

Back Pain and Common Musculoskeletal Problems

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Introduction

A large proportion of the musculoskeletal problems for which patients seek medical attention are related to periarticular structures and do not represent a true articular process or a more generalized systemic illness.^[1] Knowledge of the common nonarticular regional rheumatic disorders is important because of their high prevalence in primary care practice, the dependence on clinical findings for diagnosis, and the high cost that can result from unnecessary laboratory evaluations. The ability to recognize important patterns of pain and physical signs is essential to making a correct diagnosis; in most cases, radiographic and laboratory studies are not needed. Diagnostic studies should be utilized judiciously and must be interpreted in the light of existing clinical findings and prestudy suspicion for specific diagnoses.

Most regional rheumatic disorders respond to local measures, such as application of heat or cold, splinting, and injection of glucocorticoids. Nonsteroidal anti-inflammatory drugs (NSAIDs) or mild analgesic medications are often helpful therapeutic adjuncts. Referral for surgical intervention may be indicated for patients with certain conditions. For example, in cases of cervical or lumbar disk disease or spinal stenosis with definite nerve entrapment or spinal cord compression, well-timed decompression may be necessary to restore function or prevent further functional impairment. Arthroscopic intervention is sometimes useful to better define and treat refractory knee and shoulder pain syndromes. Surgical release is indicated for entrapment neuropathies when there is evidence of motor dysfunction. Surgical consultation may be useful for a variety of other syndromes when the response to conservative measures proves to be less than optimal. Physical therapy and occupational therapy are useful for many patients--particularly those patients who have persistent back and shoulder pain--though these therapies may constitute an important part of the treatment of almost any refractory regional pain syndrome.

Common regional rheumatic disorders include various types of bursitis, tendinitis, tenosynovitis, myofascial pain, and entrapment neuropathies. Bursitis results from mechanical or inflammatory changes of one of the many bursae in the body. Bursae are synovia-lined sacs around the joints that serve to minimize friction between tendons, ligaments, and bony structures. Tendinitis usually results from trauma or overuse of tissues near sites where tendons attach to bone or at the musculotendinous junction. Myofascial pain originates at sites within muscle groups and surrounding fascial tissues that become tender and painful as a result of localized injury or overuse. Entrapment neuropathies occur at sites where peripheral nerves are compressed as they traverse periarticular areas that allow relatively little room for free movement of the affected nerves.

Neck Pain

Neck pain may result from degenerative changes in the cervical disks and zygapophyseal (facet) joints or from a variety of muscular, ligamentous, and tendinous conditions. In whiplash injuries occurring after rapid acceleration or deceleration and hyperextension of the head in motor vehicle accidents, a number of structures may be injured.^[2] Recovery from whiplash injuries is often incomplete, and a combination of physical and psychosocial factors may contribute to prolongation of pain.^[3] Judicious use of analgesics, muscle relaxants, and physiotherapy are useful in some patients. Injection of the facet joints with glucocorticoids appears to have no efficacy.^[4] In some patients with chronic neck pain after whiplash injury, the zygapophyseal joints may be the source of pain, and local nerve block with an anesthetic or ablation often brings relief.^[5]

The term cervical sprain denotes transient neck pain associated with muscle tenderness and spasm. Cervical sprain usually responds to heat, rest, and, occasionally, immobilization and traction. Manual therapy or exercises may provide relief in some patients.^[6] In cervical disk herniation, nerve root impingement results in pain, paresthesia, and sometimes muscle weakness in the distribution of the affected nerve (usually at the C5 to C7 level). In such patients, radiographic documentation and surgical decompression are sometimes needed if symptoms do not improve with rest or traction or if significant neurologic deficit is present.^[7] In some patients with long-standing cervical spondylosis, cervical stenosis may cause chronic compression of the spinal cord (most often at the C3 to C5 level). Surgical decompression is indicated in patients with evolving myelopathy.

Back Pain

Low back pain is the most common musculoskeletal complaint requiring medical attention; it is the fifth most common reason for all physician visits.^[8,9] Over half of the general population will seek medical attention for back pain at some point in their lives. An increased risk of back pain is associated with male sex, smoking, frequent lifting of children or heavy objects, poor general health and conditioning, and certain occupational and sports activities.^[10] In most patients, the cause of pain cannot be determined with any degree of certainty and is usually attributed to muscular or ligamentous strain, facet joint arthritis, or disk pressure on the annulus fibrosus, vertebral end plate, or nerve roots.

Acute Back Pain

Diagnosis. For patients with acute back pain, the initial history should be used to identify those who are at increased risk for serious underlying conditions, such as fracture, infection, tumor, or major neurologic deficit^[8] [see [Table 1](#)]. The presence of such indicators in patients with acute back pain may indicate the need for radiographic and laboratory studies earlier than in patients without such indicators. The initial physical examination should include evaluation for areas of localized bony tenderness and assessment of flexion and straight leg raising. Because acute low back pain will improve within a month in over 90% of patients, further evaluation is usually unnecessary. Plain radiographs should be reserved for patients at high risk for more serious underlying conditions [see [Table 1](#)], because abnormal findings on plain films are common and do not correlate with back pain.

Treatment. A number of therapeutic interventions are available for acute back pain, but data supporting efficacy are minimal for most therapies.^[11] Strict bed rest should be kept to a minimum (no more than 2 to 4 days), and the continuation of normal activities within the limits permitted by pain will lead to a more rapid recovery than will either enforced rest or a back-mobilizing exercise program, even in patients with sciatica.^[12-14] Mild analgesics and NSAIDs may be useful for early symptom control; muscle relaxants and opiates should be used sparingly. Spinal manipulation or specific exercise programs may be effective in acute back pain, but most controlled studies suggest little to no advantage of any particular regimen compared to other measures.^[15-17] Patient education about the natural history of back pain may result in fewer demands for further diagnostic tests and physician visits and should improve patient satisfaction. However, a study of a preventive "back school" educational program in the workplace did not find any reduction in the frequency or severity of episodes of back pain.^[18]

Chronic Back Pain

Diagnosis. Patients whose pain persists after 4 to 6 weeks of conservative treatment measures should be reassessed. Plain radiography and basic laboratory studies (e.g., complete blood count, sedimentation rate, chemistry profile, and urinalysis) should be considered to screen for systemic illnesses. A herniated lumbar disk should be considered in patients with symptoms of radiculopathy, as suggested by pain radiating down the leg with symptoms reproduced by straight leg raising. Magnetic resonance imaging may be necessary to confirm a herniated disk, but findings should be interpreted with caution because many asymptomatic persons have disk abnormalities.^[19] Electromyography may be useful in differentiating lumbar radiculopathy from other causes of radicular leg pain. Most lumbar disk herniations producing sciatica occur at the L4-L5 and L5-S1 levels. Surgical intervention is indicated in patients with persistent sciatica and clear-cut evidence of a herniated disk on MRI or myelogram-computed tomographic scanning.^[20]

Treatment. Patients with chronic back pain should undergo physical therapy with local modalities, an exercise program, and an education program emphasizing proper ergonomics for lifting and other activities. Light normal activity and a regular walking program should be encouraged. Judicious use of analgesics, NSAIDs, and tricyclic antidepressants may help the patient function more fully and may improve outcome.^[21] In some patients with chronic low back pain that worsens with prolonged standing and extension, the source of pain may be lumbar facet joint disease. Flexion exercises and NSAIDs may be useful, but facet joint injections with glucocorticoids do not appear to be effective.^[22] Recent controlled studies have suggested that therapeutic massage or low-impact aerobic exercise provides more benefit than other strategies (e.g., acupuncture, standard physical therapy, or machine-based strengthening exercises).^[23,24]

Lumbar Stenosis. Lumbar spinal stenosis, usually a result of extensive degenerative disk disease and osteophytes, should be suspected in elderly patients with chronic back pain associated with sciatica.^[25] Patients typically complain of pain, numbness, and weakness in the buttocks that extends to one or both legs. Symptoms are usually brought on by standing or walking and improve when the patient assumes a flexed position or lies down (i.e., neurogenic claudication or pseudoclaudication). The diagnosis may be confirmed by MRI or myelogram-CT scanning.^[26] Although conservative measures may be helpful in some patients, surgical decompression by multilevel laminectomy and fusion should be considered in patients with progressive functional deterioration.^[27,28]

Shoulder Pain

Shoulder pain is one of the most common musculoskeletal problems seen in the outpatient setting.^[29] Most shoulder pain results from conditions of the periarticular structures of the joint; true arthritis of the glenohumeral joint is uncommon [see *Figure 1*]. The initial evaluation of shoulder pain should include consideration of pain that may be referred from the neck, thorax, or abdomen. The examination should assess active and passive range of flexion, abduction, and internal and external rotation of the shoulder, along with forward elevation. In addition, areas of localized tenderness may help differentiate the various potential causes of shoulder pain. Plain radiographs are seldom diagnostic but are indicated in patients with a history of trauma or refractory pain or when true glenohumeral joint disease is suspected. For patients who respond poorly to conservative therapy, a variety of specialized tests (e.g., arthrography, arthroscopy, and MRI) are available for further definition of lesions that may require surgery.

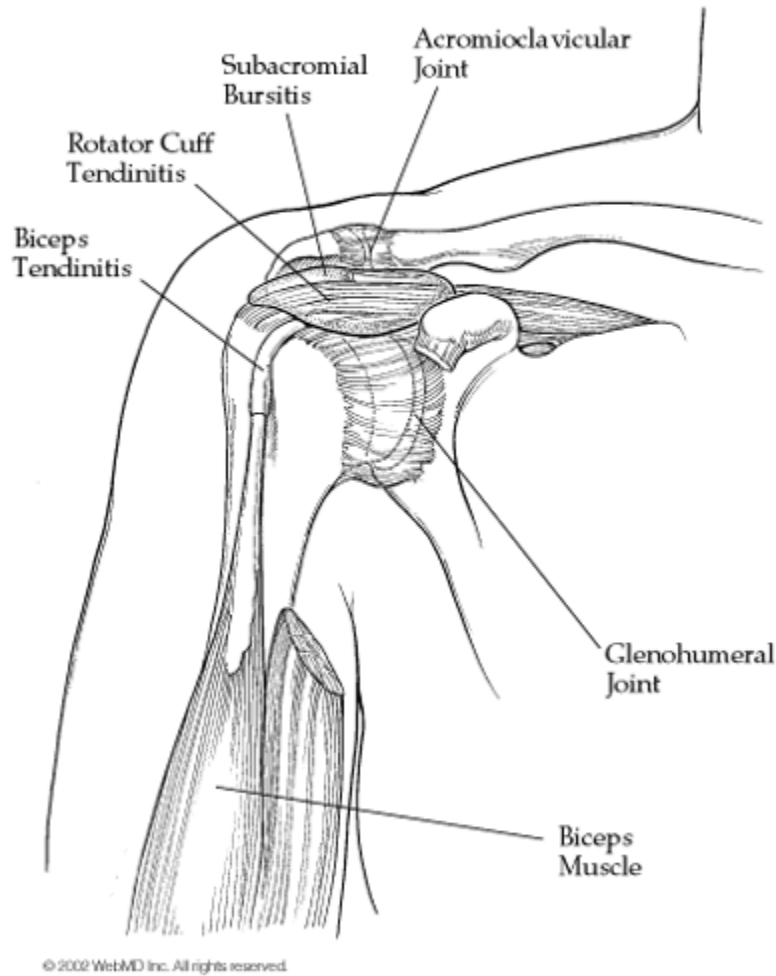


Figure 1. Pain Distribution in Tendinitis. Tendinitis of the rotator cuff and subacromial bursitis cause pain that is felt over the lateral aspect of the shoulder, whereas bicipital tendinitis, acromioclavicular joint disease, and glenohumeral joint disease cause anterior shoulder pain.

Rotator Cuff Tendinitis (Impingement Syndrome)

Rotator cuff tendinitis, or impingement syndrome, is often associated with bursitis of the overlying subacromial bursa and is the cause of most nontraumatic cases of shoulder pain. Rotator cuff tendinitis results from inflammation, degeneration, and attrition of the rotator cuff by mechanical impingement on the acromion, coracoacromial ligament, and sometimes the acromioclavicular joint.

Rotator cuff tendinitis presents most commonly in patients 35 to 60 years of age, but younger patients may be affected as a result of athletic activities involving overhand throwing. Patients report an insidious pain that may be diffuse over the lateral deltoid or more localized to the anterior acromial region. Pain worsens with reaching and may be accompanied by a catch as the patient brings the arm into an overhead position. Rotator cuff pain is often particularly bothersome at night and interferes with sleep. On examination, pain may limit movement and may be reproduced by resistance of active movement. The so-called impingement sign is elicited by forced forward elevation of the arm with the scapula stabilized from behind. A coexistent rotator cuff tear may be suspected if the patient cannot hold the arm in a horizontal position against gravity.

The goal of therapy for rotator cuff tendinitis is to relieve pain and maintain or restore range of motion. Treatment should begin with rest and a progressive program of stretching and strengthening exercises, facilitated by an NSAID. Injection of glucocorticoids and local anesthetic into the subacromial space or glenohumeral joint may result in dramatic relief of symptoms and may allow a more rapid, full recovery.^[30,31] Avoidance of repetitive overhead activities of the arms is necessary during recovery, and job modification may be needed to prevent recurrence. In refractory cases, surgical division of the coracoacromial ligament or acromioplasty may be indicated.

Calcific Tendinitis

Calcific tendinitis is the cause of pain in a subset of patients with apparent rotator cuff disease. In most cases, a more chronic tendinitis is implicated, with associated deposition of calcium in the rotator cuff; calcification in the subacromial space is apparent radiographically. Patients usually have a more acutely painful condition, similar to that seen in crystal-induced arthritis. NSAIDs and local glucocorticoid injections are usually helpful, and surgery is indicated in selected cases. Ultrasound therapy has been shown to provide short-term improvement in symptoms and radiographic calcification when compared to placebo.^[32]

Bicipital Tendinitis

Bicipital tendinitis occurs in the region of the anterior shoulder, where the long head of the biceps tendon passes through the bicipital groove of the humerus and through the joint to insert over the glenoid cavity. Diagnosis is based on the localization of tenderness anteriorly, though this condition may coexist with rotator cuff tendinitis. Rupture of the tendon may occur occasionally, particularly in older patients, and often presents as a bulge in the biceps muscle. Treatment with local measures and range-of-motion exercises is effective, as in rotator cuff disease, and surgical repair of a ruptured tendon is indicated only in younger patients with acute rupture.

Frozen Shoulder (Adhesive Capsulitis)

Frozen shoulder, or adhesive capsulitis, is characterized by progressive pain and global loss of motion in the shoulder. This condition is usually seen in patients with an underlying rotator cuff tendinitis or bicipital tendinitis but has also been associated with stroke, myocardial infarction, cervical radiculopathy, and pulmonary disease. The pathophysiology of frozen shoulder is unclear, and controversy exists as to how significantly capsular inflammation or fibrosis really contributes to the loss of motion that is characteristic of the condition. Treatment is directed toward pain relief and restoration of function, often with a combination of exercises, local heat, ultrasonography, NSAIDs or mild analgesic medications, and periodic glucocorticoid injections. Maximal rehabilitation of a frozen shoulder often requires 1 to 2 years. Surgical procedures, capsular distention with saline injection, and closed manipulation have reportedly been useful in individual cases. Suprascapular nerve blockade has been shown to improve pain but does not improve function or range of motion in patients with frozen shoulder.^[33]

Myofascial Shoulder Pain Syndrome

Myofascial shoulder pain syndromes are characterized by pain over the trapezius or medial or lateral scapular borders posteriorly, with the finding of reproducible trigger points. These poorly characterized syndromes usually respond to local injection with glucocorticoids and an anesthetic, though local modalities may be needed in more chronic cases.

Chest Wall Pain

Musculoskeletal chest wall pain syndromes account for about 10% to 15% of cases in which adults are seen for chest pain in the emergency room setting, and they account for about 15% to 20% of patients who have had chest pain but whose coronary angiograms are negative.^[34] The diagnosis of musculoskeletal chest wall pain requires the finding of consistent areas of tenderness that reproduce the patient's pain. In rare cases, chest pain may result from Tietze syndrome--a benign, painful, nonsuppurative localized swelling of the costosternal, sternoclavicular, or costochondral joints, most often involving the area of the second and third ribs. In most cases, only one area is involved. Young adults are more commonly affected.

More often, patients with musculoskeletal chest wall syndromes have a more diffuse pain syndrome, termed costochondritis or costosternal syndrome, the specific etiology of which is not well understood. Areas of tenderness are not accompanied by heat, erythema, or swelling; multiple areas of tenderness are found, usually in the upper costochondral or costosternal junctions. A number of less common chest wall syndromes have been described, each defined by the area of tenderness (e.g., xiphoidalgia, sternalis syndrome, and slipping rib syndrome). Musculoskeletal chest wall syndromes are usually self-limited and respond to analgesics, local heat, stretching exercises, and local glucocorticoid injection.

Elbow Pain

The most common nonarticular syndromes of the elbow include epicondylitis, olecranon bursitis, and ulnar nerve entrapment.

Epicondylitis

Epicondylitis is caused by an inflammation at the origin of the tendons and muscles serving the forearm; it is usually caused by overuse or by repetitive activity.

Patients typically complain of elbow and forearm pain with activity. When the extensor muscles are involved (i.e., tennis elbow), tenderness is maximal over the lateral epicondyle and aggravated by extension of the wrist against resistance. A similar, less common process may affect the flexor muscles originating at the medial epicondyle (i.e., golfer's elbow).

Epicondylitis usually responds to rest, local heat or ice, NSAIDs, and forearm support to reduce tension at the epicondyle. Local infiltration of glucocorticoids and lidocaine often results in more rapid improvement than other measures in the first month or two but does not appear to affect the outcome over 6 to 12 months.^[35,36]

Olecranon Bursitis

Olecranon bursitis presents as a discrete swelling with palpable fluid over the tip of the elbow. Traumatic bursitis is characterized by minimal heat or surrounding erythema. The fluid aspirated is noninflammatory and often contains multiple red cells. Infectious bursitis--usually caused by gram-positive skin organisms--is accompanied by heat, erythema, and induration. When infection is suspected, prompt aspiration and culture of the fluid are mandatory. Antibiotics should be started empirically, and the bursa should be reaspirated frequently until the fluid no longer reaccumulates and cultures are negative.^[37] Olecranon bursitis may also be part of rheumatoid arthritis or gout, usually in a patient in whom a diagnosis has already been made. On occasion, an initial diagnosis of gout is made by examination of bursal fluid for urate crystals.

Ulnar Nerve Entrapment

Ulnar nerve entrapment is caused by compression of the ulnar nerve as it passes through the ulnar groove at the elbow^[38] [see *11:II Diseases of the Peripheral Nervous System*]. Patients typically complain of pain and numbness that radiates from the elbow to the little finger and the medial side of the hand. An increase in paresthesia with elbow flexion is helpful in making the diagnosis, but nerve conduction studies are often needed to confirm the diagnosis. Conservative therapy with a loose cast may help limit elbow flexion and improve symptoms in some patients; surgical decompression is indicated in patients with disabling pain or weakness.

Hand and Wrist Pain

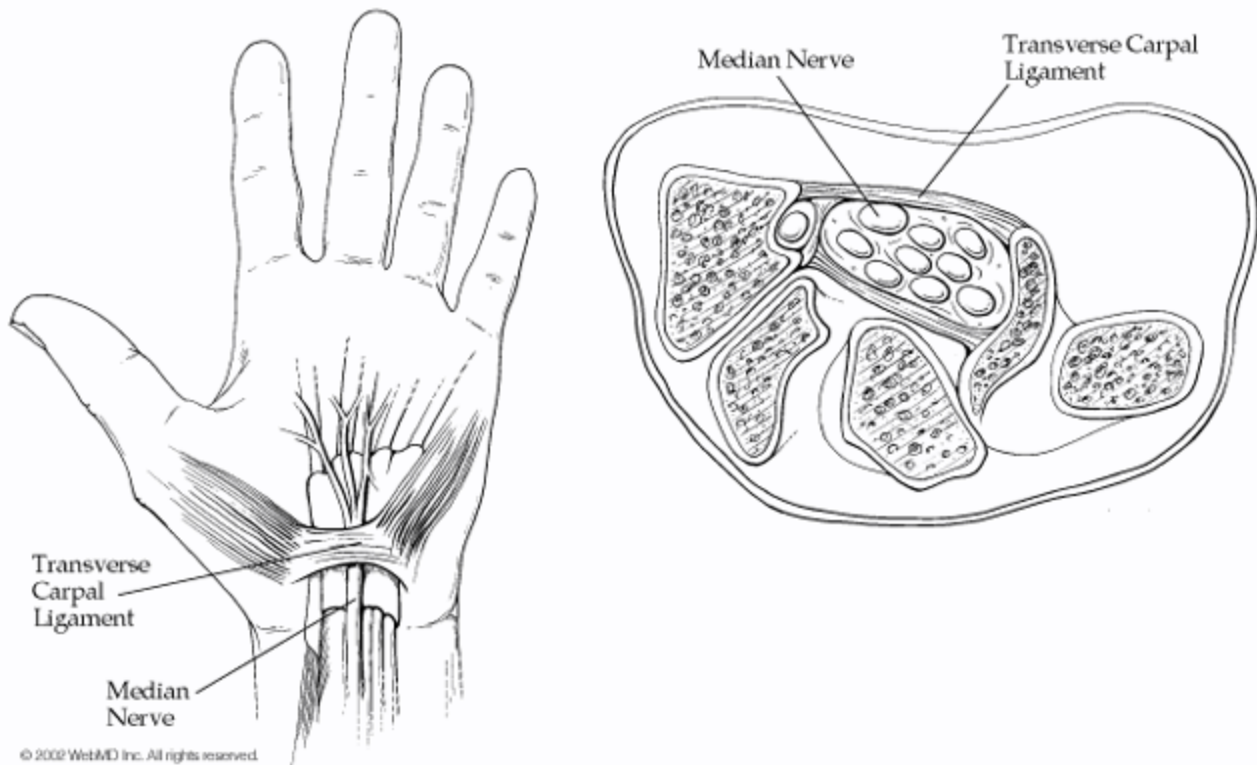
Painful conditions of the tendons and tendon sheaths of the hand and wrist are often related to repetitive or unaccustomed activities. The resultant edema, inflammation, and fibrosis of the structures interfere with the normal function of the tendon as it moves within the sheath.

De Quervain Tenosynovitis and Flexor Tenosynovitis

De Quervain tenosynovitis affects the abductor pollicis longus and extensor pollicis brevis. Typical symptoms are pain over the radial aspect of the wrist during activities and tenderness that is usually found over the affected tendons proximal to the level of the carpometacarpal joint of the thumb. Pain is reproduced by stretching the tendons with the thumb inside a closed fist (i.e., the Finkelstein maneuver). Flexor tenosynovitis, or trigger finger, is caused by involvement of the flexor tendons of the digits, usually at the level of the metacarpophalangeal joint. Patients complain of locking of the affected digit in a flexed position, often with a sudden painful release on extension. Treatment of de Quervain tenosynovitis and flexor tenosynovitis may require rest, local heat, immobilization with a splint, or local infiltration with glucocorticoids. Surgical release is rarely required.

Carpal Tunnel Syndrome

Carpal tunnel syndrome is caused by compression of the median nerve at the wrist as it courses with the flexor tendons^[38] [see Figure 2] and [see 11:II Diseases of the Peripheral Nervous System]. Entrapment is usually associated with flexor tenosynovitis related to overuse or trauma. In addition, an association has been observed with medical conditions such as diabetes mellitus, rheumatoid arthritis, pregnancy, and hypothyroidism, as well as with rare conditions, such as amyloidosis, acromegaly, and localized infection. Carpal tunnel syndrome is relatively common in the general population. A recent study found that 14% of the general population have symptoms suggestive of carpal tunnel syndrome; such symptoms were confirmed by clinical examination and electrophysiologic studies in 2% to 3% of the patients studied.^[39] In addition, 18% of asymptomatic people were found to have electrophysiologic evidence of median nerve entrapment. Carpal tunnel syndrome is more common in persons with occupations that require repetitive wrist movements, awkward wrist positions, or the use of vibrating tools or great force. Patients report numbness, tingling, and pain over the palmar radial aspect of the hand; these symptoms are often worse at night or after use. Reproduction of paresthesia with maximal wrist flexion (i.e., the Phalen test) or tapping over the volar aspect of the wrist (i.e., the Tinel sign) are often considered to be helpful clinical findings. However, a recent review of published studies suggests that the pattern of pain and findings of decreased sensation and weakness of thumb abduction are the most reliable diagnostic findings.^[40] Because of the uncertainties in the reliability of diagnostic findings, electrodiagnostic testing is usually necessary to confirm a diagnosis, particularly when surgical intervention is considered.



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Figure 2. Carpal Tunnel Syndrome. Carpal tunnel syndrome involves the entrapment of the median nerve in the canal that encloses the nerve and several flexor tendons and that is formed by bones of the wrist and the transverse carpal ligament. Traumatic thickening of the flexor tendon sheaths can compress the median nerve.

Conservative treatment measures include use of NSAIDs and placement of a wrist splint in a neutral position. Local injection of glucocorticoids affords short-term relief in most patients, but long-term improvement is less predictable.^[41] Surgical decompression by sectioning of the volar carpal ligament results in excellent outcome in 67% to 80% of patients; it is indicated in patients whose conditions respond poorly to conservative therapy, patients with chronic or recurrent symptoms, or patients with weakness or atrophy of the thenar muscles. In a recent study, patients with poor upper extremity function, patients who used alcohol, or patients with worse mental health status were less likely to have good results from surgical therapy.^[42]

Dupuytren Contracture

Dupuytren contracture is a fibrosing condition of the palmar and digital fascia that results in thickening and puckering of the palmar skin with subcutaneous nodules and often in flexion contracture of the underlying digit. Dupuytren contracture may be associated with other fibrosing syndromes, with an autosomal dominant inheritance pattern, and possibly with liver disease, epilepsy, and alcoholism. Although spontaneous improvement may be seen, surgical intervention to improve function may be useful in individual cases.

Stiff-Hand Syndrome

The stiff-hand syndrome, resembling scleroderma, is characterized by thickening of the skin and subcutaneous tissues and generalized limitation of hand and wrist motion. This condition is seen almost exclusively in young patients with long-standing insulin-dependent diabetes mellitus.^[43]

Hip Girdle Pain

Pain around the hip girdle is a common complaint in clinical practice. Patients with pain resulting from diseases of the hip joint usually describe pain in the anterior thigh or inguinal region that worsens with weight bearing. More commonly, patients with a chief complaint of hip pain have a problem in one of the nonarticular structures of the hip girdle, usually located posteriorly or laterally [see Table 2]. A multitude of bursae have been described in the hip girdle

region. Pain in the upper buttock in and around the gluteal muscles is often referred to as myofascial hip pain or gluteal bursitis. Pain in this area is often difficult to differentiate from referred lumbar pain. Local therapy with heat, stretching, or glucocorticoid injection is usually helpful, but many patients require long-term therapy.

Trochanteric Bursitis (Greater Trochanteric Pain Syndrome)

Trochanteric bursitis is probably the most common cause of hip girdle pain, although a recent study using MRI suggests that most patients with this pain syndrome may have tendinitis or a partial tear of the gluteus medius tendon.^[44] Patients typically complain of pain over the lateral aspect of the hip girdle, sometimes radiating down the thigh, that is worse at night when they lie on the affected side. Pain is sometimes present when the patient arises from a chair, but it tends to improve with ambulation. Point tenderness over the lateral or posterior aspect of the greater trochanter is usually diagnostic, though some patients with referred lumbar facet or disk disease may have a similar presentation. Patients with more severe pain may have a positive Trendelenburg sign on physical examination. Local heat and NSAIDs may be helpful, and a local glucocorticoid injection is curative in most patients. In refractory cases, repeated injections, physical therapy, and, in rare instances, surgical excision of the bursa may be indicated.

Ischiogluteal Bursitis

Ischiogluteal bursitis results from an irritation of the bursa in the area of the attachments of the hamstring and gluteal muscles at the ischial tuberosity. The condition may be brought on by prolonged sitting or by pressure in the area and usually responds to local heat, stretching, or glucocorticoid injection.

Iliopectineal Bursitis

Iliopectineal bursitis, which is caused by irritation of the bursa between the iliopsoas muscle and the inguinal ligament, is an uncommon cause of inguinal pain and may mimic true hip joint disease. The diagnosis is suggested by the presence of inguinal pain that is aggravated by extension of the hip (in a patient whose hip x-ray is normal). Confirmation by ultrasonography or CT scanning may be required. Treatment is usually with local measures or, in rare cases, by means of surgical excision.

Meralgia Paresthetica

Meralgia paresthetica is characterized by intermittent paresthesia, hypoesthesia, or hyperesthesia over the upper anterolateral thigh. The syndrome is caused by an entrapment of the lateral femoral cutaneous nerve at the level of the anterosuperior iliac spine where the nerve passes through the lateral end of the inguinal ligament. Causes include local trauma, rapid weight gain, and the wearing of constrictive garments around the hips. Useful therapies include avoidance of pressure in the area, weight loss, and local infiltration of glucocorticoids at the level of nerve exit.

Knee and Lower Leg Pain

Clinically, it can be difficult to differentiate articular from nonarticular knee pain. Most patients with articular knee pain have a relatively diffuse pain that is not well localized to one area of the knee. Physical examination shows loss of motion, crepitus (in osteoarthritis), warmth (in inflammatory arthritis), or the presence of effusion. If knee pain is localized or if the knee has full range of motion without warmth, crepitus, or effusion, one of the following nonarticular syndromes should be considered: infrapatellar tendinitis, Osgood-Schlatter disease, prepatellar bursitis, anserine bursitis, anterior knee pain syndromes, and restless legs syndrome.

Infrapatellar Tendinitis

Infrapatellar tendinitis, or jumper's knee, causes anterior knee pain below the patella and is often related to athletic activities. Tenderness is localized to the infrapatellar tendon, with no associated swelling, and conservative measures almost always result in resolution of symptoms.

Osgood-Schlatter Disease

Osgood-Schlatter disease is characterized by pain and swelling over the tibial tubercle at the tendon insertion point. This condition is seen predominantly in adolescent males and is thought to represent a traumatic avulsion injury. Symptoms usually resolve with temporary immobilization and slow resumption of activities.

Prepatellar Bursitis

Prepatellar bursitis, or housemaid's knee, causes pain and swelling in the anterior knee superficial to the patella and infrapatellar tendon. An area of localized fluid collection is usually detectable; aspiration is often needed for diagnosis. As in olecranon bursitis of the elbow, prepatellar bursitis may be associated with trauma, localized bacterial infection, and, less commonly, gout, rheumatoid arthritis, and atypical infections. The differentiation between trauma and infection is particularly important for initiation of appropriate therapy.

Anserine Bursitis

Anserine bursitis, which is caused by irritation of the bursa near the attachment of the sartorius and hamstring muscles at the medial tibial condyle, is a common cause of medial knee pain. Patients with this condition complain of pain at night or when climbing stairs, and an area of localized tenderness can be found on examination. Coexistent osteoarthritis of the knee joint is present in many patients, and relief with local heat or injection of glucocorticoids and anesthetic may be helpful both diagnostically and therapeutically.

Anterior Knee Pain Syndromes

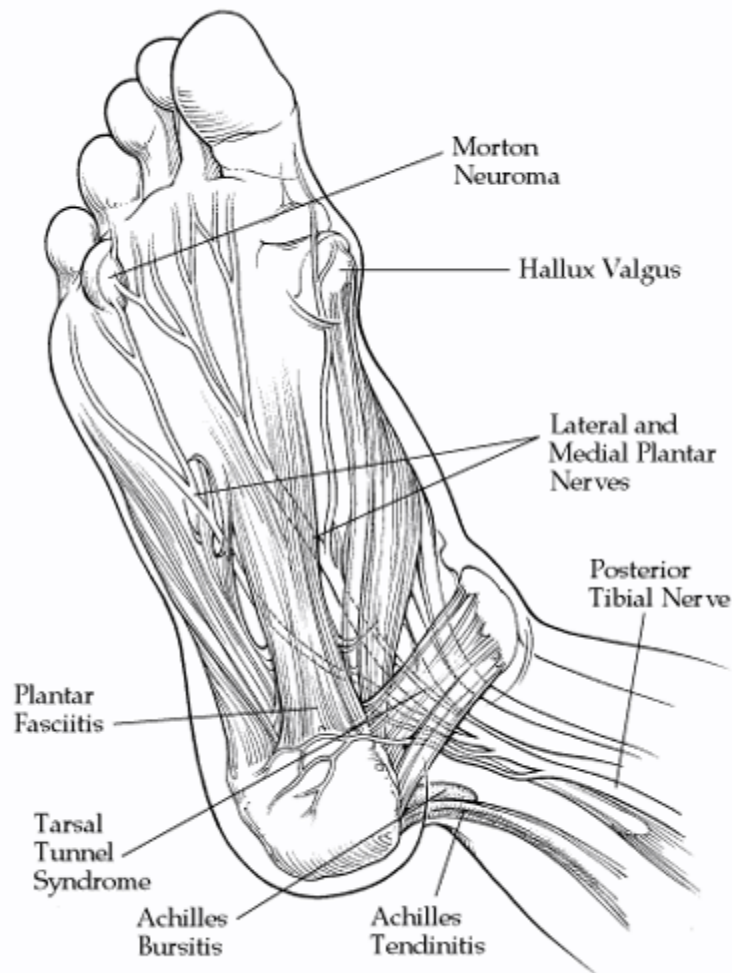
Anterior knee (patellofemoral) pain syndromes usually manifest themselves as pain and crepitus associated with activities that require knee flexion under load conditions (e.g., stair climbing).^[45] Physical findings that help with diagnosis include (1) reproduction of pain with pressure over the patella during knee motion and (2) tenderness over the medial surface of the patella. The cause of most anterior knee pain syndromes is uncertain, but the pain may be related to misalignment of the quadriceps with lateral patellar subluxation, patella alta, hypermobility, or findings of chondromalacia of the patella on arthroscopic evaluation. Local measures and an exercise program that emphasizes isometric quadriceps strengthening is helpful in most patients. Some patients require arthroscopic intervention to diagnose and correct articular irregularities or patellar misalignment.

Restless Legs Syndrome

Restless legs syndrome is characterized by unpleasant, deep-seated paresthesia in both legs that usually occurs during rest and that is relieved by movement.^[46] Most patients with this syndrome have associated disturbance of sleep, and many have abnormal periodic leg movements during sleep [see 11:XIII Disorders of Sleep]. Although idiopathic in most patients, restless legs syndrome has been associated with iron deficiency, uremia, pregnancy, diabetes, and polyneuropathies. Patients with severe symptoms may respond to levodopa-carbidopa. However, some patients may require treatment with bromocriptine, carbamazepine, clonidine, benzodiazepines, or opioids.

Ankle and Foot Pain

Nonarticular foot and ankle pain is best approached with a consideration of the region affected: the forefoot, midfoot, or hindfoot [see Figure 3].



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Figure 3. Causes of Foot Pain. In the anterior foot, hallux valgus may cause diffuse pain, whereas Morton neuroma is usually localized. Tarsal tunnel syndrome causes paresthesias over the medial and plantar aspect. Plantar fasciitis and Achilles tendinitis are common causes of posterior foot pain.

Forefoot Pain

Hallux valgus is the leading cause of forefoot pain. It is a common deformity that causes pain because of direct pressure over the first metatarsophalangeal joint resulting from footwear or because of pressure over the lateral toe joints caused by crowding of the toes. In the lateral toes, hammer toe (i.e., plantar flexion of the proximal interphalangeal joint), claw toe (i.e., plantar flexion of the proximal and distal interphalangeal joints), or mallet toe (i.e., isolated flexion contracture of the distal interphalangeal joint) may be associated with a dorsiflexion contracture of the metatarsophalangeal joint. Initial treatment of these problems should begin with adequate footwear that allows ample width for the metatarsal heads, individualized orthoses, and surgical correction (reserved for patients with persistent pain). Morton neuroma is an entrapment neuropathy of the interdigital nerve, with or without an associated plantar neuroma, that is most commonly seen between the third and fourth metatarsal heads. Patients report pain and paresthesia radiating into the affected toes; tenderness between the metatarsal heads that reproduces the described symptoms will also be found. Orthoses to decrease pressure in the area, local glucocorticoid injection, or surgical excision of the neuroma may be needed to relieve symptoms.

Midfoot Pain

Midfoot pain is usually the result of deformities of the arch of the foot or arthritic changes of the midfoot joints. Patients with a cavus foot deformity, peripheral neuropathies, or previous ligamentous injuries from sprains may be predisposed to excessive stresses on the midfoot and early osteoarthritic changes. Tarsal tunnel syndrome is caused by entrapment of the posterior tibial nerve under the flexor retinaculum on the medial side of the ankle. Symptoms of pain and paresthesia over the plantar and distal foot and toes are usually present, and the Tinel sign may be positive. Tarsal tunnel syndrome is much less common and more difficult to diagnose than carpal tunnel syndrome in the wrist. Treatment consists of splinting and NSAIDs. Local glucocorticoid injection and surgical decompression are not as predictably successful as in carpal tunnel syndrome.

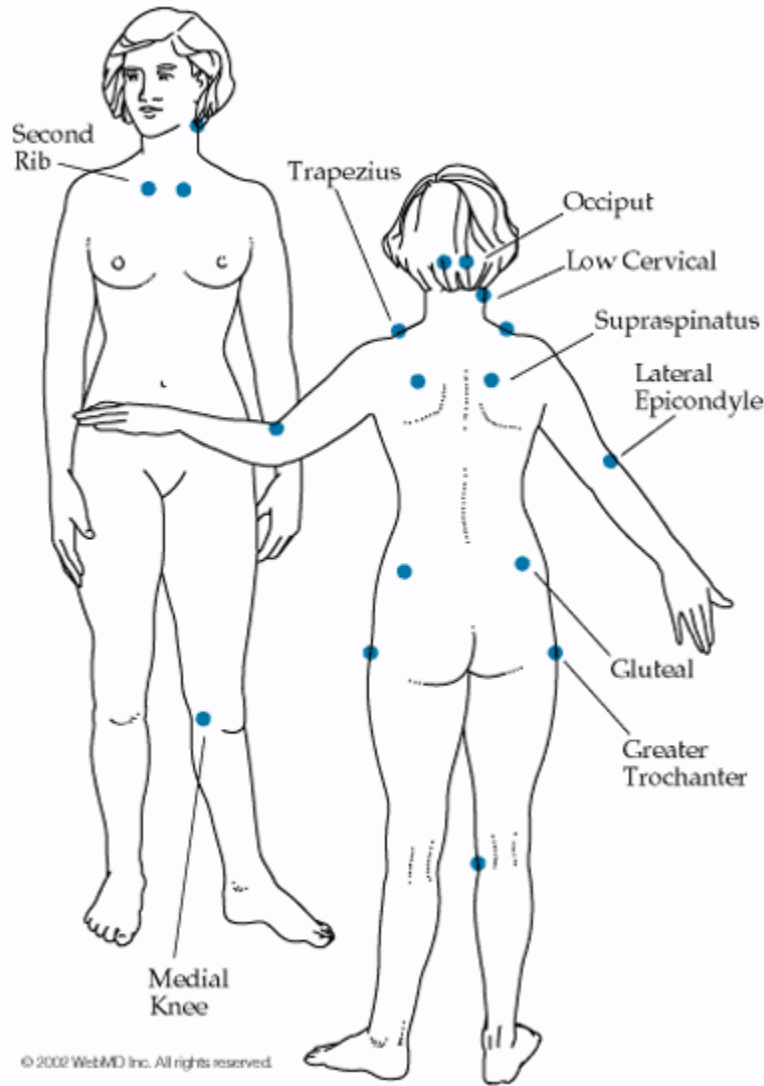
Hindfoot Pain

Plantar fasciitis is one of the most common causes of hindfoot pain. Patients report pain over the plantar aspect of the heel and midfoot that worsens with walking. Localized tenderness along the plantar fascia or at the insertion of the calcaneus is helpful in diagnosis. Plantar fasciitis is associated with obesity, pes planus, and activities that stress the plantar fascia and may also be seen in systemic arthropathies such as ankylosing spondylitis and Reiter syndrome. Although radiographic spurs in the affected area are common, they may also be seen in asymptomatic persons and are therefore not diagnostic. Orthoses, heel cord stretching exercises, NSAIDs, and local glucocorticoid injection may be helpful, whereas surgery is seldom indicated. Posterior heel pain is usually caused by Achilles tendinitis or by bursitis of the bursae that lie superficial or deep to the insertion of the Achilles tendon at the calcaneus. Although usually associated with overactivity, Achilles tendinitis may also be part of ankylosing spondylitis and Reiter syndrome. NSAIDs and orthoses designed to reduce stress on the tendon (e.g., heel lifts) are usually helpful. In most cases, glucocorticoid injections in the Achilles tendon area should be avoided because of the risk of tendon rupture.

Fibromyalgia

Fibromyalgia is a chronic musculoskeletal pain syndrome associated with widespread pain and localized areas of deep muscle tenderness.^[47] Patients typically complain of severe chronic pain, usually with stiffness that is most pronounced in the axial skeleton, shoulders, and hips, but the distal extremities are sometimes painful as well. Most patients complain of fatigue, which may be overwhelming, and nearly all patients report nonrefreshing sleep. A variety of other symptoms may be present, including headache, irritable bowel syndrome, paresthesia, swelling, and depression or anxiety.

Physical examination of the joints and muscles in patients with fibromyalgia is normal except for the presence of multiple localized areas of tenderness in periarticular areas, most commonly in specific anatomic areas [see Figure 4]. The diagnosis of fibromyalgia is based on the history of widespread chronic pain and the findings of tender points at a majority of these typical areas. Laboratory studies such as an erythrocyte sedimentation rate, muscle enzymes, thyroid profile, antinuclear antibodies, rheumatoid factor, or radiographs of specific areas are appropriate in the initial evaluation of patients to exclude other potential causes of widespread pain and fatigue.



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Figure 4. Tender Points in Fibromyalgia. Patients with fibromyalgia exhibit many specific, widespread tender points that are revealed by deep palpation.

The pathogenesis of fibromyalgia is uncertain and probably complex. Most studies of patients with fibromyalgia have shown an increased incidence of previous depression or other psychological disorders, although a majority of patients are not clinically depressed at the time of diagnosis. Other abnormalities observed include disturbance of stage 4 sleep, decreased skeletal muscle high-energy phosphates, abnormalities in the concentration of substance P in the cerebrospinal fluid, subtle decreases in growth hormone, and other changes in hypothalamic-pituitary function.^[48] The relationship of these changes to the etiology and pathogenesis of this syndrome is unclear.

Therapy for fibromyalgia is usually only partially effective. Low-dose tricyclic antidepressants (e.g., amitriptyline, 10 to 50 mg at bedtime) and most other antidepressants have been shown to lead to improvement in symptoms when compared to placebo.^[49] Other agents that improve the quality of sleep may be effective as well. NSAIDs are less effective in general but may be useful in certain patients. Cardiovascular-fitness training and aerobic-exercise programs have been shown to be effective in many patients, and strategies that involve training patients in techniques of internal control ("mind-body therapy") may be useful as well.^[50] Most patients with fibromyalgia continue to have symptoms for years. The disease course is characterized by temporary improvements and relapses; complete remission occurs in a few patients.

For more information, visit <http://www.samed.com>.

Tables

Table 1. Indications That Acute Back Pain May Involve Underlying Conditions

Patient demographics	Age > 70 yr History of cancer Glucocorticoid or immunosuppressive drug therapy Alcohol or I.V. drug abuse
Historical features	Weight loss Fever Pain increased by rest
Neurologic symptoms	Bowel or bladder dysfunction Saddle block anesthesia Progressive motor weakness

Table 2. Differential Diagnosis of Hip Girdle Pain

Clinical Syndrome	Location of Pain	Diagnostic Features and Comments
Acetabular joint pain	Anterior hip (inguinal)	Worse with weight bearing Radiographic confirmation
Ileopsoas bursitis	Anterior hip (inguinal)	Pain with extension Normal radiograph ? Ultrasound or CT scanning
Meralgia paresthetica	Anterior hip (midthigh)	Numbness and tingling Normal hip movement
Trochanteric bursitis	Lateral hip, posterior hip, or both	Normal hip movement Point tenderness Relief with glucocorticoid injection
Myofascial pain	Posterior hip	Localized tenderness Relief with glucocorticoid injection ? Mimics lumbar disease
Gluteal bursitis	Posterior hip	Localized tenderness Relief with glucocorticoid injection ? Mimics lumbar disease
Ischiogluteal bursitis	Posterior hip	Normal hip movement Point tenderness

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