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Review

## Effectiveness Of Physiotherapy Interventions In Cubital Tunnel Syndrome: A Literature Review

Aiswarya Sri C<sup>1</sup>, R. Sedhunivas<sup>\*2</sup>, Shwetha Sasidharan<sup>3</sup>.



<sup>1</sup>Post Graduate Student, M.P.T. Musculoskeletal Sciences, Garden City University, Bangalore.

<sup>2</sup>Assistant Professor, Department Of Physiotherapy, Garden City University, Bangalore.

<sup>3</sup>Assistant Professor, Department Of Physiotherapy, Garden City University, Bangalore.

\*Author for Correspondence: R.Sedhunivas

Email: sedhunivasravi@gmail.com

	<b>Abstract</b>
Published on: 20 May 2025	<b>Background:</b> Cubital Tunnel Syndrome (CTS) is a common neuropathic condition resulting from the compression of the ulnar nerve at the elbow, leading to symptoms such as pain, numbness, tingling, and weakness in the affected arm and hand. Physiotherapy plays a vital role in the conservative management of CTS by alleviating symptoms, improving function, and preventing progression. This review of the literature explores various physiotherapy interventions utilized in the treatment of CTS, including nerve gliding exercises, stretching, strengthening, manual therapy, and ergonomic adjustments.
Published by: DrSriram Publications	<b>Methodology:</b> A comprehensive literature study was done using the specified search criteria to carry out a literature review, the search phrases "physiotherapy interventions in cubital tunnel syndrome" were employed between the years 2010 and 2024. We have discovered 20 publications with complete text and methodologies for additional examination from diverse academic journals.
2025  All rights reserved.	<b>Results:</b> Recent studies show that nerve gliding exercises can reduce tension and improve ulnar nerve movement, leading to symptom relief. Stretching alleviates muscle tightness while strengthening exercises address weaknesses caused by nerve compression. These conservative approaches are effective for many, but treatment protocols vary, underscoring the need for personalized rehabilitation plans.
	<b>Conclusion:</b> We discovered 20 publications that had physiotherapy interventions in cubital tunnel syndrome for all individuals. All articles designed for his review emphasize the importance of a multidisciplinary approach and individualized care in optimizing patient outcomes for those with CTS.
<a href="https://creativecommons.org/licenses/by/4.0/">Creative Commons Attribution 4.0 International License.</a>	<b>Keywords:</b> Cubital Tunnel Syndrome, physiotherapy interventions, nerve gliding exercises, rehabilitation, ulnar nerve compression, stretching, strengthening.

## INTRODUCTION

Cubital Tunnel Syndrome (CuTS) is a common peripheral neuropathy caused by the compression of the ulnar nerve at the elbow. The ulnar nerve, which is responsible for the motor and sensory function of the forearm and hand, can get trapped in the cubital tunnel. This entrapment leads to symptoms such as numbness, tingling, weakness, and pain, particularly in the ring and little fingers. The condition is often worsened by repetitive elbow flexion, prolonged pressure on the elbow, or direct trauma to the area.<sup>1</sup>

Because the ulnar nerve is not shielded by bone or muscle, damage to it are somewhat common. If left untreated, muscular atrophy, primarily in the hand's dorsal interossei muscles, develops as the illness progresses naturally. It is critical to understand that CuTS is a syndrome, which is a group of symptoms that coexist but may have distinct underlying causes, progressions, and therapeutic modalities.

Managing CuTS usually involves both conservative and surgical treatments. Physiotherapy plays a crucial role in conservative management, aiming to relieve symptoms, improve function, and prevent further nerve damage. Techniques such as nerve gliding exercises, stretching, strengthening exercises, ergonomic adjustments, and manual therapy have been shown to reduce compression on the ulnar nerve, enhance mobility, and improve functional outcomes for those affected. Research indicates that physiotherapy interventions are effective in managing Cubital Tunnel Syndrome. Several studies have suggested that a structured rehabilitation program can significantly alleviate symptoms and enhance the quality of life for individuals experiencing this condition.<sup>1,2</sup>

Motor abnormalities (weakness and atrophy of the hand's intrinsic muscles) gradually develop as sensory complaints increase over time, and this can result in joint contractures, paresis, and irreversible sensory abnormalities. McGowan distinguished three phases of CuTS based on the intensity of symptoms: Stage 1 was characterised by paroxysmal subjective sensory complaints; Stage 2 was marked by considerable sensory loss and hand intrinsic muscle weakness; and Stage 3 was characterised by severe sensorimotor deficits and muscular atrophy.<sup>4</sup>

Treatment choices should be based on the requirements, symptoms, and preferences of each patient because every patient presents differently. In order to offer well-informed suggestions and work with patients to create individualised treatment plans, healthcare practitioners must have a solid awareness of the various treatment modalities that are available.<sup>5</sup>

Moderate to mild symptoms of CuTS can be effectively treated with conservative measures. According to Dellon *et al.*, conservative treatment helped around 90% of patients with grade 1 and 38% of patients with grade. The goal of conservative therapy for CuTS is to reduce elbow joint flexion and the amount of external stress on the nerve.<sup>12</sup>

### Need of the study

A compression of the ulnar nerve in the elbow, which impairs hand and forearm function and causes persistent discomfort and sensory abnormalities. While surgery is an option, many patients benefit from conservative treatments like physiotherapy.

However, the effectiveness and best practices of physiotherapy for CuTS are not well-researched, resulting in inconsistent treatment protocols. With the increasing prevalence of repetitive strain injuries and nerve entrapment disorders, it is crucial to explore how physiotherapy can improve symptoms and functional outcomes while preventing long-term disability.

### Objective of the study

This literature review will specifically analyze existing evidence regarding physiotherapy interventions for cubital tunnel syndrome.

## MATERIALS AND METHODS

### Study Design

This review of literature is based on the PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analysis) guidelines.

### Inclusion Criteria

- Only articles published in the English language will be considered.
- The study will include full-text articles, rather than abstracts or summaries.
- Both sexes are encompassed
- The articles were published between 2010 and 2024.

### Exclusion Criteria

- Articles published in languages other than the regional language were omitted.
- Studies that are not relevant to the specified keywords.
- Articles published before 2010 were excluded.

### Methodology

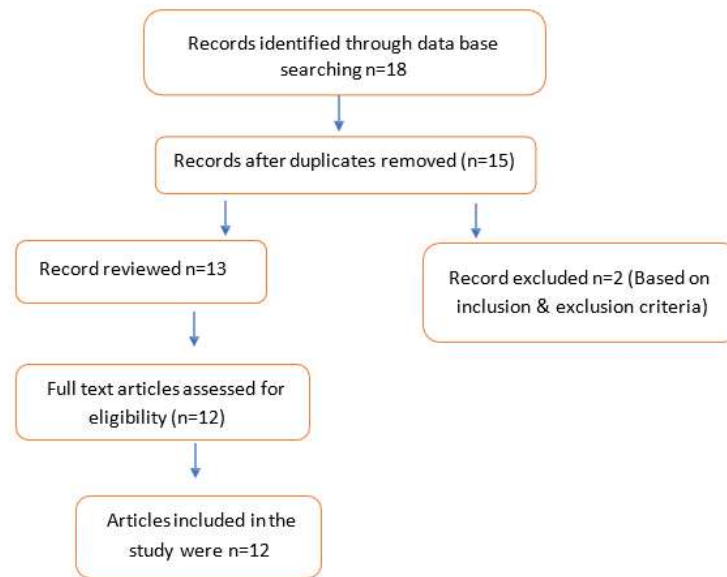
The evidence was gathered from online web publications obtained from different search engines, including Google Scholar, PubMed, and other obesity journals. A tailored search was conducted using physiotherapy interventions in cubital tunnel syndrome to retrieve relevant publications. The period was designated as 2010 to 2024 to gather precise and current facts from throughout the globe over the past decade. We have identified a total of 20 articles that meet our specific criteria for inclusion and exclusion. All 20 publications were obtained in their entirety to be analyzed and continued with further analysis. The results are derived using a systematic approach from all articles and displayed in a tabular format for enhanced comprehension. The selection techniques are detailed in the PRISMA

### Review of literature

Sl no	Author	Title	Duration of treatment	Outcome measures	Study design	conclusion
1	<u>Gurbet ya ğci, meliha kasapoğlu aksoy et al</u> 2024 3	The effects of photobiomodulation therapy in cubital tunnel syndrome, clinical trial	3months	Visual analog scale (vas), the quick disability of arm, shoulder, and hand questionnaire	Randomized clinical trial	Treatment of cuts, laser treatment is superior to placebo in the short term, but they have equivalent effects in the medium term.
2	Hamed mamipour et al 20236	Effectiveness of physiotherapy plus acupuncture compared with physiotherapy alone on pain, disability and grip strength in people with carpal tunnel syndrome: a randomized clinical trial	4weeks	Visual analog scale, boston carpal tunnel questionnaire ,shorte ned disability of arm, shoulder, hand (quick-dash	Randomized clinical trial.	Physiotherapy plus acupuncture, was more effective than physiotherapy alone in <u>pain relief</u> and improving disability of patients suffering from cts.
3	<u>César fernández-de-las-peñas et al</u> 2022 8	Ultrasound-guided percutaneous electrical stimulation for a patient with cubital tunnel syndrome: a case report with a one-year follow-up	1 year	Disabilities of the arm, shoulder and hand outcome measure (dash) and self-reported version of the leeds assessment of neuropathic symptoms and signs (s-lanss) pain scale as outcomes	A case report	Once the patient was treated with ultrasound-guided pens targeting the ulnar nerve, full functional recovery and resolution of symptoms were documented.
4	Dina othman shokri morsigalal pt, phd et	Effect of dry cupping therapy with neurodynamic mobilization on pain intensity,	12months	Cupping therapy ,neurodynamic mobilization methods, strength and closed kinetic	A randomized clinical trial.	The current study does not support the efficacy of adding dry cupping therapy to selected physical

al 2021 9	muscle strength and functional abilities in patients with cubital tunnel syndrome		chain exercises) has an additional effect		therapy program in a patient suffering from cubital tunnel syndrome.
5 <u>Sudarshan anandkumar</u> et al 2019 10	Effect of dry needling on cubital tunnel syndrome	3weeks	Medication, massage, exercise therapy, ultrasound therapy, neurodynamic mobilization, and taping.	A case report	This is potentially a first-time description of the successful management of cubital tunnel syndrome with dry needling (dn) using a recently published dn grading system
6 Alexander graf md 2022 11	Modern treatment of cubital tunnel syndrome	1month	<u>Electrodiagnostic</u> studies, ultrasound, computed tomography (ct), and magnetic resonance image (mri)	Evidence and controversy	Treatment controversies stem from a lack of prospective, randomized, controlled trials of patients with a similar diagnosis being treated with different techniques using standard objective and subjective outcomes measures
7 Mohamed r. gaber et al 2021 12	Ultrasound versus nerve gliding on hand grip strength in cubital tunnel syndrome	6weeks	Measurements of hand grip strength	Randomized controlled trial.	Nerve gliding technique is more effective than ultrasound in improving hand grip strength in cuts patients.
8 Hayat hamzeh pt, msc et al 2021 13	The long-term effect of neurodynamics vs exercise therapy on pain and function in people with carpal tunnel syndrometrial	6months	Symptom severity scale (sss), <u>functional status</u> scale (fss), shortened version of the disabilities of the arm, shoulder, and hand	A randomized parallel-group clinical trial	Although both treatments led to positive outcomes, neurodynamics therapy was superior in improving function and strength and in decreasing pain.
			(dash), <u>numerical pain rating scale</u>		
9 <u>Tomasz wo lny</u>	Manual therapy based on	3weeks	Boston carpal tunnel questionnaire	Randomized controlled	The use of neurodynamic

	et al 15	neurodynamic techniques effective in the treatment of carpal tunnel syndrome			trial.	techniques in conservative treatment for mild to moderate forms of carpal tunnel syndrome has significant therapeutic benefits
10	<u>Irfan koca</u> et al 2014 17	Assessment of the effectiveness of interferential current therapy and tens in the management of carpal tunnel syndrome: a randomized controlled study	3weeks	Visual analog scale (vas), a symptom severity scale, the functional capacity scale of the bctq, and measurement of median nerve motor distal latency (mmdl) and median sensory nerve conduction velocity (msncv)	A randomized controlled study	There was no statistically significant difference between tens and splint therapy with respect to improvement in clinical scores, whereas ifc therapy provided a significantly greater improvement in vas, mmdl, and msncv values than splint therapy
11	<u>Gary kearns</u> et al 2013 18	Medical diagnosis of cubital tunnel syndrome ameliorated with thrust manipulation of the elbow and carpals	6weeks	VAS scale	A case study	this patient was successfully treated with thrust manipulation when joint dysfunction of the elbow and wrist were appropriately identified.
12	<u>Deran oska y pt, phd</u> et al 2010 21	Neurodynamic mobilization in the conservative treatment of cubital tunnel syndrome: long-term follow-up of 7 cases	8weeks	VAS scale	A randomized control	Physiotherapy program consisted of cold application, pulsed ultrasound, nerve mobilization techniques, strengthening exercises, postural adaptations, patient education, and ergonomic modifications.

**Flow chart****DISCUSSIONS**

Cubital Tunnel Syndrome (CuTS) is a common condition that involves the entrapment of the ulnar nerve at the elbow. Various physiotherapy interventions have been explored for their effectiveness in managing CuTS, and the literature presents a promising array of strategies aimed at alleviating symptoms, improving function, and preventing nerve compression.

One of the most widely used physiotherapy interventions is nerve gliding exercises. Several studies have indicated that these exercises help mobilize the ulnar nerve, thereby reducing compression and enhancing its glide through the cubital tunnel (McClure et al., 2020). These exercises are often combined with stretching techniques that target the muscles surrounding the elbow, which further alleviates tension and improves the range of motion. Stretching exercises have been shown to relieve nerve entrapment by reducing muscle tightness and promoting better alignment of the ulnar nerve (Chung et al., 2021).

Strengthening exercises, especially for the forearm and hand muscles, have also demonstrated positive effects in managing CuTS. Weakness in the intrinsic hand muscles, resulting from prolonged ulnar nerve compression, can be addressed with strengthening exercises designed to enhance grip strength and dexterity (Terry et al., 2019). Additionally, manual therapy techniques, such as joint mobilizations and soft tissue therapy, can supplement these interventions by improving elbow joint mobility and reducing muscle spasms around the cubital tunnel (Dagenais et al., 2022).

Ergonomic modifications and lifestyle adjustments are often recommended as part of a comprehensive physiotherapy plan. Proper elbow positioning—particularly avoiding excessive elbow flexion during daily activities is crucial for reducing pressure on the ulnar nerve. Occupational interventions, such as adjusting workstation ergonomics, may also be necessary for patients who perform repetitive tasks that exacerbate their symptoms (McClure et al., 2020).

While physiotherapy interventions show considerable promise, not all patients respond favourably to conservative treatment. Some individuals may require surgical intervention if conservative methods, including physiotherapy, do not alleviate their symptoms. A significant limitation in the current literature is the variability in the protocols for physiotherapy interventions, along with differences in the duration and intensity of treatment programs across studies. Further high-quality randomized controlled trials (RCTs) are essential to establish the optimal approach for managing CuTS through physiotherapy.

**CONCLUSION**

In conclusion, physiotherapy is essential for managing CuTS conservatively. Techniques like nerve gliding exercises, stretching, strengthening, manual therapy, and ergonomic adjustments effectively reduce symptoms and prevent nerve compression. A tailored approach based on individual symptoms is crucial for the best outcomes. While many patients benefit from conservative treatment, those with severe or persistent symptoms may need surgery. However, physiotherapy remains a key early intervention and prevention strategy.

### Limitations of the study

- Many existing studies included small participant groups, which limits the generalizability of the findings.
- There are significant variations in the treatment protocols among studies, making standardization and comparison difficult.
- Most studies do not include long-term follow-up, which is essential for assessing the durability of treatment effects and the recurrence of symptoms.
- Unblinded participants and therapists may introduce bias into the intervention studies, affecting outcomes.

### Recommendations

Future research should prioritize more extensive and diverse studies to strengthen the evidence base regarding physiotherapy interventions for CuTS. It is crucial to standardize parameters such as frequency, intensity, and duration of therapy to facilitate better comparisons across studies. Incorporate long-term follow-ups in studies to evaluate the sustained benefits of treatments and the incidence of symptom recurrence. Future research should compare physiotherapy interventions with both emerging and conventional therapies to help establish clear clinical guidelines. Including patient-reported outcomes and quality of life measures can provide a more comprehensive understanding of treatment benefits.

### Abbreviations

CuTS – Cubital Tunnel Syndrome

NPRS – Numerical Pain Rating Scale

VAS – Visual Analog Scale

BCTQ – Boston Carpal Tunnel Questionnaire

SSS – Symptom Severity Scale

FSS – Functional Status Scale

DASH – Disabilities of the Arm, Shoulder, and Hand NCS - Nerve Conduction Studies

EMG – Electromyography

PRISMA – Preferred Reporting Items for Systematic Reviews and Meta-Analyses

### Declarations

Ethics approval and consent to participate: NA

Consent for publication: YES, we give consent for publication of this study. This study material is not published or under review elsewhere

Availability of data and material: Data openly available in a public repository that issues datasets with DOIs.

Competing interests: None

Funding: NA

### Authors' contributions

Aiswarya Sri C - Conceptualization, design, data collection, implementation, monitoring, data analysis, interpretation and manuscript writing.

R Sedhunivas - Analysis & Review of final manuscript.

Shwetha Sasidharan - Analysis & Review of final manuscript.

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