

hours per day as the student-athletes mentioned above. Chronic injury rates for orchestral musicians in the ICSOM study⁵ were similar to the 50% point prevalence rate for university athletes,⁴ and two studies on instrumentalists have reported that about 15% of those with a performance-related musculoskeletal disorder still had persistent symptoms 1 year after initial presentation.^{6,7} It is well accepted that female instrumentalists have a higher injury rate than do male instrumentalists, even after controlling for instrument,⁸ concordant with the higher chronic injury rate in the female student-athletes.⁴

The full spectrum of symptoms affecting athletes with overtraining syndrome includes not only the physical but also the mental/emotional.³ Anyone who has seen musicians with more chronic “overuse syndrome” symptoms has observed the same phenomenon: in addition to a combination of specific and ill-defined somatic complaints, the patient often describes symptoms consistent with depression and other affective disorders. The latter are frequently thought to be secondary to not being able to play their instrument and advance their career, but they may be a more intrinsic part of an overtraining syndrome.

One of the interesting aspects of overtraining syndrome is that the complexity of its effects (i.e., the symptoms and objective abnormalities) is probably mirrored by the multiple factors that contribute to its evolution. While one theory is that overtraining syndrome is caused by excessive physical training, an alternative theory holds that it results from the combination of several factors, including both training and nontraining related events.³ This, too, will sound

familiar to experienced performing arts medicine professionals: the violinist who was doing well until the end of a relationship, when left arm discomfort developed; the pianist who struggled with hand symptoms after the death of a parent; the flutist whose neck pain became unmanageable coincident with the arrival of a new conductor.

Both performing artists and performing arts medicine professionals have to choose among competing priorities when deciding on preventive and therapeutic strategies, and we are often making these decisions with a dearth of high-quality scientific evidence to guide us. We don't have randomized controlled trials of intensive vs moderate practice loads or constant vs periodized schedules,⁹ and we probably won't in the foreseeable future. Lacking those, it may be useful to look at the conclusions of a paper written by several physicians and scientists on the prevention of physical training-related injuries.¹⁰ They used a multistep process to review 40 prevention strategies that had been studied and published in peer-reviewed journals. In addition to education, leader support, surveillance and research, the first recommended intervention was overtraining prevention. While the overlap between the physical training that is done by army recruits and the musical training that instrumentalists do is far from complete, it is worth some thought.

While it may be shown in the future that musicians with chronic performance-related pain have a totally different set of physiologic aberrations than do athletes with overtraining syndrome, the process of looking for the markers of overtraining syndrome in musicians will probably be a fruitful

undertaking. Even if we don't find a direct explanation, there's a good chance that we will make other discoveries that will improve our understanding of this puzzling clinical scenario. At the same time, we should do similar studies in dancers and other performing artists with chronic performance-related pain.

RALPH A. MANCHESTER, MD
Rochester, New York
rmanchester@uhs.rochester.edu

1. Drinkwater EJ, Klopfer CJ. Quantifying the physical demands of a musical performance and their effects on performance quality. *Med Probl Perform Art* 2010;25:66-71.
2. Brandfonbrener AG. Report on a multi-orchestra injury prevention program. Presented at the 10th Annual Symposium on Medical Problems of Musicians and Dancers, Aspen, CO, June 1992, pp 2-5.
3. Roose J, deVries WR, Schmikli SL, et al. Evaluation and opportunities in overtraining approaches. *Res Q Exerc Sport* 2009; 80(4):756-764.
4. Vetter RE, Symonds ML. Correlations between injury, training intensity, and physical and mental exhaustion among college athletes. *J Strength Condition Res* 2010; 24(3):587-596.
5. Fishbein M, Middlestadt SE, Ottati V, et al. Medical problems among ICSOM musicians: overview of a national survey. *Med Probl Perform Art* 1988; 3:1-8.
6. Knishkowsky B, Lederman RJ. Instrumental musicians with upper extremity disorders: a follow-up study. *Med Probl Perform Art* 1986; 1:85-89.
7. Manchester RA, Lustik S. The short-term outcome of hand problems in music students. *Med Probl Perform Art* 1989; 4: 95-96.
8. Manchester RA, Flieder D. Further observations on the epidemiology of hand injuries in music students. *Med Probl Perform Art* 1991; 6:11-14.
9. Manchester RA. Periodization for performing artists? *Med Probl Perform Art* 2008; 23:45-46.
10. Bullock SH, Jones BH, Gilchrist J, Marshall SW. Prevention of physical training-related injuries. *Am J Prev Med* 2010; 38(1S):S156-S181.

CALL FOR PAPERS: Hearing Protection at Schools of Music

Papers presenting data on the state of hearing protection at music schools, as well as descriptions of hearing protection programs that have been implemented, are invited for consideration in MPPA. For information or to submit papers, please email the Editor at mppa@sciandmed.com.