

*Questions
& Answers
about . . .*

Bursitis and Tendinitis

*National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)
National Institutes of Health
Public Health Service • U.S. Department of Health and Human Services*

For Your Information

This publication contains information about medications used to treat the health condition discussed here. When this booklet was printed, we included the most up-to-date (accurate) information available. Occasionally, new information on medication is released.

For updates and for any questions about any medications you are taking, please contact the U.S. Food and Drug Administration at 1-888-INFO-FDA (1-888-463-6332, a toll-free call) or visit their Web site at www.fda.gov.

This booklet is not copyrighted. Readers are encouraged to duplicate and distribute as many copies as needed.

Additional copies of this booklet are available from

National Institute of Arthritis and Musculoskeletal
and Skin Diseases

NIAMS/National Institutes of Health

1 AMS Circle

Bethesda, MD 20892-3675

You can also find this booklet on the NIAMS Web site at www.niams.nih.gov.

Table of Contents

What Is Bursitis and What Is Tendinitis?	1
What Causes These Conditions?	2
What Parts of the Body Are Affected?	2
Tennis Elbow and Golfer’s Elbow	3
Shoulder Tendinitis, Bursitis, and Impingement Syndrome	4
Knee Tendinitis or Jumper’s Knee	6
Achilles Tendinitis	7
How Are These Conditions Diagnosed?	9
What Kind of Health Care Professional Treats These Conditions?	10
How Are Bursitis and Tendinitis Treated?	10
Can Bursitis and Tendinitis Be Prevented?	12
What Are Researchers Learning?	13
Where Can People Get More Information?	14
Key Words	17

This booklet contains general information about bursitis and tendinitis. It describes what these conditions are and how they are diagnosed and treated. At the end is a list of key words to help you understand the medical terms used in this booklet. If you have further questions after reading this booklet, you may wish to discuss them with your doctor.

What Is Bursitis and What Is Tendinitis?

Bursitis and tendinitis are both common conditions that involve inflammation of the soft tissue around muscles and bones, most often in the shoulder, elbow, wrist, hip, knee, or ankle.

A bursa is a small, fluid-filled sac that acts as a cushion between a bone and other moving parts: muscles, tendons, or skin. Bursae are found throughout the body. Bursitis occurs when a bursa becomes inflamed (redness and increased fluid in the bursa).

A tendon is a flexible band of fibrous tissue that connects muscles to bones. Tendinitis is inflammation of a tendon. Tendons transmit the pull of the muscle to the bone to cause movement. They are found throughout the body, including the hands, wrists, elbows, shoulders, hips, knees, ankles, and feet. Tendons can be small, like those found in the hand, or large, like the Achilles tendon in the heel.

What Causes These Conditions?

Bursitis is commonly caused by overuse or direct trauma to a joint. Bursitis may occur at the knee or elbow; for example, from kneeling or leaning on the elbows longer than usual on a hard surface. Tendinitis is most often the result of a repetitive injury in the affected area. These conditions occur more often with age. Tendons become less flexible with age, and therefore, more prone to injury.

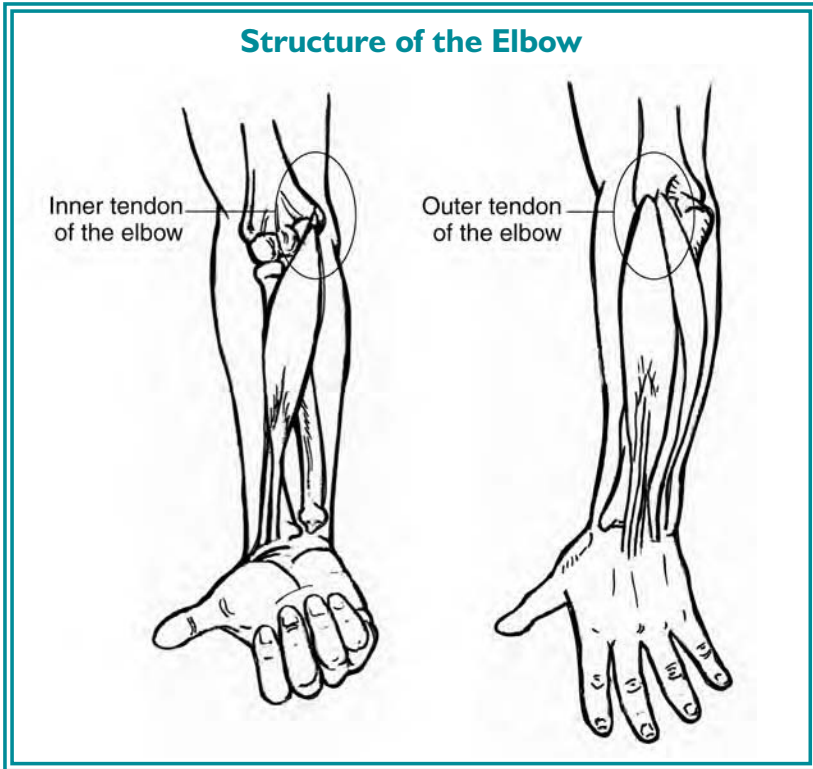
People such as carpenters, gardeners, musicians, and athletes who perform activities that require repetitive motions or place stress on joints are at higher risk for tendinitis and bursitis.

An infection, arthritis, gout, thyroid disease, and diabetes can also bring about inflammation of a bursa or tendon.

What Parts of the Body Are Affected?

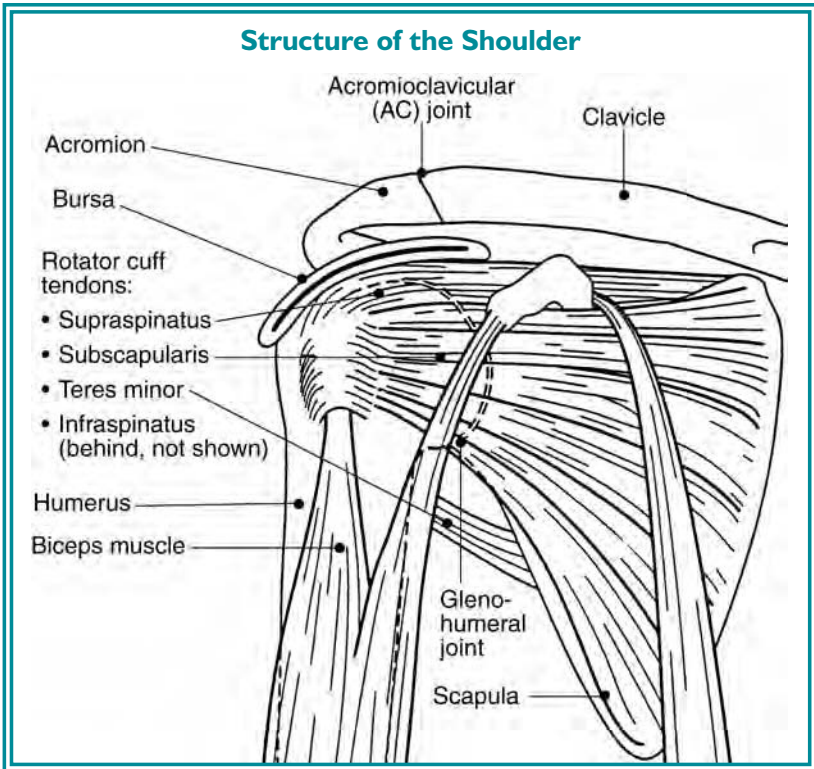
Tendinitis causes pain and tenderness just outside a joint. Some common names for tendinitis identify with the sport or movement that typically increases risk for tendon inflammation. They include tennis elbow, golfer's elbow, pitcher's shoulder, swimmer's shoulder, and jumper's knee. Some common examples follow.

Tennis Elbow and Golfer's Elbow



Tennis elbow refers to an injury to the outer elbow tendon. Golfer's elbow is an injury to the inner tendon of the elbow. These conditions can also occur with any activity that involves repetitive wrist turning or hand gripping, such as tool use, hand shaking, or twisting movements. Carpenters, gardeners, painters, musicians, manicurists, and dentists are at higher risk for these forms of tendinitis. Pain occurs near the elbow, sometimes radiating into the upper arm or down to the forearm. Another name for tennis elbow is lateral epicondylitis. Golfer's elbow is also called medial epicondylitis.

Shoulder Tendinitis, Bursitis, and Impingement Syndrome

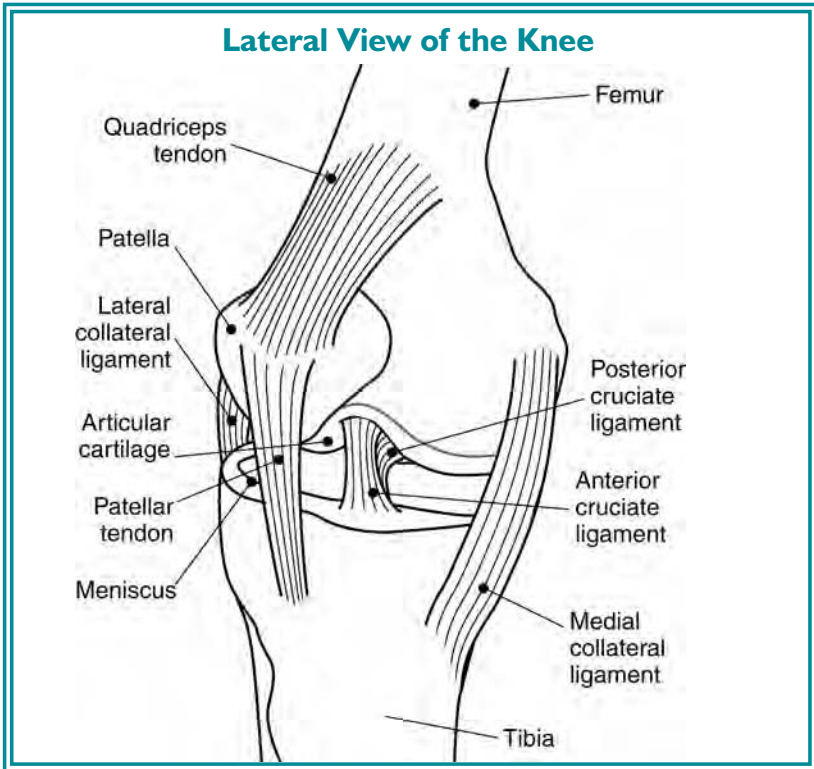


Two types of tendinitis can affect the shoulder. Biceps tendinitis causes pain in the front or side of the shoulder and may travel down to the elbow and forearm. Pain may also occur when the arm is raised overhead. The biceps muscle, in the front of the upper arm, helps stabilize the upper arm bone (humerus) in the shoulder socket. It also helps accelerate and decelerate the arm during overhead movement in activities like tennis or pitching.

Rotator cuff tendinitis causes shoulder pain at the tip of the shoulder and the upper, outer arm. The pain can be aggravated by reaching, pushing, pulling, lifting, raising the arm above shoulder level, or lying on the affected side. The rotator cuff is primarily a group of four muscles that attach the arm to the shoulder girdle/shoulder blade. The rotator cuff attaches the arm to the shoulder joint and allows the arm to rotate and elevate. If the rotator cuff and bursa are irritated, inflamed, and swollen, they may become compressed between the head of the humerus and the acromion, the outer edge of the shoulder blade. Repeated motion involving the arms, or the aging process involving shoulder motion over many years, may also irritate and wear down the tendons, muscles, and surrounding structures. Squeezing of the rotator cuff is called shoulder impingement syndrome.

Inflammation caused by rheumatoid arthritis may cause rotator cuff tendinitis and bursitis. Sports involving overuse of the shoulder and occupations requiring frequent overhead reaching are other potential causes of irritation to the rotator cuff or bursa, and may lead to inflammation and impingement.

Knee Tendinitis or Jumper's Knee



If a person overuses a tendon during activities such as dancing, cycling, or running, it may elongate or undergo microscopic tears and become inflamed. Trying to break a fall may also cause the quadriceps muscles to contract and tear the quadriceps tendon above the knee cap (patella) or the patellar tendon below it. This type of injury is most likely to happen in older people whose tendons tend to be weaker and less flexible. Tendinitis of the patellar tendon is sometimes called jumper's knee because in sports that require jumping,

such as basketball, the muscle contraction and force of hitting the ground after a jump strain the tendon. After repeated stress, the tendon may become inflamed or tear.

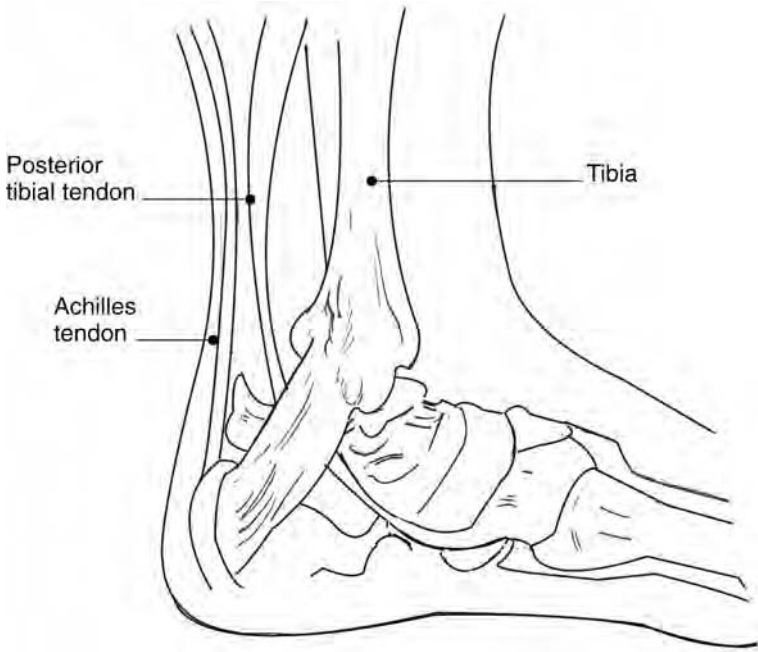
People with tendinitis of the knee may feel pain during running, hurried walking, or jumping. Knee tendinitis can increase risk for ruptures or large tears to the tendon. A complete rupture of the quadriceps or patellar tendon is not only painful, but also makes it difficult for a person to bend, extend, or lift the leg; or to bear weight on the involved leg.

Achilles Tendinitis

Achilles tendon injuries involve an irritation, stretch, or tear to the tendon connecting the calf muscle to the back of the heel. Achilles tendinitis is a common overuse injury, but can also be caused by tight or weak calf muscles or any condition that causes the tendon to become less flexible and more rigid, such as reactive arthritis or normal aging.

Achilles tendon injuries can happen to anyone who regularly participates in an activity that causes the calf muscle to contract, like climbing stairs or using a stair-stepper, but are most common in middle-aged “weekend warriors” who may not exercise regularly or take time to warm up and stretch properly before an activity. Among professional athletes, most Achilles injuries seem to occur in quick-acceleration or jumping sports like football, tennis, and basketball, and almost always end the season’s competition for the athlete.

Lateral View of the Ankle



Achilles tendinitis can be a chronic condition. It can also cause what appears to be a sudden injury. Tendinitis is the most common factor contributing to Achilles tendon tears. When a tendon is weakened by age or overuse, trauma can cause it to rupture. These injuries can be so sudden and agonizing that they have been known to bring down charging professional football players in shocking fashion.

How Are These Conditions Diagnosed?

Diagnosis of tendinitis and bursitis begins with a medical history and physical examination. The patient will describe the pain and circumstances in which pain occurs. The location and onset of pain, whether it varies in severity throughout the day, and the factors that relieve or aggravate the pain are all important diagnostic clues. Therapists and physicians will use manual tests called selective tissue tension tests to determine which tendon is involved, and then will palpate (a form of touching the tendon) specific areas of the tendon to pinpoint the area of inflammation. X rays do not show tendons or bursae, but may be helpful in ruling out problems in the bone or arthritis. In the case of a torn tendon, x rays may help show which tendon is affected. In a knee injury, for example, an x ray will show that the patella is lower than normal in a quadriceps tendon tear and higher than normal in a patellar tendon tear. The doctor may also use magnetic resonance imaging (MRI) to confirm a partial or total tear. MRIs detect both bone and soft tissues like muscles, tendons and their coverings (sheaths), and bursae.

An anesthetic-injection test is another way to confirm a diagnosis of tendinitis. A small amount of anesthetic (lidocaine hydrochloride) is injected into the affected area. If the pain is temporarily relieved, the diagnosis is confirmed.

To rule out infection, the doctor may remove and test fluid from the inflamed area.

What Kind of Health Care Professional Treats These Conditions?

A primary care physician or a physical therapist can treat the common causes of tendinitis and bursitis. Complicated cases or those resistant to conservative therapies may require referral to a specialist, such as an orthopaedist or rheumatologist.

How Are Bursitis and Tendinitis Treated?

Treatment focuses on healing the injured bursa or tendon. The first step in treating both of these conditions is to reduce pain and inflammation with rest, compression, elevation, and anti-inflammatory medicines such as aspirin, naproxen (Naprosyn¹, Aleve), or ibuprofen (Advil, Motrin, or Nuprin). Ice may also be used in acute injuries, but most cases of bursitis or tendinitis are considered chronic, and ice is not helpful. When ice is needed, an ice pack can be applied to the affected area for 15–20 minutes every 4–6 hours for 3–5 days. Longer use of ice and a stretching program may be recommended by a health care provider.

Activity involving the affected joint is also restricted to encourage healing and prevent further injury.

¹ Brand names included in this booklet are provided as examples only, and their inclusion does not mean that these products are endorsed by the National Institutes of Health or any other Government agency. Also, if a particular brand name is not mentioned, this does not mean or imply that the product is unsatisfactory.

In some cases (e.g., in tennis elbow), elbow bands may be used to compress the forearm muscle to provide some pain relief, limiting the pull of the tendon on the bone. Other protective devices, such as foot orthoses for the ankle and foot or splints for the knee or hand, may temporarily reduce stress to the affected tendon or bursa and facilitate quicker healing times, while allowing general activity levels to continue as usual.

The doctor or therapist may use ultrasound (gentle sound-wave vibrations) to warm deep tissues and improve blood flow. Iontophoresis may also be used. This involves using an electrical current to push a corticosteroid medication through the skin directly over the inflamed bursa or tendon. Gentle stretching and strengthening exercises are added gradually. Massage of the soft tissue may be helpful. These may be preceded or followed by use of an ice pack. The type of exercises recommended may vary depending on the location of the affected bursa or tendon.

If there is no improvement, the doctor may inject a corticosteroid medicine into the area surrounding the inflamed bursa or tendon. While corticosteroid injections are a common treatment, they must be used with caution because they may lead to weakening or rupture of the tendon (especially weight-bearing tendons such as the Achilles [ankle], posterior tibial [arch of the foot], and patellar [knee] tendons). If there is still no improvement after 6–12 months, the doctor may perform either arthroscopic or open surgery to repair damage and relieve pressure on the tendons and bursae.

If the bursitis is caused by an infection, the doctor will prescribe antibiotics.

If a tendon is completely torn, surgery may be needed to repair the damage. After surgery on a quadriceps or patellar tendon, for example, the patient will wear a cast for 3–6 weeks and use crutches. For a partial tear, the doctor might apply a cast without performing surgery.

Rehabilitating a partial or complete tear of a tendon requires an exercise program to restore the ability to bend and straighten the knee and to strengthen the leg to prevent repeat injury. A rehabilitation program may last 6 months, although the patient can return to many activities before then.

Can Bursitis and Tendinitis Be Prevented?

To help prevent inflammation or reduce the severity of its recurrence:

- Warm up or stretch before physical activity.
- Strengthen muscles around the joint.
- Take breaks from repetitive tasks often.
- Cushion the affected joint. Use foam for kneeling or elbow pads. Increase the gripping surface of tools with gloves or padding. Apply grip tape or an oversized grip to golf clubs.

- Use two hands to hold heavy tools; use a two-handed backhand in tennis.
- Don't sit still for long periods.
- Practice good posture and position the body properly when going about daily activities.
- Begin new activities or exercise regimens slowly. Gradually increase physical demands following several well-tolerated exercise sessions.
- If a history of tendonitis is present, consider seeking guidance from your doctor or therapist before engaging in new exercises and activities.²

What Are Researchers Learning?

Researchers supported by the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) are studying the role of the immune system in the inflammation of tendinitis. Their aim is to develop new strategies to prevent and treat tendinitis effectively. Others are exploring worksite issues in the development of tendinitis and other work-related musculoskeletal disorders.

² Adapted from MayoClinic.com

Where Can People Get More Information?

- **National Institute of Arthritis and Musculoskeletal and Skin Diseases Information Clearinghouse**
National Institutes of Health
1 AMS Circle
Bethesda, MD 20892–3675
Phone: 301–495–4484 or
877–22–NIAMS (226–4267) (free of charge)
TTY: 301–565–2966
Fax: 301–718–6366
E-mail: NIAMSInfo@mail.nih.gov
www.niams.nih.gov

The NIAMS provides information about various forms of arthritis and rheumatic diseases and bone, muscle, and skin diseases. It distributes patient and professional education materials and refers people to other sources of information. Additional information and updates can also be found on the NIAMS Web site (www.niams.nih.gov).

- **American Academy of Orthopaedic Surgeons (AAOS)**
P.O. Box 1998
Des Plaines, IL 60017
Phone: 800-824-BONE (2663) (free of charge)
Fax: 847-823-8125
www.aaos.org

The academy provides education and practice management services for orthopaedic surgeons and allied health professionals. The academy is committed to increasing the public's awareness of musculoskeletal conditions, with an emphasis on preventive measures. Its public service advertising programs address such issues as the prevention of injuries, bone health, hip fractures, back pain, and the importance of musculoskeletal research. It also maintains a patient education Web site, *Your Orthopaedic Connection*, which contains nearly 400 articles on a variety of musculoskeletal conditions (orthoinfo.aaos.org).

- **American College of Rheumatology**
1800 Century Place, Suite 250
Atlanta, GA 30345-4300
Phone: 404-633-3777
Fax: 404-633-1870
www.rheumatology.org

This national professional organization can provide referrals to rheumatologists and allied health specialists, such as physical therapists. One-page fact sheets are also available on various forms of arthritis.

- **American Physical Therapy Association**

1111 North Fairfax Street

Alexandria, VA 22314-1488

Phone: 703-684-2782 or

800-999-2782, ext. 3395 (free of charge)

TDD: 703-683-6748

Fax: 703-684-7343

www.apta.org

This national professional organization represents physical therapists, allied personnel, and students. Its objectives are to improve physical therapy practice, research, and education. The association provides a searchable database of physical therapists on its Web site. A catalog of consumer awareness publications can also be found there. Single copies of brochures are available by calling the 800 number above.

- **Arthritis Foundation**

P.O. Box 7669

Atlanta, GA 30357-0069

Phone: 404-965-7888 or

800-568-4045 (free of charge)

or call your local chapter (listed in the telephone directory)

www.arthritis.org

This voluntary organization supports research on arthritis and other rheumatic diseases. The foundation publishes pamphlets on arthritis, such as “Arthritis Answers,” that may be obtained by calling the toll-free telephone number. The foundation also can provide physician and clinic referrals. Local chapters also provide information and organize exercise programs for people who have arthritis.

Key Words

Acromion – The outer part of the shoulder blade.

Arthroscopic surgery – Repairing the interior of a joint by inserting a microscope-like device and surgical tools through small cuts rather than one, large surgical cut.

Biceps muscle – The muscle in the front of the upper arm.

Bursa – A small sac of tissue located between a bone and other moving structures such as muscles, skin, or tendons. The bursa contains a lubricating fluid that allows these structures to glide smoothly.

Bursitis – Inflammation or irritation of a bursa.

Corticosteroids – Synthetic preparations of cortisol, which is a hormone produced by the body. Corticosteroids block the immune system's production of substances that trigger allergic and inflammatory responses. These drugs may be injected directly into the inflammation site. Generally, symptoms improve or disappear within several days. Frequent injections into the same site are not recommended.

Epicondylitis – A painful and sometimes disabling swelling of the tissues of the elbow.

Humerus – The upper arm bone.

Impingement syndrome – When the rotator cuff becomes inflamed and thickened, it may get trapped under the acromion, resulting in pain or loss of motion.

Inflammation – The characteristic reaction of tissue to injury or disease. It is marked by four signs: swelling, redness, heat, and pain.

Joint – A junction where two bones meet. Most joints are composed of cartilage, joint space, the fibrous capsule, the synovium, and ligaments.

Muscle – A tissue that has the ability to contract, producing movement or force. There are three types of muscle: striated muscle, which is attached to the skeleton; smooth muscle, which is found in such tissues as the stomach and blood vessels; and cardiac muscle, which forms the walls of the heart. For striated muscle to function at its ideal level, the joint and surrounding structures must all be in good condition.

Patella – A flat triangular bone located at the front of the knee joint. Also called the kneecap.

Quadriceps muscle – The large muscle at the front of the thigh.

Radius – The larger of the two bones in the forearm.

Range of motion – The extent to which a joint can move freely and easily.

Rheumatoid arthritis – An autoimmune inflammatory disease that causes pain, swelling, stiffness, and loss of function in the joints.

Rotator cuff – A set of muscles and tendons that secures the arm to the shoulder blade and permits rotation of the arm.

Tendinitis – Inflammation or irritation of a tendon.

Tendons – Fibrous cords that connect muscle to bone.

Acknowledgments

The NIAMS gratefully acknowledges the assistance of Kimberly Kimpton, PT, HealthMark, Denver, CO; Cato Laurencin, M.D., Ph.D., University of Virginia; James Panagis, M.D., M.P.H., and Michael Ward, M.D., NIAMS, NIH, Bethesda, MD; and Joseph Shrader, P.T.C. Ped., CC, NIH, Bethesda, MD in the preparation and review of this booklet. Cori Vanchieri was the author of this booklet.



The mission of the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), a part of the Department of Health and Human Services' National Institutes of Health (NIH), is to support research into the causes, treatment, and prevention of arthritis and musculoskeletal and skin diseases; the training of basic and clinical scientists to carry out this research; and the dissemination of information on research progress in these diseases. The National Institute of Arthritis and Musculoskeletal and Skin Diseases Information Clearinghouse is a public service sponsored by the NIAMS that provides health information and information sources. Additional information can be found on the NIAMS Web site at www.niams.nih.gov.



U.S. Department of Health and Human Services
Public Health Service
National Institutes of Health
National Institute of Arthritis and
Musculoskeletal and Skin Diseases

NIH Publication No. 07-6240
April 2007