Referral guidelines: carpal tunnel syndrome

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The contribution on the postoperative management and rehabilitation of patients with carpal tunnel syndrome should be carefully considered by every surgeon. The operation is simply not over when the last stitch goes in; careful postoperative management is quite important if one is to obtain optimal surgical results. The principles outlined here are valuable and help to explain the occasional poor outcome. We have become convinced that the use of a dorsal splint in the 1st week to 10 days following surgery is a helpful measure. It is designed to prevent the median nerve from prolapsing forward and becoming adherent to or trapped by the edges of the severed transverse carpal ligament.

With regard to surgical management of carpal tunnel syndrome. It is exceedingly important to continue producing outcome studies showing that our interventions really do eliminate the problem and allow people to return to productive work. Templates for outcome assessment are under development by the Outcomes Committee of the American Association of Neurological Surgeons and the Congress of Neurological Surgeons and also by the American College of Surgeons. Hopefully, they can be applied to the treatment of carpal tunnel syndrome. The following segment represents some suggested referral guidelines for patients with carpal tunnel syndrome. The present differential diagnosis, methods of confirming the diagnosis, and appropriate indications for considering surgery. These guidelines have been reviewed by the various authors who have contributed to this issue of Neurosurgical Focus and other colleagues in neurosurgery, orthopedics, plastic surgery, neurology, and occupational therapy. It is hoped that they will be a reasonable start in our efforts to inform referring physicians as to the nature of median thenar neuropathy and its overall management.

### REFERRAL GUIDELINES: CARPAL TUNNEL SYNDROME (MEDIAN THENAR NEUROPATHY)

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<th>I. Diagnostic Criteria</th>
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<td>A. Symptoms (History)</td>
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<td>1. Painful (disagreeable) numbness of the hand and central fingers; usually worse at night; aggravated by use of the hand, particularly for repetitive motions; pain may extend proximally to involve the forearm, rarely above the elbow</td>
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<td>2. Progressive weakness of grip</td>
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<td>3. Trauma to wrist or hand</td>
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<td>B. Signs (Physical Examination)</td>
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<td>1. Weakness of abductor pollicis brevis</td>
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<td>2. Atrophy of abductor pollicis brevis</td>
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<td>3. Tinel’s signs at the wrist</td>
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<td>4. Phalen’s sign</td>
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<td>5. Variable sensory examination in hands and fingers; no dermatomal sensory loss</td>
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<td>6. Normal and symmetrical deep tendon reflexes in the upper extremities; no pathological reflexes</td>
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<td>7. Normal blood supply to hand and fingers (pulses and capillary blush)</td>
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8. Normal neck examination: ROM, spasm, radicular signs
9. Normal autonomic function: skin, sweating, nails

C. Laboratory Studies
1. Thyroid function tests
2. Pregnancy tests, when appropriate

D. Electrophysiological Tests
1. Electromyography and nerve conduction velocity: characteristic median nerve conduction delay at the wrist (latency)
2. Absence of radicular or polyneuropathic patterns of abnormality

E. Imaging Studies
1. Plain x-ray films of the wrist and hand: advisable only when previous traumatic injury has occurred
2. Magnetic resonance imaging: not advisable on a routine basis

F. Predisposing Factors
1. Occupational
2. Previous wrist injury/surgery
3. Hypothyroidism
4. Pregnancy
5. Diabetes mellitus
6. Acromegaly
7. Rheumatoid/collagen vascular disease
8. Primary amyloidosis
9. Peripheral neuropathy: alcoholism, nutritional
10. Dupuytren's contracture
11. Peripheral vascular disease

G. Differential Diagnosis
1. Cervical radiculopathy: disc herniation, spondylosis
2. Peripheral neuropathy
3. Cervical myelopathy: syrinx, spinal cord tumor

H. Conservative Management
1. Avoid or alter occupational stress
2. Correct metabolic disorders
3. Wrist splints
4. Occupational therapy consultation
5. Administration of steroids/diuretics: not generally advisable as they rarely provide lasting benefit

I. Indications for Surgical Management
1. Progressively disabling painful numbness of the hand
2. Atrophy and weakness of abductor pollicis brevis
3. Electromyographical and nerve conduction velocity confirmation: desirable

J. Anticipated Results and Complications of Surgery
1. Relief of symptoms and signs: 92%
2. Wound healing, infection, adhesions, motor branch injury: 3%

K. Appropriate Surgical Referral
1. Neurosurgeon
2. Orthopedist
3. Hand surgeon
4. Plastic surgeon

L. Referral to Hand Surgeon Specialist
1. Recurrent postoperative median thenar neuropathy
2. Associated wrist fracture or dislocation
3. Associated tendon pathology (synovial cysts, trigger finger)
4. Severe rheumatoid disease

M. Postoperative Management
1. Wrist splints
2. Occupational therapy program

N. Anticipated Return to Normal Activities (Work)
1. 10 days to 3 weeks