

# NFL players' careers most affected by surgery to patellar tendon, Achilles tendon and ACL

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In the hard-hitting world of American football, injuries are an inherent risk of the game with players in the National Football League (NFL) experiencing a higher rate of injury than in any other professional sport. Orthopaedic surgeries are often required to manage player injuries, but until recently little information was available to assess the effect these procedures may have on players' future performance and career trajectory. To better understand surgery's impact, Northwestern Medicine researchers created the NFL Orthopaedic Surgery Outcomes Database (NO-SOD), a comprehensive injury database that compares return-to-play rates (RTP) and performance-based outcomes in NFL players who had orthopaedic surgery.

Analyzing data from the NO-SOD, the Northwestern Medicine researchers published a study in the *American Journal of Sports Medicine* that finds that players who undergo surgical procedures for [tendon injuries](#) experience a worse career trajectory than players who have surgery to fix fractures and sports hernia. Patellar tendon repair has the greatest effect on NFL careers, with anterior cruciate ligament repair (ACLR) and Achilles tendon repair also having a strong impact on players' careers.

"NFL rosters have a very high turnover rate, so an athlete's career longevity is often dependent on his ability to return to baseline performance following an injury and recovery from surgery," said

Wellington K. Hsu, MD, an orthopaedic surgeon at the Center for Comprehensive Orthopaedic and Spine Care at Northwestern Memorial Hospital and study's senior author. "While previous studies have reported outcomes for specific procedures, ours is the first that looks at the effect these injuries and surgeries have in comparison with others."

Hsu and his team created the NO-SOD using team injury reports and other public records, including newspaper archives, player profiles and press releases, over a 10-year time period to identify NFL athletes who had orthopaedic surgeries. They then developed performance-based outcome measures based on preoperative and postoperative statistics including games played, games started, seasons played and performance score. A total of 559 athletes were included in the database, with nearly 80 percent returning to play after an orthopaedic procedure.

"The existing NFL Injury Surveillance System tracks the incidence of injuries, but does not allow for outcome studies, which significantly limits league and medical personnel from identifying trends following common orthopaedic procedures," said Hsu, who is also the Clifford C. Raisbeck Distinguished Professor of Orthopaedic Surgery and director of research for the department of orthopaedic surgery at Northwestern University Feinberg School of Medicine.

Included in the NO-SOD are players who had procedures for [anterior cruciate ligament](#) (ACL) tears, Achilles tendon tears, patellar tendon tears, cervical disc herniation, lumbar disc herniation, sports hernia, knee articular cartilage repair (microfracture technique), forearm fractures, tibial shaft fractures and ankle fractures.

The researchers found that players who had knee surgeries experienced the most significant decline in performance. Athletes who had surgery to repair the patellar tendon, the tendon connecting the knee bone to the shin, fared the worst with respect to the RTP rate, career length after

surgery, games played and performance at one year, two years and three years after surgery.

Players had a RTP rate of only 50 percent after patellar tendon repair, which was significantly lower compared to all other procedures analyzed. After ACLR, players experience significant declines in statistical performance even three seasons after their injury.

"Our findings related to patellar repair and ACLR highlight how devastating a tendon or ligament injury to the knee can be for an NFL athlete," said Hsu. "A healthy knee is crucial to a player's ability to pivot, jump, run, kick and make stopping movements- all elements of the game of football - so it's not surprising these procedures would have strong impact on performance."

Athletes who underwent Achilles tendon repair fared slightly better than those who required knee procedures. While they experienced longer recovery periods and decreases in games played and performance the first season after surgery, these players were able to return to baseline performance two and three seasons after surgery. Procedures for traumatic bony fractures and sports hernia lead to the best postoperative outcomes with RTP rates of more than 90 percent.

"Understanding performance outcomes for common orthopaedic procedures may lead to alterations in training regimens for NFL athletes as well as help guide short- and long-term postoperative expectations for an athlete's career," said Hsu. "Knowing the relative differences in recovery after orthopaedic procedures may be interesting to NFL [players](#), coaches and fans alike."

**More information:** H. T. Mai et al. The NFL Orthopaedic Surgery Outcomes Database (NO-SOD): The Effect of Common Orthopaedic Procedures on Football Careers, *The American Journal of Sports*

*Medicine* (2016). [DOI: 10.1177/0363546516651426](https://doi.org/10.1177/0363546516651426)

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