Colorado Division of Workers Compensation Medical Treatment Guidelines

Universal Principles

Cumulative Trauma Conditions

Other Highlights

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Discussion Points

- Administrative changes
- Causation analysis for cumulative trauma

Treatment for

- Aggravated wrist osteoarthritis
- Epicondylitis
- TFCC
- Carpal Tunnel
- Cubital Tunnel
- Knee
- Shoulder
Change to Rule 16-4 “Required Use of the Medical Fee Schedule”

*modified:*

“ All providers' are required to report services in accordance with codes and standards in Rule 18 Medical Fee Schedule **THAT ACCURATELY REPRESENT THE SERVICES PROVIDED.**

- This statement requires providers to be accountable for their billing accuracy. (CPT, Rule 18 and RVP etc.)
Change to Rule 16-4 “Required Use of the Medical Fee Schedule”

NEW paragraph (C):

“The provider may be subject to penalties under the Workers’ Compensation Act for inaccurate billing when the provider knew or should have known that the services billed were inaccurate as determined by the Director or an Administrative Law Judge.”
Changes to Rule 16-7 “Required Billing Forms and Accompanying Documentation”

*Modified a sentence and added a new sentence*

- “National Provider Identification (NPI) numbers are required for workers’ compensation bills.
- Providers who are not permitted to obtain NPI numbers are exempt from this requirement.
- When billing on a CMS 1500(08-05) the NPI should be that of the rendering professional at the line level whenever possible.”
Significant Changes to Rule 18: “Medical Fee Schedule”
Effective: 1/1/11
Changes to Rule 18-1&2

Updated the following “incorporated by reference” documents:

- **2010 edition** of the “Relative Values for Physicians” (RVP)

## Conversion Factor Changes in Rule 18-4

<table>
<thead>
<tr>
<th>Section</th>
<th>Effective 1/1/10</th>
<th>Effective 1/1/11</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicine</td>
<td>$7.56</td>
<td>$7.56</td>
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<tr>
<td>E&amp;M</td>
<td>$9.16</td>
<td>$9.62</td>
<td>4.78%</td>
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<td>PM&amp;R</td>
<td>$5.73</td>
<td>$5.90</td>
<td>2.88%</td>
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<td>Anes.</td>
<td>$50.87</td>
<td>$50.87</td>
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</tr>
<tr>
<td>X-Code</td>
<td>$38.07</td>
<td>$38.07</td>
<td>0.00%</td>
</tr>
<tr>
<td>Surgery</td>
<td>$94.64</td>
<td>$94.64</td>
<td>0.00%</td>
</tr>
<tr>
<td>Radiology</td>
<td>$17.43</td>
<td>$17.43</td>
<td>0.00%</td>
</tr>
<tr>
<td>Pathology</td>
<td>$12.99</td>
<td>$12.99</td>
<td>0.00%</td>
</tr>
</tbody>
</table>
E & M Code Standards

To bill for time you must have specific description of the return to work/function issues discussed with that patient.

HPI – extended – detailed description of functional status, goals, work activities.

Past Family and social history-
- complete-psychosocial history, family adjustment, stress
- for recurrent can review forms

PE – vital signs, bilateral exams, neuro, vascular
Change to Rule 18-5(D)(1)
“Surgery/Anesthesia”
“X-Codes Section”

RVUs in rule only because of new codes without RVU in 2010 text.

- Paravertebral facet, zygapophyseal joint or nerves with guidance are reimbursed:
  - 10 RVUs for a single level of the cervical or thoracic,
    - 5 RVUs for second level or more; and
  - 8 RVUs for the lumbar or sacral single level,
    - 4 RVUs for the second level or more.
A New Paragraph (I) to Rule 18-5(D)(2)

“Surgery Section”

Arthroscopy to Open Surgical Procedure (Actual Verbiage)

- “If a arthroscopy procedure is converted to the same surgical open procedure on the same joint, only the open procedure is payable.”

- “If an arthroscopic procedure and open procedure are performed on different joints, the two procedures may be separately payable with anatomic modifiers or modifier 50.”

- “This edit was also added to the outpatient surgery facility fee schedule”
Change to Rule 18-6(G)(4) “Special Reports”

- Changed billing increment from 30 minutes to 15 minutes for Special Report fees.
- $325.00 per hour did not change
  - $81.25 per 15 minutes; or
  - $162.50 per 30 minutes;
Change to Rule 18-6(G)(5) Chronic Opioid Management Report Fee - $75.00

(b) …a written report with all the following review services completed and documented:

- (1) Ordering and reviewing drug tests
- (2) Ordering and reviewing PDMP results
- (3) Reviewing the medical records,
- (4) Reviewing the injured worker’s current functional status
- (5) Determining what actions, if any, need to be taken.
- (6) Chronic Pain Diagnostic Code (ICD)
New Paragraph added to Rule 18-6(G)(5)(b) Chronic Opioid Management Report Fee

*Added “NOTE: this code is not to be used for acute or sub-acute pain management.”*
General Concepts

- Evidence derivation
- Smoking
- Osteoporesis
- General Principles – functional gains
- Pre-operative and post-op PT
Medical Evidence

Derivation of Evidence Recommendations

Evidence Level = Study Type + Quality Assessment

- Volume of Evidence
- Consistency of Evidence
- Generalisability
- Clinical Impact

Systematic Literature Review

Evidence Summary Critique

Consensus Judgment of Multidisciplinary Guideline Task Force

Guideline Evidence Recommendation
Medical Evidence Statements . . .

- **Some** at least one adequate scientific study reported that the treatment was effective;

- **Good** multiple adequate scientific studies or at least one relevant high-quality scientific study reported treatment as effective;

- **Strong** multiple relevant and high quality scientific studies arrived at similar conclusions about effectiveness of treatment.

- **NOTE 1**: All recommendations are considered to represent reasonable care in appropriately selected cases, regardless of the level of evidence attached to it.

- **NOTE2**: Methodology will be on line.
Consensus

Derivation of Consensus Recommendations

- Functional Benefit to Patient
- Acceptable Risk, Morbidity, Mortality
- Length of Disability and Time of Therapeutic Intervention
- Acceptable Cost

Systematic Literature Review Fails to Provide Adequate Scientific Studies

Consensus Judgment of Multidisciplinary Guideline Task Force

Guideline Consensus Recommendation
Consensus

**Consensus recommendations:**

- Represent opinion of experienced professionals
- Based on general medicine principles
- Are designated in the guideline as:
  - “Generally Well Accepted”
  - “Generally Accepted”
  - “Acceptable”
  - “Well Established”
Universal Concepts

- Coverage for smoking cessation with bone pathology and when ordered by physician
- Osteoporosis screening and treatment during claim
- Pre-operative physical therapy for complex surgery
- Successful objective functional improvement justifies need for treatment
Smoking may affect fracture healing. Patients should be strongly encouraged to stop smoking and be provided with appropriate counseling by the physician. Smokers have a higher risk of non-union and post-operative costs. Carriers should cover a smoking cessation program peri-operatively. Smoking cessation may be monitored with laboratory tests such as cotinine levels. If a treating physician orders a smoking cessation program it should be covered.
Osteoporosis

All patients with fractures, traumatic or surgical, especially those over 50 should be encouraged to ingest at least 1200 mg of Calcium and 800 IU of Vitamin D per day.

Some evidence that, for density, greater callus forms.

Coverage for these medications during the fracture healing time period is recommended.

No evidence that bisphosphonates increase acute fracture healing.
Risk Factors for Osteoporosis

- Female patients over 65

- Prednisone at a dose of 5 to 7.5 mg for more than 3 months.

- Males over 70 who:
  - are physically inactive
  - have previous fragility fracture
  - have a BMI less than 20 or
  - have been hypogonadal for 5 yrs.

- Women under 65
  - with menopause before 40
  - current smoker or
  - body mass index less than 20.
Physical Therapy

Section on rotator cuff, and joint replacements are meant to convey the need for separate PT or OT before and after surgery.

Do not try to use one set of numbers e.g. general PT section to cover both pre and post op therapy.
“Have you ever considered another line of work?”
General Principles

Need for treatment to be based on functional gains – increased lifting exercise, work duties

Principles 6&7 - review and re-evaluate at least 3-4 weeks
Cumulative Trauma Conditions

CTC or CTD are not acceptable diagnoses!!!!
Cumulative Trauma Medical Treatment Guidelines
Task Force 2009

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David Doupbrate, PhD  Ergonomist
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Keith J. Graves, DC  Chiropractic/Acupuncture
Eric Hammerberg, MD  Neurology
Pat Huddleston, ARM-P  Risk Management
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Task Force 2009

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Surgery- Ortho.

Alexia Singer, RN
Nurse Case Manager

Robert Turner, Esq.
Claimant’s Attorney

Mark Winslow, DO
Osteopathic Medicine
### Physical Examination Findings

#### Specific Musculoskeletal Diagnosis

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Symptoms</th>
<th>Signs</th>
</tr>
</thead>
</table>
| *De Quervain’s Tenosynovitis* | *Tenderness over the first dorsal extensor compartment.* | *At least one of the following:*
|                               |                                               |   *Pain worsened by resisted thumb abduction and/or extension with or without resistance;*
|                               |                                               |   *Positive Finkelstein’s test.*                           |
Medial Causation Assessment

General Principals Treatment for a work-related condition is covered when:

1) The work exposure causes a new condition;
2) The work experience causes the activation of a previously asymptomatic or latent medical condition;
3) The work exposure combines with accelerates, or aggravates a pre-existing symptomatic condition.

“Is it medically probable that the patient would need the treatment that the clinician is recommending if the work exposure had not taken place?”
In some cases, the clinician may need to order diagnostic testing or jobsite evaluations to make a judgment on a medical probability.

Step 1: Make a specific and supportable diagnosis. Cumulative trauma, repetitive strain and repetitive motion are not diagnosis. Refer to Sections F for the specific findings of common CTC’s.
Step 2: Determine whether the disorder is known to be or is plausibly associated with work.

Step 3: Interview the patient to identify risk factors. In some cases, a formal jobsite evaluation may be necessary.

Step 4: Complete the required match between the risk factors identified on the Risk Factor Table and the established diagnosis.
Medial Causation Assessment

-Continued-

Step 5: Determine whether a temporal association exists between the workplace risk factors and the onset or aggravation of symptoms.

Step 6: Identify non-occupational diagnoses. This information infrequently affects the work-related causation decision. It may be applicable when exposure levels are low.
Foundations for Evidence of Occupational Relationships

- Studies relied upon healthy worker populations with a variety of exposures.
- Individual variability lies outside the scope of these studies and must be addressed by the physician on a case by case basis.
- The clinician is responsible for documenting risk factors as listed in “Risk Factors Definitions”. Job title alone is not sufficient.
Foundations for Evidence of Occupational Relationships -Continued-

• Studies with 1) an accepted clinical exam confirming the diagnosis and 2) work exposures validated by direct observation, provide the strongest evidence.

• Cohort studies are preferred; however we considered other large prevalence and incidence studies as lower level evidence when minimum quality criteria had been met and the self-reported exposure used reliable questionnaires.
Foundations for Evidence of Occupational Relationships -Continued-

• Studies now available provide good evidence that keyboarding in a reasonable ergonomic posture (wrist with 30 degrees or less of extension and 15 degrees of less of radial deviation) up to 7 hours per day under usual conditions is very unlikely to cause carpal tunnel syndrome or other upper extremity disorders.
Foundations for Evidence of Occupational Relationships

- Some evidence that mouse use appears to be associated with carpal tunnel syndrome and related symptoms with 4 hours or greater per day use.

- Interpretation of lower quality studies took into account reasonable pathophysiology and exposure limits.

- Dose response relationships were also examined to look at trends.
Foundations for Evidence of Occupational Relationships -Continued-

- Indirect evidence from a number of studies supports the conclusion that task repetition up to 6 hours per day unaccompanied by other risk factors is not causally associated with cumulative trauma conditions.

- The variability in study design presented a challenge for reasonable hour limits. The strongest studies for the specific risks involved and extrapolated the measures utilizing quartiles in the working day.
Foundations for Evidence of Occupational Relationships -Continued-

• For example, ¾ of the day exposure was translated to a 6 hour exposure.

• For the secondary risk factor, one study provided direct evidence of 4 hours for the most common risks. (Haahr J 2003).

• Indirect supporting evidence from studies assessing upper extremity functional impairment and presence of upper extremity symptoms.
Using Risk Factors to Determine Causation (Directions)

1. Determine the diagnosis. Refer to section F (Specific Musculoskeletal Disorders and G Specific Peripheral Nerve Disorders).

2. Clearly define the job duties of the worker. Jobsite evaluations are always appropriate, but are sometimes unnecessary when the physician can identify a method for ergonomically correcting the activity.

3. Compare the worker’s duties with the Primary Risk Factor Definition table.
Algorithmic Steps for Causation Assessment

Step 3
Job duties meet the following risk factor definitions From the table

- Neither Primary nor Secondary risks Are present
  - Case probably not job related
    - Physiologically related To diagnosis
      - Case is probably work related
  - Case probably not job related

- One or more Primary Risk Factors
  - Primary Risk Factor Is
    - Not Physiologically related To diagnosis
      - Case is probably work related
Algorithmic Step #4 for Causation Assessment

- Step 4 only secondary risk factors met
  Consult Diagnosis-Based Risk Factor tables

  - Matches Diagnostic-Based Risk Factors tables
  - Risk is physiologically Related to the diagnosis and Does not meet Diagnosis-Based Risk
    Additional Risk Factor Present from the diagnosis-based Risk Factor table that does not Overlap the Secondary Risk Factors
    May be work-related
**Risk Factor Definitions**

_Causation may be established by the presence of 1) a diagnosis-related sole primary risk factor which is physiologically related to the diagnosis or; 2) at least one secondary risk factor that meets the requirements from the diagnosis-based risk factor table._

<table>
<thead>
<tr>
<th>Category</th>
<th>Primary Risk Factor</th>
<th>Secondary Risk Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
## Risk Factor Definitions

<table>
<thead>
<tr>
<th>Category Factor</th>
<th>Primary Risk Factor</th>
<th>Secondary Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awkward Posture</td>
<td>4 hrs of: Wrist flexion $&gt;45$ degrees, extension $&gt;30$ degrees, Ulnar deviation $&gt;20$ degrees.</td>
<td>6 hrs. of: Elbow – flexion $&gt;90$ degrees, 4 hrs. of: Elbow – continuous supination/pronation</td>
</tr>
</tbody>
</table>
### Risk Factor Definitions

<table>
<thead>
<tr>
<th>Category Factor</th>
<th>Primary Risk Factor</th>
<th>Secondary Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Force and Repetition/Duration per hour</td>
<td>6 hrs. of: &gt;50% of individual maximum force regularly – for individuals 3-5kg</td>
<td>4 hrs. Of: &gt;50% of force regularly most</td>
</tr>
<tr>
<td></td>
<td>lifting 10 lbs &gt;60x per hour</td>
<td>lifting 10 lbs &gt;60x</td>
</tr>
<tr>
<td></td>
<td>use of hand held tools weighing 2 lbs or greater</td>
<td>use of hand tools</td>
</tr>
</tbody>
</table>


## Risk Factor Definitions

<table>
<thead>
<tr>
<th>Category Factor</th>
<th>Primary Risk Factor</th>
<th>Secondary Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Computer Work</strong></td>
<td>Up to 7 hours per day at an ergonomically correct workstation is not a risk factor.</td>
<td>4 hrs. of: Mouse use</td>
</tr>
<tr>
<td></td>
<td>&gt;4 hrs. of: Mouse use</td>
<td></td>
</tr>
<tr>
<td><strong>Use of hand/held Vibratory Power tools &amp; Duration</strong></td>
<td>6 hrs. for more common types of vibration exposure.</td>
<td>2 hrs.</td>
</tr>
<tr>
<td><strong>Cold Working Environment</strong></td>
<td><strong>Ambient temp of 45F or less</strong></td>
<td>4 hrs</td>
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</table>
## Carpal Tunnel Syndrome

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Good Evidence</th>
<th>Some Evidence</th>
<th>Evidence Against</th>
<th>Non-Evidence-Based</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Combination of</strong></td>
<td><strong>repetition and force – Repetition &amp; vibration or force &amp; awkward posture</strong></td>
<td><strong>Wrist bending or awkward posture for 4 hrs.</strong></td>
<td><strong>Good – Keyboarding less than or equal to 7 hrs. good ergonomics</strong></td>
<td><strong>High repetition defined less than 30 sec. more than 50%</strong></td>
</tr>
<tr>
<td>Diagnosis</td>
<td>Good Evidence</td>
<td>Some Evidence</td>
<td>Evidence Against</td>
<td>Non-Evidence-Based</td>
</tr>
<tr>
<td>-------------------</td>
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<td>------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Carpal Tunnel Syndrome (continued)</td>
<td>Computer use</td>
<td>Mouse use more than 4 hours.</td>
<td>Good evidence-Repetition alone less than or equal to 6 hrs. Not Related.</td>
<td>High repetition defined less than 30 sec. more than 50%</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>Good Evidence</td>
<td>Some Evidence Against</td>
<td>Non-Evidence-Based</td>
<td></td>
</tr>
<tr>
<td>---------------------------------</td>
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<td>--------------------</td>
<td></td>
</tr>
<tr>
<td>Epicondylitis Lateral</td>
<td>Awkward Posture (forearm supination past 45 degrees) or force &amp; repetition</td>
<td>Some – Keyboarding less than or equal to 7 hrs. in using good ergonomics</td>
<td>Wrist posture in extension; repetitive supination of the forearm and/or elbow extension.</td>
<td></td>
</tr>
</tbody>
</table>
Patient education: One study demonstrated a 70% reduction in the number of patients desiring surgery when they were provided with 3 sessions of hand therapy explaining the use of splints; accessories such as fitted scissors, book support, pen handles; and modification of their work environment.
It is strongly suggested that all patients receive hand therapy support before considering surgery, especially if the job requirements place a high demand on fine hand activities. (Berggren M 2001)
Aggravated Osteoarthritis
Viscosupplementation injections


- Some evidence that intra-articular injection of high-molecular weight hyaluronic acid is more effective than saline in improving function and pain at 6 months for osteoarthritis at the base of the thumb (Ayhan F 2009).

- Time to Produce Effect: 1 injection.
- Optimum Frequency: 2 injections per year.
Epicondylitis – Lateral (Epicondylalgia)

Non-operative Treatment Procedures:

i. Initial Treatment: Over the counter medications for symptomatic relief, ice, bracing, and restriction of activities. Topical NSAIDs may also be effective. Literature indicates that over 80% of cases improve with conservative therapy only.

ii. Patient education should include instruction in self-management techniques, ergonomics, and home therapy program.
Job Hazard/Evaluation

Office
- Back properly supported the back upright or leaning backwards slightly, allowing change in position with backrest adjustment
- Good knee and legroom, with the feet resting comfortably on the floor or footrest
- Tools within easy reach, and twisting or bending should be avoided. (McAtamney L 1993, Cal/OSHA 1999)

Job Hazard Checklist: Adopted with modification from Washington State’s job hazard checklist, generally accepted guide for identifying job duties which may pose ergonomic hazards. The fact that an ergonomic hazard exists at a specific job, does not establish a causal relationship between the job and the individual with a musculoskeletal injury.
Tools

- Should be assessed for the individual and not used universally.
- Work in the most neutral position and use the least force possible. For force tools, the grip should not span more than 3.5 inches, and the handle diameter should not be greater than 2 inches. Precision tools may require a smaller diameter (NIOSH 1997).
- If possible, continual forearm tasks requiring supination/pronation should be avoided by using automatic tools.
Identifying Job Duties Which May Pose Ergonomic Hazards

<table>
<thead>
<tr>
<th>Type of Job Duty</th>
<th>Hours per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wrist palmar flexion greater than 45 degrees, wrist extension greater than 30 degrees, ulnar deviation greater than 20 degrees, or radial deviation greater than 20 degrees.</td>
<td>More than 3 hour total/day</td>
</tr>
<tr>
<td>Most of the work cycle performed with the elbow flexed equal to or greater than 90 degrees.</td>
<td></td>
</tr>
<tr>
<td>Repetitive Motion (using the same motion with little or no variation) with a cycle time 30 seconds or less or greater than 50% of cycle time performing the same task</td>
<td></td>
</tr>
</tbody>
</table>
Epicondylitis – Lateral (Epicondylalgia)

**Steroid injections:** Strong evidence that steroid injection decreases pain in the first few weeks but has a worse outcome at 52 weeks than PT or more conservative therapy including bracing, platelet-rich plasma injections, heat or cold therapy, and change in activities. The potential for negative long-term effects should be strongly considered.
Epicondylitis – Lateral (Epicondylalgia)

Good evidence that botulinum toxin A injection may provide short-term pain relief from pain due to chronic (3 months or longer) lateral epicondylitis.

However, the long-term functional benefits are unknown.

Good evidence that botulinum toxin A injections cause weakness in finger extension and/or digit paresis.
Other injections:

Due to lack of evidence of their effectiveness and the cost involved, prolotherapy and polidocanol are not recommended.

Autologous Whole Blood Injections: are inexpensive treatments and may be used in patients who have not made sufficient functional progress with initial therapy for lateral or medial epicondylitis after 10 to 12 weeks. (Rabago D 2009)
Epicondylitis – Lateral (Epicondylalgia)

Some evidence that for patients with symptoms lasting 6 months or more, autologous blood injections result in better pain and functional outcomes after 1 year than steroid injections. (Ozturan K 2010)

- Optimum Frequency: 2 injections may be required.
Epicondylitis – Lateral (Epicondylalgia)

Platelet-Rich Plasma Injections: Good evidence that for patients with symptoms lasting 6 months or more, platelet-rich plasma injections result in better pain and functional outcomes after 1 year than steroid injections. (Peerbooms J 2010)

- Optimum Frequency: 2 injections.
Epicondylitis – Lateral (Epicondylalgia)

The natural history of epicondylitis supports an expectation of improvement within 3 months using patient education and modified activities. (Bisset L 2006)

No clinical evidence or sound physiologic rationale for magnets or diathermy - not recommended.

Good evidence that low level laser is not more effective than placebo for lateral epicondylitis - not recommended.
Epicondylitis – Lateral
Extra-corporal Shock Wave Therapy

Extracorporeal shock therapy (ESWT). Large studies have not provided evidence that this intervention provides long-term benefit. (Buchbinder R 2009, Cochrane; Buchbinder R 2006, BMJ Clinical Evidence).

Some evidence that highly motivated patients may show up to a 35% additional improvement over no other treatment, when administered low energy shock wave treatment without local anesthesia. (Rompe J 2004)
Epicondylitis – Lateral
Extra-corporal Shock Wave Therapy

Patients who have experienced some positive response to other therapy but continue to have functional deficits after 10 to 12 weeks may be considered for this treatment.

Peripheral vascular disease, upper extremity neuropathy and diabetes are all relative contraindications.
Epicondylitis – Lateral
(Epicondylalgia)

Other therapies:

- Ultrasound, phonophoresis, and iontophoresis may be used occasionally but there is no evidence that they alter long-term function. (Bisset L 2005, Smidt N 2002, Nirschl R 2003)

- Neither deep tissue massage nor manipulation alone, have sufficient evidence to support their routine isolated use. (Cochrane, Brousseau L 2002, Bisset L 2005)
Epicondylitis – Lateral (Epicondylalgia)

Massage or manipulation may be used in conjunction with a complete upper extremity therapy program when functional progress is demonstrated within the time to effect found in Therapeutic Procedures, Non-operative.

Good evidence physical therapy using manipulation, home exercise and supervised exercise reduced pain at 6 weeks but not at 52 weeks. This may be appropriate therapy to hasten return to work. (Bisset L 2006)

- Time to Produce Effect: 4 treatments.
- Optimum Frequency: 8 treatments over 6 weeks.
Triangular Fibrocartilage Complex Tear (TFCC)

- **Diagnostic Testing Procedures:** X-ray and MRI or MRI arthrography. As with knee degenerative changes, many patients with TFCC tears are asymptomatic.

- In one study of patients with a history of TFCC and related falls, ligament disruptions were commonly found in the opposite asymptomatic hand over 50% of the time. (Cantor R 1994)

- It may be reasonable to also image the opposite wrist if it is asymptomatic.
Triangular Fibrocartilage Complex Tear (TFCC)

**Surgical Indications/Considerations:**
- concomitant fractures
- instability
- if symptoms continue to interfere with ADLs or job duties after non-surgical interventions for 2 to 3 months.

**Non-surgical interventions:**
- rest from inciting factors, ergonomic job changes, and steroid injections
- pathology is identified on MRI and there is not should not be another diagnosis which better explains the patients complaints.
Prior to surgical intervention, the patient and treating physician should identify functional operative goals and the likelihood of achieving improved ability to perform activities of daily living or work activities and the patient should agree to comply with the pre-and post-operative treatment plan including home exercise.

It is recommended that carriers cover a smoking cessation program peri-operatively.
Triangular Fibrocartilage Complex Tear (TFCC)

Post-operative Treatment:

An individualized rehabilitation program

Wrist splints are usually required for 6 weeks and power grip and axial loading are discouraged.

Range of motion is usually begun at 2 weeks. (Bernstein M 2004)

Usually light activity only is recommended for 3 months.
Carpal Tunnel Syndrome

**Diagnostic Testing Procedures:**

- **Diagnostic Steroid Injections:** When the diagnosis is in question, steroid injection into the carpal tunnel is a strongly supportive test if it is followed by significant relief of symptoms.
Electrodiagnostic (EDX) Testing Not recommended CTS

- Multiple median F wave parameters, median motor nerve residual latency, and sympathetic skin response are not recommended. (AANEM 20020.

- Electroneurometer: This is not recommended as a diagnostic tool because it requires patient participation, cannot distinguish between proximal and distal lesions, and does not have well-validated reference values.

- Portable Automated Electrodiagnostic Device: Measures distal median nerve motor latency and F-wave latency.
Electrodiagnostic (EDX) Testing - Recommended

To assure accurate testing, temperature should be maintained at 30 to 34°C preferably recorded from the hand/digits. For temperature below 30°C the hand should be warmed.

Positive Findings –

- Slowing of median distal sensory and/or motor conduction through the carpal tunnel region.
- Electromyographic changes in the median thenar muscles in the absence of proximal abnormalities.
Non-operative Treatment - CTS

Initial Treatment:

Medications such as analgesics and over the counter medications for symptomatic relief
wrist splint at night
restriction of activities such as forceful gripping, awkward wrist posture, and repetitive wrist motion.

A number of studies have followed patients with mild clinical carpal tunnel symptoms. Approximately 40 to 50% of patients improved over time, most of whom received conservative treatment.
Non-operative Treatment - CTS

- Patients with
  - positive Phalen’s at 30 seconds
  - symptoms lasting 10 months
  - over 50 years of age
  - bilateral symptoms

were less likely to improve. (Kaplan S 1990, Ortiz-Corredor F 2008, Padua L 2001).

Patient education should include instruction in self-management techniques including sleeping postures which avoid excessive wrist flexion; ergonomics; and home therapy program.
Non-operative Treatment - CTS

In 2007 published study 73% of mild cases referred for carpal tunnel surgery received splints, 23% steroid injections and only 15% modification in activities recommendations.

Job alterations are an expected treatment
1) instructing the worker how specific duties might be performed to meet ergonomic standards
2) actual job worksite or duty changes; and/or
3) a formal jobsite evaluation at the worksite.
Non-operative Treatment - CTS

**Ultrasound:** Some evidence ultrasound may be effective in symptom relief and in improving nerve conduction in mild-to-moderate cases of CTS (Cochrane, O’Connor D 2003, Ebenbichler G 1998). It is suggested that treatment be limited to 12 sessions over 6 weeks (Jarvik J 2009).

**Low Level Laser:** No evidence that low level laser therapy alone is beneficial in changing the outcome for patients with carpal tunnel syndrome and therefore it is not recommended (Evcik D 2007, Chang WD 2008).
Non-operative Treatment - CTS

Yoga: Some evidence Hatha yoga instruction may reduce pain, improve grip strength, as compared to patients receiving only wrist splints (Garfinkel M 1998).

- **Time to Produce Effect:** 2 to 6 treatments.
- **Frequency:** 2 times per week.
- **Optimum and Maximum Duration:** 4 to 8 weeks.

Ionotophoresis: has not yet been shown to be effective for CTS (Amirjani N 2009) but may be an appropriate option for patients refusing surgery and injections.

- **Optimum and Maximum Frequency:** 6 to 9 sessions over 5 weeks.
Carpal Tunnel Release Surgery

- **Median nerve trauma has occurred:** “acute carpal tunnel syndrome”, or
- **Thenar atrophy is present and due to median nerve compression’** or
- **Electrodiagnostic evidence of moderate to severe neuropathy is present.**
Carpal Tunnel Release Surgery

- Surgery may be considered when electrodiagnostic testing is normal and initial non-operative therapy has failed and
- the patient’s signs and symptoms are specific for carpal tunnel syndrome; and
- the patient experiences significant temporary relief following steroid injection into the carpal tunnel.

- Patients should be strongly encouraged to stop smoking and be provided with appropriate counseling. If a treating physician recommends a specific smoking cessation program peri-operatively this should be covered by the insurer.

- A second opinion from a hand surgeon is strongly recommended.
Carpal Tunnel Release Surgery not recommended

- **Neurolysis**: has not been proven advantageous for carpal tunnel syndrome. Internal neurolysis should never be done. Very few indications exist for external neurolysis. (AAOS, Keith M 2009).

- **Tenosynovectomy**: If a patient with documented CTS experiences pain along the volar wrist, hand, and/or distal forearm as the predominant symptom, clearly overshadowing the paresthesias, there may be a significant component of tenosynovitis. Tenosynovectomy should be considered in these unusual cases at the time of carpal tunnel release.
Carpal Tunnel Release Surgery

Post-operative Treatment:

Home therapy protocol involving stretching, ROM, scar management and resistive exercises.

Some evidence showing immediate mobilization of the wrist following surgery is associated with less scar pain, and faster return to work (Cook A 1995).

An individual rehabilitation program may be helpful in patients who do not show functional improvements post-operatively or in patients with heavy or repetitive job activities. At least 2 therapy visits are recommended to insure appropriate scar management and return to function.
Carpal Tunnel Release Surgery

Suggested parameters for return-to-work are:

<table>
<thead>
<tr>
<th>Time Frame</th>
<th>Activity Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Days</td>
<td>Return to work with restrictions on utilizing the affected extremity</td>
</tr>
<tr>
<td>2 to 3 Weeks</td>
<td>Sedentary and non-repetitive work</td>
</tr>
<tr>
<td>4 to 6 Weeks</td>
<td>Case-by-case basis</td>
</tr>
<tr>
<td>6 to 12 Weeks</td>
<td>Heavy Labor, forceful and repetitive</td>
</tr>
</tbody>
</table>
Cubital Tunnel Syndrome

**Non-operative Treatment Procedures:**

- **Initial Treatment:**
  - Medications,
  - elbow pad anteriorly at 30 to 60 degrees or towel around elbow at night, optional posterior pad for daywear, and
  - restriction of activities. (Darowish M 2009).

- **Patient education:** Some evidence to support the effectiveness of education, regarding nerve anatomy and how to avoid pronation, as first line therapy (Svernolv G 2009).
Cubital Tunnel Syndrome

**Surgical Indications/Considerations:**

- 1) findings on history and objective evidence correlate specifically with the diagnosis;
- 2) jobsite alteration and other conservative measures have not alleviated the symptoms; and
- 3) functional deficits persist after 6 to 8 weeks.

**Subjective complaints should be localized and appropriate to the diagnosis, neurologic complaints should be consistent with the nerve distribution in question, and physical exam findings should correlate with the history.**
Cubital Tunnel Syndrome

**Objective evidence should be present and include:**
- positive physical exam findings as described in section 2c;
- positive electrodiagnostic (EDX) studies;
- diagnostic peripheral nerve block which eradicates the majority of the patient’s symptoms; or a motor deficit commensurate with the suspected neurologic lesion.

**In general, patients with minimal symptoms or without objective findings of weakness tend to respond better to conservative treatment.**
Questions ???