

Provincial Carpal Tunnel Syndrome (CTS) Primary Care Clinical Pathway

Quick Links:

[Primer & Expanded details](#)

[Provider resources](#)

[Patient pathway](#)

[Provide feedback](#)

1. History

- Numbness and tingling in hand(s) including nighttime presentation
- Pain in hand and wrist(s): sharp, burning
- Difficulty with fine motor tasks/clumsiness
- Median nerve distribution
- Precipitating factors/Repetitive action/positional worsening (especially wrist flexion)
- Flick sign
- Consider other underlying conditions
- Previous treatment

2. Physical exam

- Assess sensation
- Atrophy of thenar muscles
- Weakness of thumb opposition
- Consider provocative tests to support diagnosis: Durkan's test, Tinel's sign; Phalen's test

Consider **cervical radiculopathies** and **diabetic polyneuropathy** if CTS signs unclear
Diabetic Peripheral Neuropathy Clinical Pathway

3. Red Flags

- Signs of infection
- Post-traumatic median nerve involvement

- Rapidly progressive, onset within 7 days

Other Considerations

- Non-specific muscle atrophy and weakness (broader than thenar muscles) or numbness and tingling outside the median nerve distribution.

[RAAPID Upper limb surgeon, or ER](#)

[Neurology urgent referral or ER, depending on local resources](#)

[Referral to Neurology or Physiatry](#)

No Red Flags and clear clinical picture
Clinical diagnosis of CTS is made

4. Management

Mild/Moderate

- Intermittent symptoms
- Numbness associated with certain activities
- Overall minimal impact to daily life

Severe

- Constant symptoms
- Weakness affecting activity and grip strength
- Atrophy
- Pronounced impacts to ADLs, QoL, and/or sleep

Conservative Management Strategies (Mild/Moderate)

- Wrist splint while sleeping and during activities that exacerbate symptoms
- Activity modification
- Avoid precipitating factors
 - Reduce / eliminate repetitive motions
- Consider referral for **one** ultrasound-guided steroid injection

If there is no clinical improvement in **8-12 weeks**; steroid injection is unavailable, ineffective or not tolerated, or symptoms worsen.

Management (Severe or Persistently Symptomatic Mild/Moderate)

- Initiate or continue conservative management strategies for mild/moderate
- Consider referral if **first** steroid injection is ineffective
 - Advise against repeated carpal tunnel steroid injections (limit to 3 in a lifetime)
- Complete **FAST** referral to surgeon AND order Investigations during referral process:
 - **Mild/moderate not responsive to conservative management/non-operative measures:** Routine referral
 - **Severe:** Priority referral
 - Refer for **electrodiagnostic studies (EDS)** – Should be requested at time of referral but are not mandatory. Forward results to surgeon once available.
 - If EDS not available or long wait times, consider referral for **Ultrasound** of wrist (EDS is preferred).

An optimal referral letter includes a description of:

- Symptoms along the median nerve distribution
- Whether symptoms constant or intermittent
- Impacts to ADLs, QoL, or sleep (pain)
- ******Presence or absence of thumb weakness and/or atrophy of thenar muscles
- Whether EDS or ultrasound have been completed (attach copy of results) or ordered, date booked (if known)
- What management has taken place and the efficacy



This primary care pathway was co-designed by Primary Care Providers, Specialist Physicians (Plastic Surgery, Orthopedic Surgery, Physiatry, and Neurosurgery), Patient and Family Advisors, and the Alberta Health Services (AHS) Provincial Pathways Unit. It is intended to be used in conjunction with specialty advice services, when required, to support care within the medical home.

EXPANDED DETAILS

Pathway Primer

Carpal tunnel syndrome (CTS) is a common entrapment neuropathy that occurs when there is pressure on the median nerve within the carpal tunnel. Anything that causes a reduction in the volume of the carpal tunnel or increases pressure in the carpal tunnel may cause the symptoms associated with CTS: Pain, burning, numbness, tingling, and weakness in the wrist and hand [(thumb, index and long fingers, and part of the ring finger (not the little finger)] [1] [2] (Figure 1). In severe cases, the thenar muscles at the base of the thumb may atrophy. CTS is most commonly seen in adult populations (aged 40 to 60 years) and women are more likely to develop CTS than their male counterparts [1].

Assessment and diagnosis of CTS usually occurs in primary care settings and in mild/early stages, CTS symptoms can often be managed conservatively in primary care. When conservative management strategies are not effective, carpal tunnel release surgery provides good results [2]. Referrals to specialty care for CTS [e.g., for electrodiagnostic studies (EDS) or surgery] are triaged based on clinical presentation (e.g., symptoms constant or intermittent, median nerve distribution, thumb weakness, atrophy of the thenar muscles); quality of life impacts (e.g., ADLs, sleep); management strategies that have been trialed and the response; and EDS results (when available must be sent by ordering provider to specialist). A quality referral helps specialists appropriately triage patients for care.

1. History

- Numbness and tingling in hand(s) including nighttime presentation: Symptoms often appear first at night (during sleep) and are intermittent.
- Pain in hand(s) and wrist(s): Sharp, shooting, burning (versus OA type pain which is typically achy in nature).
- Difficulty with fine motor tasks (e.g., difficulty doing up buttons, zippers, putting on earrings) and clumsiness (e.g., dropping things).
- Median nerve distribution of symptoms (Figure 1): The median nerve provides sensation to the skin of the thumb, index and long fingers and radial half of the ring finger. Compression of the median nerve in the carpal tunnel typically spares the sensory territory overlying the thenar muscles (supplied by palmar cutaneous nerve which is usually outside the carpal tunnel). The median nerve also innervates the majority of the thenar muscles [3].
- Typically, sensory function is impaired first with carpal tunnel syndrome. Progression of symptoms to include impairment of motor function signifies more advanced/severe carpal tunnel syndrome [2].
- Weakness of thumb opposition: Patient may report difficulty opening jars or doorknobs, twisting caps off bottles, writing and/or doing buttons.
- Precipitating factors, repetitive actions/positional worsening (especially wrist flexion): Ask about activities (new and ongoing) that improve or exacerbate symptoms. Examples may include repeated use of vibrating hand tools or repetitive motion (knitting, needlepoint).

- Flick sign: Pain and numbness resolve when the patient shakes out their affected hand.
- Underlying conditions: There are many conditions that are thought to contribute to carpal tunnel syndrome. Although the cause is often idiopathic, underlying etiologies that should be considered and evaluated if clinical evidence of disease is present are diabetes, inflammatory or autoimmune arthropathy, and hypothyroidism [2] [4] [5].
- Some people with very severe CTS cannot discriminate between hot and cold by touch.
- Previous treatment: Inquire about previous strategies that patients have trialed and their effectiveness.

**The CTS-6 Score is a validated diagnostic scoring tool for CTS (Appendix A).*

Figure 1: Carpal Tunnel Syndrome [1] and Sensory territory of the median nerve [3]

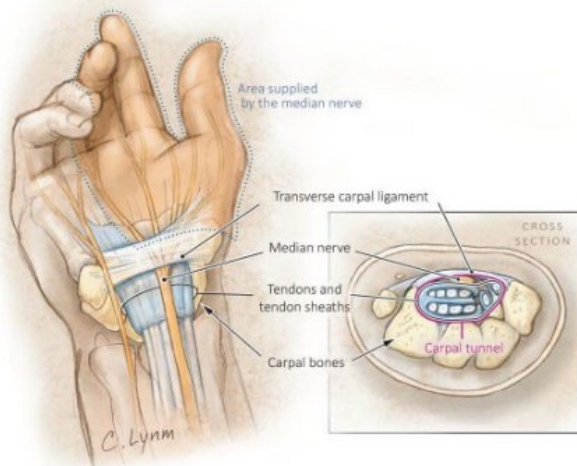


Image from Dynamed

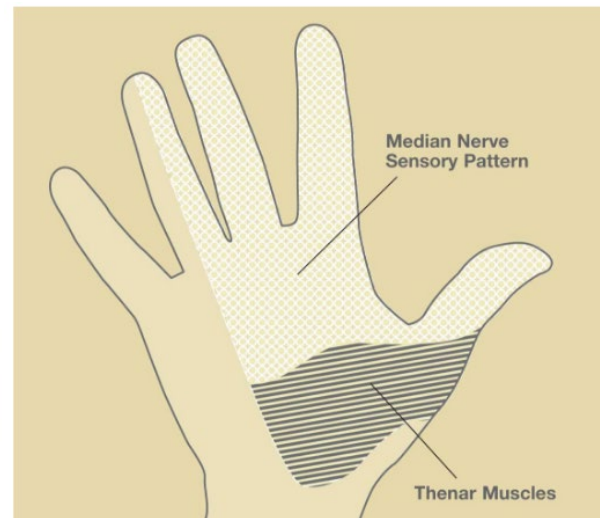


Image from American Society for Surgery of the Hand

2. Physical exam

- Assess sensation: The typical altered sensation pattern should follow the median nerve distribution (thumb, index and long finger, and radial half of the ring finger. The thenar region and little finger are usually not impacted) (Figure 1).
- Atrophy of thenar muscles: Prolonged and severe CTS may result in atrophy of the muscles at the base of the thumb (Figure 2) [6] [2].
- Thumb opposition strength should be tested bilaterally, and the results documented in the referral.

Figure 2: Atrophy of the Thenar muscles [7]



Image from e-hand: The Electronic Textbook of Hand Surgery

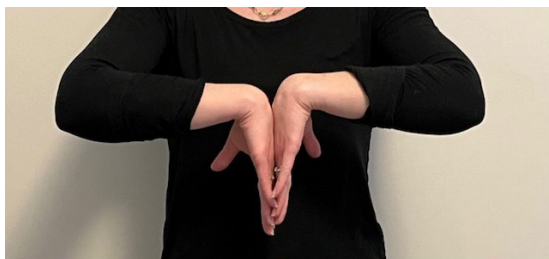
- Consider Provocative tests: Durkan’s test, Phalen’s test and Tinel’s sign can all be used to support the CTS diagnosis.
 - Durkan’s test (Appendix B, Figure 3): Durkan’s test (also known as Carpal Compression Test or Median Compression test) is a diagnostic test for CTS. During the test, the provider places pressure over the carpal tunnel for 30 seconds. Durkan’s test is positive if the patient experiences numbness, pain or paresthesia along the distribution of the median nerve [8].

Figure 3: Durkan’s test



- Tinel’s sign (Appendix C): Used to test for compression neuropathies and is commonly used in the diagnosis of CTS. The test is considered positive when the clinician taps on the area of the wrist over the nerve and the patient reports a tingling or prickling sensation along the median nerve distribution [9].
- Phalen’s test (Appendix D, Figure 4): Provocative test used in CTS diagnosis. During the test, the patient is asked to place the back of their hands together with their wrists flexed. The test is considered positive if the patient experiences symptoms of carpal tunnel syndrome [10].

Figure 4: Phalen’s test



3. RED Flags

- Signs of infection: A deep infection can cause symptoms of carpal tunnel syndrome. If an infection is suspected to be the underlying cause of acute onset carpal tunnel symptoms, call RAAPID to refer to an upper limb surgeon (i.e., plastic surgery or orthopedic surgery) or the emergency room as these cases most likely require surgical drainage. Do not trial antibiotics before referral.

- Post-traumatic median nerve involvement: Some dislocations and fractures can cause acute carpal tunnel syndrome and may require urgent surgery (e.g., carpal dislocations, carpal or distal radius fractures). Call RAAPID to refer to an upper limb surgeon (i.e., plastic surgery or orthopedic surgery) or the emergency room.
- Rapidly progressive: Quick progression of numbness/pain and/or weakness within a week or less can be indicative of wider spread neurological problems. Call RAAPID for Neurologist on call or Emergency Room to investigate potential causes.

Other considerations

Non-specific muscle atrophy and weakness (broader than the thenar muscles) or numbness and tingling outside the median nerve distribution. Refer to Neurology or Physical Medicine & Rehabilitation.

SPECIAL CONSIDERATIONS

There are certain populations and situations that may require additional considerations when presenting with carpal tunnel syndrome complaints.

1. Pregnancy: CTS can occur during pregnancy. It occurs most often in the third trimester and is typically the result of fluid retention. Pregnancy-related CTS usually resolves following delivery [11]. If the CTS is severe during pregnancy, consider referral for EDS. Early onset of CTS, more severe symptoms and higher post-partum depression scores have been shown to increase risk for CTS that does not resolve post-partum [12].
2. Some patients (e.g., the elderly) are less bothered by symptoms and may only present once the disease process is significantly advanced (e.g., severe thenar atrophy). EDS is especially useful for these patients to help determine if surgery will be of benefit. Consider a referral to occupational therapy for adaptive devices to assist with functional limitations, as needed.

4. Management

Stages of Carpal Tunnel Syndrome

CTS is largely diagnosed and differentiated based on clinical presentation and quality of life impacts. CTS can be classified as mild/moderate or severe based on history and physical assessment. It is critically important to *first* determine symptom severity for CTS to ensure that the right patients are referred for EDS and specialty care. CTS severity is also graded as mild, moderate or severe based on EDS results. Severity classification from physical signs and symptoms and EDS may not necessarily align. For example, some individuals with severe nerve compression may report only minimal symptoms and vice versa.

Important note: A referral for surgery should be explored with patients who have trialed conservative management for 8-12 weeks without satisfactory improvement and/or whose EDS results indicate significant nerve compression.

Physical Signs/Symptoms of Mild/Moderate Carpal Tunnel Syndrome

- Symptoms are intermittent
- May feel pain from the wrist spreading to the shoulder with tingling in the hand and fingers. Pain usually resolves when the patient shakes out the affected hand (i.e., flick sign)
- Symptoms usually noted with certain activities or hand/wrist positions
- Patient may notice clumsiness when they use their hands to grip objects (e.g., dropping objects)
- Minimal impacts to daily life

Physical Signs/Symptoms of Severe Carpal Tunnel Syndrome

- Constant symptoms
- Hand weakness affecting activity and grip strength
- Thenar atrophy
- Symptoms interrupt sleep
- Pronounced impacts to activities of daily living (ADLs), QoL, and/or sleep

Management of Mild/Early Carpal Tunnel Syndrome

Once diagnosed, treatment of CTS should begin early. If underlying conditions have been identified, they should be addressed first, and then conservative management strategies should be trialed. Symptoms may resolve in six months especially in those under age 30 and for people with unilateral symptoms of short duration [4]. The patient should be instructed to arrange follow-up in 8-12 weeks from initial assessment if symptoms do not improve and encourage earlier follow-up if symptoms worsen.

Conservative Management Strategies

Wrist splinting is a common initial treatment for CTS (Figure 5). Splints should immobilize the wrist and leave the thumb and fingers free. The wrist is held in a neutral position and reduces pressure in the carpal tunnel [1]. Benefits of splinting are that it is low cost and well tolerated [13]. These should be worn while sleeping and during activities that exacerbate symptoms. Splints can be purchased at a pharmacy or health supply store and may or may not be covered by private insurance plans with a prescription. If fit and/or compliance are concerns, consider a referral to occupational therapy or hand therapy clinics for custom splint fabrication.

Activity modification and avoid precipitating factors: Eliminate offending activity/minimize repetitive activity and see if symptoms resolve.

Figure 5: Rigid Wrist Splint [1]



Steroid Injections: Local corticosteroid injections reduce swelling/inflammation around the median nerve and flexor tendons [11]. Recent randomized control trials and systematic reviews have assessed the efficacy of steroid injections to relieve pain, restore function, and to defer the need for carpal tunnel surgery [14] [11] [15].

- Unguided steroid injections are effective, however the inclusion of ultrasonographic guidance produce “superior clinical, functional and electrophysiological parameters” [11].

- Splinting in conjunction with steroid injections resulted in “a greater reduction in symptoms, superior functional recovery, and greater improvement in nerve function at [three-month] follow up” [15].
- Pain attenuation from steroid injections is time limited, with evidence of pain relief beyond six months being unclear [11]. In a randomized controlled trial of patients with idiopathic CTS, researchers stratified participants into an 80mg methylprednisolone, 40mg methylprednisolone, and placebo groups. Patients who received methylprednisolone injections were able to avoid carpal tunnel release surgery more often than patients who received a placebo injection (8.1-16.2% of patients avoided surgery in the treatment group compared to 2.7% in the placebo group at 5 year follow up, $p < 0.05$) [13]. In those that went on to have surgery, steroid injection delayed the need for surgery by approximately 6 months [14].
- A Cochrane review of adults with CTS (9 trials, n=639 patients) found that corticosteroid injection was effective for symptom relief in mild-moderate CTS with benefits lasting up to 6 months and avoided the need for surgery in some patients [16].
- If the patient is going to have surgery, they should not have steroid injections for at least 1 month before the surgery as it may increase the chance of infection and impair wound healing [17].
- Steroid injections may be a good treatment option for those with a reversible cause (e.g., pregnancy) [11], elderly patients with significant co-morbidities, when the diagnosis is less certain or when a patient is close to retirement and their occupation is thought to exacerbate their CTS symptoms.

Management of Severe/Non-Responding Carpal Tunnel Syndrome

Conservative management strategies described for mild/moderate CTS should be initiated or continued while the patient is awaiting specialty care.

Pharmacological

- Consider referral for surgery if the **first** steroid injection is ineffective or symptoms return. Patients should not receive more than three carpal tunnel steroid injections in their lifetime as this is unlikely to permanently resolve their symptoms and the nerve compression may become irrecoverable in the interim.
 - Note: Patients who present with severe CTS should generally be referred for surgery instead of steroid injections unless medical comorbidities preclude surgical intervention.
- Opioids should not be used in the treatment of CTS.
- Gabapentin can provide symptomatic relief in some patients but is not a treatment. It may mask symptoms and unnecessarily delay surgery, resulting in poorer functional recovery.

Referral to Surgeon AND Order Investigations during Referral Process

Patients with typical symptoms do not usually require additional testing to verify the CTS diagnosis. Additional tests are available which can help confirm the CTS diagnosis, help quantify severity for triage and determine surgical prognosis [13]. If additional testing is required, Electrodiagnostic Studies (EDS) are generally preferred over ultrasound. However, ultrasound may also be a useful tool in CTS diagnosis, particularly where access to EDS may be limited [18].

Electrodiagnostic Studies (EDS):

A thorough assessment and accurate diagnosis for CTS in primary care helps ensure that the right patients are referred for EDS. These studies complement the clinical assessment by quantifying the presence and severity of

demyelination and/or axonal loss [8]. Symptoms may not always correlate with EDS severity. Electrodiagnostic studies stratify the degree of nerve dysfunction that (1) leads to more permanent nerve damage and muscle atrophy and, therefore, assists the surgeon with triage and (2) provides information regarding prognosis after surgical release. EDS is most beneficial when CTS symptoms are severe or when the diagnosis of CTS is unclear. The most common electrodiagnostic study used for CTS is a nerve conduction study, which entails the use of small pulses of electrical current delivered *through electrodes taped to the skin* to stimulate the motor and sensory nerves. Recording electrodes are placed on the skin over the nerves and muscles that are served by the median nerve to capture the electrical responses. Typically, electromyography (EMG), which requires needle insertion in muscle, is unnecessary for the diagnosis of CTS, but may be deployed if alternative diagnoses are suspected. The vast majority of patients tolerate EDS quite well.

Ultrasound of the median nerve: If EDS is not available or there are long wait times, consider referral for Ultrasound of the wrist (EDS preferred). If a referral for EDS is made, do not concurrently order an ultrasound. Measurement of the cross-sectional area of the median nerve via ultrasound can be used to support the diagnosis of CTS [11]. Advantages of Ultrasound over EDS include patient comfort, lower cost, access and evaluation of certain potential underlying causes (e.g., mass lesions, tendinopathies) [13].

Blood tests: Only needed if history and examination suggest a specific underlying cause (e.g., hypothyroidism, rheumatoid arthritis) and should not be ordered routinely [19].

Surgery: Patients with markedly symptomatic CTS that fail to respond to conservative measures or who have severe compression may be offered surgery [13]. Surgical treatment of carpal tunnel syndrome is effective, provides long lasting results and addresses the underlying cause of symptoms by releasing the pressure on the median nerve [11]. There are a few surgical treatment options that the surgeon will review with the patient at their appointment.

Differential Diagnoses

Other conditions may produce symptoms similar to CTS. A thorough history and physical examination is required to rule out other differential diagnoses. If the diagnosis is still uncertain, consider advice or referral for EDS.

Condition	Typical presentation
Cervical radiculopathies	Neck pain, numbness in the thumb and index finger only, positive Spurling test [13].
Diabetic Polyneuropathy	History of diabetes mellitus; bilateral, lower extremity involvement [13].
Hypothyroidism	Symptoms in both arms and legs and/or reflexes are lost or diminished [2].
Inflammatory arthropathy of the hand/wrist	Look for features of systemic disease. May co-exist with CTS [2].
Vibration white finger or hand-arm vibration syndrome	Ask about use of vibrating tools in patient history [2].
Cubital tunnel syndrome	Second most common nerve entrapment in the upper limb. Cubital tunnel syndrome is caused by compression of the ulnar nerve at the elbow which causes paresthesia of the small finger and ulnar half of

	the ring finger. In severe compression, weakness of the intrinsic hand muscles results in loss of grip and pinch strength [19].
Motor neuron disease	Does not typically have a sensory component [2]
Brachial plexopathy	Usually affects more peripheral nerves in the upper extremity than just the median nerve.
Multiple sclerosis	Symptoms outside of median nerve territory. Multiple neurological symptoms concurrently. Upper motor neuron signs.
Neurogenic thoracic outlet syndrome	Fine motor dexterity loss with limited sensory complaints in the little finger and medial forearm.



Advice and Referral Information

There are several surgical specialties who can support the surgical management of carpal tunnel syndrome. It is important to note that not all specialists within a given specialty treat carpal tunnel syndrome. The FAST office will ensure that referrals for carpal tunnel syndrome are directed to the right provider.

- Plastic Surgery
- Orthopedic Surgery
- Neurosurgery
- General Surgery (in some rural settings)
- Family Physicians with enhanced surgical skills

For emergency medical attention, call RAAPID for on-call support

Zone	Program	Online Request	Phone Number	Hours of operation	Anticipated Turnaround Time
Urgent Telephone					
All Zones (All Specialties)	RAAPID  <small>Referral, Access, Advice, Placement, Information & Destination</small>	N/A	North: 1-800-282-9911 780-735-0811 South: 1-800-661-1700 403-944-4486	7 days per week 24 hours	1 hour
Non-Urgent Electronic					
All Zones (Orthopedic Surgery)	eReferral (FAQ) 	N/A	N/A	Mon - Fri	5 business days

Non-Urgent Telephone					
Edmonton, North (Plastic, Orthopedic & General Surgery)	ConnectMD 	Online Request	1-844-633-2263	Mon - Fri 9am – 6pm*	2 business days
Calgary (Orthopedic & General Surgery)	Specialist Link 	Online Request	403-910-2551	Mon - Fri 8am – 5pm*	1 hour

You can request non-urgent advice at any point when uncertain about medications, next steps in treatment, investigations, or resources available. *There are some exceptions to non-urgent telephone program hours of operation and exclusion.

Referral Process

Referral pathways are guidelines to help referring providers know what information, labs and diagnostic imaging are required with their referral to a specialty. These pathways are co-designed with Primary and Specialty Care, AHS Operations, and patients to ensure the right amount of information is included throughout the referral process to triage the patient as quickly as possible.

To ensure referring providers have referral information at their fingertips, referral pathways may link to clinical pathways when available. AHS manages referral pathways and extensive work is ongoing as part of the [Alberta Surgical Initiative](#). If you have questions or want to know more about the referral pathway development process, please email access.ereferral@ahs.ca.

- Urgent Referral – Call surgeon on call via [RAAPID](#) or call 911.
- Follow the Provincial Referral Pathway and use the Facilitated Access to Specialized Treatment (FAST) Provincial Referral Form (if available, see www.albertapathways.ca).
 - If not yet available - Send referral to Upper Limb Surgeon; see [Alberta Referral Directory](#) for referral information.

Appendices

Appendix A: CTS-6 Score for the Diagnosis of Carpal Tunnel Syndrome [20]

	Points
Symptoms and History	
Numbness predominantly or exclusively in the median nerve distribution <i>Sensory symptoms are mostly in the thumb, index, middle and/or ring fingers</i>	3.5
Nocturnal symptoms <i>Symptoms are prominent when patient sleeps; numbness wakes patient from sleep</i>	4
Physical Examination	
Thenar atrophy or weakness <i>The bulk of the thenar area is reduced or manual motor testing shows strength <4</i>	5
Positive Phalen test <i>Flexion of the wrist reproduces or worsens symptoms of numbness in the median nerve territory</i>	5
Loss of 2-point discrimination <i>A failure to discriminate two points held 5mm of less apart from one another, in the median nerve innervated digits, is a positive test suggestive of CTS</i>	4.5
Positive Tinel sign <i>Light tapping over the median nerve at the level of the carpal tunnel causing radiating paresthesiae into the median nerve innervated digits is a positive test</i>	4
Total	/ 26

Score of 12 = 0.80 probability of carpal tunnel syndrome

Score of 5 = 0.25 probability of carpal tunnel syndrome

Appendix B: Durkan's test/Carpal Compression Test [8] [21]

Step 1. Patient can be sitting or standing.

Step 2. With the patient's forearm supinated, apply direct pressure over the carpal tunnel (median nerve) as it crosses the carpal tunnel (just distal to the distal wrist crease) for 30 seconds.

Step 3. A positive test is reproduction of patient symptoms (e.g., any numbness, pain, or paresthesia in the distribution of the median nerve).

Link to video: [Carpal Compression Test. The Student Physical Therapist.](#)

Appendix C: Tinel's sign [9]

Step 1: Patient can be sitting or standing.

Step 2: Clinician taps the median nerve at the wrist.

Step 3: Positive test is indicated by tingling and paresthesia in the thumb, index finger and middle/lateral half of the ring finger.

Link to Video: Video from Clinically Relevant on the [Tinel's Test - Physiopedia \(physio-pedia.com\)](#) site.

Appendix D: Phalen's test [10]

Step 1. Patient in sitting position with flexed elbows on the table.

Step 2: Ask the patient to push the dorsal surface of the hands together and hold for 30-60 seconds. This position increases the pressure in the carpal tunnel.

Step 3: Phalen's test is considered positive if the patient's symptoms are reproduced.

Link to video: Video from Clinically Relevant on the [Phalen's Test - Physiopedia \(physio-pedia.com\)](#).

BACKGROUND

About this pathway

- This pathway was developed in collaboration with Primary Care Providers, Plastic Surgeons, Orthopedic Surgeons, Neurosurgeons, Psychiatrists and Patient and Family Advisors, and the Alberta Health Services (AHS) Provincial Pathways Unit.
- Condition-specific clinical pathways are intended to offer evidence-based guidance to support primary care providers in caring for patients with a range of clinical conditions.

Authors and conflict of interest declaration

The authors represent a multi-disciplinary team. Names of the content creators and their conflict-of-interest declarations are available on request by emailing AlbertaPathways@ahs.ca.

Co-Design Team Project Membership	
Name and Designation/ Post Nominals	Organization
Mary Obstfeld, NP MN BScN	Nurse Practitioner, North Zone
Dr. Suvidha Jain, MD	Family Physician, Central Zone
Dr. Aderonke Achi, MD CCFP	Family Physician, Central Zone
Dr. Ali Chatha, MD CCFP	Family Physician, Calgary Zone
Dr. Hollie Power, MD FRCSC	Plastic Surgeon, Edmonton Zone
Dr. Peter Oliver Kwan, MD FRCSC PhD	Plastic Surgeon, Edmonton Zone
Dr. Stephen Cassar, MD FRCSC	Plastic Surgeon, South Zone
Dr. Maleka Ramji, MD FRCSC	Plastic Surgeon, Calgary Zone
Dr. Robert Chan, MD MSc FRCSC	Orthopedic Surgeon, Edmonton Zone
Dr. Armin Badre, MD MSc FRCSC	Orthopedic Surgeon, Edmonton Zone
Dr. Andrew Jack, MD MSc FRCSC	Complex Spine and Peripheral Nerve Surgeon, Edmonton Zone
Dr. Mark Ng, MB ChB MBA FRCPC	Physiatrist, Edmonton Zone
Nancy Verdin	Patient and Family Advisor, Central Zone
Pamela Pyle	Patient and Family Advisor, Calgary Zone

Pathway review process, timelines

Primary care pathways undergo scheduled review every two years, or earlier if there is a clinically significant change in knowledge or practice. The next scheduled review is May 2026. However, we welcome feedback at any time.

Please email comments to AlbertaPathways@ahs.ca.

Copyright information

This work is licensed under a Creative Commons Attribution-Non-commercial-Share Alike 4.0 International license. You are free to copy, distribute and adapt the work for non-commercial purposes, as long as you attribute the work to Alberta Health Services and Primary Care Networks and abide by the other license terms. If you alter, transform, or build upon this work, you may distribute the resulting work only under the same, similar, or compatible license. The license does not apply to content for which the Alberta Health Services is not the copyright owner.



This pathway represents evidence-based best practice but does not override the individual responsibility of healthcare professionals to make decisions appropriate to their patients using their own clinical judgment given their patients' specific clinical conditions, in consultation with patients/alternate decision makers. The pathway is not a substitute for clinical judgment or advice of a qualified healthcare professional. It is expected that all users will seek advice of other appropriately qualified and regulated healthcare providers with any issues transcending their specific knowledge, scope of regulated practice or professional competence.

PROVIDER RESOURCES

Enhanced Primary Care Pathway: Diabetic Peripheral Neuropathy	Neurology DiabeticPeripheralNeuropathy Pathway.pdf (specialistlink.ca)
Boston Carpal Tunnel Syndrome Questionnaire	BCTQ.pdf (gettingitrightfirsttime.co.uk)
Head and shoulders, knees and toes: Neurological presentations and serious mimics” webinar series hosted by the Physician Learning Program, the Office of Lifelong Learning, and the ALS Multidisciplinary Clinic	https://ualberta.yuja.com/v/carpaltunnelsyndrome

PATIENT RESOURCES

Patient Pathway on MyHealth Alberta > A webpage and two PDF formats are available to allow for easy printing, download, or scanning a QR code with the patient's smart phone for more information at their convenience	https://myhealth.alberta.ca/HealthTopics/carpal-tunnel-syndrome-pathway/Documents/carpal-tunnel-syndrome-pathway-summary.pdf
Carpal tunnel treatment options	Carpal-tunnel-syndrome.pdf (choosingwiselycanada.org)
MyHealth Alberta	Carpal Tunnel Syndrome: Safe Posture and Movements Carpal Tunnel Syndrome: Should I Have Surgery? Carpal Tunnel Syndrome: Care Instructions
NHS – making decisions about CTS	NHS Carpal Tunnel decision tool (england.nhs.uk)
American society for surgery of the hand	Carpal Tunnel Syndrome: What is it? Symptoms, Causes, & Treatment The Hand Society (assh.org)

REFERENCES

- [1] DynaMed, "Carpal Tunnel Syndrome," EBSCO, 2023. [Online]. Available: <https://www.dynamed.com/condition/carpal-tunnel-syndrome>. [Accessed 27 November 2023].
- [2] S. D. Middleton and R. E. Anakwe, "Carpal Tunnel Syndrome," *British Medical Journal*, pp. 1-7, 2014.
- [3] HANDCARE The Upper Extremity Expert, "Carpal Tunnel Syndrome," American Society for Surgery of the Hand, 2024. [Online]. Available: <https://www.assh.org/handcare/condition/carpal-tunnel-syndrome>. [Accessed 2 February 2024].
- [4] NHS, *Carpal Tunnel Syndrome*.
- [5] J. Geoghegan, D. Clark, L. Bainbridge, S. C and R. Hubbard, "Risk Factors in Carpal Tunnel Syndrome," *Journal of Hand Surgery (British and European Volume)*, vol. 29B, no. 4, pp. 315-320, 2004.
- [6] M. Ghasemi-rad, E. Nosair, A. Vegh, A. Mohammadi, A. Akkad, E. Lesha, M. Hossein Mohammadi, D. Sayed, A. Davarian, T. Maleki-Miyandoab and A. Hasan, "A Handy Review of Carpal Tunnel Syndrome: From Anatomy to Diagnosis and Treatment," *World Journal of Radiology*, vol. 6, no. 6, pp. 284-300, 2014.
- [7] E-Hand.com: The Electronic Textbook of Hand Surgery, "Clinical Example: Thenar Atrophy and Pseudoatrophy," [Online]. Available: <https://www.eatohand.com/img/img00015.htm>. [Accessed 16 May 2024].
- [8] Physiopedia, "Carpal Compression Test," 2023. [Online]. Available: https://www.physio-pedia.com/Carpal_Compression_Test. [Accessed 28 November 2023].
- [9] Physiopedia, "Tinel's test," Physiopedia, 2023. [Online]. Available: https://www.physio-pedia.com/Tinel%E2%80%99s_Test. [Accessed 5 December 2023].
- [10] L. Padua, C. Cuccagna, S. Giovannini, D. Coraci, L. Pelosi, C. Loreti, R. Bernabei and L. D. Hobson-Webb, "Carpal Tunnel Syndrome: Updated Evidence and New Questions," *Lancet Neurol*, vol. 22, pp. 255-267, 2023.
- [11] M. Meems, S. E. M. Truijens, V. Spek, L. H. Visser and V. J. M. Pop, "Follow-up of pregnancy-related carpal tunnel syndrome symptoms at 12 months postpartum: A prospective study," *Eur J Obstet Gynecol Reprod Biol*, vol. 211, pp. 231-232, 2017.
- [12] J. Wiperman and K. Goerl, "Carpal Tunnel Syndrome: Diagnosis and Management," *American Family Physician*, vol. 94, no. 12, pp. 993-999, 2016.
- [13] M. Hofer, J. Ranstam and I. Atroshi, "Extended followup of local steroid injection for carpal tunnel syndrome," *Journal of the American Medical Association*, vol. 40, no. 10, pp. 1-9, 2021.
- [14] J. Wang, K. Liao, K. Lin, C. Chou, T. Yang, Y. Huang, K. Wang and J. Chiu, "Efficacy of combined ultrasound-guided steroid injection and splinting in patient with carpal tunnel syndrome: a randomized control trial," *Archives of Physical Medicine and Rehabilitation*, vol. 98, pp. 947-956, 2017.
- [15] N. Ashworth, J. Bland, K. Chapman, G. Tardif, L. Albarqouni and A. Nagendran, "Local corticosteroid injection versus placebo for carpal tunnel syndrome," *Cochrane Database Systematic Review*, vol. 2, 2023.
- [16] O. Fakunle, K. Farley, E. DeMaio, M. Gottschalk, E. Wagner and C. Daly, "When is it safe to operate after therapeutic carpal tunnel injections?," *Hand*, vol. 18, no. 1, pp. 139-145, 2023.
- [17] J. Chen and J. R. Fowler, "Comparison of Diagnostic Accuracy of Electrodiagnostic Testing and Ultrasonography for Carpal Tunnel Syndrome," *HAND*, vol. 18, no. 3, pp. 407-412, 2023.
- [18] British Society for Surgery of the Hand (BSSH), British Orthopaedic Association (BOA), Royal College of Surgeons of , "Commissioning Guide: Treatment of Carpal Tunnel Syndrome," London , 2017.

- [19] B. Graham, G. Regehr, G. Naglie and J. Wirght, "Development and Validation of Diagnostic Criteria for Carpal Tunnel Syndrome," *The Journal of Hand Surgery*, vol. 31, no. 6, pp. 919-924, 2006.
- [20] The Student Physical Therapist, "Carpal Compression Test," 2017. [Online]. Available: <https://www.youtube.com/watch?v=5vC-r1FaZZE>. [Accessed 21 May 2024].