

## FACTS ABOUT KNEE SURGERY

Every year, almost 20 million visits are made to physicians' offices because of knee problems. The knee is the largest joint in the human body and one of the most easily injured. In addition to injuries, there are several medical conditions that cause knee problems. While some patients can be treated medically, there are others who require surgery to correct the knee problem. More joint replacement surgeries are performed on the knee than on any other joint in the body.

## HOW THE KNEE WORKS

The knee is a hinge joint made up of the lower end of the femur, the upper end of the tibia, and the patella. The femur rotates on the tibia and the patella is in front of the lower end of the femur. Major ligaments connect the bones and brace the joint. The ends of the bones in the knee joint are covered with cartilage, a tough rubbery material that helps absorb shock and allows the knee to move smoothly. Separating the bones are pads of tissue called menisci (one is called a meniscus) that act as shock absorbers and also provide stability to the joint. Two groups of muscles are attached to the knee, the quadriceps and the hamstrings. The quadriceps straighten the knee from a bent position. The hamstrings work to bend the knee. Tendons connect the muscles to the bones of the knee joint. Ligaments are part of a joint capsule that wraps around the knee joint. The capsule surrounding the joint is lined with a thin, soft tissue that secretes synovial fluid to keep the bones lubricated.

## COMMON CONDITIONS AFFECTING THE KNEE JOINT

- » **Arthritis**, which is the inflammation of a joint, often affects the knee. Arthritis causes pain and swelling in the joint, and over time can lead to loss of knee function. Osteoarthritis and rheumatoid arthritis are the two most common types of knee arthritis.
  - **Osteoarthritis** is the most common type of arthritis. It is a progressive, degenerative disease in which the cartilage slowly wears away, causing the bones in a joint to rub against each other. It is often called "degenerative joint disease" (DJD) and is more common as a person ages. It is more common when the person has a family history of osteoarthritis. It is made worse by obesity, since obesity causes the knee to bear more weight than it was designed to withstand.
  - **Rheumatoid arthritis** causes the synovial membrane inside the joint capsule to swell and produces chemical changes causing the cartilage to soften. This leads to actual loss of cartilage causing pain and stiffness in the joint. Rheumatoid arthritis can occur at any age and is more common in women than in men.
- » **Ligament injuries** are sometimes referred to as "sprains." The anterior cruciate ligament (ACL) is most often injured by sudden twisting motions of the knee, often during sports activities. The posterior cruciate ligament (PCL) is most often injured by a direct impact, such as during an automobile accident or a direct "hit" on the knee. Such injuries may require knee surgery, but do not require joint replacement.
- » **Meniscus injuries** may occur by the force of rotating the knee during weight bearing, while the foot stays still. The injury may cause severe pain, and later the knee may "lock." Meniscus injuries may require surgery, but not a joint replacement.

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- » **Cartilage injuries** often occur in young adults and can be caused by injury, overuse, or poor alignment. The cartilage becomes rough and may wear away. Cartilage injuries are common among long-distance runners, cyclists, skiers, and soccer players. The injury may require surgery, but is not likely to require a joint replacement.
- » **Tendinitis and ruptured tendon injuries** occur from overuse. Tendinitis is an inflammation of the tendon, and a ruptured tendon is one that has torn away from the muscle. Tendon injuries occur in people of all ages. They may occur in older people when they are trying to “break” a fall. Tendinitis of the patellar tendon is sometimes called “jumper’s knee” because it can occur in basketball or volleyball players when their feet land forcefully after a high jump. If the tendon is ruptured, surgery is required to reattach the ends of the tendon to the muscle.

#### TYPES OF KNEE SURGERY

There are several different surgical procedures to treat arthritis or knee injuries. The most common ones are knee arthroscopy, open repair, partial knee replacement, and total knee replacement.

##### KNEE ARTHROSCOPY

During a knee arthroscopy, a small camera is inserted into the knee joint through a small incision. The camera is attached to a monitor so the surgeon can see inside the joint. Additional small incisions are made to insert surgical instruments to repair the joint. Arthroscopy can be used for several types of repair, including damage to the ACL, or PCL, torn meniscus or cartilage, and mild arthritis.

##### OPEN REPAIR

During open repair, a wide incision is made and the surgeon opens the knee joint in order to repair damage. This type of surgery is sometimes required when alignment of the joint cannot be done by arthroscopy.

##### PARTIAL KNEE REPLACEMENT

Partial (also called uni-compartmental) knee replacement is a surgical procedure that replaces only one component of the knee, rather than the entire joint. It is used for cases of osteoarthritis in which the damage to only one section of the knee is causing the debilitation. The incision is 2-3 inches long, and the recovery time is much less than recovery from a total knee replacement.

##### TOTAL KNEE REPLACEMENT

Total knee replacement is called total knee arthroplasty (TKA). This surgery is usually required only for advanced cases of arthritis. In a total knee replacement, the diseased portions of the femur, patella, and tibia are replaced by prostheses. Most of the connecting ligaments and tendons remain intact. The knee prosthesis is made of metal and plastic and there are more than 150 different designs of prosthesis. While the prosthetic joints last much longer today than ever before, the prosthesis will eventually “wear out” and the patient may need revision surgery. The average total knee prosthesis lasts 10-15 years before one or more of its components wear out. However, newer prostheses are being developed that are likely to extend that time.

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**CARING FOR PATIENTS FOLLOWING KNEE SURGERY**

Recovery from one type of knee surgery will be different from another. However, there are some common components of care that are the same. It is extremely important that the home health aide carefully read the assignment sheet and contact the supervisor if the instructions are not clear.

**Assisting with exercises, braces, and icing**

Physical therapists will be visiting most knee surgery patients and will develop an exercise program for each patient. Regular exercise is essential to restore knee mobility following surgery. The following describe common exercises. Keep in mind that you must strictly follow the assignment sheet regarding exercises.

- » A continuous passive motion (CPM) machine is often used following knee surgery. The CPM is a frame upon which the leg is placed. The frame, which is jointed at the knee area is electrically powered and passively moves the affected leg. The machine very slowly raises the leg and flexes the knee, then slowly straightens the leg, repeating this motion continuously while connected. Only the physician or therapist adjusts the machine — home health aides never adjust a CPM. If you are to assist the patient in any way, you will be given specific instructions. Patients who use a CPM will use it while sleeping for the first two weeks following surgery.
- » Quad sets, ankle pumps, and straight leg raises are usually begun immediately and continue throughout recovery.
- » Crutches or walkers will be used until the patient is able to bear full weight. The therapist will instruct you about how much weight bearing is allowed.
- » Ice packs are applied several times a day to decrease swelling and pain. Ice is never worn continuously and never applied directly to the skin. The assignment sheet will describe how to use ice packs.
- » Knee braces are often used to stabilize the knee following surgery. If you are to assist with application or removal of the brace, you will be given specific instructions.

**Observing and reporting**

Home health aides should look for complications that may occur following surgery. In addition, you should contact the supervisor if at any time you do not understand part or all of the instructions, or if the patient asks you to do a task not on the assignment sheet. The following are important observations to report:

- » Excessive swelling of the legs and feet, calf tenderness, and redness below the knee can be signs of blood clots in the leg.
- » Sudden onset of chest pain, increased shortness of breath, and coughing can be warning signs of a blood clot that has traveled to the lungs.
- » Fever, chills, increased redness and/or swelling at the incision, drainage from around the surgical site, and increasing knee pain can be signs of infection.
- » Nosebleeds, bleeding from the gums, bruising, or blood in the urine and stool can be signs that the patient's blood is not clotting properly. Many patients will receive anticoagulant medications following surgery and bleeding may indicate the medications need to be adjusted.

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**KEY POINTS**

- Read and follow the assignment sheet closely. Read the sheet at the beginning of every single visit since the therapist may have updated it.
- Ask the therapist or supervisor if there is anything about the care of the patient you do not understand.
- Provide the assistance needed, but allow the patient to help himself or herself as much as possible.
- Make certain that you understand any weight bearing restrictions.
- Encourage good nutrition with fresh fruits and vegetables along with several glasses of water every day. Prepare fresh water for the patient just before the visit is completed.
- Make certain that you are familiar with any assistive devices the patient uses so that you can observe the patient's use of them.

## CASE STUDY

Karl has worked as a home health aide for several years and has cared for many patients who had knee surgery. Today he is visiting Mr. Carter and then Mr. Schumaker, both of whom recently had knee surgery.

Mr. Carter is 67 and had a total arthroplasty on his right knee because of osteoarthritis. Karl arrives at Mr. Carter's home, introduces himself, and reviews the assignment sheet. The assignment sheet lists the following duties: assist with shower, assist with exercises to right lower extremity (quad sets, ankle pumps, and straight leg raises), apply ice packs to right knee for 15 minutes following exercises, apply leg brace, and assist with ambulation with crutches (weight bearing as tolerated right lower extremity).

After Mr. Carter's shower is completed, Karl begins to assist with the exercises. He notices that Mr. Carter's right leg is swollen and reddened below the knee. When Mr. Carter is doing the ankle pumps, he complains of pain in his right calf. He tells Karl his right lower leg has been hurting since yesterday. Karl asks Mr. Carter if he called the therapist about the calf pain and swollen leg and Mr. Carter replies, "No, I just take my pain pills and that seems to help some." Karl applies the ice packs and tells Mr. Carter that he is going to call the therapist about the swelling and tenderness. When he is assisting Mr. Carter with the brace, Mr. Carter asks Karl if he knows how to put on such a complex brace. Karl replies that the therapist had demonstrated the brace to him and allowed him to practice. "Otherwise," says Karl, "I would have called when I first read the assignment sheet." Karl calls the therapist, reports the findings, and the therapist talks with Mr. Carter to set up an immediate visit.

Mr. Schumaker is 47 and had surgery to repair a torn anterior cruciate ligament (ACL). When Karl arrives and reviews the assignment sheet he notices that he is supposed to assist Mr. Schumaker in removing the continuous passive motion (CPM) machine he wears at night. He finds, however that Mr. Schumaker is not using the machine. Mr. Schumaker tells Karl that his knee and leg began hurting much worse yesterday and that's why he didn't use the CPM machine last night. While providing cares, Karl notices yellowish drainage from around the incision and a lot of swelling and redness around the knee.

## THINK ABOUT IT

- » Why do you believe Karl telephoned the therapist about Mr. Carter? What signs and symptoms do you think he reported? Do you think the signs and symptoms were important to report? Why or why not?
- » Should Karl have been concerned about the drainage from Mr. Schumaker's incision?
- » List several things Karl should document on his visit report for Mr. Carter.
- » List several things Karl should document on his visit report for Mr. Schumaker.



# Knee Surgery

DIRECTIONS: READ EACH QUESTION CAREFULLY. THEN, DETERMINE THE BEST ANSWER. CHECK THE CORRESPONDING BOX ON YOUR ANSWER SHEET. DO NOT WRITE ON THIS POST-TEST.

1. Which of the following is not a condition that commonly affects the knee?
  - a. Arthritis
  - b. Sprains
  - c. Diabetes
  - d. Tendinitis
  
2. Which are the two major muscle groups attached to the knee?
  - a. The biceps and triceps
  - b. The hamstrings and quadriceps
  - c. The trapezius and pectoralis
  - d. The plantaris and gluteus
  
3. Which of the following is not replaced during a total knee arthroplasty?
  - a. Anterior cruciate ligament
  - b. Lower end of the femur
  - c. Upper end of the tibia
  - d. Patella
  
4. Which of the following observations should be reported to the supervisor?
  - a. Excessive swelling of the legs and feet
  - b. Blood in the urine
  - c. Increasing knee pain
  - d. All of the above
  
5. When ice packs are used following knee surgery, they should be applied directly to the skin and remain on the knee continuously.
  - a. True
  - b. False
  
6. What should a home health aide do when a patient asks you to do tasks not on the assignment sheet?
  - a. Perform the tasks, but don't record them.
  - b. Tell the patient you can't do anything else.
  - c. Call the supervisor for direction.
  - d. Pretend you didn't hear the patient.

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7. What is the name of the machine often used following knee surgery?

- a. Continuous positive airway pressure machine
- b. Continuous passive motion machine
- c. Continuous intravenous infusion pump
- d. Lymphedema pump

8. Which of the following is not a component of the knee joint?

- a. The lower end of the humerus
- b. The lower end of the femur
- c. The upper end of the tibia
- d. The patella

9. The knee is the largest joint in the body.

- a. True
- b. False

10. What is another name for osteoarthritis?

- a. Muscular dystrophy
- b. Osteoporosis
- c. Multiple myeloma
- d. Degenerative joint disease

– END –



NAME \_\_\_\_\_ DATE \_\_\_\_\_

**DIRECTIONS: READ EACH QUESTION IN THE POST-TEST CAREFULLY. THEN, DETERMINE THE BEST ANSWER. CHECK THE CORRESPONDING BOX ON THIS ANSWER SHEET. DO NOT WRITE ON THE POST-TEST.**

**MULTIPLE CHOICE ANSWER SHEET**

- |     |                            |                            |                            |                            |
|-----|----------------------------|----------------------------|----------------------------|----------------------------|
| 1.  | <input type="checkbox"/> a | <input type="checkbox"/> b | <input type="checkbox"/> c | <input type="checkbox"/> d |
| 2.  | <input type="checkbox"/> a | <input type="checkbox"/> b | <input type="checkbox"/> c | <input type="checkbox"/> d |
| 3.  | <input type="checkbox"/> a | <input type="checkbox"/> b | <input type="checkbox"/> c | <input type="checkbox"/> d |
| 4.  | <input type="checkbox"/> a | <input type="checkbox"/> b | <input type="checkbox"/> c | <input type="checkbox"/> d |
| 5.  | <input type="checkbox"/> a | <input type="checkbox"/> b |                            |                            |
| 6.  | <input type="checkbox"/> a | <input type="checkbox"/> b | <input type="checkbox"/> c | <input type="checkbox"/> d |
| 7.  | <input type="checkbox"/> a | <input type="checkbox"/> b | <input type="checkbox"/> c | <input type="checkbox"/> d |
| 8.  | <input type="checkbox"/> a | <input type="checkbox"/> b | <input type="checkbox"/> c | <input type="checkbox"/> d |
| 9.  | <input type="checkbox"/> a | <input type="checkbox"/> b |                            |                            |
| 10. | <input type="checkbox"/> a | <input type="checkbox"/> b | <input type="checkbox"/> c | <input type="checkbox"/> d |

**INSTRUCTOR'S COMMENTS/SIGNATURE**

Signature \_\_\_\_\_ RN \_\_\_\_\_ Date \_\_\_\_\_

