

# INPLASY PROTOCOL

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**Review Stage at time of this submission:** The review has not yet started.

**Conflicts of interest:**  
None declared.

## Exercise interventions for treating depression after stroke: A protocol for systematic review and meta-analysis

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**Review question / Objective:** Post-stroke depression (PSD) is one of the most common neuropsychiatric complications after stroke and are associated with increased mortality and poor functional outcomes. Strong evidence shows that exercise has benefits for depression. But it is no clear whether exercise has benefits for PSD. Therefore our purpose of this systematic review is to explore the effects of exercise on post-stroke depression and to determine safe and effective exercise prescriptions.

**Condition being studied:** Post-stroke depression (PSD). PubMed, EMBASE, and Cochrane Library databases will be searched using prespecified search strategies. Randomized controlled trials and non-randomized prospective controlled cohort studies regarding exercise for PSD will be included in this study. The primary outcomes are depression scale and stroke outcome. The secondary outcomes are the occurrence of adverse events, cognitive function, quality of life indices, and the expression of nerve cell factors. The methodological quality of each study will be evaluated by the physiotherapy evidence database scale. The heterogeneity will be evaluated using the I<sup>2</sup> test. If I<sup>2</sup>>50%, the random effects models will be used to analyze. Otherwise, the fixed model will be used to pool the data.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 27 January 2021 and was last updated on 27 January 2021 (registration number INPLASY202110100).

### INTRODUCTION

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after stroke and are associated with increased mortality and poor functional outcomes. Strong evidence shows that exercise has benefits for depression. But it is no clear whether exercise has benefits

for PSD. Therefore our purpose of this systematic review is to explore the effects of exercise on post-stroke depression and to determine safe and effective exercise prescriptions.

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## METHODS

**Participant or population:** Patients diagnosed with post-stroke depression were medically stable enough at the beginning of the intervention.

**Intervention:** The study will include any exercise intervention with unlimited exercise type (aerobic exercise, resistance training, aerobic combined with anaerobic training, upper or lower limb training, Tai Chi and yoga), frequency, intensity or duration. Interventions in any environment will also be included, including outpatient rehabilitation, family rehabilitation, community rehabilitation and hospital rehabilitation.

**Comparator:** Control group should not receive exercise intervention.

**Study designs to be included:** We only considered randomized controlled trials and non-randomized prospective controlled cohort studies of early post-

stroke exercise rehabilitation training published in English.

**Eligibility criteria:** Other types of research, such as observational studies, animal trials, research programs, ongoing trials, etc., will be excluded.

**Information sources:** We will use computer to search the medical subject word (MESH) and text words, using separate or combined index words in the retrieval strategy. The main keywords include: Cerebrovascular Apoplexy, Cerebrovascular Stroke, CVA (Cerebrovascular Accident), Cerebrovascular Accident, Acute Stroke, Acute Cerebrovascular Accident, Post-stroke depression, Depression, Exercise, Exercise therapy, Physical exertion. Interested interventions: Cardiovascular training, Cardiopulmonary training, Aerobic training, Endurance training, Resistance training, Cycling, Treadmill, Tai Chi and Yoga.

**Main outcome(s):** The main outcomes are depression scale and stroke outcome.

**Additional outcome(s):** Secondary outcomes will include the occurrence of adverse events (such as falls, pain, injury, death, etc.), any outcome related to cognitive function (attention and processing speed, memory, language and global cognition, executive function), quality of life indices (such as the World Health Organization Quality of Life), life functions (such as Activity of Daily Living Scale) and the expression of nerve cell factors (such as serotonin and IL-23).

**Quality assessment / Risk of bias analysis:** We will use the recommended scoring, evaluation, development and evaluation (rating) system to evaluate the quality of evidence. The scoring method specifies four quality levels: high, medium, low, or very low. The highest quality level is randomized trial evidence. The reviewer can downgrade the randomized trial evidence to medium, low-quality or even very low-quality evidence according to the existence of several factors.

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**Strategy of data synthesis:** The study will strictly follow PRISMA-statement. We will use Stata V16.0 and Revman V5.3.5 to calculate the mean deviation (MD), standard deviation (SD), confidence interval (CI) and p-value (P). For the continuity variables, we will use the standardized average difference (SMD) of the 95% confidence interval (CI) as the summary statistics of the meta-analysis. We will calculate the depression score before and after intervention in each group by weighted average difference (WMD). For dichotomy data (means adverse events, such as falls and deaths), the Mantel Haenszel method will be used to calculate the combined odds ratio (OR). For those that cannot be quantitatively analyzed, we will describe the results in a narrative way. The total incidence of complications will be summarized by 95% confidence interval. The heterogeneity between the included studies will be evaluated using the I<sup>2</sup> test. If I<sup>2</sup>>50%, the study will be considered as high heterogeneity and the random effects models will be used to analyze. Otherwise, the data will be analyzed using the fixed model.

**Subgroup analysis:** If there have enough randomized controlled trials, we will conduct a subgroup analysis when there is significant heterogeneity in the trials.

**Sensitivity analysis:** If necessary, we will also conduct a sensitivity analysis.

**Country(ies) involved:** China.

**Keywords:** Post-stroke depression, exercise.

**Contributions of each author:**

Author 1 - Wei Zhang.

Author 2 - Yi Liu.

Author 3 - Dongze Li.

Author 4 - Yu Jia.