MEDICAL PROTOCOLS: INTRODUCTION

STATE OF CONNECTICUT WORKERS' COMPENSATION COMMISSION — EFFECTIVE: 1-1-1996
REVISIONS/UPDATES: 7-1-2012; 7-1-2013; 4-1-2014; 4-1-2015; 8-15-2015; 11-1-2015; 2-15-2016; 3-27-2017; 11-1-2018

CONTENTS

BACKGROUND

Workers' Compensation Medical Protocols first became effective on January 1, 1996 as a result of legislative changes to Section 31-280 of the Workers' Compensation Act.

The Workers' Compensation Commission (WCC) uses these Medical Protocols to evaluate whether a particular treatment is reasonable and appropriate based on the diagnosis of a worker's injury or illness.

NEW

In consultation with practitioners, insurers, and the Medical Advisory Panel, new Medical Protocols for treatment of injuries to the foot and ankle were created in 2018.

Opioid Management Protocols were revised in 2017. The WCC recognizes that some injured workers may require opioids to manage their acute and chronic pain. Proper opioid management is essential for the safe and efficient care of injured workers.

Protocols for Psychological Pain Assessment and Treatment were created in 2016 to assist medical practitioners in effective pain management for their patients' workers' compensation injuries.

Revisions to various Medical Protocols reflect the latest changes in the medical field regarding new procedures, treatments, and diagnostic tests:

- Protocols for treatment of injuries to the cervical spine and lumbar spine were revised in 2012 and updated in 2013 and 2015.
- Protocols for treatment of injuries to the knee were revised in 2015.
- Protocols for treatment of injuries to the hand, wrist, and elbow were revised in 2015.
- Protocols for treatment of injuries to the shoulder were revised in 2014.

EFFECTIVE DATES

- November 1, 2018*:*
  Foot, Ankle
  – *created*
- March 27, 2017*:*
  Opioid Management
  – *revised*
- February 15, 2016*:*
  Psychological Pain Assessment and Treatment
  – *created*
- November 1, 2015*:*
  Cervical Spine
  Lumbar Spine
  – *update*
- August 15, 2015*:*
  Knee
  – *revision*
- April 1, 2015:
  Hand, Wrist, and Elbow
  – *revision*
- April 1, 2014*:*
  Shoulder
  – *revision*
- July 1, 2013*:*
  Cervical Spine
  Lumbar Spine
  – *update*
- July 1, 2012*:*
  Cervical Spine
  Lumbar Spine
  – *revision*
- July 1, 2012*:*
  Opioid Management
  – *created*

FUTURE UPDATES

The Workers' Compensation Medical Protocols will continually be revised and updated, as appropriate.

The WCC advises practitioners, insurers, and other concerned parties to periodically check for announcements of revisions and updates on the WCC website:

wcc.state.ct.us

ACKNOWLEDGMENTS

The WCC thanks the medical professionals who have spent – and continue to spend – many hours working with us to bring the most appropriate treatment, and the highest standard of care, to injured workers in Connecticut.

PSYCHOLOGICAL PAIN ASSESSMENT & TREATMENT – PAGE 1 of 6

INTRODUCTION

INTRODUCTION

Pain is a complex phenomenon. Many factors contribute to and modify pain.

It is generally accepted that pain generators include both somatic and psychic elements. These factors are further modified by complex social variables.

What is generally referred to as "pain" by most laypersons is a subjective experience. As such, “pain” is a psychological experience and product of complex biopsychosocial phenomena.

Consequently, the diagnosis of the causes of “pain” and associated treatment of “pain” is an enormously challenging endeavor often complicated by insistent demand for relief. Neither biological / medical, psychological, nor environmental / social strategies may suffice.

It is clear from the literature that the highest rates of diagnostic and treatment efficacy are represented by integrated biopsychosocial and interdisciplinary models and delivery systems.

Psychological approaches to diagnosis and treatment appear to many to be a “black box.” However, even casual scrutiny reveals similar uncertainties, ambiguities, and knowledge limitations in biological / medical methods.

Psychological / neuropsychological procedures for assessment and treatment of emotional, behavioral, and motivational aspects of pain continue to evolve in accuracy and efficacy.

Inclusion of these methods in an integrated approach to pain management is increasingly and widely recognized as essential.

PROTECTED HEALTH INFORMATION

Protected Health Information in the psychological domain enjoys a higher level of HIPAA protection than general medical information.

All health care providers responsible for collection, storage and dissemination of Psychological Protected Health Information have a legitimate and formal obligation to support these standards.

Providers must familiarize themselves with the operational details of these obligations and implement them rigorously in their clinical settings.

Generally, this is accomplished by the identification and segregation of Psychological Protected Health Information with distinct procedures and documents for authorization of information release.

RECOMMENDED TIMELINES

As with all the recommendations the timelines are to be taken as guidelines and not mandates.

It is recommended that the greatest flexibility and discretion be given to providers' application of the diagnostic criteria in the earliest care time frame of INTAKE TO 4 WEEKS.

The vast majority of patients in the workers' compensation system flow through the system of care without complication.

The recommended baseline demographic data is meant to be collected as early as possible to enhance focus on those patients for whom any complication, or question of potential complication, may arise.

The timing of initial collection and documentation of these demographics will vary according to the type of treatment venue and the associated baseline population characteristics.

Optimal timing in any given clinical setting will be responsive to the earliest possible thresholds for potential treatment complications.

FORENSIC CAVEATS

Advanced diagnostic procedures and technologies allow for objective measurement and documentation of symptom over- and under-reporting, dissimulation of psychopathology, and malingered neurocognitive impairment.

It is neither cost-effective nor conducive to clinical care to prematurely implement forensic assessment.

It is similarly ineffective to delay forensic assessment despite repeated and ongoing indications of diagnostic / claim invalidity.

When properly designed and implemented the entire continuum of psychodiagnostic data collection contributes to a stepwise incremental evaluation of symptom validity.

The formal administration of a detailed and objective forensic assessment simply represents the final phase of this systematic analysis and, as such, is integrated into the entire continuum of care.

PSYCHOLOGICAL PAIN ASSESSMENT & TREATMENT – PAGE 2 of 6

INTAKE TO 4 WEEKS (with consideration of date of injury)

DIAGNOSTIC CRITERIA

Demographic screening to identify:

- any previous psychological diagnosis / treatment, including:
  - – psychiatric hospitalization
  - – outpatient psychotherapy / counseling
  - – psychopharmacological treatment (e.g., antidepressants, anxiolytics, etc.)
- diagnosis and / or treatment of any drug or alcohol abuse or dependence – e.g., life interference such as:
  - – relationships
  - – work
  - – DWI
  - – detoxification
  - – inpatient / outpatient rehabilitation
  - – 12-step participation
- prior treatment for work-related pain
- prior workers' compensation claim with pain-related lost time

Physician discretion based on anomalies of case presentation or course . . .

AND / OR

. . . positive response to any one of 4 questions obtained by any provider (above)

DIAGNOSTIC STUDIES

Recommended:

- monitor medical progress
- refer for psychodiagnostic interview:
  - – positive responders on demographic screen
  - – individuals based on physician discretion

TREATMENT

Recommended:

- medical monitoring

  and / or
- implementation of psychodiagnostic interview-generated recommendations

GOALS OF TREATMENT

Medical regimen compliance with:

- expected decreased VAS ratings
- functional improvement

PSYCHOLOGICAL PAIN ASSESSMENT & TREATMENT – PAGE 3 of 6

1-3 MONTHS

DIAGNOSTIC CRITERIA

Physician determination of:

- lack of expected improvement
- atypical presentation
- treatment noncompliance

DIAGNOSTIC STUDIES

Psychodiagnostic interview:

- by qualified psychological / psychiatric provider
- with administration of standardized screening tools, such as:
  - ODI
  - BDI

TREATMENT

Recommended, per examination results:

- continued medical management
- enhanced monitoring
- rehabilitative psychotherapy
- compliance contingency management regimens
- emotional-behavioral contraindications to medical management – e.g.:
  - primary / secondary gain
  - polypharmacy
  - interventional procedures including:
    - injections
    - blocks
    - surgery

GOALS OF TREATMENT

Support medical treatment goals with:

- enhanced medical regimen compliance
- pain reduction
- functional improvement

PSYCHOLOGICAL PAIN ASSESSMENT & TREATMENT – PAGE 4 of 6

GREATER THAN 3 MONTHS

DIAGNOSTIC CRITERIA

- continued failure of expected medical improvement
- onset of new symptoms
- unexpected symptom variability
- compromised treatment compliance

DIAGNOSTIC STUDIES

Recommended:

- formal psychological examination:
  - – by qualified psychological provider
  - – expanding diagnostic interview
  - – administration of self-report inventories
- personality inventories, with:
  - – response bias scales (e.g., MMPI-2RF, PAI, MCMI, etc.)
  - – additional self-report inventories directed at medical and pain patients (e.g., MBMD, BHI-2, etc.)

TREATMENT

Recommended, per examination results:

- continued medical management
- enhanced monitoring
- rehabilitative psychotherapy
- compliance contingency management regimens
- emotional-behavioral contraindications to medical management – e.g.:
  - – primary / secondary gain
  - – polypharmacy
  - – interventional procedures including:
    - o injections
    - o blocks
    - o surgery

GOALS OF TREATMENT

Support medical treatment goals with:

- enhanced medical regimen compliance
- pain reduction
- functional improvement

PSYCHOLOGICAL PAIN ASSESSMENT & TREATMENT – PAGE 5 of 6

GREATER THAN 6 MONTHS

DIAGNOSTIC CRITERIA

- continued failure to demonstrate functional improvement
- lack of response to pharmacological strategies
- lack of response to interventional strategies
- marked noncompliance
- marked litigiousness
- failed drug screen
- repeated loss of medications
- other compromises of medication contracting
- positive findings on PMP

DIAGNOSTIC STUDIES

Recommended:

- forensic examination:
  - by qualified psychological / neuropsychological provider
  - include:
    - systematic analysis of ability suppression
    - systematic analysis of response bias
    - formalized battery of screening measures
    - forced choice measures
    - self-report inventories with validity scales (IME?)

TREATMENT

Recommended, per examination results:

- continued medical management
- enhanced monitoring
- rehabilitative psychotherapy
- compliance contingency management regimens
- emotional-behavioral contraindications to medical management – e.g.:
  - primary / secondary gain
  - polypharmacy
  - interventional procedures including:
    - injections
    - blocks
    - surgery

GOALS OF TREATMENT

Support medical treatment goals with:

- enhanced medical regimen compliance
- functional improvement

Cessation of care, on the basis of:

- documented unreasonableness
- unnecessary evaluation
- unnecessary treatment

PSYCHOLOGICAL PAIN ASSESSMENT & TREATMENT – PAGE 6 of 6

PROCEDURE BASE CRITERIA

DIAGNOSTIC CRITERIA

- surgical interventions for pain reduction (in the absence of neurological compromise)
- interventional pain management procedures, including:
  - – trials
  - – permanent placement of implanted devices

DIAGNOSTIC STUDIES

Recommended:

- formal psychological examination:
  - – by qualified psychological provider
  - – expanding diagnostic interview
  - – administration of self-report inventories
- personality inventories, with:
  - – response bias scales (e.g., MMPI-2RF, PAI, MCMI, etc.)
  - – additional self-report inventories directed at medical and pain patients (e.g., MBMD, BHI-2, etc.)

TREATMENT

Recommended, per examination results:

- continued medical management
- enhanced monitoring
- rehabilitative psychotherapy
- compliance contingency management regimens
- emotional-behavioral contraindications to medical management – e.g.:
  - – primary / secondary gain
  - – polypharmacy
  - – interventional procedures including:
    - o injections
    - o blocks
    - o surgery

GOALS OF TREATMENT

Support medical treatment goals with:

- enhanced medical regimen compliance
- pain reduction
- functional improvement

MEDICAL PROTOCOLS: OPIOIDS – PAGE 1 of 5

OPIOID MANAGEMENT OF THE INJURED PATIENT

OVERVIEW

Proper opioid management is essential for the safe and efficient care of injured patients. The WCC recognizes that some injured patients may require opioids for the management of their acute and chronic pain. It is not the intention of the WCC to restrict the proper medical use of this class of medications, however responsible prescribing is mandatory. Additionally, studies have shown that injured workers placed on high dose opioids early in the post-injury period may experience a slower recovery, more difficulty with returning to work, more difficulty with weaning, and more frequently end up on long term opioids.

During the first two weeks post injury, low dose, short acting opioids may be appropriate for those with more severe injuries. Even during the acute phase it is preferred that the injured worker avoid opioid medications when possible. During the remaining portion of the acute and subacute period, attempts should be made to wean and discontinue opioid medications as appropriate (i.e., as symptoms improve) and as soon as possible. Dose escalation during these periods should be avoided, as the injury should be stabilized and healing. Medications that are deemed to be inappropriate for the vast majority of injured patients include immediate release, ultra-short acting sublingual and nasal opioid preparations. Long acting opioids are not recommended in the acute and sub-acute phases of treatment. In addition, following major surgical interventions, as acute postoperative pain resolves attempts should be made to wean medications as soon as possible, again avoiding dose escalation beyond the acute post-operative period.

Opioids are not meant to completely eliminate pain, but to ease symptoms and improve function (i.e., improvement of work capacity, ADLs, sleep and sexual function). Any continuation of medications beyond the first two week period must include proper documentation of improvement in pain level (VAS or other screening tool) and improvement in function or work capacity. At each visit history should be obtained to ensure medications are providing the desired pain reducing effect and looking specifically for side effects such as over sedation, cognitive impairment, or inappropriate medication usage. Any patient maintained beyond a four week period on chronic medications should have appropriate compliance monitoring documented. This should occur through history, screening questionnaires, prescription monitoring programs queries, urine drug tests (up to 2x / yr. for a stable, low risk patient and more frequently as indicated for high risk patients), and/or pill counts, as deemed appropriate by the physician. Patients continuing on opioids longer than 4 weeks should be managed under a narcotic agreement as recommended by the Federation of State Medical Boards. Medical necessity should be documented as to the need for all opioid prescriptions in terms of measured improvement in pain, function or work capacity.

If an injured patient requires opioid maintenance longer than 12 weeks, evaluation / consultation and treatment by a physician with appropriate specialty training in pain management should be considered. Documentation of medical necessity, including gains in pain, function or work capacity, is mandatory for prescribing beyond what is described within these guidelines.

The total daily dose of opioids should not be increased or maintained above 90mg oral MED (Morphine Equivalent Dose), unless the patient demonstrates measured improvement in function, pain and/or work capacity. A second opinion from an expert in pain management is recommended, if contemplating raising/maintaining the dose above 90 MED.

Before prescribing opioids for chronic pain, potential comorbidities should be evaluated. These include opioid addiction, drug or alcohol problems and depression. A baseline urine test for drugs of abuse and assessment of function and pain should be performed prior to institution of opioids for chronic pain.

GUIDELINES FOR PRESCRIBING

Connecticut law limits initial prescriptions to a 7-day supply for adults; exceptions are allowed for patients with chronic pain or acute pain that will last beyond 7 days with appropriate chart documentation.

Associated risks of addiction and overdose must be explained to the patient before prescribing controlled substances for the first time.

State law requires the PDMP be checked prior to the first prescription.

Single prescriber

Single pharmacy

Opioid agreement

Caution should be used with:

- combination therapy
- barbiturates
- sedative-hypnotics
- muscle relaxants
- benzodiazepines

Routine assessment of pain and function, if there is no improvement

Weaning of opioid

General:

- Whenever a prescribing practitioner prescribes controlled substances for the continuous or prolonged treatment of any patient, such prescriber, or such prescriber's authorized agent who is also a licensed health care professional, shall review, not less than once every ninety (90) days, the patient's records in the Connecticut Prescription Monitoring and Reporting System (CPMRS) at *www.ctpmp.com*

Post-Op:

- Prior to any surgery that will require more than a 72-hour supply of any controlled substance (Schedule II-V), the prescribing practitioner or such practitioner's authorized agent who is also a licensed health care professional shall review the patient's records in the Connecticut Prescription Monitoring and Reporting System (CPMRS) at *www.ctpmp.com*

REASONS TO DISCONTINUE OPIOIDS OR REFER FOR ADDICTION MANAGEMENT

No measured improvement in function and / or pain,

or

Opioid therapy produces significant adverse effects,

or

Patient exhibits drug-seeking behaviors or diversions such as:

- selling prescription drugs
- forging prescriptions
- stealing or borrowing drugs
- frequently losing prescriptions
- aggressive demand for opioids
- injecting oral / topical opioids
- unsanctioned use of opioids
- unsanctioned dose escalation
- concurrent use of illicit drugs
- failing a drug screen
- getting opioids from multiple prescribers
- recurring emergency department visits for chronic pain management

If there is no measured improvement in pain, function, ADLs or work capacity after three (3) months of opioid medication, the prescribing physician must justify the continued use of opioids and should consider weaning of the opioid.

Opioids may allow the patient to return to work safely and more expeditiously and therefore may be indicated; nevertheless, attempts to wean these medications and avoidance of dose escalation should be the goal of treatment.

This document is meant as a guideline for the practitioner and should not supplant proper medical judgment.

SAMPLE OPIOID EQUIVALENCY TABLE

OPIOID	MED
Codeine	0.15
Fentanyl Transdermal	2.4
Hydrocodone	1
Hydromorphone	4
Methadone up to 20mg	4
Methadone 21-40mg	8
Methadone 41-60mg	10
Methadone >60mg	12
Morphine	1
Oxycodone	1.5
Oxymorphone	3

OPIOID DRUG MONITORING

INTRODUCTION

Use of chronic controlled substances in chronic pain management is acceptable in appropriate clinical situations. However, there are a number of risks associated with these medications, which have been well documented and include addiction, overdose, and death. Careful monitoring is required to maximize safety when prescribing opioid medications.

In addition to other risks, opioid medications can also interact with many medications, including:

- other prescribed controlled substances (i.e., benzodiazepines)
- anti-depressants
- medical marijuana
- other common medications

Prescribing providers must ensure the safe use of this form of potentially risky medical treatment, including its interaction with other prescribed medications.

Chronic opioid management requires careful, ongoing monitoring to ensure that each patient complies with directions given for the proper use of all prescribed medications. Such monitoring provides objective information that can help identify the presence or absence of drugs or drug classes in the body, assisting clinicians in making appropriate treatment decisions for patients requiring chronic controlled substances as part of their medical care.

In addition, each patient must be screened to assess his or her risk status (see "PATIENT RISK ASSESSMENT" on page 5 of these Opioid Protocols), by means of:

- a full medical and personal history
- administration of a risk assessment interview or questionnaire
- review of any documented evidence that may exist of any type of aberrant behavior known to indicate a potentially increased risk to the patient, if chronic opioid management is utilized as part of that patient's treatment plan

NOTE: the Commission's previously-published opioid guidelines encourage clinicians to avoid high-dose long-term prescribing, given the lack of medical evidence supporting such practice.

ROUTINE DRUG TESTING

Routine testing of patients:

- is "best practice" when providing pain management and opiate therapy – such testing can help to identify:
  - – drugs of adherence
  - – drugs of abuse
- may detect the presence of prescribed medication, helping to:
  - – verify patient compliance
  - – reinforce therapeutic compliance
  - – provide documentation demonstrating compliance
- may detect the absence of prescribed medication, indicating possible:
  - – non-compliance
  - – abuse
  - – misuse
  - – diversion
- may detect the use of substances that could result in:
  - – adverse events
  - – drug-drug interactions
- may detect the use of undisclosed substances:
  - – alcohol
  - – unsanctioned prescription medications
  - – illicit substances

FREQUENCY OF TESTING

It is neither medically indicated, nor appropriate, to test every single patient at every single visit.

To ensure patient compliance, the Connecticut workers' compensation system considers it medically appropriate to randomly perform Point-of-Care (POC) urine drug testing (UDT) for patients receiving chronic opioid treatment:

- 2x / year (minimum)
- up to 4x / year (maximum)
- more frequently (if medical indications dictate)

Additional testing – above and beyond 4x / year – will only be covered for specific, documented medical indications, including:

- following up on abnormal urine drug test results (to confirm patient compliance)
- an aberrant PMP report
- a patient at high risk for abuse
- a patient with a known history of substance abuse (based on an "outside" report of potential abuse, i.e., from the carrier, another physician, a family member, or other source)

Medical indications requiring more frequent testing must be documented in the patient's medical records.

DRUG TESTS — DEFINED

Point-of-Care (POC) Drug Testing

- qualitative testing which provides immediate results
- used when medically necessary by clinicians for immediate patient management
- available when the patient and physician are in the same location
- testing is performed by office staff
- read by the human eye
- immunoassay (IA) test method that primarily identifies drug classes and a few specific drugs
- platform consists of cups, dipsticks, cassettes, or strips
- limited accuracy, requiring confirmatory testing for unexpected or unexplained results

Qualitative Drug Testing

- when medically necessary, determines presence or absence of drugs or drug classes in urine sample
- results expressed as negative, positive, or as a numerical result
- includes competitive immunoassays (IA) and thin layer chromatography
- performed by licensed laboratorian (MT / MLT- ASCP)

Definitive / Quantitative / Confirmation

- used when medically necessary to identify specific medications, illicit substances, and metabolites
- reports the results of drugs absent or present in concentrations of ng / ml
- limited to GC-MS and LC-MS / MS testing methods only
- performed by licensed laboratorian (MT / MLT- ASCP)

Specimen Validity Testing

- ensures urine specimen is consistent with normal human urine and has not been adulterated or substituted
- may include pH, specific gravity, oxidants, temperature, and creatinine

Immunoassay (IA)

- qualitative / semi-quantitative testing
- ordered by clinicians primarily to identify presence or absence of drug classes and some specific drugs
- biochemical test to measure the presence of a substance (drug) – above a cutoff level – using an antibody
- read by photometric technology
- chemistry analyzers with IA UDT technology are used in office and clinical laboratory settings
- may be used when less immediate test results are required
- at no time is IA technology by chemistry analyzer analysis considered confirmatory testing
- performed by licensed laboratorian (MT / MLT- ASCP)

POINT-OF-CARE (POC) DRUG TESTING

POINT-OF-CARE (POC) DRUG TESTING

Point-of-Care (POC) or "in-office" (enzyme immunoassay) drug testing is that which is done in the office using any number of types of immunoassay testing.

POC testing should be the primary route of routine urine drug screening, and is encouraged, because:

- it has the advantage of providing the clinician with immediate feedback
- it assists the clinician in making appropriate clinical decisions at the same time that a prescription is provided

Basic POC dip stick / cup / card / cartridge testing is expressly allowed under these protocols.

Initial testing should be with basic immunoassay drug panels (usually 10-12 drugs).

Confirmatory testing should only be performed as described in "CONFIRMATORY DRUG TESTING" on page 4 of these Opioid Protocols.

TESTING FACILITIES – LABS

Physician Office Labs (POLs) must meet all of the same standards as those that third-party labs must meet.

Some offices, however, are not equipped to perform routine POC urine drug testing.

Offices not equipped to perform such testing themselves may send their patients to outside testing labs, which can typically be found at:

- outpatient facilities
- hospitals

URINE DRUG TESTING (UDT)

Urine Drug Testing (UDT) is an important component of proper medical monitoring for patients on chronic controlled substances, along with:

- review of data in Connecticut's Prescription Drug Monitoring Program (CT PDMP)
- pill counts
- narcotic / opioid agreements

UDT provides objective information that can help identify the presence or absence of drugs or drug classes in the body, assisting clinicians in making appropriate treatment decisions for patients requiring chronic controlled substances as part of their medical care.

Baseline UDT (typically POC testing) should be performed – and documented in the medical record:

- when the clinician decides that medications are to be prescribed to a workers' compensation patient with chronic pain, on a long-term basis, for the management of that patient's pain symptoms

  or
- when a patient enters into a new practice with a change of providers

Thereafter, UDT should be used for monitoring patients according to the guidelines listed in "FREQUENCY OF TESTING" on page 2 of these Opioid Protocols:

- periodically and randomly

  or
- non-randomly, when indicated for other medical reasons

Urine drug tests that are abnormal may be sent for confirmation (Quantitative analysis) to an outside laboratory, for either:

- not showing the appropriate medications that the patient is supposed to be taking

  or
- showing medications that the patient is not supposed to be taking

UDT – BILLING AND PAYMENT

The reimbursement for this service is set within the Official Connecticut Practitioner Fee Schedule.

No pass-through / indirect billing will be allowed for UDT confirmation or quantitative testing.

Each physician's office location that performs point-of-care drug screen testing is required to have the necessary CLIA certification.

In-office immunoassay testing is only considered to be a qualitative test (by all standards) and is not considered to be a quantitative test.

CONFIRMATORY DRUG TESTING

ABNORMAL URINE DRUG TESTS

Frequency for UDT testing should be stratified by individual patient risk profile. Risk assessment for drug abuse and addiction should be used to determine appropriate frequency for UDT. All patients should be tested with the initiation of controlled substance treatment (i.e., with the first practice visit) and then:

- low risk ..... 2x / 12 months
- moderate risk . 1-2x / 6 months
- high risk..... 1-3x / 3 months

Risk should be stratified by ORT or SOAPP and Morphine MEQ / day:

- low risk ..... < 50 mg. MEQ, ORT = 0-3
- moderate risk . 50-90 mg. MEQ, ORT = 4-7
- high risk..... > 90 MEQ, ORT ≥ 8

[NOTE: the highest level in any category defines level of risk.]

Documentation should also include an action plan designed to address any abnormal UDT results – such plan may include:

- confirmatory drug testing
  - abnormal UDTs may be sent to an outside laboratory for confirmatory testing (quantitative analysis)
- more frequent UDT
- more frequent visits for monitoring
- discontinuation of medications
- change to non-addictive medications
- prescriptions for shorter periods of time:
  - only 1-2 weeks of medications
- additional testing, such as:
  - pill counts
  - frequent checks of Connecticut's Prescription Drug Monitoring Program (CT PDMP)

CONFIRMATORY DRUG TESTING

UDTs should be sent for confirmation for all new patients (first-time visit) and:

- when there are inconsistencies in UDT with prescribed medications
- to confirm that the patient is taking all the medications on their list
- to check for illicit medications (all patients with moderate
- or high risk
  should be periodically tested for illicit medications)
- when a prescribed medication is not included in standard POC testing (documentation of the specific reason for confirming specific medications for each patient should be contained within the medical record)

Therefore, confirmatory UDT is reasonable and necessary to definitively:

- rule out error as causing an unexpected presumptive UDT result
- identify a negative – or confirm a positive – presumptive UDT screen inconsistent with a patient's:
  - self-report
  - medical history
  - presentation of symptoms
  - current prescribed pain medication plan
- identify specific substances / metabolites inadequately detected by a presumptive UDT screen
- identify specific substances / metabolites undetected by a presumptive UDT screen:
  - fentanyl
  - meperidine
  - tramadol
  - synthetic cannabinoids
  - other synthetic / analog drugs
- identify specific drugs within drug classes in a large family of drugs
- identify non-prescribed medication – or illicit use – for ongoing safe prescribing of CONTROLLED substances

When confirmatory testing is requested, the clinician must document the rationale supporting the definitive UDT, and all tests ordered must be documented in the patient's medical record as well.

Confirmatory testing is only required – and should be performed – when:

- the validity of the POC in-office test is in question
- the results of the POC in-office test need to be confirmed
- a prescribed medication is not included in standard POC testing
- POC testing results are unexpected:
  - a drug not supposed to be in the patient's system is discovered
  - an expected drug appears to be absent
- there are suspicions the patient may be using medications not tested within the normal office UDT process – including when:
  - specific drugs of abuse are expected, but are not routinely included in POC testing
    - e.g., buprenorphine, heroin, MDMA, etc.
  - not finding an expected medication, yet the patient claims to have taken it properly and recently
    - i.e., they didn't run out early
  - discovering an unexpected medication on POC testing, which the patient admits to taking:
    - confirmatory testing of that particular medication is not indicated
    - confirmatory testing of other medications may still be indicated

POC UDT should not automatically and routinely be sent for outside confirmation of large panels of multiple medications – when possible, confirmatory tests ordered should be targeted only to medications:

- suspected of being abnormal in POC testing
- shown to be abnormal in POC testing

  or
- suspected of being drugs of abuse

QUANTITATIVE ANALYSIS AND SEMI-QUANTITATIVE TESTING

The Standard for confirmation of an aberrant point-of-care UDT is a Quantitative Test, which combines

- chromatographic purification methods

  and
- mass spectrometric analysis

The combination of these tests can help identify and quantify each specific drug and / or its metabolite.

Quantitative testing is relative, affected by many factors, and should not be used to guide dosage of medication.

Semi-Quantitative Testing – using a benchtop analyzer – provides a numeric value in response to drug concentration in the urine sample.

Since an immunoassay and an enzyme assay are by definition moderately complex tests that produce qualitative and semi-quantitative results, they may not be reported with a quantitative code.

DRUG TESTING OF HIGHER-RISK PATIENTS

PATIENT RISK ASSESSMENT

Before including controlled substances in patients' pain management treatment plans, clinicians should assess them for potential risks to which they may be susceptible.

Patient risk assessment is performed by:

- taking the patient's full medical and personal history, including:
  - a full accounting of any previously-prescribed medications
  - a history of substance abuse
  - a history of substance misuse
- administering a risk assessment interview or questionnaire:
  - Opioid Risk Tool (ORT)
  - Screener and Opioid Assessment for Patients with Pain (SOAPP)

    or
  - other form of written test
- reviewing any existing documentation containing evidence of any type of aberrant behavior known to indicate a potentially increased risk to the patient (if chronic opioid management is utilized as part of that patient's treatment plan)
- classifying the patient according to the Risk Group Stratification chart at the right

Each patient's risk assessment must be documented in his or her medical record.

FREQUENCY OF TESTING

Moderate and high-risk patients require more frequent monitoring and additional oversight to ensure compliance with their medication management.

Moderate and high-risk groups should receive more frequent UDT than low-risk patients:

- at least every 3-4 months

  instead of
- 2x / year

In high-risk patients, additional testing may be periodically indicated, if the clinician has a high suspicion and can document the need for more extensive confirmatory testing (including drugs that may not be tested on a basic POC screen).

Psychiatric co-morbidity may increase risk stratification and be an indication for more frequent testing (and lower-dose therapy).

More frequent testing may be indicated following abnormal test results in high-risk patients.

RISK GROUP STRATIFICATION

Risk Group Stratification can be categorized according to 3 different criteria:

- Opioid Risk Tool (ORT) / SOAPP / other form of written test
- Morphine Equivalent Dosage (MEQ or MED)

  and / or
- prior aberrant behavior

While increased practitioner vigilance is appropriate, not all patients in these categories – based on ORT / SOAPP or MEQ / MED – will ultimately go on to demonstrate aberrant behavior.

RISK GROUP	ORT Score / SOAPP Score	MEQ / MED *	ABERRANT BEHAVIOR
Low	0 – 3 / < 7	< 50	No
Moderate	4 – 7 / ≥ 7	50 – 90	No
High	≥ 8 / ≥ 7	> 90	Yes Suspicious behaviors, including: – self-escalation of dose – doctor-shopping, with documentation on Connecticut's Prescription Drug Monitoring Program (CT PDMP) – indications / symptoms of illegal drug use – evidence of diversion – other documented misuse or abuse or – a notable change in affect or behavior pattern

* MEQ / MED = daily dosage for patient (in morphine equivalents)

MEDICAL PROTOCOLS: CERVICAL SPINE – PAGE 1 of 9

STATE OF CONNECTICUT WORKERS' COMPENSATION COMMISSION
REVISED JULY 1, 2012 – UPDATED JULY 1, 2013; NOVEMBER 1, 2015

NECK PAIN HISTORY AND PHYSICAL EXAMINATION

HISTORY OF PRESENT ILLNESS

Description of Injury:

- details of events before, during, and immediately after the alleged injury
- mechanism of injury
- identification of body parts involved
- location of the pain, characteristics of the pain, and distribution of the pain symptoms
- frequency and duration of symptoms
- alleviating / exacerbating factors

Any limitations in functional activities should be noted.

The history should include the presence and distribution of any upper extremity numbness, paresthesias, or weakness and a description as to whether or not it is precipitated or worsened by coughing or sneezing.

Any changes in gait, bowel, bladder or sexual function should be identified as they may indicate a more severe spinal injury. The presence of a serious or progressive neurological deficit demands immediate attention and appropriate triage.

The possibility of neck pain from other non-traumatic sources should be investigated by asking questions about fever, rash, swelling, unexplained weight loss, morning stiffness etc.

A visual analog pain scale should be used and monitored at each visit. The patient should be asked their current rating, average over the last week and range from low to high.

Note any history of emotional and/or psychological response to the current injury.

MEDICATIONS

History should include:

- previous medications taken for this neck injury
- a list of all current mediations, including dose and frequency
- any significant side effects from previous medications

ALLERGIES

Medication allergies should be verified at every visit.

PAST MEDICAL / SURGICAL HISTORY

Identify any previous occupational and non-occupational injuries to the same area.

Determine if the patient has any history of non-traumatic neck problems such as arthritis, cancer, surgery, etc.

Document any prior neck treatment, chronic or recurrent symptoms, response to previous treatment, and any functional limitations or previous restrictions in work capacity.

Demographic screening to identify:

- any previous psychological diagnosis/treatment including psychiatric hospitalization, outpatient psychotherapy/counseling, or psychopharmacological treatment (e.g antidepressants, anxiolytics, etc.)
- diagnosis and/or treatment of any drug or alcohol abuse or dependence (e.g. life interference such as relationships, work, DWI, detoxifications, inpatient/outpatient rehabilitation or 12-step participation)
- prior treatment for work-related pain
- prior workers' compensation claim with pain-related lost time

SOCIAL HISTORY

Identify:

- smoking
- alcohol use
- other drug use
- vocational activities
- recreational activities

REVIEW OF SYSTEMS

Identify systemic disease symptoms:

- cardiac
- endocrine
- gastrointestinal
- hematological
- infectious
- neurologic
- neoplastic
- renal
- rheumatologic
- other

PHYSICAL EXAMINATION

Physical examination:

- vital signs
- weight
- general appearance, including posture
- any pain behaviors

Signs of symptom amplification should be noted.

Visual inspection of neck

Palpation of cervical spine including:

- midline
- trapezius
- paraspinal and posterior elements
- shoulders

Make a note of:

- range of motion
- quality of motion
- exacerbating or alleviating motions of neck and shoulders
- presence of muscle spasm
- nerve tension compression
- deep tendon reflexes
- any pathological reflexes

Sensory and motor examination of the upper and lower extremities with specific description of abnormalities

Assessment of transfers and gait

In cases where the mechanism of injury, history, or clinical presentation suggests a possible severe injury, additional evaluation is indicated.

A detailed neurological examination for possible spinal cord injury should include:

- sharp and light touch, deep pressure, temperature, and proprioceptive sensory function
- anal sphincter tone and / or perianal sensation

STATE OF CONNECTICUT WORKERS' COMPENSATION COMMISSION
REVISED JULY 1, 2012 – UPDATED JULY 1, 2013; NOVEMBER 1, 2015

ACUTE AXIAL NECK INJURY (LESS THAN 4 WEEKS)

DIAGNOSTIC CRITERIA

On initial visit:

- complete history
- physical examination
- pain diagram

Height and weight (BMI)

On each visit document:

- primary diagnosis
- precise location and character of pain
- VAS pain level
- exam pertinent to injured body part
- functional capacity
- appraisal of ADLs and functional activity

Work capacity and status

DIAGNOSTIC STUDIES

Recommended:

- no X-Rays, unless indicated by amount of trauma or based on documented medical suspicion
- MRI or CT myelogram for progressive neurological deficit

TREATMENT

Recommended:

- Chiropractic or Physical Therapy:
  - encourage increased activity ASAP
  - education
  - active treatment strengthening and aerobic, as tolerated
  - passive modalities up to 2 weeks (hot pack / cold pack, ultrasound, electrical stimulation)
- Up to 12 visits
  - document functional and VAS improvement to continue after 8 visits

Medications:

- NSAIDs
- acetaminophen
- muscle relaxants
- opioid – see Opioid Protocol

Injections:

- see IPM Protocol

Follow-up:

- 1 week, if work modified
- 4 weeks, if no work modification

Not recommended:

- bed rest

GOALS OF TREATMENT

Recommend RTW:

- sedentary..... 0-3 days
- light-med..... 7-17 days
- heavy ..... 14-35 days

Contingent on assessment of functional capacity

IF GOALS NOT MET

Document:

- compliance
- no shows / cancellations
- effort: clinic
- effort: home

Consider oral steroids for severe pain.

STATE OF CONNECTICUT WORKERS' COMPENSATION COMMISSION
REVISED JULY 1, 2012 – UPDATED JULY 1, 2013; NOVEMBER 1, 2015

SUBACUTE AXIAL NECK INJURY (1-3 MONTHS)

DIAGNOSTIC CRITERIA

On initial visit:

- complete history
- physical examination
- pain diagram

Height and weight (BMI)

On each visit document:

- primary diagnosis
- precise location and character of pain
- VAS pain level
- current meds
- exam pertinent to injured body part
- functional capacity
- appraisal of ADLs and functional activity

Work capacity and status

Appraise compliance

Consider specialty referral, if not improving

DIAGNOSTIC STUDIES

Recommended:

- X-Ray, especially if previous injury or surgery
- MRI after 6 weeks, if clinically indicated

Not Recommended:

- CT Scan
- Discogram

TREATMENT

Chiropractic or Physical Therapy:

- no isolated passive modalities (hot pack / cold pack, ultrasound, electrical stimulation)
- exercise
- strengthening
- core
- aerobic
- assess and document progress
- up to 12 additional visits based on measured improvement in VAS, function and work capacity

Assess BMI and smoking and counsel appropriately

Medications:

- NSAIDs
- acetaminophen
- opioid – see opioid protocol
- antidepressants
- muscle relaxants

Injections:

- see IPM Protocol

Limited Indication:

- anticonvulsants

GOALS OF TREATMENT

Recommend RTW:

- sedentary..... 0-3 days
- light-med..... 7-17 days
- heavy ..... 14-35 days

Contingent on assessment of functional capacity

IF GOALS NOT MET

Consider alternative cause

Consider psychological factors

- see Psychological Guideline

Administer standard psych assessment tool such as ODI

STATE OF CONNECTICUT WORKERS' COMPENSATION COMMISSION
REVISED JULY 1, 2012 – UPDATED JULY 1, 2013; NOVEMBER 1, 2015

CHRONIC AXIAL NECK INJURY (GREATER THAN 3 MONTHS)

DIAGNOSTIC CRITERIA

On initial visit:

- complete history
- physical exam
- pain diagram

Height and weight (BMI)

On each visit document:

- primary diagnosis
- precise location and character of pain
- VAS pain level
- current meds
- exam pertinent to injured body part
- functional capacity
- appraisal of ADLs and functional activity

Work capacity and status

Appraise compliance

Consider specialty referral, if not improving

DIAGNOSTIC STUDIES

Recommended:

- X-Rays
- consider F&E X-Rays

MRI, if not already done

Consider CT Scan to evaluate bony anatomy

Consider SPECT Scan to evaluate for pseudoarthrosis from previous surgery or alternative causes of neck pain

TREATMENT

Recommended:

- Chiropractic or Physical Therapy
- no passive modalities, unless acute flare-up (hot pack / cold pack, ultrasound, electrical stimulation)
- exercise, strengthening, core, aerobic
  - assess and document measured improvement in VAS, functional and work capacity to continue treatment
- TENS (not isolated Rx), only if compliant with other modalities and not improving
- assess BMI and smoking and counsel appropriately
- weight reduction for BMI > 30

Medications:

- NSAIDs
- acetaminophen
- opioid – see Opioid Protocol
- antidepressants
- muscle relaxants

Injections:

- see IPM Guideline

Not Recommended:

- bed rest
- anticonvulsants

GOALS OF TREATMENT

Recommend RTW:

- sedentary..... 0-3 days
- light-med..... 7-17 days
- heavy ..... 14-35 days

Contingent on assessment of functional capacity

IF GOALS NOT MET

Consider alternative cause

Consider psychological factors

- see Psychological Guideline

Administer standard psych assessment tool such as ODI

Consider time limited behavioral cognitive therapy

Functional capacity evaluation / vocational rehab

Change of job

Surgery may be considered for appropriate cases

- see Surgery page

STATE OF CONNECTICUT WORKERS' COMPENSATION COMMISSION
REVISED JULY 1, 2012 – UPDATED JULY 1, 2013; NOVEMBER 1, 2015

ACUTE CERVICAL RADICULOPATHY (LESS THAN 4 WEEKS)

DIAGNOSTIC CRITERIA

On initial visit:

- complete history
- physical exam
- pain diagram

Height and weight (BMI)

On each visit document:

- primary diagnosis
- precise location and character of pain
- accurate description of weakness, sensory and reflex abnormalities
- root tension signs
- VAS pain level and / or leg on each visit
- functional capacity
- appraisal of ADLs and functional activity

Work capacity and status

DIAGNOSTIC STUDIES

Recommended:

- no X-Rays
  (unless indicated by amount of trauma or based on documented medical suspicion)
- MRI or CT myelogram for progressive neurological deficit

Not Recommended:

- CT Scan
  (unless indicated by degree of trauma)
- Discogram

TREATMENT

Recommended:

- Chiropractic or Physical Therapy:
  - encourage increased activity ASAP
  - education
  - active treatment strengthening and aerobic, as tolerated
  - passive modalities up to 2 weeks (hot pack / cold pack, ultrasound, electrical stimulation)
  - traction
- Up to 12 visits
  - document functional and VAS improvement to continue after 8 visits

Medications:

- NSAIDs
- steroids, if severe
- muscle relaxants – 2 weeks
- opioid – see Opioid Protocol
- anticonvulsants
- antidepressants
- acetaminophen

Injections:

- see Injection Guideline

Follow-up:

- within 2 weeks

Not Recommended:

- bed rest

GOALS OF TREATMENT

Recommend RTW:

- sedentary..... 0-3 days
- light-med..... 7-17 days
- heavy ..... 14-35 days

Contingent on assessment of functional capacity

IF GOALS NOT MET

Document:

- compliance
- no shows / cancellations
- effort: clinic
- effort: home

STATE OF CONNECTICUT WORKERS' COMPENSATION COMMISSION
REVISED JULY 1, 2012 – UPDATED JULY 1, 2013; NOVEMBER 1, 2015

SUBACUTE CERVICAL RADICULOPATHY (1-3 MONTHS)

DIAGNOSTIC CRITERIA

On initial visit:

- complete history
- physical exam
- pain diagram

Height and weight (BMI)

On each visit document:

- primary diagnosis
- precise location and character of pain
- accurate description of weakness, sensory and reflex abnormalities
- root tension signs
- VAS Pain level and / or leg on each visit
- functional capacity
- appraisal of ADLs and functional activity

Current meds

Work capacity and status

Appraise compliance

Consider specialty referral, if not improving

DIAGNOSTIC STUDIES

Recommended:

- X-Ray
  (especially if previous injury or surgery)
- MRI
- consider CT Scan to evaluate bony anatomy for foraminal stenosis
- EMG (needle) with neurological signs and symptoms and equivocal MRI or CT findings

Not Recommended:

- Discogram

TREATMENT

Recommended:

- Chiropractic or Physical Therapy:
  - no isolated passive modalities (hot pack / cold pack, ultrasound, electrical stimulation)
  - exercise, strengthening, core, aerobic (assess and document progress)
  - additional visits based on measured improvement in VAS, functional and work capacity
  - assess BMI and smoking and counsel appropriately

Medications:

- NSAIDS
- antidepressants
- anticonvulsants
- acetaminophen
- opioid – see Opioid Protocol

Injections:

- see IPM Guideline

Follow-up:

- within 3 weeks

Not Recommended:

- bed rest

GOALS OF TREATMENT

Recommend RTW:

- sedentary..... 0-3 days
- light-med..... 7-17 days
- heavy ..... 14-35 days

Contingent on assessment of functional capacity

IF GOALS NOT MET

Document compliance

Consider psychological factors

- see Psychological Guideline

Administer standard psych assessment tool (such as ODI)

Consider surgery for compressive radiculopathy

STATE OF CONNECTICUT WORKERS' COMPENSATION COMMISSION
REVISED JULY 1, 2012 – UPDATED JULY 1, 2013; NOVEMBER 1, 2015

CHRONIC CERVICAL RADICULOPATHY (GREATER THAN 3 MONTHS)

DIAGNOSTIC CRITERIA

On initial visit:

- complete history
- physical exam
- pain diagram

Height and weight (BMI)

On each visit document:

- primary diagnosis
- precise location and character of pain
- accurate description of weakness, sensory and reflex abnormalities
- root tension signs
- VAS pain level and / or leg on each visit
- functional capacity
- appraisal of ADLs and functional activity

Current meds

Work capacity and status

Appraise compliance

Consider specialty referral, if not improving

DIAGNOSTIC STUDIES

Recommended:

- X-Ray
  (especially if previous injury or surgery)
- MRI

Consider CT Scan to evaluate bony anatomy for foraminal stenosis

EMG (needle) with neurological signs and symptoms and equivocal MRI or CT findings

TREATMENT

Recommended:

- Chiropractic or Physical Therapy:
  - no passive modalities, unless acute flare-up (hot pack / cold pack, ultrasound, electrical stimulation)
  - exercise, strengthening, core, aerobic (assess and document progress)
  - assess BMI and smoking and counsel appropriately
  - weight reduction for BMI > 30

Medications:

- NSAIDs
- antidepressants
- anticonvulsants
- acetaminophen
- opioid – see Opioid Protocol

Injections:

- see IPM Guideline

Surgery:

- if documented compression

Not Recommended:

- bed rest

GOALS OF TREATMENT

Recommend RTW:

- sedentary..... 0-3 days
- light-med..... 7-17 days
- heavy ..... 14-35 days

Contingent on assessment of functional capacity

IF GOALS NOT MET

EMG to document neurological status

Consider psychological factors

- see Psychological Guideline

Administer standard psych assessment tool (such as ODI)

Consider time-limited behavioral cognitive therapy

Functional capacity evaluation / vocational rehab

Functional restoration program

Spinal cord stimulation:

- neurological pain > 6 months
- adequate psychological evaluation prior to SCS trial
- see psychological guideline

STATE OF CONNECTICUT WORKERS' COMPENSATION COMMISSION
REVISED JULY 1, 2012 – UPDATED JULY 1, 2013; NOVEMBER 1, 2015

ROOT DECOMPRESSION (NECK)

DIAGNOSIS

- radiculopathy due to compression
  – symptoms in the distribution of a nerve root caused by compression of a herniated disc or altered bony anatomy

INDICATIONS

- failure to improve with appropriate chiropractic or physical treatment, including traction, documented compliance
- time: 4-6 weeks minimum, unless progressive neurological deficit
- medications: steroids, NSAIDs

RADIOGRAPHIC INDICATIONS

- lateral disc herniation
- lateral recess stenosis

SURGERY

- administer standard tool, ODI before and after surgery to document outcome
- hemilaminectomy with or without discectomy
- laminectomy for stenosis with myelopathy, normal cervical lordosis

POST-OPERATIVE RECOVERY

- Chiropractic or PT rehabilitation for strength and aerobic capacity
- return to work:
  – temporary total disability up to 4 weeks
  – return to light or modified duty 4-8 weeks
  – return to full duty after 8 weeks

MMI

- 6 months
- impairment based on objective standard (per CT WC Statute)

FUSION (NECK)

DIAGNOSIS

- severe degeneration with foraminal stenosis
- recurrent disc herniation
- instability (<3.5mm or 11 degrees)
- myelopathy
- pseudoarthrosis from previous fusion

INDICATIONS

- failure to improve with at least 3 months of conservative care, including traction, documented compliance
- no long-acting opioids
- no smoking — smoking is an absolute contraindication for fusion
- warning: signs of symptom amplification, narcotics, long time out of work, failed psychological screening

RADIOGRAPHIC INDICATIONS

- X-Rays (including obliques to assess foraminal stenosis)
- flexion extension views for instability
- MRI to assess adjacent levels
- CT or SPECT to assess pseudoarthrosis
- Discography for appropriate clinical indications

SURGERY

- administer standard tool, ODI before and after surgery to document outcome
- consider psychological screening prior to fusion surgery
- one or two levels only
- autograft or allograft with internal fixation

POST-OPERATIVE RECOVERY

- Chiropractic or PT rehabilitation for strength and aerobic capacity
- return to work:
  – temporary total disability up to 4 weeks
  – return to full duty after 8 weeks

MMI

- 12 months
- impairment based on objective standard (per CT WC Statute)

STATE OF CONNECTICUT WORKERS' COMPENSATION COMMISSION
REVISED JULY 1, 2012 – UPDATED JULY 1, 2013; NOVEMBER 1, 2015

INTERVENTIONAL PAIN MANAGEMENT: BASIC GUIDELINES FOR AXIAL NECK PAIN

- Medical necessity for all injections must be documented with a clear description of the diagnosis and rationale for the injection.
- Injured workers should be re-evaluated @ 2 weeks following any intervention to assess change in pain level, change in function (and hence work status), and to determine next steps in the treatment course if medically indicated. IPM treatments ('blocks') are generally not a treatment performed in isolation; it is important to look at the underlying cause and include functional based exercise programs along with injections.
- Frequently cervical injuries are simply myofascial strains that can be relieved with PT and stretching. Trigger point injections may be used to facilitate and speed the recovery process if the injured worker is not progressing with conservative management alone or if it is felt that early intervention will speed return to normal work activities.
- All spinal injections must be performed with radiologic guidance, typically fluoroscopy is utilized. CT guided pain management injections should only be performed for specific indications and medical necessity must be documented. Ultrasound is a form of radiologic guidance being used for many different pain injections but cannot be recommended for spinal injections at this time.
- All spinal injections should be accompanied with a report of both the diagnostic and therapeutic response. An injection that does not provide relief still provides diagnostic information as to what is not the cause of the pain. A lack of response to a particular intervention still provides useful information and that should be duly noted in the records. This will prevent further unnecessary injections for pain generating structures that have been found to not be the cause of pain.
- For injured workers who fail to respond to treatment, alternative diagnoses should be considered. If the worker fails to respond to treatment that appears to be appropriate for the condition, evaluation of other barriers to improvement such as psychological issues should be considered.
- Cervical facet blocks are indicated for the diagnosis and treatment of neck pain with or without pseudoradicular symptoms for pain that is suspected of arising from the facet joints. A history and physical examination should document the clinician's rationale for this suspected diagnosis. Definitive diagnosis requires documenting the patient's response to a diagnostic injection.
- Therapeutic facet blocks will only be considered as proper management when they provide at least 70% relief of the cervical symptoms and at least 3 months of pain relief and will be limited to a maximum of 3 sets of therapeutic facet injections/year. All facet injections should include steroid (unless otherwise contraindicated) in hopes of providing long term therapeutic effect and to improve the diagnostic specificity of these injections. Patients obtaining only short term relief (less than 3 months) should be considered for more long lasting solutions, such as RF ablation. Some patients can be managed with intermittent therapeutic facet injections.
- Repeat therapeutic injections/procedures are only indicated for those individuals who document sustained improvement in both pain and function, including improved ADL's and functional capacities for at least three months.
- In addition, if the patient has significant bilateral pain, bilateral injections should be performed with the diagnostic injection so the clinician can better and more fully assess the etiology of the pain. Residual pain from joints that are not treated will confuse the diagnostic information that is obtained from a diagnostic block.
- Radiofrequency ablation (Facet rhizotomy) may be considered for patients who achieve short-term relief with at least 70% reduction of target symptoms along with improved function and ROM with a diagnostic injection (Note-facet blocks are not expected to result in improvement of radicular symptoms). Radiofrequency ablation requires that the patient has had a facet medial branch mapping procedure; intra-articular injections are not diagnostic for determining the need for RF. Rhizotomy cannot be performed more frequently than once every 6 months.
- If there is a question about the etiology of recurrent pain, re-evaluation and repeat diagnostic workup should be considered prior to repeat injections.
- Epidural steroid injections may be indicated for axial neck pain that is felt to be radicular or discogenic in origin and for which there is a specific possible spinal cause. A diagnosis of discogenic pain is often a diagnosis of exclusion and other causes of neck pain should be evaluated before considering ESI's for treatment of axial pain. Epidural steroid injections may not be performed without an MRI documenting the specific location and extent of spinal pathology, for both safety and accuracy reasons. The routine performance of three epidural steroid injections is not appropriate and results in unnecessary treatment. After each injection, the response should be documented both for pain and functional improvement; if a repeat injection is required medical necessity should be documented even if a series of injections has been approved.
- Pain can arise out of multiple structures and therefore can be multifactorial in origin, nevertheless it is not expected that every single injured worker with a cervical injury will require every single different type of injection, and in fact such practice is not recommended and is strongly discouraged.

INTERVENTIONAL PAIN MANAGEMENT: THERAPIES FOR CERVICAL RADICULOPATHY

- Epidural Steroid Injections (ESI) are indicated for the treatment of a radiculopathy/ radiculitis with symptoms of pain in a radicular distribution, which can be associated with numbness, tingling, and/or weakness in that nerve root distribution. A lack of response should lead the clinician to reconsider the diagnosis or look for alternative treatment options. Medical necessity for all injections must be documented with a clear description of the symptoms, physical findings, diagnosis and rationale for the injection.
- Injured workers should be re-evaluated @ 2 weeks following any intervention to assess change in pain level, change in function (and hence work status), and to determine next steps in the treatment course if medically indicated. IPM treatments ('blocks') are generally not a treatment performed in isolation; it is important to look at the underlying cause and include functional based exercise programs along with injections.
- All spinal injections should be accompanied with a report of both the diagnostic and therapeutic response. An injection that does not provide relief still provides diagnostic information as to what is not the cause of the pain. This will prevent further unnecessary injections for structures that have been found not to be the cause of pain.
- Earlier intervention with an ESI may help to speed recovery and promote progress in PT and therefore should be considered in the management of an acute radiculopathy that is not responding to conservative management.
- Epidural steroid injections may not be performed without an MRI documenting the specific location and extent of spinal pathology and should be correlated with neurologic findings.
- Delivery of medication to the location of nerve irritation is the key to success. Injections require radiologic guidance for accuracy and safety. All spinal injections must be performed with radiologic guidance, typically fluoroscopy. CT guided pain management injections should only be performed for specific indications and medical necessity must be documented. Ultrasound is not recommended for spinal injections at this time.
- There are several different approaches to the epidural space but delivery of medication as close as possible to the target location is helpful to optimize outcomes. The choice between interlaminar, transforaminal, and catheter guided approaches will be left to the clinician but the risks and benefits of the various approaches should be carefully considered when deciding technique.
- The routine performance of three epidural steroid injections is not appropriate and results in unnecessary treatment. After each injection, the response should be documented both for pain and functional improvement; if a repeat injection is required medical necessity must be documented.
- Injured Workers who do not respond with sustained benefit should be considered for definitive decompression of the involved nerve root(s).

MEDICAL PROTOCOLS: LUMBAR SPINE – PAGE 1 of 9

LOW BACK PAIN HISTORY AND PHYSICAL EXAMINATION

HISTORY OF PRESENT ILLNESS

Description of Injury:

- details of events before, during, and immediately after the alleged injury
- mechanism of injury
- identification of body parts involved
- location of the pain, characteristics of the pain, and distribution of the pain symptoms
- frequency and duration of symptoms
- alleviating / exacerbating factors

Any limitations in functional activities should be noted.

The history should include the presence and distribution of any lower extremity numbness, paresthesias, or weakness and a description as to whether or not it is precipitated or worsened by coughing or sneezing.

Any changes in bowel, bladder, or sexual function should be identified, as they may indicate a more severe spinal injury. The presence of a serious or progressive neurological deficit demands immediate attention and appropriate triage.

The possibility of low back pain from other non-traumatic sources should be investigated by asking questions about fever, rash, swelling, unexplained weight loss, morning stiffness, etc.

A visual analog pain scale should be used and monitored at each visit. The patient should be asked their current rating, average over the last week and range from low to high.

Note any history of emotional and/or psychological response to the current injury.

MEDICATIONS

History should include:

- previous medications taken for this back injury
- a list of all current mediations, including dose and frequency
- any significant side effects from previous medications

ALLERGIES

Medication allergies should be verified at every visit.

PAST MEDICAL / SURGICAL HISTORY

Identify any previous occupational and non-occupational injuries to the same area.

Determine if the patient has any history of non-traumatic back problems such as arthritis, cancer, surgery, etc.

Document any prior back treatment, chronic or recurrent symptoms, response to previous treatment, and any functional limitations or previous restrictions in work capacity.

Demographic screening to identify:

- any previous psychological diagnosis/treatment including psychiatric hospitalization, outpatient psychotherapy/counseling, or psychopharmacological treatment (e.g antidepressants, anxiolytics, etc.)
- diagnosis and/or treatment of any drug or alcohol abuse or dependence (e.g. life interference such as relationships, work, DWI, detoxifications, inpatient/outpatient rehabilitation or 12-step participation)
- prior treatment for work-related pain
- prior workers' compensation claim with pain-related lost time

SOCIAL HISTORY

Identify:

- smoking
- alcohol use
- other drug use
- vocational activities
- recreational activities

REVIEW OF SYSTEMS

Identify systemic disease symptoms:

- cardiac
- endocrine
- gastrointestinal
- hematological
- infectious
- neurologic
- neoplastic
- renal
- rheumatologic
- other

PHYSICAL EXAMINATION

Physical examination:

- vital signs
- height
- weight
- general appearance, including posture
- any pain behaviors

Signs of symptom amplification should be noted.

Visual inspection of back

Palpation of lumbar spine including:

- midline
- sacroiliac regions
- gluteal regions
- paraspinal and posterior elements
- hips

Make a note of:

- range of motion
- quality of motion
- presence of muscle spasm
- exacerbating or alleviating motions
- deep tendon reflexes
- nerve tension testing, both single leg and crossed leg

Sacroiliac and piriformis testing should be considered.

Sensory and motor examination of the lower extremities with specific description of abnormalities.

Assessment of transfers and gait

In cases where the mechanism of injury, history, or clinical presentation suggests a possible severe injury, additional evaluation is indicated.

A detailed neurological examination for possible spinal cord injury should include:

- sharp and light touch, deep pressure, temperature, and proprioceptive sensory function
- anal sphincter tone and / or perianal sensation

ACUTE AXIAL BACK INJURY (LESS THAN 4 WEEKS)

DIAGNOSTIC CRITERIA

On initial visit:

- complete history
- physical examination
- pain diagram

Height and weight (BMI)

On each visit document:

- primary diagnosis
- precise location and character of pain
- VAS pain level
- exam pertinent to injured body part
- functional capacity
- appraisal of ADLs and functional activity

Work capacity and status

DIAGNOSTIC STUDIES

Recommended:

- no X-Rays
  (unless indicated by amount of trauma or based on documented medical suspicion)
- MRI or CT myelogram for progressive neurological deficit

TREATMENT

Recommended:

- Chiropractic or Physical Therapy:
  - encourage increased activity ASAP
  - education
  - active treatment strengthening and aerobic, as tolerated
  - passive modalities up to 2 weeks (hot pack / cold pack, ultrasound, electrical stimulation)
- Up to 12 visits
  - document functional and VAS improvement to continue after 8 visits

Medications:

- NSAIDs
- acetaminophen
- muscle relaxants
- opioid – see Opioid Protocol

Injections:

- see IPM Protocol

Follow-up:

- 1 week, if work modified
- 4 weeks, if no work modification

Not recommended:

- bed rest

GOALS OF TREATMENT

Recommend RTW:

- sedentary..... 0-3 days
- light-med..... 7-17 days
- heavy ..... 14-35 days

Contingent on assessment of functional capacity

IF GOALS NOT MET

Document:

- compliance
- no shows / cancellations
- effort: clinic
- effort: home

Consider oral steroids for severe pain

SUBACUTE AXIAL BACK INJURY (1-3 MONTHS)

DIAGNOSTIC CRITERIA

On initial visit:

- complete history
- physical examination
- pain diagram

Height and weight (BMI)

On each visit document:

- primary diagnosis
- precise location and character of pain
- VAS pain level
- current meds
- exam pertinent to injured body part
- functional capacity
- appraisal of ADLs and functional activity

Work capacity and status

Appraise compliance

Consider specialty referral, if not improving

DIAGNOSTIC STUDIES

Recommended:

- X-Ray, especially if previous injury or surgery
- MRI after 6 weeks, if clinically indicated

Not Recommended:

- CT Scan
- Discogram

TREATMENT

Recommended

- Chiropractic or Physical Therapy:
  - no isolated passive modalities (hot pack / cold pack, ultrasound, electrical stimulation)
  - exercise
  - strengthening
  - core
  - aerobic
  - assess and document progress
  - up to 12 additional visits based on measured improvement in VAS, function and work capacity

Assess BMI and smoking and counsel appropriately

Medications:

- NSAIDs
- acetaminophen
- opioid – see Opioid Protocol
- antidepressants
- muscle relaxants

Injections:

- see IPM Protocol

Limited Indication:

- anticonvulsants

GOALS OF TREATMENT

Recommend RTW:

- sedentary..... 0-3 days
- light-med..... 7-17 days
- heavy ..... 14-35 days

Contingent on assessment of functional capacity

IF GOALS NOT MET

Consider alternative cause

Consider psychological factors

- see Psychological Guideline

Administer standard psych assessment tool such as ODI

CHRONIC AXIAL BACK INJURY (GREATER THAN 3 MONTHS)

DIAGNOSTIC CRITERIA

On initial visit:

- complete history
- physical exam
- pain diagram

Height and weight (BMI)

On each visit document:

- primary diagnosis
- precise location and character of pain
- VAS pain level
- current Meds
- exam pertinent to injured body part
- functional capacity
- appraisal of ADLs and functional activity

Work capacity and status

Appraise compliance

Consider specialty referral, if not improving

DIAGNOSTIC STUDIES

Recommended:

- X-Rays
  – consider F&E x-rays
- MRI, if not already done
- Consider CT to evaluate bony anatomy (e.g., spondylolithesis)
- Consider SPECT scan to evaluate for pseudoarthrosis from previous surgery alternative causes of back pain

TREATMENT

Recommended:

- Chiropractic or Physical Therapy:
  – no passive modalities, unless acute flare-up (hot pack / cold pack, ultrasound, electrical stimulation)
  – exercise, strengthening, core, aerobic
  – assess and document measured improvement in VAS, functional and work capacity to continue treatment
  – TENS (not isolated Rx), only if compliant with other modalities and not improving
  – assess BMI and smoking and counsel appropriately
  – weight reduction for BMI > 30

Medications:

- NSAIDs
- acetaminophen
- opioid – see Opioid Protocol
- antidepressants

Injections:

- see IPM Guideline

Not Recommended:

- bed rest
- muscle relaxants

GOALS OF TREATMENT

Recommend RTW:

- sedentary..... 0-3 days
- light-med..... 7-17 days
- heavy ..... 14-35 days

Contingent on assessment of functional capacity

IF GOALS NOT MET

Consider alternative cause

Consider psychological factors

- see Psychological Guideline

Administer standard psych assessment tool such as ODI

Consider time limited behavioral cognitive therapy

Functional capacity evaluation / vocational rehab

Change of job

Surgery may be considered for appropriate cases

- see Surgery page

ACUTE LUMBAR RADICULOPATHY (LESS THAN 4 WEEKS)

DIAGNOSTIC CRITERIA

On initial visit:

- complete history
- physical exam
- pain diagram

Height and weight (BMI)

On each visit document:

- primary diagnosis
- precise location and character of pain
- accurate description of weakness, sensory and reflex abnormalities
- root tension signs
- VAS pain level and / or leg on each visit
- functional capacity
- appraisal of ADLs and functional activity

Work capacity and status

DIAGNOSTIC STUDIES

Recommended:

- no X-Rays
  (unless indicated by amount of trauma or based on documented medical suspicion)
- MRI or CT myelogram for progressive neurological deficit

Not Recommended:

- Discogram

TREATMENT

Recommended:

- Chiropractic or Physical Therapy:
  - encourage increased activity ASAP
  - education
  - active treatment strengthening and aerobic, as tolerated
  - passive modalities up to 2 weeks (hot pack / cold pack, ultrasound, electrical stimulation)
  - traction
- Up to 12 visits
  - document functional and VAS improvement to continue after 8 visits

Medications:

- NSAIDs
- acetaminophen
- muscle relaxants – 2 weeks
- opioids – see Opioid Protocol
- anticonvulsants
- antidepressants
- oral steroids

Injections:

- see Injection Guideline

Follow-up:

- 2 weeks

Not Recommended:

- bed rest

GOALS OF TREATMENT

Recommend RTW:

- sedentary..... 0-3 days
- light-med..... 7-17 days
- heavy ..... 14-35 days

Contingent on assessment of functional capacity

IF GOALS NOT MET

Document:

- compliance
- no shows / cancellations
- effort: clinic
- effort: home

Consider oral steroids for severe pain

STATE OF CONNECTICUT WORKERS' COMPENSATION COMMISSION
REVISED JULY 1, 2012 – UPDATED JULY 1, 2013; NOVEMBER 1, 2015

SUBACUTE LUMBAR RADICULOPATHY (1-3 MONTHS)

DIAGNOSTIC CRITERIA

On initial visit:

- complete history
- physical exam
- pain diagram

Height and weight (BMI)

On each visit document:

- primary diagnosis
- precise location and character of pain
- accurate description of weakness, sensory and reflex abnormalities
- root tension signs
- VAS pain level and / or leg on each visit
- functional capacity
- appraisal of ADLs and functional activity

Current meds

Work capacity and status

Appraise compliance

Consider specialty referral, if not improving

DIAGNOSTIC STUDIES

Recommended:

- X-Ray
  (especially if previous injury or surgery)
- MRI
- Consider CT Scan to evaluate bony anatomy for foraminal stenosis
- EMG (needle) with neurological signs and symptoms and equivocal MRI or CT findings

Not Recommended:

- Discogram

TREATMENT

Recommended:

- Chiropractic or Physical Therapy:
  - no isolated passive modalities (hot pack / cold pack, ultrasound, electrical stimulation)
  - exercise, strengthening, core, aerobic (assess and document progress)
  - additional visits based on measured improvement in VAS, functional and work capacity
  - assess BMI and smoking and counsel appropriately

Medications:

- NSAIDS
- acetaminophen
- opioid – see Opioid Protocol
- antidepressants
- anticonvulsants

Injections:

- see IPM Guideline

Follow-up:

- within 3 weeks

Not Recommended:

- bed rest

GOALS OF TREATMENT

Recommend RTW:

- sedentary..... 0-3 days
- light-med..... 7-17 days
- heavy ..... 14-35 days

Contingent on assessment of functional capacity

IF GOALS NOT MET

Document compliance

Consider psychological factors

- see Psychological Guideline

Administer standard psych assessment tool (such as ODI)

Consider surgery for compressive radiculopathy

STATE OF CONNECTICUT WORKERS' COMPENSATION COMMISSION
REVISED JULY 1, 2012 – UPDATED JULY 1, 2013; NOVEMBER 1, 2015

CHRONIC LUMBAR RADICULOPATHY (GREATER THAN 3 MONTHS)

DIAGNOSTIC CRITERIA

On initial visit:

- complete history
- physical exam
- pain diagram

Height and weight (BMI)

On each visit document:

- primary diagnosis
- precise location and character of pain
- accurate description of weakness, sensory and reflex abnormalities
- root tension signs
- VAS pain level and / or leg on each visit
- functional capacity
- appraisal of ADLs and functional activity

Current meds

Work capacity and status

Appraise compliance

Consider specialty referral, if not improving

DIAGNOSTIC STUDIES

Recommended:

- X-Ray
  (especially if previous injury or surgery)
- MRI

Consider CT Scan to evaluate bony anatomy (e.g., spondylolithesis)

EMG (needle) with neurological signs and symptoms and equivocal MRI or CT findings

TREATMENT

Recommended:

- Chiropractic or Physical Therapy:
  - no passive modalities, unless acute flare-up (hot pack / cold pack, ultrasound, electrical stimulation)
  - exercise, strengthening, core, aerobic (assess and document progress)
  - additional visits based on measured Improvement in VAS, functional and work capacity
  - assess BMI and smoking and counsel appropriately
  - weight reduction for BMI > 30

Medications:

- NSAIDS
- acetaminophen
- opioid – see Opioid Protocol
- antidepressants
- anticonvulsants

Injections:

- see IPM Guideline

Surgery:

- if documented compression

Not Recommended:

- bed rest

GOALS OF TREATMENT

Recommend RTW:

- sedentary..... 0-3 days
- light-med..... 7-17 days
- heavy ..... 14-35 days

Contingent on assessment of functional capacity

IF GOALS NOT MET

EMG to document neurological status

Consider psychological factors

- see Psychological Guideline

Administer standard psych assessment tool (such as ODI)

Consider time-limited behavioral cognitive therapy

Functional capacity evaluation / vocational rehab

Functional restoration program

Spinal cord stimulation:

- neurological pain > 6 months
- adequate psychological evaluation prior to SCS trial
- see psychological guideline

ROOT DECOMPRESSION (BACK)

DIAGNOSIS

- radiculopathy due to compression

  – symptoms in the distribution of a nerve root caused by compression of a herniated disc or altered bony anatomy

INDICATIONS

- failure to improve with appropriate chiropractic or physical treatment for aerobic and strength with documented compliance
- time: 4-6 weeks minimum (unless progressive neurological deficit)
- medications: steroids, NSAIDs and transforaminal injection

RADIOGRAPHIC INDICATIONS

- lateral disc herniation
- lateral recess stenosis
- spinal stenosis

SURGERY

- administer standard tool (ODI) before and after surgery to document outcome
- hemilaminectomy, discectomy, laminectomy, laminectomy for stenosis

POST-OPERATIVE RECOVERY

- Chiropractic or PT rehabilitation for strength and aerobic capacity
- return to work:

  – temporary total disability up to 4 weeks

  – return to light or modified duty 4-8 weeks

  – return to full duty after 8 weeks

MMI

- 6 months
- impairment based on objective standard (per CT WC Statute)

FUSION (BACK)

DIAGNOSIS

- spondylolytic spondylolithesis
- degenerative spondylolithesis
- recurrent disc herniation
- removal of facet for decompression
- instability (>4mm or 10 degrees)
- pseudoarthrosis from previous fusion

INDICATIONS

- failure to improve with at least 3 months of conservative care, documented compliance
- no long acting opioids
- smoking is an absolute contraindication to fusion surgery
- BMI >30 significantly increases the risks, complications and/or poor outcomes and should be objectively assessed prior to consideration of fusion.
- warning: signs of symptom amplification, narcotics, long time out of work, failed psychological screening

RADIOGRAPHIC INDICATIONS

- X-Rays (including obliques for spondylolithesis)
- flexion extension views for instability
- MRI to assess adjacent levels
- Discography for appropriate clinical indications
- CT or SPECT to assess pseudoarthrosis

SURGERY

- administer standard tool, ODI before and after surgery to document outcome
- consider psychological screening prior to fusion surgery
- one or two levels only
- posterolateral fusion (PLF)
- PSF + Pedicle screws
- TLIF
- ALIF + PSF + Pedicle Screws

POST-OPERATIVE RECOVERY

- Chiropractic or PT rehabilitation for strength and aerobic capacity
- return to work
- temporary total disability up to 16 weeks.
- return to light or modified duty depending on demand level

MMI

- 12 months
- impairment based on objective standard (per CT WC Statute)

INTERVENTIONAL PAIN MANAGEMENT: BASIC GUIDELINES FOR LOW BACK PAIN

- Medical necessity for all injections must be documented with a clear description of the diagnosis and rationale for the injection.
- Injured workers should be re-evaluated @ 2 weeks following any intervention to assess change in pain level, change in function (and hence work status), and to determine next steps in the treatment course if medically indicated. IPM treatments ('blocks') are generally not a treatment performed in isolation; it is important to look at the underlying cause and include functional based exercise programs along with injections.
- All spinal injections must be performed with radiologic guidance, typically fluoroscopy is utilized. CT guided pain management injections should only be performed for specific indications and medical necessity must be documented. Ultrasound is a form of radiologic guidance being used for many different pain injections but cannot be recommended for spinal injections at this time.
- All spinal injections should be accompanied with a report of both the diagnostic and therapeutic response. An injection that does not provide relief still provides diagnostic information as to what is not the cause of the pain. A lack of response to a particular intervention still provides useful information and that should be duly noted in the records. This will prevent further unnecessary injections for pain generating structures that have been found to not be the cause of pain.
- For injured workers who fail to respond to treatment, alternative diagnoses should be considered. If the worker fails to respond to treatment that appears to be appropriate for the condition, evaluation of other barriers to improvement such as psychological issues should be considered.
- Facet blocks are indicated for the diagnosis and treatment of axial low back pain with or without pseudoradicular symptoms for pain that is suspected of arising from the facet joints. A history and physical examination should document the clinician's rationale for this suspected diagnosis. Definitive diagnosis requires documenting the patient's response to a diagnostic injection. Therapeutic facet blocks will only be considered as proper management when they provide at least 70% relief of the axial back symptoms and at least 3 months of pain relief and will be limited to a maximum of 3 sets of therapeutic facet injections/year. Patients obtaining only short term relief (less than 3 months) should be considered for more long lasting solutions, such as RF ablation.
- Sacroiliac joint injections are appropriate for suspected sacroiliac joint pain. This should be specifically confirmed by history and physical examination and the clinician must document medical necessity. A diagnostic sacroiliac block can be used to confirm this diagnosis. A negative response indicates this is not the cause of the pain. Therapeutic sacroiliac joint injections will only be considered as proper management when they provide at least 3 months of pain relief and will be limited to a maximum of 3 injections/year.
- All facet and sacroiliac joint injections should include steroid (unless otherwise contraindicated) in hopes of providing long term therapeutic effect and to improve the diagnostic specificity of these injections. It should be recognized that patients who have short term relief with these injections may benefit from rhizotomy to achieve longer term pain relief. Some patients can be managed with intermittent therapeutic facet and/or sacroiliac joint injections in hopes of providing long term therapeutic effect and to improve the diagnostic specificity of these injections. Patients obtaining only short term relief (less than 3 months) should be considered for more long lasting solutions, such as RF ablation. Some patients can be managed with intermittent therapeutic facet injections.
- Repeat therapeutic injections/procedures are only indicated for those individuals who document sustained improvement in both pain and function, including improved ADL's and work capacities for at least three months.
- In addition, if the patient has significant bilateral pain, bilateral injections should be performed with the diagnostic injection so the clinician can better and more fully assess the etiology of the pain. Residual pain from joints that are not treated will confuse the diagnostic information that is obtained from a diagnostic block.
- Radiofrequency ablation (Facet and sacroiliac rhizotomy) may be considered for patients who achieve at least 70% reduction of target symptoms along with improved function and ROM with a diagnostic injection (Note- facet and sacroiliac joint blocks are not expected to result in improvement of radicular symptoms). Radiofrequency ablation requires that the patient has had a facet medial branch mapping procedure; intra-articular injections are not diagnostic for determining the need for RF. Rhizotomy cannot be performed more frequently than once every 6 months.
- If there is a question about the etiology of recurrent pain, re-evaluation and repeat diagnostic workup should be considered prior to repeat injections.
- Epidural steroid injections are indicated for back pain that is felt to be radicular or discogenic in origin and for which there is a specific possible spinal cause. There are situations where epidural steroid injections may help with axial low back pain, such as a central disc herniation, spinal stenosis, and/or other discogenic pain problems. A diagnosis of discogenic back pain is often a diagnosis of exclusion and other causes of back pain should be evaluated before considering ESI's for treatment of axial back pain. Epidural steroid injections may not be performed without an MRI documenting the specific location and extent of spinal pathology. The routine performance of three epidural steroid injections is not appropriate and results in unnecessary treatment. After each injection, the response should be documented both for pain and functional improvement; if a repeat injection is required medical necessity should be documented even if a series of injections has been approved.
- Pain can arise out of multiple structures and therefore can be multifactorial in origin, nevertheless it is not expected that every single injured worker with back pain will require every single different type of injection, and in fact such practice is not recommended and is strongly discouraged.

INTERVENTIONAL PAIN MANAGEMENT: THERAPIES FOR LUMBAR RADICULOPATHY

- Epidural Steroid Injections (ESI) are indicated for the treatment of a radiculopathy/ radiculitis with symptoms of pain in a radicular distribution, which can be associated with numbness, tingling, and/or weakness in that nerve root distribution. A lack of response should lead the clinician to reconsider the diagnosis or look for alternative treatment options. Medical necessity for all injections must be documented with a clear description of the symptoms, physical findings, diagnosis and rationale for the injection.
- Injured workers should be re-evaluated @ 2 weeks following any intervention to assess change in pain level, change in function (and hence work status), and to determine next steps in the treatment course if medically indicated. IPM treatments ('blocks') are generally not a treatment performed in isolation; it is important to look at the underlying cause and include functional based exercise programs along with injections.
- All spinal injections should be accompanied with a report of both the diagnostic and therapeutic response. An injection that does not provide relief still provides diagnostic information as to what is not the cause of the pain. This will prevent further unnecessary injections for structures that have been found not to be the cause of pain.
- Earlier intervention with an ESI may help to speed recovery and promote progress in PT and therefore should be considered in the management of an acute radiculopathy that is not responding to conservative management.
- Epidural steroid injections may not be performed without an MRI documenting the specific location and extent of spinal pathology and should be correlated with neurologic findings.
- Delivery of medication to the location of nerve irritation is the key to success. Injections require radiologic guidance for accuracy and safety. All spinal injections must be performed with radiologic guidance, typically fluoroscopy. CT guided pain management injections should only be performed for specific indications and medical necessity must be documented. Ultrasound is not recommended for spinal injections at this time.
- There are several different approaches to the epidural space but delivery of medication as close as possible to the target location is helpful to optimize outcomes. The choice between interlaminar, transforaminal, and catheter guided approaches will be left to the clinician but the risks and benefits of the various approaches should be carefully considered when deciding technique.
- The routine performance of three epidural steroid injections is not appropriate and results in unnecessary treatment. After each injection, the response should be documented both for pain and functional improvement; if a repeat injection is required medical necessity must be documented.
- Injured Workers who do not respond with sustained benefit should be considered for definitive decompression of the involved nerve root(s).

MEDICAL PROTOCOLS: SHOULDER – PAGE 1 of 4

SHOULDER PAIN HISTORY AND PHYSICAL EXAMINATION

HISTORY OF PRESENT ILLNESS

Description of injury:

- details of events before, during, and immediately after the alleged injury, including the mechanism of injury

Identification of body parts involved:

- location of pain
- characteristics of the pain
- distribution of the pain symptoms
- frequency and duration of symptoms
- alleviating / exacerbating factors

Any limitations in functional activities should be noted.

The history should include the presence and distribution of any numbness, paresthesias, or weakness.

A visual analog pain scale should be used and monitored at each visit. The patient should be asked their current rating, average over the last week, and range from low to high.

Note any history of emotional and / or psychological response to the current injury.

MEDICATIONS

History should include previous medications taken for this injury and a list of all current mediations including dose and frequency.

Any significant side effects from previous medications should be noted.

ALLERGIES

Medication allergies should be verified at every visit.

PAST MEDICAL / SURGICAL HISTORY

Identify any previous occupational and non-occupational injuries to the same area.

Determine if the patient has any history of non-traumatic shoulder problems such as arthritis, diabetes mellitus, cancer, surgery etc.

Document any prior shoulder treatment, chronic or recurrent symptoms, response to previous treatment, and any functional limitations or previous restrictions in work capacity.

SOCIAL HISTORY

Identify:

- smoking
- alcohol use
- other drug use
- vocational activities
- recreational activities
- secondary gain/ histrionics
- psychological profile

REVIEW OF SYSTEMS

Identify systemic disease symptoms:

- cardiac
- endocrine
- gastrointestinal
- hematological
- infectious
- neurologic
- neoplastic
- renal
- rheumatologic
- other

PHYSICAL EXAMINATION

Vital signs:

- height
- weight
- general appearance, including posture
- any pain behaviors

Signs of symptom amplification should be noted.

Visual inspection of shoulder:

- range of motion
- stability anterior, inferior, posterior
- muscle atrophy and definition
- skin examination, i.e., temperature, scars, discoloration
- neurologic exam motor and sensory with reflexes
- strength testing (supraspinatus thumbs down test, external rotation, speed's test, Yergason's, Hawkins', O'Brien test, etc.)
- vascular exam pulses and capillary refill (rule out thoracic outlet)
- AC joint or acromioclavicular joint pain
- subacomial vs. glenohumeral pathology
- rule out cardiac, i.e., myocardial infarction or failure
- rule out pulmonary etiology, i.e., carcinoma, or embolus, pleurisy
- cervical etiologies (thorough cervical exam)
- autoimmune diseases (rheumatoid, lupus, ankylosing spondylitis, etc.)
- Lyme Disease vs. infectious process
- neoplasm primary vs. metastatic (benign vs. malignant)
- post traumatic (previous fracture)
- congenital
- metabolic gout, pseudogout, diabetes mellitus
- birth trauma (nerve palsy)
- neurologic causes
- iatrogenic (post-surgical)
- malingering, adhesive capulitis / frozen shoulder
- psychologic or psychiatric phenomenon (depression, anxiety, hysteria, emotional disorders, behavioural disorders, and motivational)

In cases where the mechanism of injury, history, or clinical presentation suggests a possible severe injury, additional evaluation is indicated.

MEDICAL PROTOCOLS: SHOULDER – PAGE 2 of 4

ACUTE TRAUMATIC OR OVERUSE/REPETITIVE SHOULDER INJURY (LESS THAN 4 WEEKS)

DIAGNOSTIC CRITERIA

On initial visit:

- complete history
- physical examination
- pain diagram

Height and weight (BMI)

On each visit document:

- primary diagnosis
- precise location and character of pain
- VAS pain level
- exam pertinent to injured body part
- functional capacity
- appraisal of ADLs and functional activity

Work capacity and status

DIAGNOSTIC STUDIES

Recommended:

- X-Rays, if indicated by amount of trauma or based on documented medical suspicion

No MRI

No CT Scan

TREATMENT

Recommended:

- ice / heat
- rest / immobilization
- physical therapy / rehabilitation
  - 4 to 6 weeks
- chiropractic care
  - maximum 12 weeks

Medications:

- nonsteroidal anti-inflammatory drugs
- analgesics
- antispasmodics
- psychotropics

Injections / Blocks:

- steroids with documentation of result and duration including medicines and dosage

Surgery may be indicated for some acute tears of rotator cuff, labrum, capsule, biceps or displaced fractures (see surgery guidelines on page 3).

Non-Consensus Modalities:

- PRP (platelet rich injections)
- acupuncture
- hyaluronic acid injections
- stem cell preparations

GOALS OF TREATMENT

Recommend Return To Work:

- Non-Surgical:
  - generally light duty within 3 to 4 weeks
  - full duty within 6 to 8 weeks for most cases

Contingent on assessment of functional capacity

IF GOALS NOT MET

Document:

- compliance
- no shows / cancellations
- effort: clinic
- effort: home

Refer to orthopedic specialist after 2 weeks with primary care or occupational center with no positive result or benefit in symptoms with regard to clinical exam and history.

MEDICAL PROTOCOLS: SHOULDER – PAGE 3 of 4

SUBACUTE SHOULDER INJURY (1-3 MONTHS)

DIAGNOSTIC CRITERIA

On initial visit:

- complete history
- physical examination
- pain diagram

Height and weight (BMI)

On each visit document:

- primary diagnosis
- precise location and character of pain
- VAS pain level
- current meds
- exam pertinent to injured body part
- functional capacity
- appraisal of ADLs and functional activity

Work capacity and status

Appraise compliance

Consider specialty referral, if not improving

DIAGNOSTIC STUDIES

Recommended, if clinically indicated:

- X-Ray neck and shoulder
- MRI with and without gadolinium
- CT Scan
- Ultrasound
- bone scan
- nuclear testing
- white blood cell tagged, indium scans
- neuro conductive, i.e., EMG testing

TREATMENT

Chiropractic

- maximum 12 weeks

Physical Therapy

- maximum 6 weeks

Medications:

- nonsteroidal anti-inflammatory drugs
- analgesics
- antispasmodics
- psychotropics

Injections / Blocks:

- steroids with documentation of result and duration

Open Surgery or Arthroscopic Surgery

- surgical correlates (positive)
  - young age
  - dominant extremity
  - acute event (i.e., less than 3 months duration)
  - acute symptomatology
- surgical correlates (negative)
  - smoking
  - diabetic / immunosuppression
  - obesity / deconditioned
  - cervical disease
  - poor physiology
  - previous surgery
  - workers' compensation causality
  - porcine xenograft
  - multiple physician or caregivers' involvement
  - chronicity (i.e., more than 3 months of symptoms since injury)
  - retraction or atrophy of cuff or shoulder musculature
- consensus opinion:
  - asymptomatic full or partial rotator cuff tears are NOT surgical candidates

Rehabilitation Protocol (post-surgical):

- 2 to 3 times per week for 4 to 6 weeks (extendable)
- re-evaluate every 4 to 6 weeks by clinical and treating physician
- physical therapy for three month maximum, accumulative in nature with the exception of special circumstances

Non-Consensus Modalities:

- PRP (platelet rich injections)
- acupuncture
- hyaluronic acid injections
- stem cell preparations

GOALS OF TREATMENT

Recommend RTW:

- Non-Surgical:
  - generally light duty within 3 to 4 weeks
  - full duty within 6 to 8 weeks for most cases
- Surgical:
  - light duty within 4 to 6 weeks for most surgical interventions
  - full duty within 8 to 12 weeks for most surgical interventions
  - potentially longer for rotator cuff repairs especially for manual laborers
  - contingent on assessment of functional capacity predicated on the treater's judgment with second opinion when appropriate

IF GOALS NOT MET

Consider alternative cause

Consider psychological factors

- see psychological guideline

Second Opinion:

- after 3 to 6 months of non-surgical or conservative treatment without benefit
- after 6 to 12 months post-surgical with poor result

At any time during treatment, the patient should be given the option for second opinion if there is an apparent physician-patient problem.

MEDICAL PROTOCOLS: SHOULDER – PAGE 4 of 4

CHRONIC SHOULDER INJURY (GREATER THAN 3 MONTHS)

DIAGNOSTIC CRITERIA

On initial visit:

- complete history
- physical examination
- pain diagram

Height and weight (BMI)

On each visit document:

- primary diagnosis
- precise location and character of pain
- VAS pain level
- current meds
- exam pertinent to injured body part
- functional capacity
- appraisal of ADLs and functional activity

Work capacity and status

Appraise compliance

Consider specialty referral, if not improving

DIAGNOSTIC STUDIES

Recommended, if clinically indicated:

- X-Ray neck and shoulder
- MRI with and without gadolinium
- CT Scan
- Ultrasound
- bone scan
- nuclear testing
- white blood cell tagged, indium scans
- neuro conductive, i.e., EMG testing

TREATMENT

Chiropractic

- maximum 12 weeks

Physical Therapy

- maximum 6 weeks

Medications:

- nonsteroidal anti-inflammatory drugs
- analgesics
- antispasmodics
- psychotropics

Injections / Blocks:

- steroids with documentation of result and duration

Open Surgery or Arthroscopic Surgery

- surgical correlates (positive)
  - young age
  - dominant extremity
  - acute event (i.e., less than 3 months duration)
  - acute symptomatology
- surgical correlates (negative)
  - smoking
  - diabetic / immunosuppression
  - obesity / deconditioned
  - cervical disease
  - poor physiology
  - previous surgery
  - workers' compensation causality
  - porcine xenograft
  - multiple physician or caregivers' involvement
  - chronicity (i.e., more than 3 months of symptoms since injury)
  - retraction or atrophy of cuff or shoulder musculature
- consensus opinion:
  - asymptomatic full or partial rotator cuff tears are NOT surgical candidates

Rehabilitation Protocol (post-surgical):

- 2 to 3 times per week for 4 to 6 weeks (extendable)
- re-evaluate every 4 to 6 weeks by clinical and treating physician
- physical therapy for three month maximum, accumulative in nature with the exception of special circumstances

Non-Consensus Modalities:

- PRP (platelet rich injections)
- acupuncture
- hyaluronic acid injections
- stem cell preparations

GOALS OF TREATMENT

Recommend RTW:

- Non-Surgical:
  - generally light duty within 3 to 4 weeks
  - full duty within 6 to 8 weeks for most cases
- Surgical:
  - light duty within 4 to 6 weeks for most surgical interventions
  - full duty within 8 to 12 weeks for most surgical interventions
  - potentially longer for rotator cuff repairs especially for manual laborers
  - contingent on assessment of functional capacity predicated on the treater's judgment with second opinion when appropriate

IF GOALS NOT MET

Consider alternative cause

Consider psychological factors

- see psychological guideline

Second Opinion:

- after 3 to 6 months of non-surgical or conservative treatment without benefit
- after 6 to 12 months post-surgical with poor result

At any time during treatment, the patient should be given the option for second opinion if there is an apparent physician-patient problem.

STATE OF CONNECTICUT WORKERS' COMPENSATION COMMISSION
REVISED APRIL 1, 2015

HAND/WRIST/ELBOW TREATMENT GUIDELINES

CONTENTS

OBJECTIVES

Injuries to the upper extremity in the workplace are common. The following sections review common injuries to the hand, wrist, and elbow.

The guidelines are not intended to be all-inclusive, nor absolute with respect to recommendations. The Commission recognizes the variability inherent in injuries and the importance of individualized treatment for the injured worker.

The recommendations should not be construed as a rule, as the ultimate judgment regarding care of a patient must be made by the physician in light of all circumstances presented. These guidelines are intended as an outline for those participating in the care of injured workers to facilitate appropriate care in the most expeditious and effective manner.

These guidelines specifically do not address causation. Many conditions have clear causation such as a witnessed fall and fracture at work, yet many do not.

The Commission recognizes the importance of assessment by providers of each individual claim based upon all data provided and in accordance with published data to determine causation. As these factors are unique to each claim, it is beyond the scope of this document to comment on causation for diagnoses included in this document.

GENERAL GUIDELINES

These guidelines are divided into sections based upon diagnosis. Practitioners are responsible for diagnosis.

An overview is provided in each section for general considerations with respect to management and expectations for particular pathology. Tables specific to diagnoses follow with more specific recommendations for evaluation, clinical studies and timeframe for specialty referral, surgical intervention, and recovery.

Many of the tables refer to therapy as a treatment option. Specific recommendations are noted for CHT (Certified Hand Therapy) or OT (occupational therapy). We recognize that many Physical Therapists (PT), as well as Chiropractors, also work with the hand and elbow. When possible, hand therapy is recommended to maximize therapy benefit.

WORK STATUS

Within the guidelines, there is an attempt to clarify timing of return to work for given diagnoses. Accordingly, ranges are given for time out of work (Totally Disabled), Return to Work (With Restrictions), and Return to Work (Without Restrictions).

Restrictions are specific to patient, injury, and work environment. Clinical issues may offset timelines.

The ranges include no Temporary Total Disability, which is typical in non-operative sprains, strains, and tendinopathy, to weeks in post-operative and more severe traumatic scenarios.

In some cases, these times may be significantly shortened. In others, patients may have chronic injuries resulting in pain or functional deficits that require further assessment such as Functional Capacity Evaluation (FCE), or potentially candid discussion regarding symptom chronicity and limitations with regard to further management.

SOFT TISSUE INJURIES: TENDINOPATHIES/TENDONITIS/SPRAINS OF THE HAND, WRIST, AND ELBOW

OVERVIEW

Tendon injuries are some of the most common injuries sustained in the workplace. These injuries include acute sprains and strains, in addition to more chronic inflammatory/degenerative conditions of tendon. Ligament sprains, degeneration, and tearing are similar with both acute and chronic injury patterns.

Treatment of common "tendonitis" has long been directed at the presumptive inflammation. This terminology implies that pain arises from inflammation, while data has shown little of this is actually present. Current studies are underway to further understand the pathophysiology of tendon-associated pain.

Occasionally, acute strain (tendon) or sprain (ligament) may be well documented based on specific injury. These injuries will typically follow a common pathway of initial inflammation, followed by healing phase, and can often be treated by supportive means. More chronic injury will often present with peritendinous fibrosis or retinacular thickening, as seen in stenosing tenosynovitis or de Quervain's tenosynovitis.

EVALUATION

Workers need to be evaluated within the context of their occupation.

These injuries may occur with a specific acute injury or in the process of more chronic overuse of the tendon, with the pathophysiology as noted above. Tendon function would be expected to correlate with the described injury pattern.

The evaluator should be able to identify the specific structure contributing to the pain complaint, and direct management specific to that tendon or ligament.

TREATMENT

Treatment for tendon injuries is directed at the type of injury, and in many cases the tendon or ligament involved.

While common management – including rest and anti-inflammatory medications – remain standard practice, it should be noted that there is limited information as to the efficacy of these treatments. Many acute injuries will subside well with this standard approach; some more chronic tendinopathies may not.

Furthermore, different tendons clearly respond differently to different treatments (e.g. corticosteroid injections have a documented "cure" rate for stenosing tenosynovitis and yet, more recently, have been shown to only have temporary palliative effects in lateral epicondylitis).

SPRAIN/STRAIN OF THE HAND, WRIST, AND FOREARM

INITIAL EVALUATION

Complete History

Physical Exam

Specifics:

- location of pain
- mechanism of injury
- work / hobby / sports Hx
- ROM
- instability
- Crepitus
- VAS / functional ability

Follow-Up:

- interval history
- pertinent exam
- VAS / functional ability

DIAGNOSTIC STUDIES

As indicated:

- X-Ray
- MRI
- Ultrasound

TREATMENT

Splint / Brace

NSAIDs

Therapy:

- CHT
- OT

Consider steroid injection(s).

Follow-Up:

- 1-2 weeks, if work modified
- 4 weeks, if work *not* modified

RECOVERY

Most soft tissue injuries are stable within 10-14 days.

Frequently indicated after casting or surgery, as hand is susceptible to significant loss of motion:

- CHT
- OT

WORK CAPACITY

Totally Disabled..... 0-2 weeks

With Restrictions ..... 2-4 weeks

Without Restrictions ..... 4-12 weeks

MMI..... 6-12 months

WRIST TENDINOPATHY (e.g., de QUERVAIN'S, DORSAL AND VOLAR WRIST TENOSYNOVITIS)

INITIAL EVALUATION

Complete History

Physical Exam

Specifics:

- acute / chronic
- mechanism of injury
- location of pain
- work / hobby / sports Hx
- ROM
- VAS / functional ability

Provocative tests:

- Finkelstein Test
  – specific for de Quervain's Tenosynovitis

DIAGNOSTIC STUDIES

As indicated:

- X-Ray
- MRI

TREATMENT

Initial:

- splinting
- medications
- steroid injection(s)
- therapy
  – CHT
  – OT
- activity modification

If no improvement after 2 weeks, recommend referral to a specialist.

Continued non-surgical treatment or surgical treatment may be appropriate.

RECOVERY

After surgery:

- 1-2 weeks
  – sutures out
  – splinting, as needed, for comfort
- 2-4 weeks
  – progress to gentle active ROM
  – consider therapy
- 4-6 weeks
  – continue with active ROM exercises
  – begin gentle resistive exercises
- 6+ weeks
  – progress to normal activity

WORK CAPACITY

Totally Disabled..... 0-2 weeks

With Restrictions ..... 2-6 weeks

Without Restrictions ..... 6-12 weeks

MMI..... 6-12 months

STENOSING TENOSYNOVITIS (TRIGGER FINGER/THUMB)

INITIAL EVALUATION

Complete History

Physical Exam

Specifics:

- acute / chronic
- which digit(s)
- locking
- location of pain
- mechanism of Injury
- work / hobby / sports Hx
- ROM
- Diabetes Hx
- VAS / functional ability

DIAGNOSTIC STUDIES

X-Ray may be indicated

Other studies occasionally necessary:

- MRI
- Ultrasound

TREATMENT

NSAIDs

Steroid Injection(s)

Therapy:

- CHT
- OT

Activity Modification

If no improvement within 2 weeks recommend referral to specialist

RECOVERY

After surgery:

- 1-2 weeks
  – sutures out
  – splinting, as needed, for comfort
- 2-4 weeks
  – progress to gentle active ROM
  – consider therapy
- 4-6 weeks
  – continue with active ROM exercises
  – begin gentle resistive exercises
- 6+ weeks
  – progress to normal activity

WORK CAPACITY

Totally Disabled..... 0-2 weeks

With Restrictions ..... 2-6 weeks

Without Restrictions ..... 6-12 weeks

MMI..... 6-12 months

LATERAL AND MEDIAL EPICONDYLITIS (TENNIS AND GOLFER'S ELBOW)

INITIAL EVALUATION

Complete History

Physical Exam

Specifics:

- location of pain
  (epicondyle vs. forearm musculature)
- mechanism of injury
- work / hobby / sports Hx
- ROM
- wrist extension test
- radial neuritis
- acute / chronic
- VAS / functional ability

DIAGNOSTIC STUDIES

X-Ray

Other studies occasionally necessary:

- MRI
- Ultrasound

TREATMENT

Activity Modification

Brace / Splint

NSAIDs

Therapy:

- CHT
- OT

Steroid Injection(s)

Surgery:

- most commonly improves without surgical intervention
- surgery frequently delayed until 6-12 months after onset of syptoms, with the expectation that patient may improve with non-op management

RECOVERY

After surgery:

- 1-2 weeks
  – sutures out
  – splinting, as needed, for comfort
- 2-4 weeks
  – progress to gentle active ROM
  – consider therapy
- 4-6 weeks
  – continue with active ROM exercises
  – begin gentle resistive exercises
- 6+ weeks
  – progress to normal activity

With non-operative management, prolonged recovery of 4-6 months is not unusual.

Appropriate work modifications may be necessary.

WORK CAPACITY

Totally Disabled..... 0-4 weeks

With Restrictions ..... 2-12 weeks

Without Restrictions ..... 6-24 weeks

MMI..... 12 months

CONTUSION, LACERATION, AND CRUSH TO THE HAND/WRIST/ELBOW

INITIAL EVALUATION

Complete History

Physical Exam

Specifics:

- mechanism of injury
- location of pain
- interval Tx
- Abx / Tetanus
- document each tendon / nerve function
- VAS / functional ability

Follow-Up:

- interval history
- pertinent exam
- VAS / functional ability

DIAGNOSTIC STUDIES

X-Ray:

- at least 2 orthogonal X-Rays (typically 3)

Considered for:

- crush
- significant contusion
- laceration (if foreign material may be present)

Other studies, depending upon indications:

- Ultrasound
- MRI

TREATMENT

Initial Management:

- open wounds irrigated and closed, when clean
- consider Abx
- splint for comfort or tendon deficit

Emergent Referral:

- compartment concern
- vascular compromise
- evolving neurologic status

Early Referral:

- tendon deficit
- neurologic deficit (static)
- concern for ligament instability (beyond sprain)

Definitive management based upon injured structures.

Surgery indicated for:

- tendon laceration
- nerve laceration
- ligament rupture

RECOVERY

Most soft tissue injuries are stable within 10-14 days.

Tendon repairs require specific post-operative splinting protocols under guidance of therapist.

Frequently indicated after casting or surgery, as hand is susceptible to significant loss of motion:

- CHT
- OT

Specific early therapy program, with splinting mandatory, for tendon repairs:

- Certified Hand Therapist critical

WORK CAPACITY

No surgery required:

Totally Disabled..... 0-2 weeks

With Restrictions ..... 2-6 weeks

Without Restrictions ..... 6-12 weeks

Post-surgery:

Totally Disabled..... 0-2 weeks

With Restrictions ..... 2-6 weeks

Without Restrictions ..... 6-12 weeks

MMI..... 6-12 months

BICEP AND TRICEP INJURIES OF THE ELBOW

INITIAL EVALUATION

Complete History

Physical Exam

Specifics:

- location of pain
- deformity
- mechanism of injury
  (usually single episode traumatic for complete ruptures and can be repetitive for partial ruptures/"tendinosis")

Detailed history of potential associated aggravating activities (i.e., weight lifting, use of fluoroquinolone antibiotics)

VAS / functional Ability

DIAGNOSTIC STUDIES

Radiographs:

- rule out other causes or bone avulsion injuries

MRI:

- study of choice, especially for evaluating partial (or incomplete) ruptures

With some complete ruptures, exam findings are obvious enough to complete the diagnosis without diagnostic tests.

Confirm complete or partial.

TREATMENT

Partial ruptures:

- bicep tears
  - lifting, pulling, climbing restrictions
- partial triceps
  - pushing, weight-bearing, climbing restrictions

Non-operative modalities:

- rest
  - work and personal restrictions
- physical therapy
  - more effective for triceps
- injections
  - not recommended
- reassessment every 2-6 wks

Complete ruptures:

- triceps
  - critical to repair
- biceps
  - optional to repair depending on patients needs / desires

Surgical repair optimal within 3 weeks of acute complete rupture to minimize detrimental effects of muscle retraction / scarring and need of grafts

RECOVERY

Pain relief and functional strength recovery

Partial rupture:

- consider surgical repair after failure of non-operative methods

WORK CAPACITY

RTW on TPD..... 0-4 days, if no surgery planned

Totally Disabled..... 0-2 weeks

With Restrictions ..... 2-12 weeks

Without Restrictions ..... 6-24 weeks

MMI..... 1 year post-operatively

WRIST PAIN (ACUTE)

INITIAL EVALUATION

Complete History

Physical Exam

Specifics:

- location of pain
- mechanism of injury
- work / hobby / sports Hx
- ROM
- DRUJ pain / instability
- Crepitus
- Scaphoid Shift
- VAS / functional ability

DIAGNOSTIC STUDIES

Plain film X-Rays:

- minimum 3 views

Consider 7 view formal wrist series films and/or contralateral wrist for comparison.

TREATMENT

Normal X-Ray:

- splint continuously for 2 weeks
- NSAIDs
- ice and heat
- rest
- reassess

Abnormal X-Ray:

- treat for appropriate fracture or acute ligament injury (see other Protocols)

RECOVERY

2 weeks

WORK CAPACITY

Totally Disabled..... 0-2 weeks

With Restrictions ..... 2-6 weeks

Without Restrictions ..... 6-12 weeks

MMI..... 6-12 months

MEDICAL PROTOCOLS: HAND – PAGE 10 of 22

WRIST PAIN (2 WEEKS AFTER INJURY)

INITIAL EVALUATION

2 weeks after injury

DIAGNOSTIC STUDIES

Repeat plain film X-Rays with special views, if needed (e.g. Scaphoid views).

TREATMENT

Still normal X-Rays:

- consider cortisone injection
- continue NSAIDs
- consider occupational therapy, if low suspicion
- splint continuously 4 more weeks for significant symptoms and a high suspicion

Abnormal X-Rays:

- treat for appropriate fracture or ligament injury (see other Protocols)

For DISI / VISI, scapholunate gap, clunking or signs of instability, positive scaphoid shift test, consider:

- MRI
- arthrogram / arthroscopy
- surgery

RECOVERY

4 weeks

WORK CAPACITY

Totally Disabled..... 0-2 weeks

With Restrictions ..... 2-6 weeks

Without Restrictions ..... 6-12 weeks

MMI..... 6-12 months

MEDICAL PROTOCOLS: HAND – PAGE 11 of 22

WRIST PAIN (6-12 WEEKS AFTER INJURY)

INITIAL EVALUATION

6-12 weeks after injury

DIAGNOSTIC STUDIES

Physical Exam:

- is wrist pain localizing?

TREATMENT

Reassess

If non-tender or improving:

- wean splint
- start occupational therapy
- consider injection, if not yet done

If still tender:

- MRI arthrogram

If MRI / A abnormal:

- arthroscopy / surgery

If MRI / A normal:

- Occupational therapy
- consider cortisone injection
- consider diagnostic arthroscopy

RECOVERY

4 weeks

WORK CAPACITY

Totally Disabled..... 0-2 weeks

With Restrictions ..... 2-6 weeks

Without Restrictions ..... 6-12 weeks

MMI..... 6-12 months

WRIST PAIN (CHRONIC: GREATER THAN 3 MONTHS)

INITIAL EVALUATION

chronic wrist pain – greater than 3 months

DIAGNOSTIC STUDIES

Wrist exam:

- localizing pain or signs of instability

Reassess in 4 weeks

TREATMENT

Repeat X-Rays, if not already done.

If normal:

- consider splint
- NSAIDs
- OT
- cortisone injection

If still significantly tender:

- MRI +/- Arthrogram

If abnormal:

- arthroscopy / surgery

If normal, consider:

- diagnostic arthroscopy
- bone scan
- rheumatologic lab studies
- steroid injection(s)

If negative MRI / A, negative arthroscopy, negative X-Rays, ongoing pain despite steroid injections, splinting, therapy – then consider:

- rheumatology referral
- accupuncture
- ergonomic changes
- job modifications or job change
- vocational training
- candid discussion that not all pain has a surgical remedy and a hand surgeon no longer needed
- may always have some wrist discomfort

Discharge

RECOVERY

4 weeks

WORK CAPACITY

One or two-handed duty with restrictions, if necessary.

Return to some type of work, possible with splint.

NERVE COMPRESSION SYNDROMES OF THE HAND, WRIST, AND ELBOW

OVERVIEW

Work-related nerve injuries can occur through repetitive trauma, blunt injury or via penetrating and open injuries.

Onset can be acute, subacute, or chronic. Symptoms vary on presentation and depend on the degree and type of nerve injury.

Nerve injuries can be classified as Neuropraxia, Axonotmesis and Neurotmesis:

- Neuropraxia represents physiological dysfunction of the nerve without anatomic disruption.
- Axonotmesis represents anantomic disruption with interruption and injury to the nerve axon.
- Neurotmesis is defined as disruption of all elements of the nerve.

In the case of Axonotmesis and Neurotmesis, Wallerian degeneration of the distal nerve end takes place. This process occurs before nerve regeneration and basically is a debridement process of the distal stump of the nerve to aid in nerve regeneration.

Nerve healing takes place in an organized, sequential manner; first with Wallerian degeneration of the distal nerve ending, followed by axonal regeneration and growth, and finally nerve reinnervation.

Unfortunately, the process of nerve healing is variable and, thus, the time required to recover from nerve injury is often difficult to predict.

IDENTIFYING NERVE INJURIES

Understanding the functional anatomy of nerve is critical in making the correct diagnosis of nerve injury.

Identification of sensory and / or muscle loss will help identify the location of nerve injury and possibly help with prognosis predictions. Supplemental testing such as nerve conduction testing and electromyography are also often helpful in identifying not only the location of nerve injury, but may also indicate the severity of injury.

These tests can also help provide information concerning degree of healing of the nerve. Although these tests are helpful, they should not be the only determining factor in recommending treatment.

Based upon current literature, strong consideration should be given to pre-operative electrodiagnostic testing to assess for concomitant or coexisting neuropathy, and to serve as a baseline study for comparative purposes should another study be needed following treatment.

It is important to recall that these studies have a well-documented false-negative rate, and the presence of a negative study does not necessarily indicate absence of disease or necessity of treatment.

PROGNOSIS

Prognosis for peripheral nerve injuries is often difficult to determine, but with a thorough neurological exam based on the clear understanding of the anatomy and the use of supplemental testing – such as nerve conduction tests and electromyography – treatment plans can be developed and predictions for return to work status made.

CARPAL TUNNEL SYNDROME

INITIAL EVALUATION

Complete History

Physical Exam

Specifics:

- location of symptoms
- work / hobby / sports Hx
- atrophy
- 2-point discrimination
- VAS / functional ability
- comorbidities

Provocative tests:

- Median nerve compression test
- Tinel's Sign
- Phalen's Test

DIAGNOSTIC STUDIES

X-Ray

Electrodiagnostic testing

Other, with specific indication:

- MRI
- CT scan
- Ultrasound

TREATMENT

Initial (first 2 weeks):

- splinting
- possible NSAIDs
- possibly vitamin B6
- possible steroid injection
- possible therapy
  - – CHT
  - – OT
- activity modification
- ergonometric evaluation, as indicated

If no improvement after 2 weeks, consider referral to a specialist for continued non-surgical treatment or surgical treatment.

RECOVERY

Non-operative treatment:

- continued depending on nerve recovery

Post-operative treatment:

- post-operative mobilization, as tolerated
- post-operative therapy, as needed

WORK CAPACITY

Non-operative treatment:

- frequently does not require work restrictions

Operative treatment:

Totally Disabled..... 0-2 weeks

With Restrictions ..... 2-6 weeks

Without Restrictions ..... 6-12 weeks

MMI..... 6-12 months

CUBITAL TUNNEL SYNDROME

INITIAL EVALUATION

Complete History

Physical Exam

Specifics:

- location of symptoms
- work / hobby / sports Hx
- atrophy
- froments
- Wartenberg Sign
- clawing
- 2-point discrimination
- VAS / functional ability
- comorbidities

Provocative tests:

- Elbow Flexion Test
- Tinel's Sign

DIAGNOSTIC STUDIES

X-Ray

Electrodiagnostic testing

Other, with indications:

- MRI
- CT scan
- Ultrasound

TREATMENT

Initial (first 2 weeks):

- splinting
- possible NSAIDs
- possibly vitamin B6
- possible steroid injection
- possible therapy
  - – CHT
  - – OT
- activity modification
- ergonometric evaluation as indicated

If no improvement after 2 weeks, consider referral to a specialist for continued non-surgical treatment or surgical treatment.

RECOVERY

Non-operative treatment:

- continued depending on nerve recovery

Post-operative treatment:

- post-operative mobilization, as tolerated
- post-operative therapy, as needed

WORK CAPACITY

Non-operative treatment:

- frequently does not require work restrictions

Operative treatment:

Totally Disabled..... 0-2 weeks

With Restrictions ..... 2-6 weeks

Without Restrictions ..... 6-12 weeks

MMI..... 6-12 months

OTHER COMPRESSION NEUROPATHIES (PRONATOR SYNDROME, ANTERIOR INTEROSSEUS SYNDROME, RADIAL NERVE PALSY, RADIAL TUNNEL SYNDROME, SUPERFICIAL RADIAL NERVE PALSY, ULNAR TUNNEL SYNDROME)

INITIAL EVALUATION

Complete History

Physical Exam

Provocative tests:

- Pronator Syndrome
  - Tinel's Sign
  - resisted forearm pronation
  - resisted elbow flexion with forearm pronation
  - resisted flexion of the middle finger sublimis
- Radial Nerve Palsy
  - Tinel's Sign
- Radial Tunnel Syndrome
  - pain at the origin of the extensor carpi radialis brevis with resistance of middle finger extension
  - pain with resisted forearm supination
- Superficial Radial Nerve
  - Tinel's Sign
  - sensory in first web
- Ulnar Tunnel Syndrome
  - Tinel's Sign
  - wrist extension and flexion maneuver

DIAGNOSTIC STUDIES

X-ray

Electrodiagnostic testing

Other, with indications:

- MRI
- CT scan
- Ultrasound

Note that electrodiagnostic studies are well recognized to be negative in Radial Tunnel Syndrome and proximal median nerve compression, but a positive result is significant, and the study serves as a baseline for comparison following treatment or surgery, and is therefore still recommended.

TREATMENT

Initial (first 2 weeks):

- splinting
- anti-inflammatory
- possibly vitamin B6
- possible steroid injection
- therapy
  - CHT
  - OT
- activity modification
- ergonometric evaluation as indicated

If no improvement after 2 weeks, consider referral to a specialist for continued non-surgical treatment or surgical treatment.

RECOVERY

Non-operative treatment:

- continued, depending on nerve recovery

Post-operative treatment:

- post-operative mobilization, as tolerated
- post-operative therapy, as needed

WORK CAPACITY

Non-operative treatment:

- return to work, depending on nerve recovery
- does not always require work restrictions

Operative treatment:

Totally Disabled..... 0-2 weeks

With Restrictions ..... 2-6 weeks

Without Restrictions ..... 6-12 weeks

MMI..... 6-12 months

FRACTURES AND DISLOCATIONS OF THE HAND, WRIST, AND ELBOW

OVERVIEW

Guidelines provided are intended to establish a consistent framework for initial evaluation and subsequent management for common workplace fractures of the upper extremity.

These are guidelines provided to improve consistency, and providers should understand that these do not supersede individual circumstances, which should be appropriately documented.

INITIAL DIAGNOSIS AND MANAGEMENT

Evaluation:

- history and physical examination should include mechanism of injury and any other complaints from present injury

History should include:

- previous history of injury / fracture to the same body part
- sensory complaints
- history of smoking

Physical examination should include:

- documentation of any pain throughout limb
- status of skin (open or closed fracture, tenting, blistering)
- neurological examination (pre- and post-immobilization)
- tendon function
- degree of wound contamination
- any visible structures (e.g., lacerated tendon) should be noted

Radiographs:

- at least 2 orthogonal views of area of concern
- joints above and below fracture should be evaluated
- CT scan possible to further clarify fracture specifics, such as degree of joint displacement
- MRI possible for soft tissue injuries or to determine presence of scaphoid fracture

Management:

- Closed fractures
  - Fractures and acute soft tissue injuries should be managed expeditiously. Fractures should be aligned and splinted, whenever possible, to avoid further soft tissue injuries and minimize pain. This is typically accomplished with longitudinal traction. Further reduction maneuvers should be limited to those with appropriate expertise.
- Open fractures
  - Open fractures pose significant risk for infection. Time to administration of IV antibiotics and debridement in open fractures has been shown to be critically important to minimize infection risk. These should be transferred to appropriate center emergently. Wound irrigation and hemostasis, when possible, is appropriate. As with closed fractures, splinting is critical to reduce risk to other soft tissues and control pain. Further management may require hospitalization. Many hand injuries with minimal wound contamination may be managed with irrigation in office or ER setting and oral antibiotics.

EMERGENCIES

While many simple fractures can be managed in the office setting, providers should be acutely aware of these emergent situations.

Open fractures:

- See above. These require emergent intervention and administration of antibiotics.
- Providers should be aware that a very small laceration associated with fracture may represent a small "poke-hole" or Grade I open fracture. In the upper extremity, many of these may be treated with antibiotics alone, but antibiotic management is critical.

Compartment Syndrome:

- Compartment Syndrome occurs when tissue pressure exceeds perfusion pressure and tissue ischemia results. In the upper extremity, the most common area of concern is the forearm. Compartment Syndrome in the hand can occur much less often and, while reported, occurrence isolated to the fingers is extremely rare. These are often associated with fracture and crush injuries.
- As tissue pressures increase, pain escalates. The compartments become tight, but may be covered by splint. The splints should be loosened to further investigate. Neurologic deficits and vascular occlusion occur later, usually after irreparable tissue necrosis. Early diagnosis is essential.
- Hallmark findings in Compartment Syndrome are pain out of proportion to exam, and pain with passive stretch. For example, in the forearm the scenario is much more common with fracture of the shaft of radius and ulna rather than at the wrist. Passive flexion and extension of the digits should normally be somewhat tolerable. Concern should be raised when there is little to no active motion, and small amounts of passive motion elicit severe pain.

Neurologic injury:

- Neurological deficits should be noted on initial examination. These are typically static and, as such, do not require emergent treatment, but should be evaluated immediately. However, change in neurological status following reduction or progression of neurologic deficit should be evaluated and managed emergently.

Vascular injury:

- Loss of pulse or capillary refill is indicative of insult to the arterial inflow. Typical vascular deficit in the hand and wrist are a result of laceration to the artery or displaced fracture.
- Initial reduction is performed and vascular status is reevaluated. Persistent deficit or arterial laceration compromising distal perfusion should be referred to ED and managed emergently.

REFERRAL

Referral to ED should be made emergently in cases of contaminated wound, open fractures, concern for Compartment Syndrome, or evolving neurological deficit.

Closed fractures, if stabilized, should be referred to an Orthopedic surgeon within a week for definitive management.

SURGICAL INDICATIONS

Fractures often require operative intervention.

Fractures are reduced and immobilized initially.

Based upon position after reduction, or progression of displacement, surgery may be indicated to correct and maintain position.

RETURN TO WORK

Most fractures of the hand and wrist will be stable in 6-8 weeks, but often not fully healed.

Typically, these are transitioned to splints, to allow for range of motion and eventually strengthening while the fracture goes on to full healing.

Often, patients may be able to return to limited capacity within 2-4 weeks, depending on fracture, pain level, and degree of immobilization.

FRACTURES OF METACARPALS AND PHALANGES

INITIAL EVALUATION

Complete History

Physical Exam

Specifics:

- location of pain
- mechanism of injury
- deformity
- open wounds
- compartments
- instability
- Crepitus

Must document neurological and vascular status pre- and post-reduction or splinting

Interval Hx

VAS / functional ability

DIAGNOSTIC STUDIES

X-Ray:

- at least 2 orthogonal X-Rays (typically 3) must be obtained of any area of concern or complaint of pain

CT scan:

- occasionally considered to define fracture

MRI:

- not typical for isolated fractures
- may be necessary to define ligament injuries

Specific X-Ray views:

- for isolated injury to digit, recommend X-Ray of specific digit more helpful than whole hand film

Things to look out for:

- common missed diagnosis occurs with poor lateral film of involved digit
- metacarpal injury best viewed with 3 views of hand
- base of 5th metacarpal often best seen with reverse oblique

TREATMENT

General:

- open wounds irrigated and closed, when possible
- if open, usually begin Abx and refer immediately
- always splint

Emergent referral:

- open fractures
- compartment concern
- vascular compromise
- evolving neurologic status

Early referral:

- closed fractures with stable neurological status

Management:

- definitive management based upon fracture alignment and stability
- may require cast vs. surgical reduction / fixation
- surgical indications include
  - rotational malalignment
  - shortening
  - angular deformity (not reducible)

RECOVERY

Most metacarpal or phalangeal fractures require casting 4-6 weeks.

Surgical repair occasionally allows for earlier motion but not loading until healed.

Frequently indicated after casting or surgery, as hand is susceptible to significant loss of motion:

- CHT
- OT
- typically 2 visits per week for 2-8 weeks

WORK CAPACITY

Totally Disabled..... 0-2 weeks

With Restrictions ..... 2-12 weeks

Without Restrictions ..... 6-24 weeks

MMI..... 6-12 months

FRACTURES OF WRIST

INITIAL EVALUATION

Complete History

Physical Exam

Specifics:

- location of pain
- mechanism of injury
- deformity
- open wounds
- compartments
- instability
- Crepitus

Must document neurological and vascular status pre- and post-reduction or splinting.

Interval Hx

VAS / functional ability

DIAGNOSTIC STUDIES

X-Ray:

- at least 2 orthogonal views (typically 3)

CT scan:

- considered, if more information needed on fracture specifics

MRI:

- useful for occult fractures
- should be considered – typically at 2 weeks – for exam concerning for scaphoid fracture with negative radiographs

Specific X-Ray views:

- concern for scaphoid injury with snuffbox tenderness – obtain "scaphoid view"
- distal radius angulation best seen with "facet lateral" view (20 degrees off true lateral)

Things to look out for:

- scaphoid fractures often subtle; if snuffbox tenderness, obtain scaphoid view

  – when in doubt, splint

Perilunate injuries often missed

TREATMENT

Wounds:

- irrigate open wounds
- begin Abx and refer immediately
- reduction performed, if displaced
- always splint

Emergent Referral:

- open fractures
- compartment concern
- vascular compromise
- evolving neurologic status

Early Referral:

- closed fractures with stable neurological status

Management:

- definitive management based upon fracture alignment and stability
- may require cast vs. surgical reduction / fixation
- surgical indication based upon patient age, fracture stability, and position
- frequent – but not definitive – indications for surgery in distal radius

  – articular displacement

  – dorsal tilt > 10 deg

  – shortening > 3 mm

RECOVERY

Most distal radius fractures require casting 4-6 weeks.

Surgical repair occasionally allows for earlier motion but not loading until healed.

Frequently indicated after casting or surgery, as hand is susceptible to significant loss of motion:

- CHT
- OT
- typically 2 visits per week for 2-8 weeks
- complex regional pain syndrome (RSD) may necessitate substantially greater amount of therapy

WORK CAPACITY

Totally Disabled..... 0-2 weeks

With Restrictions ..... 2-6 weeks

Without Restrictions ..... 6-12 weeks

MMI..... 6-12 months

Carpal fractures – and notably scaphoid – are slow to heal and may more than double above timeline.

FRACTURES OF ELBOW

INITIAL EVALUATION

Complete History

Physical Exam

Specifics:

- location of pain
- mechanism of Injury
- ROM
- instability
- Crepitus

Detailed history of work injury, usually single traumatic event

Detailed history of any previous elbow injuries/fractures

Appropriate relevant neurovascular exam

VAS / functional ability

DIAGNOSTIC STUDIES

Radiographs:

- critical to obtain initially, and additional special views if necessary

CT Scan:

- often necessary to confirm treatment plan

MRI:

- occasionally useful to evaluate occult fractures

TREATMENT

Open fractures:

- treated acutely with direct emergency room evaluation and urgent surgical intervention

Closed fractures:

- initial immobilization with or without a closed reduction, then acute referral to orthopedic surgeon

Surgery:

- open reduction / internal fixation (ORIF):
  - scheduled typically less than two weeks
  - optimally less than one week for closed fractures (immediate for open fractures)

Medications:

- OTC analgesics
- narcotic pain medication
- injections:
  - may be appropriate for selected cases, i.e. aspiration and injection for acute radial head fracture

RECOVERY

Pain relief and functional strength recovery

If goals not met:

- most simple elbow fractures (i.e., single fractures not associated with dislocations) heal in 2-4 months
- if a simple fracture treated non-operatively is not healed in 2-4 months, further specialist consultation and / or diagnostic tests (i.e., CT Scan) are necessary
- complex fracture dislocations needing ORIF take much longer to heal and obtain functional recovery, not uncommonly 6-9 months

WORK CAPACITY

For non-operative/cast immobilization:

Totally Disabled..... 1-4 weeks

With Restrictions ..... 2-12 weeks

Without Restrictions ..... 6-12 weeks

For open reduction/internal fixation:

Totally Disabled..... 1-4 weeks

With Restrictions ..... 2-12 weeks

Without Restrictions ..... 6-12 weeks

MMI..... 1 year

Post-operative:

- extended accordingly for complex cases, including at least 6 months after full RTW

OSTEOARTHRITIS OF THE HAND, WRIST, AND ELBOW

OVERVIEW

Osteoarthritis (osteoarthrosis, DJD) is the most common disease of the joints. It is characterized by progressive deterioration and loss of articular cartilage, and by reactive changes at the margins of the joints and in the subchondral bone. Associated synovitis is common.

Clinical manifestations are characterized by progressive joint pain, stiffness, and enlargement.

Prevalence increases with age and is almost universal in persons over the age of 65. It is more common in women. Genetic, hormonal, and biomechanical factors also play a role.

Direct injury to joints can lead to post-traumatic arthritis, which may present in a delayed fashion. Most likely no specific type of manual labor can directly "cause" arthritis.

The role of repetitive trauma is controversial, but in certain scenarios it may worsen underlying and pre-existing arthritis.

EVALUATION

Osteoarthritis will present with focal / joint specific findings. These are not always painful, but may restrict range of motion.

Evaluation should focus on focal pain and mobility.

Radiographs are essential to diagnosis.

TREATMENT

There is no cure for cartilage wear.

Treatment is often directed to alleviate the associated painful synovitis, either by decreasing load on the affected joint through activity modification, bracing, medication, or injection.

Surgical treatment may offer relief after all conservative measures have been exhausted.

OSTEOARTHRITIS

INITIAL EVALUATION

Complete History

Physical Exam

Specifics:

- location of pain
- mechanism of injury
- work / hobby / sports Hx
- ROM
- swelling
- instability
- Crepitus
- grip strength
- Grind Test (thumb CMC)
- Heberden's / Bouchard's

Interval Hx

VAS / functional ability

DIAGNOSTIC STUDIES

X-Rays

Controversial if repetitive strain without discreet injury materially and substantially aggravates underlying arthritis, or is pain part of the natural history of arthritis, and unrelated to job.

A remote injury can result in certain patterns of arthritis years later, such as SLAC wrist after scapholunate ligament injury. A patient presenting with an arthritis pattern that appears to be from an old injury may be experiencing the natural history of their original injury rather than an injury caused by work.

Consider blood work to rule out rheumatoid arthritis or other non-work related cause of arthritis.

TREATMENT

Rest

Splinting

Steroidal / NSAIDs

Heat

Topicals:

- e.g., Diclofenac, Flector Patch, capsaiscin

Steroid injection(s)

Therapy:

- CHT
- OT

Arthritis may require long-term management as opposed to cure. Patients may never be completely pain free. Symptoms may wax and wane depending upon activity level.

Surgery is indicated for refractory cases, unresponsive to conservative measures, or interfering with activities of daily living and causing loss of work.

Surgery:

- arthroplasty
  (with or without replacement)
- arthrodesis

RECOVERY

Maximum 8 weeks of conservative treatment, including:

- CHT
- OT

Recovery following surgery 3 months.

WORK CAPACITY

Totally Disabled..... 0-2 weeks

With Restrictions ..... 2-12 weeks

Without Restrictions ..... 6-24 weeks

MMI..... 6-12 months

Return to work with permanent restrictions, if cannot perform full duty; otherwise consider alternative employment.

May need permanent restrictions following surgery

MEDICAL PROTOCOLS: KNEE – PAGE 1 of 4

HISTORY AND PHYSICAL EXAMINATION

HISTORY OF PRESENT ILLNESS

Description of Injury:

- details of events before, during, and immediately after the alleged injury
- mechanism of injury
- identification of body parts involved
- location of the pain, characteristics of the pain, and distribution of the pain symptoms
- frequency and duration of symptoms
- alleviating / exacerbating factors

Any limitations in functional activities should be noted. Inquire about previous insults, surgery, prescriptions, and limitations of the knee.

The history should include the presence and distribution of any lower extremity numbness, weakness, or radicular symptoms, as well as limpness and / or other leg symptoms.

A visual analog pain scale should be used and monitored at each visit. The patient should be asked their current rating, average over the last week and range from low to high. Note any pain at night or at rest.

Note any history of emotional and / or psychological condition, i.e. psychiatric diagnoses and hospitalizations for mental illness.

MEDICATIONS

History should include:

- previous medications taken for this knee injury
- a list of all current medications, including dose and frequency
- any significant side effects from previous medications
- tolerance to specific medications

Medication allergies should be verified at every visit.

PAST MEDICAL / SURGICAL HISTORY

Identify any previous occupational and non-occupational injuries to the same area.

Determine if the patient has any history of non-traumatic knee problems such as arthritis, cancer, surgery, etc.

Document any prior knee treatment, chronic or recurrent symptoms, response to previous treatment, and any functional limitations or previous restrictions in work capacity.

Determine if the patient has any history of non-knee medical conditions such as diabetes, cardiac arrest, etc.

SOCIAL HISTORY

Identify:

- smoking
- alcohol use
- other drug use
- psychologic profile
- vocational activities
- recreational activities

Note potential primary or secondary gains.

REVIEW OF SYSTEMS

Identify systemic disease symptoms:

- cardiac
- endocrine
- gastrointestinal
- hematological
- infectious
- neurologic
- neoplastic
- renal
- rheumatologic
- other

PHYSICAL EXAMINATION

Physical exam:

- height
- weight
- vital signs
- general appearance
- note signs of symptom amplification; consider:
  - affect
  - behavior

Visual inspection of knee:

- skin color
- scars
- deformity
- edema

Compare to contralateral:

- muscle atrophy
- alignment of extremity
- temperature of knee

Knee range of motion:

- extension to full flexion

Reflexes:

- patella tendon

Strength testing:

- quadriceps
- hamstring muscles

Patella – femoral exam:

- crepitus
- alignment
- tracking
- compression test
- grind test

Meniscal testing:

- McMurray's
- Apley

Ligament assessment (Lachman, Drawer, Step off):

- anterior
- posterior

Collaterals:

- Varus
- Valgus
- stress

Stress Testing:

- posterior lateral
- posterior medial

Tenderness:

- distal thigh
- proximal tibia
- note areas of soreness

Examine Joints above / below:

- hip
- ankle

Gait Pattern:

- limp
- short arc
- avoidance

Evaluate non-knee-related issues:

- hip
- sciatica
- vascular

Consider autoimmune phenomenon and inflammatory etiologies, i.e.:

- gout
- lyme
- rheumatoid
- sepsis

Arthrofibrosis:

- separate guarding from true contracture

MEDICAL PROTOCOLS: KNEE – PAGE 2 of 4

ACUTE TRAUMATIC OR OVERUSE/REPETITIVE STRESS (LESS THAN 4 WEEKS)

DIAGNOSTIC STUDIES

Recommended:

- X-Rays, if indicated by trauma or medical suspicion
- MRI or CT, only if suggestion of locked knee, ligament instability, or suspicion of significant occult process

TREATMENT

Recommended:

- Ice / Heat:
  – elevation +/- compression
- Rest / Immobilization:
  – question crutches
- Physical Therapy:
  – 4-6 weeks (12-18 visits)
  – as indicated by progress
- Chiropractic Care:
  – 4-6 weeks (12-18 visits)
- Acupuncture
  – 4-6 weeks (12-18 visits)

Medications:

- NSAIDs
- analgesics
- antispasmodics
- psychotropics
- aspiration / injection, if necessary

GOALS OF TREATMENT

Recommend RTW – Non-Surgical:

- light duty.....within 3-4 weeks (generally)
- full duty.....within 6-8 weeks (for most cases)

Contingent on assessment of functional capacity

IF GOALS NOT MET

Document:

- compliance
- no shows / cancellations
- effort: clinic
- effort: home

Refer to specialist:

- after 2 weeks with no positive result or benefit of symptoms with regard to clinical exam and history

MEDICAL PROTOCOLS: KNEE – PAGE 3 of 4

SUBACUTE KNEE INJURY (1-3 MONTHS)

DIAGNOSTIC CRITERIA

On initial visit:

- complete history
- physical examination
- pain diagram

Height and weight (BMI)

On each visit document:

- primary diagnosis
- precise location and character of pain
- VAS pain level
- current medications
- exam pertinent to injured body part
- functional capacity
- appraisal of ADLs and functional activity

Work capacity and status

Appraise compliance

Consider specialty referral, if not improved

DIAGNOSTIC STUDIES

Recommended, if clinically indicated:

- X-Ray of knee:
  - question hip
- MRI:
  - with or without contrast (if previous surgery)
- CT Scan:
  - for some fractures
  - for tumor
- Ultrasound to rule out DVT
- Bone Scan to rule out:
  - contusion
  - infection
  - cancer
  - fatigue FX
- Nuclear Testing:
  - prosthetic loosening vs. infection
- White Blood Cell Tagged:
  - indium scan to rule out infection
- Neuro Conductive:
  - to rule out nerve compression injuries

TREATMENT

Recommended:

- Chiropractic Care:
  - 6 to 8 weeks (18 to 24 visits)
- Physical Therapy:
  - 6 to 8 weeks (18 to 24 visits)

Medications:

- NSAIDs
- analgesics (oral or topical)
- antispasmodics
- psychotropics
- injection / aspiration
- steroid / hyaluronic acid

Document result and duration.

Surgery:

- dependent on DX and response to conservative treatment

Negative Surgical Correlates:

- smoking
- poor physiology
- diabetic / immunosuppression
- previous surgery
- obesity / de-conditioned
- chronicity – i.e., more than three months of symptoms since injury
- retraction or atrophy of thigh musculature
- multiple physician or caregiver involvement

Rehabilitation Protocol (post-surgical):

- 2 to 3 times per week for 4 to 6 weeks (extendable)
- re-evaluate every 4 to 6 weeks by clinical and treating physician
- physical therapy for three month maximum, accumulative in nature with the exception of special circumstances

GOALS OF TREATMENT

Recommend RTW:

- Non-Surgical:
  - generally light duty within 3 to 4 weeks
  - full duty within 6 to 8 weeks for most cases
- Surgical:
  - light duty within 4 to 6 weeks for most surgical interventions
  - full duty within 6 to 8 weeks for most surgical interventions
  - potentially longer (3 to 4 months) for extensive ligament reconstruction or arthroplasty with some vocations
  - contingent on assessment of functional capacity predicated on the treater's judgment with second opinion when appropriate

IF GOALS NOT MET

Consider alternative cause.

Consider psychological and motivational factors

- see Psychological Guideline

Second opinion:

- after 3 to 6 months of non-surgical or conservative treatment without benefit
- after 6 to 12 months post-surgical with poor result

At any time during treatment, the patient should be given the option for second opinion, if there is an apparent physician-patient problem.

MEDICAL PROTOCOLS: KNEE – PAGE 4 of 4

CHRONIC KNEE INJURY (GREATER THAN 3 MONTHS)

DIAGNOSTIC CRITERIA

On initial visit:

- complete history
- physical examination
- pain diagram

Height and weight (BMI)

On each visit document:

- primary diagnosis
- precise location and character of pain
- VAS pain level
- current medications
- exam pertinent to injured body part
- functional capacity
- appraisal of ADLs and functional activity

Work capacity and status

Appraise compliance

Consider specialty referral, if not improved

DIAGNOSTIC STUDIES

Recommended, if clinically indicated:

- X-Ray of knee:
  - question hip
- MRI:
  - with or without contrast (if previous surgery)
- CT Scan:
  - for some fractures
  - for tumor
- Ultrasound to rule out DVT
- Bone Scan to rule out:
  - contusion
  - infection
  - cancer
  - fatigue FX
- Nuclear Testing:
  - prosthetic loosening vs. infection
- White Blood Cell Tagged:
  - indium scan to rule out infection
- Neuro Conductive:
  - to rule out nerve compression injuries

TREATMENT

Recommended:

- Chiropractic Care:
  - 6 to 8 weeks (18 to 24 visits)
- Physical Therapy:
  - 6 to 8 weeks (18 to 24 visits)

Medications:

- NSAIDs
- analgesics
- antispasmodics
- psychotropics
- injection / aspiration
- steroid / hyaluronic acid

Document result and duration.

Surgery:

- dependent on DX and response to conservative treatment

Negative Surgical Correlates:

- smoking
- poor physiology
- diabetic / immunosuppression
- previous surgery
- obesity / de-conditioned
- chronicity – i.e., more than three months of symptoms since injury
- retraction or atrophy of thigh musculature
- multiple physician or caregiver involvement

Rehabilitation Protocol (post-surgical):

- 2 to 3 times per week for 4 to 6 weeks (extendable)
- re-evaluate every 4 to 6 weeks by clinical and treating physician
- physical therapy for three month maximum, accumulative in nature with the exception of special circumstances

GOALS OF TREATMENT

Recommend RTW:

- Non-Surgical:
  - generally light duty within 3 to 4 weeks
  - full duty within 4 to 6 weeks for most cases
- Surgical:
  - light duty within 4 to 6 weeks for most surgical interventions
  - full duty within 6 to 12 weeks for most surgical interventions
  - potentially longer for ligament reconstruction, fracture repair, and arthroplasty
  - contingent on assessment of functional capacity predicated on the treater's judgment with second opinion when appropriate

IF GOALS NOT MET

Consider alternative cause.

Consider psychological factors

- see Psychological Guideline

Second opinion:

- after 3 to 6 months of non-surgical or conservative treatment without benefit
- after 6 to 12 months post-surgical with poor result

At any time during treatment, the patient should be given the option for second opinion, if there is an apparent physician-patient problem.

FOOT/ANKLE TREATMENT GUIDELINES

CONTENTS

OVERVIEW

Guidelines are provided for the evaluation and treatment of common foot and ankle injuries in the workplace.

This list is not all inclusive.

Injuries have been divided into sections:

- soft tissue injuries
- nerve injuries
- acute fractures and dislocations of bones and joints
- arthritis

Injuries include both acute injuries in the workplace and the sequelae of acute injuries in the workplace.

Also included are repetitive stress injuries.

GENERAL GUIDELINES

Initial Evaluation:
- Complete History, including the specifics of the injury:
  - time
  - place
  - mechanism
  - ability to bear weight
  - initial treatment prior to current presentation
- Physical Examination:
  - gait
  - weight bearing alignment
  - examination of the reported injury
  - general foot and ankle exam, with regard to skin integrity
  - swelling
  - tenderness
  - ROM
  - sensation
  - strength to provide a thorough baseline evaluation to help differentiate injuries obtained at the time of the incident versus subsequent compensatory injuries from altered gait / stance

Radiographic Evaluation:
- Assessment and Plan:
  - diagnosis
  - causation
  - treatment
  - prognosis
  - work capacity

Follow-Up Evaluations:
- Interval History:
  - interventions utilized
  - ADLs
  - ability to work (if relevant)
- Pertinent Exam and Radiographic Studies:
  - diagnosis
  - treatment
  - prognosis
  - work capacity

WORK STATUS

Return to work is specific to patient.

May differ, secondary to existing comorbidities / type of work.

General guidelines are suggested for timing of return to work.

Complicated cases may delay recovery / return to full duty.

SOFT TISSUE INJURIES: ANKLE SPRAINS

INITIAL EVALUATION

Mechanism of injury

Ability to bear weight

Localization of:

- swelling
- ecchymosis
- tenderness to palpation

ROM

As tolerated:

- clinical stress testing, with anterior drawer
- inversion testing

Syndesmosis squeeze testing

Sensation

DIAGNOSTIC STUDIES

Weight bearing (if tolerated)

Ankle X-Ray views:

- AP
- mortise
- lateral

Stress views:

- Anterior
- Varus
- with / without anesthesia
- with / without MRI, indicated to assess for:
  - ankle ligament injury, including syndesmosis
  - talar osteochondral lesions
  - occult fracture
  - tendon injury, if:
    - indication for acute surgical intervention
    - nonresponsive to appropriate nonoperative treatment

TREATMENT

Nonoperative treatment:

- for non- or partial-weight bearing:
  - wheelchair
  - crutches
  - rolling knee walker
  - other ambulatory assists
- CAM boot
- splint / brace
- NSAIDS / icing / compression
- physical therapy

Operative treatment:

- ankle arthroscopy / debridement with possible microfracture
- other treatment of osteochondral lesions
- lateral and / or deltoid ligament repair
- stabilization of syndesmosis

RECOVERY

Most ankle sprains are stable within:

- 1-3 weeks

Higher grade sprains / tears, avulsion type injuries, and syndesmotic injuries may:

- take significantly longer to heal
- require surgery

Return to work for mild sprains, if activity is restricted due to work demands:

- generally 1 week

More severe sprains, if work activity is restricted:

- 6 weeks

SOFT TISSUE INJURIES: MIDFOOT SPRAINS

INITIAL EVALUATION

Mechanism of injury:

- crush
- twisting
- axial load on a plantar flexed foot
- dorsal fold over injury

Ability to bear weight

Localization of:

- swelling
- presence / absence of plantar ecchymosis
- tenderness to palpation

ROM

Skin integrity

Sensation

Evaluation for foot compartment syndrome

DIAGNOSTIC STUDIES

Weight bearing or stress foot views:

- AP
- oblique
- lateral

MRI to assess:

- Lisfranc ligament

and / or

CT to assess for:

- associated fractures
  (if indicated to determine treatment)

TREATMENT

For non- or partial-weight bearing:

- wheelchair
- crutches
- rolling knee walker
- other ambulatory assists

CAM / casting / splint / brace

NSAIDS / icing / compression

PT

RECOVERY

Stable recovery for mild midfoot sprains:

- 1-3 weeks

More serious Lisfranc or Chopart type injuries may require:

- extended non-weight bearing and / or surgery
- up to 4 or more months off of work
  (depending on type of work)

SOFT TISSUE INJURIES: TOE SPRAINS

INITIAL EVALUATION

Mechanism of injury

Ability to bear weight

Alignment of the toes

Localization of:

- swelling
- tenderness to palpation

ROM:

- active
- passive

Stability to stress testing at the MTP joints

Skin / nail integrity

Sensation

DIAGNOSTIC STUDIES

Weight bearing foot x-ray views:

- AP
- oblique
- lateral
- sesamoid (if indicated)

MRI:

- more often for the great toe, to assess plantar plate
- sesamoids (if indicated)

TREATMENT

Weight bearing as tolerated in a:

- flat hard sole shoe
- heel wedge shoe

For affected toe(s):

- taping
- splinting

PT (if stiffness and restricted ROM occurs)

NSAIDS / icing

RECOVERY

Stable recovery for most toe sprains:

- 1-3 weeks

Return to work:

- in a few days
- if great toe, may take longer

For multiple or severely sprained toes:

- ability to return to work may be limited by:
  - swelling
  - required shoe wear

SOFT TISSUE INJURIES: PLANTAR FASCITIS

INITIAL EVALUATION

Mechanism of injury:

- acute / abrupt onset

versus

- increasing pain over time

Ability to bear weight

Tenderness to palpation at the insertion on the calcaneus or more distally

Tenderness of

- FHL
- calcaneus

Coexisting Tinel's sign over tarsal tunnel / proximal abductor hallucis

Tightness of the gastrocnemius / triceps surae

Heel and plantar foot sensation

DIAGNOSTIC STUDIES

X-Rays:

- lateral
- axial

MRI, if suspected:

- acute rupture
- calcaneal stress fracture

TREATMENT

Well cushioned shoes / insoles with arch support / cushioned heel lift

Activity modification

Possible weight bearing restrictions

PT

Dorsiflexion night splints

NSAIDS

Cortisone injections

CAM boot / cast immobilization

May consider surgery (if no improvement for 6-12 months)

Non-consensus modalities:

- platelet rich plasma injections
- amniotic tissue injections

RECOVERY

Resolution may take:

- 6-9 months, may require:
  - activity modification
  - immobilization
  - work restrictions

SOFT TISSUE INJURIES: ACHILLES TENDON PATHOLOGY

INITIAL EVALUATION

Mechanism of injury

Onset:

- acute / abrupt

versus

- chronic

Ability to bear weight, Thompson test

Tenderness to palpation:

- musculotendinous junction
- midsubstance
- insertion

Fusiform thickening versus gap

Presence of Haglund's deformity

Gastrocnemius / triceps surae tightness

ROM ankle

Sensation

Strength:

- ability to do single or double leg heel rise
- pain or weakness with resisted ankle plantar flexion

DIAGNOSTIC STUDIES

Weight bearing lateral foot view (+/-) axial view

MRI to assess for extent of rupture, if:

- Thompson test is equivocal
- clinical exam is unclear

TREATMENT

Nonoperative treatment of Achilles rupture:

- functional bracing
- physical therapy

Nonoperative treatment for Achilles tendinopathy:

- activity modification
- shoewear modification
- bracing
- use of Achilles wedges and lifts
- PT
- NSAIDS
- brisement
- bursal injections

Operative treatment for Achilles tear / tendinopathy:

- direct repair
- triceps surae / gastrocnemius lengthening
- Achilles debridement
- Haglund / retrocalcaneal spur ostectomy
- Achilles reconstruction / augmentation with tendon transfer / allograft

Non-consensus modalities:

- extracorporeal shockwave therapy
- platelet rich plasma injections
- amniotic tissue injections

RECOVERY

Operative:

- for up to 10 weeks post-op:
  - weight bearing restrictions (+/-)
  - immobilization / bracing
- for 6 months post-op:
  - no impact activity
- full return of strength may:
  - not occur
  - take 1 year post-op

Nonoperative:

- May require several months of:
  - weight bearing restrictions
  - activity modification
  - PT
  - bracing

SOFT TISSUE INJURIES: POSTERIOR TIBIAL TENDON TENDINOPATHY

INITIAL EVALUATION

Mechanism of injury

Onset:

- acute / abrupt

versus

- chronic

Ability to:

- bear weight
- perform a single heel rise

Foot alignment:

- pes planus
- normal
- cavus

Hindfoot alignment with:

- weight bearing
- comparison to contralateral foot / ankle
- evaluate for presence of foot alignment:
  - cavovarus
  - pes planus

Presence / absence of:

- pronation with gait
- painful accessory navicular

Flat foot deformity (if present):

- flexible

versus

- rigid

Assess for:

- coexisting hallux valgus
- hypermobility of the 1st MT

Gastrocnemius tightness

Strength with resistance to:

- inversion
- eversion
- dorsiflexion
- plantarflexion of the foot

Tenderness / ROM at:

- Tibiotalar
- Subtalar
- Talonavicular
- CC joints
- TMT joints

Tenderness / swelling:

- of the ankle
- of the PTT tendon and peroneals
- in the area of the lateral gutter / sinus tarsi

Evaluate:

- skin for calluses
- soft tissue envelope
- vascular supply
- sensation (presence of tarsal tunnel symptoms)

DIAGNOSTIC STUDIES

X-Ray views of foot:

- weight bearing AP
- lateral
- oblique
- Cobey
- to evaluate alignment / presence of arthropathy

Weight bearing AP or mortise views of ankle, to evaluate for:

- valgus tilt of the talus
- calcaneofibular impingement
- arthropathy

MRI / CT of the ankle (if indicated)

TREATMENT

Nonoperative treatment:

- cast immobilization / orthotic support
- insole with medial hindfoot posting / arch support
- UCBL
- ankle brace
- hinged or rigid AFO
- CAM walker
- NSAIDS
- compression
- corticosteroid injection
- activity modification
- physical therapy

Operative treatment:

- may require posterior tibial tendon debridement
- repair
- advancement
- tendon transfer
- spring ligament repair / reconstruction
- triceps surae lengthening
- arch reconstruction with osteotomy
- arthrodesis
- potentially arthroereisis

RECOVERY

Nonoperative treatment may require:

- several weeks to lifelong:
  - orthotics
  - bracing
  - activity modification

Operative treatment:

- 6-8 weeks nonweight bearing

followed by

- several weeks of protected weightbearing in a CAM walker / brace

Full return to unrestricted activity:

- 3- 6 months (maybe longer, depending upon clinical response and degree of activity)

SOFT TISSUE INJURIES: PERONEAL TENDINOPATHY

INITIAL EVALUATION

Mechanism of injury

Onset:

- acute / abrupt

versus

- chronic

Assess for:

- tendinopathy
- partial / complete tear
- subluxation / dislocation

History of ankle inversion sprains

Ability to bear weight

Foot alignment:

- pes planus
- normal
- cavus

Hindfoot alignment:

- weight bearing
- comparison to other foot / ankle
- evaluate for presence of foot alignment:
  - cavovarus
  - pes planus
- flexible versus rigid

Plantar calluses

Subluxation of peroneals at distal fibula

Testing of ankle:

- anterior drawer
- stress (various)

Tenderness / swelling:

- along peroneal tendons:
  - specifically posterior to fibula
  - at peroneal tubercle of calcaneus
- ATFL
- CFL
- anterior ankle
- to palpation
- sesamoid

Presence of:

- cavovarus foot alignment
- plantar flexed metatarsal

Strength:

- hindfoot eversion
- first metatarsal plantar flexion

DIAGNOSTIC STUDIES

Mortise x-ray views of foot and ankle:

- weight bearing AP
- Lateral
- Oblique
- Cobey

Assess for:

- os peroneum
- lateral ligament / retinacular sheath avulsion fractures

Anterior and varus stress testing of the ankle

MRI to assess for:

- peroneal tendon
- other associated pathology (if indicated)

CT to assess for:

- subtalar arthropathy
- anterior ankle arthropathy / osteophytes

TREATMENT

Nonoperative treatment:

- immobilization / bracing and PT (if no acute tendon tears)
- orthotics with lateral shelf / 1st MT head relief for flexible hindfoot cavovarus
- NSAIDS
- corticosteroid / other injections
- compression

Operative treatment:

- repair of peroneal tendon tears with possible peroneus longus to brevis tenodesis
- possible excision os peroneum / peroneal tubercle calcaneus
- possible retinacular sheath repair with fibular groove deepening
- possible lateral displacement calcaneal / first metatarsal dorsiflexion osteotomy

RECOVERY

Nonoperative tendinitis, 2-6 weeks with:

- bracing
- activity modification
- NSAIDS
- PT

Nonoperative tendinosis / tears may require:

- permanent bracing
- activity modification

Operative treatment, may require:

- 6 weeks nonweight bearing
- 2-4 months protected weight bearing
- activity modification

If osteotomies involved:

- 3- 6 months until full return to duty

SOFT TISSUE INJURIES: CRUSH INJURIES OF SOFT TISSUE

INITIAL EVALUATION

Mechanism of injury

Gait analysis for:
- limping
- compensation

Weight bearing:
- ability to bear weight
- foot and ankle alignment

For open wounds, assess for:
- communication with underlying fracture / joint
- degloving injury

Ecchymosis:
- location
- size

Swelling / compartment syndrome

Tenderness to palpation

Vascular exam

Sensation exam:
- superficial / deep peroneal nerves
- sural nerve
- medial / lateral plantar nerves
- saphenous nerve

ROM:
- active
- passive
- ankle
- subtalar
- midfoot
- toes

DIAGNOSTIC STUDIES

Weight-bearing radiographs (if indicated):
- foot
- ankle

Evaluation for compartment syndrome with pressure monitors

EMG / NCS to differentiate peripheral versus spinal nerve injury (if indicated)

TREATMENT

Non-operative:
- ice
- elevation
- compression
- NSAIDS
- activity modification
- splinting / bracing
- immobilization
- well cushioned supportive shoes and / or accomodative orthotics
- may require gabapentin for dysesthesia

Operative:
- washout / debridement of soft tissue / joints
- compartment releases (if indicated)
- stabilization of soft tissues / bone with external fixation (if indicated)
- surgical nail plate decompression should be considered in digital crush injuries with subungual hematoma

RECOVERY

Recovery may vary from:
- days

to
- months

to
- permanent restrictions

Severe crush injuries often:
- associated with nerve / scarring
- have a poor prognosis

May be useful :
- splinting
- bracing
- well cushioned supportive shoes
- accommodative orthotics

SOFT TISSUE INJURIES: COMPARTMENT SYNDROME

INITIAL EVALUATION

Mechanism of injury

Assessment of:

- swelling
- pain out of proportion to radiographic findings
- active / passive ROM of:
  - toes
  - ankle

Neurovascular examination of:

- foot
- ankle

DIAGNOSTIC STUDIES

Radiographs to rule out underlying fractures:

- foot
- ankle
- acute

CT indicated for:

- comminuted fractures
- midfoot / Chopart subluxations / dislocations

Pressure measurement of suspected compartments

CT angiogram for:

- assessment of vascular flow (if indicated)

Doppler US of the lower extremity for:

- assessment of vascular flow (if indicated)

Chronic exertional:

- pressure measurement of suspected compartments:
  - at rest
  - after exertion, if not elevated at rest

TREATMENT

Acute:

- emergent decompression of suspected compartments with reduction
- temporary stabilization of underlying subluxations and fractures
- wounds packed open / negative pressure dressings applied
- subsequent I&D of devitalized tissue (as needed)
- staged wound closure / definitive fracture treatment / fixation

Chronic:

- activity restriction
- physical therapy
- orthotic management
- elective fasciotomy through limited incisions

RECOVERY

Ranges from:

- full recovery

to

- severe loss of function with chronic pain

SOFT TISSUE INJURIES: LACERATIONS, ABRASIONS AND PENETRATING WOUNDS

INITIAL EVALUATION

Mechanism of injury

Disruptions in the soft tissue envelope:

- location
- size
- depth

Loss of overlying soft tissue envelope

Quality of surrounding soft tissue envelope

Open communication with a joint

Presence of foreign bodies in the wound

Visible tendons / bone in the wound

Neurovascular exam

ROM:

- active
- passive

DIAGNOSTIC STUDIES

If an open ankle joint is suspected:

- methylene blue injection of ankle joint

To assess for foreign bodies:

- foot radiograph
- ankle radiograph

MRI to assess for:

- radio opaque foreign bodies (if indicated)

CT to assess for:

- fractures (gunshot, etc.)

TREATMENT

I&D of wound (single versus multiple)

Removal of foreign body(s)

Wound closure

Negative pressure dressing (if indicated)

Local or rotational flap coverage

RECOVERY

Ranges from:

- full to severe loss of function, with chronic pain

SOFT TISSUE INJURIES: AMPUTATIONS

INITIAL EVALUATION

Mechanism of injury

Physical examination, with respect to:

- partial amputation
- complete amputation

Evaluation of integrity and function of body parts / systems:

- bone
- tendon
- muscle
- vascular
- nerve

Evaluation of wound:

- size
- depth
- presence / absence of overlying soft tissue deficits

DIAGNOSTIC STUDIES

Radiographs and CT (as indicated)

CT angiography (as indicated)

Arterial Doppler US (as indicated) of:

- ankle
- foot
- toes

MRI to assess:

- soft tissues
- extent of osteomyelitis (as indicated)

TREATMENT

For Salvage:

- I&D

Provisional / definitive fixation of fractures proximal to the amputation site

Repair as indicated :

- vascular
- nerve
- tendon

For non-salvageable injuries:

- amputations with I&D
- immediate versus delayed wound closure with flaps (if indicated)

Prostheses / shoe fillers (as indicated)

Accommodative / supportive orthotics (if indicated)

Accommodative shoes

RECOVERY

Full functional recovery:

- may not occur
- will differ based on:
  - level of amputation
  - activity at work
  - presence / absence of chronic pain symptoms

Common complications include:

- stump neuromas

May require:

- life-long use of prosthesis
- ambulatory aids

NERVE INJURIES: COMPRESSION SYNDROMES, NEUROPRAXIA/CAUSALGIA, NEUROPATHY

INITIAL EVALUATION

History of:

- onset of symptoms
- correlation to trauma or activity

Physical examination with respect to:

- nerve distribution
- function

Presence of a Tinel's sign

Observation of the affected area:

- color
- temperature
- swelling
- atrophy
- normal hair distribution of the affected area

DIAGNOSTIC STUDIES

Semmes Wienstein monofilament testing for:

- neuropathy

EMG / NCS to assess for localized nerve:

- injury
- radiculopathy
- neuropathy

MRI to assess for:

- bony / soft tissue masses causing compression symptoms
- neuromas

MRI of the lumbosacral spine for:

- nerve root compression

TREATMENT

Improved alignment / stabilization of foot and ankle with:

- orthotics
- bracing

PT for:

- soft tissue mobilization
- joint mobilization
- nerve desensitization

Corticosteroid / anesthetic injections

Surgical nerve decompression / neurolysis

Excisional biopsy of neuroma

Oral and / or topical anti-neuritic and anti-inflammatory medication

Complex Regional Pain Syndrome:

- pain management referral for sympathetic blocks
- physical and / or behavioral therapy
- medication
- other modalities

RECOVERY

Nerve symptoms due to trauma / surgery:

- will generally recover within 1 year
- some symptoms may be life-long

Work activity:

- may be restricted
- secondary to pain tolerance levels

ACUTE FRACTURES AND DISLOCATIONS OF BONES AND JOINTS: ANKLE/PILON FRACTURES

INITIAL EVALUATION

Mechanism of injury

History of:

- smoking
- diabetes
- obesity
- vascular disease
- chronic steroid use

Examination of the overlying soft tissue envelope, with regard to:

- skin integrity (closed or open injury)
- degree of swelling
- fracture blisters
- documentation of pre-existing conditions, including:
  - lymphedema
  - venous stasis
  - other chronic ulceration

Neurovascular status / exam of the affected limb(s)

DIAGNOSTIC STUDIES

Radiographs and CT (as indicated)

CT or MRA angiograms (as indicated)

Doppler US of the ankle / foot to assess for blood flow (as indicated)

Compartment pressure measurements (as indicated)

Weight bearing / stress x-rays of the ankle (if indicated) to assess for syndesmotic / deltoid instability

TREATMENT

Casting, for fractures that are:

- non displaced
- minimally displaced

External / percutaneous temporary fixation techniques, for:

- temporary / definitive reductions
- stabilization

Open reduction internal fixation, for fractures that are:

- unstable
- displaced

Amputation:

- for mangled extremities

Consecutive I&Ds may be required for open injuries:

- at the time of injury
- if postoperative wound complications develop

Soft tissue coverage may be required with:

- flaps
- grafts

Compartment release surgery (as indicated)

Bone stimulator (if indicated)

RECOVERY

Treated non-operatively or with surgery:

- minimum 6-10 week period
  - of non-weight bearing for intra-articular fractures of the weight bearing surface of the distal tibia
- longer
  - if high energy injury with extensive soft tissues and osseous damage
  - in the presence of coexisting morbidities, including:
    - diabetes
    - smoking
    - vascular disease
    - chronic steroid use

For full return to work, if a heavy laborer:

- as much as 6 months - 1 year

Development of post traumatic arthritis not uncommon after pilon fractures

Reconstructive surgery may consist of:

- debridement
- corrective osteotomies
- total ankle replacement
- arthrodesis

ACUTE FRACTURES AND DISLOCATIONS OF BONES AND JOINTS: TALUS FRACTURE/DISLOCATIONS

INITIAL EVALUATION

Mechanism of injury

History of:

- smoking
- diabetes
- obesity
- vascular disease
- chronic steroid use

Examination of the overlying soft tissue envelope, with regard to:

- skin integrity (closed or open injury)
- degree of swelling
- fracture blisters
- documentation of pre-existing conditions, including:
  - lymphedema
  - venous stasis
  - other chronic ulceration

Neurovascular status / exam of the affected limb(s)

DIAGNOSTIC STUDIES

Foot and Ankle Radiographs and CT (as indicated)

CT or MR angiograms (as indicated)

Doppler US of the foot / ankle to assess for blood flow (as indicated)

MRI to assess for:

- osteochondral lesions of the ankle and subtalar joints
- associated bony edema
- loose bodies
- ligament / tendon damage
- AVN

TREATMENT

Casting, for fractures that are:

- non displaced
- minimally displaced

External / percutaneous temporary fixation techniques, for:

- temporary / definitive reductions
- stabilization

Open reduction internal fixation, for fractures that are:

- unstable
- displaced

Amputation:

- for mangled extremities

For tibiotalar osteochondral lesions:

- arthroscopic debridement
- possible microfracture / bone grafting

Bone stimulator (if indicated)

RECOVERY

For minor fractures / dislocations:

- up to 6-10 weeks of immobilization and non-weight bearing

Significant chronic morbidity associated with development of post traumatic avascular necrosis of the talus

Development of post traumatic arthritis not uncommon for:

- ankle
- hindfoot joints

May require lifelong use of:

- orthotics / bracing
- PT
- cortisone injections
- reconstructive surgery for:
  - post traumatic arthritis
  - associated soft tissue injuries that remain symptomatic, despite conservative therapy

Reconstructive surgery may consist of:

- debridement
- corrective osteotomies
- total ankle replacement
- ankle / subtalar arthrodesis

ACUTE FRACTURES AND DISLOCATIONS OF BONES AND JOINTS: CALCANEUS FRACTURES

INITIAL EVALUATION

Mechanism of injury

History of:

- smoking
- diabetes
- obesity
- vascular disease
- chronic steroid use

Examination of the overlying soft tissue envelope, with regard to:

- skin integrity (closed or open injury)
- degree of swelling
- fracture blisters
- documentation of pre-existing conditions, including:
  - lymphedema
  - venous stasis
  - other chronic ulceration

Neurovascular status / exam of the affected limb(s)

Generally a high energy injury associated with polytrauma

A thorough physical exam should be completed.

DIAGNOSTIC STUDIES

Foot X-Rays:

- AP
- lateral
- axial
- Broden's

CT scan of the affected limb(s) to assess:

- intra-articular damage
- comminution for pre-operative planning / prognosis

CT or MRA angiograms / Doppler US:

- to assess vascular supply (as needed)

TREATMENT

Splinting for:

- stabilization of calcaneal fractures

Open reduction internal fixation of comminuted displaced calcaneal fractures:

- especially if the overlying soft tissue envelope is at risk

Consecutive I&Ds for open injuries may be required:

- at the time of injury
- if post-operative wound complications develop

Soft tissue coverage may be required, with:

- flaps
- grafts

Soft tissue compartment release surgery (as indicated)

Bone stimulator (if indicated)

RECOVERY

Up to 6-12 weeks non-weight bearing, for:

- intra-articular unstable calcaneal fractures

Commonly associated with:

- development of hindfoot arthritis

Non-anatomic reduction may require specialized shoewear, due to:

- heel widening
- deformity

Typical return to work, depending on the type of work:

- 4 months - 1 year

May never regain full:

- range of motion
- resolution of pain

ACUTE FRACTURES AND DISLOCATIONS OF BONES AND JOINTS: MIDFOOT FRACTURES/DISLOCATIONS (CHOPART, LISFRANC)

INITIAL EVALUATION

Mechanism of injury

History of:

- smoking
- diabetes
- obesity
- vascular disease
- chronic steroid use

Examination of the overlying soft tissue envelope, with regard to:

- skin integrity (closed or open injury)
- degree of swelling
- fracture blisters
- documentation of pre-existing conditions, including:
  - lymphedema
  - venous stasis
  - other chronic ulceration

Neurovascular status / exam of the affected limb(s)

Generally a high energy injury associated with polytrauma

A thorough physical exam should be completed.

DIAGNOSTIC STUDIES

Foot Radiographs:

- AP
- lateral
- oblique, to assess for fracture / Lisfranc stability
- may be weight bearing
- may exist with stress

CT / MRI to assess suspected:

- Lisfrance fracture
- Chopart fracture / soft tissue damage

Intra-operative stress radiographs (as indicated)

TREATMENT

Non-operative treatment with immobilization for:

- non displaced fractures
- minimally displaced fractures

Temporary / definitive treatment, with:

- reduction and stabilization
- external fixation / pinning of unstable fractures

Open reduction internal fixation, for:

- displaced unstable fractures
- possible fusion

May require subsequent removal of joint spanning internal fixation.

Bone stimulator (if indicated)

RECOVERY

Non-weight bearing of the affected limb:

- up to 6-10 weeks

Full return to work, depending on activity restrictions:

- 4-6 months

If driving foot affected:

- no driving for 6-10 weeks

If able to get to work:

- may return to sedentary duty in 2-6 weeks

ACUTE FRACTURES AND DISLOCATIONS OF BONES AND JOINTS: FOREFOOT FRACTURES – METATARSALS, TOES

INITIAL EVALUATION

Mechanism of injury

History of:

- smoking
- diabetes
- obesity
- vascular disease
- chronic steroid use

Examination of the overlying soft tissue envelope, with regard to:

- skin integrity (closed or open injury)
- degree of swelling
- fracture blisters
- documentation of pre-existing conditions, including:
  - lymphedema
  - venous stasis
  - other chronic ulceration

Neurovascular status / exam of the affected limb(s)

DIAGNOSTIC STUDIES

Weight bearing AP / lateral oblique radiographs, to assess for:

- fracture stability
- widening at the Lisfranc articulation

CT / MRI:

- if Lisfranc injury suspected

Intra-operative stress radiographs (if indicated)

Sesamoid view radiographs (if indicated)

TREATMENT

Non-operative treatment of stable fractures (+/-), offloading with:

- orthotics
- immobilization in a cast
- walking boot
- post-op shoe

For significantly displaced fractures:

- closed reduction with percutaneous pinning

versus

- open reduction internal fixation

Bone stimulator (if indicated)

RECOVERY

Weight bearing as tolerated in a:

- heel wedge
- flat post-op shoe
- walking boot

Full recovery, without restrictions for heavy labor:

- 3-6 months

Return to work, for sedentary duty:

- 2 weeks

If driving foot affected:

- no driving for 6-10 weeks

ACUTE FRACTURES AND DISLOCATIONS OF BONES AND JOINTS: STRESS FRACTURES

INITIAL EVALUATION

History of:

- mechanism of injury
- shoe wear

History of:

- smoking
- diabetes
- obesity
- vascular disease
- chronic steroid use

Prior bone density studies also important

Evaluate for weight bearing foot / ankle (mal)alignment

Examination for:

- localized swelling
- tenderness
- quality of the soft tissue envelope
- neuropathy

DIAGNOSTIC STUDIES

Weight bearing foot / ankle radiographs

To confirm fractures, if not seen on plain radiographs:

- CT
- MR
- Tc99 bone scan

Metabolic bone workup for non-unions

TREATMENT

Metatarsal stress fractures:

- WBAT in a:
  - flat post-op shoe
  - heel wedge shoe
  - CAM boot for support / pain control

Rarely require operative fixation

5th Metatarsal Stress Fracture – Jones:

- may be treated non-operatively with non-weight bearing

  versus
- operative stabilization with internal fixation
- additional procedures may be required in a cavovarus foot, including:
  - lateral calcaneal shift (+/-)
  - 1st metatarsal dorsiflexion osteotomy
- bone stimulator (if indicated)

Tarsal stress fractures:

- non-weight bearing in cast / CAM
- navicular stress fractures may require operative fixation

Calcaneal stress fractures:

- weight bearing, as tolerated in a CAM boot
- initial treatment generally consists of offloading for:
  - potentially unstable stress fractures, such as navicular fractures
  - pain relief
- progression to weight bearing in supportive shoe or CAM walker boot
- ORIF (if progresses to chronic non-union)

RECOVERY

Non-weight bearing, depending on the location of the stress fracture:

- may require 6-12 weeks

Otherwise, activity and shoe wear modification, until fracture healed:

- usually in about 6-12 weeks

ARTHRITIS: POST TRAUMATIC ARTHRITIS (SECONDARY TO WORK INJURY OR AGGRAVATION OF PRE-EXISTING INJURY)

INITIAL EVALUATION

Prior history of workplace injury to the affected joint(s)

or

Recent injury / aggravation of a pre-existing workplace injury

Abnormalities:

- gait
- stance

Use of walking assists

Presence of deformity

Evaluate for:

- swelling
- pain / crepitus with range of motion
- decreased range of motion
- joint line tenderness

Evaluation of overlying soft tissue envelope

DIAGNOSTIC STUDIES

Radiographs:

- plain weight bearing radiographs to assess for loss of:
  - cartilage interval
  - sclerosis
  - spurs
  - subchondral cysts
  - deformity

CT or MRI to assess extent of arthritis (if indicated), including:

- bone stock available for reconstruction
- potential avascular necrosis

If infection is a concern, then:

- labs
- MRI
- bone scan to further assess
- potentially bone biopsy

Diagnostic injection

TREATMENT

Initial treatment:

- activity modification
- PT
- corticosteroid
- NSAIDS
- bracing

Failure of conservative therapy may indicate:

- joint debridement / exostectomy
- interposition arthroplasty (for example, 4th and 5th TMT, first MTP joints)
- corrective osteotomy
- selective fusions in the foot and ankle
- total ankle replacement

Non-consensus modalities:

- hyaluronic acid injections
- platelet rich plasma injections
- amniotic tissue injections

RECOVERY

If treated non-surgically, may require:

- several weeks to months of bracing
- activity modification

Following surgical treatment, may require:

- 6-12 weeks non-weight bearing

ARTHRITIS: AGGRAVATED OSTEOARTHRITIS (PRE-EXISTING)

INITIAL EVALUATION

History of arthritis in the affected joint

History of recent:

- onset of pain
- swelling
- restricted range of motion
- ability to bear weight in the affected joint

Abnormalities:

- gait
- stance

Use of walking assists

Presence of deformity

Evaluate for:

- swelling
- pain / crepitus with range of motion
- joint line tenderness

Evaluation of overlying soft tissue envelope

DIAGNOSTIC STUDIES

Radiographs:

- plain weight bearing radiographs to assess for loss of:
  - cartilage interval
  - sclerosis
  - spurs
  - subchondral cysts
  - deformity

CT or MRI to assess extent of arthritis (if indicated), including:

- bone stock available for reconstruction
- potential avascular necrosis

Comparison to contralateral side

Diagnostic injection

TREATMENT

Initial treatment:

- activity modification
- PT
- cortisone injections
- NSAIDS
- bracing

Long term treatment:

- activity modification
- bracing
- walking aides

Failure of conservative therapy may indicate:

- operative debridement
- osteotomy
- fusion
- total ankle replacement (if indicated)

RECOVERY

If treated non-surgically, may require:

- several weeks to months of bracing
- activity modification

Following surgical treatment, may require:

- 6-12 weeks non-weight bearing