Chapter 20: The Knee and Related Structures

Overview

The knee is one of the most complex joints in the human body. It is also one of the most traumatized joints because many sports place extreme stress on it. The team physician is responsible for diagnosing the severity and exact nature of a knee injury. Although the physician makes the final evaluation, the coach or athletic trainer is usually the first person to observe the injury; therefore he or she makes the initial evaluation and provides immediate care. The earlier the determination of the extent of the injury, the better, because subsequent swelling will often mask the full extent of the injury.

Any evaluation of the knee should include inspection and evaluation of the patella. Because of its position, function, and its relationship to surrounding structures, it is exposed to a variety of traumas and diseases related to sports activities that may cause pain and discomfort for the athlete. All structures must be thoroughly evaluated in both acute and chronic conditions to rule out more serious pathological conditions.

As with any injury, the athletic trainer's job does not stop after the evaluation and immediate treatment. In cooperation with the team physician, a rehabilitation program should be constructed to restore the athlete's muscle strength, power, endurance, flexibility, proprioception, and agility before allowing the athlete to return to sports activities.

Learning Objectives

After completing this chapter, the student will be able to:

- Recognize the normal structural and functional knee anatomy.
- Demonstrate the various ligamentous and meniscal stability tests discussed in this chapter.
- Explain how knee injuries can be prevented.
- Compare and contrast male/female differences relative to ACL injuries.
- Discuss etiological factors, symptoms and signs, and management procedures for the injuries to the ligaments and menisci.
- Identify the various etiological factors, symptoms and signs, and management procedures for injuries that occur in the patellofemoral joint and in the extensor mechanism.
- Design appropriate rehabilitation protocols for the injured knee.

KEY TERMINOLOGY

- A-angle - Created by the intersection of lines drawn bisecting the patella longitudinally and from the tibial tubercle to the apex of the interior edge of the patella, measuring the patella orientation to the tibial tubercle.
- anterior drawer test - Used to test the integrity of both cruciate ligaments and the joint capsule.
- avascular - Devoid of blood circulation.
- bipartite patella - A congenital anomaly where the patella develops into two separate portions.
- chondromalacia - Degeneration of the articular cartilage on the posterior aspect of the patella caused by friction over the femoral condyles.
- hemarthrosis - Blood in a joint cavity.
- iliotibial band tendinitis - Inflammation of the iliotibial band resulting from varus stresses on the knee; commonly occurs in cyclists and runners.
- joint capsule - soft tissue structures divided into four regions lined on the interior by synovial membrane and externally by various ligamentous and muscle structures to help stabilize the joint.
- joint mice - Chips of cartilage loose within the joint that cause clicking or locking of the knee.
- jumper's knee - Patellar or quadriceps tendinitis.
- knee plica - The remains of unabsorbed fetal synovial cavities in the knee, which form synovial folds and cause pain.
- Lachman drawer test - Test for cruciate laxity.
- Larsen-Johansson disease - Disease similar to Osgood-Schlatter disease, but it occurs at the inferior pole of the patella.
- McMurray test - Inspection of the menisci for tears or separated pieces.
- menisci - Two oval-shaped, semilunar fibrocartilages that deepen the facets of the tibia and provide cushion for stresses on the joint.