

Evaluation of the patient with hand pain

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Literature review current through: Mar 2014. | **This topic last updated:** Feb 7, 2014.

INTRODUCTION — The major nontraumatic disorders that cause hand pain will be reviewed here. Thumb and wrist pain are discussed separately. (See "[Evaluation of the patient with thumb pain](#)" and "[Evaluation of the adult with acute wrist pain](#)".)

ANATOMY — The bones of the hand include five metacarpals, two phalanges in the thumb, and three phalanges in each of the other fingers. The joints of each finger include the metacarpophalangeal (MP), the proximal interphalangeal (PIP), and the distal interphalangeal (DIP); the thumb has only one interphalangeal (IP) joint.

Extrinsic muscles of the hand originate in the forearm and elbow area. The flexor tendons for each digit travel in a fibro-osseous tunnel between the metacarpal and the DIP joint. The superficialis tendon attaches to the middle phalanges, and the profundus tendon attaches to the distal phalanges. The extensor tendons pass over the dorsum of the wrist in six separate compartments.

Intrinsic muscles of the hand include the thenar, hypothenar, interosseous, and lumbricals. The thenar muscles control adduction and opposition of the thumb; other thumb movements are controlled by forearm muscles. The interosseous and lumbrical muscles flex the MP joints, help extend the IP joints, and abduct and adduct the fingers.

The ulnar nerve provides the motor supply to the intrinsic hand muscles (other than the two radial lumbricals and the thenar muscles); it also provides sensation to the little finger and one-half of the ring finger. The median nerve is the motor supply to the thenar muscles and the two radial lumbricals; it is the sensory supply to the palmar aspect of the first three fingers and the radial half of the ring finger. The radial nerve is the sensory supply to the dorsum of the hand.

ETIOLOGY/PRESENTATION — The patient's affected joint and loss of function are the strongest clues to the etiology of hand pain. Multiple joint involvement suggests either osteoarthritis (OA) or inflammatory arthritis [1].

Osteoarthritis — OA of the hands is a common disorder, most often presenting in patients over 40 years of age. The principal symptom associated with OA is pain, which is typically exacerbated by activity and is relieved by rest. With more advanced disease, pain may be noted with progressively less activity, eventually occurring at rest and at night. Pain in OA is not caused directly by cartilage damage, since cartilage is aneural. As a result, osteoarthritic radiologic changes are often noted in patients without symptoms at affected sites; patients may complain more about the appearance of the joints rather than pain or loss of function.

Osteoarthritic enlargements of the distal and proximal interphalangeal (DIP, PIP) joints are referred to as Heberden's and Bouchard's nodes, respectively. There appears to be a genetic predisposition to the development of the former [2,3]. The first carpometacarpal joint is also a common area affected in OA. By comparison, involvement of the metacarpophalangeal (MP) joint is relatively uncommon. (See "[Clinical manifestations of osteoarthritis](#)".)

Inflammatory arthritis — Rheumatoid arthritis (RA) and psoriatic arthritis are the two most common forms of inflammatory arthritis affecting the hands. The onset of inflammatory changes is usually insidious, with the

predominant symptoms being pain, stiffness, and fusiform swelling along the lateral margins of many joints. The hands are a common site of early involvement, particularly the MP and PIP joints [4,5]. Symmetrical involvement is a characteristic feature, although this may be less apparent early in the disease. Symptoms limited to the DIP joints are usually due to OA, while PIP involvement can reflect either RA or OA.

Morning stiffness or stiffness after any prolonged period of inactivity is seen in virtually all inflammatory arthropathies and myopathies [6]. However, morning stiffness lasting more than one hour reflects a severity of joint inflammation which rarely occurs in diseases other than RA. (See "[Clinical features of rheumatoid arthritis](#)".)

Trigger finger — The fibro-osseous tunnel (tenosynovial sheath), through which the flexor tendon of each digit travels, provides lubrication and nutrition to the tendon as well as mechanical stability. Irritation or inflammation of the fibro-osseous tunnel can occur as the result of repetitive use or direct pressure; swelling of the tendons within the tunnel proximally at the MP joint in the palm results in trigger finger (flexor tenosynovitis).

Nodule formation on the flexor tendon prevents smooth gliding of the tendon under the A-1 pulley, the specialized ligament that anchors the tendon to the bone. The tendon may “catch” under the A-1 pulley at the MP joint, causing the finger to lock in flexion. Patients often complain of pain and a sensation of “snapping”; the pain radiates into the palm or the distal finger. The patient rubs over the tendon in the palm or actually demonstrates the locking phenomenon when describing the condition. (See "[Trigger finger \(stenosing flexor tenosynovitis\)](#)".)

Tendon cyst — A tendon cyst is an abnormal collection of tenosynovial fluid, either within or adjacent to the tendon. Direct nonpenetrating trauma causes damage to the tendon or tendon sheath, leading to an overproduction of fluid and cyst formation. Penetrating trauma should alert the clinician to the possibility of infectious tenosynovitis.

In contrast to the mechanical locking of trigger finger, active and passive movements of the digit are unimpaired. Patients complain of a lump in the palm of the hand that may be mildly tender.

Dupuytren's contracture — Dupuytren's contracture is a relatively common disorder that presents as a nodular fibrosing lesion within the palmar fascia and related structures. It produces contractures that draw one or more fingers into flexion at the MP joint. It occurs primarily in white males over the age of 50 and appears to have a pronounced genetic predisposition.

The incidence of Dupuytren's contracture is two to five times higher among workers exposed to repetitive handling tasks or vibration compared with those not exposed such trauma [7]. It also occurs more frequently in patients with diabetes mellitus [8,9] and may be associated with cigarette smoking and with alcohol abuse [10,11].

Patients complain of painless nodular lesions on the palmar fascia, usually affecting the fourth and fifth digits, with puckering and tethering of the overlying skin. Over time, the tendon thickening causes stiffness and loss of full extension. The patient often rubs the palm and fingers in an attempt to straighten them out as the condition is described. (See "[Dupuytren's contracture](#)".)

Mallet finger — Mallet finger is an avulsion injury of the extensor tendon of the DIP joint. The injury occurs due to acute forceful passive flexion of the DIP joint during concomitant active joint extension. The finger deformity can result from stretching or partial tearing the extensor tendon, from complete rupture, or from rupture with avulsion fracture of the distal phalanx. Patients complain of the obvious deformity plus pain over the DIP joint and an inability to actively extend the joint. (See "[Extensor tendon injury of the distal interphalangeal joint \(mallet finger\)](#)".)

Mucinoid cyst — Excessive amounts of synovial fluid produced by an osteoarthritic DIP or PIP joint may leak into the subcutaneous tissues, causing the formation of a 4 to 5 mm cyst atop the DIP or, less commonly, PIP joint.

Traumatic MP arthritis — Isolated arthritic involvement of the MP joint is uncommon, usually affecting the second and third MP joints as the result of remote and often unrecognized trauma. Patients complain of pain or swelling in the affected joint or of an inability to make a closed fist.

Carpal tunnel syndrome — Carpal tunnel syndrome (CTS) is the most common nerve entrapment disorder. It is caused by increased pressure and consequent compression of the median nerve within the carpal tunnel. Median nerve impingement may result from diseases that invade the carpal tunnel, from swelling of tendon sheaths within the tunnel, from stenosis of the tunnel by bone enlargement, or from thickening and degeneration of the volar carpal ligament. (See ["Etiology of carpal tunnel syndrome"](#).)

The clinical features of CTS are variable but usually include pain and paresthesia in the thumb, the first two fingers, and the radial half of the ring finger (the distribution of the median nerve). Paresthesia and sensory deficits may involve the entire palm area in some cases due to variable nerve innervation. In addition, pain may radiate proximally into the forearm and, occasionally, to the shoulder. (See ["Clinical manifestations and diagnosis of carpal tunnel syndrome"](#).)

EXAMINATION — Efficient examination of the hand begins by assessing overall function of the small joints followed by specific maneuvers used to define the most common conditions ([table 1](#)). Testing the overall function of the hand readily separates focal musculoskeletal process from the more encompassing rheumatologic conditions, determines the number of affected joints, and assesses the severity of the condition.

- Pain, stiffness, and bony enlargement of multiple distal interphalangeal (DIP) joints suggest the presence of osteoarthritis (OA). Bony enlargement along the lateral margins of the joints, rather than synovial thickening or swelling, is the key physical finding when palpating the lateral joint lines.
- Pain, swelling, and fusiform enlargement of multiple hand joints are the classic features of inflammatory arthritis. Involvement of the DIP joints is seen with psoriatic arthritis, and proximal interphalangeal (PIP) and metacarpophalangeal (MP) involvement is seen with rheumatoid arthritis (RA). Compressible synovial thickening and swelling are the key physical findings when palpating the lateral joint lines.
- Localized tenderness over a single MP joint in the palm, with or without loss of smooth digit motion, is the classic physical finding of flexor tenosynovitis (trigger finger).
- Tendon cysts and Dupuytren's contracture present as relatively painless nodules that form in or along the flexor tendons in the palm. A firm nodule located adjacent to a single MP joint is characteristic of a benign tendon cyst; despite their size, these rarely interfere with the function of the digit or hand. In contrast, multiple nodules adjacent to several MP joints in the palm are characteristic of Dupuytren's contracture; this progressive scarring of the palmar fascia does affect finger function, gradually interfering with extension of the digit.
- Pain localized to the dorsum of a single MP joint is typically due to posttraumatic arthritis.

Overall hand function — Overall hand function is assessed by opening and closing the hand and by measuring grip strength.

Opening and closing the hand — Asking the patient to open and close the hand assesses the full and smooth movement of the small joints of the hand ([picture 1](#)). Full function of the hand requires normal joint function, normally functioning flexor and extensor tendons, and an intact median and ulnar nerve. Arthritis from any cause, trigger finger, and Dupuytren's contracture can all affect hand movement.

Grip strength — Gripping provides an objective measurement of the integrity and strength of the intrinsic muscles of the hand and of the forearm muscles. Grip strength can be crudely estimated by manual gripping of the examiner's fingers ([picture 2](#)). Physical measurement using a dynamometer is more accurate and reproducible ([picture 3](#)). The differential diagnosis of reduced grip strength includes disuse atrophy, arthritis, carpal tunnel syndrome, severe epicondylitis, and radiculopathy involving motor function.

Maneuvers assessing specific conditions — Patients who have mild joint pain and stiffness, minimal impairment of range of motion, and no contractures or deformities can be treated empirically without further investigation. Empiric treatment includes avoiding repetitious gripping and grasping, avoiding vibration exposure, avoiding prolonged contact with cold, wearing thick leather gloves for protection, direct application of heat, and gentle range of motion exercises in flexion and extension to prevent contractures.

Patients with persistent or chronic symptoms despite these measures or those who have more severe initial

symptoms such as palpable swelling, nodularity, synovial thickening, or early joint contracture should have a more comprehensive examination for specific conditions, as well as possible x-rays and/or blood work.

Simple inspection — The hands are inspected for alignment, fusiform swelling, bony enlargement, joint deformity including ankylosis or contracture, and the presence of cysts or nodules ([picture 4](#)).

Palpation of the DIP and PIP joints — The DIP and PIP joints are palpated to determine the extent of arthritic involvement of the joints and to determine whether the enlargement is due to bony changes, inflammatory synovial thickening, or both ([picture 5](#) and [picture 6](#)).

MP joint evaluation — The MP joints are squeezed to determine involvement of these joints ([picture 7](#)). The joints are also observed for swelling ([picture 8](#)). The differential diagnosis of pain with squeezing or MP swelling includes posttraumatic arthritis (single joint involvement) and RA (multiple joint involvement).

Palpation of the flexor tendon — The flexor tendon is palpated for tenderness or cyst formation ([picture 9](#)). Active tenosynovitis (trigger finger) is characterized by local tenderness aggravated by passive stretching of the tendon in extension (see "[Trigger finger \(stenosing flexor tenosynovitis\)](#)"). The majority of flexor tendon cysts occur within one centimeter of the flexor creases at the base of the fingers.

Palpation of the palmar fascia for nodularity — Palpation of the palmar fascia is used to assess the degree of palmar fibrosis ([picture 10A-B](#)). (See "[Dupuytren's contracture](#)".)

Inspection of mallet finger — The integrity of the extensor profundus tendon is assessed in patients with a history of direct blows to the tip of the finger and with the characteristic mallet finger deformity. Patients are unable to actively extend the affected DIP joint against resistance ([picture 11](#)).

Inspection of the dorsum of the hand — The dorsum of the hand is inspected for the presence of mucinous cysts ([picture 12](#)). The differential diagnosis of cystic swelling in this location includes herpetic whitlow, foreign body reaction, abscess, or dermatofibroma.

Clinical pearls

- The earliest sign of Dupuytren's contracture is a triangular "puckering" of the dermal tissue over the flexor tendon just proximal to the flexor crease of the finger. As the scarring process progresses, nodules form, and the finger gradually loses its flexibility.
- A comprehensive hand examination is the most important method of evaluating patients complaining of generalized hand arthralgia. Radiographic and serologic testing is nearly always normal unless the specific maneuvers of the hand demonstrate objective findings of bony enlargement, synovial thickening, or joint swelling.
- An efficient screening examination for RA includes general hand inspection, grip measurement, palpation of the PIP joints for tenderness, the MP squeeze sign, extension and flexion of the wrists, observation of gait and of walking on tiptoes, and the metatarsophalangeal (MTP) squeeze sign.
- Tenosynovitis of the flexor tendons always precedes the mechanical symptoms of triggering. However, not all patients demonstrate active tenosynovitis at the time they are examined. As the patient tries to avoid the triggering phenomenon (by using the finger less and less), the tenosynovial signs gradually subside, leaving the patient with a relatively painless mechanical triggering. In some cases, flexor tenosynovitis and mechanical triggering can be so dramatic as to preclude movement of the finger from a flexed position; this is referred to as a "fixed-locked" digit.
- As mentioned, despite their size, tendon cysts rarely lead to mechanical dysfunction.

CONFIRMATORY MANEUVERS AND PROCEDURES

Radiography — Plain films of the hand are indicated in patients with suspected inflammatory arthritis, with posttraumatic arthritis, or, in some patients, with osteoarthritis (OA). X-rays are also warranted in patients with a mallet finger deformity to identify an avulsion fracture of the distal phalanx.

- OA of the hands is a clinical diagnosis that rarely requires x-ray documentation; most diagnostic tools do

not incorporate x-ray findings to make the diagnosis of hand OA (see ["Diagnosis and classification of osteoarthritis", section on 'Osteoarthritis of the hand'](#)). X-rays are indicated when the patient presents with unusual degrees of joint swelling or synovial thickening, suggesting the concomitant presence of an inflammatory arthritis ([image 1](#)).

- X-rays of the hands of patients with inflammatory arthritis are often normal in the early stages of the disease. Juxtaarticular osteoporosis, reflecting increased blood flow to the joints, is the early radiographic change. Late findings include symmetrical wear of the articular cartilage, generalized osteopenia, erosive changes, angulation, and ankylosis ([image 2](#)). Erosions, typically in the metacarpophalangeal (MP) and proximal interphalangeal (PIP) joints, are present in 15 to 30 percent of patients in the first year of rheumatoid arthritis (RA). There is a subsequent cumulative increase in frequency of joint erosions over time (greater than 90 percent after the first two years) [[12,13](#)]. (See ["Diagnosis and differential diagnosis of rheumatoid arthritis"](#).)
- X-rays may confirm rupture of the extensor profundus tendon and avulsion fracture of the distal phalanx in patients with a mallet finger deformity ([image 3](#)).

Confirming the presence of trigger finger — The mechanical function of the affected finger is assessed in patients with suspected trigger finger to document the severity of triggering ([picture 13](#)). Passive stretching in extension should also be performed to confirm the presence of active inflammation; pain with stretching is consistent with tenosynovitis ([picture 14](#)).

Cyst puncture — A presumptive diagnosis of a tendon cyst is based upon the size and location of the nodule. Simple cyst puncture can be used to confirm the presence of a benign tenosynovial cyst ([picture 15](#)) or mucinoid cyst. Cysts that fail to decompress with puncture may be giant cell tumors; surgical removal may be necessary to determine the diagnosis.

Local anesthetic block — The diagnosis of MP joint arthritis is usually based upon the characteristic swelling and loss of range of motion of the MP joint. Occasionally, local anesthetic block is required to distinguish this disorder from flexor tenosynovitis or from injury to the supporting ligaments. Involvement of the MP joint is confirmed by pain relief with local anesthetic block ([picture 16](#)).

Blood tests — Acute phase reactants, particularly the erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP), are relatively nonspecific tests that should not be used as a substitute for a comprehensive examination and appropriate imaging. The ESR and CRP are normal in the noninflammatory conditions, such as OA. Most patients with inflammatory arthritis will have elevated levels, although such findings lack diagnostic specificity. Acute phase reactants may also be elevated in the setting of concurrent non-rheumatologic inflammatory conditions. Normal results of acute phase reactants may occur early in the course of inflammatory rheumatic disease, especially if only a modest degree of inflammation is present. (See ["Acute phase reactants"](#).)

Rheumatoid factors occur in 70 to 80 percent of patients with RA. Their diagnostic specificity is similarly limited, however, because rheumatoid factors are also found in about 70 percent of patients with Sjögren's syndrome, in 20 to 30 percent of those with systemic lupus erythematosus, occasionally in patients with virus infections, and in 5 to 10 percent of healthy, especially older, individuals. (See ["Origin and utility of measurement of rheumatoid factors"](#) and ["Diagnosis and differential diagnosis of rheumatoid arthritis"](#).)

INFORMATION FOR PATIENTS — UpToDate offers two types of patient education materials, "The Basics" and "Beyond the Basics." The Basics patient education pieces are written in plain language, at the 5th to 6th grade reading level, and they answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials. Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are written at the 10th to 12th grade reading level and are best for patients who want in-depth information and are comfortable with some medical jargon.

Here are the patient education articles that are relevant to this topic. We encourage you to print or e-mail these topics to your patients. (You can also locate patient education articles on a variety of subjects by searching on "patient info" and the keyword(s) of interest.)

- Basics topic (see "[Patient information: Hand pain \(The Basics\)](#)")

SUMMARY AND RECOMMENDATIONS

- The patient's affected joint and loss of function are the strongest clues to the etiology of hand pain. An understanding of the anatomy is essential. Both the medical history and physical examination are useful in identifying features which help distinguish joint from tendon involvement and inflammatory from noninflammatory disease, and they provide specific clues to the diagnosis. Numerous conditions should be considered in the differential diagnosis of hand pain ([table 1](#)). (See '[Anatomy](#)' above and '[Etiology/presentation](#)' above.)
- Efficient examination of the hand begins by assessing overall function, which separates focal musculoskeletal processes from the more encompassing rheumatologic conditions, determines the number of affected joints, and assesses the severity of the condition. Asking the patient to open and close the hand assesses the full and smooth movement of the small joints of the hand; full hand function requires normal joint function, normally functioning flexor and extensor tendons, and an intact median and ulnar nerve. Gripping provides an objective measurement of the integrity and strength of the intrinsic muscles of the hand and of the forearm muscles. (See '[Examination](#)' above and '[Overall hand function](#)' above.)
- Specific maneuvers are used to define the most common conditions ([table 1](#)) following assessment of overall hand function. Potentially affected joints, tendons, and other soft tissues should undergo inspection and palpation. (See '[Examination](#)' above and '[Maneuvers assessing specific conditions](#)' above.)
- We obtain plain films of the hand in patients with suspected inflammatory arthritis, with posttraumatic arthritis, or, in some patients, with osteoarthritis (OA). Radiographs are also warranted in patients with a mallet finger deformity to identify an avulsion fracture of the distal phalanx. Radiographic and serologic testing is nearly always normal unless the specific maneuvers of the hand demonstrate objective findings of bony enlargement, synovial thickening, or joint swelling. (See '[Confirmatory maneuvers and procedures](#)' above and '[Radiography](#)' above.)
- Acute phase reactants, particularly the erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP), are relatively nonspecific tests, limiting diagnostic and prognostic utility. Elevated levels are nonspecific, and normal results may be observed in patients with modest inflammation. (See '[Blood tests](#)' above.)

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REFERENCES

1. Anderson BC. Office Orthopedics for Primary Care: Diagnosis and Treatment, 3rd Edition, Elsevier Company, Philadelphia 2005.
2. Cicuttini FM, Spector TD. Genetics of osteoarthritis. *Ann Rheum Dis* 1996; 55:665.
3. Spector TD, Cicuttini F, Baker J, et al. Genetic influences on osteoarthritis in women: a twin study. *BMJ* 1996; 312:940.
4. Fleming A, Crown JM, Corbett M. Early rheumatoid disease. I. Onset. *Ann Rheum Dis* 1976; 35:357.
5. Jacoby RK, Jayson MI, Cosh JA. Onset, early stages, and prognosis of rheumatoid arthritis: a clinical study of 100 patients with 11-year follow-up. *Br Med J* 1973; 2:96.
6. Edworthy SM. Morning stiffness: sharpening an old saw? *J Rheumatol* 1999; 26:1015.
7. Liss GM, Stock SR. Can Dupuytren's contracture be work-related?: review of the evidence. *Am J Ind Med* 1996; 29:521.
8. Sibbitt WL. Fibrosing syndromes: diabetic stiff hand syndrome, Dupuytren's contracture and plantar fasciitis. In: *Arthritis and Allied Conditions*, 11th Edition, McCarty DJ (Ed), Lea & Febiger, Philadelphia 1989.
9. Noble J, Heathcote JG, Cohen H. Diabetes mellitus in the aetiology of Dupuytren's disease. *J Bone Joint*

Surg Br 1984; 66:322.

10. Burge P, Hoy G, Regan P, Milne R. Smoking, alcohol and the risk of Dupuytren's contracture. J Bone Joint Surg Br 1997; 79:206.
11. Descatha A, Carton M, Mediouni Z, et al. Association among work exposure, alcohol intake, smoking and Dupuytren's disease in a large cohort study (GAZEL). BMJ Open 2014; 4:e004214.
12. van der Heijde DM, van Leeuwen MA, van Riel PL, et al. Biannual radiographic assessments of hands and feet in a three-year prospective followup of patients with early rheumatoid arthritis. Arthritis Rheum 1992; 35:26.
13. Fuchs HA, Kaye JJ, Callahan LF, et al. Evidence of significant radiographic damage in rheumatoid arthritis within the first 2 years of disease. J Rheumatol 1989; 16:585.

Topic 1830 Version 8.0

GRAPHICS

Examination of the hand

Examination signs	Diagnosis	Confirmation
Bony enlargement of the distal interphalangeal (DIP) or proximal interphalangeal (PIP) joints**	#1 - Osteoarthritis	Hand x-rays (optional)
Stiffness and decreased flexion or extension		
Minimal signs of inflammation		
Loss of smooth motion of the PIP joint - "triggering"**	#2 - Trigger finger	Local anesthetic block at the flexor tenosynovium (optional)
Tenderness of the flexor tendons over the metacarpophalangeal (MCP) joint in the palm		
Pain reproduced by passive extension of the finger		
Synovial thickening, swelling of the DIP, PIP, and MCP joints**	Inflammatory arthritis	Clinical diagnosis, ESR, hand x-rays, serologies (optional)
Stiffness and decreased flexion or extension	Psoriatic arthritis (DIP joints)	
	Rheumatoid arthritis	
Thickening of the flexor tendons of the palm**	Dupuytren's contracture	
Loss of full extension of the fingers due to contracture		
Cystic swelling of the flexor tendons near the MCP joint**	Tenosynovial cyst	Cyst aspiration
Normal finger range of motion		
Tenderness of the MCP joint to palpation**	Monoarticular posttraumatic arthritis of the MCP joint	Lidocaine injection of joint
MCP joint squeeze sign		
Inability to fully extend the DIP joint and characteristic flexion deformity**	Mallet finger	Clinical diagnosis
Pale grey colored 3 to 5 mm cyst overlying the DIP or PIP joint**	Mucinoid cyst	Clinical diagnosis
Associated osteoarthritic signs of the adjacent joint		

** is used to identify the hallmark sign; that is, the sign that has the greatest specificity for the diagnosis listed.

#1 and #2 refer to the most common conditions affecting the hand.

Graphic 72098 Version 1.0

Physical examination for general function of the hand



The patient is simply asked to open and close the hand, noting the ability to actively flex and extend the joints of the thumb and fingers.

Courtesy of Bruce C Anderson, MD.

Graphic 69129 Version 5.0

Manual testing of grip strength



Manual gripping of the examiner's fingers provides a crude estimate of grip strength.

Courtesy of Bruce C Anderson, MD.

Graphic 80580 Version 2.0

Dynamometry



Dynamometry is the most objective measurement of grip strength and forearm muscle integrity.

Courtesy of Bruce C Anderson, MD.

Graphic 56541 Version 5.0

General inspection of the hands

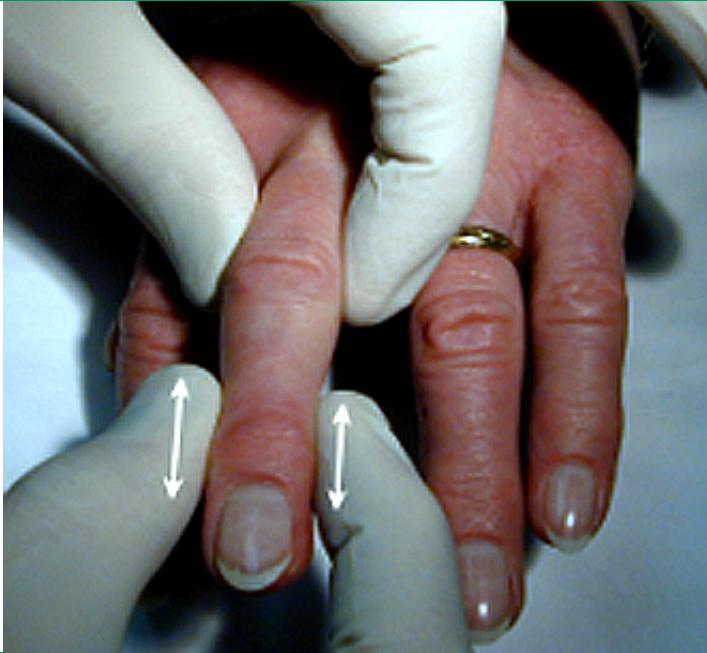


The hands are inspected in the palms-down and palms-up position for alignment, fusiform swelling, bony enlargement, joint deformity (including ankylosis and contracture), and the presence of any cyst or nodules.

Courtesy of Bruce C Anderson, MD.

Graphic 52133 Version 5.0

Palpation of the distal interphalangeal (DIP) joint



The examiner places two fingers of one hand on the lateral joint lines and two fingers from the opposite hand at the base of the finger. Pressure is applied from the sides while simultaneously feeling for the distensibility of synovial thickening, excessive joint fluid, or both. The synovial lining of the small joints extends 5 to 6 mm above and below the joint line. An excessive amount of fluid causes the characteristic fusiform shape.

Courtesy of Bruce C Anderson, MD.

Graphic 76825 Version 4.0

Palpation of the proximal interphalangeal (PIP) joint

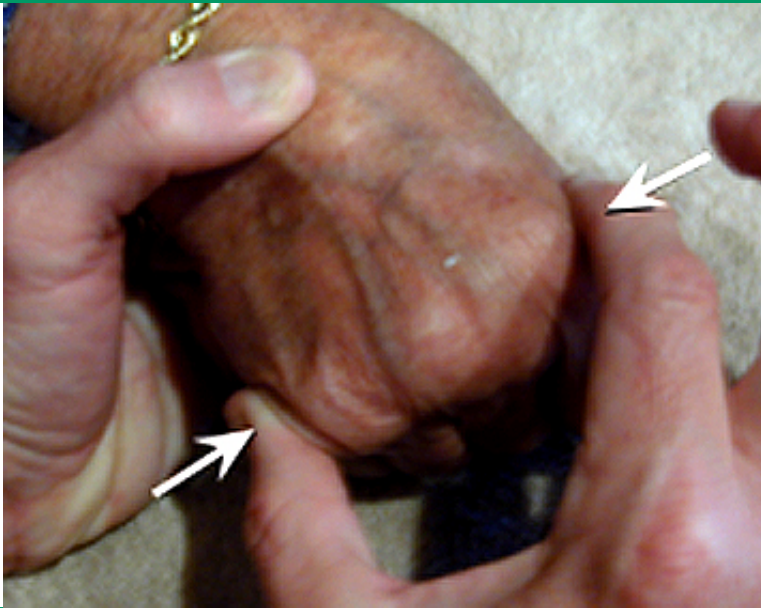


The examiner places two fingers of one hand on the lateral joint lines and two fingers from the opposite hand on the top and bottom of the joint. Pressure is applied from the top and bottom while simultaneously feeling for the distensibility of synovial thickening, excessive joint fluid, or both. The maneuver can be enhanced by alternating the pressure from one set of fingers to the other. The synovial lining of the small joints extends 5 to 6 mm above and below the joint line. An excessive amount of fluid causes the characteristic fusiform shape.

Courtesy of Bruce C Anderson, MD.

Graphic 76902 Version 3.0

Metacarpophalangeal (MP) squeeze sign



With one hand placed over the middle of the metacarpal bones to hold them in line (examiner's left hand), pressure is applied to the 2nd and 5th metacarpal heads, forcing all four metacarpal joints together. When a fist is made, the joint lines are located 1/4 to 3/8 inch from the center of the knuckle.

Courtesy of Bruce C Anderson, MD.

Graphic 70187 Version 3.0

Metacarpophalangeal (MP) joint swelling



The patient is asked to make a partial fist and the MP joints are inspected for swelling. Swelling of multiple MP joints is recognized in this patient by loss of the normal hills and valleys between the knuckles.

Courtesy of Bruce C Anderson, MD.

Graphic 60459 Version 3.0

Palpation of the flexor tendons of the hand



The flexor tendon is palpated for tenderness or cyst formation. The hand is placed with the palm up on the exam table and with the fingers extended. The flexor tendon is palpated along its entire course from the distal interphalangeal (DIP) joint through the palm to the wrist. If a cyst is felt, passive movement of the finger is performed to determine if the cyst is intratendinous (cyst moves with finger movement) or peritendinous (cyst does not move).

Courtesy of Bruce C Anderson, MD.

Graphic 78638 Version 3.0

Palpation of the palmar fascia for nodularity



The hand is placed in the palm-up position. Each of the four digits are passively stretched in extension, noting any differences in flexibility and tendon scarring between the fingers. Next, the tendons are palpated for thickening or nodularity along their course through the palm.

Courtesy of Bruce C Anderson, MD.

Graphic 69444 Version 4.0

Dupuytren's contracture



Nodular fibrosing lesions with bands radiating distally are features of Dupuytren's contracture. The ulnar side of the hand is affected, with the fourth and fifth fingers usually involved first.

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Graphic 70486 Version 8.0

Resisting the action of the extensor profundus tendon



The affected finger is grasped with one hand and the finger of the second hand is placed atop the distal phalanges. The patient is asked to actively extend the DIP joint.

Courtesy of Bruce C Anderson, MD.

Graphic 65406 Version 4.0

Mucinous cyst



The dorsum of the hand is inspected for the presence of a cyst, which, in this case, is appreciated distally near the nail bed. The size, shape, and compressibility of the cyst are determined by physical measurement and palpation.

Courtesy of Bruce C Anderson, MD.

Graphic 80546 Version 6.0

Osteoarthritis of the distal interphalangeal (DIP) joints



This plain film demonstrates complete loss of the articular cartilage at all four DIP joints, large osteophytes, and ankylosis of the DIP joint of the middle finger.

Courtesy of Bruce C Anderson, MD.

Graphic 55802 Version 2.0

Inflammatory arthritis



This plain film demonstrates erosive changes at the distal interphalangeal (DIP) joints (synovial thickening or pannus eroding the adjacent bone), as well as juxtaarticular osteoporosis of the metacarpophalangeal joints (hyperemia).

Courtesy of Bruce C Anderson, MD.

Graphic 53662 Version 2.0

Avulsion fracture with mallet finger



A 3 to 4 mm avulsion fracture is evident accompanying rupture of the extensor profundus tendon.

Courtesy of Bruce C Anderson, MD.

Graphic 64713 Version 2.0

Mechanical triggering with flexor tenosynovitis (trigger finger)



The hands are placed in the palms-up position and the patient is asked to actively flex and extend the fingers. Alternatively, if active triggering is not present, the examiner places his fingers on the proximal interphalangeal (PIP) joint as the finger is actively flexed and extended, noting the presence of loss of smooth motion or a clicking sensation.

Courtesy of Bruce C Anderson, MD.

Graphic 63023 Version 5.0

Passive stretching sign for active tenosynovitis of the finger (trigger finger)

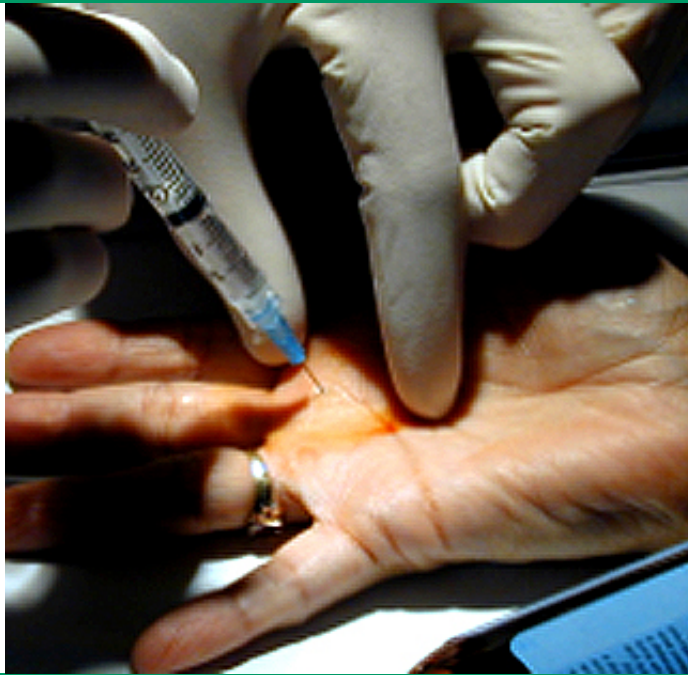


The hands are placed in the palms-up position, and the affected finger is passively stretched in the extended position.

Courtesy of Bruce C Anderson, MD.

Graphic 55130 Version 4.0

Confirmation of a tenosynovial cyst by simple puncture



The hand is flat in a palm-up position with the fingers extended. The point of entry is over the metacarpal head, proximal to the finger crease. Ethyl chloride is applied to the skin for anesthesia. A 5/8-inch, 25 gauge needle is inserted to a depth of 3/8 to 1/2 inch and 1/4 mL lidocaine is injected subcutaneously and at the flexor tendon.

Courtesy of Bruce C Anderson, MD.

Graphic 63337 Version 3.0

Local anesthetic block of the metacarpophalangeal (MP) joint



The wrist is placed flat on the table, palm side down. The point of entry is in the web space between the metacarpal heads. Ethyl chloride is applied to the skin for anesthesia. A 5/8-inch, 25-gauge needle is inserted at a 45 degree angle, 1/4 to 3/8 inch deep, and 1/2 mL lidocaine is injected.

Courtesy of Bruce C Anderson, MD.

Graphic 80531 Version 4.0