EVIDENCE-BASED MEDICINE IN HUMAN ACL SURGERY
Martha M Murray, MD
Children’s Hospital Boston, Boston, MA

Key Points:
- ACL Injuries in humans are common
- Standard of treatment of human ACL injuries is ACL reconstruction
- The specific technique and graft choice for ACL injury may not affect outcomes
- Further research into novel techniques may be of interest for the human population

Treatment of the torn ACL is of great interest in the human sports medicine world. Over 400,000 patients are estimated to get an ACL tear each year in the US. ACL injuries in humans are of great interest not only because of their large numbers, but also because of the significant disability that accompanies these injuries – the short term disability of pain and loss of knee function, and the longer-term disability of premature osteoarthritis. In this talk, we will review the evidence-based approach to ACL injuries in humans, including the epidemiology of this injury, what are the most reliable ways to diagnose this injury,

There are three diagnostic tools used to determine if a human patient has an ACL injury: history, physical examination and MRI. Key components of the history are feeling a “pop”, early swelling of the knee (hemarthrosis) and inability to return to play that day. Physical exam can also be helpful, with the Lachman test having the greatest sensitivity of the standard exam tests, and all tests having a similar specificity. Examination under anesthesia brings the sensitivity of both pivot shift and anterior drawer testing up significantly, adding to the precision of those tests. MRI imaging has a high sensitivity, specificity and accuracy.

The evidence to date suggests that surgical treatment of ACL tears in humans with ACL reconstruction can significantly decrease the meniscal tear rate in patients with ACL injuries. ACL reconstruction has not been found to significantly reduce the rates of premature osteoarthritis however. Once surgery is elected, there has been found to be no difference between the two principal surgical techniques – one or two incision techniques result in equivalent patient outcomes. Similarly, the choice of autograft tissue (hamstrings vs bone-patellar tendon-bone) also has no significant effect on patient outcomes. The use of double bundle techniques has not yet shown a significant improvement in patient outcomes either. Allograft should be used with great caution in the young and active patient population, and the processing of the allograft tissue prior to implantation is likely to be important in determining patient outcomes. Choice of fixation techniques similarly has not been found to significantly affect patient outcomes, with the exception of bioresorbable screws leading to a higher effusion rate than the use of metallic screws.

Current outcomes suggest that ACL reconstruction in humans is a generally successful procedure. However, there is room for improvement and thus much interest in novel techniques for treatment of this important injury.