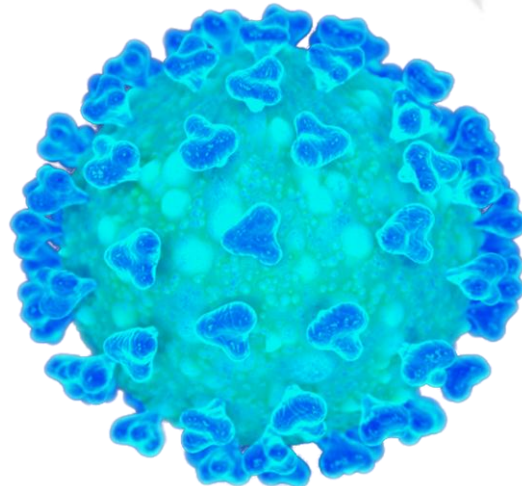


Sleep & COVID-19



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Outlines:

- Background of sleep medicine (Definition, Fields, Milestone)
- Definition of Sleep
- Introduction of Sleep & COVID-19
- Sleep Stages
- Impact of COVID-19 on Sleep
- Immunology and Sleep
- Sleep and Healthcare Professionals
- Sleep Hygiene Recommendations

Sleep Medicine Definition :

- **Sleep medicine** is a medical specialty or subspecialty devoted to the diagnosis and therapy of sleep disturbances and disorders.

Sleep Medicine Fields :

Sleep Medicine deals with sleep disorder," such as:

- sleep apnea
- Narcolepsy
- Idiopathic hypersomnia
- Kleine-Levin syndrome
- Menstrual related hypersomnia
- Idiopathic recurrent stupor
- Circadian rhythm disturbances

Sleep Medicine Milestone :

Societies

Association for the Psychophysiological
Study of Sleep (APSS)

Association of Sleep Disorders Centers (ASDC)

Clinical Sleep Society (CSS)

Association of Professional Sleep Societies (APSS)

American Sleep Disorders Association (ASDA)

Associated Professional Sleep Societies

American Board of Sleep Medicine (ABSM),
National Sleep Foundation (NSF)

Sleep Medicine Education & Research Foundation (SMERF),

American Academy of Sleep Medicine (AASM)

American Sleep Medicine Foundation (ASMF)

Milestones

1964

Stanford Narcolepsy Center

1968

Manual for Scoring Sleep

1970

Stanford Sleep Center

1975

5 Centers

PSGs Reimbursed

1977

ASDC Center Accreditation

1978

Journal SLEEP

Certification in Sleep Medicine

1984

1986

1987

1988

1989

ASDA Fellowship Training Programs

1991

International Classification of Sleep Disorders
(ICSD-1)

1998

1999

2003

Behavioral Sleep Medicine Certification

2005

International Classification of Sleep Disorders (ICSD-2)

Journal of Clinical Sleep Medicine (JCSM)



Sleep Definition :

- Sleep is the intermediate state between wakefulness and death; wakefulness being regarded as the active state of all the animal and intellectual functions, and death as that of their total suspension

Introduction:

- All across the globe, people's lives, as well as their physical and mental well-being, have been affected by the COVID-19 pandemic. The stress and strain of home life, as well as being a healthcare professional in this time, and the wider societal impact of COVID-19 have led to altered sleep patterns in many people and specifically in healthcare professionals on the frontline in the fight against COVID-19.

Sleep Stages:

There are two major phases of sleep:

- Non-rapid eye movement (NREM) sleep
- Rapid eye movement (REM) sleep

Sleep Stages:

Non-rapid eye movement (NREM) sleep is subdivided into three stages (N1, N2 and N3) of increasing sleep depth.

- Non-rapid eye movement (NREM) sleep Stage 1 (N1)
 - the transition period from being awake to being asleep
 - lasts around 5 - 10 minutes

Sleep Stages:

Non-rapid eye movement (NREM) sleep is subdivided into three stages (N1, N2 and N3) of increasing sleep depth.

- Non-rapid eye movement (NREM) sleep Stage 1 (N1)
 - the transition period from being awake to being asleep
 - lasts around 5 - 10 minutes

Sleep Stages:

Non-rapid eye movement (NREM) sleep Stage 2 (N2)

- the onset of sleep
- drop in body temperature
- heart rate slows down
- the-brain produces sleep spindles
- people are less aware of their surroundings
- lasts around 20 minutes

Sleep Stages:

Non-rapid eye movement (NREM) sleep Stage 3 (N3)

- also known as slow-wave sleep (SWS)
- muscles relax & blood pressure drops
- Breathing rate drops
- The deepest sleep occurs
- People are less responsive
- Noises and activity in the surrounding environment may fail to generate a response
- The transitional period between light sleep and very deep sleep

Sleep Stages:

- REM sleep
 - The brain becomes more active
 - The body becomes relaxed and immobilised
 - Dreams occur
 - Eyes move rapidly

Impact of COVID-19 on Sleep

Ways COVID-19 Affects Sleep

- People are sleeping longer.
- People are not setting alarms.
- People are going to bed later.
- People are experiencing strange and vivid dreams.
- People are experiencing a lack of sleep.

Challenges to Sleep during the COVID-19 Pandemic

- **Disruption of daily life**
- **Anxiety and Worry**
- **Depression and Isolation**
- **Greater family and work stress**
- **Excess screen time**
- **Stress-related fatigue**

Importance of Sleep during the COVID-19 Pandemic

Sleep is paramount during the COVID-19 pandemic because of its vast benefits for both physical and mental health. These include:

- Strengthening the immune system
- Improves brain function
- Enhances mood
- Improves mental health

Importance of Sleep during the COVID-19 Pandemic

- For healthcare professionals sleep is a public health and safety issue. Poor sleep has been linked to mental health issues, physical health issues and is related to stress and anxiety. It is also an occupational health hazard in the context of healthcare where so many healthcare professionals are already in a fatigued state and overworked during the COVID-19 pandemic

Immunology and Sleep

- There is a bidirectional link between sleep and the immune system.
- Sleep is altered by immune system activation and the innate and adaptive immune systems are affected by sleep.

Immunology and Sleep

- **Neuroimmune Interactions**
- **Adaptive Immune Response to Infection**
- **Pro-inflammatory State during Sleep**

Pro-inflammatory State during Sleep

- During the nocturnal sleep period in humans, the two main stress systems are down-regulated. These systems are the hypothalamus-pituitary-adrenal (HPA) axis and the sympathetic nervous system(SNS). Alongside this down-regulation, there is a drop in blood levels of cortisol, epinephrine and norepinephrine. In contrast to this, mediators such as the pituitary growth hormone (GH), prolactin and melatonin show an increase in blood levels during sleep. These mediators serve cell growth, differentiation and restoration.
- **So Sleep is a pro-inflammatory process**

Pro-inflammatory State during Sleep

What are the benefits of this process

- The benefits of this pro-inflammatory function of sleep can be seen in response to vaccinations. Sleep after vaccinations can enhance the adaptive immune response against the invading antigen.
- Immune activation, like protein synthesis and cell proliferation, is an energy-dependent process. Endocrine changes during sleep permit the allocation of energy-rich fuels like glucose from insulin-dependent tissue such as muscle, to the immune system

**Strengthen your immune system with
sleep**

Effects of Prolonged Sleep Restriction

- Prolonged periods of sleep loss can lead to negative changes in health and immune function. In studies investigating the effects of prolonged sleep deprivation, a general enhancement in markers for inflammatory activity was reported. Eighty-eight hours of sleep deprivation or 10 days of sleep restriction to 4 hours per night increased the concentration of C-reactive protein, a biomarker of inflammation. Even mild restrictions of sleep have been shown to increase the level of pro-inflammatory cytokines.

Effects of Prolonged Sleep Restriction

- The low-grade systemic inflammation associated with sleep deprivation is also associated with medical conditions such as diabetes type 2, cardiovascular disease and obesity
- Research has shown a weakened immune response to the influenza vaccination after 6 days of restricted sleep. There is also evidence for enhanced susceptibility to the common cold associated with chronic sleep loss.

Sleep and Healthcare Professionals

- During this pandemic healthcare professionals are in the frontline and delivering incredible service. Alongside these healthcare professionals are the scientists and public health leaders who are working to find the best forms of treatment as well as creating strategies to prevent the spread of the virus. This scenario inevitably leads to fatigue, stress and unfortunately sleep deprivation. [\[14\]](#)
- This lack of sleep or sleep debt suppresses the body's immune response and disrupts circadian rhythms

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Take Home messages

Healthcare professionals should **prioritise** sleep and practice good sleep hygiene.

Ways to do this include:

- Keep a consistent sleep schedule
- Get at least 7 hours of sleep
- Do not go to bed unless sleepy
- Establish a relaxing bedtime routine
- Keep the bedroom quiet
- Keep the bedroom at a comfortable temperature

Take Home messages

- Turn off electronic devices at least 30 min before bedtime
- Do not eat a large meal before bedtime
- Physical activity/exercise
- Avoid consuming caffeine in the late afternoon or evening - or have a caffeine intake cut-off time
- Avoid consuming alcohol before bedtime
- Ensure adequate exposure to natural light
- Nap for no longer than 30 minutes

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Thank you for your attention