

How Much Training Is Too Much?

Managing training practices in elite performance domains is recognised to play an important role in preventing musculoskeletal overload, and hence reducing the risk of overuse-related injuries.¹ The lifetime hours involved in such training have been estimated to be at least 10,000 hours,² with musicians reaching their performance peak after an average of 16 years of systematic training.³ Additionally, this research of Ericsson and colleagues² emphasises the importance of the structure and quality of this practice rather than just volume—the process they term *deliberate practice*.

In international studies spanning four decades, the duration of playing, especially in combination with sudden increases in playing and inadequate rest breaks, remains one of the most common causes of injuries. With musculoskeletal performance in occupational and sports domains, both the work:rest ratio⁴ and the acute:chronic workload ratio⁵ are considered critical in making an approximate determination in the length of training sessions. However, there are many complex underlying mechanisms that interact with the duration of training and how long a performing artist may safely rehearse or practice. Both peripheral and central mechanisms contribute to this. The time at which ultimate physical and mental capacity has been reached may vary according to the intensity, duration, and type of activity or repertoire undertaken.⁶ In addition, it also will be affected by a vast array of individual and environmental characteristics, such as the association between increased arm elevation and shoulder pain during musical performance, as seen in the paper in this issue by Kok et al.⁷

Knowing when the amount of training is “too much” is a complex undertaking, as even day-to-day conditions may create a variable impact on the performing artists’ capacity and fatigue—for example, not getting enough sleep, poor diet, exposure to a variety of stressors, and feeling pain, amongst many other possibilities. Training or practice loads are frequently set as a result of factors such as personal expectations, experience, tradition, teacher/trainer guidelines, anecdotal sources, and often as a result of poor planning. Instead of trying to set rigid timelines, particularly for personal practice/training, recognising mental and physical signs of fatigue⁸ may be more useful to inform the performing artist when to stop and rest rather than to persist.

In addition to being alert to fatigue signs in personal practice, it seems timely for those working in performing arts medicine to evaluate rehearsal scheduling and where it may be possible to implement flexible approaches. Such

initiatives require forward planning, and perhaps a leap of faith, but research is clearly showing that some repertoire is more strenuous than others and so a “one size fits all approach” does not make sense physiologically or artistically. In music, there is cultural tradition in most countries (except Scandinavia) to perform a long rehearsal of about 100 minutes, followed by a 20- to 30-minute break, then another 40-minute rehearsal session. In most cases, this scheduling is not performance-specific, as most classical opera and symphony concerts rarely exceed 50 minutes without breaks. As Stanek et al.⁹ indicate in this issue, the inability to control load may be even more difficult for college students, particularly where they have no alternative or substitute players available to play in a large number of bands, orchestras, and so on to achieve good grades.

As part of the highly innovative Musicians’ Health and Performance support program at the elite Australian National Academy of Music (ANAM), several efforts have been made to moderate training in a way to support student well-being while optimising performance output. In a pilot study with the cooperation of ANAM administration, rehearsal scheduling for orchestra week was changed from the traditional model of one long, one moderate length orchestral rehearsal to three moderate length rehearsals interspersed with two shorter breaks (still working within existing overall time frameworks). This received exceptionally positive feedback from the musicians, with the resulting orchestral performance considered to possibly be better than usual, and definitely no worse.

This was accompanied by a dramatic drop in physical injuries that typically occurred every orchestral week. Reported benefits included marked improvements in concentration and energy, being able to recover and refuel more effectively, and better hydration because musicians were able to take more bathroom breaks between rehearsals. Such changes need to be considered in light of the task at hand, but the reason to mention this here is that altering schedules even at such a simple level can have strongly positive results. In addition to altered rehearsal schedules, students received detailed instruction on pre-practice preparation, practice planning, post practice reflection and recovery, as well as strategies to enhance the efficacy of practice. Altering the content and structure of rehearsals can also be beneficial, as has previously been shown in reducing injury in ballet.¹⁰

In other approaches to increasing performance capacity, strengthening has long been recommended to enhance the ability to endure physical loads. In this issue, Moita et

al.'s systematic review on strength and injury in dancers indicates there is some lack of clarity yet about the direct association between strengthening and injury, and this review indicates how we may benefit from further research to clarify this relationship.¹¹ Further to this, the circus arts review paper by Wolfenden and Angioi¹² suggests differing classifications for injuries may be part of the reason for a less clear association of causal factors.

While strengthening to increase endurance, avoiding radical increases in training loads, and allowing adequate recovery all appear to have great potential for injury prevention in the performing arts domain, we need to increase both our research and practical implementation of such potential initiatives. Close collaboration and exploration between health professionals, artistic administrators, educators, and performing artists will allow us to take these steps forward.

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MPPA Mar 2017; 32(1): 61–62.
<https://doi.org/10.21091/mppa.2017.1011>
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EDITOR'S NOTE—New Associate Editor for Dance

MPPA is pleased to announce that Judith R. Peterson, MD, has become the new Associate Editor for Dance for the journal and will handle the peer-review of papers in this area. Judith is based in the Sanford School of Medicine at the University of South Dakota, Sioux Falls, and specializes in physical medicine and rehabilitation and pain medicine. She continues to serve as a consulting physician for the Pennsylvania Ballet, beginning with her residency years spent in Philadelphia.