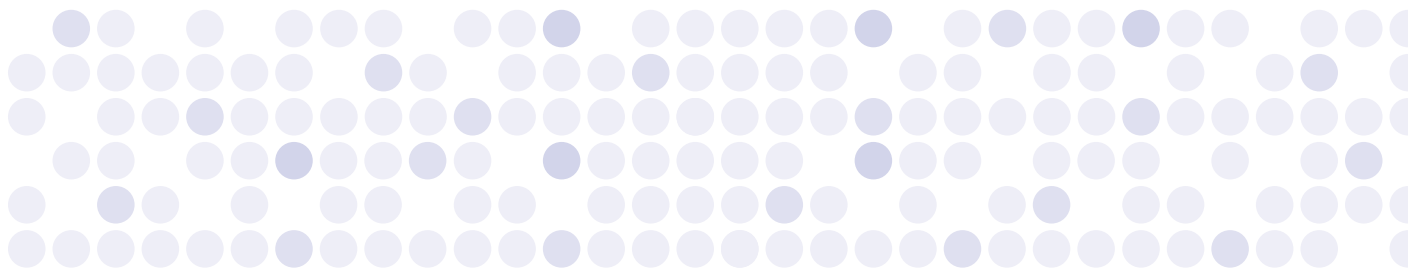


Clinical guidelines for the Queensland workers' compensation scheme

Wrist





Contents

Before you start

Relevance to the workers' compensation sector.....	2
Agree appraisal.....	3
Register of clinical practice guidelines for wrist.....	4

Click to the relevant guideline

Diagnosis and treatment of work-related carpal tunnel syndrome (OCTS).....	5
Forearm, wrist and hand complaints.....	11
Forearm, wrist & hand (acute & chronic).....	18
Hand-wrist.....	28
Carpal tunnel syndrome (acute & chronic).....	33

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Foreword

Clinical guidelines for the Queensland workers' compensation scheme is a selection of clinical guidelines or 'treatment protocols' used by other jurisdictions and medical bodies.

Q-COMP compiled this selection to create a resource for clinicians treating injured workers in Queensland.

Over the course of our research it became clear what type of guidelines are successfully applied to practice and what we should include.

They include guidelines where:

- medical providers were consulted
- nurse and allied health providers identified relevant areas to include
- medical specialty groups endorsed the guidelines
- an effective promotion program was used
- patient education brochures or fact sheets for general practitioners to provide to their patients were developed
- an education strategy included the Continuing Professional Development (CPD) program
- frameworks for evaluating the guidelines effectiveness were developed ahead or simultaneously with the guidelines themselves.

I am looking forward to receiving your feedback on *Clinical guidelines for the Queensland workers' compensation scheme* and your support in achieving the best outcomes for injured workers in Queensland.

Elizabeth Woods
Chief Executive Officer

Relevance to the workers' compensation sector

Each item is rated on a 5-point scale ranging from 5 "Strongly Agree" to 1 "Strongly Disagree". The scale measures the extent to which a criterion (item) has been fulfilled.

	1	2	3	4	5
	Diagnosis and treatment of work-related carpal tunnel syndrome (OCTS)	Forearm, wrist and hand complaints	Forearm, wrist & hand (acute & chronic)	Hand-wrist	Carpal tunnel syndrome (acute & chronic)
<i>Functional Restoration</i> Does the guideline consider graded increases in activity and function?	4	5	5	3	4
<i>Psychosocial Factors</i> To what degree does the guideline consider psychosocial factors that may influence recovery?	1	3	1	1	1
<i>Return to Work Process (vocational rehabilitation)</i> To what degree does the guideline consider the Return to Work Process (vocational rehabilitation)?	5	5	5	3	5
<i>Risk Factors for Recovery</i> To what degree does the guideline consider Risk Factors for Recovery?	4	4	4	1	4
Total Score	14	17	15	8	14

Rating criteria All of the CPG'S except CPG 4 score well on Functional Restoration, Return to Work Process and Risk Factors for recovery



Agree appraisal

Each item is rated on a 5-point scale ranging from 5 “Strongly Agree” to 1 “Strongly Disagree”. The scale measures the extent to which a criterion (item) has been fulfilled.

The aggregate scores are then converted into a percentage scale ranging from 100% “Strongly Agree” to 1% “Strongly Disagree”.

	1	2	3	4	5
	Diagnosis and treatment of work-related carpal tunnel syndrome (OCTS)	Forearm, wrist and hand complaints	Forearm, wrist & hand (acute & chronic)	Hand-wrist	Carpal tunnel syndrome (acute & chronic)
Scope and Purpose	61%	50%	67%	39%	61%
Stakeholder Involvement	29%	42%	29%	58%	25%
Rigour of Development	29%	29%	43%	38%	57%
Clarity and Presentation	63%	79%	100%	50%	92%
Applicability	0%	0%	6%	11%	6%
Editorial Independence	83%	17%	17%	83%	17%

Register of clinical practice guidelines for wrist

CPG	Name	Source	Developed by
1	Diagnosis and treatment of work-related carpal tunnel syndrome (OCTS)	National Guideline Clearinghouse www.guideline.gov	Washington State Department of Labor and Industries. Diagnosis and treatment of work-related carpal tunnel syndrome (OCTS). Olympia (WA): Washington State Department of Labor and Industries; 2002 Aug. 10 p.
2	Forearm, wrist and hand complaints	National Guideline Clearinghouse www.guideline.gov	Forearm, wrist, and hand complaints. Elk Grove Village (IL): American College of Occupational and Environmental medicine (ACOEM); 2004; 2004.34 p. [101 references]
3	Forearm, wrist & hand (acute & chronic)	National Guideline Clearinghouse www.guideline.gov	Forearm, wrist, and hand complaints. Elk Grove Village (IL): American College of Occupational and Environmental medicine (ACOEM); 2004; 2004.34 p. [101 references]
4	Hand-wrist	National Guideline Clearinghouse www.guideline.gov	Expert Clinical Benchmarks. King of Prussia (PA): MedRisk, Inc.; 2004. 56 p.
5	Carpal tunnel syndrome (acute & chronic)	National Guideline Clearinghouse www.guideline.gov	Work Loss Data Institute. Carpal tunnel syndrome (acute & chronic). Corpus Christi (TX): Work Loss Data Institute; 2006. 159 p. [246 references]



Diagnosis and treatment of work-related carpal tunnel syndrome (OCTS)

Contents

1. Developed by	6
2. Guideline status	6
3. Where located/how accessed	6
4. Description/scope	6
5. Outcomes considered	7
6. AGREE Appraisal	7
7. Relevance/Appropriateness of use in workers' compensation sector	8
a) Functional progression	8
b) Physical/psychiatric rehabilitation.....	9
c) Risk factor/recovery	9
d) Return to work.....	9
8. Priority for Q-COMP.....	10



1. Developed by

Washington State Department of Labor and Industries. Diagnosis and treatment of work-related carpal tunnel syndrome (OCTS). Olympia (WA): Washington State Department of Labor and Industries; 2002 Aug.10 p.

2. Guideline status

This is the current release of the guideline

This guideline updates a previous version: Washington State Department of Labor and Industries . Diagnosis and treatment of work-related carpal tunnel syndrome (OCTS). Olympia (WA): Washington State Department of Labor and Industries; 1999 Jun

3. Where located/how accessed

National Guideline Clearinghouse www.guideline.gov

Electronic copies: Available from the Washington State Department of Labor and Industries Website.

Print copies; L&I Warehouse, Department of Labor and Industries, P.O. Box 44843, Olympia, Washington 98504-4843

Availability of companion documents

This guideline is one of 16 guidelines published in the following monograph:

Medical treatment guidelines. Olympia (WA): Washington State Department of Labor and Industries, 2002 Aug. 109 p.

Also included in this monograph:

Grannemann TW (editor). Review, regulate or reform? What works to control worker's compensation medical costs? In: Medical treatment guidelines. Olympia (WA): Washington State Department of Labor and Industries, 1994 (republished 2002).P.3-19.

Electronic copies : Available from the Washington State Department of Labor and Industries Website.

The following is also available;

Washington State Department of Labor and Industries. Utilization Review Program. New Ur Firm . (Provider Bulletin: PB 02-04). Olympia (WA): Washington State Department of Labor and Industries

Print copies ; L&I Warehouse, Department of Labor and Industries, P.O. Box 44843, Olympia, Washington 98504-4843

4. Description/scope

Disease/condition(s)

- Work-related carpal tunnel syndrome (OCTS)

Guideline category

- Diagnosis
- Evaluation
- Treatment



Clinical speciality

- Neurological Surgery
- Neurology
- Orthopaedic Surgery
- Physical Medicine and Rehabilitation

Intended users

- Health Care Providers
- Health Plans
- Physicians
- Utilization Management

Guideline objectives

- To present guidelines for the diagnosis and treatment of work-related carpal tunnel syndrome (OCTS)

Target population

- The injured worker with carpal tunnel syndrome

Interventions and practices considered

Diagnostic evaluation

1. Evaluation of subjective and objective clinical findings (e.g., symptoms of numbness, tingling, weakness, and decreased sensation to pin in palm and first 3 digits)
2. Work-relatedness assessment
3. Electrodiagnostic studies, including nerve conduction testing (NCVs), electromyogram (EMG) , or needle examination

Treatment

1. Conservative care
 - Splinting of the wrist
 - Anti-inflammatory medication including non-steroidal
 - Steroid injections
2. Conservative care and job modification
3. Surgery
 - Decompression of the transverse carpal tunnel ligament
 - Internal neurolysis

5. Outcomes considered

- Sensitivity and specificity of diagnostic assessments for carpal tunnel syndrome
- Response to surgical decompression of the median nerve

6. Agree appraisal

- Scope and Purpose 61%
- Stakeholder Involvement 29%
- Rigour of Development 29%
- Clarity and Presentation 63%
- Applicability 0%
- Editorial Independence 83%

7.Relevance/appropriateness of use in workers' compensation sector

a) Functional progression

Major recommendations

Criteria for the Diagnosis and Treatment of Work-Related Carpal Tunnel

Syndrome (OCTS)

Procedure	Conservative care		Clinical findings		
			Subjective		Objective
Decompression Of The Median Nerve	<ul style="list-style-type: none"> • Splinting • Anti-inflammatory medication • Steroid Injections * • * No more than 2 injections in 3 months <p>NOTE: In the absence of conservative care or with minimal conservative care, a request for surgery can still be clinical findings</p>	AND	<p>Complaints of numbness, tingling, or "burning" pain of the hand or thumb and first 2 fingers.</p> <p>Nocturnal symptoms may be prominent.</p> <p>NOTE: Pain may radiate to inner elbow or to the shoulder.</p>	OR	<p>Decreased sensation to pin in palm and first 3 digits</p> <p>OR</p> <p>Weakness or atrophy of the thenar eminence muscles</p>
Nerve conduction studies should be done if worker is off work for > two weeks or surgery requested.					

Abbreviations: EMG, electromyogram; NCV, nerve conduction testing; RTW,return to work



b) Physical/psychiatric rehabilitation

Not discussed

c) Risk factor/recovery

None stated

d) Return to work

Work-relatedness (for claim acceptance)

Any activity requiring extensive or continuous use of the hands in work may be an appropriate exposure. In general, one of the following work conditions should be occurring on a regular basis:

1. Repetitive hand use, especially for prolonged periods (e.g., keyboard users), against force (e.g., meat cutters), or with awkward hand positions (e.g., grocery checkers), with repeated wrist flexion, extension, or deviation as well as forearm rotation, or with constant firm gripping
2. The presence of regular, strong vibrations (e.g., jackhammer, chainsaw)
3. Regular or intermittent pressure on the wrist (Note: acute carpal tunnel syndrome may be associated with acute trauma [i.e., fracture, crush injury of wrist, etc.].)

The types of jobs that are most frequently mentioned in the literature or reported in Labor and Industry's (L&I's) data include meat cutting; seafood, fruit, or meat processing or canning; carpentry; roofing; dry walling; boat building; book binding; wood products work; dental hygienist; and intensive word processing. This is not an exhaustive list. It is only meant to be a guide in consideration of work-relatedness. If the history of exposure is unclear, then speaking directly with the employer or claimant or doing a walk through to obtain more detailed information on job duties would be critical.

Special cases

Questions may arise in several specific situations that may raise questions about the validity of the claim for OCTS or about the need for surgery.

- A. Work-relatedness may not be obvious. Some work exposures do not meet the guidelines for work-relatedness. If there is a question about the job exposure and whether such exposure could cause OCTS, the claim manager should refer the case to the occupational medical consultant.
- B. Surgery may be requested in those injured workers whose clinical picture and work relatedness is quite clear, but whose NCVs are normal. Most clinicians agree that a minority (<10%) of patients with clinical OCTS may have normal NCVs. Options here may be the following:
 1. Were the most sensitive and specific NCV tests done (e.g., palm-wrist median sensory latency)? If not, request that they be done.
 2. If the NCVs were done after a period of not working, previously abnormal NCVs may have returned to normal. It would be reasonable in these cases to suggest that the claimant return to work for a brief time (a few days to a week) and repeat NCVs while they are still working.
 3. If OCTS is not documented by clinical criteria and NCV testing, other clinical problems related to repetitive use (i.e., tendonitis) should be investigated and treated appropriately. It would also be important to rule out other neurologic causes of tingling in the hands. Referral to an appropriate specialist (neurologist, physiatrist) would be prudent in such cases.
- C. Carpal tunnel syndrome may also be caused by anything that decreases the cross-sectional area of the carpal tunnel or adds to the volume of the carpal tunnel, resulting in increased pressure on the median nerve. This could occur by distortion of the bones or ligaments by fracture or crush injury of the forearm or hand associated with generalized or chronic swelling (oedema).

- D. Carpal tunnel syndrome may be associated with other chronic conditions that may cause nerve damage or predispose a nerve to injury from compression. The most common of these conditions is diabetes. The key test here is whether, in spite of the presence of such condition, the symptoms of OCTS can be documented to have begun only after beginning work at the job in question.
- E. A predisposing, physiological condition is pregnancy, wherein increased plasma volume increases pressure within the carpal tunnel. In such cases, symptoms universally disappear immediately after birth. If they do not, other etiologies (e.g., work-related, diabetes) should be pursued.

Return to Work after OCTS Surgery

The vast majority of persons with work-related OCTS are expected to have dramatic relief of their symptoms after carpal tunnel decompression surgery and should return to their same job. Return to work, with or without job modification, should be tried in most people. If symptoms worsen or reappear after return to work, repeat NCVs will help to sort out if OCTS has recurred and if surgery successfully removed the pressure on the median nerve (NCVs will improve with successful surgery, although they may not return completely to normal).

8. Priority for Q-COMP

Rating criteria

Functional restoration Does the guideline consider graded increases in activity and function?	4
Psychosocial factors To what degree does the guideline consider psychosocial factors that may influence recovery?	1
Return to work process (vocational rehabilitation) To what degree does the guideline consider the return to work process (vocational rehabilitation)?	5
Risk factors for recovery To what degree does the guideline consider risk factors for recovery?	4
Total rating	14



Forearm, wrist and hand complaints

Contents

1. Developed by	12
2. Guideline status	12
3. Where located/how accessed	12
4. Description/scope	12
5. Outcomes considered	13
6. Agree appraisal.....	13
7. Relevance/appropriateness of use in workers' compensation sector.....	13
a) Functional progression	13
b) Physical/psychiatric rehabilitation.....	16
c) Risk factor/recovery	16
d) Return to work.....	16
8. Priority for Q-COMP.....	17



1. Developed by

Forearm, wrist, and hand complaints. Elk Grove Village (IL): American College of Occupational and Environmental medicine (ACOEM); 2004; 2004.34 p. [101 references]

2. Guideline status

This is the current release of the guideline.

This guideline updates a previous version;Harris,J,ed. Occupational Medicine Practice Guidelines:American College of Occupational and Environmental Medicine. Beverly Farms , MA:OEM Press:1997

3. Where located/how accessed

National Guideline Clearinghouse www.guideline.gov

Print copies are available from ACOEM, 25 Northwest Point Boulevard, Suite 700, Elk Grove Village, IL 60007; Phone:847-818-1800 x399. To order a subscription to the online version, call 800-441-9674 or visit <http://www.aceompracguides.org/>

4. Description/scope

Disease/condition(s)

- Forearm, wrist and hand complaints

Guideline category

- Diagnosis
- Evaluation
- Management
- Treatment

Clinical speciality

- Family Practice
- Internal Medicine
- Orthopaedic Surgery
- Physical Medicine and Rehabilitation
- Preventative Medicine
- Surgery

Intended users

- Advanced Practice Nurses
- Physician Assistants
- Physicians
- Utilization Management

Guideline objectives

- To provide information and guidance on generally accepted elements of quality care in occupational and environmental medicine
- To improve the efficiency with which the diagnostic process is conducted, the specificity of each diagnostic test performed, and the effectiveness of each treatment in relieving symptoms and relieving cure
- To present recommendations on assessing and treating adults with work-related forearm, wrist, or hand complaints



Target population

- Adults with potentially work-related forearm, wrist, or hand complaints

Interventions and practices considered

*Note from the National Guideline Clearinghouse (NGC):*The following general clinical measures were considered. Refer to the original guideline document for information regarding which specific interventions and practices under these general headings are recommended, optional, or not recommended by the American College of Occupational and Environmental Medicine.

- History and physical exam
- Patient education
- Medication
- Physical treatment methods
- Injections
- Rest and immobilization
- Activity and exercise
- Detection of neurologic abnormalities
- Radiography
- Other imaging procedures
- Surgical considerations
- Psychosocial factors

5. Outcomes considered

Missed work days

6. Agree appraisal

- | | |
|----------------------------|-----|
| • Scope and Purpose | 50% |
| • Stakeholder Involvement | 42% |
| • Rigour of Development | 29% |
| • Clarity and Presentation | 79% |
| • Applicability | 0% |
| • Editorial Independence | 17% |

7. Relevance/appropriateness of use in workers' compensation

a) Functional progression

The following clinical algorithms are provided in the original guideline document:

- American College of Occupational and Environmental Medicine Guidelines for care of acute and subacute occupational forearm, wrist, and hand complaints
- Initial evaluation of occupational forearm, wrist, and hand complaints
- Initial and follow-up management of occupational forearm, wrist, and hand complaints
- Evaluation of slow-to-recover patients with occupational forearm, wrist, and hand complaints (symptoms >4 weeks)
- Surgical considerations for patients with anatomic and physiologic evidence of nerve root compression and persistent forearm, wrist, and hand symptoms
- Further management of occupational forearm, wrist, and hand complaints

Summary of recommendations for evaluating and managing forearm, wrist, and hand complaints

(refer to the original guideline document for more detailed information)

Clinical Measure	Recommended	Optional	Not recommended
History and physical exam	Basic history, focused exam, and search for red flags		
Patient education	Patient education regarding prevention, diagnosis, prognosis, and expectations of medical treatment		
Medication (See Chapter 3 in the Original guideline document)	Acetaminophen Non-steroidal anti-inflammatory drugs (NSAIDs)	Opioids, short course Rarely, corticosteroids	Use of opioids for more than 2 weeks
Physical treatment methods	Instructions for home exercises	At-home applications of heat or cold packs	Passive modalities Transcutaneous electrical neurostimulation (TENS) Biofeedback
Injections	Injection of corticosteroids into carpal tunnel in mild or moderate cases of carpal tunnel syndrome (CTS) after trial of splinting and medication Initial injection into tendon sheath for clearly diagnosed cases of DeQuervain's syndrome, tenosynovitis, or trigger finger	Initial injection of corticosteroids in moderate cases of tendinitis	Repeated or frequent injection of corticosteroids into carpal tunnel, tendon sheaths, ganglia, etc.
Rest and immobilization	Splinting as first-line conservative treatment for carpal tunnel syndrome, DeQuervain's syndrome, strains, etc.	Prolonged splinting (leads to weakness and stiffness) Prolonged postoperative splinting	
Activity and exercise	Stretching Aerobic exercise Maintaining strength and mobility of all remaining body parts while recovering from wrist problems		Reduced general activities while recovering
Detection of neurologic abnormalities	Nerve conduction velocity (NCV) for median or ulnar impingement at the wrist after failure of conservative treatment		Routine use of NCV or electromyography (EMG) in diagnostic evaluation of nerve entrapment or screening in patients w/o symptoms Use of vibrometry for screening



Summary of recommendations for evaluating and managing forearm, wrist, and hand complaints

(refer to the original guideline document for more detailed information)

Clinical Measure	Recommended	Optional	Not recommended
Radiography	Plain films for suspected scaphoid fractures, repeat films in 7–10 days	Limited bone scan to detect fractures if clinical suspicion exists	Routine use for evaluation of forearm, wrist, and hand
Other imaging procedures		Use of arthrography, magnetic resonance imaging (MRI), or computed tomography (CT) scans prior to history and physical examination by a qualified specialist	
Surgical considerations	Early surgical intervention for severe carpal tunnel syndrome (CTS) confirmed by NCV may be indicated Tendinitis (DeQuervain's), ganglion, or trigger finger: referral to surgeon only after patient education and conservative treatment, including splinting and injection, have failed		
Psychosocial factors	Consider counselling for severe hand injuries Awareness by treating practitioner of interplay between physical, economic, and psychological factors in patients with muscular skeletal disorders (MSDs)		



b) Physical/psychiatric rehabilitation

As mentioned above:

Physical treatment methods

- Recommended
 - Instructions for home exercises
- Optional
 - At-home applications of heat or cold packs
- Not recommended
 - Passive modalities
 - Transcutaneous electrical neurostimulation (TENS)
 - Biofeedback

Rest and immobilization

- Recommended
 - Splinting as first-line conservative treatment for carpal tunnel syndrome, DeQuervain's syndrome, strains, etc.
- Optional
 - Prolonged splinting (leads to weakness and stiffness)
 - Prolonged postoperative splinting

Activity and exercise

- Recommended
 - Stretching
 - Aerobic exercise
 - Maintaining strength and mobility of all remaining body parts while recovering from wrist problems
- Not recommended
 - Reduced general activities while recovering

Psychosocial factors

- Recommended
 - Consider counselling for severe hand injuries
 - Awareness by treating practitioner of interplay between physical, economic, and psychological factors in patients with muscular skeletal disorders (MSDs)

c) Risk factor/recovery

Potential harms

Risks and complications of surgical procedures and imaging studies (e.g., infection, radiation)

d) Return to work

Missed work days is the major outcome considered.



8. Priority for Q-COMP

Rating criteria

Functional restoration Does the guideline consider graded increases in activity and function?	5
Psychosocial factors To what degree does the guideline consider psychosocial factors that may influence recovery?	3
Return to work process (vocational rehabilitation) To what degree does the guideline consider the return to work process (vocational rehabilitation)?	5
Risk factors for recovery To what degree does the guideline consider risk factors for recovery?	4
Total rating	17



Forearm, wrist & hand (acute & chronic)

Contents

1. Developed by	19
2. Guideline status	19
3. Where located/how accessed	19
4. Description/scope	19
5. Outcomes considered	21
6. Agree appraisal.....	21
7. Relevance/appropriateness of use in workers' compensation sector.....	21
a) Functional progression	21
b) Physical/psychiatric rehabilitation.....	25
c) Risk factor/recovery	25
d) Return to work.....	25
8. Priority for Q-COMP.....	27



1. Developed by

Work Loss Data Institute. Forearm, wrist & hand (acute & chronic). Corpus Christi (TX); Work Loss Data Institute ;2006.66p. [83 references]

2. Guideline status

This is the current release of the guideline.

This guideline updates a previous version: Work Loss Data Institute. Forearm, wrist & hand . Corpus Christ (TX); Work Loss Data Institute ;2005.69 p.

3. Where located/how accessed

National Guideline Clearinghouse www.guideline.gov

Electronic copies: Available to subscribers from the Work Loss Data Institute web site

Print copies: Available from the Work Loss Data Institute , 169 Saxony Road, Suite 210, Encinitas, CA 92024; Phone 800-488-5548, 760-753-9992, Fax: 760-753-9995: www.worklossdata.com

The following companion documents are available:

Background information on the development of the Official Disability Guidelines of the Work Loss Data Institute is available from the Work Loss Data Institute Web site

Appendix A. ODG Treatment in Workers' Comp. Methodology description using the agree instrument. Available to subscribers from the Work Loss Data Institute Web site.

The following patient resources are available:

Appendix B. ODG Treatment in Workers' Comp. Patient information resources .2006

Electronic copies: Available to subscribers from the Work Loss Data Institute web site

Print copies: Available from the Work Loss Data Institute , 169 Saxony Road, Suite 210, Encinitas, CA 92024; Phone 800-488-5548, 760-753-9992, Fax: 760-753-9995: www.worklossdata.com

4. Description/scope

Disease/condition(s)

- Work-related injuries of the forearm, wrist, and hand, no9t including carpal tunnel syndrome

Guideline category

- Diagnosis
- Evaluation
- Management
- Treatment

Clinical speciality

- Chiropractic
- Family medicine
- Internal medicine
- Orthopaedic surgery
- Physical medicine and rehabilitation



Intended users

- Advanced Practice Nurses
- Health Care Providers
- Health Plans
- Nurses
- Physician Assistants
- Physicians

Guideline objectives

- To offer evidence-based step-by-step decision protocols for the assessment and treatment of workers' compensation conditions

Target population

- Workers with occupational injuries of the forearm, wrist and hand (excluding carpal tunnel syndrome)

Interventions and practices considered

The following interventions/procedures were considered and recommended as indicated in the original guideline document:

- Activity restrictions/ work modifications
- Arthrodesis (fusion)
- Bone-growth stimulators
- Cold/heat packs
- Computed tomography (CT)
- Continuous passive motion (CPM)
- Corticosteroid injections
- Dupuytren's release/fasciectomy
- Exercises
- Fasciotomy
- Magnetic resonance imaging (MRI)
- Non-prescription medication; acetaminophen, non-steroidal anti-inflammatory drugs (NSAIDs)
- Occupational therapy/ physical therapy
- Plaster casting
- Radiography
- Return to work
- Trapeziectomy
- Triangular fibrocartilage complex (TFCC) reconstruction
- Trigger finger surgery
- Vitamin C
- Yoga

The following interventions/procedures are under study and are not specifically recommended.

1. Casting versus splinting
2. Ergonomic interventions
3. Mallet finger injuries (treatment)



The following interventions/procedures were considered, but are not recommended:

1. Acupuncture
2. Arthroplasty (joint replacement)
3. Chiropractic/ manipulation
4. De Quervain's tenosynovitis surgery
5. Immobilization/ rest as primary treatment
6. Surgery for broken wrist (in the absence of displacement or delayed healing)
7. Transcutaneous electrical neurotransmission (TENS)

5. Outcomes considered

Effectiveness of treatments in relieving pain, improving stability, and restoring normal function

6. Agree appraisal

- Scope and Purpose 67%
- Stakeholder Involvement 29%
- Rigour of Development 43%
- Clarity and Presentation 100%
- Applicability 6%
- Editorial Independence 17%

7. Relevance/appropriateness of use in workers' compensation sector

a) Functional progression

Major recommendations

Initial diagnosis

1. Determine the type of injury or contributing factors (direct trauma, fall, repetitive motion, twisting incident, etc.)
2. Determine whether the problem is acute, subacute, chronic, or of insidious onset.
3. Record the severity and specific anatomic location of the pain asserted.
4. Assess the ability of the patient to use the forearm, wrist, or hand, from no to full ability.
5. Search for any evidence of an open or penetrating wound.
6. Search for any evidence of deformity (anterior/posterior or lateral/medial) of the wrist.
7. Test the range-of-motion of the joint (normal, mild restriction, severe restriction, or complete restriction).
8. Record any present medication.
9. Elicit any previous medical history, history of systemic disease, or previous wrist injury or disability.

Presumptive diagnosis

- **Fracture or dislocation** (see original guideline document for International Classification of Diseases, Ninth Revision [ICD-9] codes for this and other diagnoses)
- **Other diagnoses:**
 - Sprain, sprain-fracture or contusion, excluding carpal tunnel syndrome (see separate chapter)
 - Laceration
 - Tenosynovitis



Fracture or dislocation of wrist

A. *Definitive evaluation*

- Record a history of the cause of injury.
- Search for any evidence of an open wound in the vicinity of the injury.
- Perform a clinical examination for deformity, tenderness, or ecchymosis, or associated nerve, neurovascular, or tendon injury.
- Check for snuff box tenderness.
- Search for any evidence of dislocation or arterial vascular compromise (cold, dusky hand with loss of sensation). If found, an immediate reduction should take place (prior to x-rays, if necessary, or proper consultations).
- Perform an evaluation for an associated injury of the wrist or fingers.
- X-ray the wrist. Include a navicular view.
- Consider the easily missed scapholunate dissociation, or scaphoid fracture.

B. *Initial therapy*

1. Simple, undisplaced, stable fractures of the wrist can be treated by the primary care physician.
 - a. Place the wrist in a plaster or sugar tong splint for seven to ten days, and then change to a short arm cast.
 - b. Ice prior to application of cast, if applicable, and elevate for 4 to 7 days to prevent or reduce swelling (Hand Higher than Heart - HHH).
 - c. Give the patient instructions to prevent tight cast problems.
 - d. Analgesics and/or nonsteroidal anti-inflammatory drugs for up to two weeks may be appropriate.
 - e. Recheck at seven days and then at two-week intervals until healed. Repeat x-rays at seven days and at two weeks to assure that the fracture has not slipped. X-ray again at five weeks; in most cases, the cast can be removed at that time.
 - f. Estimate a return-to-work date for temporary transitional and regular work at each visit.
 - g. Prescribe temporary transitional and job modifications at each visit.
2. Undisplaced navicular fractures can be treated by the primary care physician.
 - a. With a negative x-ray but clinical suspicion of a navicular fracture (i.e., localized pain at snuff box following fall/trauma), a short arm thumb spica cast is used for seven to ten days. Then a repeat x-ray out of plaster is obtained to clarify the diagnosis. Rarely is a bone scan useful to confirm a suspected diagnosis of navicular fracture.
 - b. Confirmed navicular fractures should be immobilized in a short arm thumb spica cast for 10 to 12 weeks until healed by x-ray examination.
 - c. Analgesics and/or nonsteroidal anti-inflammatory drugs for up to two weeks may be appropriate.
 - d. Recheck at seven days and then at two-week intervals until healed. Treatment may be as long as 12 to 36 weeks.
 - e. Wrist x-rays should be taken at four to six weeks. It is often necessary to remove the cast to obtain the quality of x-rays necessary to determine healing status. Persistent fracture line on the x-ray and continued clinical tenderness over the navicular suggest delayed union that should prompt referral.
 - f. Estimate a return-to-work date for temporary transitional and regular work at each visit.
 - g. Prescribe temporary transitional and job modifications at each visit, and maybe a brace to prevent re-injury.
3. Minimally displaced fractures can be reduced and treated by a primary care physician with proper training.
 - a. Patients with minimally displaced fractures and no loss of length can have local anaesthesia injected into the fracture; then the physician can perform a reduction. Parenteral analgesic will facilitate the reduction.
 - b. Ice prior to application of cast, if applicable, and elevate for up to seven days is appropriate to prevent or reduce swelling.



- c. Apply a sugar tong splint with an ace bandage. Replace with a short arm cast after seven days or when swelling has subsided.
- d. Give the patient instructions to prevent tight cast problems.
- e. Analgesics and/or nonsteroidal anti-inflammatory drugs for up to two weeks may be appropriate.
- f. Recheck at seven days and then at two-week intervals until healed.
- g. Obtain x-rays after reduction, seven to ten days, and at four weeks.
- h. Physical therapy (three to four visits) to teach patient range-of motion and muscle-strengthening exercises is appropriate following removal of cast.
- i. Estimate a return-to-work date for temporary transitional and regular work at each visit.
- j. Prescribe temporary transitional and job modifications at each visit.

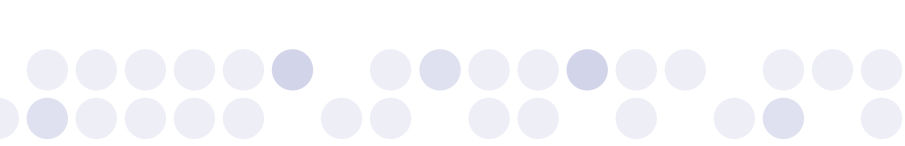
Wrist fractures with any question of non-union and all other wrist fractures not described above should be referred to an orthopaedic surgeon for care.

Evaluate for delayed union, malalignment, or signs of associated tendon or nerve injury.

Promptly refer to an orthopaedic surgeon if one of these conditions is found, otherwise continue therapy.

Other diagnoses

- Record a history including the onset of symptoms, limitations of present activity, and history of previous episodes, including type of treatment and results.
- The history should include the nature of symptoms (numbness, pain, tingling), the time of day symptoms are experienced, and how the pain is relieved.
- Separate cases of true nerve root impairment from those that mimic carpal tunnel syndrome (CTS). These include sprains, tenosynovitis, contusions, and hand arm vibration syndrome (HAV).
- X-rays are not usually needed, unless local pathology or referred pain in the wrist from cervical spine pathology is suspected or the case is persistent. In such cases, wrist or cervical spine x-rays are appropriate.
- Order laboratory studies including glycohemoglobin, sedimentation rate, thyroid-stimulating hormone (TSH), and a Rheumatoid Factor, if appropriate.
- The initial evaluation of the wrist needs to include a careful history for type of injury and the possibility of both repetitive microtrauma and vibration type injuries. It is extremely important to make sure that any painful injury of the wrist does not have its origin in the upper extremity or the neck. It is also important to evaluate the patient's history for avocational activities that may be the cause of or be aggravating the problem, as it is necessary to have the patient modify these activities if one is to successfully treat the problem.
- The presumptive diagnosis is used to classify the type of problem prior to a thorough evaluation. Subsequent to a thorough evaluation, the diagnosis may change (e.g., if the physician classifies a patient with a sprain and the x-rays subsequently show a fracture). In such a case, therapy should follow the subsequent rather than the initial diagnosis.
- An open wound in the vicinity of a fracture makes it a compound fracture, even if no clear connection to the fracture site is apparent. All compound fractures should be referred to an orthopaedic surgeon for care.
- Snuff box tenderness is often a sign of injury to the scaphoid bone. If symptoms persist for seven days or longer, repeated navicular view x-rays should be taken.
- Trans-scaphoid perilunar dislocation is a rare, severe injury which should be referred to an orthopaedic surgeon.
- Scapholunate dissociation is the most frequent serious ligamentous injury of the wrist and is diagnosed by the "Terry Thomas sign" on wrist x-rays. There is a widening of the space between the lunate and the scaphoid on the anteroposterior view.
 - Magnetic resonance imaging (MRI) of the wrist shows:
 - 82% of triangular fibrocartilage (TFC) tears confirmed by arthroscopy (Injuries to the triangular fibrocartilage complex are a frequent cause of ulnar-sided wrist pain. The TFC is a complex structure that



involves the central fibrocartilage articular disc, merging with the volar edge of the ulnocarpal ligaments and, at its dorsal edge, with the floors of the extensor carpi ulnaris and extensor digiti minimi.)

- 50% of scapholunate ligament tears
- 40% of intercarpal dorsal ligament tears
- Arthroscopy is thought to be superior to arthrograms in delineating ligament tears.
- Fluoroscopy exam is helpful in diagnosing tears and abnormal motion.
- Undisplaced navicular fractures can be treated by the primary care physician. Those navicular fractures that are displaced or have a wide gap between the fragments should be immediately referred to an orthopaedic surgeon, as they have a significant increased incidence of nonunion.
- Wrist sprains are common industrial injuries, and must be differentiated from carpal tunnel syndrome and tendonitis.
- Tendon injuries are not common with sprains, but it is important to check for such injuries as they require different therapy than a simple sprain.
- Grade III sprains involve tears of the carpal ligaments and are impairing injuries. Clinically they have significant swelling, ecchymosis, and an unstable joint. These are the sprains that are more likely to have associated injury of tendons or nerves. Injuries to the triangular fibrocartilage complex (TFCC) may have pain and stiffness as the only relevant findings. These injuries should be referred to an orthopaedic surgeon or hand surgeon for evaluation and treatment.
- A wrist splint or short arm cast is sometimes necessary for the initial treatment of sprains which are very tender, swollen, and painful with motion. Splinting is continued until symptoms abate. An early nonresisted exercise program is indicated.
- The Terry Thomas sign refers to the x-ray appearance of a widening gap between the two carpal bones of the wrist in patients with scapholunate dissociation. (Terry Thomas's teeth were apart when he smiled).
- Imaging procedures are appropriate for sprains that have been treated for six weeks with little or no improvement in the patient's complaints or physical findings. Repeat x-rays with navicular views are indicated, since routine anteroposterior and lateral x-rays generally fail to demonstrate navicular fractures. Additionally, an arthrogram may be of value to demonstrate carpal ligament tears and help determine the necessity of surgical therapy, but should be obtained only after a consultation with an orthopaedic surgeon.
- A laceration produced by crush injury needs an x-ray to rule out any underlying fracture and to answer any question of penetration of the joint or a foreign body in the wound.
- Neurovascular and tendon function need evaluation with any laceration around a joint. No anaesthesia should be used in the wound until the sensation has been checked distal to the laceration and the function of the tendons has been identified as intact.
- Antibiotic therapy for contaminated lacerations should include both anti-staphylococcal and broad-spectrum coverage.
- Tenosynovitis is a common enthesopathy of the tendon of the wrist. It is most important to rule out infection, for this is an emergent problem that requires prompt referral. Infectious tenosynovitis will usually demonstrate marked tenderness and more pain than non-infectious tenosynovitis. The patient with septic tenosynovitis will frequently have an elevated temperature, lymphangitis, erythematous swelling, and severe pain with attempted motion along with an elevated white blood count.
- Ganglions of the wrist are benign synovial cysts and usually do not require treatment. An initial aspiration with injection of corticosteroids is acceptable. There is a 50% recurrence rate. With an accurate diagnosis, no further treatment is necessary. Surgery, though commonly done, has a significant recurrence rate and is only indicated in unusually symptomatic wrists. Placing the wrist in a splint post injection for a short time is often helpful.
- Hand arm vibration syndrome (HAV) is a relatively common industrial injury in workers whose job involves work with frequent and sustained vibrations. Sensory impairment of the fingers and Raynaud's phenomenon are the common complaints. It must be differentiated from carpal tunnel syndrome, as the treatment is never surgical for HAV. The treatment is primarily reduction of vibration exposure and taking a slow release calcium channel blocker (e.g., nifedipine).



- Acute carpal tunnel syndrome (CTS) occasionally occurs with acute trauma to the wrist, most commonly with severe sprains. It can occur in fractures and with a direct blow to the volar aspect of the wrist. There is rapid and intense development of symptoms with paresthesias, pain, and numbness in the distribution of the median nerve. This is an urgent (four to eight hours) surgical problem. It can be differentiated from other problems by the measurement of the pressure in the carpal tunnel.
- Acute episodes of traumatic arthritis frequently follow minor wrist fractures and severe sprains. One of the common sites of traumatic arthritis of the wrist is the trapeziometacarpal joint at the base of the first metacarpal. Persistent and increasing impairment of this joint from arthritis often requires surgical treatment.

b) Physical/psychiatric rehabilitation

As above:

Fracture or dislocation of wrist

B. Initial Therapy

1. Simple, undisplaced, stable fractures of the wrist can be treated by the primary care physician.
 - a. Estimate a return-to-work date for temporary transitional and regular work at each visit.
 - b. Prescribe temporary transitional and job modifications at each visit.
2. Undisplaced navicular fractures can be treated by the primary care physician
 - a. Estimate a return-to-work date for temporary transitional and regular work at each visit.
 - b. Prescribe temporary transitional and job modifications at each visit, and maybe a brace to prevent re-injury.
3. Minimally displaced fractures can be reduced and treated by a primary care physician with proper training
 - a. Physical therapy (three to four visits) to teach patient range-of motion and muscle-strengthening exercises is appropriate following removal of cast.
 - b. Estimate a return-to-work date for temporary transitional and regular work at each visit.
 - c. Prescribe temporary transitional and job modifications at each visit.

c) Risk factor/recovery

Potential harms

Participants who underwent trapeziectomy had 16% fewer adverse effects than the other commonly used procedures studied in this review; conversely, those who underwent trapeziectomy with ligament reconstruction and tendon interposition had 11% more (including scar tenderness, tendon adhesion or rupture, sensory change, or Complex Regional Pain Syndrome Type 1).

d) Return to work

Official disability guidelines (odg) return-to-work pathways - fracture of carpal bone(s)

Stable, clerical/modified work: 1 day

Stable, manual work: 7 days

Reduction/manipulation, clerical/modified work: 7 days

Reduction/manipulation, manual work: 21 days

Reduction/manipulation, heavy manual work: 56 days



ODG Return-to-work pathways – fracture of radius and ulna

Stable, clerical/modified work: 2 days

Stable, manual work: 14 days

Reduction/manipulation, clerical/modified work: 14 days

Reduction/manipulation, manual work: 28 days

Reduction/manipulation, heavy manual work: 42 days

Open surgery, clerical/modified work: 21 days

Open surgery, manual work: 56 days

Open surgery, heavy manual work: 112 days

ODG Return-to-work pathways – dislocation of wrist

Non-dominant arm, clerical/modified work: 0 days

Non-dominant arm, manual work: 14 days

Non-dominant arm, heavy manual work: 35 days

Dominant arm, clerical/modified work: 7 days

Dominant arm, manual work: 42 days

Dominant arm, heavy manual work: 63 days

(See *ODG Capabilities & Activity Modifications for Restricted Work* under “Work” in the Procedure Summary of the original guideline document)

ODG Return-to-work pathways – sprains and strains of wrist and hand

Mild, clerical/modified work: 0 days

Mild, manual work: 5 days

Moderate, clerical/modified work: 7 days

Moderate, manual work: 21 days

Severe, clerical/modified work: 10 days

Severe, manual work: 35 days

ODG Return-to-work pathways – contusion of upper limb

Superficial contusions: 0 days

Deep contusions, clerical/modified work: 5 days

Deep contusions, manual work: 21 days

ODG Return-to-work pathways – open wound of elbow, forearm, and wrist

Minor: 0 days

Major, clerical/modified work: 3 days

Major, manual work: 8 days

Tendon repair, clerical/modified work: 14 days

Tendon repair, manual work: 91 days

ODG Return-to-work pathways – trigger finger

Medical treatment: 0 days

Surgical release, clerical/modified work: 14 days

Surgical release, manual work: 28 days



ODG Return-to-work pathways - radial styloid tenosynovitis

- Medical treatment, clerical/modified work: 0-1 days
- Medical treatment, manual work: 10 days
- Medical treatment, regular work if cause of disability: 42 days
- Medical treatment, heavy manual work: 56 days
- Surgical release, clerical/modified work: 14 days
- Surgical release, manual work: 42 days

ODG Return-to-work pathways - other tenosynovitis or hand and wrist

- Medical treatment, clerical/modified work: 0 days
- Medical treatment, manual work: 21 days
- Medical treatment, heavy manual work: 35 days
- Surgical treatment, clerical/modified work: 7 days
- Surgical treatment, manual work: 21 days

ODG Return-to-work pathways - ganglion and cyst of synovium, tendon and bursa

- Asymptomatic: 0 days
- Aspiration, clerical/modified work: 0 days
- Aspiration, manual work: 3 days
- Excision of wrist ganglion, clerical/modified work: 7 days
- Excision of wrist ganglion, manual work: 14 days
- Excision of wrist ganglion, manual work, dominant arm: 14-21 days

8. Priority for Q-COMP

Rating criteria

Functional restoration Does the guideline consider graded increases in activity and function?	5
Psychosocial factors To what degree does the guideline consider psychosocial factors that may influence recovery?	1
Return to work process (vocational rehabilitation) To what degree does the guideline consider the return to work process (vocational rehabilitation)?	5
Risk factors for recovery To what degree does the guideline consider risk factors for recovery?	4
Total rating	15



Hand-wrist

Contents

1. Developed by	29
2. Guideline status	29
3. Where located/how accessed	29
4. Description/scope	29
5. Outcomes considered	30
6. Agree appraisal.....	30
7. Relevance/appropriateness of use in workers' compensation sector.....	30
a) Functional progression	30
b) Physical/psychiatric rehabilitation.....	31
c) Risk factor/recovery	32
d) Return to work.....	32
8. Priority for Q-COMP.....	32



1. Developed by

Expert Clinical Benchmarks. King of Prussia (PA): MedRisk, Inc.; 2004. 56 p.

2. Guideline status

This is the current release of the guideline.

3. Where located/how accessed

National Guideline Clearinghouse www.guideline.gov

The Expert Clinical Benchmark (ECB) Physical Therapy Guidelines are available in electronic form to subscribers for the Expert Clinical Benchmarks

4. Description/scope

Disease/condition(s)

- Work-related hand and wrist injury

Guideline category

- Treatment

Clinical speciality

- Chiropractic
- Family Practice
- Orthopaedic Surgery
- Physical Medicine and Rehabilitation
- Intended users
- Physical Therapists
- Physicians
- Utilization Management

Guideline objectives

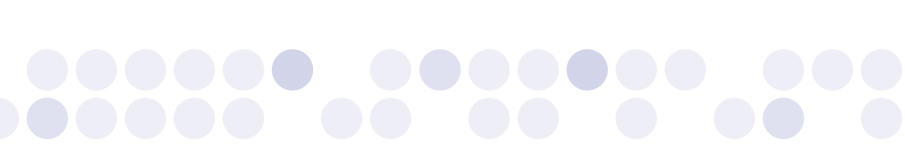
- To offer evidence-based ranges of appropriate treatment of workers' compensation conditions

Target population

- Workers with functional impairment due to work-related hand and wrist injury

Interventions and practices considered

1. Activities of daily living (ADL) training at home
2. Assistive devices
3. Body mechanics and postural stabilization
4. Compression therapies
5. Cryotherapy
6. Device and equipment use and training (home and work)
7. Electrical stimulation
8. Electrotherapeutic delivery of medications

- 
9. Ergonomic training
 10. Flexibility exercises
 11. Functional training programs (home and work)
 12. Hydrotherapy
 13. Instrumental ADL (IADL) training (home)
 14. Injury prevention and reduction (home and work)
 15. Massage
 16. Mobilization/manipulation
 17. Neuromotor development training
 18. Organized functional training programs (e.g., back schools, simulated environments and tasks)
 19. Orthotic devices
 20. Passive range of motion
 21. Prosthetic devices and training
 22. Protective devices
 23. Soft tissue mobilization and manipulation
 24. Strength, power and endurance training
 25. Superficial thermal modalities (e.g., heat, paraffin baths, hot packs, fluidotherapy)
 26. Supportive devices
 27. Therotherapy

5. Outcomes considered

- Pain relief/symptom control
- Functional status

6. Agree appraisal

- Scope and Purpose 39%
- Stakeholder Involvement 58%
- Rigour of Development 38%
- Clarity and Presentation 50%
- Applicability 11%
- Editorial Independence 83%

7. Relevance/appropriateness of use in workers' compensation sector

a) Functional progression

Major recommendations

General

- During the initial evaluation, the therapist should include questions about work task requirements in the patient history interview and incorporate these findings in the treatment objectives.
- The therapist's treatment regimen should be directed toward improving the patient's functional ability rather than based on the patient's impairment.
- The therapist's treatment regimen should emphasize active interventions over passive modalities and should become less frequent toward the end of the episode of care in order to encourage patient behavioral gains.



Non-surgical

For non-surgical hand and wrist conditions, a series of physical therapy treatments should be delivered ranging from 10 to 18 visits over a period of 6 to 10 weeks, depending upon severity (see table below). Refer to the original guideline document for recommendations on the time, choice, and sequence of interventions, as well as interventions that are generally recommended, interventions recommended on a case specific/clinical judgement basis, and interventions that are not recommended. Specific interventions are listed in the “Interventions and Practices Considered” field in the Complete Summary.

Surgical

For surgical hand and wrist conditions, a series of physical therapy treatments should be delivered ranging from 12 to 28 visits over a period of 5 to 14 weeks, depending upon severity (see table below). Refer to the original guideline document for recommendations on the time, choice and sequence of interventions as well as interventions that are generally recommended, interventions recommended on a case specific/clinical judgement basis, and interventions that are not recommended. Specific interventions are listed in the “Interventions and Practices Considered” field in the Complete Summary.

Pre-cert product treatment patterns—no regional adjustment

	Surgical			Non-surgical		
	Total visits	Sequence of visits	Total # weeks	Total visits	Sequence of visits	Total # weeks
Acute/non delayed						
Non-complicated	16	3v @ 4 wks 2v@2 wks	6 Weeks	10	2v@ 4 wks 1v @2 wks	6 Weeks
Complicated	28	3v @ 3 wks 2v @ 9 wks 1v @ 1 wk	13 Weeks	14	3v @1wk 2v @ 4 wks 1v @ 3 wks	8 Weeks
Acute delayed						
Complicated	28	3v @ 4 wks 2v @ 6 wks 1v @ 4 wks	14 Weeks			
Chronic/non delayed						
Non-complicated	12	3v @ 2 wks 2v @ 3 wks	5 Weeks	12	3v @ 2 wks 2v @ 2 wks 1v @ 2 wks	6 Weeks
Complicated	28	3v @ 3 wks 2v @ 9 wks 1v @ 1 wk	13 Weeks	18	3v @ 2 wks 2v @ 4 wks 1v @ 4 wks	10 Weeks
Chronic delayed						
Complicated	28	3v @ 3 wks 2v @ 8 wks 1v @ 3 wks	14 Weeks			

b) Physical/psychiatric rehabilitation

Not discussed

c) Risk factor/recovery

None stated

d) Return to work

Not discussed

8. Priority for Q-COMP

Rating criteria

Functional restoration Does the guideline consider graded increases in activity and function?	3
Psychosocial factors To what degree does the guideline consider psychosocial factors that may influence recovery?	1
Return to work process (vocational rehabilitation) To what degree does the guideline consider the return to work process (vocational rehabilitation)?	3
Risk factors for recovery To what degree does the guideline consider risk factors for recovery?	1
Total rating	8



Carpal tunnel syndrome (acute & chronic)

Contents

1. Developed by	34
2. Guideline status	34
3. Where located/how accessed	34
4. Description/scope	34
5. Outcomes considered	37
6. Agree appraisal.....	37
7. Relevance/appropriateness of use in workers' compensation sector.....	37
a) Functional progression	37
b) Physical/psychiatric rehabilitation.....	39
c) Risk factor/recovery	40
d) Return to work.....	40
8. Priority for Q-COMP.....	40



1. Developed by

Carpal tunnel syndrome (acute & chronic)

2. Guideline status

This is the current release of the guideline.

This guideline updates a previous version: Work Loss Data Institute. Carpel tunnel syndrome. Corpus Christi (TX): Work Loss Data Institute;2005.154 p.

3. Where located/how accessed

National Guideline Clearinghouse www.guideline.gov

Electronic copies: Available to subscribers from the Work Loss Data Institute Web site.

Print copies: Available from the Work Loss Data Institute, 169 Saxony Road, Suite 210, Encinitas,CA 920224: Phone: 800-488-5548, 760 – 753 – 9992, Fax: 760 – 753 – 9995; www.worklossdata.com

The following companion documents are available:

- Background information on the development of the Official Disability Guidelines of the Work Loss Data Institute is available from the Work Loss Data Institute Web site
- Appendix A. ODG Treatment in Workers' Comp. Methodology description using the agree instrument. Available to subscribers from the Work Loss Data Institute Web site

The following patient resource is available:

Appendix B. ODG. Treatment in Workers' Comp. Patient information resources. 2006.

Electronic copies: Available to subscribers from the Work Loss Data Institute Web site.

Print copies: Available from the Work Loss Data Institute, 169 Saxony Road, Suite 210, Encinitas,CA 920224: Phone: 800-488-5548, 760 – 753 – 9992, Fax: 760 – 753 – 9995; www.worklossdata.com

4. Description/scope

Disease/condition(s)

- Work-related carpal tunnel syndrome

Guideline category

- Diagnosis
- Evaluation
- Management
- Treatment

Clinical speciality

- Family Practice
- Internal Medicine
- Neurology
- Orthopaedic Surgery



Intended users

- Advance Practice Nurses
- Health Care Providers
- Health Plans
- Nurses
- Physician Assistants
- Physicians

Guideline objectives

- To offer evidence-based step-by-step decision protocols for the assessment and treatment of workers' compensation conditions

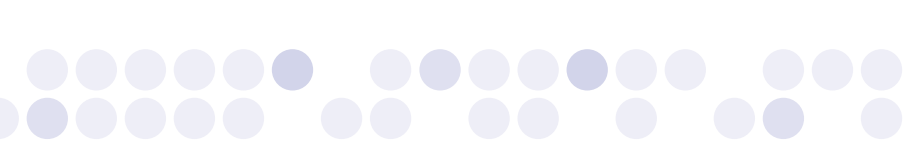
Target population

- Workers with occupational carpal tunnel syndrome

Interventions and practices considered

The following interventions/procedures were considered and recommended as indicated in the original guideline document:

1. Aerobic exercise
2. Assessment of night pain symptoms/nocturnal paresthesias
3. Assessment of thumb abduction strength
4. Braces/splinting
5. Breaks (microbreaks)
6. Carpal tunnel release surgery (CTR)
7. Cold packs
8. Comorbidities assessment (e.g., depression, diabetes, hypothyroidism, obesity, pregnancy)
9. Continuous cold therapy (CCT) in the postoperative setting
10. Corticosteroid injections
11. Diagnostic ultrasound
12. Differential diagnosis
13. Durkan's compression test
14. Electrodiagnostic studies
15. Electromyography (EMG) when diagnosis is difficult
16. Endoscopic surgery
17. Flick sign (shaking hand) in diagnostic assessment
18. Hand and wrist exercises
19. Heat therapy after initial cold packs
20. Hypalgesia (in the median nerve territory in diagnostic assessment)
21. Katz hand diagram scores
22. Nerve conduction studies (NCS)
23. Nerve/tendon gliding exercises
24. Nocturnal parasthesis
25. Nonprescription medications
26. Psychosocial management
27. Return to work

- 
28. Semmes-Weinstein monofilament test
 29. Static 2-point discrimination (>6 milliliters)
 30. Thenar atrophy assessment
 31. Work restrictions/modified duty
 32. Yoga

The following interventions/procedures are under study and are not specifically recommended:

1. Arnica
2. Avoidance of computer mouse
3. Ergonomic interventions
4. Insulin
5. Iontophoresis/phonophoresis
6. Lidocaine patch
7. Mobilization (carpal bone)
8. Oral corticosteroids
9. Physical therapy/occupational therapy
10. Polarized polychromatic light (Bioptron light)
11. Therapeutic ultrasound
12. Traumatic carpal tunnel syndrome (CTS)
13. The following interventions/procedures are under study and are not specifically recommended:
14. Acupuncture
15. Assessment of wrist pain
16. Biofeedback
17. Botulin toxin
18. Closed fist sign
19. Diuretics
20. Gel-padded glove
21. Hypnosis
22. Laser acupuncture
23. Low-level laser therapy
24. Magnets/magnet therapy
25. Magnetic resonance therapy (MRI)
26. Manipulation/chiropractic
27. NC-stat nerve conduction studies
28. Non-steroidal anti-inflammatory drugs (NSAIDS) as first line therapy
29. Phalen's test
30. Portable nerve conduction devices
31. Square wrist sign in diagnostic assessment
32. Therapeutic touch
33. Tinel's sign in diagnostic assessment
34. Tourniquet test
35. Transcutaneous electrical neurostimulation (TENS)
36. Vitamin B (pyridoxine) supplementation



5. Outcomes considered

Sensitivity and specificity of diagnostic tests

Effectiveness of treatments for relief of pain and symptoms

6. Agree appraisal

- Scope and Purpose 61%
- Stakeholder Involvement 25%
- Rigour of Development 57%
- Clarity and Presentation 92%
- Applicability 6%
- Editorial Independence 17%

7. Relevance/appropriateness of use in workers' compensation sector

a) Functional progression

Major recommendations

Initial diagnosis

First visit: with Primary Care Physician MD/DO (100%)

Determine severity:

- Mild/moderate (Go to Initial Conservative Treatment):
 - Symptoms: pain/numbness in hand/wrist/forearm, below the elbow, with tingling that is primarily in thumb, index, and long finger (Katz hand diagram and hypesthesia index finger compared to little finger), with nocturnal awakening, impaired dexterity, and having to shake the hand for relief (the Flick sign has a sensitivity of 93% and specificity 96%)
 - Tests: Phalen's/Tinel's signs not always useful; also consider Semmes Weinstein monofilament test, Durkan's pressure provocation test. See Table, "Sensitivity and Specificity of Diagnostic Tests for Carpal Tunnel Syndrome Measured Against Nerve Conduction Studies" in the original guideline document.
 - Recommended: findings that best distinguish between patients with electrodiagnostic evidence of carpal tunnel syndrome (CTS) and patients without it are hypalgesia in the median nerve territory, classic or probable Katz hand diagram results, and weak thumb abduction strength. See Table, "Sensitivity and Specificity of Diagnostic Tests for Carpal Tunnel Syndrome Measured Against Nerve Conduction Studies" in the original guideline document.
 - Muscle atrophy: mild weakness of thenar muscles (thumb abduction)
 - History/exam, comorbidities: diabetes, hypothyroidism, rheumatoid arthritis, obesity, hypertension, inactivity, age, work, and hobbies
 - Concurrent pregnancy: CTS likely to resolve on its own within 6 to 12 weeks after delivery
- Severe (*Go Directly to Electrodiagnostic Testing*)
 - Muscle atrophy: severe weakness of thenar muscles
 - Test: 2-point discrimination over 6 mm
- Rule out diagnoses (See other treatment parameters for each of these):
 - Cervical radiculopathy (refer to the original guideline document for relevant International Classification of Diseases, Ninth Revision [ICD- 9] codes for CTS and other diagnoses)
 - Tendonitis

- Osteoarthritis
- Thoracic outlet syndrome, brachial plexus disorders

Mild/moderate -- initial conservative treatment (70% of cases)

- Also first visit (day 1):
 - Prescribe alteration of activity (home and work), frequent breaks, stretching, night and possibly day splint, appropriate analgesia (i.e., acetaminophen) [*Benchmark cost: \$14*], back to work--modified duty if condition caused by job, possible ergonomic evaluation of job, patient education
- Second visit (day 7-14--about 2 weeks after first visit)
 - Document progress.
 - If not significantly improved then *may* (approximately 50% of cases) prescribe physical therapy for home exercise training [*Benchmark cost: \$250*]; Refer to Physical Therapist (50%) or Occupational Therapist (50%) for 3 visits per week for 2 weeks.
- Third visit (day 28--about 1 month after first visit)
 - Document progress.
 - Corticosteroid injection trial (high likelihood of relief, but may have recurrence of symptoms within several months--initial relief of symptoms good indicator for success of surgery, can assist in confirmation of diagnosis) [*Benchmark cost: \$276*]. Should be performed by musculoskeletally trained physician because of nerve injury risk. Recommend only one injection.
 - If prescribe therapy, then continue therapist, change from passive to active modality, 2 visits per week, teach home exercises.
 - Ultrasound therapy has been successful, but there are few studies
- Fourth visit (day 42--about 6 weeks after first visit)
 - Refer for Electrodiagnostic Testing.

Electrodiagnostic testing (50% of cases)

[*Benchmark cost: \$370*]

- All severe cases, plus mild/moderate cases after Initial Conservative Treatment above; See "Protocols for electrodiagnostic studies" in the original guideline document.
- Refer to Neurologist (70%) or Physical Medicine (30%) specialists certified in electrodiagnostic medicine, for electromyography (EMG)/Nerve Conduction Studies, the "gold standard" tests for the evaluation of CTS.
- Positive test: refer for Carpal Tunnel Release depending on severity
- Note: ODG recommends that nerve conduction studies should be done to support the diagnosis of CTS prior to surgery. If an individual has appropriate responses to treatment (i.e. injections, modification of activities, meds) but still has symptoms with normal nerve conduction studies, surgery may be appropriate on a case-by-case basis and reasonable documentation by the treating physician.

Carpal tunnel release (35% of cases)

(See also *ODG Indications for Surgery™ -- Carpal Tunnel Release* in the Procedure Summary in the original guideline document) [*Benchmark cost: \$2,621*]

- Only after the positive diagnosis of CTS is made by history, physical examination, and electrodiagnostic studies
- Performed by Hand Surgeon: Orthopaedic Surgeon (75%), Neurosurgeon (10%), Plastic Surgeon (10%), or General Surgeon (5%)
- On an outpatient basis
- May be open or endoscopic, depending on experience of surgeon (risk of



- nerve injury, although slight, may be greater with endoscopic, but recovery is faster)
- If bilateral (25% of cases), schedule separate surgeries (usually)
- Expected outcome:
 - Mild/moderate cases: over 90% success with complete recovery after failure of Initial Conservative Treatment (Outcomes in workers' comp cases may not be as good as outcomes overall, but still support surgery.)
 - Severe cases: Complete recovery is unlikely, but 90% will benefit from at least partial recovery.
- Post-surgical treatment:
 - Splint - day and night: not recommended
 - Stitches out in 5 to 10 days
 - Physical/Occupational Therapy: A short course may be needed; if so, then post-surgical treatment (endoscopic): 14 visits over 8 weeks; post-surgical treatment (open): 20 visits over 10 weeks
- Failed Carpal Tunnel Release (4% of cases):
 - Repeat Electrodiagnostic Testing
 - Repeat Carpal Tunnel Release (by fellowship-trained Hand Surgeon)

b) Physical/psychiatric rehabilitation

As mentioned above:

Mild/moderate -- initial conservative treatment (70% of cases)

- Also first visit (day 1):
 - Prescribe alteration of activity (home and work), frequent breaks, stretching, night and possibly day splint, appropriate analgesia (i.e., acetaminophen) [*Benchmark cost: \$14*], back to work--modified duty if condition caused by job, possible ergonomic evaluation of job, patient education
- Second visit (day 7-14--about 2 weeks after first visit)
 - If not significantly improved then *may* (approximately 50% of cases) prescribe physical therapy for home exercise training [*Benchmark cost: \$250*]: Refer to Physical Therapist (50%) or Occupational Therapist (50%) for 3 visits per week for 2 weeks
- Third visit (day 28--about 1 month after first visit)
 - If prescribe therapy, then continue therapist, change from passive to active modality, 2 visits per week, teach home exercises.

Carpal tunnel release

- Post-surgical treatment:
 - Splint - day and night: not recommended
 - Stitches out in 5 to 10 days
 - Physical/Occupational Therapy: A short course may be needed; if so, then post-surgical treatment (endoscopic): 14 visits over 8 weeks; post-surgical treatment (open): 20 visits over 10 weeks

c) Risk factor/recovery

Potential harms

Endoscopic surgery is associated with greater risk of nerve injury (although slight) than open surgery

d) Return to work

Official disability guidelines (odg) return-to-work pathways

Conservative treatment, modified work (no repetitive use of hand/wrist): 0 days
Conservative treatment, regular work (if not cause of or aggravating to disability/use of splint): 0-5 days (See *ODG Capabilities & Activity Modifications for Restricted Work* under "Work" in the Procedure Summary of the original guideline document)

ODG Return-to-work pathways

Conservative treatment, regular work (if work related): 28 days

Conservative treatment, regular work (with severe nerve impairment): indefinite

ODG Return-to-work pathways

Endoscopic surgery, modified work: 3-5 days

Endoscopic surgery, regular work, non-dominant arm: 14-28 days

Endoscopic surgery, regular/repetitive/heavy manual work, dominant arm: 28 days to indefinite

Open surgery, mini palm technique, modified work: 3-5 days 10 of 15

Open surgery, mini palm technique, regular work, non-dominant arm: 14-28 days

Open surgery, mini palm technique, regular/repetitive/heavy manual work, dominant arm: 56 days to indefinite

Open surgery, traditional approach, modified work: 14 days

Open surgery, traditional approach, regular work, non-dominant arm: 42 days

Open surgery, traditional approach, regular/repetitive/heavy manual work, dominant arm: 28 days to indefinite

8. Priority for Q-COMP

Rating criteria

Functional restoration Does the guideline consider graded increases in activity and function?	4
Psychosocial factors To what degree does the guideline consider psychosocial factors that may influence recovery?	1
Return to work process (vocational rehabilitation) To what degree does the guideline consider the return to work process (vocational rehabilitation)?	5
Risk factors for recovery To what degree does the guideline consider risk factors for recovery?	4
Total rating	14