



Workers' Compensation Board

January 13, 2022

New York Workers' Compensation Medical Treatment Guidelines for Hand, Wrist and Forearm Injuries

A Training Module Developed by the Medical Director's Office

Hand/Wrist/Forearm Training Module

■ Medical Care

- Medical care and treatment required as a result of a work-related injury should be focused on restoring the patient's functional ability to perform their daily and work activities with a focus on return to work, while striving to restore the patient's health to its pre-injury status in so far as is feasible.
- Any medical provider rendering services to a workers' compensation patient must utilize the Workers' Compensation Board's *New York Medical Treatment Guidelines (MTGs)* as provided for with respect to all work-related injuries and/or illnesses.

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- Positive results are defined primarily as functional gains that can be objectively measured. Objective functional gains include, but are not limited to, positional tolerances, range of motion, strength, endurance, activities of daily living (ADL), cognition, psychological behavior, and efficiency/velocity measures that can be quantified. Subjective reports of pain and function may be considered and given relative weight when the pain has anatomic and physiologic correlation in proportion to the injury.

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- If a given treatment or modality is not producing positive results within a well-defined time frame, the provider should either modify or discontinue the treatment regime. The provider should evaluate the efficacy of the treatment or modality two to three weeks after the initial visit and three to four weeks thereafter. These time frames may be slightly longer in the context of conditions that are inherently mental health issues, and shorter for other non-musculoskeletal medical conditions (e.g., pulmonary, dermatologic etc.). Recognition that treatment failure is at times attributable to an incorrect diagnosis, a failure to respond should prompt the clinician to reconsider the diagnosis in the event of an unexpected poor response to an otherwise rational intervention.

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- Education of the patient and family, as well as the employer, insurer, policy makers and the community, should be a primary emphasis in the treatment of a work-related injury or illness. Practitioners should develop and implement effective educational strategies and skills. An education-based paradigm should always start with communication providing reassuring information to the patient. No treatment plan is complete without addressing issues of individual and/or group patient education as a means of facilitating self-management of symptoms and prevention of future injury.

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■ Acuity

- Acute, subacute and chronic are generally defined as time frames for disease stages:
 - Acute – Less than one month
 - Subacute – One to three months, and
 - Chronic – Longer than three months

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■ Time Frames

- Diagnostic time frames for conducting diagnostic testing commence on the date of injury.
- Treatment time frames for specific interventions commence once treatments have been initiated, not on the date of injury.
- Clinical judgment may substantiate the need to accelerate or decelerate the time frames discussed in this training module.
- Specific durations of treatments and number of treatment visits (e.g., physical therapy/occupational therapy (PT/OT)) are beyond the scope of this training module and the provider should refer to the recommendations in the *MTGs*.

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■ Delayed Recovery

- For those patients who fail to make expected progress 6-12 weeks after an injury and whose subjective symptoms do not correlate with objective signs and tests, reexamination in order to confirm the accuracy of the diagnosis and reevaluation of the treatment program should be performed. When addressing a clinical issue that is not inherently a mental health issue, assessment for potential barriers to recovery (yellow flags/psychological issues) should be ongoing throughout the care of the patient. At 6-12 weeks, alternate treatment programs, including formal psychological or psychosocial evaluation should be considered. Clinicians must be vigilant for any pre-existing mental health issues or subsequent, consequential mental health issues that may be impacting recovery.

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■ Delayed Recovery

- For issues that are clearly and inherently mental health issues from the outset (i.e., when it is evident that there is an underlying, work-related, mental health disorder as part of the claim at issue), referral to a mental health provider can and should occur much sooner. Referrals to mental health providers for the evaluation and management of delayed recovery do not indicate or require the establishment of a psychiatric or psychological condition. The evaluation and management of delayed recovery does not require the establishment of a psychiatric or psychological claim.

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■ Active Interventions

- Active interventions emphasizing patient responsibility, such as therapeutic exercise and/or functional treatment, are generally emphasized over passive modalities, especially as treatment progresses. Generally, passive and palliative interventions are viewed as a means to facilitate progress in an active rehabilitation program with concomitant attainment of objective functional gains.

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■ Diagnostic Imaging and Testing Procedures

- Clinical information obtained by history taking and physical examination should be the basis for selection of imaging procedures and interpretation of results.
- It may be of value to repeat diagnostic procedures (e.g., imaging studies) during the course of care to reassess or stage the pathology when there is progression of symptoms or findings, prior to surgical interventions and therapeutic injections when clinically indicated, and post-operatively to follow the healing process.

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■ Surgical Interventions

- Consideration of surgery should be within the context of expected functional outcome. The concept of "cure" with respect to surgical treatment by itself is generally a misnomer. All operative interventions must be based upon positive correlation of clinical findings, clinical course, imaging, and other diagnostic tests.

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■ Surgical Interventions

- For surgery to be performed to treat pain, there must be clear correlation between the pain symptoms and objective evidence of its cause. In all cases, shared decision making with the patient is advised.

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■ Pre-Authorization

- All diagnostic imaging, testing procedures, non-surgical and surgical therapeutic procedures within the criteria of the *MTGs* and based on a correct application of the *MTGs* are considered authorized, with the exception of the procedures listed in section 324.3(1)(a) of Title 12 NYCRR.

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■ Pre-Authorization

- Second or subsequent procedures (the repeat performance of a surgical procedure due to failure of, or incomplete success from, the same surgical procedure performed earlier, if the *MTGs* do not specifically address multiple procedures) also require pre-authorization.

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■ Personality/Psychological/Psychosocial Evaluations

- In select patients, mental health evaluations are essential to make, secure or confirm a diagnosis. Of course, the extent and duration of evaluations and/or interventions by mental health professionals may vary, particularly based on whether: the underlying clinical issue in the claim is inherently a mental health issue; there is a mental health issue that is secondary or consequential to the medical injury or illness that is at issue in the claim in question; or there is a pre-existing, unrelated mental health issue that has been made worse by, and/or is impeding the recovery from the medical injury or illness that is at issue in the claim in question.

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■ Personality/Psychological/Psychosocial Evaluations

- When assessing for a pre-existing, unrelated mental health issue that has been made worse by and/or is impeding the recovery from a work-related, medical injury or illness, then a one-time visit for initial psychiatric/psychological encounter should be sufficient, as care would normally be continued by the prior treating provider.
- If psychometric testing is indicated by findings in the initial encounter, time for such testing should not exceed an additional three hours of professional time.

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■ Personality/Psychological/Psychosocial Evaluations

- For conditions in which a mental health issue is a central part of the initial claim, or in which there is a mental health issue that is secondary or consequential to the work-related, medical injury or illness, that is part of the claim in question, then more extensive diagnostic and therapeutic interventions may be clinically indicated and are discussed in detail in the *MTGs* for such mental health conditions.

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■ Functional Capacity Evaluation (FCE)

- Functional capacity evaluation is a comprehensive or more restricted evaluation of the various aspects of function as they relate to the patient's ability to return to work.
 - In most cases, the question of whether a patient can return to work can be answered without an FCE.
 - An FCE may be considered at time of maximum medical improvement (MMI), following reasonable prior attempts to return to full duty throughout course of treatment, when the treating physician is unable to make a clear determination on work status on case closure. An FCE is not indicated early during a treatment regime for any reason including one to support a therapeutic plan.

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■ Functional Capacity Evaluation (FCE)

- When an FCE is being used to determine return to a specific job site, the treating provider is responsible for understanding and considering the job duties. FCEs cannot be used in isolation to determine work restrictions. The authorized treating provider must interpret the FCE in light of the individual patient's presentation and medical and personal perceptions. FCEs should not be used as the sole criteria to diagnose malingering.

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■ Functional Capacity Evaluation (FCE)

- An FCE may be considered at time of MMI, following reasonable prior attempts to return to full duty throughout the course of treatment, when the treating provider is unable to make a clear determination on work status on case closure.

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■ Return To Work

- For purposes of the *MTGs*, return to work is defined as any work or duty that the patient is able to perform safely. It may not be the patient's regular work. Ascertaining a return-to-work status is part of medical care and should be included in the treatment and rehabilitation plan. It is normally addressed at every outpatient visit.

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■ Return To Work

- A description of the patient's status and task limitations is part of any treatment plan and should provide the basis for restriction of work activities when warranted. Early return to work should be a prime goal in treating occupational injuries. The emphasis within the *MTGs* is to move patients along a continuum of care and return to work, since the likelihood of returning an injured worker to work drops progressively the longer the worker has been out of work.

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■ Return To Work

- When returning to work at the patient's previous job task/setting is not feasible given the clinically determined restrictions on the patient's activities, inquiry should be made about modified duty work settings.

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■ History Taking and Physical Examination

- History taking and physical examination establish the foundation/basis for and dictate subsequent stages of diagnostic and therapeutic procedures. When findings of clinical evaluations and those of other diagnostic procedures are not consistent with each other, the objective clinical findings should have preference.

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■ History of Present Injury

- **Patient information**: Age, hand dominance, gender.
- **Mechanism of injury**: Details of symptom onset (date of onset), progression, triggering event (if present) versus gradual onset, and activity at or before onset of symptoms.
- **Prior injuries**: Previous occupational and non-occupational injuries to the same area including specific prior treatment.
- **Location of symptoms**: Include uninjured side.

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■ History of Present Injury cont'd.

- **Nature of symptoms**: Pain, numbness, tingling, weakness, swelling, stiffness, limited movement, temperature change, moisture change, color change.
- **Time of day**: When symptoms get better or worse, e.g., upon awakening, after work.
- **Symptom improvement**: When away from work (weekends, vacations).
- **Traumatic injuries**: Note any hand/wrist deformities, if the area was swollen at any time and, if so, how quickly swelling occurred (immediately or delayed).”

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■ History of Present Injury cont'd.

- **Functional abilities**: Ability to perform job duties and activities of daily living. Assess the overall degree of restriction or combination of restrictions.
- **Relationship to work**: This includes a statement of the probability that the illness or injury is work-related.
- **Treatment of current symptoms**: Note the treatments used, e.g., medications, splints, ice/heat, rest, surgery, etc., and whether they were helpful.
- **Comprehensive pain diagrams**: Use to better localize pain symptoms.
- **Sleep disturbances**: Note any disturbances in sleep patterns.

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■ Past History

- Past medical history includes, but is not limited to, neoplasm, gout, arthritis, and diabetes;
- Review of systems includes, but is not limited to, symptoms of rheumatologic, neurologic, endocrine, neoplastic, and other systemic diseases;
- Smoking history;
- Vocational and recreational pursuits;
- Prior imaging studies; and
- Past surgical history.

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■ Physical Examination

- **Visual inspection**: Examine both hands, wrists and forearms and look for and note asymmetries and for deformities suggestive of degeneration, malformation, fracture, or dislocations. Observe for signs of serious injuries, e.g., degloving injuries, lacerations, puncture wounds, open wounds and crush injuries.
- **Neurologic and vascular status**: Evaluation of the hand, wrist, forearm, and upper limb should include peripheral pulses, motor function, reflexes, and sensory status. It should also describe any dystrophic changes or variation in skin color or turgor. Examining the neck and cervical nerve root function is also recommended for most patients.

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■ Physical Examination cont'd

- Examination of a joint should include the joint above and below the affected area, including the opposite side for comparison.
- Physical examination should include accepted tests and exam techniques applicable to the joint or area being examined, including: visual inspection, palpation, bilateral range of motion (active/passive), strength, joint stability, neurologic assessment.

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■ Assessing Red Flags

- Certain findings raise red flags—suspicions of potentially serious medical conditions (see **Table 3** in the Medical Treatment Guidelines). These findings or indicators may include: fracture, dislocation, infection or inflammation, tumor, tendon rupture and neurological or vascular compromise including compartment syndrome. Further evaluation/consultation or urgent/emergency intervention may be indicated.
- Early consultation by a hand or upper limb specialist, rheumatologist, or other relevant specialist is recommended depending on the provider's training and experience in dealing with the particular disorder.

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■ Diagnostic Criteria and Differential Diagnosis

- The criteria presented in the Diagnostic Criteria for Hand, Wrist, or Forearm Disorders table (**Table 4**) list the probable diagnosis or injury, potential mechanism(s) of illness or injury, symptoms, signs, and appropriate tests and results to consider in assessment and treatment. This table can be found on page 16 of the MTG.

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■ Diagnostic Testing and Procedures

- One diagnostic imaging procedure may provide the same or distinctive information as obtained by other procedures. Therefore, prudent choice of procedure(s) for a single diagnostic procedure, a complementary procedure in combination with other procedures(s), or a proper sequential order in multiple procedures will ensure maximum diagnostic accuracy, minimize adverse effect to patients and promote cost effectiveness by avoiding duplication or redundancy.

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■ Diagnostic Testing and Procedures

- When a diagnostic procedure, in conjunction with clinical information, provides sufficient information to establish an accurate diagnosis, a second diagnostic procedure will be redundant if it is performed only for diagnostic purposes. At the same time, a subsequent diagnostic procedure can be a complementary diagnostic procedure if the first or preceding procedures, in conjunction with clinical information, cannot provide an accurate diagnosis.

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■ Diagnostic Testing and Procedures

- It is recognized that repeat imaging studies and other tests may be warranted by the clinical course and to follow the progress of treatment in some cases. It may be of value to repeat diagnostic procedures (e.g., imaging studies) during the course of care to:
 - Reassess or stage the pathology when there is progression of symptoms or findings,
 - Prior to surgical interventions and therapeutic injections when warranted, and
 - Post-operatively to follow the healing process.

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■ Medication General Guidelines

- For most patients, generic ibuprofen, naproxen, or other older generation nonsteroidal anti-inflammatory drugs (NSAIDs) are recommended as first-line medications. Second-line medications should include one of the other generic medications. Acetaminophen (or the analog paracetamol) may be a reasonable alternative for these patients, although most evidence suggests acetaminophen is modestly less effective. There is evidence that NSAIDs are as effective for relief of pain as opioids (and tramadol) and less impairing.
- See also: NY WC MTG for Non-Acute Pain

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■ Medication General Guidelines

- NSAIDs for patients at high risk of gastrointestinal bleeding
 - **Recommended** – Concomitant use of cytoprotective classes of drugs: misoprostol, sucralfate, histamine Type 2 receptor blockers, and proton pump inhibitors for patients at high risk of gastrointestinal bleeding.
 - At-risk patients include those with a history of prior gastrointestinal bleeding, elderly, diabetics, and cigarette smokers.

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■ Medication General Guidelines

- NSAIDs for patients at risk for cardiovascular adverse effects:
 - **Recommended** – Acetaminophen or aspirin as the first-line therapy appears to be the safest for high risk cardiovascular patients.
 - **Recommended** – If needed, NSAIDs that are non-selective are preferred over COX-2 specific drugs. In patients receiving low-dose aspirin for primary or secondary cardiovascular disease prevention, to minimize the potential for the NSAID to counteract the beneficial effects of aspirin, the NSAID should be taken at least 30 minutes after or eight hours before the daily aspirin.

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■ Carpal Tunnel Syndrome

- Diagnosis of Carpal Tunnel Syndrome (CTS) requires symptoms suggestive of median nerve entrapment at the wrist, supported by physical examination findings.
- Prior to surgery, confirmation of the diagnosis by electrodiagnostic studies (EDX) is required.
- It is recommended and preferred that EDX in the out-patient setting be performed and interpreted by physicians board certified in Neurology or Physical Medicine and Rehabilitation.
- Presence of severe symptoms of muscle weakness in the clinical context of a possible CTS diagnosis requires prompt consideration to EDX and surgical treatment.

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■ Carpal Tunnel Syndrome

- Physical Exam
- No single physical finding is diagnostic of CTS. Final diagnosis is dependent on a correlation of symptoms, physical exam findings, and EDX testing where appropriate, as any of these alone can be false positive or false negative. See the NY WC MTG for specific exam suggestions.
- The evaluation of any patient with suspected CTS should begin at the neck and upper back, proceed downward and include a neuro exam.

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■ Carpal Tunnel Syndrome

- Diagnostic Studies
 - **Not Recommended –**
 - EMG for initial evaluation of most patients with a clear diagnosis of CTS (confirming history and correlating clinical signs) as it will not alter the treatment plan.
 - EMG prior to glucocorticosteroid injection.
 - Use of hand-held/portable automated devices.
 - Surface EMG, ultrasound, MRI.

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■ Carpal Tunnel Syndrome

- Initial treatments
 - Initial treatment of CTS should begin with conservative measures including:
 - Medications such as over-the-counter NSAIDs, or other analgesics for symptomatic relief.
 - Wrist splint at night.
 - Restriction of activities such as forceful gripping, awkward wrist posture, and repetitive wrist motion.

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■ Carpal Tunnel Syndrome

- Systemic Glucocorticosteroids
 - **Recommended** – In select patients for the treatment of Acute, Subacute or Chronic CTS among patients who decline carpal tunnel injection.
 - Indication – CTS unresponsive to splinting. Most patients should be injected rather than given oral steroids. However, for patients declining injection, oral glucocorticosteroids may be warranted.
 - Frequency/Dose – It is recommended that one course (10 to 14 days) of oral glucocorticosteroids be prescribed rather than repeated courses. Prescriptions of low rather than high doses are recommended to minimize potential for adverse effects.

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■ Carpal Tunnel Syndrome

- Medications – See also Medication General Guidelines
 - **Recommended** – Lidocaine patches in select patients for treatment of acute, subacute, or chronic CTS with pain when other treatable causes of the pain have been eliminated and after more efficacious treatment strategies, such as splinting and glucocorticosteroid injection(s), have been attempted and failed.
 - **Not Recommended** – Gabapentin, vitamins, opioids for routine/chronic use.

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■ Carpal Tunnel Syndrome

- Rehabilitation
 - **Recommended** – Therapeutic exercise, ice/heat, phonophoresis, steroid injection.
 - **Not Recommended** – Yoga, biofeedback, diathermy, manipulation, acupuncture, magnets, pulse therapy, low level laser therapy, ultrasound, massage/therapeutic touch, Iontophoresis, IM injections, botulism injection, insulin injection.

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■ Carpal Tunnel Syndrome

- Surgery/Procedures
 - **Recommended** – Surgical release, open or endoscopic release.
 - **Not Recommended** – Epineurotomy, internal neurolysis, flexor retinacular lengthening, ulnar bursal preservation, ulnar Incisional approach, flexor tenosynovectomy, biopsy of abnormal tenosynovium, superficial nerve-sparing incision.

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■ Triangular Fibrocartilage Complex (TFCC) Tears

- Medical History
 - Non-radiating ulnar-sided pain and clicking. It is important to correlate the symptoms with the physical examination and mechanism of injury since MRI studies suggest TFCC tears are both prevalent while also apparently frequently asymptomatic. Ulnar deviation with axial loading tends to increase pain. A “click” or “clunk” in the ulnar wrist joint may be reproduced with forearm rotation (supination/pronation). Occupational cases will tend toward symptomatic onset after a discrete traumatic event such as a slip and fall.
 - The history should include ulnar wrist joint pain and a catching, snapping or popping sensation in the wrist with movement. The physical examination should reproduce these symptoms.

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■ Triangular Fibrocartilage Complex (TFCC) Tears

- Triangular fibrocartilage complex (TFCC) tears are frequent wrist injuries involving the cartilaginous meniscus between the radius and ulna with symptoms often described as occurring on the ulnar side of the wrist joint.
 - Physical Exam.
 - The exam may reveal dorso-ulnar wrist joint tenderness that is not focally tender over an extensor compartment. Swelling is generally not present, although it may be present with an acute, large tear. The examiner should generally attempt to reproduce catching or snapping in the ulnar wrist joint.

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■ Triangular Fibrocartilage Complex (TFCC) Tears

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 - The history should include ulnar wrist joint pain and a catching, snapping or popping sensation in the wrist with movement. The physical examination should reproduce these symptoms.

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■ Triangular Fibrocartilage Complex (TFCC) Tears

- Initial assessment
 - A primary focus of the initial assessment is ascertaining if the TFCC is significantly torn, and if so, determining if intervention is required.
 - Monitoring patient's symptoms for healing without immediate surgical intervention is generally the most common approach.
 - Some do not heal, continue to be symptomatic and do well with surgical repair or removal.

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■ Triangular Fibrocartilage Complex (TFCC) Tears

- Diagnostic studies
 - **Recommended** –
 - X-rays (once), MRI.
 - Arthroscopy (if continued wrist pain unresponsive to conservative management and the MRI does not reveal etiology).

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■ Triangular Fibrocartilage Complex (TFCC) Tears

■ Treatments

■ **Recommended** –

- Surgical repair (arthroscopic or open surgical repair) for select patients with instability, concomitant fractures, or symptoms that persist without trending towards resolution despite non-operative treatment and the passage of approximately three to six weeks.
- Ulna shortening and wafer procedures for chronic TFCC tears for select cases of chronic tears for which non-surgical treatment is unsuccessful and there is a demonstrable ulna positive variance.

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■ Triangular Fibrocartilage Complex (TFCC) Tears

- Rehabilitation modalities
 - **Recommended** –
 - Therapeutic exercise; rest, ice, compression, elevation (RICE); cryotherapy/heat; immobilization/splint in select patients.

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■ Crush Injuries and Compartment Syndrome

- Compartment syndrome is an emergency requiring urgent evaluation.
- Crush injuries that include compartment syndrome are usually surgical emergencies. Mild cases of crush injuries, such as contusions, may be treated similar to non-specific hand, wrist, forearm pain with particular emphasis on RICE.

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■ Crush Injuries and Compartment Syndrome

- Physical Exam
 - The physical examination ranges from mild abnormalities with mild injuries (e.g., contusions) to severe with fractures, limited range(s) of motion and neurovascular compromise.
- Medical History
 - Those with vascular compromise may have a cool extremity compared with the unaffected limb. Crush injuries have clear mechanisms of injury on history. However, there are many causes of compartment syndrome including trauma, excessive traction from fractures, tight casts, bleeding disorders, burns, snakebites, intra-arterial injections, infusions, and high-pressure injection injuries.

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■ Crush Injuries and Compartment Syndrome

- Initial assessment
 - Focus on the degree of injury severity and if the injury requires emergent surgical evaluation and treatment. Milder injuries may be managed non-operatively; however, the threshold for surgical consultation should be low. Those with milder injuries should be monitored for neurovascular compromise.

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■ Crush Injuries and Compartment Syndrome

- Diagnostic studies
 - **Recommended** – X-rays; MRI/CT scan for select patients without overt evidence of compartment syndrome.
- Treatment
 - **Recommended** – Emergency fasciotomy for release of tension from compartment syndromes and/or other surgical procedures for fractures/other remediable defects.

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■ Kienböck Disease

Kienböck disease of the wrist involves changes in the **lunate** that eventually lead to collapse of the lunate bone, which results in progressive pain and disability. Patients with Kienböck disease often develop chronic pain.

- Diagnostic studies
 - **Recommended** – X-rays, CT scan, MRI in select cases.

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■ Kienböck Disease

Additional Medications – See also General Medication Guidelines

- Topical Medications
 - **Recommended** – In select patients for treatment of pain associated with acute, subacute, or chronic Kienböck disease, including topical creams, ointments, and lidocaine patches (e.g., capsaicin, topical lidocaine, topical NSAIDs and topical salicylates and nonsalicylates).

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■ Kienböck Disease

- Rehabilitation
 - **Recommended** –
 - Therapeutic exercise – post-operative/recovery (not in acute phase).
 - Ice/heat/splints.
- Surgery
 - **Recommended** – As an option for patients with moderate to marked impairment if not improved eight weeks post-injury or after six weeks of non-operative treatment due to Kienböck disease. The choice of surgery is dependent upon staging of disease and discretion of the surgeon.

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■ Wrist Sprains

- Partially or totally disrupted ligaments typically occur with acute traumatic events and commonly result from slips, trips and falls. Often a *diagnosis of exclusion* among patients with pain in the setting of trauma in the absence of a fracture. Sprains may also occur in conjunction with fracture.

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■ Wrist Sprains

- Diagnostic studies
 - **Recommended** –
 - X-rays: to determine whether a fracture is present, particularly for patients with scaphoid pain or scaphoid tubercle tenderness.
 - CT scan: to determine whether a fracture is present, particularly for patients with scaphoid pain or scaphoid tubercle tenderness with negative X-rays.

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■ Wrist Sprains

- Diagnostic studies
 - **Recommended** – MR arthrography, for patients without improvement in wrist sprains after approximately six weeks of treatment, helpful to identify ligamentous issues such as scapholunate, lunotriquetral, and TFCC tears that may be diagnosed as simple sprains.

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■ Wrist Sprains

- Rehabilitation
 - **Recommended** – Therapeutic exercise for treatment of moderate or severe acute or subacute wrist sprains.
 - **Recommended** – Rest/ice/heat/splint.
- Surgery
 - **Not Recommended** – For treatment of acute or subacute wrist sprain in the absence of a remediable defect.

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■ Mallet Finger

- Common occupational injury, although it may occur with minimal apparent trauma. The injury involves rupture of the extensor mechanism of a digit at the distal upper extremity joint with or without fracture of the distal phalangeal segment.
- Mallet finger is readily diagnosed based on the presentation of inability to extend the distal interphalangeal joint, generally in the context of trauma or distal interphalangeal joint arthrosis.

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■ Mallet Finger

- Diagnostic studies
 - **Recommended** – X-rays to determine if fracture is present.
 - **Not Recommended** – CT scan, ultrasound, MRI.

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■ Mallet Finger

- Rehabilitation
 - **Recommended** – Passive therapy (splints).
 - **Not Recommended** – Therapeutic exercise.
- Surgery
 - **Not Recommended** – Surgery in general, except for select patients with displaced fractures when the DIP joint is subluxed.

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■ Flexor Tendon Entrapment (Tenosynovitis and Trigger Digit)

- Disorder characterized by snapping or locking of the thumb or fingers (with or without pain). Most cases are secondary to thickening of the digit's A1 pulley, but other pathogeneses are possible.

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■ Flexor Tendon Entrapment (Tenosynovitis and Trigger Digit)

- **Not Recommended –**

- Diagnostic studies: There are no special tests that are typically performed. X-rays are usually not helpful. The threshold for testing for confounding conditions such as diabetes mellitus, hypothyroidism and connective tissue disorders should be low particularly to prevent other morbidity.

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■ Flexor Tendon Entrapment (Tenosynovitis and Trigger Digit)

- Treatments
 - Injection Therapy
 - **Recommended** – Glucocorticosteroid injections (ultrasound guidance not recommended).
 - **Recommended** – Splints.

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- **Flexor Tendon Entrapment (Tenosynovitis and Trigger Digit)**
 - Rehabilitation
 - **Not Recommended** – Therapeutic exercise for acute cases and for most patients with flexor tendon entrapment, except for residual deficits post operatively.

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■ Flexor Tendon Entrapment (Tenosynovitis and Trigger Digit)

- Surgery
 - **Recommended** – For persistent or chronic flexor tendon entrapment (Trigger Finger) in patients who have been partially or temporarily responsive to two glucocorticosteroid injections. Those without any response should be evaluated carefully for possible alternate conditions. If there is no therapeutic response to two glucocorticosteroid injections in the presence of an obvious trigger finger, surgery may be appropriate.

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- **Extensor Compartment Tenosynovitis (including de Quervain's Stenosing Tenosynovitis and Intersection Syndrome)**
 - De Quervain's stenosing tenosynovitis may be occupational when jobs require repeated forceful gripping or sustained wrist extension. However, most cases are not likely occupational. De Quervain's is the most common of the extensor compartment tendinoses.
 - Diagnostic studies
 - **Not Recommended** – There are no special tests that are typically performed for extensor compartment tenosynovitis.

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- **Extensor Compartment Tenosynovitis (Including de Quervain's Stenosing Tenosynovitis and Intersection Syndrome)**
 - Treatment
 - Initial care usually involves limitation of the physical factors thought to be contributing.
 - **Recommended** – Thumb spica splints for de Quervain's and wrist braces for the other compartment tendinoses are generally believed to be helpful.
 - Rehabilitation
 - **Not Recommended** – Therapeutic Exercise except for residual defects.

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- **Extensor Compartment Tenosynovitis (Including de Quervain's Stenosing Tenosynovitis and Intersection Syndrome)**
 - Rehabilitation
 - **Recommended – Iontophoresis for Acute and Subacute injuries** using glucocorticosteroids and sometimes NSAIDs for select patients with wrist compartment tendinoses who either fail to respond adequately to NSAIDs, splints, and activity modifications or decline injection.

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- **Extensor Compartment Tenosynovitis (Including de Quervain's Stenosing Tenosynovitis and Intersection Syndrome)**
 - Rehabilitation
 - **Recommended** – Glucocorticosteroid injections for wrist compartment symptoms of pain.
 - **Not Recommended** – Manipulation and mobilization, massage, deep friction massage, or acupuncture.

Hand/Wrist/Forearm Training Module

- **Extensor Compartment Tenosynovitis (Including de Quervain's Stenosing Tenosynovitis and Intersection Syndrome)**
 - Surgery
 - **Recommended** – Surgical release for patients with subacute or chronic symptoms who fail to respond to two injections.

Hand/Wrist/Forearm Training Module

- **Ulnar Nerve Entrapment at the Wrist (including Guyon's Canal Syndrome and Hypothenar Hammer Syndrome)**
 - Involves delayed conduction of the ulnar nerve with associated symptoms. The location of the lesion affecting the ulnar nerve as it crosses through Guyon's canal and the wrist is predictive of clinical symptoms. This canal is dissimilar to the carpal canal in that the tendons and their tenosynovium do not accompany the nerve, thus most of the usual postulated causal mechanisms for carpal tunnel syndrome are not possible. However, use of the hypothenar area of the hand as a hammer is a postulated occupational mechanism.

Hand/Wrist/Forearm Training Module

- **Ulnar Nerve Entrapment at the Wrist (including Guyon's Canal Syndrome and Hypothenar Hammer Syndrome)**
 - Diagnostic studies
 - **Recommended** – Electrodiagnostic studies to confirm clinical suspicion of ulnar nerve entrapment at the wrist.
 - **Not Recommended** – MRI or ultrasound unless suspected soft-tissue mass. MRI is generally preferable for soft tissue masses such as ganglion cysts.

Hand/Wrist/Forearm Training Module

- Ulnar Nerve Entrapment at the Wrist (including Guyon's Canal Syndrome and Hypothenar Hammer Syndrome)
 - Diagnostic studies
 - **Recommended** – CT scan, *if* hook of the hamate fracture is suspected based upon the history, a mechanism of potential fracture, focal pain at the hamate and where there are ulnar nerve symptoms. CT scan is preferable for evaluation of fractures.

Hand/Wrist/Forearm Training Module

- **Ulnar Nerve Entrapment at the Wrist (including Guyon's Canal Syndrome and Hypothenar Hammer Syndrome)**
 - Treatments
 - **Recommended** – Neutral Wrist Splinting, as *first-line treatment*.
 - **Not Recommended** – Glucocorticosteroids, oral and/or injected.
 - Rehabilitation
 - **Not Recommended** – Therapeutic exercise, except post operatively and for unresolved deficits.
 - **Not Recommended** – Manipulation, iontophoresis, massage, acupuncture.

Hand/Wrist/Forearm Training Module

- **Ulnar Nerve Entrapment at the Wrist (including Guyon's Canal Syndrome and Hypothenar Hammer Syndrome)**
 - Surgery
 - **Recommended** – Surgical decompression after failure of non-operative treatment or if space-occupying lesions are present.

Hand/Wrist/Forearm Training Module

■ Radial Nerve Entrapment

- Usually presents as radial nerve palsies affecting the hand and wrist, most commonly occurring at points along the course of the arm and forearm, well proximal to the wrist. The medical history should include a search for sensory symptoms. Symptoms may also include pain over the course of the nerve, wrist extensor weakness and wrist drop.
- Diagnostic studies
 - **Recommended** – Electrodiagnostic studies to confirm clinical suspicion of a radial nerve motor neuropathy.
 - **Not Recommended** – Ultrasound.

Hand/Wrist/Forearm Training Module

■ Radial Nerve Entrapment

- Treatments

- **Recommended** – Splinting—wrist extension or thumb spica splint—for treatment of acute, subacute, or chronic radial nerve compression neuropathy.

Hand/Wrist/Forearm Training Module

■ Radial Nerve Entrapment

- Rehabilitation
 - **Recommended** – Therapeutic exercise to preserve function and post operatively.
 - **Recommended** – Ice/heat.
 - **Not Recommended** – Mobilization, acupuncture, iontophoresis, massage.

Hand/Wrist/Forearm Training Module

■ Radial Nerve Entrapment

- Surgery
 - **Recommended** – Surgical release for subacute or chronic cases of radial nerve compression neuropathy that persist despite other interventions.

Hand/Wrist/Forearm Training Module

■ Non-Specific Hand, Wrist and Forearm Pain

- Typically occurs in the absence of direct trauma. Instead, it frequently occurs in settings of high physical job demands or ill-defined exposures. Most cases will resolve. However, if there is no improvement after several weeks of treatment, *focused diagnostic testing* should be considered. Non-specific pain lasting more than two months is fairly rare. The search for a specific diagnosis should include proximal pathology including spine-related (e.g., radiculopathy, spinal tumor, infection), as well as psychological disorders particularly when widespread symptoms are elicited or a pattern or recurrent unexplained illnesses is present. Patients most commonly give a history of gradual onset of pain or other symptoms in the absence of direct trauma. Symptoms are most often in the forearm, and frequently are not well localized.

Hand/Wrist/Forearm Training Module

■ Non-Specific Hand, Wrist and Forearm Pain

- Diagnostic studies
 - **Recommended** –
 - Rheumatological studies for evaluation of select patients with persistent unexplained arthralgias or tenosynovitis.
 - ***Frequency/Duration*** – Repeat studies may be required after passage of time as some patients, particularly those with less severe diseases, tend to develop positive anti-bodies after months to years.

Hand/Wrist/Forearm Training Module

■ Non-Specific Hand, Wrist and Forearm Pain

- Diagnostic studies
 - **Recommended** – Arthrocentesis for joint effusions in inexplicable joint effusions, particularly for evaluation of infections and crystalline arthropathies.
 - **Recommended** – Electrodiagnostic to evaluate non-specific hand, wrist, or forearm pain for patients with paresthesia or other neurological symptoms. Providers are cautioned that the prevalence rate of abnormal electrodiagnostic studies in asymptomatic populations are high and interpretations of abnormal results should be correlated with clinical findings.
 - **Frequency/Dose** – Should generally be performed at least three weeks after symptom onset.

Hand/Wrist/Forearm Training Module

■ Non-Specific Hand, Wrist and Forearm Pain

- Diagnostic studies
 - **Recommended** – X-rays for evaluation of cases in which non-specific hand, wrist, or forearm pain persists.

Hand/Wrist/Forearm Training Module

■ Non-Specific Hand, Wrist and Forearm Pain

■ Treatments

- **Recommended** – Relative rest in select cases of acute non-specific hand, wrist, or forearm pain, particularly where there are high ergonomic exposures (high force or high force combined with other risk factors).
- **Recommended** – Splinting for treatment of select patients with acute or subacute non-specific hand, wrist, or forearm pain.
- **Not Recommended** – For chronic use since reinforces debility.

Hand/Wrist/Forearm Training Module

■ Non-Specific Hand, Wrist and Forearm Pain

- Rehabilitation
 - **Recommended** – Therapeutic exercise for treatment of acute, subacute, or chronic symptoms.
 - **Recommended** – Ice/heat.

Hand/Wrist/Forearm Training Module

■ Scaphoid Fracture

- Also known as wrist navicular fractures, scaphoid fractures are among the most common fractures of the carpal bones. Most are not occupational, but some clearly are work-related. The primary mechanism is a fall on the outstretched hand, or from axial loading with a closed fist such as grasping a steering wheel in an auto accident. They are prone to non-union and avascular necrosis, particularly those involving the proximal third of the navicular, and especially if displaced. Healing problems in the proximal third have been attributed to limited blood supply that is disrupted by the fracture plane.

Hand/Wrist/Forearm Training Module

■ Scaphoid Fracture

- The main initial tasks are to confirm a fracture, identify those patients with fractures best treated with surgery, and treat those with a high clinical suspicion of fracture with appropriate splinting. Patients frequently complain of persistent swelling and tenderness near the thumb base in the area of the scaphoid.

Hand/Wrist/Forearm Training Module

■ Scaphoid Fracture

- Diagnostic studies
 - **Recommended** – X-rays for diagnostic purposes that include at least three to four views including a “scaphoid view.” Follow up in two weeks is negative imaging and still symptomatic.
 - **Recommended** – MRI or bone scan in select patients for diagnosis of occult scaphoid fractures when clinical suspicion remains high despite negative X-rays.
 - **Recommended** – CT scan if MRI contraindicated.

Hand/Wrist/Forearm Training Module

■ Scaphoid Fracture

- Treatments
 - **Recommended** – Splinting—these fractures heal well due to adequate blood supply.
 - **Recommended** – Cast immobilization for treatment of stable non displaced scaphoid fractures.
 - ***Frequency/Duration*** – Casting should be performed for six to eight weeks with cast removal clinical reevaluation, and re-X-ray to determine whether additional casting is required.

Hand/Wrist/Forearm Training Module

■ Scaphoid Fracture

- Treatments
 - **Recommended** – Thumb immobilization with spica casting; concurrent immobilization of the thumb with the wrist.
 - **Recommended** – Spica splint for patients with suspicion of scaphoid fracture, but with negative X-rays.

Hand/Wrist/Forearm Training Module

■ Scaphoid Fracture

- Rehabilitation
 - **Recommended** – Therapeutic exercise for post-operative care.
- Surgery
 - **Recommended** – Surgical fixation for displaced scaphoid fractures.
 - **Not Recommended** – For non displaced fractures unless athlete or other urgency for healing/stabilization.
 - High-risk scaphoid fractures should be promptly referred to hand or orthopedic surgical specialists for definitive treatment because of the higher risk of these fractures developing a nonunion, malunion, or degenerative joint disease.

Hand/Wrist/Forearm Training Module

■ Distal Phalanx Fractures and Subungual Hematoma

- Fingertip or distal phalangeal fractures are frequently cited as the most common fractures of the hand, with the tuft being the most common.
 - Tuft fractures are most often due to a crush injury of the fingertip, resulting in comminuted or transverse fractures and are a common occupational injury. Often, they are accompanied with nail bed laceration and subungual hematoma. Tuft fractures are generally stable and heal uneventfully because of the soft tissue support of the fibrous septae and nail plate.

Hand/Wrist/Forearm Training Module

■ Distal Phalanx Fractures and Subungual Hematoma

- Crush fractures or avulsion fractures involving the proximal base of the distal phalanx, however, may also involve flexor or extensor tendons and may require surgical intervention.
- Mallet fracture or mallet finger is a common injury of the distal phalanx involving loss of continuity of the extensor tendon over the distal interphalangeal joint.
- Subungual Hematoma occurs when blood is trapped under the nail after trauma.

Hand/Wrist/Forearm Training Module

■ Distal Phalanx Fractures and Subungual Hematoma

- Diagnostic studies
 - **Recommended** – X-rays.
 - **Not Recommended** – MRI, CT scan, ultrasound, bone scan imaging.
- Medications
 - **Recommended** – Tetanus immunization for wounds that are not clean or burns if more than five years have elapsed since last tetanus immunization.
 - **Not Recommended** – Antibiotic prophylaxis post-trephination for open fractures.

Hand/Wrist/Forearm Training Module

■ Distal Phalanx Fractures and Subungual Hematoma

- Treatment/Surgery
 - **Recommended** –
 - Lacerations: Trephination, reduction or removal of the nail plate under the eponychium.
 - Fractures: Protective splinting of the distal phalanx to the PIP.
 - Surgical fixation: If extremely displaced, unable to be reduced or are unstable. Retrograde percutaneous Kirschner-wire fixation is the preferred internal fixation technique.

Hand/Wrist/Forearm Training Module

■ Middle and Proximal Phalangeal and Metacarpal Fractures

- Fractures of the proximal and middle phalanges represent approximately 46% of fractures of the hand and wrist. Fortunately, most are uncomplicated and are non-surgical cases.
- Metacarpal fractures comprise roughly 1/3 of hand fractures, with fifth metacarpal neck fractures (sometimes called “Boxer’s fracture”) accounting for 1/3 to 1/2 of these injuries, and fractures of the thumb constituting another 25%.

Hand/Wrist/Forearm Training Module

■ Middle and Proximal Phalangeal and Metacarpal Fractures

- Improper management may result in permanent impairment and disability from bone shortening, permanent angulation, joint and finger stiffness, and loss of hand function. Proximal phalangeal fractures particularly have a significant potential for hand impairment particularly if sub optimally managed because of the importance of this bone in longitudinal transfer of axial forces between the carpal and distal phalangeal joints, and the PIP joint for digit mobility. Decisions for surgical intervention should be offered upon careful consideration, balancing risk of superior radiographic reduction with higher risk of debilitating stiffness from the post-operative rehabilitative state, with confidence that non-operative therapy can be improved upon.

Hand/Wrist/Forearm Training Module

■ Middle and Proximal Phalangeal and Metacarpal Fractures

- Diagnostic studies
 - **Recommended** – X-rays should include three projections, including a posteroanterior, lateral, and oblique view. A true lateral projection isolating the involved digit is required.
 - **Not Recommended** – MRI, CT scan, ultrasound, or bone scan.

Hand/Wrist/Forearm Training Module

■ Middle and Proximal Phalangeal and Metacarpal Fractures

- Initial Management
 - Treatment of soft tissue injuries and pain control following completion of physical examination.
 - Immobilization or fixation technique is dictated by the physical and radiographic findings. More than 90% of phalangeal fractures can be managed non-operatively. Non-operative management techniques include padded aluminum splints, buddy tape, functional splinting, and gutter casting. Base phalanx splinting may require closed reduction prior to splinting.

Hand/Wrist/Forearm Training Module

■ Middle and Proximal Phalangeal and Metacarpal Fractures

- Rehabilitation
 - **Recommended** – Therapeutic exercise, ice, elevation, compression.
- Surgery
 - See the NY WC MTG for specific fracture management.

Hand/Wrist/Forearm Training Module

■ Distal Forearm Fractures

- There are several types of distal forearm fractures in adults, the most common being Colles' fracture. The distinguishing feature for Colles' fracture is that fracture fragments are displaced or angulated dorsally on a lateral view X-ray. Other adult distal radial fractures include displaced fracture fragments that have an anterior angulation and displaced fracture fragments that are displaced palmarly and may have an anterior angulation. Despite the severity of these injuries, with proper diagnosis and management most patients will have a satisfactory outcome.
- Distal radial fractures are the result of traumatic forces, most commonly related to falling on the outstretched hand. The typical mechanism for Colles' fracture is breaking the fall with the hand outstretched and wrist in dorsiflexion, although a minority occur due to an impact on the dorsal aspect of the hand while the wrist is flexed (jam injury into the dorsum of hand) or a direct blow to the radial styloid.

Hand/Wrist/Forearm Training Module

■ Distal Forearm Fractures

- Wrist injuries associated with significant pain, swelling, ecchymosis, crepitus, or deformity should be considered to be fractured until proven otherwise. Forearm fractures may also result in concomitant vascular, neurological, ligament and tendon injuries. Further, as distal forearm fractures are the result of trauma, careful inspection for other traumatic injuries should be included, such as elbow, shoulder, neck, head, and hip. In general, most distal forearm fractures should be managed by an orthopedic or hand surgeon and consultation is recommended.

Hand/Wrist/Forearm Training Module

■ Distal Forearm Fractures

- Diagnostic studies
 - **Recommended** – X-rays as a first-line study for suspected distal forearm fractures; posterior-anterior, lateral and, if available, oblique views are recommended.
 - **Recommended** – Contralateral wrist X-ray images should be considered as a comparison that may improve reliability of some radiographic measurements.

Hand/Wrist/Forearm Training Module

■ Distal Forearm Fractures

- **Recommended –**
 - MRI to diagnose suspected soft-tissue trauma after X-ray images confirm a complex displaced, unstable, or comminuted distal forearm fracture.
 - **Indication** – X-ray confirmation of complex displaced, unstable, or comminuted distal forearm fracture.
 - **Rationale for Recommendation** – Upon confirmation of displaced, comminuted or unstable fracture, MRI may be an important diagnostic technique for the evaluation of suspected injuries of soft tissues related to distal radius fractures, such as to the flexor and extensor tendons or the median nerve. Other potential indications include identification of triangular fibrocartilage complex perforations, ruptures of carpal ligaments, and demonstration of contents of the carpal tunnel.

Hand/Wrist/Forearm Training Module

■ Distal Forearm Fractures

- **Recommended** – CT scan for investigation of occult and complex distal forearm fractures to gain greater clarity of fracture displacement, articular involvement, and subluxation of the distal radioulnar joint.
- **Indication** – Negative X-rays with occult fracture strongly suspected.
- **Rationale for Recommendation** – In contrast to MRI, CT scan should be considered when X-ray images are negative but an occult fracture is strongly suspected on the basis of physical findings. CT scan may also be useful for evaluation of complex comminuted fractures, providing superior depiction of distal radial articular surface involvement, fragment positioning, and diagnosis of subluxations of the distal radioulnar joint.

Hand/Wrist/Forearm Training Module

■ Distal Forearm Fractures

- Treatments/Surgery
 - **Recommended** –
 - **Non-displaced fractures:** immobilization/casting.
 - **Displaced fractures:** closed reduction and casting.
 - **Severely displaced fractures:** medullary pinning, intramedullary fixation, open reduction internal fixation.
 - Rehabilitation
 - **Recommended** – Therapeutic exercise.

Hand/Wrist/Forearm Training Module

■ Ganglion Cyst

- Ganglion cysts occur in nearly any joint of the hand and wrist. They account for 50 to 70% of all wrist masses identified and most are asymptomatic. Other causes include giant cell tumors also known as localized nodular tenosynovitis and fibrous xanthoma, epidermal inclusion cysts and fibromas.

Hand/Wrist/Forearm Training Module

■ Ganglion Cyst

- Diagnostic studies
 - **Recommended** –
 - Xray - only in the setting of trauma.
 - MRI- if pain >3 weeks despite treatment-to evaluate for synovitis.
 - Ultrasound - if MRI needed but contraindicated.
- Treatments
 - **Recommended** – Non surgical if asymptomatic. Simple aspiration for pain.

Hand/Wrist/Forearm Training Module

■ Ganglion Cyst

- Treatment
 - **Not Recommended** – Aspiration with steroids, multiple punctures, splinting, injections.
- Rehabilitation
 - Only if significant residual post operative symptoms.
- Surgery
 - Only in select patients.

Hand/Wrist/Forearm Training Module

■ Hand/Arm Vibration Syndrome (HAVS)

- The constellation of adverse physiological responses causally associated with high-amplitude vibratory forces, such as those experienced through the use of various hand tools including pneumatic drills, riveters and chain saws or from vibratory rich activities such as driving off-road vehicles.
- The adverse effects of HAVS are characterized by circulatory disturbances associated with digital arteriole sclerosis and manifest as vasospasm with local finger blanching; sensory and motor disturbances manifest as numbness, loss of finger coordination and dexterity, clumsiness and inability to perform intricate tasks; and musculoskeletal disturbances manifest as swelling of the fingers, bone cysts and vacuoles.

Hand/Wrist/Forearm Training Module

■ Hand/Arm Vibration Syndrome (HAVS)

- Epidemiologic evidence indicates there is a latency period of from 1 to 16 years of exposure before onset of HAVS, with a trend for decreasing prevalence as changes in work practice and anti-vibratory tools and dampening actions have been implemented.
- The pathophysiologic changes related to vibration are initially reversible, but with increasing duration and intensity of exposure, the disorder may continue to progress or become permanent.

Hand/Wrist/Forearm Training Module

■ Hand/Arm Vibration Syndrome (HAVS)

■ Treatments

- The most prudent form of treatment is to first remove or reduce the exposure to vibration.
- Smoking cessation: Smoking has been identified as a risk factor for HAVS.
- Other common advice based on the proposed pathophysiology of vasospasm includes avoidance of beta-blockers, sympathetic stimulants, including caffeine, decongestants and amphetamines, as they may act as potential triggers. Further, maintenance of hand and body temperature in cold environments may help avoid or reduce the risk of symptoms.

Hand/Wrist/Forearm Training Module

■ Hand/Arm Vibration Syndrome (HAVS)

- Rehabilitation
 - **Recommended** – Therapeutic exercise for the treatment of functional deficits related to HAVS, and acute, subacute, chronic, or post-operative crush injuries.
- Work activities
 - Restricted to those tasks that do not involve high-amplitude, low-frequency vibration exposures from hand-held tools. For some patients, tasks that do not involve cold exposures.

Hand/Wrist/Forearm Training Module

■ Laceration Management

- The primary purpose of wound and laceration management is to avoid infection, detect if a nerve injury has occurred, manage tendon lacerations, and achieve a cosmetically acceptable result with the highest degree of function and patient satisfaction.
- Diagnostic studies
 - **Recommended** – X-rays if from trauma, if foreign body suspected.
 - **Not Recommended** – CT scan.

Hand/Wrist/Forearm Training Module

■ Human Bites, Animal Bites and Associated Lacerations

- Although most bites occur from animals known to the victim, occupations that may be at higher risk for animal bites include veterinarians, animal handlers, police officers, utility services personnel who access private property, mail carriers, and other similar professions. Human bites are common in care givers, educators, law enforcement officers, and in instances of accident or workplace violence that may involve the fist or hand being cut by contact with teeth.

Hand/Wrist/Forearm Training Module

■ Human Bites, Animal Bites and Associated Lacerations

- Other than deep destruction of tissue requiring reconstruction, risk of infection is the primary concern for animal bites. There also are other zoonotic diseases such as rabies, cat scratch fever, and human blood-borne pathogen exposures that should also be considered. Rates may be higher for wounds of the hand, depth of penetration into the skin, and length of time before wound is irrigated and cleaned. For purposes of this guideline, discussion and recommendations are made based on bites and/or contact with saliva regarding rabies risk to the extremities or trunk.

Hand/Wrist/Forearm Training Module

■ Human Bites, Animal Bites and Associated Lacerations

- Physical exam
 - A careful history for time and location of the bite and/or contact with saliva should be obtained as it will help guide clinical decisions regarding prophylaxis. If possible, information about the type of animal and its health status as well as the circumstances related to why the bite occurred should be obtained. Tetanus and rabies immunization status should be established and prophylaxis given if indicated.

Hand/Wrist/Forearm Training Module

■ Human Bites, Animal Bites and Associated Lacerations

- A detailed medical history pertaining to tetanus, and in the case of animal bites, exposure to saliva, rabies immunization status, and underlying medical conditions such as diabetes mellitus or other immune-compromising conditions is important. Tetanus immunization and rabies prophylaxis should be given per CDC guidelines. Most bite wounds are puncture wounds, but some may be considered for suturing.

Hand/Wrist/Forearm Training Module

■ Human Bites, Animal Bites and Associated Lacerations

- Diagnostic studies
 - **Not Recommended** – Routine wound culture and sensitivity
- Treatment
 - **Recommended** – Human bites that could be considered high risk for viral blood-borne pathogen transmission should be evaluated and treated according to blood-borne pathogen protocols.
 - **Recommended** – Prophylactic antibiotics for animal and human bite wounds.

Hand/Wrist/Forearm Training Module

■ Hand/Finger Osteoarthritis

- For most purposes, a history and physical examination is sufficient but sometimes X-rays are used. X-rays may be used to document the degree and extent of involvement. However, X-rays can be negative in those with symptomatic osteoarthrosis or may demonstrate evidence of disease among those who are asymptomatic.

Hand/Wrist/Forearm Training Module

■ Hand/Finger Osteoarthritis

- Alternative therapies
 - **Recommended** – Capsaicin for treatment of chronic or acute flares.
 - **Not Recommended** – Glucosamine, chondroitin sulfate, methyl-sulfonyl methane, diacerein (diacerhein, diacetylrhein), harpagophytum, avocado, soybean unsaponifiables, ginger, oral enzymes, and rose hips are often classified as complementary and alternative therapies that are sometimes used by patients for treatment of osteoarthritis.

Hand/Wrist/Forearm Training Module

■ Hand/Finger Osteoarthritis

- Treatments
 - **Recommended** – Splinting for acute flares or chronic symptoms.
- Injection therapies
 - **Recommended** – Intra-articular glucocorticosteroid injections in select patients for the treatment of subacute or chronic symptoms.
 - **Indications** – Moderately severe or severe hand osteoarthrosis pain with insufficient control with NSAIDs, acetaminophen, and potentially splinting and/or exercise. Its usual purpose is to gain sufficient relief to either resume medical management or to delay operative intervention.

Hand/Wrist/Forearm Training Module

■ Hand/Finger Osteoarthritis

- Injection therapies
 - **Recommended** – Intra-articular hyaluronate injection in select patients for the treatment of subacute or chronic symptoms where other treatments have failed.
 - **Not Recommended** – Prolotherapy injections.
- Rehabilitation
 - **Recommended** – Therapeutic exercise, ice, heat.
 - **Not Recommended** – Low-level laser therapy.

Hand/Wrist/Forearm Training Module

■ Hand/Finger Osteoarthritis

■ Surgeries

- Various surgical procedures are utilized to treat patients with hand osteoarthrosis. Among these are arthrodesis, arthroplasty and various other reconstructive procedures.
- **Recommended** – Reconstructive surgery for treatment of select patients with trapeziometacarpal arthrosis.
- **Recommended** – Trapeziectomy for treatment of thumb CMC joint osteoarthritis. The alternative approaches are at the discretion of the surgeon.
- **Recommended** – Fusion for treatment of select patients.

Hand/Wrist/Forearm Training Module

■ Dupuytren's Disease

- There is insufficient evidence relating Dupuytren's disease to occupational activities.
- Dupuytren's disease is a disorder of the hand involving the formation of fibrosis (scar tissue) in the palm and digits with subsequent contractures. It has strong age and inheritance patterns. Purported risks include the use of alcohol, smoking, diabetes mellitus, and epilepsy. There are some reported associations with both heavy and manual work. For additional information, this disorder is included as an appendix to the *NY WC MTG for Hand, Wrist, and Forearm Injuries*.

Hand/Wrist/Forearm Training Module

- For additional questions, please email MTGTrainings@wcb.ny.gov.

Thank You