

# How sleep important for Athletes

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## Introduction

Sleep is extremely important for performance, learning, development and physical and mental health.<sup>3</sup> Some of the consequences of inadequate sleep include: a reduction in academic performance, mood disturbance, increases in risk taking behaviour and drowsy driving. From an athletic perspective, reductions in performance, decision-making ability, learning and cognition can occur alongside reductions in immune function and an increased susceptibility to weight gain. While this chapter will outline the importance of sleep for all athletes, additional focus will be placed on the adolescent athlete. It is becoming increasingly clear that adolescence (ages 12–18

years) is a period of development where sleep is particularly important. What is also becoming obvious is that many adolescents do not obtain the recommended amount of sleep. This chapter will discuss consequences of reduced sleep, how much sleep is required, reasons for poor sleep and strategies that can be utilized to enhance sleep quality, and quantity in athletes and adolescents



#### ❖ Consequences of reduced sleep

##### • **Athletic Performance**

While there is limited research on exercise performance and sleep, a small number of studies have examined the effect of partial sleep deprivation on athletic performance in adults. Reilly and Deykin reported decrements in a range of psychomotor functions after only one night of restricted sleep; however, muscle strength, lung power and endurance running were unaffected. Reilly and Hayles reported similar effects in females following partial sleep deprivation, with gross motor functions being less affected by sleep loss than tasks requiring fast reaction times. Reilly and Percy found a significant effect of sleep loss on maximal bench press, leg press and dead lifts, but not maximal bicep curl. Sub maximal performance, however, was significantly affected on all four tasks and to a greater degree than maximal efforts. The greatest impairments were found later in the

protocol, suggesting an accumulative effect of fatigue from sleep loss. From the available research it appears that sub maximal prolonged tasks may be more affected than maximal efforts, particularly after the first two nights of partial sleep deprivation.

##### • **Other consequences**

There are a number of other biological functions that can be altered following sleep deprivation. Changes in glucose metabolism and neuroendocrine function as a result of chronic, partial sleep deprivation may result in alterations in carbohydrate metabolism, appetite, food intake, and protein synthesis. Ultimately these factors can all negatively influence an athlete's nutritional, metabolic and endocrine status and hence potentially reduce athletic performance.

##### • **Effects of Sleep Extension**

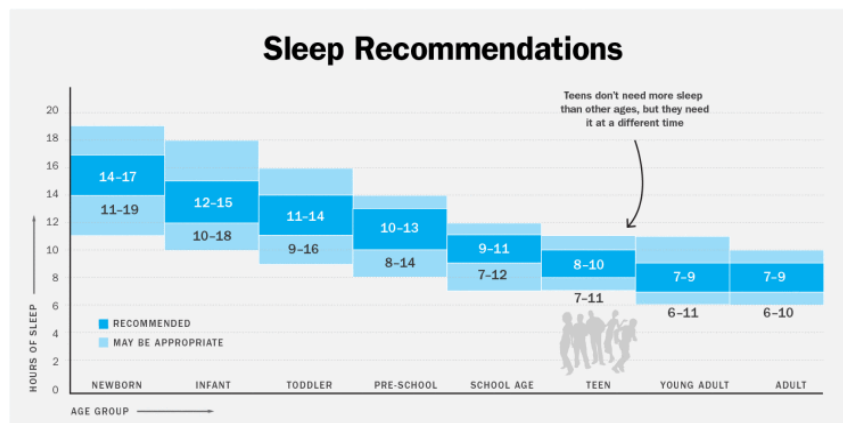
Another means of examining the effect of sleep on performance is to extend the amount of sleep an athlete receives and determine the effects on subsequent performance. Mah et al, instructed six basketball players to obtain as much extra sleep as possible following two weeks of normal sleep habits. Faster sprint times and increased free-throw accuracy was observed at the end of the sleep extension period. Mood was also significantly improved, with increased

vigour and decreased fatigue. While limited, this data suggests that increasing the amount of sleep an athlete receives may significantly enhance performance.

### • Effects of Napping

Athletes suffering from some degree of sleep loss may benefit from a brief nap, particularly if a training session is to be completed in the afternoon or evening. Waterhouse et al are one of the only groups to investigate the effects of a lunchtime nap on sprint performance following partial sleep deprivation (4 h of sleep). Following a

30-min nap, 20-m sprint performance was increased (compared to no nap), alertness was increased, and sleepiness was decreased. In terms of cognitive performance, sleep supplementation in the form of napping has been shown to have a positive influence on cognitive tasks following a night of sleep deprivation (2 h). Naps can markedly reduce sleepiness and can be beneficial when learning skills, strategy or tactics. Napping may be beneficial for athletes who have to routinely wake early for training or competition and for athletes who are experiencing sleep deprivation.



### ❖ How much sleep are athletes getting?

In a study from the Australian Institute of Sport, athletes and coaches ranked sleep as the most prominent problem when they were asked about the causes of

fatigue/tiredness. Sleep characteristics ranked first when athletes were asked about the aspects of the clinical history that they thought were important.

Therefore, it appears that sleep disturbances in athletes can occur at two time points: 1) prior to important competitions and 2) during normal training. This sleep disruption during normal training may be due to poor routine as a consequence of early training sessions, poor sleep habits (i.e., watching television in bed), nocturnal waking to use the bathroom, caffeine use, and excessive thinking/worrying/planning. While not documented in the literature, anecdotal evidence also suggests that athletes such as soccer players who compete at night also have significant difficulties falling asleep post competition.

### ❖ How much sleep do adolescents need?

Research suggests that the sleep needs of adolescents do not differ from that of younger children.<sup>10</sup> Evidence suggests that when adolescents are allowed to sleep as much as they want, they sleep for an average of 9.25 hrs per night.<sup>2</sup> Further, during mid-puberty, there is an increased desire to sleep during the day even when sufficient sleep occurred at nighttime.<sup>2</sup> From the literature available, it appears that adolescents require a minimum of 9 hrs per night of sleep.

### ❖ How much sleep are adolescents getting?

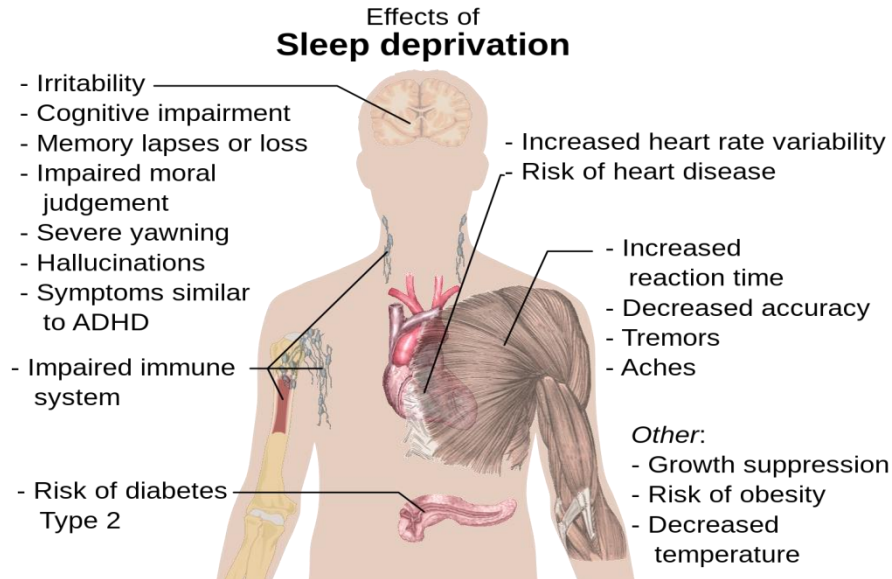
Despite the recommendation that 12–18 year olds obtain a minimum of 9 hrs of sleep per night, research shows that adolescents sleep between 7.5 and 8.5 hrs per night.<sup>11</sup> While there is certainly going to be individual differences, it is clear that many adolescents are not meeting the minimum requirements for the recommended hours of sleep.

### How to assess sleep

A simple sleep diary in which information on bedtime, wake-up time, total sleep time, caffeine consumed prior to sleep, activities performed before going to bed, perceptions of sleep quality, and daytime functioning is recorded can be very useful. The National Sleep Foundation (<http://www.sleepfoundation.org/>) has excellent resources including diaries for adults and teens, which can be helpful to gain insight into sleep habits. A sleep clinician can conduct a detailed sleep history and assessment to determine if the athlete has a clinical sleep disorder. Psychiatric and medical conditions may need to be considered due to their interaction with sleep. A sleep clinician may conduct sleep assessments using

actigraphy (wearing of a wristwatch to detect movement during sleep) or polysomnography (overnight stay in a sleep laboratory to measure brain

activity and other physiological functions).



## Solutions to sleep problems

Many of the strategies suggested for optimizing sleep in adults also apply to the adolescent. However, there are some specific tips and tricks that may be useful for this age group.

- Naps can help pick you up and make you work more efficiently, if you plan them right. Naps that are too long or too close to bedtime can interfere with your regular sleep.
- Make your room a sleep haven. Keep it cool, quiet and dark. If you

need to, get eyeshades or blackout curtains. Let in bright light in the morning to signal your body to wake up.

- No pills, vitamins or drinks can replace good sleep. Consuming caffeine close to bedtime can hurt your sleep, so avoid coffee, tea, soda/pop and chocolate late in the day so you can get to sleep at night. Nicotine and alcohol will also interfere with your sleep.
- When you are sleep deprived, you are as impaired as when driving with a blood alcohol content of .08%, which is illegal for drivers

in many states. Drowsy driving causes over 100,000 crashes each year. Recognize sleep deprivation and call someone else for a ride. Only sleep can save you!

- Establish a bed-and wake-time and stick to it, coming as close as you can on the weekends. A consistent sleep schedule will help you feel less tired since it allows your body to get in sync with its natural patterns. You will find that it's easier to fall asleep at bedtime with this type of routine.
- Don't eat, drink, or exercise within a few hours of your bedtime. Try to avoid the TV, computer and telephone in the hour before you go to bed. Stick to quiet, calm activities, and you'll fall asleep much more easily.
- If you do the same things every night before you go to sleep, you teach your body the signals that it's time for bed. Try taking a bath or shower (this will leave you extra time in the morning), or reading a book.
- Try keeping a diary or to-do lists. If you jot notes down before you go to sleep, you'll be less likely to stay awake worrying or stressing.
- Most teens experience changes in their sleep schedules. Your internal body clocks can cause you to fall asleep and wake up later. You can't change this, but you can

participate in interactive activities and classes

to help counteract your sleepiness. Make sure your activities at night are calming to counteract your already heightened alertness.

- Sleep, you'll be less likely to stay awake worrying or stressing.

## Conclusion

Sleep is one of the body's most important biological functions with roles in performance, cognition, learning, development and mental and physical health. While there are numerous consequences as a result of inadequate sleep, identifying sleep problems and following the recommended sleep guidelines can help ensure sporting performance is maximized.

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