Recovery working party - Sleep

Most experts in various disciplines discussing recovery indicate that sleep both in quantity and quality [especially] is a very important factor in achieving good recovery.
Like many aspects of life and sport there is tremendous individual variation in individuals needs.

There is some debate about the number of hours required in an average sporting person[immunologist Gleeson says 6 hours minimum –most sleep experts say 7 hours plus. In adolescents in particular the correct amount is that which allows them to wake naturally i.e. without the stimulus of the alarm clock.

Correspondingly sleep disturbance is a major symptom of Overtraining Syndrome or Unexplained Underperformance Syndrome as it is now known.

So what is the effect of sleep and sleep deprivation on performance and recovery?

When the amount of night sleep is reduced, the tendency to fall asleep or be drowsy during the day increases and this affects performance. This sleep tendency problem is not linear, being significantly greater if less than 5 hours sleep is obtained the previous night.

This sleep loss is cumulative and if sleep reduction is by exactly the same amount on consecutive nights the tendency to sleep during the day becomes progressively stronger each day. This amount of lost sleep is registered by the brain as a debt and adds up over time. The amount of sleep required to avoid debt varies from individual to individual. A large sleep debt does not go away spontaneously and can only be reduced by extra sleep.

Sleep loss of an hour or two over a number of nights' leads to significant sleepiness during the day which can manifest in daily living such as falling asleep in lectures, automobile errors or reduced performance in sport. An experiment in the USA showed that when volunteers were allowed extra sleep their wakefulness during the day improved considerably as did mood, energy levels and sense of well being.

Another study showed that even one night of extended sleep improved mood and vigilance. In High Performance sport, evidence has to be anecdotal as it would be a brave player or coach who would volunteer themselves or a team to suffer sleep deprivation as part of a study. There are many such anecdotal accounts eg: the Stanford University's swim team who participated in a sleep extension study and claimed their best sprint performances during this time.

Another US study disproved the old myth that extra sleep leads to sluggish performance as all measurements relevant to performance improved with extra sleep.

Importantly mild sleep deprivation does not affect performance but the accumulation of deprivation does, thus a restless night before a major championship or match is not a problem, but the months before can be.

In the sporting context and in the world in general there can be a useful role for napping

In a perfect world napping would not be needed, but sporting life styles sometimes make sleep deprivation inevitable, therefore intelligent use of a short nap (20 minutes) can reduce sleepiness and normalise performance. Longer naps are also restorative but come with a price in the form of sleep inertia. This is sub optimal functioning with reduced reaction times, reduced grip strength co-ordination problems, and reduced visual and perceptive skills leading to poor performance on wakening. In some individuals this can last for 2 hours, so such long naps must take place more than 2 hours prior to event or match. Sleep inertia may be reduced by showering, caffeine, bright light and light exercise.

There are various scales that are used in monitoring training such as POMS [profile of moods state] but the best seems to be the RESTQ-sport which uses a multilevel systematic approach assessing subjective stress and recovery concurrently. In contrast to POMS which has negative mood states incorporated with only one positive state of mood aspect the RESTQ shows a distinct view of athletes state. RESTQ includes behavioural and performance aspects as well as emotional, physical and social aspects of stress and recovery.

In athletes with sleep disturbance as part of any multi disciplinary assessment there has to be a medical component to exclude medical conditions and to evaluate the nature of the insomnia.

Work on the female hockey diary project at the Institute found that the self recorded bad night sleep categories reduced from 12% of total to 5% of total nights after a lecture on sleep hygiene.

Conclusions

Sleep is a crucial component of recovery and further education is required. Further research is being carried out using Actography - a meter that records movement and thus measures sleep.

Recommendations

The Scottish Institute of Sport should continue its ongoing research in to sleep patterns.
Some standard form of diary recording some simple important parameters should be encouraged in institute athletes. A trial of using RESTQ-sport amongst a small number of athletes i.e. piloting with one sport or sub group should be carried out.

Sleep hygiene

- Be regular in routine as sleep is a habit which is trainable.
- Try to use the bedroom for sleep only (apart from perhaps sex) do not watch TV or read thus the mind associates bed with sleep and retiring to the bedroom sends a trigger to the sleep inducing areas of the brain.
- Use night shades and ear plugs when needed.
- While light reading prior to bedtime can be useful it should take place in another room.
- Avoid stimulants in late evening such as caffeine and alcohol. Similarly while exercise is helpful to sleep it should ideally take place in early evening to allow arousal to settle prior to bedtime.
- Avoid big meals for 3 hours prior to bed but light carbohydrate and warm drink e.g. milk may help.
- A warm bath may help, however too hot a bath too close to bedtime is counter productive.
- Have subdued lighting in the bedroom and a comfortable temperature not too hot nor too cold and making sure the extremities are warm.