What is the ACL and what is its function?
Dr. Matava: ACL stands for anterior cruciate ligament which is one of the four major ligaments of the knee. The main function of a ligament is to connect a bone to a bone. In the case of the ACL, this important ligament directly connects the femur (thigh bone) to the tibia (shin bone). In doing so, it is the primary ligamentous restraint to forward motion of the tibia in relation to the femur.

How is the ACL injured and how is it diagnosed?
Dr. Matava: In the United States, approximately one in 3000 people tear their ACL annually. These injuries are very common in an athletic population such as football players; however, females are up to eight times more likely to injure their ACL than males. There have been a variety of theories put forth to explain this phenomenon. Most recent research suggests that females have altered firing patterns to their lower extremity muscles during athletic activity that predisposes them to tear their ACL.

These injuries are most commonly the result of a noncontact athletic injury involving twisting, deceleration, or hyperextension of the knee. However, a direct blow to the outside part of the knee is frequently seen in football players due to the nature of contact experienced by these athletes. Once an athlete sustains this injury, he or she is unlikely to return to competition that day. The player often recalls a pop in the knee at the time of the injury. Significant swelling develops over the first six hours following the injury due to bleeding within the knee joint. These are often not isolated injuries, as athletes who tear their ACL experience concomitant damage to the knee cartilage approximately 50%-60% of the time. Athletes who attempt to play with a chronic ACL tear frequently develop recurrent knee instability manifested as a shifting sensation. They may also complain of swelling or locking which makes return to high-level sports that involve cutting and pivoting very difficult.

The diagnosis of an ACL tear can typically be made by an experienced sports medicine specialist based on the players history of the injury and physical examination. The most accurate method physicians use to diagnose an ACL tear is the Lachman test that reveals increased motion of the tibia relative to the femur in a slightly flexed position. Imaging studies are routinely obtained by the treating physician when an ACL tear is suspected. Despite the fact that plain x-rays are usually normal, magnetic resonance imaging (MRI) can be a valuable aid in making the diagnosis and identifying associated injuries.

How is an ACL tear treated?
Dr. Matava: Nonoperative management of ACL tears in young, active patients often fails, resulting in persistent knee instability. This instability has been shown to result in cartilage damage in over 90% of patients if left untreated. ACL tears that occur in more sedentary individuals often do not result in further symptoms if they avoid cutting, twisting, or pivoting maneuvers. Therefore, activities such as golf, cycling, swimming, and walking can usually be performed despite the presence of an ACL tear in these less active patients.

As result of the rather poor prognosis of conservative treatment in active individuals, surgery is usually recommended in this patient population to reestablish normal knee stability. Direct repair of the torn ligament has historically been unsuccessful due to the ligaments inability to heal. Modern surgical treatment of this injury involves reconstruction of the ACL through the use of a variety of grafts to replace the torn ligament. The most common of these grafts are the patients own central one-third of the patellar tendon (the tendon connecting the knee cap to the tibia) and the hamstring tendons located behind the thigh. A donor graft, known as an allograft, has also been used. The choice of graft tissue is dependent upon several factors that the surgeon will discuss with the patient preoperatively. Overall outcomes, irrespective of graft choice, have been favorable. Modern reconstructive techniques are usually performed arthroscopically on an out-patient basis, with only a small incision, minimal blood loss, and no cast or brace.

Postoperatively, these patients begin rehabilitation almost immediately with weight bearing allowed with the assistance of crutches and knee motion encouraged. Concurrent procedures may alter the typical rehabilitation program. The patient usually is allowed light jogging at the three-month interval, with running at four months, cutting and sport-specific drills at five months, and return to sports at six months postoperatively. Unfortunately, even with successful surgery and an aggressive rehabilitation regimen, most patients do not feel normal for up to a year after the surgery. Nevertheless, normal knee stability, lower extremity strength, and knee motion can be expected over 90% of the time.