



Lay Summary

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Feasibility of High Repetition Upper Extremity Rehabilitation for Children with Unilateral Cerebral Palsy

Why was the research done?

Children with movement difficulty due to stroke around the time of birth experience unique challenges throughout life. This often includes struggles with daily activities such as tying shoelaces or playing on the monkey bars. Occupational therapists select and prescribe repeated practice of difficult movements to improve ability to do such tasks. While medications are carefully studied in terms of dose and duration, this is not the case for the use of movement as treatment. This study tries to understand how repetitions of movement practice relate to the ability to do everyday tasks.

How was the research done?

This was part of a larger study for children with unilateral cerebral palsy affecting one side of the body. It included three children's hospitals across Canada. Therapy was provided within a two-week summer camp. Activities focussed on personalized hand and arm movements that were difficult for each child but important to their everyday function. In the first week of camp, children wore a removable splint on their good arm to encourage movement of the affected arm. In the second week, the children focused on using both hands together to achieve their own activity goals (e.g., tying shoelaces). Each day included 90 minutes of one-to-one therapy with occupational therapists. This involved repeated practice of specific movements (e.g., gripping, opening hand, and reaching). The sessions aimed for 300 repetitions of movement per hour; actual repetitions were recorded during the session. Measures of motor function evaluated before and after the camp were compared to the repetition counts.



What were the results of the study?

55 children were included in the analysis. The average across all children was 365 repetitions per hour in week 1 with the dominant hand splinted and 285 repetitions per hour in week 2 while using both hands together. This suggests that high repetition therapy for children with unilateral cerebral palsy is possible. However, there was a very wide range of repetitions per hour across all of the children. Some children were unable to reach 300 repetitions per hour, particularly in week 2.

Improvement on measures of motor function after the camp was linked to higher repetitions per hour. We also found that the type of practice mattered: higher repetitions per hour in week 1 with the dominant hand splinted was related to improved grasp and release by the affected hand. In addition, higher repetitions in week 2 was related to better ability to use both hands together.

What should youth with disabilities and their caregivers know?

Just like improving skill in a sport or playing an instrument requires dedicated hours of practice, improving skills related to everyday tasks for individuals with unilateral cerebral palsy requires many repetitions.

Glossary of terms

Motor function: the ability to control and coordinate muscle movements.

Stroke: an injury due to blockage of blood flow or uncontrolled bleeding in the brain which can cause difficulties with movement and sensation in the body.

Unilateral Cerebral Palsy: difficulty moving primarily one side of the body due to a brain problem (often stroke) present from early in life.

Occupational Therapy: health care that partners with individuals to achieve meaningful everyday activities.

How to cite this summary

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Where can I learn more about this study?

This Lay Summary is based on this article:

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