

# INPLASY

## Assessing Carpal Tunnel and Associated Neural Structures with Superb Microvascular Imaging: A Study Protocol of Systematic Review

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### ADMINISTRATIVE INFORMATION

**Support** - TSUM.

**Review Stage at time of this submission** - Completed but not published.

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY2023100015

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 05 October 2023 and was last updated on 05 October 2023.

### INTRODUCTION

**Review question / Objective** To determine the role of superb microvascular imaging (SMI) in the evaluation of carpal tunnel syndrome (CTS.)

**Rationale** SMI is an advanced ultrasound technology designed for detecting microvasculature. It employs a sophisticated algorithm to differentiate slow-velocity blood flows from background tissue motion artifacts. Numerous studies have investigated the application of SMI in CTS. Therefore, this systematic review explores SMI's role in diagnosing CTS or assessment of relevant neural structures.

**Condition being studied** The systematic review is constructed upon the PICO (Population,

Intervention, Comparison, Outcome) framework: Population (P): patients with CTS; Intervention (I): SMI; Comparison (C): healthy controls; Outcome (O): median nerve vascularity detected by SMI.

### METHODS

**Search strategy** Two authors will make independent searches in PubMed, Embase, and Web of Science from inception without language restrictions. The search term is as followed: ("carpal tunnel" OR "carpal tunnel syndrome" OR "median nerve") AND ("superb microvascular imaging" OR "blood flow" OR "vascularity" OR "vasculature" OR "vascularization".)

**Participant or population** Human participants with CTS.

**Intervention** SMI.

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**Comparator** Ultrasound imaging modality other than SMI.

**Study designs to be included** Clinical studies.

**Eligibility criteria** Studies that (1) were clinical trials examining the median nerve with ultrasound and (2) utilized SMI to assess median nerve vascularity.

**Information sources** Electronic databases of PubMed, Embase and Web of Science will be searched. The following search term will be used: (“carpal tunnel” OR “carpal tunnel syndrome” OR “median nerve”) AND (“superb microvascular imaging” OR “blood flow” OR “vascularity” OR “vasculature” OR “vascularization”).

**Main outcome(s)** The SMI findings of CTS, with emphasis on its diagnostic ability of CTS.

**Data management** Two independent authors will extract the first author, year of publication, study design, number of participants, demographics, ultrasound machine and setting from the included study.

**Quality assessment / Risk of bias analysis** Two independent authors will rate the quality of the included studies using the Quality Assessment of Diagnostic Accuracy Studies (QUADAS)-2 tool. This checklist encompasses four critical domains: (1) patient selection, (2) index test, (3) reference standard and (4) flow and timing.

**Strategy of data synthesis** Blood flow condition of the carpal tunnel evaluated by SMI as well as other ultrasound modes will be gathered and compared.

**Subgroup analysis** Not applicable.

**Sensitivity analysis** Not applicable.

**Language restriction** No language limit.

**Country(ies) involved** Taiwan.

**Keywords** Carpal tunnel syndrome, peripheral neuropathy, median nerve, superb microvascular imaging, ultrasound.

**Contributions of each author**

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