

# Arthritis Prevention for Athletes

## Sport participation is associated with an increased risk of future osteoarthritis as a result of injury, particularly of the knee joint.

There are many strategies to help reduce the risk of developing osteoarthritis (OA), commonly called arthritis. When an injury does occur, optimal injury management may lower the risk of developing arthritis in the future.

High-intensity sports and activities involving dynamic movement (e.g., rapid changes in speed and direction), contact, and high-impact forces (e.g., cutting and jumping) are tough on the joints and may cause degeneration of cartilage.

**Consistent moderate** exercise and activity **reduces** the risk of arthritis by strengthening muscles and improving mobility.

**Arthritis prevalence is dependent on intensity, frequency, level, and type of sport, as well as factors specific to the athlete including sex, coordination, and skill level.**

## Injury Prevention

Preventing injury to ultimately prevent arthritis for athletes.

40% of all lower body injuries are preventable.

Injury prevention and training programs may prevent up to a quarter of all knee arthritis cases.

## Neuromuscular Training Strategies

1. Deliberately focus on proper coordination, technique and movement during these athletic tasks: running, cutting, jumping, and landing.

- A. Running
- B. Cutting
- C. Jumping
- D. Landing

Neuromuscular training programs incorporate warm-up routines consisting of: strength and plyometric exercises, balance training, agility drills, and active stretching and mobility. The goal is to allow athletes to have more control of their movements.

Improved coordination results in proper movement during athletic maneuvers thereby reducing injury risk. Examples include increased balance, knee and core stability.

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## 2. Address muscle weakness, imbalance and joint stability

Notable Injury Prevention Programs:

F-MARC: FIFA 11+ Program for male and female soccer players 14 years and older

<http://f-marc.com/11plus/home/>

Knee Injury Prevention Program (KIPP) for females playing a variety of sports

<http://kipp.instituteforsportsmedicine.org/>

## After an Injury Has Happened:

You are 3-6 times more likely to develop knee arthritis with a history of knee injury.

Gender and age are major risk factors.

Females over the age of 12 are up to 8x more likely to sustain an ACL injury (compared to males of the same age), leading to early onset arthritis due to differences in:

- Anatomy
- Hormones
- Neuromuscular Coordination
- Strength

**Approximately 50% of those who suffer ACL or meniscus injury may develop arthritis later in life.**

## Injuries associated with the development of arthritis:

1. Knee ligament sprains - especially of the Anterior Cruciate Ligament (ACL)
2. Meniscal injuries
3. Fractures involving articular surfaces (e.g., where the knee cap, thigh bone and shinbone all connect)

## Rehabilitation

1. Immediate focus should be decreasing pain, restoring function and a gradual, monitored return to regular activity.
2. Address biomechanical and neuromuscular impairments.
3. Sports-specific rehabilitation with focus on regaining coordination, strength and proprioception, similar to that of an injury prevention protocol.
4. Appropriate return to sport *after* complete rehabilitation may reduce the incidence of arthritis development.

## Surgery

Surgery has not been shown to prevent the development of knee arthritis.

- There is a higher reported incidence of knee arthritis when ACL reconstruction surgery is performed with a patellar tendon autograph vs semitendinosus or gracilis autograph.
- Meniscectomy (removal or partial removal of the meniscus) is a primary risk factor for OA.
- Following ACL surgery and the completion of 3 months of physical rehabilitation, knee extension deficits and knee pain are the biggest predictors of long-term disability.
- Knee extension deficits increase the odds of developing knee osteoarthritis by over double.

**The best way to avoid arthritis is to avoid injury!**

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## References

1. Shelbourn K, Benner R, Gray T. Minimum 20-year results of anterior cruciate ligament reconstruction with patellar tendon autograph. *Am Acad Orthop Surgery*. 2017;[Abstract].
2. Ratzlaff CR, Liang MH, Boling M, et al. New developments in osteoarthritis. Prevention of injury-related knee osteoarthritis: opportunities for the primary and secondary prevention of knee osteoarthritis. *Arthritis Res Ther*. 2010;12(4):215. doi:10.1186/ar3113.
3. Keats MR, Emery CA, Finch CF, Nettel-Aguirre A, Mechelen W van. Are we having fun yet? Fostering adherence to injury preventive exercise recommendations in young athletes. *Sports Med*. 2012;42(3):175-184. doi:10.2165/11597050-000000000-00000.
4. Silvers-Granelli H, Mandelbaum B, Adeniji O, et al. Efficacy of the FIFA 11+ injury prevention program in the collegiate male soccer player. *Am J Sports Med*. 2015;43(11):2628-2637. doi:10.1177/0363546515602009.
5. Fox AS, Bonacci J, McLean SG, Saunders N. Efficacy of ACL injury risk screening methods in identifying high-risk landing patterns during a sport-specific task. *Scand J Med Sci Sports*. 2017;27(5):525-534. doi:10.1111/sms.12715.
6. Thorborg K, Krommes KK, Esteve E, et al. Effect of specific exercise-based football injury prevention programmes on the overall injury rate in football: a systematic review and meta-analysis of the FIFA 11 and 11+ programmes. *Br J Sports Med*. 2017;49(5 Suppl):S51-S57. doi:10.1136/bjsports-2016-097066.
7. McCall A, Dupont G, Ekstrand J, Clausen MB, Bartels EM, Rathleff MS. Injury prevention strategies, coach compliance and player adherence of 33 of the UEFA Elite Club Injury Study teams: a survey of teams' head medical officers. *Br J Sports Med*. 2016;50(12):725-730. doi:10.1136/bjsports-2015-095259.
8. Driban JB, Eaton CB, Lo GH, Ward RJ, Lu B, McAlindon TE. Association of knee injuries with accelerated knee osteoarthritis progression: Data from the Osteoarthritis Initiative. *Arthritis Care Res*. 2014;66(11):1673-1679. doi:10.1002/acr.22359.
9. Leppänen M, Aaltonen S, Parkkari J, Heinonen A, Kujala UM. Interventions to prevent sports related injuries: a systematic review and meta-analysis of randomised controlled trials. *Sport Med*. 2014;44(4):473-486. doi:10.1007/s40279-013-0136-8.
10. Lauersen JB, Bertelsen DM, Andersen LB. The effectiveness of exercise interventions to prevent sports injuries: a systematic review and meta-analysis of randomized controlled trials. *Br J Sports Med*. 2014;48(11):871-877. doi:10.1136/bjsports-2013-092538.
11. Whittaker JL, Woodhouse LJ, Nettel-Aguirre A, Emery CA. Outcomes associated with early post-traumatic osteoarthritis and other negative health consequences 3–10 years following knee joint injury in youth sport. *Osteoarthr Cartil*. 2015;23(7):1122-1129. doi:10.1016/j.joca.2015.02.021.
12. Guh DP, Zhang W, Bansback N, Amarsi Z, Birmingham CL, Anis AH. The incidence of co-morbidities related to obesity and overweight: A systematic review and meta-analysis. *BMC Public Health*. 2009;9(1):88. doi:10.1186/1471-2458-9-88.
13. Finch CF, Kemp JL, Clapperton AJ. The incidence and burden of hospital-treated sports-related injury in people aged 15+ years in Victoria, Australia, 2004–2010: a future epidemic of osteoarthritis? *Osteoarthr Cartil*. 2015;23(7):1138-1143. doi:10.1016/j.joca.2015.02.165.
14. Ajuied A, Wong F, Smith C, et al. Anterior cruciate ligament injury and radiologic progression of knee osteoarthritis. *Am J Sports Med*. 2014;42(9):2242-2252. doi:10.1177/0363546513508376.
15. Johnson VL, Hunter DJ. The epidemiology of osteoarthritis. *Best Pract Res Clin Rheumatol*. 2014;28(1):5-15. doi:10.1016/j.

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