



# Disordered sleep in elite athletes – possible solutions

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The sleep of athletes is a hot topic at the moment, one that generates much discussion but offers few solutions. What is clear is that athletes require more sleep than the general population for adequate recovery, and that lack of sleep is caused by stress and is also a source of stress. There are no statistics available regarding the use of pharmacologic sleep aides by athletes, but there was enough activity and attention around the issue that on the eve of the London Olympic Games in 2012, the Australian Olympic Committee (AOC) banned the use of specific sedatives including Stilnox. All other sedatives were restricted to three successive days of use to avoid addictive effects. In the revised medical manual of the AOC, sleep and relaxation strategies were outlined for athletes and for prescription by the professionals working with athletes.

Sleep difficulties were a common presentation to the Australian Headquarters Psychology Team during the Olympic Games in London. High anxiety and rumination

about impending or previous performances, the environmental challenges of shared accommodation, and practical issues such as a late night finish in competition or drug testing were amongst the most common factors reported to contribute to poor sleep.

A range of resources developed by the Headquarters Psychology Team promoting healthy approaches to sleep management were available to all athletes and staff. Information sheets and guided relaxation tracks were accessible at the Headquarters Medical Centre in the Athletes Village and the Australian recovery centre. A relaxation space was established at the recovery centre, with sport and clinical psychologists available for assessment and consultation, or to facilitate relaxation training.

The collaboration with doctors and physiologists within the Headquarters Medical Team provided a well-coordinated response and holistic management of sleep issues for athletes. An assertive approach to educating athletes on the importance of healthy strategies for sleep both prior to, and during, the London Olympic Games ensured athletes were able to address concerns about sleep issues and minimise the potential impact of poor sleep on their Olympic performance.

## Are athlete sleep issues 'disordered'?

There is a broader question of where the line is drawn between 'normal' and 'disordered' regarding the sleep issues experienced by athletes. An example is the sleep problems reported by athletes whose competitions are scheduled late at night for the purpose of increasing crowd numbers or television ratings. Pumping adrenaline combined with late finishes, followed by warm-downs and media commitments anecdotally causes sleep problems for many athletes. Pre-competition is another phase likely to elicit self-reported poor sleep by over half of athletes. Athletes entering an Olympic village report sleep problems

from the first day due to the change of environment and high level of excitement, regardless of when their competition is due to commence. On a more day-to-day scale, early morning training schedules are a barrier to attaining adequate sleep for many sports.

It could be argued in all of these scenarios that the sleep issues experienced by the athletes are not necessarily

'disordered', but are an expected response of an otherwise healthy person to an extraordinary situation. Although the sleep symptoms may not meet clinical diagnosis in all cases, for athletes the experience of sleep loss is unwelcome and often anxiety-inducing in itself, leading them to seek treatment from medical and psychological professionals.

## Why athletes experience sleep problems

There is a physiological explanation as to why some sleep issues occur for athletes pre- and post-performance. Socio-evaluative threat is defined as the threat of negative evaluation from others and has a distinct effect on elite performance (for example, see Suay et al., 1999). In brief, the hypothalamic-pituitary-adrenal axis is responsible for the secretion of the stress hormone cortisol and is primarily activated when the body responds to physical and mental stress (Miller & O'Callaghan, 2002). Elevated cortisol levels interfere with normal sleep architecture (Buckley & Schatzberg, 2005).

To further complicate the picture, all people fall somewhere on a continuum for trait anxiety, and athletes are no different. State anxiety is a transitory condition involving feelings of

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apprehension or fear, whereas trait anxiety is considered a personality characteristic indicative of the predisposition to respond to stressors (Endler, Edwards, Vitelli, & Parker, 1989). Trait anxiety can be differentiated between subtypes: social evaluation, physical danger, ambiguous and daily routines. In an investigation of the relationship between state and trait anxiety and sleep structure in individuals with identified sleep issues, trait and state anxiety were significantly correlated with sleep onset latency and number of awakenings during the night. Athletes lose sleep because they are stressed, and this is worse for those with high trait anxiety, in particular high trait social evaluation anxiety.

### **The effects of sleep loss on athletes' performance, recovery and wellbeing**

Although research has indicated that short-term sleep loss prior to competition does not detrimentally affect performance, athletes still experience worry about the effects of sleep lost pre-performance that often exacerbates sleep problems ("I can't sleep, therefore I am going to be tired and won't be at my best"). Athletes consistently self-report poor pre-performance sleep despite subjective measurement (via polysomnography or actigraphy) recording regular sleep patterns (Richmond et al., 2007).

Recovery is critical to performance in competition and training, and long-term sleep loss can have significant detrimental effects on both physical and mental markers of recovery. The effects of sleep issues on athlete mental wellbeing in particular have not been studied, as it is most likely assumed that these are the same as those experienced by the general population (including mood disturbance, concentration decrements, and increased stress in the short term, and a higher likelihood of major depression in the long term).

### **Possible solutions for athletes' sleep problems**

With the banning of selected sedatives, and restrictions and warnings on the use of other sedatives by athletes, attention must now be placed on how to treat sleep issues in athletes presenting for professional assistance. Historically, the standard practice applied by professionals working with athletes included psychoeducation about basic sleep hygiene guidelines, including recommendations on the restricted use of alcohol, caffeine and electronics close to bedtime, appropriate room temperature and darkness, and strategies for when to attempt sleep and for when sleep does not occur. There are no data available reflecting the success of sleep psychoeducation for athletes, and some suggestion that the general sleep hygiene knowledge of athletes is limited (Dickinson & Hanrahan, 2009).

Recently published Australian elite athlete data by Juliff, Halson and Peiffer (2014) indicate that 59.1 per cent of team sport athletes reported having no strategy to overcome poor

sleep, compared with individual athletes (32.7%,  $p = 0.002$ ) who utilised relaxation and reading. These statistics are congruent with the presentation of athletes to the Australian Headquarters Psychology Team during the Olympic Games in London. Relaxation strategies were offered as one of the critical interventions at the Australian recovery centre, including progressive muscle relaxation (PMR). PMR is a form of structured muscle tensing and relaxing with demonstrated efficacy as a sleep aide for insomnia in general and clinical populations. A pilot evaluation of the use of PMR with elite performers found that PMR reduced sleep onset latency in those with above mean trait social evaluation anxiety (McCloughlan, Hanrahan, Anderson & Halson, 2013). The findings offer empirical support to the use of PMR by athletes experiencing sleep onset issues, although further research on PMR and other mental recovery strategies is needed.

### **Challenges in evaluating athlete sleep strategies and recommendations for practice**

There are substantial challenges in assessing the efficacy of sleep strategies used by athletes. Self-report sleep measures do not correlate with objective sleep measures (polysomnography or actigraphy); accessing athletes willing to participate in research during high-level competition is near impossible; and the infrequency of significant competitions, such as the Olympics, mean few opportunities exist to apply and assess sleep strategies. Future research will need to overcome these barriers in order to develop guidelines for empirically-based non-pharmacologic treatment for the sleep issues of athletes. In the meantime, it is recommended that clinicians consider applying practices with their athlete clients that have an evidence base in general and clinical populations, such as progressive muscle relaxation.

### **Conclusion**

Given the banned use or restriction of many sedatives for professional athletes, there is a need to continue to promote alternative strategies that facilitate sleep both in and out of competition to provide effective alternatives to the use of medication. In addition, athletes need to be encouraged to engage in psychological services to assist in the management of anxiety and learn to effectively cope with the stress of the competition environment. Finally, multidisciplinary collaboration with medical staff to provide a holistic response to the issue is of great benefit to the athlete. ■

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