

# INPLASY PROTOCOL

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## Effectiveness of different exercise training on musculoskeletal function and clinical outcomes in patients with diabetic peripheral neuropathy: A systematic review and meta- analysis

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Zhang, XQ<sup>8</sup>; Yang, Z<sup>8</sup>.

**Review question / Objective:** This study intends to objectively evaluate the improvement of various musculoskeletal function indicators and clinical effectiveness of various exercise programs in patients with diabetic neuropathy by meta-analysis, Selection of study method for the RCT trial.

**Condition being studied:** Diabetes mellitus is considered to be one of the biggest public health problems, and its peripheral neuropathy can negatively affect the function (strength and flexibility) of the foot and ankle joints, further affecting the daily physical activity and quality of life of patients. Exercise treatment programs aimed at strengthening intrinsic and extrinsic foot muscles and increasing flexibility may be a promising approach to improve lower extremity function, prevent further complications, and improve autonomy in activities of daily living in these patients. Therefore, there is an urgent need to find exercise interventions to control and ameliorate peripheral neuropathy. We conducted this systematic review and meta-analysis to summarize the effects of different exercises on musculoskeletal function and clinical outcomes in patients with diabetic peripheral neuropathy.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 30 April 2023 and was last updated on 30 April 2023 (registration number INPLASY202340112).

### INTRODUCTION

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## METHODS

**Participant or population:** Clearly diagnosed DPN patients, aged  $\geq 18$  years.

**Intervention:** Exercise training on the basis of usual care.

**Comparator:** Usual care.

**Study designs to be included:** RCT.

**Eligibility criteria:** ① studies of patients with gestational diabetes. ② literatures that cannot get full text or original data. ③ repeated publications. ④ gray literatures such as conference papers.

**Information sources:** Cochrane Library, PubMed, Embase, Web of Science, Medline, ClinicalKey, CNKI, Wanfang Database, VIP Chinese Journal Database, and Chinese Biomedical Literature Database.

**Main outcome(s):** ankle dorsiflexion range of motion left, ankle plantar flexion range of motion left, hallux strength, toes strength, glycated hemoglobin (HbA1c), Michigan diabetic neuropathy score (MDNS), Michigan neuropathy screening instrument (MNSI), five-time sit-to-stand test (FTSST test), body mass index (BMI).

**Quality assessment / Risk of bias analysis:** Cochrane Handbook for Systematic Reviews 5.1.0.

**Strategy of data synthesis:** Meta-analysis was performed using Review Manager software (Revman 5.4 Cochrane Collaboration). For continuous data, weighted mean difference (MD) analysis was used for the same assessment tool, and standardized mean difference (SMD) analysis was used for different assessment tools. The presence of heterogeneity among studies was determined by the statistic  $I^2$ , which means that heterogeneity among studies was acceptable if  $I^2 < 50\%$ . Fixed effects models were used if  $P \geq 0.1$ ,  $I^2 < 50\%$ . Random effects models were used if  $P < 0.1$ ,  $I^2 \geq 50\%$ , and could not be explained by clinical or methodological heterogeneity. For data that could not be combined, descriptive analysis was selected and subgroup analysis or sensitivity analysis was performed to investigate the source of heterogeneity.

**Subgroup analysis:** In the subgroup analysis by exercise type.

**Sensitivity analysis:** Sensitivity analysis was performed using the Revman 5.4 Cochrane Collaboration to reflect the sensitivity of the article by the change in effect size after the removal of one of the articles.

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

**Keywords:** diabetic peripheral neuropathy, exercise, musculoskeletal function, meta-analysis.

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