondents from every region of the U.S. Ten practice settings were represented (see Table 1), with the highest percentage of respondents working in an acute care setting (32.9%). Eighty-four percent of the respondents worked 31 to 50 hours per week. The percent of direct care time spent working with clients with CVA in current practice ranged from 1% to 95% with a median of 25%. The number of occupational therapy sessions clients received per week ranged from 2 to 14, and the median number of sessions was five. The average length of occupational therapy sessions ranged from 6 to 120 minutes, with a median of 60 minutes.

### **Addressing Occupational Performance Deficits and Specific Impairments**

Respondents were asked how frequently their treatment activities directly addressed specific occupational performance deficits, rating each occupational performance area as *always*, *often*, *occasionally*, *rarely*, or *never*. A wide range of responses were given across varied occupational performance areas, which are illustrated in Figures 1, 2, and 3. For example, 55 respondents (72%) indicated that they *always* worked on safety while no respondents indicated that they *always* addressed sexuality. Most respondents reported they *often* or *always* addressed most of the ADL listed. Most IADL were addressed *occasionally* or *often* by the majority of respondents. Other areas of occupation including rest/sleep, driving, and work were reported as being addressed less frequently. Cross-tabulations were conducted to compare practice setting with occupational performance areas, but no obvious connections were seen.

All of the impairments typically seen post-stroke were commonly addressed, with the exception of dysphagia (see Figure 4). Upper extremity motor control deficits, poor endurance/fatigue, and abnormal tone were treated *often* or *always* by 90% or more of

respondents. All other impairments were addressed *often* or *always* by 66-82% of respondents, except for dysphagia, which 58% of respondents reported they *rarely* or *never* treated.

### **Treatment Methods for Specific Impairments**

The survey included a list of treatment methods for each of several impairments commonly seen after stroke, and the respondents rated how frequently they used each treatment method during intervention as *often*, *occasionally*, *rarely*, or *never*. A variety of treatment methods were used *often* by the majority of respondents for each impairment (see Table 2). Awareness training was used *often* by a high percentage of respondents for sensory loss (85.5%), vision and visual/perceptual problems (78.9%), and cognitive impairments (55.3%). Also, when addressing these same impairments, a modify/adapt approach (teaching compensatory strategies and adapting the environment) was *often* used by a high percentage of respondents. On the other end of the spectrum for cognitive impairments, 45 respondents (59%) indicated that they *rarely* or *never* used errorless learning. Of those 45 respondents, 43 (95%) said it was a lack of knowledge or training that kept them from using it.

The respondents also indicated a number of commonly used treatment methods for physical deficits often seen after stroke, such as poor balance, impaired tone, and motor control deficits. A biomechanical approach was commonly used. Exercise/activity was used *often* by 88.2% of respondents to increase endurance/decrease fatigue, 85.5% of respondents to improve sitting balance, and 55.3% of respondents to improve standing balance. Passive range of motion/stretching was reported as being used *often* to manage abnormal tone by 84.2% of the respondents, to increase PROM by 82.9% of the respondents, and to decrease pain by 57.9% of the respondents. Strengthening was used by 76.3% of respondents to increase upper extremity motor control and elevation was used by 85.5% of respondents to decrease edema.

The task-oriented approach and occupation-based interventions were used more often than the traditional approaches of neurodevelopmental treatment (NDT) and proprioceptive neuromuscular facilitation (PNF) for sitting and standing balance as well as upper extremity motor control. The exception to this was constraint-induced movement therapy (CIMT), which was *rarely or never* used by 44 respondents (58%). Thirty of those 44 respondents (68%) indicated a lack of knowledge or training as the reason for not using it.

Client education was also reported as being commonly used by a high percentage of respondents for several impairments. The education came in varying forms depending on the impairment. Teaching scanning patterns was used *often* by a majority of respondents (60.5%) to help with vision and visual/perceptual deficits, while teaching sitting posture and proper body mechanics were used *often* by a majority to improve trunk control/sitting balance. Fall risk education was *often* used to improve standing balance by 67.1% of respondents. Teaching energy conservation strategies to increase endurance or decrease fatigue and providing safety awareness for sensory deficits were also used by a high percentage of respondents.

Respondents reported less variety in the treatment methods they used *often* for edema and dysphagia. Sixty- respondents (85.5%) said they used elevation *often* to decrease edema, and no other treatment method was used *often* by more than 35.5% of the respondents. Dysphagia was the one impairment that the respondents in this study appeared to rarely treat. Forty-three respondents (56%) indicated not treating dysphagia at all in their setting. Of the 33 remaining respondents, 28 (82%) said they often refer to a specialist when a client presents with dysphagia.

### **Evidence for Chosen Treatment Methods**

Varying numbers of respondents indicated that research evidence guided their treatment decisions for each treatment method. There were 65 treatment methods listed and each one

provided the opportunity for a respondent to report the use of research evidence as their rationale for using it. Twenty-three respondents (30.3%) did not report the use of research evidence for any of the treatment methods used. Of those 23 respondents, 14 had a bachelor's degree as their highest occupational therapy degree, eight had a master's degree as their highest occupational therapy degree, and one had a doctorate. The mean number of treatment methods used based on research evidence was 15.6 ( $SD = 17.9$ ) and the median was 8.5. The number of treatment methods used based on research evidence was not statistically significantly correlated with years of experience or level of occupational therapy degree.

Overall, education (basic or continued) and clinical experience far outweighed research evidence in the respondents' reasons for using particular treatment methods. For any single treatment method, no more than 38% of the respondents cited the use of research evidence to guide treatment decisions. Education was indicated as the rationale behind treatment by over 70% of the respondents for 14 of the 65 treatment methods. Over 70% of respondents also indicated that clinical experience guided their treatment for 39 of the 65 treatment methods listed. None of the respondents provided further information about the use of research evidence in the comments section.

## **Discussion**

### **Limitations**

The complexity and length of the survey used in this study may have deterred some occupational therapists from responding. Results may not be generalizable to the larger population of all occupational therapists who work with clients after a stroke, as the original sample was limited to AOTA members and the response rate was low (34.7%). The options available on the survey for reasons why a treatment method was not used should have included



not having enough time with the client, as 12 respondents (16%) wrote this in. The complexity of stroke rehabilitation itself was difficult to represent in the form of a survey; for example, respondents could not indicate if they used a single treatment method to treat multiple impairments at the same time. The survey also did not solicit data regarding the combinations of impairments respondents commonly saw in clients post-stroke and how the patterns of impairments influenced their clinical reasoning in selecting and prioritizing treatment activities.

### **Use of Occupational Performance Activities in Treatment**

The patterns of use of occupational performance activities to remediate deficits found in the current study expand on the findings of Latham et al. (2006) who looked at interventions used to increase independence in ADL in a hospital-based setting and found that neuromuscular education interventions were used most often. The current study provided more specific information about how frequently ADL are addressed in a variety of practice settings and showed that ADL are commonly addressed directly, not only through remediation of underlying impairments. However, it is difficult to make comparisons between the two studies because Latham et al. (2006) based their findings on the percentage of treatment time in which each intervention was used. The current study also adds to the research conducted by Smallfield and Karges (2009) who investigated prefunctional versus functional activity in occupational therapy during inpatient rehabilitation and found that ADL were addressed in over half of the sessions, but prefunctional activities were used more often. The results of the current study seem to indicate that ADL are directly addressed often in occupational therapy, but that there is also a place for interventions focused on remediation approaches depending on the impairment. For example, strengthening exercises were used commonly to improve upper extremity voluntary

motor control, but fine motor activities were also used often in therapy for this impairment and may be worked on through the use of ADL, such as dressing.

The current study was inconsistent with the findings of a few previous studies. Brodie et al. (1994) found that occupational therapists at that time were using more remediation techniques than focusing on ADL. While the current study did not contrast these two areas of treatment directly, it did reveal that a large number of occupational therapists in stroke rehabilitation report using both techniques and may even use occupation-based approaches more often. This suggests that occupational therapy may have progressed towards a more occupation-based practice in the last 15 years. The results of the current study were also inconsistent with the findings by Ballinger et al. (1999) who investigated the types and frequency of intervention in stroke rehabilitation and found that therapists spend only a small amount of time working on ADL with stroke clients. The respondents in the current study indicated frequent use of several ADL. This variability could be partially due to the specific practice setting used in the previous study or the fact that they looked at percentage of treatment time that each intervention was used rather than overall frequency of use.

### **Treatment Methods for Specific Impairments**

The results of this study also support the finding of Latham et al. (2006) that occupational therapists use a variety of interventions when working with clients who have had a stroke and expands on that finding by linking the interventions used to the specific impairment seen. The current study gives a clearer picture of which interventions are used when a client presents with a given impairment (e.g. impaired sitting balance or sensory deficits). The survey respondents indicated the use of the task-oriented approach and occupation-based interventions more commonly than traditional remediation approaches such as PNF and NDT. This suggests that

occupational therapists are using occupation-based approaches, which should improve overall performance and satisfaction, according to Phipps and Richardson (2007).

It is difficult to quantify the interventions that are used most often in treatment with clients post-stroke because oftentimes more than one method is used for each client. The current study clarifies this complexity by discovering which interventions are used most often by occupational therapists depending on specific impairments. Modify/adapt approaches, such as awareness training and teaching compensatory strategies, are used for impairments that may not recover as quickly, such as cognition and visual/perception. Biomechanical approaches, such as PROM and strengthening, are commonly used for physical impairments. Also, there is an overarching theme of client education used for several impairments, but the type of education given is very specific to the impairment.

### **Use of Evidence in Treatment**

It has now been more than a decade since Holm (2000) called for evidence-based practice in occupational therapy. During that time many changes have been made to occupational therapy curricula and a push towards evidence-based practice has been made. However, the findings of this study suggest that many occupational therapists may still be relying primarily on their entry-level education and clinical experience rather than research evidence in practice. If respondents had indicated more use of research evidence, some of the more empirically-based treatment methods, such as CIMT, may have been used more often in treatment.

The more empirically-based treatment methods indicated on the survey, such as CIMT and errorless learning, were used far less than other methods, due in part to therapists' self-reported lack of knowledge or training. However, even though these methods may not have been taught in the curricula of occupational therapy schools, there is sufficient research evidence

about them that could be drawn upon to justify the use of the treatments during intervention. Education and clinical experience are very important factors for choosing interventions, but as the occupational therapy profession strives to become more scientific, clinicians should incorporate empirical findings to make sure their clients receive the best treatment.

### **Implications for Occupational Therapy**

Occupational therapists play a major role in the recovery of clients after a stroke. In order to give clients the most beneficial treatments, occupational therapists must be knowledgeable about the treatment methods that are most effective. Since such a large portion of clientele with whom occupational therapists work are recovering from stroke, it is important that occupational therapy entry-level programs continue to incorporate information about CVA into the curricula. Clinical experience does play a large role in stroke rehabilitation; however, occupational therapists working in stroke rehabilitation need to supplement their clinical experience with research evidence in order to provide the best treatment for their clients who have had a stroke.

### **Future Research**

It is clear that stroke rehabilitation is a very complex undertaking that needs further research in order to be explained fully. The next step to delve deeper into this complexity would be to investigate the treatment methods that the current study found to be commonly used in clinical settings to determine which ones are lacking research about effectiveness and to gather more empirical data. Qualitative studies with occupational therapists who work extensively with clients following stroke could also provide more insight into the clinical reasoning in choosing treatment methods for each client post-stroke. These qualitative studies may also help clarify why clinicians report that experience guides treatment methods more often than research. Also,

descriptive and outcome studies that focus on occupational therapy in stroke rehabilitation in one specific practice setting, such as Smallfield and Karges (2009), may clarify what impairments and occupational performance areas occupational therapists in each setting focus on and why.

### **Conclusions**

Most ADL are directly addressed during occupational therapy following a stroke while IADL and other areas of occupation, such as leisure and rest/sleep, are not as commonly treated. There are a variety of techniques that can be used to treat each impairment commonly seen in a client after stroke. Currently practicing occupational therapists indicated a stronger use of some more than others in the current study, such as the use of awareness training for visual/perceptual deficits, cognition, and sensory deficits and passive range of motion/stretching to decrease pain, increase soft tissue integrity, and normalize muscle tone. Also, based upon the current study, practicing occupational therapists in stroke rehabilitation rely more on clinical experience than research evidence to determine treatments, even members of the AOTA, who receive the *American Journal of Occupational Therapy* as part of their membership.

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Appendix  
Survey

**Directions:**

The purpose of this survey is to gather data about current trends in occupational therapy treatment for people who have had a stroke and evidence-based practice patterns when choosing treatments. There is a space at the end of the survey for additional comments if needed. Please return this survey in the envelope provided. Your input is greatly appreciated.

**Q1: Are you a registered occupational therapist who is currently working with clients with stroke or has worked**

**with clients with stroke within the last year?**

Yes       No

**If you answered “No” to this question, please stop here and mail your questionnaire back in the prepaid postage envelope provided. This will help me keep an accurate account of response rates.**

**If you answered “Yes” please proceed with the survey.**

**A. Demographics**

**Q2: How many years have you been working as a registered occupational therapist? \_\_\_\_\_ years**

**Q3: With what degree did you enter the profession of occupational therapy?**

Bachelor’s       Master’s       Doctoral

**Q4: What is your highest academic degree?**

Bachelor’s       Master’s       Doctoral       Other (specify): \_\_\_\_\_

**Q5: In what region in the U.S. do you currently practice?**

- Northwest (AK, CO, HI, ID, MT, OR, UT, WA, WY)  
 Southwest (AZ, CA, NM, NV, OK, TX)  
 Midwest (IA, IL, IN, KS, MI, MO, MN, ND, NE, OH, SD, WI)  
 Northeast (CT, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT)  
 Southeast (AL, AR, DC, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV)

**B. Current Practice - For the purposes of this survey, current practice is defined as your practice experience with stroke now or within the past year. Please answer the following questions based on your typical weekly practice.**

**Q6: What is your primary practice setting? (check ONE)**

- |   |  |
|---|--|
| <input type="checkbox"/> Acute Care Hospital              | <input type="checkbox"/> Free-standing Outpatient Facility |
| <input type="checkbox"/> Inpatient Acute Rehabilitation   | <input type="checkbox"/> Home Health                       |
| <input type="checkbox"/> Subacute Rehabilitation Facility | <input type="checkbox"/> Community-Based Program           |
| <input type="checkbox"/> Skilled Nursing Facility         | <input type="checkbox"/> Private Practice                  |
| <input type="checkbox"/> Outpatient (hospital-based)      | <input type="checkbox"/> Other (specify): _____            |

**Q7: How many hours do you work in a typical work week?**

- |   |   |
|---|---|
| <input type="checkbox"/> 0 to 10 hours  | <input type="checkbox"/> 31 to 40 hours     |
| <input type="checkbox"/> 11 to 20 hours | <input type="checkbox"/> 41 to 50 hours     |
| <input type="checkbox"/> 21 to 30 hours | <input type="checkbox"/> More than 50 hours |

**Q8: What percentage of your direct care time is spent with clients who are post-stroke in a typical week?** \_\_\_\_\_

**Q9: What is the average length of service delivery (e.g. 7 days) and the frequency and duration of treatment (e.g. 2x/week for 30 minutes) for the clients you treat post-stroke?**  
 \_\_\_\_\_ Days                      \_\_\_\_\_ times/week for \_\_\_\_\_ minutes

**C. Intervention**

**Q10: How often does your intervention *directly address* the following occupational performance activities for clients who have had a stroke in the setting(s) in which you work?**

Activity	Never	Rarely	Occasionally	Often	Always
Feeding/Eating					
Dressing					
Bathing					
Toileting					
Transfers					
Bed Mobility					
Indoor Functional Mobility					
Rest/Sleep					
Sexuality					
Safety					
Emergency Preparation					
Communication					
Meal Preparation					
Other home IADL (specify):					
Community-Based IADL					
Social Participation					
Driving (direct treatment or referral)					
Other Community Mobility (specify):					
Work					
Leisure					
Other (specify):					

**Q11: For the following impairments often seen post-stroke, how often do you provide *direct treatment to address the deficit*?**

Impairment	Never	Rarely	Occasionally	Often	Always
Vision & Visual/Perceptual Deficits					
Cognitive Impairments					
Impaired Trunk Control/Sitting Balance					
Impaired Standing Balance					









Table 1

*Primary Practice Setting of Respondents (N = 76)*

Practice Setting	Number of Respondents (%)
Acute Care Hospital	25 (32.9)
Inpatient Acute Rehabilitation	13 (17.1)
Outpatient (hospital-based)	13 (17.1)
Skilled Nursing Facility	8 (10.5)
Subacute Rehabilitation Facility	7 (9.2)
Free-standing Outpatient Facility	5 (6.6)
Rural Hospital	2 (2.6)
Private Practice	1 (1.3)
Long-Term Acute Care	1 (1.3)
Veteran's Administration Hospital	1 (1.3)
Home Health	0 (0)

Table 2

*Treatment Methods Used Most Often for Selected Impairments*

Impairment	Treatments Used Most Frequently (%) <sup>a</sup>
Vision and Visual/Perceptual Deficits	Awareness training (78.9)
	Teach compensatory strategies (76.3)
	Teach scanning patterns (60.5)
	Adapt the environment (57.9)
Cognitive Impairments	Modify tasks (76.3)
	Teach compensatory strategies (68.4)
	Adapt the environment (65.8)
	Awareness training (55.3)
Impaired Trunk Control/Sitting Balance	Exercises/activities to improve strength (85.5)
	Teach sitting posture (73.7)
	Seating/positioning (65.8)
	Task-oriented approach (65.8)
	Teach body mechanics (63.2)
Impaired Standing Balance	Functional mobility (73.7)
	Fall risk education (67.1)
	Task-oriented approach (65.8)
	Therapeutic exercise to improve balance (55.3)
Abnormal Muscle Tone	PROM/stretching (84.2)
	Positioning (84.2)



	Inhibitory/Facilitory techniques (53.9)
UE Voluntary Motor Control Deficits	Strengthening (76.3)
	Fine motor activities (75.0)
	Task-oriented approach (69.7)
Soft Tissue Integrity Impairments	PROM/stretching (82.9)
	Positioning (82.9)
	Self-range of motion (75.0)
Pain	Positioning (78.9)
	PROM/stretching (57.9)
Decreased Endurance or Fatigue	Exercises/activities to increase endurance (88.2)
	Teach energy conservation strategies (64.5)
Sensory Deficits	Safety awareness (85.5)
	Teach compensatory strategies (73.7)
Edema	Elevation (85.5)
Dysphagia	Refer to Specialist (36.8)

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<sup>a</sup> Most frequent treatments determined by the percentage of respondents indicating that they *often* use that treatment method.

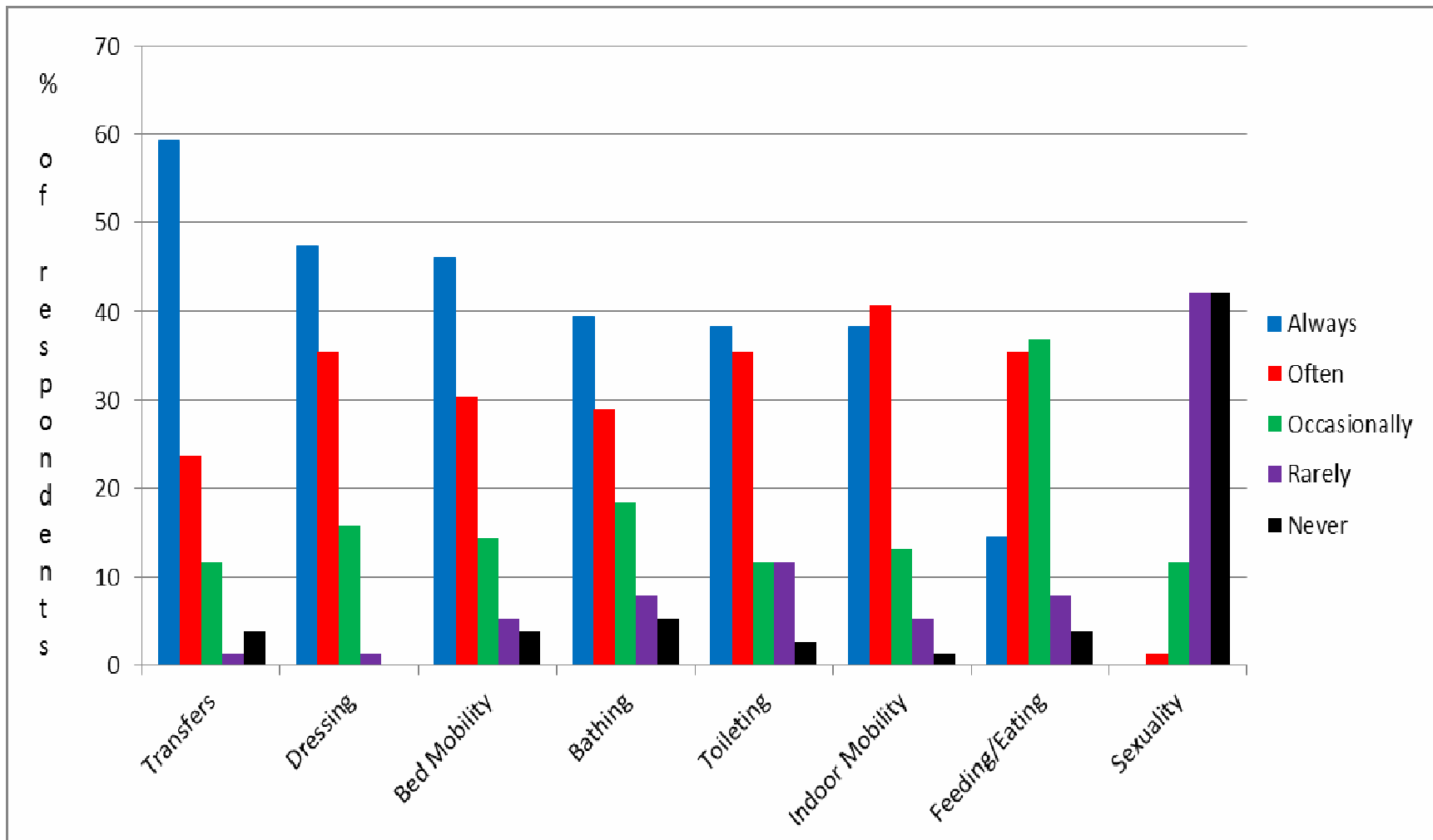


Figure 1. Occupational therapy treatment directly addressing activities of daily living (ADL) with clients post-stroke.

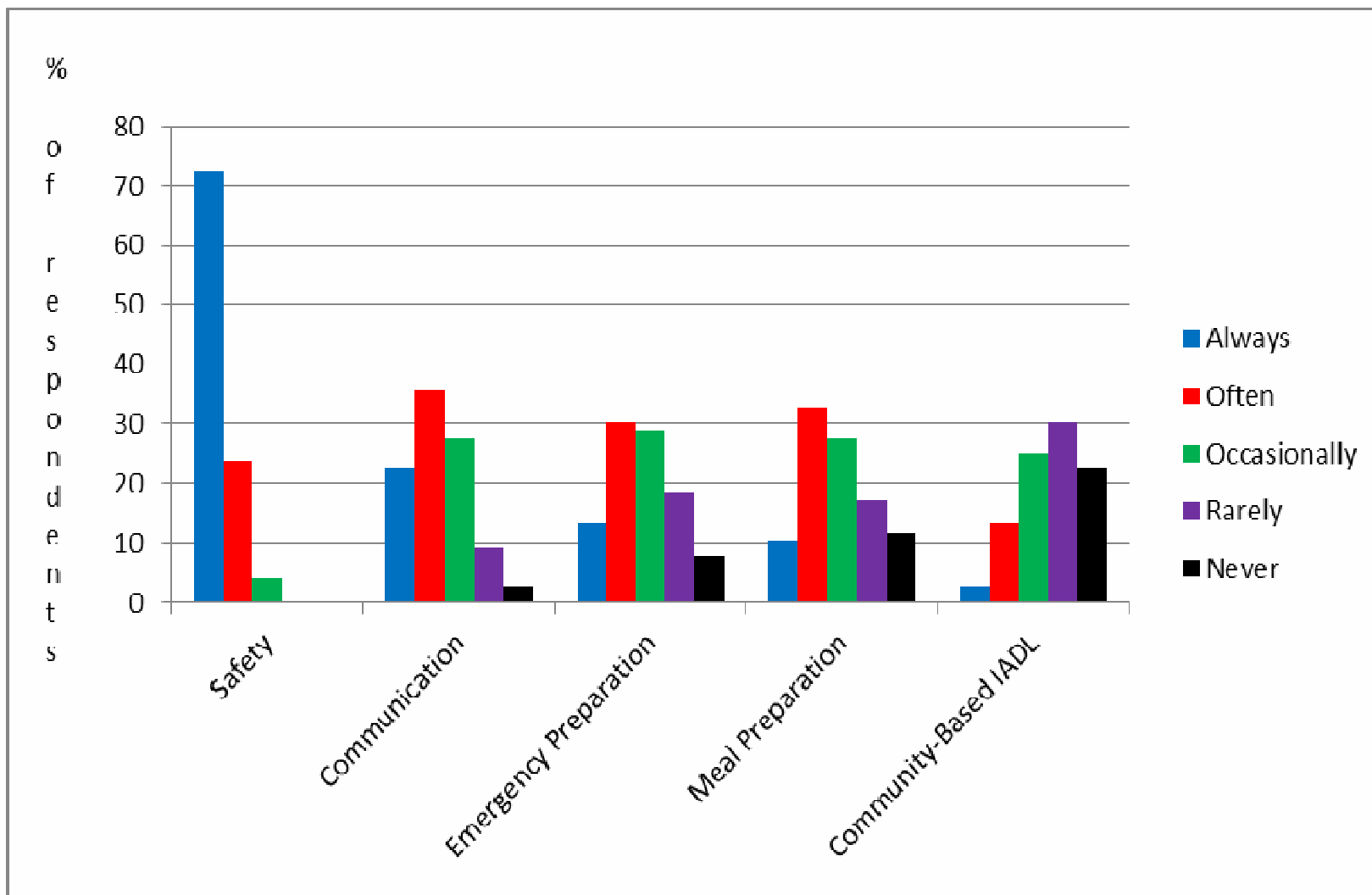


Figure 2. Occupational therapy treatment directly addressing instrumental activities of daily living (IADL) with clients post-stroke.

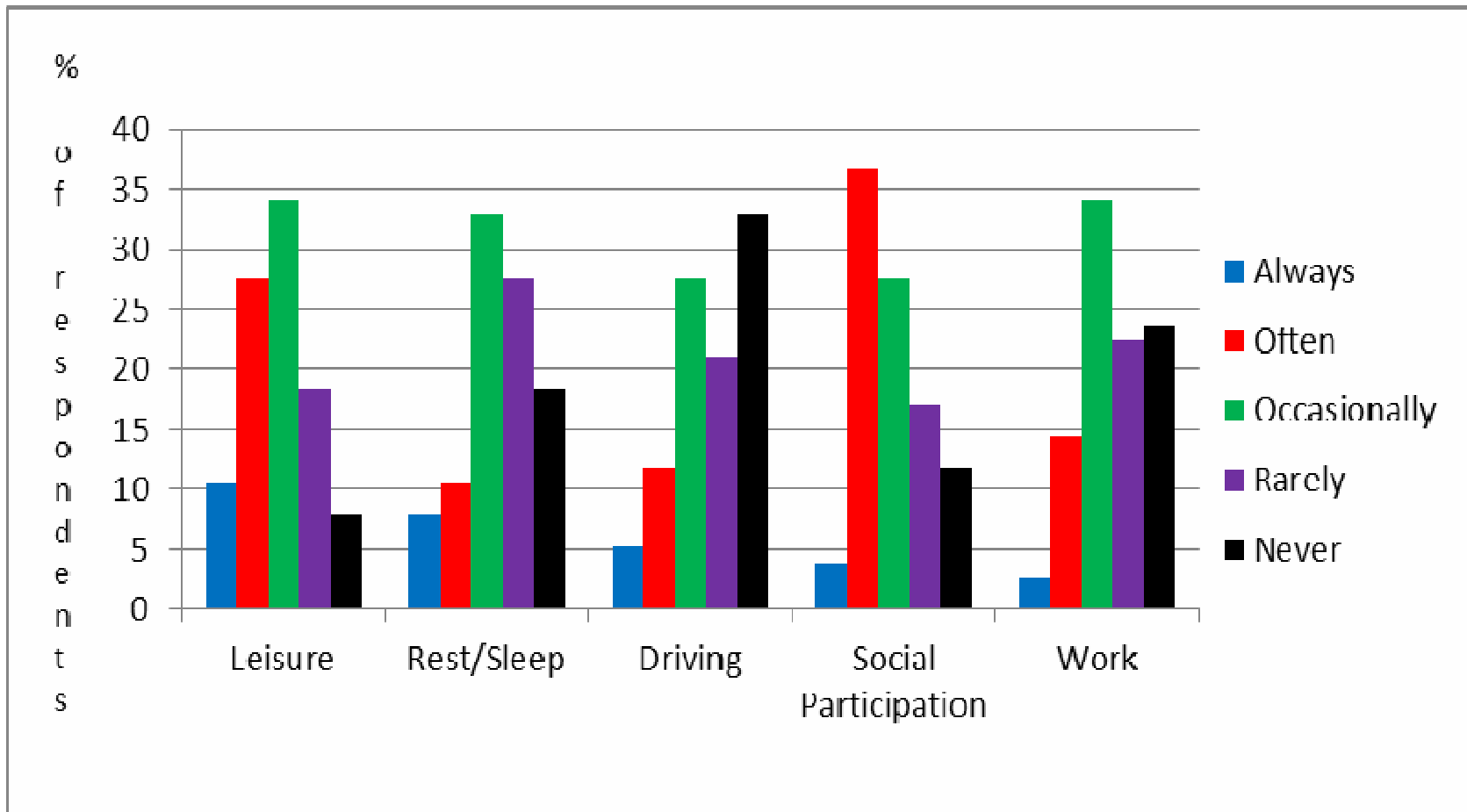


Figure 3. Occupational therapy treatment directly addressing other areas of occupation with clients post-stroke.

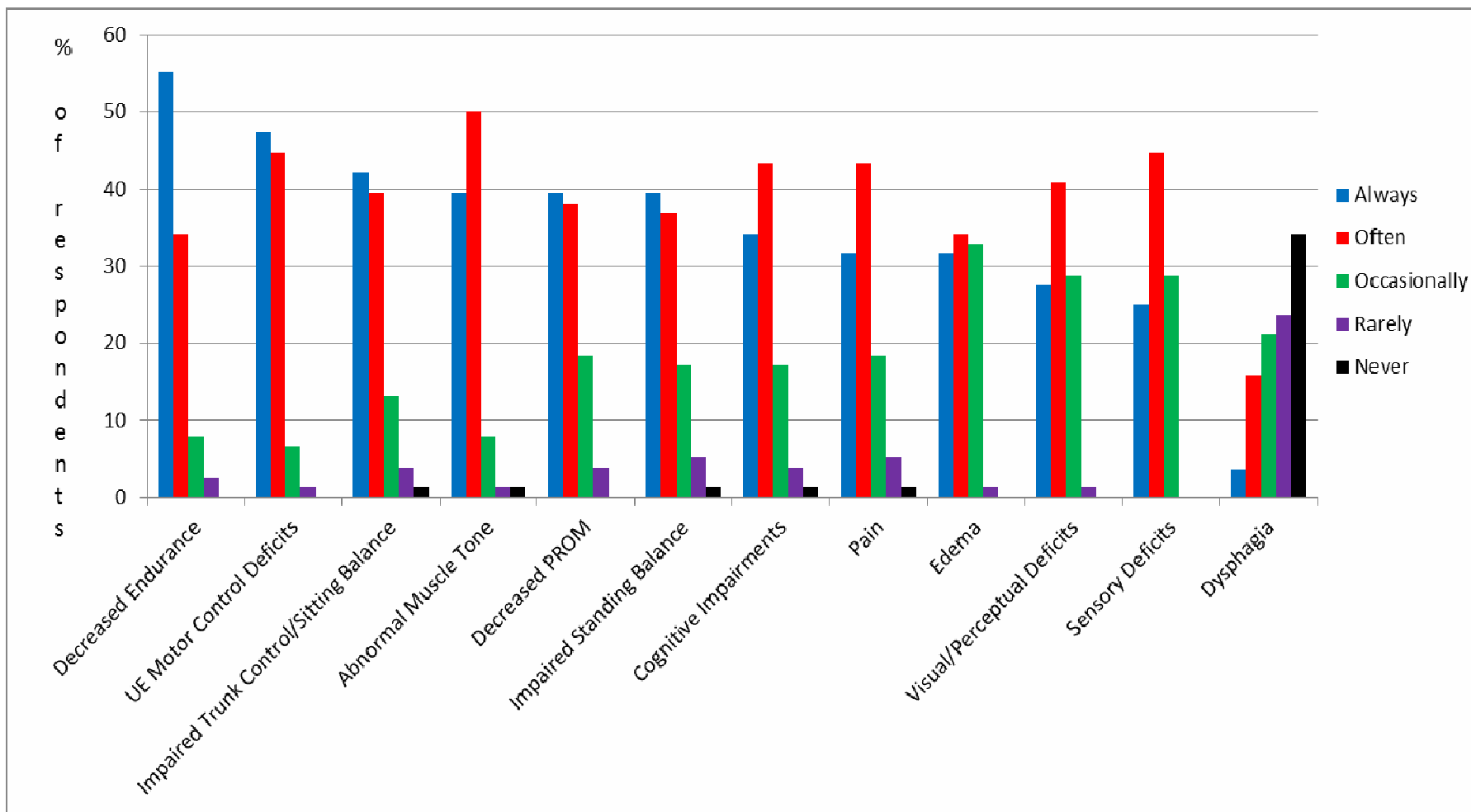


Figure 4. Treatment of impairments commonly seen after stroke in occupational therapy.

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