



LOWER EXTREMITY INJURY PREVENTION

Evidence-based preventive training programs (PTPs) used as warm-ups before sport and physical activity participation are cost-effective strategies to reduce injury risk and injury rates.¹ However, the effectiveness of a PTP relies on the program being done correctly and consistently.^{2,3} PTPs must include feedback on proper exercise technique and include a variety of exercise types: strength, plyometrics, agility, balance, and flexibility.^{4,5} A 10-15 minute warm-up before each bout of activity could reduce lower extremity injury risk by up to 70%.¹

Athletic trainers can design and directly assist with running PTPs, or could train others to implement PTPs. While some individuals may prefer a pre-packaged PTP, such as the FIFA 11+,⁶ resources exist to help athletic trainers build their own tailored program (e.g., Remain in the Game; see resource section),⁷ which may help promote buy-in with coaches and athletes if PTPs are tailored to the athlete's skill level, time available, and sport.

highlights FREE COMMUNICATIONS PROGRAM

“Differences in Attitudes Towards Injury Prevention Program Participation Based on Races” (*Gabriel et al, 2023*) S-139. Non-Caucasian athletes report more barriers to participation in Injury Prevention Programs (IPPs) and lower comfort with community-led programs. Solutions addressing these barriers and further research on contextual factors are essential.

“Awareness of Best Practices Among Athletic Trainers in Secondary Schools” (*DiStefano et al, 2022*) S-50. Sport-related injury and illnesses can be improved through policy adoption, which can be promoted through comprehensive resources delivered to individual schools.

“Effectiveness of a Framework to Disseminate and Implement Preventive Training Programs in Youth Basketball” (*Sheldon et al, 2022*) S-149. Improvements in implementation and dissemination of preventive training programs are needed to maximize effectiveness for youth athletes.

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Lauren Sheldon, MS, LAT, ATC

“Preventive Training Programs in Secondary Schools”

Many high school sport teams perform team-based warm-up programs, but these programs are primarily flexibility exercises and do not contain other exercise types, such as strength, agility, or plyometrics, that would follow best practice guidelines. An educational workshop that is tailored to the specific needs of a school is effective in encouraging teams to incorporate more preventive training program guidelines into their warm-up routines.



from RECENT ARTICLES

“Is an exercise-based injury prevention programme effective in team handball players? A systematic review and meta-analysis”

Naderi et al, 2023. Team handball is one of the most popular ball sports in the world. Exercise-based injury prevention programs may reduce knee and ankle injury risk by 35-78% and 40-81%, respectively.

“Preventive training program feedback complexity, movement control, and performance in youth athletes”

Root et al, 2022. Simplified feedback cues given during a preventive training program were as effective as providing a full range of feedback cues for reducing injury risk. Streamlining feedback may be advantageous when working with youth athletes or training coaches and other stakeholders to implement programs. While feedback is critical to ensure exercises are performed correctly, providing too many cues at once may be too overwhelming for athletes to translate into performance, which could have an opposing effect where no movement corrections are made.

“Understanding youth sport coaches’ perceptions of evidence-based injury prevention training programs: a systematic literature review”

Hawkinson et al, 2022. Youth sport coaches had positive attitudes about anterior cruciate ligament preventive training programs (PTPs) but lacked the knowledge and self-efficacy to implement the programs. Athletic Trainers should use coaches’ motivations and the intervention context to inform implementation strategies to optimize changes in adopting a PTP and continuing to use a PTP over time. For instance, co-creating PTPs with coaches that combine teaching how to choose appropriate exercises and deliver effective cues with discussing ways to overcome barriers related to accessing additional resources and implementing within site-specific time and space constraints is one strategy to ensure long-term PTP success.

References:

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2. Silvers-Granelli H, Bizzini M, Mandelbaum B, Arundale A, Pohl R, Snyder-Mackler L. High compliance with the 11+ injury prevention program results in better win-loss records. *Int J Sports Phys Ther*. 2023;18(5):1065-1075
3. Sugimoto D, Myer GD, Bush HM, Klugman MF, Medina McKeon JM, Hewett TE. Compliance with neuromuscular training and anterior cruciate ligament injury risk reduction in female athletes: a meta-analysis. *J Athl Train*. 2012;47(6):714-723. doi:10.4085/1062-6050-47.6.10
4. Al Attar WSA, Bakhsh JM, Khaleidi EH, Ghulam H, Sanders RH. Injury prevention programs that include plyometric exercises reduce the incidence of anterior cruciate ligament injury: a systematic review of cluster randomised trials. *J Physiother*. 2022;68(4):255-261. doi:10.1016/j.jphys.2022.09.001
5. Sugimoto D, Myer GD, Foss KD, Hewett TE. Specific exercise effects of preventive neuromuscular training intervention on anterior cruciate ligament injury risk reduction in young females: meta-analysis and subgroup analysis. *Br J Sports Med*. 2015;49(5):282-289. doi:10.1136/bjsports-2014-093461
6. Thorborg K, Krommes KK, Esteve E, Clausen MB, Bartels EM, Rathleff MS. 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;51(7):562-571. doi:10.1136/bjsports-2016-097066

RESOURCES



Mobile App/Online Toolkit

- **Remain in the Game Mobile App** – create a tailored sports warm-up to use on the court and in the field.
- **FIFA 11+ Injury Prevention Program Demonstration Videos**
- **Aspen Institute Project Play National ACL Injury Coalition**



Infographics

- **Osteoarthritis: Staying in the game is a ‘joint’ effort!**
- **Sample Exercises to Build a Preventive Training Program**
- **BJSM: Effects of specific injury prevention programs in football**



Webinars

- **Osteoarthritis Action Alliance YouTube playlist for injury prevention seminars**
- **Lower Limb Preventive Training Program Best Practice and Implementation**



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