**Additional detail regarding the methodology**

**Sample size**

Rasch guidelines (<https://www.rasch.org/rmt/rmt74m.htm>) state that for item calibrations or person measures stable within ± ½ logit and 95% confidence interval, 144 people are required for best targeting. The sample size of 149 participants is thus sufficient.

**Sample**

In contrast to many prior CI therapy studies, relatively broad inclusion criteria were applied to enhance the external validity of the findings. Participants with impaired cognition (unless unable to provide consent) and those with balance/mobility impairments were included.

**Types of Constraint-Induced Movement Therapy** (NCT02631850, NCT03094364, NCT01725919, NCT03005457) The studies were approved by the local institutional review board and conform to the Helsinki Declaration.

Participants in this study received one of six different interventions.

1. Constraint-Induced Movement (CI) therapy: Participants received a 35-hour "dose" of CI therapy. Treatment consisted of 35 therapist/client contact hours in the clinic, 10 weekdays, over 2-3 weeks. To promote carry-over of motor gains to daily activities, participants completed: (1) a treatment contract, (2) daily self-report of arm use, and (3) problem-solving to overcome barriers to use of the more affected upper extremity. In addition, clients agreed to wear a padded restraint mitt on the less affected hand for the majority of waking hours to encourage use of the weaker hand for daily activities. Finally, participants agreed to 30 minutes per day of individualized task-practice outside the clinic (in addition to training in the clinic) focused on functional activities catered towards accomplishing the person's therapeutic goals.
2. Game-based CI therapy #1: Participants were prescribed a target of 30 hours of rehabilitation gaming through in-home video game play over 2 weeks. Participants played the game during times of their choosing for durations of their choosing. As with traditional CI therapy, the client agreed to wear a padded restraint mitt on the less affected hand for the majority of waking hours and to perform an additional 30 minutes per day of individualized task-practice. Five therapist/client contact hours occurred in the clinic on approximate treatment days 1, 3, 6, and 11 focused on treatment elements that could not be readily addressed through the game, such as problem-solving to help the participant carry over motor gains to daily life.
3. Game-based CI therapy #3: This treatment was the same as Game-based CI therapy #1, but the treatment duration and therapist consultation visits were spaced out over 4 weeks. The padded restraint mitt was replaced with accelerometer-based activity monitoring biofeedback devices (PebbleTime smart-watches with app) worn on the more affected wrist. The biofeedback device would prompt movement via vibrotactile cue when a 10-minute period of inactivity was detected.
4. Game-based CI therapy #3: Participants were prescribed a target of 15 hours of progressive massed motor practice through in-home video game play over 3 weeks. Participants played the game during times of their choosing for durations of their choosing. Participants wore activity monitor biofeedback devices (PebbleTime smart watch with app) for the majority of waking hours. As with traditional CI therapy, the client agreed to an additional 30 minutes per day of individualized task-practice. Five therapist/client contact hours occurred in the clinic on approximate treatment days 1, 3, 6, and 11 focused on treatment elements that could not be readily addressed through the game, such as problem-solving to help the participant carry over motor gains to daily life.
5. Game-based CI therapy #4: This group received treatment that was identical to Game-based CI therapy #3 but received an additional 6 video conference consultations throughout the treatment period (4 hours additional face-to-face contact).
6. Control group: Five therapist/client contact hours occurred on approximate treatment days 1, 3, 6, and 11 (same schedule of in-person visits as Game-based CI therapy #3). Treatment time was allocated as follows: one hour of progressive resistance exercise to establish and progress an upper extremity home exercise program, 2 hours of neuromuscular reeducation, and 2 hours functional practice on ADLs with verbal encouragement to use the more affected upper extremity to the largest extent possible. Assigned home practice consisted of stretching exercises, designed to increase range of motion, prescribed twice daily (about 30 minutes total).

**References**

1. Lawshe CH. A quantitative approach to content validity 1. Personnel Psychology. 1975;28(4):563-575.
2. Gagnier JJ, Mullins M, Huang H, Marinac-Dabic D, Ghambaryan A, Eloff B, Mirza F, Bayona M. A Systematic Review of Measurement Properties of Patient-Reported Outcome Measures Used in Patients Undergoing Total Knee Arthroplasty. J Arthroplasty. 2017;32(5):1688-1697.