The Bottom Line

The Bottom Line is a translation of study findings for application to clinical practice. It is not intended to substitute for a critical reading of the research article.

What problems did the researchers set out to study, and why?

Low spontaneous use of the upper extremity following stroke is an important predictor of quality of life and function. However, long-term change in arm use following intensive motor learning therapy is variable. Previous research has suggested that this may be related to dose of therapy and the type of motor learning that occurs. The authors of this study set out to determine if a threshold of function exists for patients undergoing rehabilitation for upper-extremity paresis. Above this threshold, spontaneous use would continue beyond therapy; below this threshold, spontaneous use would decrease.

Who participated in this study?

This study was a secondary analysis of data from 169 subjects who completed the Extremity Constraint-Induced Therapy Evaluation (EXCITE) trial.

What new information does this study offer?

The computer models presented in this study confirm the existence of a threshold for arm use following therapy. Immediate assessment of spontaneous arm use after therapy is a rough predictor of long-term arm use.

What new information does this study offer for patients?

This study helps clinicians and researchers understand the non-linear relationship between dose of therapy and arm use after therapy for people with upper-extremity paresis following stroke. An improved understanding of this relationship can help guide interventions to ensure that improvement of arm use continues beyond therapy, specifically related to the dose of the intervention.

How did the researchers go about this study?

The researchers entered data from the EXCITE trial into new computer simulation models. In the EXCITE trial, participants received constraint-induced movement therapy (CIMT) for 2 weeks and were tested both 1 week and 1 year following therapy. The computer simulation models had the ability to demonstrate that arm use following therapy was dependent on a performance threshold.

How might the results be applied to physical therapist practice?

This research helps provide information that can enable clinicians to better determine a stopping point for physical therapy. If function at this point is above a threshold, then improvement in arm performance will continue beyond therapy.

What are the limitations of the study, and what further research is needed?

Future research is needed to determine how clinicians can detect when individuals reach a performance threshold and therapy can be stopped. Limitations of this study included a low predictive value for the computer simulation models and a limited clinical practicality of some of the measured used in the analysis.

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