Dance/USA
Task Force on Dancer Health

The Importance of Cross-Training for Dancers

INTRODUCTION

Dancers are athletes. They undergo the same physical and mental demands as their sport counterparts. Across many genres of sports, cross-training (doing other forms of exercise), has added to the athletes' strength and fitness levels allowing them to handle the demands of competing at the highest level.

Dance class alone does not prepare dancers for performance. Research has shown that dance class is anaerobic, meaning that rather than needing oxygen, the body is able to get energy by breaking down the sugar stored in muscle. However, dance performance, the equivalent of a sport competition, is aerobic, requiring oxygen for muscles to sustain activity. Similar to athletes of other sports, professional dancers can also benefit from cross-training.

CROSS-TRAINING: WHAT IS IT?

Cross-training for dancers means doing exercises and activities that support what is done in class to improve fitness, strength, balance, and agility. Endurance is required so that dancers can make it through entire performances, sometimes many in one day, without feeling exhausted, which may lead to an increased injury potential. For example, dancers can benefit from more cardiovascular exercise such as swimming, running, cycling, elliptical, rowing, stair climbing, and jumping rope. A large variety of exercises can be done to improve strength, without changing the physique: muscle size will not increase (for more information please see *Building Strong Performers: Weight Lifting or Resistance Training for Dancers*). Strength, core, balance, and agility exercises can all be tailored to improve the dancers' response to the demands of choreography for specific roles.

CROSS-TRAINING: WHY DO IT?

Cross-training has research-proven benefits including the following:

- improved mental health
- improved performance
- reduced rate of injuries

- faster recovery from injuries
- decreased quantity of injuries
- significant cost-savings for companies

Mental health benefits include stress reduction, improved job satisfaction, improved productivity, and less burnout. Performance benefits include improved coordination, improved stability, increased jump height, increased power with jumps, improved arabesque height, improved pirouettes, improved strength without changing– and often improving aesthetics, and improved endurance.

CROSS-TRAINING: WHERE TO START?

Ideally, cross-training should be integrated into the schedule by someone who knows the company and is familiar with the choreography demands, such as the healthcare provider or strength and conditioning coach, with the collaborative support of the company manager and an informed artistic staff. It may take some time to figure out the optimal schedule. Research has shown benefits for programs that are done in as little as 30 minutes, two times per week.

A program can be implemented in the dance studio with minimal equipment, requiring little to no storage space, using bands, body weight resistance, and jump ropes. If there is more room, weights, bosu balls, and agility equipment can be added. The Task Force on Dancer Health's Subcommittee on Cross-training will be developing a sample program, so stay tuned!

CROSS-TRAINING: A SUMMARY

Cross-training is an integral part of the elite athlete's training regimen. Dancers fall into this same category of athleticism and can benefit from cross-training in the same way.

Cross-training should be incorporated into the dancer's schedule. It enables a dancer to become more efficient, handle the mental demands better, be less susceptible to injury, recover faster from an injury, and perform better, resulting in cost-savings and improved performance for a company. Many companies have been implementing programs and dancers, company managers, and artistic staff have noted significant benefits.

REFERENCES

1. Wyon MA, Grant A, Redding E, Head A, Sharp NCC. Oxygen uptake during modern dance class, rehearsal, and performance. *J Strength Cond Res.* 2004;18(3):646-649.

2. Wyon MA, Redding E. Physiological monitoring of cardiorespiratory adaptations during rehearsal and performance of contemporary dance. *J Strength Cond Res*. 2005;19(3):611-614.

3. Wyon MA, Deighan MA, Nevill AM, et al. The cardiorespiratory, anthropometric, and performance characteristics of an international/national touring ballet company. *J Strength Cond Res*. 2007;21(2):389-393.

4. Sanders DJ, Walker AJ, Prior KE, Poyssick AN, Arent SM. Training demands and physiological profile of cross-disciplined collegiate female dancers. *J Strength Cond Res.* 2021;35(8):2316-2320.

5. Bonham K. The prevalence and efficacy of cross-training in a professional ballet environment: a literature review. Senior Thesis. 2021;397.

6. Van Winden D, van Rijn RM, Savelsbergh GJP, Oudejans RRD, Stubbe JH. The association between stress and injury: a prospective cohort study among 186 first-year contemporary dance students. *Front Psychol*. 2021;12:770494.

7. Duda JL. Antecedent of burnout among elite dancers. *Psychol Sport Exerc*. 2011;12(2):159-167.

8. Cahalan R, O'Sullivan K. Job satisfaction of professional Irish dancers: implications for performer health and well-being. *J Dance Med Sci.* 2013;17(4):139-149.

9. Jones DL, Tanigawa T, Weiss SM. Stress management and workplace disability in the US, Europe and Japan. *J Occup Health.* 2003;45(1):1-7.

10. Clark T, Gupta A, Ho CH. Developing a dancer wellness program employing developmental evaluation. *Front Psychol.* 2014;5:731.

11. Angioi M, Metsios G, Twitchett EA, Koutedakis Y, Wyon M. Effects of supplemental training on fitness and aesthetic competence parameters in contemporary dance: a randomised controlled trial. *Med Probl Perform Art.* 2012;27(1):3-8.

12. Koutedakis Y, Hukam H, Metsios G, et al. The effects of three months of aerobic and strength training on selected performance- and fitness-related parameters in modern dance students. *J Strength Cond Res*. 2007;21(3):808-812.

13. Fitt S. Conditioning for dancers: investigating some assumptions. *Dance Res J*. 1981;14(1):32-38.

14. Grigoletto D, Marcolin G,, Borgatti E, et al. Kettlebell training for female ballet dancers: effects on lower limb power and body balance. *J Hum Kinet.* 2020;74(1):15-22.

15. Long KL, Milidonis MK, Wildermuth VL, Kruse AN, Parham UT. The impact of dance-specific neuromuscular conditioning and injury prevention training on motor control, stability, balance, function and injury in professional ballet dancers: a mixed-methods quasi-experimental study. *Int J Sports Phys Ther.* 2021;16(2):404-417.

16. Dowse RA, McGuigan MR, Harrison C. Effects of a resistance training intervention on strength, power, and performance in adolescent dancers. *J Strength Cond Res*. 2020;34(12):3446-3453.

17. Watson T, Graning J, McPherson S, et al. Dance, balance and core muscle performance measures are improved following a 9-week core stabilization training program among competitive collegiate dancers. *Int J Sports Phys Ther*. 2017;12(1):25-41.

18. Kalaycioglu T, Apostolopoulos NC, Goldere S, Duger T, Baltaci G. Effect of a core stabilization training program on performance of ballet in modern dancers. *J Strength Cond Res*. 2020;34(4):1166-1175.

19. Koutedakis Y, Sharp NCC. *The Fit and Healthy Dancer*. Chichester: John Wiley and Sons;1999.

20. Stalder MA, Noble BJ, Wilkinson JG. The effects of supplemental weight-training for ballet dancers. *J Applied Sport Science Res*. 1990;4(3):95-102.

21. Stracciolini A, Hanson E, Kiefer AW, Myer GD, Faigenbaum AD. Resistance training for pediatric female dancers. *J Dance Med Sci*. 2016;20(2):64-71.

22. Koutedakis Y, Sharp NCC. Thigh-muscle strength training, dance exercise, dynamometry, and anthropometry in professional ballerinas. *J Strength Cond Res*. 2004;18(4):714-718.

23. Welsh TM, Pierce Jones G, Lucker KD, Weaver BC. Back strengthening for dancers - a within-subject experimental analysis. *J Dance Med Sci*. 1998;2(4):141-148.

24. Rajic S, Legg HS, Maurus P, Nigg SR, Cleather DJ. The effects of a 9-week hip-focused weight-training program on hip and knee kinematics and kinetics in experienced female dancers. *J Hum Kinet*. 2020;75:29-39.

25. Escobar-Alvarez JA, Jimenez-Reyes P, Da Conceicao FA, Fuentes-Garcia JP. Effect of supplementary physical training on vertical jump height in professional ballet dancers. *Int J Sports Physiol.* 2022;17(8):1257-1263.

26. Sadigursky D, Braid JA, De Lira DNL, Machado BAB, Carneiro RJF, Colavolpe PO. The FIFA 11+ injury prevention program for soccer players: a systematic review. *BMC Sports Sci Med Rehabil.* 2017;9:18.

27. Yang J, Wang Y, Chen J, et al. Effects of the "FIFA11+ Kids" program on injury prevention in children: a systematic review and meta-analysis. *Int J Environ Res Public Health*. 2022;19(19):12044.

28. Gomes Neto M, Conceição CS, de Lima Brasileiro AJA, de Sousa CS, Carvalho VO, de Jesus FLA. Effects of the FIFA 11 training program on injury prevention and performance in football players: a systematic review and meta-analysis. *Clin Rehabil*. 2017;31(5):651-659.

29. Kaufmann JE, Nelissen RGHH, Stubbe JH, Gademan MGJ. Neuromuscular warm-up is associated with fewer overuse injuries in ballet dancers compared to traditional ballet-specific warm-up. *J Dance Med Sci*. 2022;26(4):244-254.

30. Allen N, Nevill AM, Brooks JH, Koutedakis Y, Wyon MA. The effect of a comprehensive injury audit program on injury incidence in ballet: a 3-year prospective study. *Clin J Sport Med.* 2013;23:373-378.

31. Bronner S, McBride C, Gill A. Musculoskeletal injuries in professional modern dancers: a prospective cohort study of 15 years. *J Sports Sci.* 2018;36:1880-1888.

32. Garrick JG, Requa RK. Ballet injuries: an analysis of epidemiology and financial outcome. *Am J Sports Med.* 1993;21(4):586-590.

33. Bronner S, Ojofeitimi S, Rose D. Injuries in a modern dance company: effect of comprehensive management on injury incidence and time loss. *Am J Sports Med*. 2003;31(3):365-373.

Disclaimer: The information on cross-training contained in this paper is intended to help guide and inform the dancer. It is not meant to take the place of personalized advice from an examining medical professional. This information is provided by Dance/USA Task Force on Dancer Health.

Written by: Selina Shah, M.D., FACP, FAMSSM with contributions from the Subcommittee on Cross-Training of the Dance/USA Task Force on Dancer Health: Kevin Brown, M.Ed., A.T.C., Hope Davis-Coen, M.S., A.T.C., Jennifer Janowski, P.T., D.Sc.P.T., C.S.C.S., Suzanne Martin, P.T., D.P.T., Tracy Espiritu McKay, D.O., Sheyi Ojofeitimi, P.T., D.P.T., Bonnie Robson, M.D., F.R.C.P.C., Emily Sandow, P.T., D.P.T., Marissa Schaeffer, P.T., D.P.T., Dana Sheng, M.D., Heather Southwick, P.T., M.S.P.T. (2023)