Chapter 6: Sleep, sleep loss, safety and health

Multiple-choice questions

1. To measure sleep, eye movements are tracked using:
   a. EMG
   b. EEG
   c. alpha waves
   d. **EOG**

2. Which of the following statements is **untrue**?
   a. Slow wave sleep is characterised by delta brainwaves
   b. It is hard to wake someone out of deep sleep
   c. Growth hormone is released during slow wave sleep (SWS)
   d. **Most dreaming occurs in deep sleep**

3. Which of the following statements is **untrue**?
   a. REM sleep is named for its ‘butterfly’ eye movements
   b. Muscle tone turns off during REM sleep to stop people acting out their dreams
   c. REM sleep has been called ‘paradoxical sleep’
   d. **On a typical night, most REM sleep occurs during the first half of the sleep period**

4. Which of the following statements is **untrue**?
   a. Circadian rhythms are roughly 24-hour cycles in functioning
b. Circadian rhythms can be measured in performance, core body temperature and melatonin

c. The main timekeeper in our body is the suprachiasmatic nucleus (SCN) in the brain

d. The primary time cue for the SCN is food

5. Which of the following statements is true?
   a. The homeostatic drive decreases sleepiness across the day, while our circadian system helps to keep us awake
   b. The homeostatic drive increases sleepiness across the day, while our circadian system promotes sleep
   c. The homeostatic drive increases wakefulness across the day, while our circadian system helps to keep us awake
   d. The homeostatic drive increases sleepiness across the day, while our circadian system helps to keep us awake

6. The time of maximum sleepiness is referred to as the circadian:
   a. nadir
   b. trough
   c. low
   d. all of the above

7. Sleep loss and circadian disruption during shiftwork are related to:
   a. increased consumption of caffeine
   b. eating at night
   c. social and domestic disruption
   d. all of the above
8. Obstructive sleep apnoea is:
   a. more common among women
   b. always accompanied by snoring
   c. **often treated with CPAP**
   d. all of the above

9. Insomnia is:
   a. only related to problems getting to sleep
   b. not treated with drugs
   c. **often treated with a combination of approaches including cognitive behaviour therapy**
   d. all of the above

10. Which of the following statements is **true**?
    a. Going to bed at a different time each night is good for you
    b. Alcohol is good for sleep
    c. Exercising right before bed makes your sleep better
    d. Screens should be kept out of the bedroom

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**Short-answer questions**

1. How do we know when someone is in SWS, and why do we think SWS is important?
   SWS, often referred to as deep sleep, is characterised by large delta waves in the EEG. People are difficult to wake from SWS. SWS has been implicated in growth and tissue repair due to the release of growth hormone during this time.
2. What is the SCN, and what is its function?

The suprachiasmatic nucleus (SCN) in the hypothalamus is the primary circadian pacemaker in the body. It keeps our circadian (24 hour) rhythms in functioning synchronised to each other and to the outside light/dark cycle – receiving light input through the eye via the retinohypothalamic tract.

3. Explain why shiftwork is associated with increased accident risk.

Our biology promotes daytime wakefulness and sleep at night. Shiftworkers often work when their bodies are primed for sleep, and sleep when their bodies are primed for wake. This disruption in circadian rhythms results in sleep of reduced duration and quality. Circadian disruption and sleep loss increase accident risk.

4. Explain the potential cycle of impairment associated with obstructive sleep apnoea (OSA).

OSA can lead to sleepiness, performance impairment and depressed mood, which in turn, can lead to further health complications. Together, this can influence exercise levels and diet, which can lead to weight gain, which exacerbates OSA. Treatments are designed to break this cycle.

5. Why is a variable sleep schedule potentially damaging for sleep?

We sleep best when our circadian rhythms in all aspects of functioning, including sleep, are synchronised. Highly variable sleep schedules, such as those often experienced by shiftworkers, can lead to circadian disruption and sleep loss. Keeping a consistent bed and wake time helps to keep our rhythms synchronised and facilitates better sleep.
Links to video/audio

Why do we sleep?

https://www.youtube.com/watch?v=LWULB9Ao0pc
In this TED talk, neuroscientist Russel Foster talks about why we sleep, how sleep has been considered historically, how much sleep we need and the relationship between sleep and mental health.

Demystifying fatigue

https://www.youtube.com/watch?v=4aQ7zUcZQIE&t=13s
Assoc. Prof. Jill Dorrian from UniSA’s Centre of Sleep Research explains workplace fatigue and why some people seem to cope better than others. This presentation was delivered for SafeWorkSA. The first 23 minutes includes the presentation, and the remainder of the video records questions from the audience.