**Title: Interventions for perceptual disorders in stroke; a systematic review**

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**Introduction**

Perception is the ability to recognize and interpret information from our senses. It is fundamental to an individual’s ability to understand and interact with their environment. Disorders of perception are common after stroke, reducing quality of life. Research evidence relating to effectiveness of interventions is unclear; this Cochrane review update and expansion assessed the effectiveness of interventions for perceptual disorders after stroke1.

**Methods**

We searched key online databases including CENTRAL, MEDLINE and Embase from inception to August 2021. We also searched trial and research registers and screened the reference lists of included studies.

We included randomized controlled trials (RCTs) of any intervention targeting perceptual disorders following stroke and affecting hearing, taste, touch, smell, somatosensation or vision. We excluded deficits of sensation e.g. visual field loss or attention e.g. neglect.

One reviewer screened titles for eligibility. Two reviewers independently screened abstracts and full‐text articles.

Data extraction and risk of bias assessment (using Risk of Bias-1 tool) were conducted by one reviewer and checked by a second; evidence quality was appraised using the Grading of Recommendations, Assessment, Development and Evaluations tool.

We compared the benefits of active interventions with no treatment, control or alternative active interventions, on stroke survivors’ activities of daily living, our primary outcome measure, and other outcomes. Meta-analysis used Review Manager software and a random-effects model.

We involved lived experience (four people) and clinical expert (four people) stakeholder groups throughout the review.

**Results**

Of 94,434 records identified, we included 18 RCTs (541 participants, 535 (98.9%) stroke survivors).

*Hearing, Taste and Smell:* no RCTs were found.

*Somatosensation:* Interventions included robot-assisted gait training, standard physiotherapy, mirror therapy and transcranial direct current stimulation.

* One RCT (n=24) compared active intervention (transcranial direct current stimulation) to control. Activities of daily living were assessed via the Korean Modified Barthel Index. Analysis showed no difference between groups (mean difference 10.08, 95% confidence interval -2.47 to 22.63, P=0.12); the evidence was assessed as being very low quality.
* Three RCTs compared one active intervention (computerized balance and movement training) with another active intervention (‘standard’ Pusher Syndrome physiotherapy) (n=80 with Pusher syndrome). Activities of daily living were assessed using the Korean Modified Barthel Index. Analysis showed the computerized therapy was more effective than standard physiotherapy (mean difference 10.19, 95% confidence interval 4.94, 15.44, p= 0.0001); there was no heterogeneity (I² = 0%) and very low quality evidence.

*Touch:* Interventions included pressure sense training, and hand exercises with an assistive glove.

* One RCT (n=24) compared one active intervention (hand exercises with robotic glove) and another active intervention (conventional hand exercises) using the Modified Barthel Index. Analysis showed no difference between the interventions (mean difference -0.41, 95% confidence interval -12.31 to 11.49). Evidence was very low quality.

*Vision:* Interventions included repeated figure drawing, computer-based games and therapist-led functional activities.

* Two RCTs (n=96) comparing one active intervention with another measured ADL using the Modified Barthel Index; data were not combined due to intervention differences.

**Discussion**

Limited evidence currently exists to determine the effectiveness of any intervention for perceptual disorders impacting any sensory modality.

Clinicians should continue to provide neurorehabilitation for perceptual disorders according to current clinical guidelines.

High-quality trials are needed on interventions for perceptual disorders in stroke. Trials should have sufficient participant numbers, 'usual care' comparisons, and measure longer‐term functional outcomes.

This paper is based on a Cochrane Review published in The Cochrane Library 2022, Issue 11 (see [www.thecochranelibary.com](http://www.thecochranelibary.com) for information). Cochrane Reviews are regularly updated as new evidence emerges and in response to feedback, and The Cochrane Library should be consulted for the most recent version of the review*.*

**Non-standard Abbreviations and Acronyms**

RCT Randomized controlled trial

**Disclosures**

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