Comparing Ways to Treat Arm Weakness Due to Stroke

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What was the research about?

Strokes occur when blood supply to the brain is blocked. A common result of stroke is weakness in one arm. One way to treat this weakness is constraint-induced movement therapy, or CIMT. In CIMT, patients work with a physical therapist, usually in person for 30 hours or more for a week.

In this study, the research team compared four ways to treat arm weakness due to stroke, including options for patients to do more at home:

- **In-person CIMT** included 35 hours of clinic CIMT, focused on practicing movement and on increasing use of the weaker arm for day-to-day tasks. Therapists helped patients set goals for arm movement and track use of their weaker arm.
- **In-person CIMT with gaming** included five hours of clinic CIMT, focused on increasing use of the weaker arm. For movement practice, therapists prescribed a video game for 15 hours over three weeks.
- **Video chat CIMT with gaming** included five hours of clinic CIMT plus short video calls between clinic visits. Therapists prescribed a video game for 15 hours over three weeks.
- **Standard care** included five hours of traditional movement practice in a clinic. Therapists asked patients to do strengthening exercises at home.

The research team looked at daily arm use and arm control and speed right after treatment and again six months later.

What were the results?

All types of CIMT improved daily arm use more than standard care right after treatment. In-person CIMT had the greatest improvement. Overall, patients maintained about 61 percent of the improvement in arm use six months later. Types of CIMT with the most therapist contact—in-person CIMT and video chat CIMT with gaming—maintained the most improvement in arm use.

In-person CIMT and video chat CIMT with gaming improved arm control and speed more than standard care right after treatment but not six months later.

Who was in the study?

The study included 193 patients with arm weakness due to stroke. The patients were receiving care at five clinics in four states. The average age was 59, and 64 percent were men. Patients' strokes happened, on average, 4.5 years earlier.

What did the research team do?

The research team assigned patients by chance to one of the four groups. The team assessed daily use and control and speed of the weakened arm before treatment, after treatment, and six months later.

Stroke survivors, their family members, and therapists helped design the study and interpret study results.

What were the limits of the study?

Many patients didn't use the video game for the full 15 hours, which may have decreased how well gaming worked. Also, the research team couldn't assess 42 percent of patients at six months. Results may have differed if the team had had complete data.

Future research could explore ways to maintain improvements in arm use after CIMT and to

encourage patients to follow home rehabilitation programs.

How can people use the results?

Doctors and patients can use the results when considering ways to treat arm weakness due to stroke.

To learn more about this project, visit www.pcori.org/GauthierLarsen354.