16. ORTHOPEDIC CONDITIONS

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The development of quality indicators for orthopedic conditions began with a MEDLINE search of the English language literature from 1985 to the present using subject headings for knee pain, shoulder pain, and various joint-specific disorders. Additional review articles and clinical trials were identified by reviewing the reference sections of articles previously identified.

Patients presenting with acute and subacute orthopedic complaints comprise a large proportion of all ambulatory care visits to primary care providers (Barker, 1991). The most common disorders not related to the back or neck involve the knee and the shoulder. This chapter provides an overview of important conditions for patients presenting with knee and shoulder complaints, including diagnosis, treatment, and follow-up. We have concentrated on the most common causes of acute or subacute knee and shoulder complaints. For that reason, screening, diagnosis, and treatment for osteoporosis, rheumatoid arthritis, or any of the crystalline-induced arthropathies will not be addressed in this chapter.

SHOULDER: OVERALL IMPORTANCE

Shoulder discomfort is the third most common reason for visits to primary care physicians in ambulatory practice (Smith and Campbell, 1992) and is responsible for significant medical costs and time lost from work. The more common shoulder syndromes include subacromial bursitis/ supraspinatus tendinitis (i.e., impingement syndrome), bicipital tendinitis, supraspinatus tendon tear or rupture, adhesive capsulitis, and acromioclavicular joint osteoarthritis. Smith and Campbell (1992) estimated the prevalence of shoulder disorders based on a combination of three reports with a total of 160 patients who presented with shoulder complaints (see Table 16.1).
Table 16.1
Estimated Prevalence of Shoulder Disorders

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Prevalence</th>
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<tbody>
<tr>
<td>Subacromial bursitis/supraspinatus tendinitis</td>
<td>60%</td>
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<tr>
<td>Bicipital tendinitis</td>
<td>4%</td>
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<tr>
<td>Supraspinatus tendon tear or rupture</td>
<td>10%</td>
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<tr>
<td>Adhesive shoulder capsulitis</td>
<td>12%</td>
</tr>
<tr>
<td>Acromioclavicular joint osteoarthritis</td>
<td>7%</td>
</tr>
<tr>
<td>Other/unclear</td>
<td>7%</td>
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</tbody>
</table>

Source: Smith and Campbell, 1992

SCREENING

There are no screening recommendations for shoulder disorders or shoulder pain.

DIAGNOSIS

Experts recommend the initial evaluation of a patient with a shoulder complaint should begin with a thorough history of the problem, including descriptions of each of the following: duration; onset (i.e., acute vs. chronic); activity or mechanism at the time of onset; activities that alleviate or exacerbate the condition; patient’s age; past history of trauma or injury; past history of shoulder/arm surgery; therapeutic interventions attempted; and other medical conditions, especially diabetes mellitus, thyroid disease, coronary artery disease, alcohol abuse, and use of corticosteroids (Sigman, 1995; Smith, 1992) (Indicator 1).

Experts also recommend that the physical examination include the following diagnostic maneuvers: observation for anatomic abnormalities, range of motion testing (both passive and active), palpation, and neurologic and vascular evaluation (Sigman, 1995; Snyder, 1993) (Indicator 2). In addition, particular diagnostic maneuvers exist which help to focus the diagnostic possibilities. Many authors consider plain x-rays an essential part of the shoulder evaluation, but no RCTs exist to support this diagnostic strategy (Sigman, 1995; Snyder, 1993).
TREATMENT

Treatment modalities for shoulder disorders focus on relieving symptoms and returning the patient to an acceptable level of physical activity. The primary form of medical management for the conditions discussed in this chapter involves decreasing the inflammatory response through the use of various anti-inflammatory agents (White et al., 1986; Petri et al., 1987; Adebajo et al., 1990; Van der Heijden et al., 1996; Itzkowitch et al., 1996; Blair et al., 1996), in conjunction with physical therapy modalities. In some cases, surgical intervention may be necessary to repair damaged structures or to alleviate pain.

FOLLOW-UP

No studies were identified that support specific follow-up regimens for shoulder complaints. While follow-up is clearly important, we have recommended no quality indicators in this area for that reason.

IMPINGEMENT SYNDROME: SUBACROMIAL BURSITIS/SUPRASPINATUS TENDINITIS

IMPORTANCE

The impingement syndrome represents the most commonly diagnosed shoulder disorder (Smith and Campbell, 1992). It is characterized by recurrent or chronic shoulder pain brought on by repetitive trauma or vigorous overhead activities. Subacromial bursitis and supraspinatus tendinitis are grouped together in the diagnosis of impingement syndrome, because their physical findings may be difficult to differentiate.

DIAGNOSIS

Patients may present with complaints of acute (within hours or days) or more progressive (weeks to months) dull pain over the deltoid area, with radiation down the lateral aspect of the arm. In the orthopedic literature (Shapiro and Finerman, 1992; Smith and Campbell, 1992) a standard x-ray series of four views is commonly recommended to assess the presence of anatomic abnormalities as the etiology of the inflammation when evaluating a patient for impingement or rotator cuff
problems. However, no studies exist to support this diagnostic course of action.

TREATMENT

The principles of rehabilitation are to restore function and allow initial healing of inflamed tissue. The effectiveness of various antiinflammatory agents for treating impingement syndrome has been demonstrated in a number of RCTs (White et al., 1986; Petri et al., 1987; Adebajo et al., 1990; Itzkowitch et al., 1996). The goal of treatment is to reduce the inflammatory changes through the use of antiinflammatory agents, and the avoidance of repetitive and aggravating activities (Indicator 3). When the inflammatory changes are reduced or reversed, experts recommend range of motion exercises, either as formal physical therapy or through a home exercise program (Fu et al., 1991) (Indicator 4).

ROTATOR CUFF (SUPRASPINATUS TENDON) TEAR OR RUPTURE

IMPORTANCE

A rotator cuff tear or rupture results from two main etiologic mechanisms. In patients over age 50, decreased blood flow to the muscle may lead to degeneration and subsequent rupture. In younger patients, the most common causes of damage are repetitive use, overuse, and trauma.

DIAGNOSIS

It is difficult to differentiate a small supraspinatus tear from supraspinatus tendinitis or subacromial bursitis (i.e., impingement syndrome) on physical examination, but arm weakness is identifiable in the presence of a large rotator cuff tear or rupture. The drop arm sign is the accepted diagnostic maneuver when evaluating a patient for rotator cuff pathology. However, no study has prospectively assessed the usefulness or predictive value of the drop arm sign, motion weakness, or impaired abduction against resistance (Smith and Campbell, 1992). Magnetic resonance imaging (MRI) is performed if there is a question regarding the etiology of a shoulder disorder, but MRI is not
required to make the diagnosis of a rotator cuff tear. Arthrography was previously the gold standard for rotator cuff imaging, but has been replaced by MRI where available (Snyder, 1993). In diagnosing rotator cuff tear, the sensitivity and specificity of MRI are 92 percent and 88-to-100 percent, respectively; for arthography, sensitivity is 92 percent and specificity is 98 percent. The sensitivity and specificity of ultrasound are only 63 percent and 50 percent, respectively (Snyder, 1993).

**TREATMENT**

Smith and Campbell (1992) suggest that the data support treatment with intraarticular steroids for small supraspinatus tendon tears, as none of the steroid injection trials revealed any deleterious effects. However, in a systematic review of randomized trials assessing the efficacy of intraarticular corticosteroid injections for shoulder disorders, Van der Heijden et al. (1996) concluded that evidence is scarce for supporting this treatment modality in small rotator cuff tears. Treatment of medium or large full-thickness tears requires early operative repair, as this has been shown to improve functional outcomes and decrease pain (Smith and Campbell, 1992; Adebajo et al., 1990; Levy, 1990) (Indicator 5). Recuperation may take six to nine months, during which recuperative passive shoulder exercises should be initiated early under orthopedic supervision and physical therapy guidance.

**ADHESIVE CAPSULITIS**

**IMPORTANCE**

Adhesive capsulitis is also known as frozen shoulder, periarthritis, and pericapsulitis. The incidence of this disorder in the general population is about two to five percent. It is more prevalent among diabetics (10-20%) than nondiabetics. Adhesive capsulitis affects women more than men, and commonly develops during middle age. An individual’s nondominant shoulder is more likely to be involved, and approximately 12 percent of patients develop the condition bilaterally. Prophylactic measures for at-risk individuals include
avoiding unnecessary immobilization of the shoulder joint, and range of motion exercises (Grubbs, 1993).

**DIAGNOSIS**

Symptoms of adhesive capsulitis frequently progress over several months. Early physical findings include lateral and anterior glenohumeral joint capsule tenderness, muscle spasms (usually in the scapular, pectoralis, and deltoid areas) as well as more diffuse pain (Smith and Campbell, 1992). Radiography rules out other shoulder conditions in adhesive capsulitis. Plain x-rays of the affected shoulder may be normal, or they may reveal calcium deposits, degenerative changes, diminished subacromial space, and osteoporotic or cystic changes.

**TREATMENT**

The goal of treatment is to alleviate pain and restore normal shoulder function. There are many treatments reported in the literature; however, the natural history of this condition is poorly understood, and no clinical studies have prospectively evaluated treatment outcomes. Nonsteroidal anti-inflammatory drugs (NSAIDs) and injectable corticosteroids are frequently used for the treatment of adhesive capsulitis (Smith and Campbell, 1992). Although intraarticular corticosteroid injection reportedly reverses the pain and fibrosis associated with adhesive capsulitis, it has not been shown to improve the rate at which function is restored to the shoulder (Grubbs, 1993). The use of exercises for treatment of this disorder has been associated with improved outcomes in observational trials (Grubbs, 1993) (Indicator 6).

**BICIPITAL TENDINITIS**

**DIAGNOSIS**

Anterior shoulder pain over the bicipital tendon, particularly with contraction of the biceps muscle, is the most prominent symptom of bicipital tendinitis. Inspection, rotation, and abduction of the
shoulder are normal, but palpation of the bicipital tendon with elbow flexion causes exquisite tenderness.

TREATMENT

Optimal medical management for bicipital tendinitis has been difficult to determine because its natural course is unknown. In addition, it may be difficult to assess the response to treatment for bicipital tendinitis in the presence of co-existing subacromial bursitis and/or supraspinatus tendinitis. Patients are advised to avoid activities that provoke or aggravate shoulder pain. No studies have focused on the medical management of isolated bicipital tendinitis (Smith and Campbell, 1992). Non-surgical treatment includes the use of antiinflammatory medications including NSAIDs and local corticosteroid injections, to reduce the inflammatory response and improve normal shoulder function. Patients may be instructed to perform gentle range of motion exercises (e.g., “the pendulum”) to avoid adhesive capsulitis and maintain range of motion (Indicator 8).

KNEE: OVERALL

IMPORTANCE

Knee disorders account for the most common orthopedic complaints among patients visiting primary care physicians. The major disorders that affect the knee are: meniscal injury; ligamentous injury (especially anterior cruciate and posterior cruciate ligaments); patellofemoral pain syndrome; osteoarthritis; inflammatory disorders/collagen vascular disease (i.e., gout, pseudogout, sarcoid, infection); and pain referred from the hip or back (Smith and Green, 1995). We cover four major acute knee syndromes: meniscal damage, cruciate and collateral ligament injuries, patellar instability, and septic arthritis.

SCREENING

There are no current recommendations on screening for knee pain or dysfunction.
DIAGNOSIS

Orthopedic expert opinion supports a detailed history and physical examination in making an accurate diagnosis for patients presenting with complaints of knee pain (Smith and Green, 1995; Litman, 1996; Neuschwander et al., 1996). The history should include the patient’s age; duration of pain; onset of the disorder (i.e., recent vs. chronic); mechanism of injury; exacerbating and relieving factors; location of pain; functional disability; past history of injury or trauma; past history of surgery; evidence of swelling; time of onset; a sense of locking, popping, or catching; pain, weakness, or redness at the knee joint; medical conditions; and health behaviors such as smoking, alcohol use, recreational drug use, diet, and exercise (Smith and Green, 1995) (Indicator 7). The physical examination should include an assessment of all of the following: range of motion, palpation of the joint lines for evidence of tenderness, ligamentous stability, cartilaginous integrity, patellar irritability, and presence of effusions (Smith and Green, 1995; Davidson, 1993; Towheed and Hochberg, 1996). Maneuvers specific for particular knee disorders are also included in the physical exam. Lachman’s test has a very high sensitivity and specificity for ACL tears. The pivot shift test also has a high sensitivity and specificity but may be difficult to perform due to patient discomfort. McMurray’s test is the most sensitive and specific maneuver for meniscal tears. The posterior drawer test has the highest sensitivity for PCL tears (Indicator 8). Smith and Green (1995) advocate examining the uninjured knee first as a comparison prior to assessing the injured joint. The knee should be examined as soon after the injury as possible, before pain and swelling develop.

In the past, obtaining radiographic studies as part of the clinical work-up of a patient with a knee injury was generally accepted, although no data supported this process. Recently, physicians at the University of Ottawa developed and prospectively validated a set of guidelines for the use of radiography in the evaluation of acute knee injuries (Stiell et al., 1993, 1996), which are as follows:
The Ottawa Knee Rules - A knee x-ray is required only when acute knee injury is accompanied by one or more of the following findings related to age, tenderness, or function:

- Inability to bear weight for four steps both immediately after injury and in the emergency department (i.e., unable to transfer weight twice onto each lower limb);
- Age 55 years or older;
- Tenderness at the head of the fibula;
- Isolated tenderness of the patella (i.e., no bone tenderness of the knee other than the patella);
- Inability to flex to 90 degrees.

These guidelines have a sensitivity of 1.0 (95% CI 0.94-1.0), but a specificity of only 0.49 (95% CI 0.46-0.52) for clinically important knee fractures (Stiell et al., 1996). A clinically important fracture is defined as any bone fragment at least five millimeters in breadth or any avulsion fracture, regardless of size, that is associated with complete disruption of tendons or ligaments. These guidelines were written to discourage use of x-rays to evaluate knee pain and not necessarily to dictate when x-rays should be obtained. Thus, we have not written any indicator regarding use of x-rays.

TREATMENT

Initial treatment for acute soft tissue injuries should include rest, ice, compression, and elevation for the first 24 to 72 hours. Use of NSAIDs to reduce the inflammation is also indicated (Altchek, 1993; Smith et al., 1995). Treatment decisions are based on a number of variables including age, chronicity of symptoms, activity level, and the presence and characteristics of associated ligamentous and meniscal injuries.

FOLLOW-UP

No studies from the literature that support specific follow-up regimens for knee complaints were identified. While follow-up is clearly important, we have recommended no quality indicators in this area for that reason.
MENISCAL INJURIES

IMPORTANCE

Meniscal injuries are the most common reason for arthroscopy of the knee (Swenson and Harner, 1995). Injury to the menisci may be traumatic or degenerative. The medial meniscus is more commonly damaged than the lateral meniscus.

DIAGNOSIS

Maneuvers that can be performed to assist in diagnosing a meniscal injury include the bounce test, McMurray’s test, and Apley’s grind test; however none of these tests is 100 percent sensitive or specific (Indicator 8). MRIs have superseded arthroscopy as the most common diagnostic test (Smith and Green, 1995; Stone and Fu, 1997).

TREATMENT

There are no standard indications for surgical repair of isolated meniscal damage. Treatment in the acute phase relies on decreasing knee swelling through the use of ice and anti-inflammatory agents, although no specific studies address their utility. With the resolution of pain and swelling, patients are encouraged to participate in physical therapy that focuses on strengthening the flexors and extensors of the thigh.

LIGAMENTOUS INJURIES

IMPORTANCE

Injury to the anterior cruciate ligament (ACL) occurs most commonly. The posterior cruciate ligament (PCL) is injured less frequently than the ACL, and only accounts for 15 to 20 percent of all knee ligament injuries. Injuries to the PCL usually occur as a result of direct anterior trauma, often from athletic activities and motor vehicle accidents. The medial collateral ligament (MCL) and lateral collateral ligament (LCL) may also sustain injury, either isolated or in conjunction with other ligamentous or meniscal injuries.
DIAGNOSIS

Patients who damage their ACL may describe their knee as having “given out” or “buckled,” and frequently report having noticed a popping sound at the time of injury. Swelling that occurs within a few hours is usually indicative of a hemarthrosis, and develops in 70 to 75 percent of cases. Three maneuvers exist that focus on evaluating the integrity of the ACL: the anterior drawer test, Lachman’s test, and the pivot-shift test (Smith and Green, 1995; Katz and Fingeroth, 1986) (Indicator 8). In order to determine the sensitivity and specificity of these three tests in making the diagnosis of ACL damage, Katz and Fingeroth (1986) performed a retrospective study that compared findings from physical examination with those from arthroscopy performed within two weeks of the initial injury. All three tests had a specificity greater than 95 percent. The sensitivity of the pivot shift test was 89 percent, Lachman’s test was 78 percent sensitive and the anterior drawer test was only 22 percent sensitive for ACL damage. Katz and Fingeroth concluded that when Lachman’s test and the pivot-shift test are positive a correct diagnosis of an ACL tear can be made, and that when these tests are negative a medium or large ACL tear can be ruled out (Katz and Fingeroth, 1986). Because the pivot shift test is very painful to the patient, Lachman’s test is the test of choice for evaluating ACL damage.

Injury to the PCL should be considered if a patient has suffered direct trauma to the anterior aspect of the knee. Diagnostic maneuvers that should be performed during the physical examination include the posterior drawer test and the posterior tibial sag test (Swenson and Harner, 1995) (Indicator 8). In a blinded RCT, the posterior drawer test was found to have a sensitivity of 90 percent and a specificity of 99 percent for isolated PCL injuries (Rubinstein et al., 1994). Identification of other ligamentous or meniscal injuries is important, because the treatment options differ if an isolated -- as opposed to combined -- PCL injury is present. Damage to the LCL usually occurs as a result of trauma to the medial aspect of the knee, or a twisting motion with a fixed foot. These injuries are less common but more severe than MCL damage, and are rarely isolated.
In order to evaluate and diagnose MCL injury or laxity, a valgus stress is applied to the knee. Injuries to the MCL are graded on the extent of laxity present.

**TREATMENT**

The goal of treatment for a patient with an ACL injury is to avoid re-injury that may lead to long-term complications. Deciding on the course of treatment depends on a number of factors, such as age, prior recreational and occupational activity levels, future expectations, ability and willingness to participate in a physical therapy program, degree of ligamentous laxity, and the presence of associated meniscal or ligamentous lesions (Swenson and Harner, 1995). In a prospective study, the factor that most strongly predicted whether a patient underwent reconstructive surgery was activity level prior to the injury (Johnson and Warner, 1993). Surgical repair for ACL injuries may be performed acutely (i.e., within 3 to 4 weeks) if necessary, but this may increase the risk for decreased loss of flexion, extension, or both, due to swelling, inflammation, and stiffness (Johnson and Warner, 1993; Swenson and Harner, 1995). No prospective studies have been performed comparing surgical and nonsurgical interventions, but patients should be referred for orthopedic evaluation at the time of diagnosis (Indicator 12). Nonsurgical interventions focus on quadriceps strengthening, proprioceptive exercises, and functional training. Surgical reconstruction of a torn PCL is usually reserved for situations in which there are combined ligament injuries, or when a patient is symptomatic from the damaged PCL (Swenson and Harner, 1995; Rubinstein et al., 1994).

Surgical intervention within three weeks of the initial injury is considered optimal treatment for injuries to the posterolateral corner of the knee, including the LCL (Swenson and Harner, 1995).

**PATELLOFEMORAL PAIN SYNDROME**

**IMPORTANCE**

Patellofemoral pain syndrome is a common diagnosis among people who participate in physical activities, and occurs most frequently among
adolescents and young adults. Women tend to have a higher incidence of patellofemoral syndrome than men. This disorder results from the repetitive microtrauma of overuse; either with normal anatomy and alignment, or with mild malalignment of the extensor mechanism.

**DIAGNOSIS**

The diagnosis of patellofemoral syndrome is usually based on the history and physical examination. Patients usually complain of a dull, aching pain that is peripatellar or retropatellar, occasionally becoming more severe during activities such as ascending or descending stairs, or with squatting or performing deep knee bends. Patients may also complain of pain after sitting with their legs bent for an extended period of time (known as the “theater sign”). Physical findings include tenderness with palpation of the patella; knee pain with compression of the patella, and pain provoked by quadriceps contraction (Davidson, 1993). Effusions are uncommon, and patients with patellofemoral pain syndrome frequently have normal knee x-rays (Davidson, 1993). There are no generally accepted guidelines or literature to support the use of knee radiography for the diagnosis of patellofemoral pain syndrome.

**TREATMENT**

Conservative treatment for patellofemoral pain syndrome is generally accepted, and includes NSAIDs, ice, and physical therapy (Davidson, 1993) (Indicator 13). These measures are successful for approximately 75 percent of patients, although some individuals may have recurrences of the disorder. Quadriceps strengthening exercises are recommended and may be provided in the context of formal physical therapy, or instruction of the patient by the provider in a home exercise regimen. Once patients have become asymptomatic, and have responded positively to leg-strengthening exercises, they may gradually increase their physical activity. Soft knee braces can be used to apply a medically directed force to counteract the abnormal tracking of the patella. Most experts agree that surgery should not be considered unless the patient has had no improvement after three to six months of conservative treatment. Surgery for those people with retropatellar
pain not associated with significant subluxation or dislocation has not been reproducibly successful (Davidson, 1993).

**SEPTIC JOINT**

**IMPORTANCE**

The majority of nongonococcal joint infections are caused by gram-positive organisms, especially *Staphylococcus aureus*; although the proportion of cases attributable to gram-negative organisms has increased (Martens and Ho, 1995). Septic arthritis due to candida species in non-intravenous drug users is extremely rare (Martens and Ho, 1995). Adults over age 55 are most commonly affected by septic arthritis, as are individuals who have chronic joint diseases. Infectious arthritis has high morbidity and mortality rates in adults with chronic medical conditions such as rheumatoid arthritis and polyarticular infections (Martens and Ho, 1995). Most cases of enterococcal septic arthritis are reported in patients with prosthetic joint infections (Raymond et al., 1995).

**DIAGNOSIS**

Septic arthritis most commonly affects the large joints, but specific joint involvement does not impact on prognosis (Martens and Ho, 1995). Patients who present with a swollen knee should be asked about the following: onset and duration of the swelling, recent knee injury or trauma, presence of pain, history of crystal-induced arthropathy, fever, and other joint involvement (Indicator 9). The presence of a joint effusion is the most specific sign for joint inflammation, while the most sensitive sign is joint pain at the extreme range of motion (Towheed and Hochberg, 1996). If a patient presents with a non-traumatic effusion with onset within the prior three weeks, aspiration of the knee joint for synovial fluid should be performed to differentiate a septic arthritis from an exacerbation of a noninfectious etiology (Indicator 10). A sample of the joint fluid obtained should be evaluated for cell count and differential, examined on Gram stain, and sent for culture (Indicator 11). The results of the Gram stain will determine choice of antibiotics.
TREATMENT

The particular joint involvement affects the therapeutic management of the patient, specifically with regard to surgical versus non-surgical treatment. If the Gram stain is negative or inconclusive and the suspicion for septic arthritis is high, empiric antibiotic treatment should be instituted (Martens and Ho, 1995) (Indicator 14). According to Martens and Ho (1995), no consensus exists regarding the comparative effectiveness for easily accessible joints of arthrocentesis versus surgical drainage. No consensus exists regarding the treatment of septic arthritis due to candida species (Cuende et al., 1993).
REFERENCES


## RECOMMENDED QUALITY INDICATORS FOR ORTHOPEDIC CONDITIONS

The following indicators apply to men and women age 18 and older.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Quality of Evidence</th>
<th>Literature</th>
<th>Benefits</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shoulder: Diagnosis</strong></td>
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<tr>
<td>1. Patients presenting with new onset shoulder pain should have a history obtained at the time of presentation that includes at least 4 of the following:</td>
<td>III</td>
<td>Barker, 1991; Shapiro &amp; Finerman, 1992</td>
<td>Prevent long-term disability through accurate diagnosis.</td>
<td>Evidence is based primarily on observational and anecdotal data. Accurate diagnosis of pain etiology is especially important if the patient sustained trauma to the shoulder prior to the onset of pain.</td>
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<td>- duration of pain;</td>
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<td>- location of pain;</td>
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<td>- activity at time the pain began;</td>
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<td>- activities that worsen the pain;</td>
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<td>- past history of injury;</td>
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<td>- past history of surgery;</td>
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<td>- therapeutic interventions attempted (e.g., NSAIDs, rest, physical therapy);</td>
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<td>- involvement of other joints.</td>
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<tr>
<td>2. Patients who present with new onset shoulder pain should have a physical examination performed at time of presentation that includes at least 3 of the following:</td>
<td>III</td>
<td>Barker, 1991; Shapiro &amp; Finerman, 1992; Fu et al, 1991; Smith &amp; Campbell, 1992</td>
<td>Prevent disability through accurate diagnosis.</td>
<td>Only observational evidence exists. No published prospective studies test the sensitivity and specificity of these maneuvers, but they are commonly used by orthopedic surgeons and primary care providers. Diagnostic accuracy of shoulder pain etiology is important in making the appropriate treatment decisions.</td>
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<tr>
<td>- range of passive motion testing;</td>
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<tr>
<td>- range of active motion testing;</td>
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<td>- the drop arm test;</td>
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<td>- testing for presence of impingement sign;</td>
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<td>- palpation to localize the site of pain;</td>
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<td>- cervical spine examination.</td>
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<tr>
<td>Indicator</td>
<td>Quality of Evidence</td>
<td>Literature</td>
<td>Benefits</td>
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<td><strong>Shoulder: Treatment</strong></td>
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<td>3. Patients diagnosed with impingement syndrome should be offered at least 1 of the following: • NSAIDs at time of presentation; • intra-articular steroid injection within 1 week of presentation.</td>
<td>III II-1 I</td>
<td>Fu et al, 1991; White et al, 1986; Petri et al, 1987; Adebajo et al, 1990; Itzkowitch et al, 1996; Blair et al, 1996</td>
<td>Decrease pain. Improve function.</td>
<td>RCTs have shown the benefits of using anti-inflammatory agents such as NSAIDs or intra-articular steroid injections</td>
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<tr>
<td>4. Patients diagnosed with impingement syndrome should be offered 1 of the following within 2 weeks of diagnosis: • physical therapy referral; • instructions for a home exercise program.</td>
<td>III</td>
<td>Fu et al, 1991</td>
<td>Decrease pain. Improve function.</td>
<td>No RCTs exist that compare these modalities, but improved physical functioning has been noted in observational studies.</td>
</tr>
<tr>
<td>5. Patients diagnosed with a medium or large rotator cuff tear who have not seen an orthopedist within 2 weeks before diagnosis, should be offered referral to an orthopedist at the time of diagnosis.</td>
<td>III I</td>
<td>Smith &amp; Campbell, 1992; Adebajo et al, 1990; Levy, 1990; Shapiro &amp; Finerman, 1992</td>
<td>Improve function. Decrease risk of long-term disability.</td>
<td>No RCTs exist that compare surgical and non-surgical treatment for medium or large rotator cuff tears.</td>
</tr>
<tr>
<td>6. Patients diagnosed with adhesive capsulitis should receive education regarding shoulder exercises at time of diagnosis.</td>
<td>III</td>
<td>Grubbs, 1993; Smith &amp; Campbell, 1992</td>
<td>Decrease pain. Improve function. Decrease risk of long-term disability.</td>
<td>In patients at risk for adhesive capsulitis, predisposing factors should be reduced or removed. Observational studies show benefit from mobilization of the shoulder.</td>
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<tr>
<td><strong>Knee: Diagnosis</strong></td>
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<td>7. Patients presenting with new onset knee pain should have a history taken at time of initial presentation that includes at least 3 of the following: • duration; • activity at time of onset; • exacerbating and relieving factors; • ability to ambulate; • history of prior trauma, surgery, or knee problems.</td>
<td>III</td>
<td>Smith &amp; Green, 1995; Jensen et al, 1985</td>
<td>Prevent disability through accurate diagnosis.</td>
<td>When there is no clear-cut history of trauma and physical examination does not indicate injury to one or more anatomical structures, the following causes for spontaneous knee pain should be considered: nonarticular rheumatism, degenerative joint disease, crystal-induced arthritis, and rheumatoid arthritis.</td>
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<tr>
<td>Indicator</td>
<td>Quality of Evidence</td>
<td>Literature</td>
<td>Benefits</td>
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| 8. Patients presenting with new onset knee pain after injury to their knee should undergo at least 2 of the following maneuvers during physical examination:  
  • Lachman’s test;  
  • anterior drawer test;  
  • posterior drawer test;  
  • posterior sag test;  
  • joint line palpation;  
  • McMurray’s test;  
  • valgus stress;  
  • varus stress. | III | Barker, 1991; Smith & Green, 1995; Katz & Fingeroth, 1986; Swenson & Harner, 1995 | Prevent disability through accurate diagnosis. | Lachman’s test has a very high sensitivity and specificity for ACL tears. The pivot shift test also has a high sensitivity and specificity but may be difficult to perform due to patient discomfort. McMurray’s test is the most sensitive and specific maneuver for meniscal tears. The posterior drawer test has the highest sensitivity for PCL tears. |
| 9. Patients presenting with new onset knee effusion should have a history taken at time of initial presentation that includes:  
  a. duration of swelling;  
  b. history of trauma and injury;  
  c. presence of pain;  
  d. history of crystalline-induced arthropathies. | III | Martens & Ho, 1995; Towheed & Hochberg, 1996; Litman, 1996 | Prevent disability through accurate diagnosis. | Accurate diagnosis of joint effusion etiology is important for instituting appropriate therapeutic interventions, especially in the case of a septic joint (where permanent joint damage may occur as a result of inappropriate treatment or delay). Various inflammatory processes have characteristic symptoms that aid in accurate diagnosis. |
| 10. Patients presenting with new onset knee effusion who do not have a history of recent trauma should undergo arthrocentesis at time of presentation. | III | Towheed & Hochberg, 1996 | Prevent disability through accurate diagnosis. | Repeat arthrocentesis may be indicated. |
| 11. Patients who undergo an arthrocentesis for new onset knee effusion should have the fluid analyzed for all of the following:  
  a. cell count;  
  b. culture;  
  c. microscopic evaluation. | III | Towheed & Hochberg, 1996 | Prevent disability through accurate diagnosis. | Cell count and culture are especially important when the suspicion for infection is very high. Microscopic examination is important in diagnosing a crystalline-induced arthropathy. |
<p>| Knee: Treatment | | | | |
| 12. Patients diagnosed with an ACL rupture who have not seen an orthopedist within 2 weeks before diagnosis should be offered referral to an orthopedist at time of diagnosis. | III | Johnson &amp; Warner, 1993; Swenson &amp; Harner, 1995 | Decrease pain. Improve function. Decrease risk for long-term disability. | Treatment will be based on severity of injury and individual patient characteristics (i.e., activity level prior to the injury, age, concomitant medical conditions). |</p>
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<td>13. Patients newly diagnosed with patellofemoral syndrome should receive the following at time of diagnosis: &lt;br&gt;a. prescription or recommendation for NSAIDs, unless contraindicated; &lt;br&gt;b. education on quadriceps-strengthening exercises.</td>
<td>III</td>
<td>Davidson, 1993</td>
<td>Decrease pain. Improve function.</td>
<td>Surgery is rarely advised for this disorder, which has been shown to improve in most situations with focused strengthening exercises.</td>
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<td>14. Patients diagnosed with a septic joint should be treated with intravenous antibiotics.</td>
<td>III</td>
<td>Towheed &amp; Hochberg, 1996</td>
<td>Prevent disability through accurate diagnosis and treatment.</td>
<td>Antibiotics with broad spectrum coverage may be used initially; however, the culture results will determine the exact therapeutic regimen.</td>
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**Definitions and Examples**

1. New onset shoulder pain: Shoulder pain existing for 3 weeks or less.
2. Impingement syndrome: Supraspinatus tendinitis or bursitis.
3. Medium or large rotator cuff tear: Diagnosis may be on physical exam or MRI, but must specify that rotator cuff has a medium or large tear.
4. Education: May be done by the provider or by referral to physical therapy.
5. New onset knee pain: Knee discomfort beginning within 3 weeks of presentation.
6. New onset knee effusion: Effusion that has developed and been present for no more than 2 weeks.
7. Recent trauma: Trauma within 6 weeks of presentation or 2 weeks before onset of effusion.
8. ACL Rupture: Diagnosis may be by physical exam or MRI, but must specify that the ligament is ruptured.
9. Contraindications to NSAID use: a history of gastrointestinal bleeding or current anticoagulant therapy.

**Quality of Evidence Codes**

I Randomized controlled trials<br>II-1 Nonrandomized controlled trials<br>II-2 Cohort or case analysis<br>II-3 Multiple time series<br>III Opinions or descriptive studies