Treatment of meniscus tears in the young athlete, the weekend warrior and the patient with established osteoarthritis.

Participation in sports at younger ages, and the appreciation that exercise is critical to long-term health, have both changed the spectrum of knee-related problems over the past two decades. Nonetheless, new treatment options and advances such as anterior cruciate ligament (ACL) reconstruction (which repairs torn or damaged ACL) have been credited with the early recovery and return of many athletes to their prior activities, often without a decrease in performance. Despite the plethora of advances in the treatment of ACL injuries, damage to the menisci of the knee are more prevalent than any other type of knee injury, and account for the lion’s share of sports related orthopaedic clinical visits. The menisci play important roles in the architecture and function of the knee joint:

The meniscus (medial and lateral) consist of two separate crescent-moon shaped fibrocartilage wedges that mold to the femur and the tibia. The menisci serve different roles in the knee joint:

**Cushioning Effect:** The menisci allow for an ideal pressure distribution across the entire surface of the joint surface, protecting the more fragile hyaline cartilage surfaces of the opposing femur and tibia. Each meniscus possesses a certain amount of mobility and can adjust to different flexion angles of the knee joint.

**Stability:** Both menisci provide stability to the knee joint (along with participating ligaments, tendons, and muscles). The perfect wedge fit of the medial meniscus provides a “shock/block” function to the knee, preventing the tibia from sliding forward with respect to the femur bone. The ACL also participates in this function, and is at greater risk of injury if the medial meniscus has been lost or significantly damaged.

**Nutrition:** Joint cartilage is nourished and lubricated by synovial fluid; menisci participate in the distribution of synovial fluid, ensuring that it is evenly distributed throughout the available joint space.

These three functions of the menisci are essential to the optimal mechanical functions of the knee joint. Thirty years ago, the most common surgery performed on knees was the complete removal of one or both menisci. It is now understood that if either meniscus is damaged or lost, there is a high risk, if not an eventual probability, that significant degeneration of the knee joint will follow. Great strides have been made in sports medicine, including meniscus repair, transplantation, and other techniques, along with menisectomy (when necessary).
Critical determinants with regard to the best approach to meniscal injury include the distinction between an acute meniscus injury in a young athlete versus a degenerative meniscus tear in a patient with osteoarthritis.

Typically, patients can be grouped into different categories:

**The Young Athlete:**
- **Age group:** usually high-school / college athlete or recreational athleteless than 30 years of age
- **Injury mechanism:** Acute injury / twisting trauma can be combined with ACL tear, sudden deep squat
- **Physical findings:** Acute joint effusion, pain at the joint line, loss of extension, usually no return to activities due to pain and instability
- **Imaging:** X-ray often normal, MRI can show meniscal tear, bone bruises, ligament damage

Acute meniscus tears in young patients may often be repaired. Critical elements to the success of a meniscus repair include immediate diagnosis, aided by a simple x-ray and an MRI scan, and immediate surgical repair procedures. Repairs can have a high degree of success if the injury is very recent, and if the injured meniscus is not torn into several pieces. The surgical repair of older meniscus injuries, however, has significantly less chance of success. Typically, acute tears are usually repaired with sutures tied within the joint or outside of the joint via minimally invasive arthroscopic surgery. If the meniscus is torn, resulting in small isolated piece, than this segment of the torn meniscus can be safely removed with a good chance of a full recovery. If, however, the entire meniscus is severely damaged, and needs to be removed, recovery may be problematic: athletes may choose to return to their sport activity after complete removal, however the individual may often experience early swelling, pain, and occasional instability in the affected joint. This collective symptomology is referred to as “postmeniscectomy syndrome” and often necessitates major surgery to maintain the integrity of the joint. Surgical intervention may include meniscus transplantation, cartilage repair procedures, and possibly correction of the axial alignment of the leg.
The Patient with Osteoarthritis:

- **Age group:** Usually over 40 years of age, in case of previous knee injuries can be significantly younger.

- **Injury mechanism:** Can be acute onset but more often slow gradual onset of symptoms.

- **Physical findings:** Slow, progressive swelling, often gradual onset, joint line tenderness, mechanical symptoms (popping, catching, locking) usually responsive to NSAIDS, allows activities that avoid twisting or squatting.

- **Imaging:** X-ray: signs of osteoarthritis, loose bodies, MRI: degenerative meniscus tear

Patients with a likely degenerative meniscus tear may initially present with an "acute on chronic" tear which are generally irreparable: often the meniscus tear may be present before any actual injury is experienced, and have no clinical relevance if asymptomatic. Notably, greater than 60% of MRIs obtained for patients with asymptomatic degenerative joint disease will reveal one or more meniscus tears. In these patients, it is important to determine if their major complaint or symptom is pain or mechanical in nature (popping, clicking, or locking of the joint). Initially, osteoarthritis patients typically complain of pain, without mechanical deficiencies, and can be effectively treated with NSAIDs and intra-articular cortisone injections. The majority of these patients may receive significant relief, and return back to their baseline with these non-operative treatments only. A relatively lower proportion of patients (~ 15-20%) may fail this treatment course, and may require a partial removal of the torn meniscus. Rarely, it may be necessary to remove the entire meniscus. If, for example, a patient complains primarily about mechanical symptoms leading to painful instability (with a high risk of falling), then arthroscopy may be necessary to remove the torn portion of the meniscus. It is always important to counsel the patient, and to be aware that patients with osteoarthritis (or degenerative joint conditions leading to osteoarthritis) may ultimately need a partial or total joint replacement.
The Group in-between or “the Weekend Warrior”:

- **Age group:** all ages, typically between 25 and 55 years of age
- **Injury mechanism:** twisting, deep squads, contact injury
- **Physical findings:** acute or chronic swelling, pain at the joint line, mechanical symptoms, can walk-it-off initially but often continue to have pain
- **Imaging:** wide spectrum from essentially normal to severe OA

Treatment options for the weekend warrior may not be as well defined as the young athlete or the osteoarthritic patient. An accurate and complete patient history is very important to determine if the patient actually falls into either of the first two groups; for example, if the patient is less than 50 years old and has a repairable meniscus tear than this individual may still be a candidate for arthroscopic meniscus repair surgery. Beyond this age, meniscus repair has little chance of success and should not be attempted. A pivotal consideration is whether the patient’s injured meniscus allows him to carry out current levels of daily living activities, or whether the patient is only bothered during sports activities. Some patients prefer modification of their activities rather than surgical procedures. It is important to understand that an asymptomatic patient with a meniscus tear does not carry a higher risk of arthritis than a patient who has undergone a partial meniscectomy. Therefore, if a patient has experienced a meniscus tear but is asymptomatic during daily activities, there is no need for surgical intervention.

Conclusion: Meniscus injuries are frequent and should be addressed aggressively in the young, active individual so that future damage may be prevented. In patients with established osteoarthritis, primary treatment options are usually non-operative. The ‘weekend warrior’ of any age should be carefully evaluated to determine if the individual fits into either of the prior two patient categories. Treatment options and the decision to refer the patient to an orthopaedic surgeon is most often warranted soon after injury, in order to determine the best course of treatment, whether non-operative or operative, in these patients.