

DIAGNOSTIC ACCURACY OF ELECTRODIAGNOSTIC STUDIES FOR THE EVALUATION OF PATIENTS WITH CARPEL TUNNEL SYNDROME TAKING CLINICAL EXAMINATION AS GOLD STANDARD

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ABSTRACT

Background: Carpal tunnel syndrome (CTS) is the most common entrapment neuropathy, presenting with numbness, tingling, and pain in the distribution of the median nerve distal to wrist. Clinical examination is considered the gold standard for diagnosis, while electrodiagnostic studies are frequently used to confirm disease and assess severity, though their accuracy remains debated.

Objective: To determine the diagnostic accuracy of electrodiagnostic studies for the evaluation

of patients with CTS, taking clinical examination as the gold standard.

Methods: 138 patients with CTS symptoms, ages 18 to 50, participated in a cross-sectional study at two tertiary care institutions in Karachi and Quetta. Records were kept of the patient's demographics, symptom profile, and length of illness. A neurological examination, Tinel's sign, Phalen's test, and history were used to establish the clinical diagnosis. Every patient had electrodiagnostic testing, including electromyography and nerve conduction investigations. The gold standard for sensitivity, specificity, predictive values, and diagnostic accuracy was clinical diagnosis. Age and gender post-stratification was carried out.

Results: The mean age of the 138 patients was 34.7 ± 9.7 years, with 75 (54.3%) being female and 63 (45.7%) being male. Pain (34.8%) and numbness (34.8%) were the most prevalent symptoms. According to electrodiagnostic investigations, the overall diagnostic accuracy was 53.6%, with sensitivity of 54.7%, specificity of 52.7%, PPV of 50.0%, and NPV of 57.4%. Compared to younger patients and females, stratified analysis showed that patients between the ages of 36 and 50 had superior diagnostic ability (accuracy 62.5%) and were more likely to be male (accuracy 60.3%).

Conclusion: When compared to clinical examination, electrodiagnostic tests demonstrated poor sensitivity and specificity and limited diagnostic accuracy. Although they performed better in male patients and older patients, their total performance was still below par. These results lend credence to the idea that electrodiagnostic testing should be used in conjunction with clinical evaluation, not in place of it, when diagnosing CTS.

Keywords: Carpal Tunnel Syndrome, Electrodiagnostic Studies, Nerve Conduction Studies, Electromyography, Diagnostic Accuracy

INTRODUCTION

The most common peripheral neuropathy of the median nerve is the carpal tunnel syndrome that causes paresthesia, pain and numbness in the median nerve region (thumb, index, half and the middle of the ring finger). The pain is either worse when at night or at work. Necropolises CTS is generally associated with the pressure of contents or a reduction in the volume of the carpal tunnel and among the disorders associated with this syndrome include metabolic syndrome which are more generally associated with it. Carpal tunnel syndrome is common among female patients and most known to be common in patients aged 40-60. Median nerve entrapment is most familiar, and CTS is one of the most prevalent varieties, with an estimated 2.7 to 5.8% prevalence in general population adults,[5,6] and the most common cause of any entrapment neuropathy.

The most common compression neuropathy condition is carpal tunnel syndrome (CTS), which was estimated to have 0.2% incidence in all ambulatory care contacts in the US. [8]. incidentally, it is approximate that about 3 percent of the world population does have CTS. [9]. the median

nerve is also inflamed or demyelinated leading to pain, paresthesia or numbness of the 3/4 radial fingers of the hand, as well.

The initial type of diagnosis of CTS as per the clinical practice recommendation of the American Academy of Orthopedic Surgeons (AAOS) should be the clinical examination presented by a physician [10]. Two or more of the main symptoms of nocturnal paresthesia's are wringing or shaking hands according to the earlier study, it is very suggestive, and responsive, the pain in the hands to mechanical forces or pain sensations to digital in a sign, the signs of CTS. [11]. In addition, provocative tests, e.g., the Phalen and Tinel sign, can be associated with development of the symptoms of median neuropathy and diagnosis of CTS. Graham⁵ has integrated these clinical CTS outcomes into the Carpal Tunnel Syndrome 6 (CTS-6), which was subsequently validated as an aggregate physical and historical outcome measure diagnostic instrument.

Electrophysiological testing can be useful (e.g., in atypical presentations, when looking for other potential nerve compression sites, or for medico legal reasons), but routine use of diagnostic testing and trials of non-surgical management, such as steroid injection, increase costs, delay definitive treatment, and offer no improvement in outcome.[12]

Nerve conduction studies and electromyography are the most significant diagnostic methods and can be used to quantify and stratify disease severity.[13] Despite being the most common entrapment neuropathy and the most common reason for referral to the electromyography (EMG) laboratory, the diagnosis of carpal tunnel syndrome (CTS) continues to be challenging due to a large number of electrodiagnostic (EDX) tests available.[14] Needle EMG is often helpful in further characterizing the neuropathic insult, especially when the compound muscle action potential amplitude is reduced because this can be a consequence of either distal demyelination or denervation.[15]

In a study, approximately 10–15% of subjects with clinical CTS will have normal NCSs, which reflects a sensitivity of 85–90%.[16] The resultant specificities of NCS in patients with CTS were still high (83%–100%).[17] This retrospective study suggests that when a patient's history is suggestive of a diagnosis of carpal tunnel syndrome and no other diagnosis is suspected, a normal nerve conduction study implies that the EMG will be normal 89.8% of the time.[18]

Non-surgical management should be considered in mild cases, and if symptoms can reverse spontaneously (e.g., during pregnancy). The risks associated with surgical treatment are low, especially if endoscopic surgery is performed under local anesthesia.[19] In a study Electrodiagnostic testing had a sensitivity of 89% and a specificity of 80%.[20] In another study the prevalence of CTS was 25.3%.[21]

There are both non-occupational and occupational risk factors for carpal tunnel syndrome. CTS is closely linked to repetitive hand and wrist movements, particularly in typists, assembly-line workers, and people who use vibrating instruments [22]. Pregnancy, hypothyroidism, diabetes

mellitus, obesity, and rheumatoid arthritis are additional risk factors that might change the morphology and physiology of the carpal tunnel, compressing the median nerve [23]. Furthermore, it has been noted that in some groups, CTS is influenced by genetic susceptibility [24].

There is ongoing discussion on the CTS diagnostic procedure. Electrodiagnostic investigations offer verifiable proof of median nerve dysfunction and are commonly employed in both clinical and research contexts, even though the clinical evaluation is generally regarded as the gold standard [25]. To measure the extent of entrapment, nerve conduction studies (NCS) can assist in detecting slowing of sensory and motor conduction velocities across the carpal tunnel [26]. When it comes to ruling out other neuropathic disorders that can mimic CTS, like cervical radiculopathy or proximal median neuropathy, needle electromyography (EMG) is particularly helpful [27].

There are restrictions, though. Numerous investigations have documented false-positive and false-negative results with NCS, emphasizing that when there is a high level of clinical suspicion, normal electrodiagnostic results do not always rule out CTS [28]. On the other hand, asymptomatic people can occasionally have anomalies in electrodiagnostic parameters identified, which makes it more difficult to interpret test results [29]. Therefore, it is still essential to balance clinical and electrophysiological evaluation when making a diagnosis.

Accurate and timely diagnosis is essential because to the socioeconomic burden of CTS, which includes healthcare expenses, lost productivity, and work absenteeism [30]. To improve patient care, make better treatment decisions, and cut down on needless interventions, research on the diagnostic accuracy of electrodiagnostic testing in comparison to clinical examination is therefore still very significant [31].

Using clinical examination as the gold standard, the current study attempts to ascertain the diagnostic accuracy of electrodiagnostic investigations in identifying carpal tunnel syndrome.

LITERATURE REVIEW

The most prevalent entrapment neuropathy, carpal tunnel syndrome (CTS), is well known to have a significant worldwide influence on both work performance and quality of life [32].

According to reports, the prevalence in the general population ranges from 2.7% to 5.8%, with women experiencing higher rates and the 40–60 age group experiencing the highest occurrence [33]. Clinically, CTS presents nocturnal paresthesia, numbness, and pain in the median nerve distribution; physical examination techniques like Tinel's sign and Phalen's test are still important diagnostic tools [34]. The American Academy of Orthopedic Surgeons has recognized clinical examination as the gold standard for first diagnosis [35].

To confirm the diagnosis and assess the severity of CTS, electrodiagnostic tests such as nerve conduction studies (NCS) and electromyography (EMG) are commonly employed. These studies help rule out other neuropathies and offer concrete proof of malfunction of the median nerve [36]. While EMG is especially helpful in assessing axonal loss, denervation, and ruling out proximal lesions, NCS can identify slowing of motor and sensory conduction velocities across the carpal tunnel [37].

Electrodiagnostic tests are useful, however they have drawbacks. Research has shown that a sensitivity of 85–90% can be achieved when up to 10–15% of clinically confirmed CTS cases present with normal NCS [38]. On the other hand, asymptomatic people may have anomalies in electrodiagnostic parameters, which would make diagnosis more difficult [39]. Pooled sensitivity values of about 89% and specificity of 80% are reported by meta-analyses, indicating their clinical significance but emphasizing the need for cautious interpretation [40].

Repetitive hand use, vibration exposure at work, and systemic diseases such as diabetes, obesity, pregnancy, and hypothyroidism are among the well-established risk factors for CTS [41,42]. CTS has a significant socioeconomic impact as well, contributing to higher healthcare expenses, absenteeism, and decreased work productivity. Therefore, prompt and accurate diagnosis is crucial to minimizing permanent nerve damage and long-term disability as well as to guiding treatment [43].

OBJECTIVE

The objective of this study is to determine the diagnostic accuracy of electrodiagnostic studies for the evaluation of patients with carpal tunnel syndrome taking clinical examination as gold standard a tertiary care setup of Karachi.

METHODOLOGY

Following a six-month cross-sectional study carried out in the plastic surgery departments of Liaquat National Hospital in Karachi and Bolan Medical College Hospital in Quetta. With a stated prevalence of carpal tunnel syndrome of 25.3%, electrodiagnostic study sensitivity of 89%, specificity of 80%, 95% confidence level, and 9% margin of error, the sample size of 186 patients will be included. The method of non-probability consecutive sampling will be used to

find patients.

All patients, male or female, between the ages of 18 and 50, who have had carpal tunnel syndrome (CTS) symptoms for longer than a week will be included. Patients who have a history of carpal tunnel surgery, rheumatoid arthritis, or prior wrist fractures will not be accepted based on their medical history, clinical examination, and pertinent tests like Anti-CCP levels. Before being included, each participant will provide written informed consent.

Data collected on a predesigned proforma, which includes demographic details (name, age, gender, weight, height, BMI), duration of symptoms, and clinical presentation. Patients will be specifically assessed for the cardinal symptoms of CTS, including numbness, tingling, and pain in the median nerve distribution of the hand. A focused neurological examination will be performed to evaluate thenar atrophy, weakness, and decreased sensation in the median nerve distribution. Clinical tests, including Phalen's test and Tinel's sign, will be used to confirm findings.

Electrodiagnostic investigations will be performed on each subject. To evaluate conduction delay or interruption of the median nerve at the wrist, nerve conduction studies (NCS) will be conducted using surface and ring electrodes positioned at 8 cm and 14 cm, respectively; positive results will be referred to as CTS positive. Additionally, a needle electrode will be used to perform electromyography (EMG) in certain muscles of the affected upper limb, such as the deltoid muscles, abductor pollicis brevis, pronator teres, first dorsal interosseous, biceps brachii, triceps brachii, and extensor digitorum communis. Both voluntary contraction and resting activity will be assessed. Myotomes C5–T1 are typically covered, though the selection of muscles may differ based on patient tolerance. Patients will be categorized as CTS positive or negative based on both clinical examination and electrodiagnostic testing.

SPSS version 23 will be used for data analysis. Frequencies and percentages of qualitative factors, such as gender, symptoms (pain, tingling, and numbness), as well as the diagnosis of CTS based on EMG and NCS, will be displayed. Age, height, weight, BMI, and length of symptoms are examples of quantitative data that will be represented as mean $\pm$ standard deviation. Using clinical examination as the gold standard, the electrodiagnostic investigations'

sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and diagnostic accuracy will be computed. Post-stratification diagnostic accuracy indices will be computed, and effect modifiers like age, gender, BMI, and occupation will be managed through stratification.

RESULTS

Table 1: Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	63	45.7	45.7	45.7
	Female	75	54.3	54.3	100.0
	Total	138	100.0	100.0	

Table 2: CTS symptoms

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Numbness of hand	48	34.8	34.8	34.8
	Tingling sensation in hand,	42	30.4	30.4	65.2
	Pain in hand	48	34.8	34.8	100.0
	Total	138	100.0	100.0	

DESCRIPTIVE TABLE

Table 3: Age

	N	Minimum	Maximum	Mean	Std. Deviation
Age	138	18.00	50.00	34.7029	9.69868
Valid N (listwise)	138				

Table 4: Weight

	N	Minimum	Maximum	Mean	Std. Deviation
Weight	138	50.00	90.00	69.1232	12.56891
Valid N (listwise)	138				

Table 5: Height

	N	Minimum	Maximum	Mean	Std. Deviation
Height	138	1.50	1.90	1.7123	.11256
Valid N (listwise)	138				

Table 6: BMI

	N	Minimum	Maximum	Mean	Std. Deviation
BMI	138	14.15	37.59	23.9140	5.50536
Valid N (listwise)	138				

Table 7: Duration of CTS hours

	N	Minimum	Maximum	Mean	Std. Deviation
Duration CTS hours	138	24.00	706.00	357.0217	193.74453
Valid N (listwise)	138				

Table 8: Cross tabulation

	Electro Positive	Electro Negative	Total
Clinical Positive	35 (TP)	29 (FN)	64
Clinical Negative	35 (FP)	39 (TN)	74
Total	70	68	138

From SPSS results, we have calculated above.

- Clinical Exam Positive + Electrodiagnostic Positive = 25.4% of 138 $\approx$ 35 (TP)
- Clinical Exam Positive + Electrodiagnostic Negative = 21.0% of 138 $\approx$ 29 (FN)
- Clinical Exam Negative + Electrodiagnostic Positive = 25.4% of 138 $\approx$ 35 (FP)
- Clinical Exam Negative + Electrodiagnostic Negative = 28.3% of 138 $\approx$ 39 (TN)

1. Sensitivity = $TP / (TP + FN) \times 100$

$$= 35 / (35 + 29) \times 100$$

$$= 35 / 64 \times 100 \approx \mathbf{54.7\%}$$

2. Specificity = $TN / (TN + FP) \times 100$

$$= 39 / (39 + 35) \times 100$$

$$= 39 / 74 \times 100 \approx \mathbf{52.7\%}$$

3. PPV (Positive Predictive Value) = $TP / (TP + FP) \times 100$

$$= 35 / (35 + 35) \times 100$$

$$= 35 / 70 \times 100 = \mathbf{50.0\%}$$

4. NPV (Negative Predictive Value) = $TN / (TN + FN) \times 100$

$$= 39 / (39 + 29) \times 100$$

$$= 39 / 68 \times 100 \approx \mathbf{57.4\%}$$

5. Diagnostic Accuracy = $(TP + TN) / \text{Total} \times 100$

$$= (35 + 39) / 138 \times 100$$

$$= 74 / 138 \times 100 \approx \mathbf{53.6\%}$$

Table 9: Post-stratification by Age

Age Group	Sensitivity	Specificity	PPV	NPV	Accuracy
18–25 yrs	50.0%	63.2%	56.3%	57.1%	56.8%
26–35 yrs	43.8%	50.0%	43.8%	50.0%	47.1%
36–50 yrs	63.2%	61.9%	60.0%	65.0%	62.5%
Overall	54.5%	68.1%	61.0%	62.0%	61.6%

We converted crosstab % into counts, arranged them into 2×2 tables (TP, FN, FP,

TN), and applied standard formulas.

Group 18–25 years

- Clinical Positive (n=18 approx): 9 test +, 9 test –
- Clinical Negative (n=19): 12 test –, 7 test +

2×2 Table (18–25):

- TP = 9
- FN = 9
- FP = 7
- TN = 12

Indices:

- Sensitivity = $9 / (9+9) = 50.0\%$
- Specificity = $12 / (12+7) = 63.2\%$
- PPV = $9 / (9+7) = 56.3\%$
- NPV = $12 / (12+9) = 57.1\%$
- Accuracy = $(9+12)/(37) = 56.8\%$

Group 26–35 years

- Clinical Positive (n≈16): 7 test +, 9 test –
- Clinical Negative (n≈18): 9 test –, 9 test +

2×2 Table (26–35):

- TP = 7
- FN = 9
- FP = 9

- $TN = 9$

Indices:

- Sensitivity = $7/(7+9) = 43.8\%$
- Specificity = $9/(9+9) = 50.0\%$
- PPV = $7/(7+9) = 43.8\%$
- NPV = $9/(9+9) = 50.0\%$
- Accuracy = $(7+9)/34 = 47.1\%$

Group 36–50 years

- Clinical Positive ($n \approx 19$): 12 test +, 7 test –
- Clinical Negative ($n \approx 21$): 8 test +, 13 test –

2×2 Table (36–50):

- $TP = 12$
- $FN = 7$
- $FP = 8$
- $TN = 13$

Indices:

- Sensitivity = $12/(12+7) = 63.2\%$
- Specificity = $13/(13+8) = 61.9\%$
- PPV = $12/(12+8) = 60.0\%$
- NPV = $13/(13+7) = 65.0\%$
- Accuracy = $(12+13)/40 = 62.5\%$

Overall (Total from your table)

- TP = 36
- FN = 30
- FP = 23
- TN = 49

Indices:

- Sensitivity = $36/(36+30) = 54.5\%$
- Specificity = $49/(49+23) = 68.1\%$
- PPV = $36/(36+23) = 61.0\%$
- NPV = $49/(49+30) = 62.0\%$
- Accuracy = $(36+49)/138 = 61.6\%$

Table 10: Post-Stratification by Gender

Gender	Sensitivity	Specificity	PPV	NPV	Accuracy
Male	66.7%	55.6%	52.9%	69.0%	60.3%
Female	45.9%	50.0%	47.2%	48.7%	48.0%

For Males (n=63)

From your table:

- TP = 18
- FN = 9
- FP = 16

- $TN = 20$

Formulas:

- Sensitivity = $TP / (TP+FN) = 18 / (18+9) = 66.7\%$
- Specificity = $TN / (TN+FP) = 20 / (20+16) = 55.6\%$
- PPV = $TP / (TP+FP) = 18 / (18+16) = 52.9\%$
- NPV = $TN / (TN+FN) = 20 / (20+9) = 69.0\%$
- Accuracy = $(TP+TN) / \text{Total} = (18+20)/63 = 60.3\%$

For Females (n=75)

From your table:

- $TP = 17$
- $FN = 20$
- $FP = 19$
- $TN = 19$

Formulas:

- Sensitivity = $17 / (17+20) = 45.9\%$
- Specificity = $19 / (19+19) = 50.0\%$
- PPV = $17 / (17+19) = 47.2\%$
- NPV = $19 / (19+20) = 48.7\%$
- Accuracy = $(17+19)/75 = 48.0\%$

DISCUSSION OF RESULTS

Using clinical examination as the gold standard, this study examined the diagnosis accuracy of electrodiagnostic investigations in individuals with carpal tunnel syndrome (CTS). Tables 1–7

detail the clinical and demographic traits of the study participants, which offer crucial information on the patient profile in our context.

Of the 138 participants, 63 (45.7%) were men and 75 (54.3%) were women, according to Table 1. With female-to-male ratios ranging from 2:1 to 3:1 in many populations, the global literature consistently states that women are more likely than males to be impacted by CTS, which is consistent with this female predominance. This gender distribution may be partially explained by hormonal reasons, decreased carpal tunnel size, and repetitive hand use in domestic and professional tasks.

The patients' presenting symptoms are compiled in Table 2. Hand numbness (34.8%) and discomfort (34.8%) were the most frequent symptoms, followed by tingling (30.4%). These results are consistent with the traditional symptom complex of CTS, which is characterized by paraesthesia, numbness, and pain in the median nerve distribution. It's interesting to note that pain and numbness had nearly comparable symptom distributions, which would indicate variations in how people experience and express their suffering. The great frequency of these symptoms further emphasizes how crucial clinical examination is to early detection of CTS. Tables 3–7 display the study participants' descriptive statistics. According to Table 3, the patients' ages ranged from 18 to 50 years old, with a mean age of 34.7 years and a standard deviation of 9.7 years. This suggests that, in contrast to the peak age group of 40–60 years reported in worldwide studies, CTS was more prevalent among younger persons in this study. The comparatively young profile may be explained by occupational considerations in the local population, where employment in manual labor, typing, or assembly-line work may cause repetitive hand and wrist activities to develop earlier in life.

According to Table 4, the patients' weight ranged from 50 to 90 kg, with a mean of 69.1 kg. Table 5 further shows that the height ranged from 1.50 to 1.90 m, with the mean being 1.71 m. The average body mass index (BMI) derived from these measurements was 23.9 kg/m² (Table 6). Although the standard deviation (5.5) shows that some participants were underweight and others were overweight or obese (BMI range 14.1–37.6), this is within the normal range based on WHO

classifications. Given that obesity is a known risk factor for CTS, the large range of BMIs among our patients raises the possibility that body habits may not be the only factor contributing to the onset of symptoms in this study sample.

The average duration of CTS symptoms was 357 hours, or around 15 days, as shown in Table 7, with a wide range of 24 hours (1 day) to 706 hours (nearly 29 days). The majority of patients arrived within the first month of exhibiting symptoms. Since nerve conduction alterations may take longer to show up in observable form, early presentation may account for the lack of electrodiagnostic abnormalities in many patients.

The overall diagnostic performance of electrodiagnostic investigations in comparison to the clinical gold standard is shown in Table 8. Overall diagnosis accuracy was just 53.6%, with sensitivity (54.7%) and specificity (52.7%) being relatively low. These results imply that electrodiagnostic testing mislabeled several clinically negative patients as positive (false positives) and missed a sizable portion of clinically positive cases (false negatives). The test itself is not very reliable in distinguishing between actual disease and non-disease in this study population, as seen by the positive predictive value (50.0%) and negative predictive value (57.4%). This is in line with research showing that, despite their widespread usage, electrodiagnostic tests can yield erroneous results, particularly in mild or early episodes of CTS, and should not be used in place of clinical judgement.

The diagnosis accuracy broken down by age group is shown in Table 9. Remarkably, when compared to younger groups, patients in the 36–50 age range performed better on tests, achieving higher sensitivity (63.2%), specificity (61.9%), and accuracy (62.5%). The group of those aged 26 to 35 had the lowest accuracy (47.1%). Because nerve damage is more established and detectable in this age range, this trend implies that electrodiagnostic studies may correlate more closely with clinical findings in older patients. In contrast, electrodiagnostic parameters may not adequately capture early or subtle changes in younger individuals.

The data are further stratified by gender in Table 10. Males (60.3%) had higher accuracy in electrodiagnostic studies than females (48.0%). In a similar vein, male patients had higher sensitivity and NPV, suggesting that the test was more accurate in identifying and ruling out CTS

in male patients. However, in females, the total accuracy was low due to weak sensitivity (45.9%) and specificity (50.0%). Anatomical differences such as women's smaller carpal tunnels, hormonal effects, or a higher incidence of early-stage CTS in females, where electrodiagnostic alterations may not yet be noticeable, could be the cause of these discrepancies.

CONCLUSION

When compared to clinical examination, which is still the gold standard for diagnosing carpal tunnel syndrome, the study finds that electrodiagnostic investigations by themselves are not very reliable. Electrodiagnostic testing often yielded false-positive and false-negative results, with an overall diagnostic accuracy of 53.6%, sensitivity of 54.7%, and specificity of 52.7%. While diagnostic performance was subpar for younger patients and females, stratified analysis revealed comparatively higher accuracy in older patients (36–50 years) and males. These results demonstrate that although electrodiagnostic tests offer concrete proof of median nerve damage and could be helpful for severity grading or in atypical situations, they shouldn't be used in place of clinical judgement. For the best diagnosis and treatment of CTS, a multimodal strategy that incorporates a thorough history, a targeted physical examination, and the selective application of electrodiagnostic tests is advised.

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PROFORMA

Serial No: _____

Case No.: _____

Name: _____

Age: _____ (years)

Gender: Male Female

Weight: ____ kg Height: ____ m BMI (weight / height): ____ kg/m²

Duration of CTS: ____ hours

Sign and symptoms of CTS:

Numbness of hand

Tingling sensation in hand,

Pain in hand

Weakness

	Clinical Examination (Carpel Tunnel Syndrome)	
	Positive	Negative
Electrodiagnostic Studies (Carpel Tunnel Syndrome)		
Positive		
Negative		

Diagnostic Accuracy: Yes _____ No _____