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Healthy Sleep for Student-Athletes: A Guide for Athletics Departments and Coaches

March 1, 2016 1:28pm

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Sleep is important for many functions in the body and brain. Some of the key areas that sleep impacts are domains of cognitive performance (such as learning, memory, decision-making and vigilance), physical health (such as healing/recovery, metabolism, muscle growth and weight control) and mental health (such as stress/anxiety, mood/depression, and emotional control). All of these areas are critically important for student-athletes. In addition, all of these processes are also influenced by natural biological rhythms that can either help facilitate or come in the way of functioning in these areas. This is doubly important for college-age young adults, who are undergoing rapid brain development at the same time as profound maturational changes to the biological processes that control these rhythms. Taken together, all of this means that student-athletes are at an age where they are particularly vulnerable to sleep problems, and this is important because sleep problems will interfere with many of the processes that we wish to support: health, recovery, fitness, mental well-being and physical performance.

With this in mind, the NCAA recently established a [“Mental Health Best Practices”](#) inter-association consensus document that outlines recommendations for addressing some of the core issues that affect student-athlete mental health. Sleep was included as a part of this document, due to its importance for mental health, though it is important for many other reasons, as well. This article is meant to summarize some of the guidelines and suggest ways to begin thinking about addressing the sleep health needs in student-athletes.

Education

The guidelines call for increased education of coaches, trainers and athletes regarding the importance of sleep in well-being and performance, including the sleep environment, sleep duration and sleep timing. Although a review of all of these topics is beyond the scope of this article, there are some resources available for further exploration of these areas. Briefly:

- **Sleep duration** refers to the amount of time a person is actually sleeping within any 24-hour period. Current guidelines suggest that college students (who are typically between the ages of 17 and 22) require approximately eight to 10 hours of sleep for

optimal health and functioning. Although most of this sleep will occur at night, it is possible to make up for some lost sleep at night by napping during the day. For this reason, these guidelines reflect 24-hour sleep rather than just nighttime sleep.

- **Sleep quality** refers to how deep and restful sleep can be, without necessarily referring to the amount of sleep. There are many things that can interfere with sleep quality. For example, if an individual is prevented from achieving enough deep sleep (if sleep is kept shallow) because something is interfering with sleep, the sleep will be of poor quality no matter what its duration. This can occur with pain, certain medications/substances, and sleep disorders such as sleep apnea (discussed below). Another aspect of poor sleep quality is when sleep is frequently interrupted. This is called “sleep fragmentation” and even though all the pieces may add up to enough time, frequently interrupting sleep can lead to poor health and functioning. A third way to experience poor sleep quality is when an individual is trying to sleep but cannot. This stressful experience can occur at the beginning of the night, after an awakening in the middle of the night, or early in the morning if the individual cannot then get back to sleep.
- **Sleep timing** refers to when in the 24-hour period sleep occurs. Our internal rhythms make it so that most of our sleep should occur during the night. However, this is not always possible. Also, for people in their late teens and early 20s, the biological “night” is actually much later than it is for adults who are older. With this in mind, the nighttime sleep of a typical adult age 30-60 will typically occur somewhere in the range of 10 p.m.- 7 a.m. For those in their late teens and early 20s, this biologically determined period is shifted later, to approximately midnight-9 a.m. This is why it is easier for people in this age group to stay up late and more difficult for them to wake up in the morning. When sleep is forced to be too early for these individuals (due to pressures of external schedules), sleep problems can develop. In addition, travel can disrupt these rhythms, especially when the internal clock is out of sync with the environment (like with jet lag). This can interfere with aspects of health, mental health and functioning.
- **Sleep environment** refers to the bedroom or place people usually sleep. An ideal sleep environment should be cool, dark and comfortable. It should be a place where only sleep occurs; activities other than sleep (or sex) in bed can lead to sleep problems. It is important to note that students often do not have a healthy sleep environment. It is often uncomfortable, noisy, bright and populated with distractions. Also, the bed can become a place of much more than just sleep, including studying and schoolwork, socializing, relaxing, etc. An unhealthy sleep environment keeps sleep duration short and sleep quality poor. It also can interfere with natural sleep timing by pushing the sleep period even later than it needs to be.

All of these sleep dimensions are important to many areas of health and functioning. As described above, sleep plays an important role in many areas of functioning:

- **Learning and memory** are processes that depend on sleep. During the day, we take in massive amounts of information. It is only during sleep that we are able to filter, sort, evaluate, consolidate and integrate this information. This applies to knowledge-based learning, as well as other types of learning ranging from physical exercises to abstract concepts.

- **Decision-making** is critical in everyday functioning, plays an important role in mental health and is crucial on the field. Sleep loss impairs your ability to make creative thoughtful decisions. Worse, sleep loss even impairs individuals' ability to be aware of their own impairments. This leads to overconfidence and a lack of insight into poor decisions.
- **Vigilance and alertness** have been extensively studied in relation to sleep loss. Not only does sleep deprivation impair a person's ability to focus and maintain attention, but these effects also accumulate over time. The individual never seems to be able to adjust, despite the individual's self-ratings consistently reflecting a belief that he or she is adjusting when he or she is, in fact, more impaired than ever.
- **Healing and recovery** are not only absolutely critical to athletic performance and injury prevention, but they also play a key role in mental health. Recent neuroscience advances show that the biological processes that control healing and recovery are the same ones that prevent depression and other mental health disorders. Sleep in humans serves the important function of maximizing rest, cell and tissue repair, and healing.
- **Muscle growth** depends on the healing properties of sleep to take place. In addition, human growth hormone is highly dependent on deep sleep occurring. So when sleep is kept shallow, the body cannot produce adequate amounts.
- **Weight control** also is related to sleep, though many do not make that connection. Shorter sleep times, poor quality sleep and sleep that is out of sync with internal rhythms can lead to weight gain and obesity. This is especially true of adolescents and young adults, who need more sleep.
- **Metabolism** is also tightly controlled by sleep. In addition to the separate effects of sleep on weight control, sleep also plays important roles in insulin and glucose functioning, secretion of metabolic hormones, and the way that fat and muscle cells use and store energy.
- **Stress and anxiety** are made much worse when sleep is disrupted. Not only is your body less able to process stressful events without restful sleep, but individuals with sleep disturbances also are less able to respond to stresses as they occur. They become more pessimistic, more irritable and more emotionally out of control. This also plays a role in the body's stress systems, which depend on sleep to maintain proper functioning. On the other side of the story, stress and anxiety are one of the leading causes of sleep loss, thus perpetuating a vicious cycle.
- **Mood and depression** are closely interwoven with sleep. Several of the functions of sleep involve processing and regulating emotions. For this reason, sleep disturbances are not only a hallmark of every type of depression and mood disorder, but they also seem to play a causal role in developing depression and are a key warning sign that a depressive episode may be returning.

Sleep plays a key role in many areas of health and functioning. Because of this, programs need to integrate sleep information into their educational curriculum.

Screening

Sleep disorders are prevalent in the population in general and may be particularly prevalent in student-athletes. The “Mental Health Best Practices” guidelines identify brief screening measures for insomnia and sleep apnea, though other sleep disorders may be relevant as well. Insomnia and sleep apnea risk screening should be undertaken at minimum, but ideally programs should screen for all sleep disorders. This is because, as noted above, sleep disorders can interfere with many (if not all) of the areas of functioning that are most important to student-athletes. Further, they are often undiagnosed so that students continue to experience the effects and are left untreated. Some of the most relevant sleep disorders include:

- **Insomnia** refers to an inability to fall asleep at the beginning of the night, during the night after an awakening, or in the morning before the intended awakening time. To qualify as a disorder, these complaints need to be relatively severe, such as 30 minutes to fall asleep or at least 30 minutes awake during the night for at least three nights per week, for at least three months. Although insomnia can be brought on by any number of things, what causes insomnia to persist is often that coping strategies for fixing insomnia often backfire and instead maintain the disorder over time. This is because insomnia, once it has become chronic, represents a condition where the brain and/or body is programmed to be alert in bed. Nonmedication treatments focus on addressing this problem and are very effective. (Note that sleep hygiene instructions and other general tips are not effective for insomnia.) Insomnia is not only a risk factor for increased stress and poor health and functioning, but it is a key risk factor for depression, anxiety and suicide.
- **Sleep apnea** is a disorder where an individual has breathing difficulty during sleep. This can result in breathing pauses for extended periods of time, resulting in sleep disturbance as well as a dangerous pattern where blood oxygen levels cycle up and down throughout the night. Most people with this disorder have no idea that they have it. It occurs most often in overweight men but can occur in all groups. It is relatively rare in young people, though sleep apnea is abnormally common among football players, especially linemen. Untreated sleep apnea is a major risk factor for cardiac events and can put excessive strain on the immune system, brain and other organ systems.
- **Circadian rhythm sleep disorders** are a group of disorders that occur very frequently in younger people. They represent instances where internal rhythms are out of sync with the external environment or social demands. For example, jet lag results when travel causes a mismatch between internal and external clocks, leading to disturbances in sleep, mood and even hormone systems. Delayed sleep phase (and advanced sleep phase) disorder refers to when individuals’ internal clocks dictate that their ideal sleep periods are much later (or earlier) than their schedules allow. These individuals try to go to bed and wake up earlier (or later) than their bodies prefer, which can cause sleep, mental health and daytime functioning problems.
- **Parasomnias** are movement-related disorders that occur during sleep. They include sleepwalking, sleep-talking and even night terrors. These are not acting out dreams but non-thinking, automatic behaviors that occur during very deep sleep. They typically only occur in children, but also can occur in young adults when they are

under extreme stress, undergo sleep deprivation or experience irregular schedules. And these are all common occurrences for student-athletes.

- **Nightmares** are common in the population but can be problematic when frequent. Frequent nightmares, if unaddressed, are a major risk factor for both depression and suicide.

These and other sleep disorders are relatively common among student-athletes and can play important roles in health and functioning. Simple screening approaches for these disorders are possible (and the “Mental Health Best Practices” guidelines describe assessments for insomnia and sleep apnea). For true sleep apnea screening, overnight studies may be required (home-based assessments are possible). With the help of a partner who has expertise in sleep medicine (see below), an athletics program could develop a relatively simple yet comprehensive sleep disorders screening program.

In addition to sleep disorders, athletics programs should also focus on the areas outlined above, including sleep duration, sleep quality, sleep timing and the sleep environment. These may not represent actual sleep disorders, but they are still important for all of the reasons outlined above.

Practitioners Providing Care

Sleep specialists who may serve as partners may be difficult to find, especially since these disorders span a wide range of specialties. Universities may have sleep centers and sleep specialists as faculty on campus – it would be recommended to start there. Often, institutional incentives can be put in place to keep the work within the same university or college, which can also substantially reduce costs. If an on-campus sleep specialist is not available, it may require venturing out into the community. With this in mind, there are several types of sleep specialists with whom you may wish to collaborate:

- **Sleep physicians** are medical doctors who have extra training in sleep. They are usually board-certified in sleep medicine, which is its own specialty. The benefit of working with these individuals is that they are usually very knowledgeable about sleep and sleep disorders, including diagnosis and treatment. Since the primary disorder that most of these doctors treat is sleep apnea, note that most of these physicians will be primarily focused on diagnosing and treating sleep apnea. Many of these doctors are primarily trained in pulmonary (lung) medicine, which is often a surprise to athletics administrators who expect sleep specialists to be focused on the brain (though sleep neurologists and psychiatrists do exist). Also, these individuals are trained in the diagnosis and treatment of insomnia, but this is usually not their specialty and they are often only trained on insomnia medications and not nonmedication treatments, which can be more effective. In short, a sleep physician is a critical member of any team focused on screening or treating sleep disorders, though they are not ideal for all aspects of the program.
- **Behavioral sleep medicine psychologists** are doctoral-level clinicians with specific expertise in non-medication treatments for sleep disorders. In particular,

their focus is on insomnia (and therefore make excellent complements to sleep physicians, who are generally lacking in this area, especially regarding treatments not involving medication). These specialists are usually certified in behavioral sleep medicine by the American Board of Sleep Medicine. In addition to insomnia, these psychologists also work with circadian rhythm sleep disorders and help sleep apnea patients use their treatments. These psychologists may also be better trained on assessing and addressing issues not part of sleep disorders, including insufficient sleep duration, poor sleep quality, sleep timing problems, etc.

- **Other sleep medicine professionals** exist, including nurses, social workers, respiratory therapists and other practitioners with some level of advanced training in sleep disorders. These individuals can be very useful members of the team, especially when a physician and psychologist with this specialty are not available.
- **Sleep scientists** may include individuals from the categories above, but their main focus is on research. Because of this, they can be excellent allies in terms of developing assessment and tracking procedures to maximize effectiveness.

If locating a sleep provider is a problem, athletics programs can reach out to the American Academy of Sleep Medicine (an organization mostly made up of sleep physicians), the Society of Behavioral Sleep Medicine (an organization made up of psychologists and others who focus on non-medication treatments for sleep disorders) or the Sleep Research Society (the largest organization of sleep scientists). Also, many states have their own state sleep societies, which can help direct athletics programs to people within their state.

Summary

Sleep is critically important for health and functioning, and plays an important role in virtually all areas of functioning important to student-athletes. Still, athletes are often not sleeping enough and/or not sleeping well. Athletics programs and coaches should use this information to develop robust, science-based, useful sleep assessment, education and treatment programs.