Rheumatoid Arthritis: Wrist and Hand

Indexing Metadata/Description

› Title/condition: Rheumatoid Arthritis: Wrist and Hand
› Synonyms: Arthritis, rheumatoid: wrist and hand; wrist and hand rheumatoid arthritis; hand and wrist rheumatoid arthritis
› Area(s) of specialty: Hand Therapy, Orthopedic Rehabilitation
› Anatomical location/body part affected: This Clinical Review focuses on rheumatoid arthritis (RA) of the wrist and hand
› Description
• An autoimmune disorder involving chronic inflammatory arthritis typically affecting many joints (polyarthritis)\(^8\)
• A disease in which the hallmark feature is chronic inflammation, primarily impacting the synovium of joints; other organs and systems (e.g., eyes, kidneys, gastrointestinal tract) may also be impacted\(^11,12\)
• Characterized by periods of exacerbations and remissions\(^1\)
• Inflammatory changes can also occur in the tendon sheaths leading to tenosynovitis, which may lead to tendons fraying or rupturing\(^1\)
• There is a high prevalence of hand and wrist symptoms and impairments with this disease
  – Wrists (85%), proximal interphalangeal (PIP) joints (65%), and metacarpophalangeal (MCP) joints (80%) are commonly affected\(^8\)
• For more information, please see:
  – Clinical Review…Rheumatoid Arthritis; CINAHL Topic ID Number: T708757
  – Clinical Review…Juvenile Idiopathic Arthritis (Occupational Therapy); CINAHL Topic ID Number: T708958
› ICD-10 codes
• M05 seropositive rheumatoid arthritis
  – M05.0 Felty's syndrome
  – M05.1 rheumatoid lung disease, such as
    - J99.0 rheumatoid lung disease
  – M05.2 rheumatoid vasculitis
  – M05.3 rheumatoid arthritis with involvement of other organs and systems, such as
    - G63.6 polyneuropathy in other musculoskeletal disorders
    - G73.7 myopathy in other diseases classified elsewhere
    - I32.8 pericarditis in other diseases classified elsewhere
    - I39 endocarditis and heart valve disorders in diseases classified elsewhere
      - I39.0 mitral valve disorders in diseases classified elsewhere
      - I39.1 aortic valve disorders in diseases classified elsewhere
      - I39.2 tricuspid valve disorders in diseases classified elsewhere
      - I39.3 pulmonary valve disorders in diseases classified elsewhere
      - I39.4 multiple valve disorders in diseases classified elsewhere
      - I39.8 endocarditis, valve unspecified, in diseases classified elsewhere
      - I41.8 myocarditis in other diseases classified elsewhere
      - I52.8 other heart disorders in other diseases classified elsewhere
    - I52.8 other heart disorders in other diseases classified elsewhere

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- M05.8 other seropositive rheumatoid arthritis
- M05.9 seropositive rheumatoid arthritis, unspecified

• M06 other rheumatoid arthritis
  - M06.0 seronegative rheumatoid arthritis
  - M06.1 adult-onset Still's disease
  - M06.2 rheumatoid bursitis
  - M06.3 rheumatoid nodule
  - M06.4 inflammatory polyarthropathy
  - M06.8 other specified rheumatoid arthritis
  - M06.9 rheumatoid arthritis, unspecified

• Optional subclassification codes to indicate site of involvement for M05, M06
  - 0 multiple sites
  - 3 forearm
  - 4 hand
  - 8 other
  - 9 site unspecified

› (ICD codes are provided for the reader’s reference, not for billing purposes)
› Reimbursement: No specific issues or information regarding reimbursement has been identified
› Presentation/signs and symptoms
  • Presentation\(^{(12)}\)
    - Involves synovial joints
    - Typically, presentation is bilateral
    - Generally progresses from the small joints of the body (e.g., MCP joints) to larger joints (e.g., elbow)
    - Other organ systems that may be impacted include (but are not limited to) the pulmonary, cardiac, visual, and integumentary systems
  • General symptoms of RA\(^{(12)}\)
    - Low fever, malaise, fatigue, weight loss, anorexia
    - Widespread pain, myalgia, weakness, arthralgia
    - Joints that are tender/painful, edematous, and inflamed
  • Symptoms of RA specific to the wrist and hand\(^{(2)}\)
    - Pain, edema, stiffness (upon waking), and erythema
    - Limitations in hand function
    - Decreased grip strength
    - Deformities within the hand may develop and are progressive. Common deformities include
      - ulnar deviation at MCPs
      - radial deviation at wrist
      - swan-neck deformity (hyperextension of PIP joint with flexion contracture of the distal interphalangeal [DIP] joint)
      - boutonniere deformity (flexion contracture of PIP joint with hyperextension of DIP joint)
      - subluxation of carpals or phalanges
  • Symptoms according to stage of RA specific to the wrist and hand\(^{(1)}\)
    - Acute stage
      - Edema, pain, restricted ROM, and increased temperature of the involved joints
      - Reduced muscular strength
      - Carpal tunnel syndrome
      - Reduced muscular endurance
    - Advanced stages
      - Joint instability
      - Subluxations
      - Deformities
Causes, Pathogenesis, & Risk Factors

› Causes
• The underlying cause of RA is largely unknown(2)
• “Familial clustering” and twin studies have shown that 50% of risk for RA is due to genetic factors(16)

› Pathogenesis
• Synovitis occurs(2)
  – The cells within the synovium secrete enzymes which break down cartilage and bone
• Joint enlargement occurs and is prolonged(8)
  – Synovial fluid is created in disproportionate amounts
  – The joint capsule and ligaments become weakened, causing joint instability
• Pannus (i.e., an abnormal layer of granulation or fibrovascular tissue) develops, devastationg the surrounding tissues(3)
• Scar tissue may result, causing the fixation of joints(2) or abnormal movements; weakened structures lead to joint deformity
• Rheumatoid factor (RF) might be found in serum(15)
  – Present in 85% of patients with RA
  – RF is not specific to RA and might be seen in patients with other conditions such as lupus or chronic osteomyelitis
• In early RA, the initial damage as well as the rate of progression of damage in the hand and wrist was higher on the dominant side in a Korean cohort of 194 patients. Based on these findings, the authors concluded that mechanical stress might contribute to the progression of joint destruction(15)
• A cohort study of 314 patients with both foot and hand involvement was conducted by researchers in Japan. The researchers concluded that, in patients with both foot and hand involvement, although joint damage began earlier in the feet the disease progressed faster in the wrist(16)

› Risk factors(4)
• Female gender (prevalence among women 2.5 times higher than men)
• Age (can occur at any age; most common between 40 to 60 years of age)
• Family history of RA
• Environmental exposures – exposure to materials such as asbestos and silica is believed to increase risk of RA
• Obesity

Overall Contraindications/Precautions

› General considerations when treating an individual with RA(1)
• The treating therapist should be experienced and have a good understanding of the disease process and the stages of rheumatoid arthritis, as well as possible deformities
• When possible, the wrist and hand should be treated by a certified hand specialist or an experienced hand therapist
• Obtain written consent from parent/guardian before treating minors
• Activity should cease if the patient feels pain or reports fatigue
  – Prevent fatigue and pain as able; maintain equilibrium between interventions/activity and rest
  - Implement small bursts of exercise throughout the day (as opposed to extended bouts of exercise)
  - Rotate interventions to circumvent fatigue
  - Reduce the intensity of the intervention or eliminate aggravating interventions as indicated by pain (if pain comes on and lasts for more than 1 hour, the intervention should be modified or stopped altogether)
• Activity must not result in undue stress on an already taxed musculoskeletal system
  – Change positions often
  – Do not stretch muscles that cross over joints that are swollen
  – Vigorous stretching and vigorous manipulative procedures are contraindicated
  – Stretching and joint mobilization require cautious implementation; the intensity of the procedures must be weighed against the disease state and potentially fragile soft tissue
  – Prevent the loss of ROM, strength, and endurance as able
  – During an acute flare-up, rest should be prolonged as indicated
  – Do not spend time in positions that encourage deformity (e.g., avoid ulnar deviation of the digits)
  – Encourage work from larger muscles and joints as able (e.g., use of a shoulder bag versus a clutch purse)
• Encourage compliance with prescribed equipment
  › See specific Contraindications/precautions to examination and Contraindications/precautions under Assessment/Plan of Care

Examination

Contraindications/precautions to examination
• Resistive manual muscle testing is contraindicated during acute flare-ups of the disease\(^3\)

History

History of present illness/injury
  – Mechanism of injury or etiology of illness
  - The onset and natural progression of RA can vary, with three typical courses most commonly seen\(^8\)
    - Monocyclic – one episode lasting 2–5 years and not recurring (20% of cases)
    - Polycyclic – RA lasting many years with fluctuations in disease activity throughout the course (75% of cases)
    - Progressive – onset and progression of RA that is rapid, severe, and unremitting (5% of cases)
  - Patients with RA may have a slowly progressive or variable course; flares in the disease are typical
  - Joints affected by RA usually remain affected (i.e., RA continues to attack the joints initially involved, in addition to any new joints affected by the condition)
  - Within the first year of disease onset, almost all of the joints (~90%) that are going to be affected become symptomatic

Course of treatment
- Medical management: May include rehabilitation, medication, recommendations for diet and exercise, surgery, and referral to specialists as indicated

- Medications for current illness/injury: Medications may include but are not limited to the following:
  - Pain medications
  - Inflammation\(^{12}\)
    - Short term – corticosteroid injections, oral corticosteroids
    - Long term – disease-modifying antirheumatic drugs (DMARDs) including sulfasalazine or minocycline and methotrexate, as well as anti-cytokines (a.k.a. biologics) such as tumor necrosis factor (TNF) alpha antagonists (e.g., etanercept, infliximab) used alone or in combination with DMARDs (more effective when used in combination)
  - Corticosteroids as a treatment intervention for RA are effective in some patients, typically those without the following “poor prognostic factors”\(^{12}\)
    - High-titer RF
    - Early bone erosion
    - Many affected joints
    - Extra-articular involvement
    - Significant physical disability at onset
  - Inquire whether patient is compliant with the medication regimen and whether or not medications are effective

- Diagnostic tests completed
  - The American College of Rheumatology/European League Against Rheumatism 2010 classification criteria for RA include: \(^{19}\)
    - A score-based algorithm -- add score of categories A-D; a score of ≥ 6/10 is needed for classification of a patient as having definite RA
      - A. Joint involvement
        - 1 large joint (shoulder, elbow, hip, knee, ankle) – 0 points
        - 2–10 large joints – 1 point
        - 1–3 small joints (with or without involvement of large joints) – 2 points
        - 4–10 small joints (with or without involvement of large joints) – 3 points
        - > 10 joints (at least 1 small joint) – 5 points
      - B. Serology (at least 1 test result is needed for classification)
        - Negative RF and negative ACPA – 0 points
        - Low-positive RF or low-positive ACPA – 2 points
        - High-positive RF or high-positive ACPA – 3 points
      - C. Acute-phase reactants (at least 1 test result is needed for classification)
- Normal CRP and normal ESR – 0 points
- Abnormal CRP or abnormal ESR – 1 point
- D. Duration of symptoms
  - < 6 weeks – 0 points
  - ≥ 6 weeks – 1 point
- Diagnostic testing can be suggestive of RA and may consist of arthrocentesis, radiographs, and laboratory tests (e.g., assessing for rheumatoid factor, anti-cyclic citrullinated peptide antibodies)\(^{12}\)
- It is recommended that conventional radiology of the hands and feet be used as the initial imaging technique to detect damage, but ultrasound and/or MRI should be considered if conventional radiographs do not show damage and may be used to detect damage at an earlier point in time, especially in early RA\(^{9}\)
- Prior to surgery, or if the patient complains of neck pain, severe fatigue, numbness of bilateral upper extremities, or incontinence, radiographs with the cervical spine in flexion (to rule out odontoid ligament laxity) should be taken because of the special care needed during intubation\(^{12}\)

- **Home remedies/alternative therapies:** Document any use of home remedies or alternative therapies (e.g., acupuncture) and whether or not they help. Home remedies commonly used for RA include ice, moist heat, magnets, gold bracelets, massage, relaxation techniques, herbs, natural supplements, and diet modifications. The scientific rationale and potential side effects of many commonly used remedies have not been established
- Acupuncture for RA of the hand has been associated with significant improvements in pain, strength, health status, quality of life, and joint swelling and tenderness\(^{24}\)

- **Previous therapy:** Document whether patient has had occupational or physical therapy for this or other conditions and what specific treatments were helpful or not helpful. Document what RA-specific patient education was included in prior therapy

- **Aggravating/easing factors:** Are there any specific activities or positions that aggravate or ease symptoms? Include length of time each item is performed before joint and/or systemic symptoms (including stiffness and fatigue) come on or are eased

- **Body chart:** Use body chart to document location and nature of symptoms
- Joint counts (of tender and/or swollen joints) are often reported on a homunculus-style figure
- Damaged joints, deformities may be recorded on the same figure

- **Nature of symptoms:** Document nature of symptoms (e.g., constant vs intermittent, sharp, dull, aching, burning, numbness, tingling). Patients commonly complain of pain and stiffness
  - Morning stiffness (gelling)\(^{13}\)
    - Stiffness often lasts > 1 hour
    - Stiffness is an indicator of disease activity (the duration of morning stiffness generally correlates with the extent of synovial inflammation; stiffness resolves when the patient is in remission)

- **Rating of symptoms:** Use a visual analog scale (VAS) or 0–10 scale to assess symptoms at their best, at their worst, and at the moment (specifically address if pain is present now and how much)

- **Pattern of symptoms:** Document changes in symptoms throughout the day and night, if any (a.m., mid-day, p.m., night); also document changes in symptoms due to weather or other external variables. Patients commonly complain of morning stiffness
  - An activity diary can be used to assess activity and response\(^{8}\)
    - Patient should keep the diary for a week day and weekend day as activities often vary between these days
    - The patient records main activities each half hour as well as rates (see rating of symptoms below) the level of pain and fatigue experienced during activity or time period

- **Sleep disturbance:** Document number of wakings/night related to the condition

- **Other symptoms:** Document other symptoms patient may be experiencing that could exacerbate the condition and/or symptoms that could be indicative of a need to refer to physician. Extra-articular involvement of organs such as the skin, heart, lungs, and eyes may be significant and should be referred to physician if symptomatic

- **Respiratory status:** There may be respiratory compromise with lung involvement. Assess as indicated

- **Barriers to learning**
  - Are there any barriers to learning? Yes__ No__
  - If Yes, describe _________________________
• Medical history
  – Past medical history
    - Previous history of same/similar diagnosis: Any history of wrist/hand surgeries or injuries?
    - Comorbid diagnoses: Ask patient about other problems, including osteoporosis, diabetes, cancer, heart disease, complications of pregnancy, psychiatric disorders, orthopedic disorders, skin conditions, etc.
    - Medications previously prescribed: Obtain a comprehensive list of medications prescribed and/or being taken (including OTC drugs). Patient’s history of disease-modifying medication provides information about disease progression. Inquire if patient has been on an extended course of steroid medications
  - Other symptoms: Ask patient about other symptoms he or she may be experiencing

• Social/occupational history
  – Patient’s goals: Document what the patient hopes to accomplish with therapy and in general
  – Vocation/avocation and associated repetitive behaviors, if any: Is the patient employed and able to work? Does the patient participate in recreational or competitive sports? Does the patient have hobbies or roles that involve repetitive use of hands (e.g., driving, using a computer, knitting, gardening) or require grip strength (e.g., bicycling, manual work with tools)? Is the patient a smoker? Smoking may be associated with increased disease activity
  – Functional limitations/assistance with ADLs/adaptive equipment: Does the patient report any impairment in ADLs? Does the patient utilize any adaptive or assistive equipment?
  – Living environment: Stairs, number of floors in home, with whom patient lives, caregivers, etc.; identify if there are barriers to independence in the home; any modifications necessary? Is the patient able to perform assumed roles (e.g., cooking, child care)?

› Relevant tests and measures: (While tests and measures are listed in alphabetical order, sequencing should be appropriate to patient medical condition, functional status, and setting.) Complete a general examination as indicated with a focus on the items listed below
  • Assistive and adaptive devices: Document the use of any assistive or adaptive devices. Does the patient use them correctly? Are they in good repair?
  • Cardiorespiratory function and endurance: Assess as indicated and appropriate. Lung involvement and decreased activity level due to disease symptoms may compromise cardiorespiratory fitness
  • Circulation: Note any signs of circulatory impairment; assess symmetry of radial pulse
  • Edema: Measure edema circumferentially or volumetrically as indicated
  • Functional mobility (including transfers, etc.): Observe functional mobility. Is the patient able to perform functional mobility with hand and wrist limitations? FIM may be used for objective measurement. Is the patient able to adequately protect hands as needed during mobility (e.g., during sit to stand)?
  • Gait/locomotion: Observe gait. Note use of any gait assistive device and assess its impact on hand and wrist
  • Functional upper extremity use
    – Functional hand use can be assessed with standardized assessments including the Disabilities of the Arm, Shoulder, and Hand (DASH) (for additional information on the DASH see Clinical Review...Disabilities of the Arm, Shoulder, and Hand (DASH); CINAHL Topic ID Number: T903177) and Manual Ability Measure (MAM)
  • Joint integrity and mobility
    – Wrists and hands: The wrists of most individuals with RA will be affected
      - MCP and PIP joints are frequently affected
      - It is rare to have involvement in the DIP joints
      - Tenosynovitis and rheumatoid nodules may impede finger flexion
      - Nodular thickening may be palpated on flexor tendons
      - Deformities generally include:
        - Ulnar deviation at MCP joints
        - Radial deviation at wrists
        - Swan-neck deformities
        - Boutonniere deformities
      - Entrapment neuropathies (e.g., carpal tunnel syndrome)
    – Assess joint laxity as indicated and appropriate
• **Motor function (motor control/tone/learning)**
  – May utilize standardized tests or examine the patient while completing functional activities\(^2\)
  – Assess coordination and finger dexterity (e.g., 9-hole peg test)
  – Assess muscle tone as indicated

• **Muscle strength**
  – Manual muscle test as indicated and appropriate\(^3\)
    - Do not apply resistance if the patient is in an acute flare-up
    - Provide resistance only in pain-free ranges; if there is pain, do not apply resistance
  – Dynamometers may be used to obtain grip-strength and pinch-strength values
    - The sphygmomanometer may be more comfortable than a standard dynamometer, but further study is required to establish reliability\(^6\)
  – Document any noted atrophy\(^2\)

• **Observation/inspection/palpation** (including skin assessment)
  – Palpate for and document any heat, redness, or swelling noted in the wrist and hand, which is indicative of synovial inflammation\(^6\)
    - DIP joints rarely involved\(^12\)
  – Observe for and document presence of nodules
    - Soft tissue swelling should be distinguished from noninflammatory bony hypertrophy (e.g. nodes), which may indicate osteoarthritis
    - Nodular thickening may be palpated along flexor tendons of palm
  – Observe for and document any joint deformities\(^6\)
    - An experienced, trained therapist can determine via palpation whether the deformities are fixed or passively correctable
    - Metatarsophalangeal (MP) joint ulnar deviation and palmar subluxation
    - Volar subluxation of the carpus on the radius
    - Distal ulna dorsal subluxation
    - Swan-neck deformity is characterized by DIP joint flexion and PIP joint hyperextension
    - Carpal translocation and wrist radial deviation
    - For boutonniere deformity of the finger, please see *Clinical Review...Boutonnière Deformity of the Finger; CINAHL*
  – Joint instability affects ADLs more than muscle weakness: even if muscle strength is good, the patient may not be able to perform ADLs if joints are deformed\(^6\)

• **Range of motion**
  – Assess active and passive ROM in the wrist and hand bilaterally with a goniometer – this may be difficult in the advanced stages of RA due to deformities\(^6\)
    - Document ability to perform thumb opposition
    - Measure ulnar deviation with fingers extended without table support
  – Palpate and listen for crepitus or grating (crunching or popping) during ROM, which may be indicative of cartilage damage\(^6\)
    - Composite measurements may be obtained if deformity limits individual joint measurement\(^2\)
    - Note end-feels\(^3\)
    - Tendon rupture may cause loss of ROM
  – Screen for shoulder involvement (ROM and strength). Patients might develop shoulder involvement early in the disease process, which might impair function and impact hand use\(^12\)

• **Reflex testing:** Assess upper extremity reflexes as indicated

• **Self-care/activities of daily living:** Observe the patient during ADLs as able; document impairments.
  – Barthel Index may be used
  – The Arthritis Impact Measurement Scales 2 may be used\(^8\)
  – Joint instability affects ADLs more than muscle weakness: even if muscle strength is good, the patient may not be able to perform ADLs if joints are deformed\(^6\)
• Sensory testing
  – Complete a sensory assessment as indicated
  - May use Semmes-Weinstein monofilaments
  - If the cervical spine has been affected by the disease, complete additional testing (e.g., proprioception)
  – Document presence of:
    - Carpal tunnel syndrome; please see Clinical Review…Carpal Tunnel Syndrome: Conservative Management; CINAHL Topic ID Number: T708574
    - Guyon's canal syndrome (ulnar nerve compression at the wrist); please see Clinical Review…Ulnar Nerve Entrapment Syndrome; CINAHL Topic ID Number: T708907

• Special tests specific to diagnosis
  – Jebsen Test of Hand Function – a standardized test measuring hand functions in ADLs in adults with neurological or musculoskeletal conditions involving hand disabilities. It consists of 7 subtests: writing, card turning, lifting small objects, simulated feeding, stacking checkers, picking up light cans, and picking up heavy cans
  – Grip Ability Test (GAT)
    - Performance-based test with 3 items. The time needed to perform is recorded in seconds with a correction factor of 1.8 for items 1 and 2. Time is added and higher score indicates decreased hand function:
      - Put a 25 cm Tubigrip (size D for women, size F for men) over non-dominant hand
      - Pick up a 30 x 10 mm paper clip from a table and place it on a letter envelope
      - Lift a 1 liter jug of water with dominant hand and fill a 200 ml cup with water

Assessment/Plan of Care
  › Contraindications/precautions
    • Manipulative techniques
    • Vigorous stretching
    • Stretching of any swollen or inflamed joints
  • Clinicians should follow the guidelines of their clinic/hospital and what is ordered by the patient’s physician. The summary below is meant to serve as a guide, not to replace orders from a physician or a clinic’s specific protocols
  • Cryotherapy contraindications
    – Raynaud’s syndrome
    – Cryoglobulinemia
    – Cold urticaria
    – Paroxysmal cold hemoglobinuria
    – Impaired circulation
    – Over area of nerve growth
    – Cold intolerance
  • Cryotherapy precautions
    – Hypertension—cold can lead to an increase in blood pressure
    – Hypersensitivity to cold or a personal aversion to cold
    – Over an open wound
    – Over superficial nerves
    – Very young or very old
  • Thermotherapy contraindications
    – Decreased circulation
    – Decreased sensation
    – Acute/subacute traumatic and inflammatory conditions
    – Skin infections
    – Impaired cognition or language barrier
    – Malignancy
    – Presence of or tendency for hemorrhage or edema
    – Following use of heat rubs
• Relevant **electrotherapy** contraindications/precautions (in some cases, when approved by the treating physician, electrotherapy may be used under some of the circumstances listed below when benefits outweigh the perceived risk)\(^{(2)}\)

- Do not place electrodes near
  - carotid bodies, cardiac pacemakers or implantable cardioverter defibrillators (ICDs), phrenic nerve or urinary bladder stimulators, phrenic nerve, eyes, gonads, areas with known peripheral vascular disease, areas with hemorrhage, areas with active osteomyelitis
  - Impaired sensation, mental status, communication
  - Cardiovascular disease (e.g., uncontrolled hyper- or hypotension, irregular heart rate)
  - Malignancy/neoplasms
  - Electrodes near compromised skin or neck/craniofacial regions in patients with a history of seizures or cerebrovascular accident (CVA)
  - Proximity of electromagnetic radiation
  - In pregnant women, near the pelvis, lumbar spine, hips, abdomen; or history of spontaneous abortion

• Relevant **therapeutic ultrasound** contraindications\(^{(2)}\)

- Over the region of a cardiac pacemaker or other implanted electronic devices
- Over the pelvis, abdominal, and lumbar regions during pregnancy
- In an area with infection or bleeding
- If a tumor or malignancy is present in the area
- Impaired circulation, sensation, or cognition
- In the area of a deep vein thrombosis (DVT) or thrombophlebitis
- Over the heart, stellate, or cervical ganglia

• **Therapeutic ultrasound** precautions\(^{(2)}\)

  – Sensory deficits
  – Ineffective communication skills in a patient (e.g., impaired cognition, language barrier)
  – Circulatory impairments
  – Plastic or metal implants
  – Peripheral vascular disease
  – Always decrease ultrasound intensity if the patient complains of discomfort

› **Diagnosis/need for treatment:** Limitations in wrist/hand ROM, strength, coordination, and endurance as well as the presence of pain, deformity, and impaired ADLs/function all warrant intervention

› **Rule out**\(^{(13)}\)

  • The differential diagnoses for RA include crystal-induced arthritis, gout, pseudo gout, spondyloarthropathies, psoriatic arthritis, ankylosing spondylitis, and enteropathic arthritis

› **Prognosis**

  • The course of RA is unpredictable and the patient might have remissions and exacerbations\(^{(11)}\)

    – Currently there is no cure or method of prevention; the most favorable management necessitates early diagnosis and the use of treatments that lessen the risk of irreversible joint damage and provide for the best prognosis

  • Pain and activity/participation measurements included in the ICF core set for RA have been reported to be significant predictors of poor hand function\(^{(2)}\)

  • Bone edema on MRI is a strong independent predictor of subsequent radiographic progression in early RA and should be considered for use as a prognostic indicator\(^{(9)}\)

  • Joint inflammation detected by MRI or ultrasound as well as joint damage detected by CT, MRI, or ultrasound is also a predictor of further joint damage\(^{(9)}\)

› **Referral to other disciplines** (as indicated)

  • Occupational therapy for splints, assistance with ADLs, joint protection and energy conservation, ergonomic assessment
  • Rheumatology, as indicated
  • Psychology
  • Nutrition/dietary services
  • Hand surgery, as indicated
  • Physical therapy
Treatment summary

- Rehabilitative treatment for the rheumatoid hand and wrist includes splinting (a.k.a. orthotic fabrication), patient education regarding joint protection and energy conservation, prescription of adaptive and assistive devices, modalities, and strengthening and ROM exercise
- The SARAH program, a progressive 12-week hand and arm exercise program tailored for patients with RA of the hand, is a low-cost adjunct to drug regimens that assists in maximizing function and quality of life(22)
  - Exercises include a combination of seven flexibility exercises for the wrist, fingers, and upper limb and four strengthening exercises for the hands and wrists(23)
  - The program incorporates six face-to-face therapist visits over a 12-week duration. Therapists incorporate support strategies such as an exercise diary and personal exercise plan into the program to increase at-home program compliance and integration of SARAH exercise into a daily routine(25)
  - iSARAH is a web-based learning resource program designed to teach physical and occupational therapists how to deliver the SARAH tailored strengthening and stretching hand exercise program for patients with RA of the hand(26)
- A 2012 meta-analysis of RCTs comparing resistance-exercise-based therapy with interventions without resistance exercise for the treatment of RA found that resistance exercise decreases disability, functional capacity impairment, and joint count and does not increase adverse events(10)
  - Ten studies with 547 patients were included
  - Only 1 of the studies specifically included hand resistance exercises; however, data on grip strength were obtained from 4 studies
    - A positive impact on grip strength was demonstrated
  - No differences in flares were found between groups participating in resistance exercise and groups not participating in resistance exercise
  - No differences in numbers of RA-related adverse events or unrelated adverse events were found, leading to the conclusion that resistance exercise is safe
- Aquatic therapy might be beneficial in decreasing pain, disease activity, and increasing quality of life in RA patients(21)
  - The authors of a study conducted in Turkey found that 3 months of aquatic therapy significantly improved disease activity scores, modified health assessment questionnaire, and VAS for pain
  - The improvements in the aquatic therapy group were not significantly different from those in the balneotherapy group or control group over the same period of time
- Orthosis: Examples(8)
  - Resting hand orthosis
    - Indications – rest during acute flares
    - Considerations – immobilizes the entire hand; typically worn while asleep and majority of waking hours; should be taken off for hygiene/ROM
  - Cock-up splint
    - Indications – minimize pain
    - Considerations – 10º to 30º of wrist extension to facilitate use of the hand (fingers are not immobilized); clinician needs to set wearing schedule
  - MCP ulnar deviation orthosis
    - Indications – to align and support joints for functional tasks in an effort to minimize pain
    - Considerations – may restrict/interfere with hand use and ability to perceive sensory input; clinician needs to set wearing schedule
  - Short thumb spica
    - Indications – supports the 1st metacarpal in an effort to reduce pain and facilitate function
    - Considerations – may hamper grasp pattern; clinician needs to set wearing schedule
  - Gutter splints (volar, dorsal, or lateral)
    - Indications – pain; protection
    - Considerations – may hamper grasp pattern; clinician needs to set wearing schedule

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<tr>
<td>Pain, inflammation, and swelling (acute flare-up)</td>
<td><strong>Therapeutic strategies</strong></td>
<td>N/A</td>
<td>Incorporate strategies into home program which address pain, inflammation, and swelling and encourage compliance with medical management</td>
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<tr>
<td>Reduce/eliminate pain, inflammation, and swelling</td>
<td>Implement joint protection strategies (e.g., change positions often, encourage work from larger muscles and joints as able). Avoid positions of deformity during activities (e.g., digit ulnar deviation)</td>
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<tr>
<td></td>
<td>Please see <strong>Overall Contraindications/Precautions</strong>, above, for more details on joint protection</td>
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<tr>
<td></td>
<td>Educate the patient on energy-conservation strategies (1)</td>
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<td></td>
<td>Active ROM is appropriate and may be beneficial to the patient; stretching is contraindicated (1)</td>
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<tr>
<td></td>
<td><strong>Prescription, application of devices and equipment</strong></td>
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<tr>
<td></td>
<td>Splinting and adaptive equipment may be indicated for joint protection and to assist in reducing pain; refer to occupational therapy as indicated</td>
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<td></td>
<td>(Please see <strong>Treatment summary</strong>, above)</td>
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<tr>
<td>Reduced ROM and potential for or presence of joint deformities</td>
<td>Improve ROM and prevent or improve joint deformities</td>
<td><strong>Therapeutic strategies</strong></td>
<td>Progress each unique patient as appropriate and indicated</td>
<td>Incorporate strategies into home program which address ROM limitations and joint deformities</td>
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<tr>
<td></td>
<td></td>
<td>A joint protection program may assist in preventing joint deformities</td>
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<tr>
<td></td>
<td></td>
<td>Implement ROM activities as indicated and appropriate</td>
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<td>Gentle stretching and joint mobilization may be utilized as appropriate (as long as the patient is not in an acute flare-up); however, the clinician is cautioned not to overtax already stressed tissues.(^{1}) Please see <strong>Overall Contraindications/Precautions</strong>, above</td>
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<td></td>
<td></td>
<td>(Please see <strong>Treatment summary</strong>, above)</td>
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<tr>
<td>Reduced strength and endurance</td>
<td>Improve strength</td>
<td>Implement progressive strengthening exercises as indicated and appropriate(^{22})</td>
<td>Progress each unique patient as appropriate and indicated</td>
<td>Incorporate strategies into home program which address strength limitations and atrophy</td>
</tr>
<tr>
<td>Muscle atrophy</td>
<td>Prevent/improve atrophy</td>
<td>(Please see <strong>Treatment summary</strong>, above)</td>
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<tr>
<td>Impaired ADLs</td>
<td>Improve ability to complete ADLs</td>
<td><strong>Therapeutic strategies</strong></td>
<td>Progress each unique patient as appropriate and indicated</td>
<td>Incorporate strategies into home program which address impaired ADLs</td>
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<td>A joint protection program may assist in improving ADLs</td>
<td>Implement adaptive equipment and devices as indicated and appropriate</td>
<td>Refer to occupational therapy as indicated</td>
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<tr>
<td></td>
<td></td>
<td>Coordination and dexterity exercises. Incorporate functional training as appropriate</td>
<td>(Please see Treatment summary, above)</td>
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<td></td>
<td></td>
<td>Improved functional UE use</td>
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</tbody>
</table>

**Desired Outcomes/Outcome Measures**

- Reduced/eliminated pain
  - VAS
- Decreased swelling
  - Girth measurements
  - Volumetric measurements
- Improved ROM
  - Goniometric measurements
- Improved strength
  - MMT
  - Dynamometer
  - Pinch meter
- Improved coordination and dexterity
  - 9-hole peg test
- Improved ability to complete ADLs/IADLs
  - FIM
  - Barthel Index
  - MAM
- Improved functional UE use
  - GAT
  - Jebsen Hand Function Test
  - DASH Outcome Measure

**Maintenance or Prevention**

- The patient should follow his or her home program and follow up with physician as indicated
- The patient should follow instructions for joint protection
### Patient Education

- Arthritis Foundation website, https://www.arthritis.org/

### Coding Matrix

<table>
<thead>
<tr>
<th>Reference Type</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Published meta-analysis</td>
<td>M</td>
</tr>
<tr>
<td>Published systematic or integrative literature review</td>
<td>SR</td>
</tr>
<tr>
<td>Published research (randomized controlled trial)</td>
<td>RCT</td>
</tr>
<tr>
<td>Published research (not randomized controlled trial)</td>
<td>R</td>
</tr>
<tr>
<td>Case histories, case studies</td>
<td>C</td>
</tr>
<tr>
<td>Published guidelines</td>
<td>G</td>
</tr>
<tr>
<td>Published review of the literature</td>
<td>RV</td>
</tr>
<tr>
<td>Published research utilization report</td>
<td>RU</td>
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<tr>
<td>Published quality improvement report</td>
<td>QI</td>
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<tr>
<td>Legislation</td>
<td>L</td>
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<tr>
<td>Published government report</td>
<td>PGR</td>
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<td>Published funded report</td>
<td>PFR</td>
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<td>Policies, procedures, protocols</td>
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<tr>
<td>Practice exemplars, stories, opinions</td>
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<tr>
<td>General or background information/texts/reports</td>
<td>GI</td>
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<tr>
<td>Unpublished research, posters, presentations or other such materials</td>
<td>U</td>
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<tr>
<td>Conference proceedings, abstracts, presentations</td>
<td>CP</td>
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</tbody>
</table>

### References