

## **SCIENCE OF SLEEP**



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1. What role does sleep play in our life? Why is it an essential function?
  - A normal sleep is essential for the facilitation of motor functions, consolidation of learning and memory, and restoration of strength and physical and mental energy.
  - In current fast paced stressful life, a sound sleep brings relaxation to mind and the body.
2. How does lack of sleep affect the body? What are the main physiological and psychological side effects of lack of good quality sleep?
  - The newborn baby sleeps for 16 to 20 hrs a day and a child, 10 to 12 hrs. Total sleep time drops to 9 to 10 hrs at age 10 and about 7 to 7.5 hrs during adolescence. An adult needs at least 6.5 to 7 hrs of sound sleep daily.
  - In current fast paced world people are not getting enough sleep. Working against circadian rhythm has completely distorted the sleep-wake cycle leading to various neuro-hormonal and neuro-psychiatric changes in the body. People are living in complete "Social Jet Lag".

- I being involved in "HORMONES MANAGEMENT" will talk more about effects of poor quality of sleep/ deprivation of sleep on the Hormones.
  - The sleep deprivation/Poor quality sleep leads to hormonal imbalances as follows:
    - a. Increased levels of stress hormones (Cortisol)
    - b. Decreased secretion of Growth hormone
    - c. Decreased secretion of Luteinizing hormone in females
    - d. Decreased secretion of Testosterone in men and Progesterone in women.
    - e. Decreased secretion of Melatonin.
    - f. Alters the pituitary-Thyroid axis.
3. Do sleep tracking apps and fitness bands help in monitoring quality of sleep?
- Sleep itself is a mystery even today.
  - There is always a debate about the definition of a good quality sleep.
  - If you are getting up fresh in the morning and are active throughout the day without having any difficulty in your daily activities, then probably you are having a sound sleep sufficient for your need.
  - If you are not getting up fresh in the morning , if you feel that your body needs more sleep , if you are feeling sleepy and drowsy the whole day, if your performances in various modalities of life activities have compromised then there is a high possibility that your sleep is not appropriate/adequate.
  - When we talk about sleep deprivation there are 5 issues :
    - a. First, you feel sleepy but not able to sleep. If this is the situation then you need to look for the Sleeping environment and hygiene around you. Also assess your work, interpersonal and social issues. Chronic Fatigue Syndrome , Migraine , Aches and pains of various conditions may lead to similar situation. Intake of Caffeine at night may lead to this situation.
    - b. Second, you don't feel sleepy at all. Here, you need to look for your hormones, neurotransmitters, ongoing medications, stress and underlying medical problems. This can also be influenced by intake of caffeine at night.
    - c. Third, you fall asleep but get up repeatedly in the night. Here you need to assess your ongoing medications , Heart problems, Kidney problems, Prostate problems, Bladder problems, Gastrointestinal problems, Eating and drinking habits, Obstructive Sleep Apnea (OSA, Snoring), Gastro-Esophageal Reflux (GERD, Hyperacidity), Diabetes Mellitus etc.
    - d. Fourth, you fall asleep but you are not fresh in the morning. Here you need to assess yourself for Sleep Apnea, Early morning hypoglycaemia, Early morning hypo- or hypertension, Hypothyroidism, Nutritional deficiencies, Stress and other hormonal imbalances (like low cortisol in the morning). Your ongoing medication can also influence this condition.



or IPD basis are available and can diagnose the sleep patterns. I would like to emphasise here that Poor quality of sleep can be a sign of underlying medical/hormonal issues. It should not be ignored. If you are suffering from sleep issues then the first thing is to consult your doctor and assess yourself for the cause and complications of sleep deprivation.

#### 4. Kindly share tips to ensure that one gets good quality sleep?

Following life style changes may help:

- Avoid caffeine at least 6 hrs before bedtime.
- Avoid alcohol or smoking 2 hrs before bedtime.
- Get regular exercise, but at least 3 hrs before bedtime.
- Establish regular bedtime hours, waking up each morning at the same time.
- Do not use bedroom to work.
- Meditation and light music may help.
- Don't keep TV in your bedrooms.
- Avoid sitting in front of the TV and surfing till late night.
- Don't be anxious about your sleep. This may enhance the sympathetic stimulation and may lead to more sleep deprivation. Let the sleep come automatically.
- Engage yourself in healthy discussions with your family while dining. Avoid debates and fights.
- Keep your mobile phones out of the bedrooms. If practically possible, keep them off in the night.
- Stay sexually active. This will help a lot by stimulating the parasympathetic nervous system.

e. Fifth, you get vivid dreams and nightmares which disturb your sleep. Here the sleep cycle and waves have to be assessed.

The best way to assess you sleep quality and disorders is to consult your doctor. There may be lot of fancy apps and bands available in the market but a good doctor can see beyond your complains and identify some health issue which if not treated can be dangerous. Conventional sleep studies done either on OPD



5. What are the major, long term health complications that can arise out of lack of good quality sleep?
  - The above hormonal changes, if persist may disturb the complete Neuro-Endocrine axis leading to Infertility, Obesity and other metabolic, Psychiatric and Reproductive disorders. Long standing Sleep deprivation brings Aging prematurely.
  - Obesity and Sexual Dysfunction are two major issues.
  - Obesity itself is precursor of diseases like Diabetes Mellitus, Hypertension, Gall stones, Kidney diseases, Cardiac complications, PCOD and other medical conditions like Cancers.
  - Sexual dysfunction becomes a reason of Infertility, Low self esteem, Interpersonal relationship issues.
  - Sleep deprivation (whether total or partial) has deleterious effects on emotions and cognition. It also causes day time sleepiness, Fatigue, Irritability, and difficulty in concentration.
  - Skilled performance goes haywire, self care gets neglected, judgement is impaired and communication skills suffer.
  - With increased deprivation, neuropsychiatric symptoms like Illusions and hallucinations may occur.
  - Mood disorders such as anxiety, depression, panic attacks are common among the sleep deprived people.
  - Chronic Sleep deprivation is a pro-inflammatory state and may lead to generalized systemic inflammation leading to chronic diseases (Ischemic Heart Disease, Diabetes etc.).

- People try to catch up with their sleep deprivation on weekends by sleeping extra hours. But sleep obtained in these extra hours is never equivalent to the sleep lost in the week. This way the damage caused is never recovered completely and cumulative effects occur leading to long term complications. Secondly, sleeping in odd hours of the weekends again disturbs the circadian rhythm and brings in more damage.
- The best way to deal with sleep deprivation complications is to avoid sleep deprivation and maintain good sleep hygiene throughout the week. A restorative 6.5 to 7 hrs of uninterrupted night sleep is mandatory for good health and happiness.
- In short, SLEEP LIKE A BABY!!!!

