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Is Constraint Induced Movement Therapy (CIMT) being used?

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Keywords

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Cover Page Footnote

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Credentials Display

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Each year, about 795,000 people suffer a stroke. In fact, stroke is the leading cause of long-term disability in the United States. The "stroke belt" is an area in the Southeastern US and Mississippi Valley that has a high rate of stroke occurrence (Casper, Wing, Anda, Knowles, & Pollard, 1995). With the prevalence of strokes in this region, it would be best practice for therapists in the area (and preferably all geographic regions) to utilize the most innovative, evidence-based techniques for neurorehabilitation. One approach that has strong scientific evidence is Constraint Induced Movement Therapy (CIMT). CIMT is an innovative, evidence-based approach to the rehabilitation of the neurologically-impaired upper limb that forces the use of the impaired limb within the context of structured practice conditions (Wolf, Blanton, Baer, Breshears, & Butler, 2002).

CIMT as evidence-based practice

The ExCITE (Extremity Constraint Induced Therapy and Evaluation), a project funded by the National Institute of Health, was a randomized clinical trial to examine CIMT as a treatment of the affected upper extremity (UE) after stroke. The ExCITE trial established the efficacy of CIMT. Research from this study found that participating in CIMT produces statistically significant improvements in arm motor function when compared to clients who undergo usual and customary care (Wolf et al., 2006). The trial determined that CIMT produces more favorable motor and behavioral outcomes than usual and customary care in stroke survivors three to nine

months after onset (Wolf et al., 2006; Wolf et al., 2008; Wolf et al., 2010). Further research shows that the results of CIMT remain intact for at least two years post treatment (Wolf et al., 2008). It is evident that CIMT is an effective therapeutic approach for the mild to moderately impaired client with hemiplegia. In the authors' opinions, therapists should utilize this method in neurorehabilitation, especially in geographic areas where stroke is most prevalent.

The ExCITE trial defined the signature treatment protocol for CIMT. The signature CIMT protocol is efficacious and produces immediate improvements in arm motor function greater than matched controls (Wolf et al., 2006). Even though the evidence for CIMT is apparent, numerous challenges in implementation of the protocol tend to decrease its use in clinic settings. The signature CIMT protocol has practical limitations for general implementation. The limitations frequently emphasized to administration include patient qualifications, restraint-wearing adherence, time constraints in facilities, and reimbursement issues. Recently, scientific findings cited time constraints, client factors, and therapists' competences as reasons given by therapists for not using CIMT (Blatt & Bondoc, 2011).

Blatt and Bondoc (2011) found that therapists in the Northeast region of the US identified a lack of skills and knowledge in the implementation of CIMT as the most common barrier. In comparison to the Northeast region, therapists within the Southeastern US and

Mississippi Valley should be utilizing the evidence-based practice of CIMT. The authors of this article were unclear about how often therapists use CIMT and how therapists would best like to obtain further knowledge regarding CIMT in order to practice more evidence-based therapies. Therefore, in order to form a better opinion of CIMT use, we conducted a survey to investigate therapists' patterns of use and opinions about CIMT.

The use of CIMT

This survey was conducted among occupational and physical therapists working within the stroke belt in order to assess the use of CIMT and to better understand the methods in which therapists want to receive continuing education and/or assistance with implementation of CIMT. All participants provided their informed consent for this study, which received the approval of an institutional review board. Specifically, the authors were interested in determining the extent to which clinical practice utilizes CIMT, therapists' attitudes toward its use, and factors that may influence a therapist's choice when deciding to use CIMT in practice. The survey also asked about therapists' preferred venues for receiving continuing education. With this information, the authors were able to ascertain what aspects of CIMT need to be disseminated in this region, as well as the best way to implement continuing education and/or services.

The researchers sent a request to complete a survey, based on the one used by Blatt and Bondoc (2011), to 725 occupational therapists, occupational therapy assistants, physical therapists, and physical

therapy assistants. Following IRB approval, the survey was sent electronically via kwik survey. Information obtained included: demographic characteristics, familiarity of use and perceived proficiency with CIMT, alternate approaches used to treat the neurologically impaired UE, CIMT practice type, length of time spent implementing CIMT, and its perceived benefits. In addition, a series of questions asked how the respondent would best like to receive continuing education about CIMT and/or assistance with CIMT services.

A fairly representative sample of therapists in and around the stroke belt region responded to the survey. Sixty therapists (out of 725) completed the survey for a response rate of 8.2%. The respondents consisted of 13 males and 47 females with a mean age of 44 (range 25-65) and a mean of 18 years of practice (range 1-41). Most respondents were occupational therapists (44), but some were physical therapists (15). The most represented places of residence were Arkansas and Texas, with 50% and 19%, respectively. Ninety-three percent of the respondents reported to treat clients with hemiparesis. The mean number of years spent working with clients with hemiparesis was 15 (range 1-37). Work settings varied, but most of the respondents described their practice settings as outpatient rehabilitation (28%, n = 19), inpatient rehabilitation (22%, n = 15), and acute care (10%, n = 7).

There was consistency among most of the intervention goals that the therapists identified and those that are frequently addressed using CIMT,

such as the goals to increase motor control and coordination, normalize tone, and promote normal movement. However, when asked what approaches therapists most use to treat UE neuromotor impairments, the top-rated responses included more traditional practice models, such as Neuro Developmental Treatment (NDT)/Bobath (Bobath, 1977) (incorporating weight bearing, inhibitory positioning, etc., in tasks to achieve motor control), Rehabilitation Approach (Trombly, 2008) (using adaptation of devices and environment to circumvent UE dysfunction), the Task-Oriented/Functional Approach (Bass-Haugen, Mathiowetz, & Flinn, 2008) (an eclectic approach that makes active use of the impaired UE in functional activities), and the Biomechanical Approach (Basmajian & Wolf, 1990) (incorporates orthotics/splints, modalities, and exercise to improve biomechanical function). Some of these approaches have not exhibited the amount of evidence-based research that has been shown with CIMT (Levit, 2002), yet therapists continue to use them. In these authors' opinions, evidence-based approaches, such as CIMT, would more effectively meet the goals identified.

Seventy-five percent of the respondents use or have used some form of CIMT. Half or more of the respondents agreed that they use a modified form of CIMT and that it is effective and consistent with their practice and philosophies. The aspects of

CIMT most utilized involved more typical "forced use" protocols (Van Der Lee et al., 1999). Forced use is usually defined as including restraint of the unaffected UE and encouragement to use the affected UE solely. CIMT differs from forced use by including CIMT in home programs, behavior contracts, home diaries, and extensive one-on-one treatment focused on repetitive and adaptive task practices. Respondents less frequently cited these aspects of treatment.

A typical session using CIMT lasted an average of 46 min (range 20-90 min). The treatment was delivered an average of three times per week (range 0-5 times) for 4 weeks (range 2-8 weeks). Therapists required their clients to complete an average of about 3.5 hr (range 0-15 hr) of home practice. Around half of the respondents rated CIMT as being "somewhat to quite effective" on the following intervention goals: increase amount of arm use, increase motor planning, increase reaching ability, and increase arm range of motion and strength (among other goals). See Table 1 for therapists' perceived efficacy of CIMT on specific UE intervention goals. It is encouraging to note that therapists are introducing CIMT into practice and have confidence in its efficacy. However, CIMT is being implemented for limited lengths of time, which does not reflect the signature CIMT protocol suggested in ExCITE (Winstein et al., 2003).

Table 1

Therapist's perceived efficacy of CIMT on UE intervention goals

(n = 30)	Not Effective	Slightly Effective	Somewhat Effective	Quite Effective	Highly Effective
Increase arm and hand strength	-	13%	52%	35%	-
Increase hand ROM	4%	13%	40%	43%	-
Increase dexterity/manipulation	-	17%	37%	46%	-
Increase grasping ability	-	20%	40%	40%	-
Increase arm ROM	-	13%	39%	48%	-
Increase reaching ability	-	10%	40%	50%	-
Increase FMC	3%	19%	42%	36%	-
Increase amount of arm use	-	10%	33%	50%	7%
Increase motor planning	-	6%	52%	39%	3%
Reduce pain	21%	23%	23%	33%	-
Reduce neglect	6%	6%	33%	49%	6%
Reduce spasticity	10%	27%	30%	33%	-
Increase engagement in occupations	-	16%	29%	45%	-

Note. Highlighted areas indicate majority

As expected, two of the most cited reasons therapists gave for not using CIMT involved client compliance and eligibility to participate in CIMT. These reasons have been reported in other studies (Blatt & Bondoc, 2011) and are frequently spoken of in discussions about CIMT. An interesting finding is that the other top two reasons cited for not using CIMT were the therapists' knowledge base and their confidence in the use of CIMT. See Table 2 for the top 10 reasons respondents gave for not

using CIMT. Further dissemination of knowledge about CIMT can address some of the main reasons cited by respondents for not using CIMT. However, in a typical therapist's world in which time and money for continuing education is extremely limited, what would be the best way to deliver information about CIMT? We want therapists to know and utilize evidence-based practice not only to enhance their clients' rehabilitation outcomes, but to further our profession as well.

Table 2

Top 10 reasons CIMT is not being used

1. Client compliance
2. Therapist's knowledge base
3. Eligibility
4. Therapist's self-reported confidence
5. Client fatigue
6. Time constraints
7. Reimbursement issues and Space/Equipment
8. Decreased interdisciplinary support
9. Therapist's preference *and* Lack of research
10. Facility preference

Increasing the use of evidence-based practice through education of CIMT

In general, therapists did not perceive themselves to be very proficient with the use of CIMT. All of the respondents rated themselves as having intermediate or basic proficiency at best (68%), or no proficiency at all (32%). Seventy-four percent of the respondents stated that they would like more education about CIMT. The most preferred resources were continuing education courses and in-house inservices. However, when asked specifically about the use of a consultant, most respondents thought they would benefit if one were available to help implement CIMT, with 49% specifying the form of online support (email, forums, blogs, etc.) and 24% specifying periodic face-to-face meetings. In addition, two-thirds of the respondents expressed interest in an online peer group that allows therapists to post and answer questions regarding CIMT.

Almost all of the respondents (97%) felt like clinical practice guidelines on the use of CIMT would be of benefit for use in clinical settings. All of the suggested areas for practice guidelines were agreed upon, including evaluation procedures, types of activities to incorporate in the clinic, types of practice schedules, types of home programs, types of equipment and space, and the materials/tools needed. The areas suggested for continuing education and guidelines for practice are logical and would advance the practice of neurorehabilitation.

This survey exhibited that therapists are using more traditional approaches with less evidence-based research, such as NDT and PNF. However, a majority of the respondents reported some use or knowledge of CIMT. The therapists in this survey agreed that CIMT would address most of the commonly stated goals for their clients with hemiparesis. In fact, satisfaction was generally agreed upon with the use of CIMT and its positive

effects on goals. The most commonly used aspects of CIMT include encouragement to use the affected UE and restraint on the unaffected UE. This shows a move beyond mere forced use, and some incorporation of the aspects of CIMT. Practice schedules utilized were significantly less than the signature ExCITE trial protocol (Winstein et al., 2003), but appeared more in line with typical treatment times allowed by third party payers in acute care and inpatient rehabilitation. In conclusion, therapists are using CIMT when they are able, but perhaps not to the extent that has been shown to make significant differences.

How can we help more therapists better implement CIMT? This survey shows that some therapists continue to cite preference for receiving continuing education through formal courses and inservices. The survey also noted a growing acceptance of some form of online support. There

was a resounding agreement on the need for clinical practice guidelines. The results of this research will give the authors an opportunity to offer scientific education and evidence-based practical assistance on CIMT. This study has the potential to contribute to the advancement of our profession by exploring issues related to the use of the innovative technique of CIMT.

In summary, the authors feel that CIMT is one of the few truly evidence-based approaches within the field of neurorehabilitation. CIMT is an evidence-based practice that shows positive results with mild to moderately impaired clients exhibiting hemiplegia. The survey presented here supports the opinion that therapists should use CIMT more frequently. The survey also summarizes the lack of CIMT use within the stroke belt. It supports the need for more education in the use of therapies that have more evidence, such as CIMT.

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