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CUBITAL TUNNEL SYNDROME: CURRENT DIAGNOSTIC AND TREATMENT STRATEGIES FROM SOCIOECONOMIC AND HEALTHCARE PERSPECTIVES — A NARRATIVE REVIEW

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ABSTRACT

Background: Cubital tunnel syndrome (CuTS) is the second most common compressive neuropathy of the upper extremity, with an estimated prevalence of 1.8–5.9% in the general population. It represents a significant clinical and socio-economic problem, contributing to pain, functional impairment, and reduced work productivity.
Aim: This narrative review aims to summarize current evidence on the pathophysiology, diagnostic approaches, and treatment strategies for CuTS, with particular emphasis on clinical outcomes and implications for healthcare systems.
Methods: A narrative review was conducted using the PubMed database, including systematic reviews, meta-analyses, and clinical studies published between 2017 and 2026.
Results: CuTS pathophysiology involves mechanical compression, traction, and ischemia of the ulnar nerve. Diagnosis is based on clinical examination supported by electrodiagnostic testing and ultrasound. Conservative treatment is effective in mild cases, while surgical techniques, including decompression and anterior transposition, show favorable outcomes. No single surgical method has demonstrated clear superiority. Treatment outcomes are influenced by disease severity and duration. From a healthcare perspective, delayed diagnosis is associated with increased costs and higher rates of surgical intervention.
Conclusion: CuTS requires an individualized, evidence-based approach. Early diagnosis and optimized treatment strategies may improve clinical outcomes while reducing healthcare costs and socio-economic burden. Future approaches should focus on improving diagnostic pathways and access to cost-effective interventions.

KEYWORDS

Cubital Tunnel Syndrome, Ulnar Neuropathy, Diagnosis, Management, Healthcare Systems, Socio-Economic Factors

CITATION

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1. Introduction

1.1 Background and Clinical Significance

Cubital tunnel syndrome (CuTS) is the second most common compressive neuropathy of the upper limb, with an estimated incidence of approximately 25 cases per 100,000 men and 19 cases per 100,000 women annually (Burahee et al., 2021). This condition involves impairment of the ulnar nerve at the elbow region, most commonly due to compression within the cubital tunnel (Cambon-Binder, 2021).

Clinically, cubital tunnel syndrome typically presents with sensory disturbances, such as numbness and tingling in the fourth and fifth digits. In more advanced stages, motor involvement may occur, leading to weakness of the intrinsic hand muscles and impaired manual dexterity (Andrews et al., 2018). In more severe cases or when treatment is delayed, progressive nerve damage may occur, potentially leading to persistent functional limitations over time (Nyman & Dahlin, 2024).

1.2 Pathophysiological Complexity and Diagnostic Challenges

Cubital tunnel syndrome develops through a multifactorial process and cannot be attributed to a single mechanism. Current data indicate that cubital tunnel syndrome arises from several overlapping mechanisms, including direct mechanical compression of the nerve, increased strain during elbow flexion, and alterations in local vascular supply (Hu & Zhou, 2026). Nevertheless, the relative importance of these mechanisms remains incompletely clarified.

From a clinical standpoint, repetitive elbow motion, prolonged flexion, and occupational or lifestyle-related strain are frequently implicated in the development of symptoms (McGurk et al., 2023).

In routine clinical practice, the diagnosis of cubital tunnel syndrome is predominantly based on clinical evaluation. Commonly used physical examination maneuvers, such as Tinel's sign and the elbow flexion test,

may aid in establishing the diagnosis; however, the diagnostic value of these provocative maneuvers is limited when used in isolation (McGurk et al., 2023).

To improve diagnostic accuracy, additional investigations are often required. These include electrodiagnostic studies and imaging modalities. Among these, ultrasonography has gained particular importance due to its ability to assess nerve morphology and detect potential sites of compression (Chang et al., 2018; Fowler, 2025).

Despite these advances, early diagnosis remains challenging, and delays are not uncommon, especially in patients with mild or non-specific symptoms (An et al., 2017).

1.3 Therapeutic Strategies and Clinical Uncertainty

The management of cubital tunnel syndrome includes both conservative and surgical approaches, with treatment selection depending on symptom severity and disease progression. In patients with mild or early-stage symptoms, non-operative strategies—such as activity modification, splinting, and physiotherapy—may be effective in alleviating symptoms and preventing further deterioration (Kooner et al., 2019; Wolny et al., 2022).

In contrast, patients who experience progression of symptoms or insufficient response to conservative treatment may require surgical intervention (Graf et al., 2023). Several surgical techniques have been described, including simple decompression, anterior transposition of the ulnar nerve, and medial epicondylectomy. Despite numerous comparative studies, there is still no clear consensus regarding the optimal surgical approach.

In clinical practice, the choice of surgical method is often individualized and influenced by both surgeon experience and patient-specific factors. This variability reflects the lack of a universally accepted gold standard for the surgical management of CuTS (Abourisha et al., 2024; Wade et al., 2020).

1.4 Socio-Economic Impact and Rationale for the Review

Cubital tunnel syndrome is associated with heterogeneous clinical outcomes and a risk of recurrence, which may necessitate revision procedures and prolonged treatment pathways, thereby contributing to increased healthcare burden (Gu et al., 2025). In addition, recent economic data indicate that surgically treated CuTS imposes a substantial direct financial burden, with median 90-day payments of $5,522 per patient and estimated annual expenditures exceeding $522 million in the United States (Brogan et al., 2025). Furthermore, long-term outcomes may be influenced by the choice of surgical technique, with some evidence suggesting higher revision rates associated with in situ decompression in extended follow-up (Reichenbach et al., 2024).

Given these considerations, there is a clear need for an updated and comprehensive synthesis of current evidence on cubital tunnel syndrome. The aim of this narrative review is to present and integrate available data on its pathophysiology, diagnostic strategies, and treatment approaches, while also highlighting its broader clinical and healthcare implications (Vij et al., 2020).

2. Materials and Methods

2.1 Search Strategy

This study was designed as a narrative review of the existing literature. A literature search was carried out using the PubMed database in March 2026. The search process incorporated various combinations of key terms, including “cubital tunnel syndrome”, “ulnar neuropathy”, “ulnar nerve entrapment”, “diagnosis”, and “treatment”.

Studies published between 2017 and 2026 were considered eligible for inclusion. To enhance the completeness of the review, reference lists of selected articles were manually screened to identify additional relevant publications not retrieved during the initial database search. Only full-text articles written in English were included.

2.2 Study Selection

Articles were included based on their relevance to cubital tunnel syndrome, with particular focus on its pathophysiology, diagnostic methods, and management strategies. Greater emphasis was placed on recent and methodologically robust studies, such as systematic reviews, meta-analyses, and original clinical research.

Studies addressing unrelated peripheral neuropathies, experimental animal models, or those without direct clinical relevance were excluded.

2.3 Data Synthesis

Given the heterogeneity of study designs, methodologies, and reported outcomes, a quantitative meta-analysis was not undertaken. Instead, the collected data were synthesized qualitatively using a narrative approach, enabling a structured and comprehensive overview of the available evidence. Particular emphasis was placed on clinically relevant outcomes and recent high-quality evidence.

2.4 Quality Assessment and Scope of Analysis

Although this study was conducted as a narrative review, particular attention was given to the quality and clinical relevance of the included studies. Priority was assigned to systematic reviews, meta-analyses, and well-designed clinical studies published in peer-reviewed journals. When available, studies with larger sample sizes and clearly defined methodologies were considered more informative for the purposes of this review.

The scope of the analysis focused on key domains relevant to cubital tunnel syndrome, including pathophysiology, diagnostic strategies, conservative management, surgical interventions, and clinical outcomes. Additionally, selected studies addressing healthcare system implications and economic burden were included to provide a broader perspective on the condition.

Due to the narrative nature of this review, no formal risk of bias assessment or statistical pooling of results was performed. However, efforts were made to ensure that the presented evidence reflects current trends and consensus in the literature, with particular emphasis on studies published within the last decade.

2.5 Limitations of the Methodology

It should be noted that the narrative design of this review may introduce a degree of subjectivity in study selection and interpretation of findings. Unlike systematic reviews, the methodology does not follow a predefined protocol for study inclusion, which may limit reproducibility. Nevertheless, this approach allows for a broader and more flexible synthesis of available evidence, particularly in areas where heterogeneity of studies precludes quantitative analysis.

3. Results

3.1 Pathophysiology of Cubital Tunnel Syndrome

Cubital tunnel syndrome (CuTS) is a multifactorial condition involving both mechanical and biological factors affecting the ulnar nerve at the elbow (Burahee et al., 2021; Hu & Zhou, 2026). One of the most widely described mechanisms is increased intraneural pressure within the cubital tunnel during elbow flexion, leading to impaired microcirculation and nerve ischemia (Burahee et al., 2021). During elbow flexion, the diameter of the cubital tunnel may decrease by approximately 55%, with intraneural pressure increasing up to 205 mmHg and nerve elongation reaching approximately 4.7 mm, all of which contribute to mechanical stress and progressive nerve injury (Cambon-Binder, 2021).

In addition to compression, traction forces play an important role. During elbow flexion, the ulnar nerve undergoes elongation and displacement, which may contribute to chronic irritation and progressive dysfunction (Nyman & Dahlin, 2024). Anatomical variations, such as fibrous bands or narrowing of the cubital tunnel, may further increase susceptibility to nerve entrapment (Cambon-Binder, 2021).

These overlapping mechanisms explain the variability in clinical presentation and disease progression observed in patients with CuTS.

3.2 Diagnostic Approaches

The diagnosis of CuTS is primarily based on clinical assessment. Clinical presentation is characterized by ulnar nerve distribution symptoms, often progressing from sensory disturbances to motor deficits in advanced stages (Andrews et al., 2018).

Physical examination remains essential, with tests such as Tinel's sign and the elbow flexion test commonly used in clinical practice. However, their diagnostic accuracy is limited, particularly in early-stage disease (McGurk et al., 2023).

Electrodiagnostic studies are widely used to confirm the diagnosis and assess disease severity, particularly in cases with unclear clinical findings (McGurk et al., 2023). Ultrasonography also allows dynamic assessment of the ulnar nerve, including detection of nerve instability or subluxation during elbow movement, which may not be identified with static diagnostic methods (Fowler, 2025).

Despite the availability of these diagnostic tools, delayed diagnosis remains a common issue and is associated with worse clinical outcomes (An et al., 2017).

Due to the complementary roles of clinical and instrumental assessment, the main diagnostic methods used in cubital tunnel syndrome are summarized in Table 1.

Table 1. Summary of main diagnostic methods used in cubital tunnel syndrome

Diagnostic method	Main clinical role	Advantages	Limitations
Clinical history	Initial recognition of symptoms and their pattern	Simple, low cost, essential in early evaluation	Symptoms may be nonspecific or intermittent
Physical examination	Assessment of sensory deficits, motor weakness, and provocative signs	Easily available, useful in routine practice	Variable sensitivity and specificity; no single test is sufficient for diagnosis (McGurk et al., 2023)
Tinel's sign	Provocative test for ulnar nerve irritation	Quick and simple bedside test	Limited diagnostic accuracy when used alone
Elbow flexion test	Reproduction of symptoms during elbow flexion	Helpful in suspected dynamic compression	False-positive and false-negative results may occur
Electrodiagnostic studies	Confirmation of diagnosis and severity assessment	Objective evaluation of nerve dysfunction; useful in differential diagnosis; Motor conduction velocity across the elbow below 50 m/s or a >20% reduction in CMAP amplitude may support the diagnosis of ulnar nerve compression (McGurk et al., 2023)	May be normal in early disease; requires specialized equipment
Ultrasonography	Visualization of nerve morphology, compression sites, and dynamic instability	Non-invasive, accessible, dynamic assessment possible; cross-sectional area (CSA) measurement may support diagnosis, with a cutoff value of approximately 10 mm^2 (McGurk et al., 2023)	Operator-dependent; limited standardization; cut-off values may vary between studies
MRI	Assessment of surrounding anatomical structures in selected cases	Detailed visualization of soft tissues	Higher cost; not routinely required

As shown in Table 1, no single diagnostic method is sufficient in all cases of cubital tunnel syndrome. Clinical evaluation remains the starting point, whereas electrodiagnostic studies and ultrasonography provide additional information regarding confirmation, severity, and structural abnormalities. This supports a multimodal diagnostic approach, particularly in patients with unclear or early-stage disease.

In clinical practice, the integration of multiple diagnostic modalities appears to provide the highest diagnostic accuracy. While clinical examination remains the initial step, its limitations—particularly in early-stage disease—necessitate the use of additional tools. Electrodiagnostic studies are especially valuable in confirming diagnosis and grading severity, whereas ultrasonography provides structural and dynamic information regarding nerve morphology and potential compression sites (Chang et al., 2018; Fowler, 2025).

Recent evidence suggests that combining electrodiagnostic testing with ultrasound may improve diagnostic accuracy compared to the use of either modality alone (Fowler, 2025). This combined approach may be particularly useful in patients with inconclusive clinical findings or atypical presentations. Furthermore, ultrasonography allows for dynamic assessment during elbow movement, which reflects the functional component of nerve compression and may enhance diagnostic precision.

3.3 Conservative Management

Conservative treatment is typically recommended for patients with mild or early-stage CuTS. The main strategies include activity modification, avoidance of prolonged elbow flexion, splinting (especially at night), and physiotherapy interventions (Kooner et al., 2019; Wolny et al., 2022). Recent studies indicate that conservative management may provide symptom relief and functional improvement in selected patients. Night splinting is commonly used in clinical practice; however, current evidence remains limited and of low quality, with uncertainty regarding its true effectiveness compared to natural disease progression (Bateman et al., 2025).

However, the effectiveness of conservative treatment varies between individuals, and long-term outcomes remain uncertain in patients with more advanced or progressive symptoms. The effectiveness of conservative treatment appears to be strongly dependent on early intervention. Patients presenting with mild symptoms and shorter duration of disease tend to respond more favorably to non-operative strategies. In contrast, individuals with prolonged symptoms or signs of motor involvement are less likely to achieve significant improvement with conservative management alone.

Adherence to recommended interventions, such as activity modification and splinting, also plays a critical role in treatment success. In clinical settings, patient compliance may vary, which can influence outcomes and contribute to variability observed across studies. Therefore, patient education and regular follow-up should be considered essential components of conservative management.

3.4 Surgical Treatment

Surgical intervention is generally considered in patients with persistent symptoms, objective neurological deficits, or failure of conservative therapy (Graf et al., 2023). Several surgical techniques are currently used, and treatment selection is often individualized according to symptom severity and surgeon preference (Abourisha et al., 2024; Graf et al., 2023; Wade et al., 2020).

Some evidence suggests that simple decompression may be associated with higher revision rates compared with transposition procedures, particularly in long-term follow-up (Reichenbach et al., 2024).

Minimally invasive approaches, including endoscopic decompression, have also been evaluated and appear to provide comparable clinical outcomes, although reported complication profiles vary between studies (Abourisha et al., 2024; Fok et al., 2021; Toirac et al., 2017). Injury to the branches of the medial antebrachial cutaneous nerve has been reported to account for up to 90% of postoperative pain cases (Cambon-Binder, 2021).

The final choice of technique is influenced by both patient-related factors and surgeon experience. In addition, available evidence suggests that when clinical outcomes are comparable across surgical techniques, cost considerations should also be incorporated into surgical decision-making, particularly when selecting between decompression and transposition procedures (Kazmers et al., 2019).

Due to the variability of available treatment strategies and the lack of a universally accepted gold standard, a structured comparison of conservative and surgical approaches is presented in Table 2.

Table 2. Summary of main management strategies for cubital tunnel syndrome

Treatment approach	Main indications	Potential advantages	Main limitations
Activity modification	Mild symptoms, early-stage disease	Non-invasive, low cost, easy to implement	Requires patient adherence; may be insufficient in progressive disease
Night splinting	Mild to moderate symptoms, especially nocturnal complaints	Reduces prolonged elbow flexion during sleep; relatively inexpensive	Variable effectiveness; limited benefit in advanced disease
Physiotherapy	Mild to moderate disease; adjunctive conservative care	May improve symptoms and function; supports non-operative management	Lack of standardization; outcomes vary across studies
Simple decompression	Persistent symptoms; failure of conservative treatment	Technically straightforward; less invasive than transposition; associated with favorable safety profiles in comparative analyses (Wade et al., 2020)	May be associated with higher revision rates in long-term follow-up, with reported revision rates of 11.9% for decompression compared to 3.2% for transposition after ≥48 months (Reichenbach et al., 2024)

Treatment approach	Main indications	Potential advantages	Main limitations
Anterior transposition	More advanced disease; selected anatomical or recurrent cases	Useful in selected patients; widely used surgical option	More extensive procedure; may be associated with higher complication or reoperation risk in some comparative analyses (Wade et al., 2020)
Medial epicondylectomy	Selected surgical cases	Alternative surgical option in specific anatomical settings	Less commonly used; evidence base is more limited
Endoscopic decompression	Selected patients; minimally invasive surgical management	Reduced tissue disruption; potentially faster recovery	Requires experience and equipment; may be associated with higher complication rates compared with open decompression (Abourisha et al., 2024).

As shown in Table 2, both conservative and surgical approaches play an important role in the management of cubital tunnel syndrome. Conservative strategies are primarily recommended in early-stage disease due to their low risk and cost-effectiveness, whereas surgical intervention is generally reserved for patients with persistent or progressive symptoms.

The absence of clear superiority among surgical techniques further supports an individualized approach, taking into account patient-specific factors, symptom severity, and clinical presentation.

Patient selection remains a key determinant of surgical success. Individuals with clearly defined nerve compression and objective neurological deficits are more likely to benefit from operative intervention. Conversely, patients with nonspecific symptoms or unclear diagnosis may experience less predictable outcomes.

In addition, the choice of surgical technique is often influenced by intraoperative findings and anatomical considerations. For example, anterior transposition may be preferred in cases with nerve instability or anatomical variations, whereas simple decompression may be sufficient in patients without these features. This highlights the importance of individualized decision-making in surgical management.

3.5 Outcomes and Prognostic Factors

Both conservative and surgical treatments may lead to improvement in symptoms and functional outcomes, particularly when intervention is initiated early. However, delayed diagnosis and prolonged nerve compression are associated with poorer prognosis and increased risk of persistent deficits (Gu et al., 2025).

Recurrence and the need for revision surgery remain important clinical challenges, with reported revision rates ranging from 1.2% to 23.8% across retrospective cohorts (Gu et al., 2025).

Factors such as disease severity, duration of symptoms, and variability in surgical technique may influence long-term outcomes (Pokharel et al., 2025). Patients undergoing surgical treatment for cubital tunnel syndrome may achieve favorable quality of life and satisfaction outcomes, although these outcomes appear to be influenced by factors such as symptom duration and patient-related characteristics (Córdoba-Mosqueda et al., 2023).

Overall, the available evidence highlights the importance of early recognition and individualized treatment strategies to optimize patient outcomes.

In addition to clinical factors, patient-related variables such as age, comorbidities, and occupational demands may influence treatment outcomes. Individuals engaged in repetitive upper limb activities may experience slower recovery or higher recurrence rates. Similarly, the presence of systemic conditions, such as diabetes, may negatively affect nerve regeneration and overall prognosis.

In clinical practice, outcome assessment in CuTS should not rely solely on surgical or clinical parameters, but also take into account individual patient-related factors that can influence recovery and long-term function.

4. Discussion

The present review highlights that cubital tunnel syndrome (CuTS) remains a complex and multifactorial condition, characterized by considerable variability in clinical presentation, diagnostic pathways, and treatment outcomes. Although traditionally considered a consequence of static mechanical compression of the ulnar nerve within the cubital tunnel, current evidence supports a more comprehensive pathophysiological model. In particular, dynamic factors such as traction during elbow flexion and alterations in intraneural vascular supply appear to play a significant role in disease development and progression. The interaction of compression, strain, and ischemia provides a plausible explanation for the heterogeneity observed in symptom severity, disease course, and response to treatment (Hu & Zhou, 2026; Nyman & Dahlin, 2024).

An important factor contributing to ulnar nerve entrapment is anatomical variability within the cubital tunnel. Structural differences, including narrowing of the tunnel, the presence of fibrous bands, and variations in nerve stability and mobility, may increase susceptibility to compression and influence clinical presentation (Cambon-Binder, 2021). These anatomical considerations may also contribute to variability in treatment outcomes, further supporting the need for individualized therapeutic approaches rather than a uniform management strategy.

From a diagnostic standpoint, clinical evaluation continues to represent the foundation of CuTS diagnosis. However, the limitations of clinical assessment alone are well recognized. Provocative tests, such as Tinel's sign and the elbow flexion test, are widely used but demonstrate variable sensitivity and specificity, particularly in early-stage disease (McGurk et al., 2023). Consequently, there is increasing reliance on adjunctive diagnostic modalities to improve accuracy and support clinical decision-making. Electrodiagnostic studies are commonly used for confirming diagnosis and assessing disease severity. They provide objective measurements of nerve conduction and are particularly useful in differentiating cubital tunnel syndrome from other neuropathies (McGurk et al., 2023).

Nevertheless, it should be noted that electrodiagnostic findings may be normal in early or mild cases, which may contribute to underdiagnosis or diagnostic delay.

Moreover, ultrasound allows for dynamic assessment during elbow movement, which is particularly relevant given the dynamic pathophysiology of CuTS. Despite these advantages, its utility may be limited by operator dependency and variability in standardization across clinical settings. Ultrasound findings should always be interpreted in conjunction with clinical presentation, as imaging alone may be insufficient for establishing the diagnosis (Chang et al., 2018).

A consistent finding across the reviewed literature is the problem of delayed diagnosis. Patients with CuTS often present with mild or intermittent symptoms, which may be overlooked or attributed to other musculoskeletal conditions. This frequently leads to delays in referral and initiation of appropriate treatment (An et al., 2017). From a clinical perspective, such delays are highly relevant, as prolonged nerve compression is associated with structural changes and less favorable functional recovery. Early recognition and timely intervention therefore represent critical factors in improving patient outcomes.

Conservative management is generally recommended in patients with mild or early-stage disease and typically includes activity modification, splinting, and physiotherapy (Kooner et al., 2019; Wolny et al., 2022). These approaches are relatively low-risk and cost-effective, making them attractive as first-line options.

However, the effectiveness of conservative treatment is variable and appears to depend on several factors, including duration of symptoms, degree of nerve compression, and patient adherence. The evidence supporting specific conservative interventions, particularly night splinting, remains limited and of low methodological quality, which contributes to uncertainty in clinical decision-making (Bateman et al., 2025).

Although most published studies report clinical improvement following physiotherapy, the overall quality of evidence remains limited, with substantial heterogeneity in study design, small sample sizes, and a high risk of bias (Wolny et al., 2022).

Evidence from systematic reviews indicates that selected conservative strategies, such as activity modification and splinting, may lead to symptom improvement in a substantial proportion of patients, with reported improvement rates reaching up to 80–90% in mild to moderate cases (Kooner et al., 2019). Furthermore, although most studies report positive outcomes, the lack of standardized physiotherapy protocols limits comparability between studies (Wolny et al., 2022). Patients with longer symptom duration or more advanced disease are less likely to benefit from non-operative management, highlighting the importance of appropriate patient selection and early intervention.

Surgical treatment is indicated in patients with persistent symptoms, neurological deficits, or failure of conservative therapy. The decision to proceed with surgery is also influenced by symptom severity, duration

of nerve compression, and the presence of motor dysfunction, which remain important clinical considerations in operative planning (Graf et al., 2023).

A variety of surgical techniques are currently employed, including simple decompression, anterior transposition, and medial epicondylectomy (Carlton & Khalid, 2018; Graf et al., 2023). Medial epicondylectomy has been associated with improvement in McGowan grade in approximately 79% of patients and good or excellent outcomes in up to 83% of cases (Cambon-Binder, 2021).

Despite numerous comparative studies and meta-analyses, there is no universal consensus regarding the superiority of any single technique, with most evidence demonstrating comparable outcomes across procedures (Abourisha et al., 2024; Carlton & Khalid, 2018; Wade et al., 2020). Network meta-analysis of randomized trials has shown no significant differences between techniques in response to treatment, re-operation rates, or return to work, although differences in complication profiles and postoperative pain may still exist (Abourisha et al., 2024). Endoscopic decompression has been associated with a higher complication rate compared with open in situ decompression (OR 4.21), although it may reduce postoperative chronic pain (Abourisha et al., 2024). In addition to functional outcomes, safety profiles and complication rates should also be considered when selecting a surgical technique, as different procedures may be associated with varying risks (Wade et al., 2020). A wide range of conservative and surgical treatment options has been described, reflecting the complexity of clinical decision-making in cubital tunnel syndrome (Vij et al., 2020).

Minimally invasive approaches, particularly endoscopic decompression, have gained increasing attention. These techniques aim to reduce tissue trauma and facilitate faster postoperative recovery while maintaining clinical effectiveness (Fok et al., 2021; Toirac et al., 2017). In one systematic review, the rate of excellent or good outcomes was 92.0% for endoscopic release compared with 82.7% for open decompression, with a lower pooled odds of complications (OR 0.28) (Toirac et al., 2017). In some comparative studies, endoscopic techniques were also associated with a markedly shorter time to return to work compared with more invasive procedures (approximately 7 vs 71 days) (Fok et al., 2021).

Early results are promising; however, long-term data remain limited, and their widespread adoption may be influenced by the need for specialized equipment and surgical expertise.

An important but often underemphasized aspect of CuTS management is the influence of patient-related factors on treatment outcomes. Variables such as age, comorbidities, occupational demands, and baseline functional status may significantly affect both disease progression and response to treatment (Gu et al., 2025). However, these factors are not consistently accounted for in existing studies, which may limit the generalizability of findings.

From a socio-economic perspective, CuTS represents a significant burden on both patients and healthcare systems. The condition may be associated with reduced work productivity, increased absenteeism, and higher utilization of healthcare resources. In more advanced cases, the need for surgical intervention and prolonged rehabilitation may further increase both direct and indirect costs (Vij et al., 2020).

Delayed diagnosis and suboptimal management contribute substantially to this burden. Early-stage disease is often amenable to conservative treatment, which is less costly and associated with lower resource utilization. In contrast, advanced disease frequently requires surgical intervention, which involves higher costs and longer recovery periods. Therefore, improving early detection and optimizing treatment pathways may have important implications not only for clinical outcomes but also for healthcare efficiency and cost reduction.

Healthcare system factors also play a critical role in the management of CuTS. Variability in access to diagnostic tools, specialist care, and surgical expertise may influence both diagnostic timelines and treatment outcomes. In some settings, limited availability of electrodiagnostic studies or ultrasonography may contribute to prolonged diagnostic pathways. Optimizing healthcare pathways, including improving access to early diagnostic evaluation and standardizing referral processes, may therefore represent an important strategy for improving outcomes. In addition, multidisciplinary collaboration between primary care physicians, neurologists, physiotherapists, and surgeons may facilitate more coordinated and efficient care.

Despite the growing body of literature, several limitations of the current evidence base should be acknowledged. There is considerable heterogeneity in study design, patient populations, diagnostic criteria, and outcome measures, which complicates direct comparison between studies (Pokharel et al., 2025). A large proportion of available evidence is derived from observational studies, which introduces potential bias (Wade et al., 2020). Furthermore, long-term follow-up data remain limited, particularly for newer surgical and minimally invasive techniques.

Another important limitation is the relative lack of patient-reported outcomes and quality of life measures. While objective clinical parameters are essential, they may not fully capture the impact of CuTS on daily functioning and overall well-being.

Economic evaluations are also underrepresented in the current literature. Although cubital tunnel syndrome is associated with a measurable socio-economic burden, there is a need for further research evaluating the cost-effectiveness of available diagnostic and therapeutic approaches (Vij et al., 2020).

Future research should focus on several key areas. The development of standardized diagnostic pathways may improve early detection and reduce variability in clinical practice. High-quality randomized controlled trials are needed to compare treatment strategies in well-defined patient populations. Long-term follow-up studies are essential to evaluate durability of outcomes and recurrence rates. Additionally, greater emphasis on patient-centered outcomes and healthcare system factors may provide a more comprehensive understanding of the effectiveness of different management approaches.

Overall, CuTS remains a complex condition requiring a comprehensive and individualized approach. The available evidence underscores the importance of early diagnosis, appropriate patient selection, and integration of both clinical and system-level considerations in optimizing patient outcomes.

4.1 Clinical Implications and Evidence Gaps

The findings of this review have several important clinical implications. First, they highlight the necessity of a more structured and standardized diagnostic approach to cubital tunnel syndrome. Given the limitations of individual diagnostic modalities, a multimodal strategy combining clinical assessment, electrodiagnostic studies, and ultrasonography may improve diagnostic accuracy, particularly in early-stage disease. Such an approach could reduce diagnostic delays and enable earlier initiation of appropriate treatment.

Second, the variability in treatment outcomes underscores the importance of individualized patient management. Rather than applying a uniform treatment algorithm, clinicians should consider factors such as symptom severity, duration of disease, occupational demands, and patient preferences. This patient-centered approach may improve both clinical outcomes and treatment satisfaction.

Despite the increasing number of studies on CuTS, several important gaps in the current evidence base remain. One of the most significant limitations is the lack of high-quality randomized controlled trials directly comparing different surgical techniques in well-defined patient populations. Existing studies often include heterogeneous groups of patients, which limits the ability to draw definitive conclusions regarding optimal management.

Another important gap concerns long-term outcomes. While many studies report short- to medium-term results, there is limited data on the durability of treatment effects over time, particularly in relation to newer surgical and minimally invasive techniques. Long-term follow-up studies are therefore essential to better understand recurrence rates, functional outcomes, and the need for revision procedures.

Another important gap is the relative lack of patient-reported outcomes and quality-of-life measures. Traditional clinical measures may not fully capture the impact of CuTS on daily functioning, work ability, and overall well-being. Incorporating patient-centered outcome measures into future studies could provide a more comprehensive understanding of treatment effectiveness.

Finally, economic evaluations remain underrepresented in the literature. Given the significant socio-economic burden associated with CuTS, further research is needed to assess the cost-effectiveness of different diagnostic and treatment strategies. Such analyses could support the development of more efficient healthcare pathways and inform policy decisions.

Addressing these gaps will be essential for advancing the understanding and management of cubital tunnel syndrome and for improving both clinical and economic outcomes in the future.

4.2 Limitations

Despite the growing body of literature on cubital tunnel syndrome (CuTS), several important limitations within the current evidence base should be acknowledged. First, there is considerable heterogeneity among available studies in terms of design, patient populations, diagnostic criteria, and outcome measures, which has been widely noted in reviews of peripheral nerve disorders (Abourisha et al., 2024; Wade et al., 2020). This variability makes direct comparison between studies challenging and limits the ability to draw definitive conclusions regarding optimal management strategies.

Second, a substantial proportion of the existing evidence is derived from observational studies rather than high-quality randomized controlled trials. As a result, the risk of bias remains significant, particularly

with respect to patient selection, treatment allocation, and outcome reporting (Abourisha et al., 2024; Wade et al., 2020). In many studies, treatment decisions are influenced by surgeon preference or institutional protocols, which may further limit the generalizability of findings.

Another limitation concerns the inconsistency in outcome assessment. While some studies focus on objective measures such as nerve conduction studies or muscle strength, others emphasize subjective patient-reported outcomes. The lack of standardized outcome measures complicates the interpretation of results and may obscure meaningful differences between treatment approaches, as also highlighted in previous analyses of surgical outcomes in CuTS (Wade et al., 2020). Moreover, variations in follow-up duration further hinder the ability to assess long-term effectiveness and compare outcomes across studies.

Additionally, long-term follow-up data remain limited. Many studies report short- to medium-term outcomes, which may not fully capture the durability of treatment effects or the risk of recurrence. This is particularly relevant in the context of surgical interventions, where late complications or symptom recurrence may occur beyond the initial follow-up period (Reichenbach et al., 2024).

The available literature also provides limited insight into patient-related factors that may influence outcomes, such as comorbidities, occupational demands, and adherence to conservative treatment. These variables may contribute to variability in clinical outcomes, although their impact remains incompletely understood (Gu et al., 2025).

Furthermore, psychosocial aspects and quality of life are not consistently evaluated, even though they may significantly influence perceived treatment success.

Another important limitation is the variability in surgical techniques and reporting standards. Even within the same category of procedures, such as anterior transposition or simple decompression, there may be differences in operative technique and perioperative management, which complicates comparisons between studies (Fok et al., 2021; Toirac et al., 2017).

Furthermore, economic evaluations are relatively scarce. Although cubital tunnel syndrome is associated with a measurable socio-economic burden, few studies have systematically assessed the cost-effectiveness of different diagnostic and treatment strategies. This represents an important gap, particularly in the context of increasing healthcare expenditures and resource constraints (Vij et al., 2020).

Finally, this review itself has inherent limitations. The analysis was restricted to studies indexed in the PubMed database and published in English between 2017 and 2026. While this approach ensured the inclusion of recent and clinically relevant evidence, it may have resulted in the omission of potentially relevant studies indexed in other databases. Additionally, as a narrative review, this study does not provide a quantitative synthesis of data, which may limit the strength of its conclusions.

4.3 Future Directions

Future research on cubital tunnel syndrome (CuTS) should focus on addressing current gaps in diagnostic and therapeutic strategies in order to improve both clinical outcomes and healthcare efficiency. One of the key priorities is the development of standardized diagnostic pathways.

Variability in current clinical practice contributes to delayed diagnosis and inconsistent management. The implementation of structured algorithms integrating clinical assessment, electrodiagnostic studies, and imaging techniques may improve diagnostic accuracy and facilitate earlier intervention.

Another important direction involves the need for high-quality randomized controlled trials comparing conservative and surgical treatment strategies. Existing studies often include heterogeneous patient populations and variable outcome measures, which limits the ability to formulate clear clinical recommendations (Abourisha et al., 2024; Wade et al., 2020). Future research should aim to stratify patients based on disease severity, duration of symptoms, and relevant clinical factors to enable more personalized treatment approaches.

Long-term follow-up studies are also required to better understand the durability of treatment outcomes. Many currently available studies focus on short- or medium-term results, which may not fully capture recurrence rates or long-term functional recovery. Extended follow-up would allow for more accurate assessment of the effectiveness of both conservative and surgical interventions, particularly in the context of revision rates and persistent symptoms (Reichenbach et al., 2024).

In addition, future studies should place greater emphasis on patient-reported outcomes and quality of life measures. Traditional clinical indicators, such as nerve conduction parameters or physical examination findings, may not fully reflect the patient's perspective on treatment success. Incorporating standardized patient-centered outcome measures would provide a more comprehensive evaluation of treatment effectiveness and support more individualized care.

Technological advancements may further enhance the diagnosis and management of CuTS. Improvements in ultrasonography, including higher-resolution imaging and dynamic assessment, may allow for earlier detection of nerve pathology and better localization of compression sites (Chang et al., 2018; Fowler, 2025). The integration of artificial intelligence into diagnostic processes may also improve accuracy and consistency in image interpretation.

From a healthcare system perspective, future research should also evaluate the organization of care pathways. Optimizing referral systems, improving access to specialist care, and reducing diagnostic delays may significantly improve patient outcomes. Economic analyses are also needed to assess the cost-effectiveness of different management strategies and to support evidence-based healthcare planning.

Finally, a multidisciplinary approach to CuTS management should be further explored. Collaboration between primary care physicians, neurologists, physiotherapists, and surgeons may facilitate earlier diagnosis, improve treatment coordination, and enhance overall patient outcomes. Greater integration of clinical practice with emerging technologies and patient-centered care models may represent a key direction for the future.

4.4 Healthcare System Perspective

Cubital tunnel syndrome (CuTS) represents not only a clinical challenge but also a significant burden on healthcare systems. Its impact extends beyond individual patient outcomes, influencing healthcare utilization, resource allocation, and economic costs. The increasing prevalence of upper limb neuropathies, combined with aging populations and occupational risk factors, suggests that the burden of CuTS may continue to rise in the coming years.

One of the key issues in the healthcare management of CuTS is delayed diagnosis. Patients often present with mild or intermittent symptoms that may initially be overlooked or misinterpreted. In primary care settings, early symptoms can be attributed to nonspecific musculoskeletal complaints, leading to delays in referral to specialists. These delays may result in disease progression, ultimately increasing the likelihood of requiring surgical intervention and more intensive treatment. Socioeconomic influences on CuTS presentation appear to be nuanced, as insurance type has been associated with delay to surgery and nonwhite race with longer symptom duration, whereas area-level economic distress was not independently associated with presenting severity (Grisdela et al., 2025).

From a system perspective, early diagnosis is closely linked to cost reduction. Conservative management in early-stage disease is generally less expensive and associated with lower healthcare utilization compared to surgical treatment and postoperative rehabilitation. A large U.S. claims-based analysis estimated that 74.3% of total 90-day treatment costs were attributable to the index surgical admission, while facility fees represented the largest cost component (median $2,555). In the same study, surgeon payments accounted for approximately 16% of overall treatment expenditures, whereas 22.1% of patients required postoperative physical or occupational therapy (Brogan et al., 2025). Therefore, improving awareness among primary care physicians and implementing clear referral pathways may have a meaningful impact on both clinical outcomes and healthcare costs. Furthermore, nearly 39.9% of procedures were performed in ambulatory surgery centers, where facility payments were approximately 2.2-fold lower than in other outpatient settings, suggesting a potential opportunity for cost reduction through optimized care pathways (Brogan et al., 2025).

Access to diagnostic tools also plays an important role. Electrodiagnostic studies and ultrasonography are valuable in confirming diagnosis and assessing severity, yet their availability may vary between healthcare settings. In some regions, limited access to these investigations contributes to prolonged diagnostic pathways. Expanding access to high-quality diagnostic services may therefore represent an important step toward improving efficiency in CuTS management.

Surgical treatment, while effective, is associated with higher direct and indirect costs, including operative expenses, hospital resources, postoperative rehabilitation, and work absence. Recent evidence suggests that cubital tunnel release performed under local or regional anesthesia is safe and feasible, with complication rates comparable to general anesthesia (2.9%, 2.3%, and 2.5%, respectively), while potentially reducing postoperative pain and the need for overnight hospital stay (Hubbard et al., 2025).

Another important consideration is variability in clinical practice. Differences in treatment approaches, surgical techniques, and rehabilitation protocols may lead to inconsistent outcomes and inefficiencies within healthcare systems. Available population-level data indicate that utilization patterns of open and endoscopic cubital tunnel release may be influenced by reimbursement structure and procedural coding (Law et al., 2017). The development of standardized clinical guidelines could reduce this variability and improve both the quality and consistency of care.

Work-related factors further contribute to the healthcare burden of CuTS. Individuals engaged in occupations involving repetitive elbow movements or prolonged flexion are at increased risk of developing the condition. Preventive strategies, including ergonomic interventions and workplace modifications, may reduce incidence and associated healthcare costs. However, these approaches are not consistently implemented and remain an underutilized aspect of CuTS management.

The role of multidisciplinary care is increasingly recognized as an important component of effective management. Collaboration between primary care physicians, neurologists, physiotherapists, and surgeons may facilitate earlier diagnosis, improve coordination of care, and enhance treatment outcomes. Integrated care pathways may also reduce duplication of services and improve overall system efficiency.

In addition, the economic burden of CuTS includes both direct medical costs and indirect costs such as loss of productivity, underscoring the need for further cost-effectiveness analyses and more efficient care pathways.

5. Conclusions

Cubital tunnel syndrome remains a complex and multifactorial condition that continues to present both diagnostic and therapeutic challenges in clinical practice. The available evidence indicates that its pathophysiology involves a combination of mechanical compression, traction, and vascular factors, which contributes to variability in clinical presentation and disease progression.

Accurate diagnosis relies on a combination of clinical assessment and supportive investigations, including electrodiagnostic studies and ultrasonography. Despite advances in diagnostic techniques, delayed recognition remains common and is associated with less favorable outcomes.

Both conservative and surgical treatment strategies can be effective, depending on disease severity and duration. Conservative management may be beneficial in early-stage disease, while surgical intervention is often required in more advanced cases. However, current evidence does not clearly support the superiority of any single surgical technique, highlighting the importance of individualized treatment decisions.

From a broader perspective, cubital tunnel syndrome is associated with a significant socio-economic burden, including reduced work productivity and increased healthcare utilization. Early diagnosis and appropriate management may therefore not only improve clinical outcomes but also reduce overall healthcare costs.

In conclusion, a patient-centered and evidence-based approach is essential for optimizing outcomes in cubital tunnel syndrome. Future research should focus on standardizing diagnostic pathways, improving long-term outcome assessment, and evaluating cost-effective management strategies.

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REFERENCES

1. Abourisha, E., Srinivasan, A. S., Barakat, A., Chong, H. H., & Singh, H. P. (2024). Surgical management of cubital tunnel syndrome: A systematic review and meta-analysis of randomised trials. *Journal of Orthopaedics, 53*, 41–48. https://doi.org/10.1016/j.jor.2024.02.041
2. An, T. W., Evanoff, B. A., Boyer, M. I., & Osei, D. A. (2017). The prevalence of cubital tunnel syndrome: A cross-sectional study in a U.S. metropolitan cohort. *The Journal of Bone and Joint Surgery. American Volume, 99*(5), 408–416. https://doi.org/10.2106/JBJS.15.01162
3. Andrews, K., Rowland, A., Pranjal, A., & Ebraheim, N. (2018). Cubital tunnel syndrome: Anatomy, clinical presentation, and management. *Journal of Orthopaedics, 15*(3), 832–836. https://doi.org/10.1016/j.jor.2018.08.010
4. Bateman, M., Swaile, H., & Tambe, A. (2025). Effectiveness of night splints for cubital tunnel syndrome: A systematic review. *Hand Therapy, 30*(3), 105–112. https://doi.org/10.1177/17589983251336157
5. Brogan, D. M., Landau, A. J., Olsen, M. A., Nickel, K. B., Buss, J. L., & Dy, C. J. (2025). Direct economic burden of cubital tunnel surgery in the United States: Total payments and components of cost. *The Journal of Hand Surgery, 50*(8), 938–947. https://doi.org/10.1016/j.jhsa.2024.07.011
6. Burahee, A. S., Sanders, A. D., Shirley, C., & Power, D. M. (2021). Cubital tunnel syndrome. *EFORT Open Reviews, 6*(9), 743–750. https://doi.org/10.1302/2058-5241.6.200129
7. Cambon-Binder, A. (2021). Ulnar neuropathy at the elbow. *Orthopaedics & Traumatology: Surgery & Research, 107*(1 Suppl), 102754. https://doi.org/10.1016/j.otsr.2020.102754
8. Carlton, A., & Khalid, S. I. (2018). Surgical approaches and their outcomes in the treatment of cubital tunnel syndrome. *Frontiers in Surgery, 5*, 48. https://doi.org/10.3389/fsurg.2018.00048
9. Chang, K.-V., Mezian, K., Naňka, O., Wu, W.-T., Lou, Y.-M., Wang, J.-C., Martinoli, C., & Özçakar, L. (2018). Ultrasound imaging for the cutaneous nerves of the extremities and relevant entrapment syndromes: From anatomy to clinical implications. *Journal of Clinical Medicine, 7*(11), 457. https://doi.org/10.3390/jcm7110457
10. Córdoba-Mosqueda, M. E., Rasulić, L., Savić, A., Grujić, J., Vitošević, F., Lepić, M., Mićić, A., Radojević, S., Mandić-Rajčević, S., Jovanović, I., & Rodríguez-Aceves, C. A. (2023). Quality of life and satisfaction in patients surgically treated for cubital tunnel syndrome. *Neurological Research, 45*(2), 138–151. https://doi.org/10.1080/01616412.2022.2126163
11. Fowler, J. R. (2025). The use of musculoskeletal ultrasound for diagnosis of peripheral nerve compression syndromes. *The Journal of Hand Surgery, 50*(4), 481–490. https://doi.org/10.1016/j.jhsa.2024.11.009
12. Fok, M. W. M., Cobb, T., & Bain, G. I. (2021). Endoscopic cubital tunnel decompression: Review of the literature. *Journal of Orthopaedic Surgery, 29*(1), 2309499020982084. https://doi.org/10.1177/2309499020982084
13. Graf, A., Ahmed, A. S., Roundy, R., Gottschalk, M. B., & Dempsey, A. (2023). Modern treatment of cubital tunnel syndrome: Evidence and controversy. *Journal of Hand Surgery Global Online, 5*(4), 547–560. https://doi.org/10.1016/j.jhsg.2022.07.008
14. Grisdela, P., Liu, C., Model, Z., Steele, A., Liu, D., Earp, B., Blazar, P., & Zhang, D. (2025). Do socioeconomic factors affect symptom duration and disease severity at presentation for cubital tunnel syndrome? *Hand, 20*(2), 179–187. https://doi.org/10.1177/15589447231213386
15. Gu, A. S., Bingi, P., Ginder, J., Flynn, J., Khak, M., & Ilyas, A. M. (2025). A systematic review of retrospective evidence on patient and surgical factors in recurrent cubital tunnel syndrome. *Archives of Bone and Joint Surgery, 13*(10), 611–621. https://doi.org/10.22038/ABJS.2025.89107.4040
16. Hu, T., & Zhou, H. (2026). Geometric and biomechanical perspectives on ulnar nerve compression in cubital tunnel syndrome: Pathomechanics and surgical strategies. *Annals of Medicine and Surgery, 88*(1), 422–435. https://doi.org/10.1097/MS9.0000000000004348
17. Hubbard, M. E., AlMasri, A., & Huq, N. S. (2025). Cubital tunnel release under local and regional anesthesia: A scoping review. *Plastic Surgery*. https://doi.org/10.1177/22925503251404418
18. Kazmers, N. H., Lazaris, E. L., Allen, C., Presson, A., & Tyser, A. R. (2019). Comparison of surgical encounter direct costs for three methods of cubital tunnel decompression. *Plastic and Reconstructive Surgery, 143*(2), 503–510. https://doi.org/10.1097/PRS.0000000000005196
19. Kooner, S., Cinats, D., Kwong, C., Matthewson, G., & Dhaliwal, G. (2019). Conservative treatment of cubital tunnel syndrome: A systematic review. *Orthopedic Reviews, 11*(2), 7955. https://doi.org/10.4081/or.2019.7955
20. Law, T. Y., Hubbard, Z. S., Chieng, L. O., & Chim, H. W. (2017). Trends in open and endoscopic cubital tunnel release in the Medicare patient population. *Hand, 12*(4), 408–412. https://doi.org/10.1177/1558944716679610
21. McGurk, K., Tracey, J. A., Daley, D. N., & Daly, C. A. (2023). Diagnostic considerations in compressive neuropathies. *Journal of Hand Surgery Global Online, 5*(4), 525–535. https://doi.org/10.1016/j.jhsg.2022.10.010
22. Nyman, E., & Dahlin, L. B. (2024). The unpredictable ulnar nerve—Ulnar nerve entrapment from anatomical, pathophysiological, and biopsychosocial aspects. *Diagnostics, 14*(5), 489. https://doi.org/10.3390/diagnostics14050489
23. Pokharel, B., Fossati, C., Bhattarai, S., Vaja, F., Kemetse, A., Traverso, A., & Randelli, P. S. (2025). Simple decompression vs. subcutaneous anterior transposition of the ulnar nerve: The 2025 update on the optimal treatment for cubital tunnel syndrome. *JSES Reviews, Reports, and Techniques, 6*(2), 100630. https://doi.org/10.1016/j.xrrt.2025.100630

24. Reichenbach, R., Chartrand, N. A., Stecher, C., Renfree, S. P., Stickels, M., & Hustedt, J. W. (2024). Higher revision rates with in situ decompression as compared to ulnar nerve transposition for cubital tunnel syndrome: A meta-regression analysis. *Cureus, 16*(8), e68116. https://doi.org/10.7759/cureus.68116
25. Toirac, A., Giugale, J. M., & Fowler, J. R. (2017). Open versus endoscopic cubital tunnel in situ decompression: A systematic review of outcomes and complications. *Hand, 12*(3), 229–235. https://doi.org/10.1177/1558944716662018
26. Vij, N., Traube, B., Bisht, R., Singleton, I., Cornett, E. M., Kaye, A. D., Imani, F., Mohammadian Erdi, A., Varrassi, G., Viswanath, O., & Urits, I. (2020). An update on treatment modalities for ulnar nerve entrapment: A literature review. *Anesthesiology and Pain Medicine, 10*(6), e112070. https://doi.org/10.5812/aapm.112070
27. Wade, R. G., Griffiths, T. T., Flather, R., Burr, N. E., Teo, M., & Bourke, G. (2020). Safety and outcomes of different surgical techniques for cubital tunnel decompression: A systematic review and network meta-analysis. *JAMA Network Open, 3*(11), e2024352. https://doi.org/10.1001/jamanetworkopen.2020.24352
28. Wolny, T., Fernández-de-las-Peñas, C., Buczek, T., Domin, M., Granek, A., & Linek, P. (2022). The effects of physiotherapy in the treatment of cubital tunnel syndrome: A systematic review. *Journal of Clinical Medicine, 11*(14), 4247. https://doi.org/10.3390/jcm11144247