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Sleep is a vital part of human health and wellness. Despite this, 50-70 million people in the United States suffer from trouble with sleep. Unfortunately, about 40% of people with irritable bowel syndrome (IBS) report these sleep problems. IBS symptoms, such as abdominal pain and diarrhea, can cause difficulty sleeping and interrupt the sleep pattern. These factors can lead to a lessened quality of sleep. There is also growing evidence that poor sleep can cause or increase IBS symptoms and pain.

### Sleep physiology

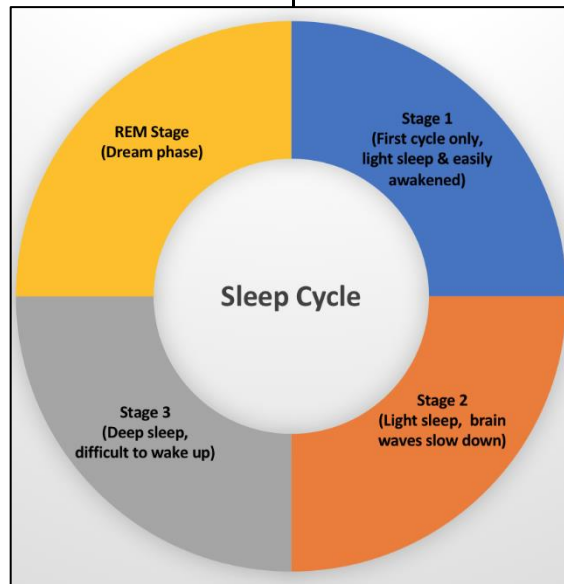
Sleep is a complex process, which is necessary for human survival. Our knowledge of the sleep cycle is poorly understood and still growing. Issues with sleep are often linked with lower quality of life, mood disorders, poor work performance, and symptoms such as pain. There are four stages of sleep. These are divided into REM (rapid eye movement) and non-REM sleep (please see figure). REM sleep has been shown to be important in sleep quality. REM sleep occupies about 20-25% of normal sleep. This occurs with increasing length in 90-minute intervals throughout a normal night of sleep.

### Sleep and IBS

There is little research on the link between sleep trouble and the gastrointestinal (GI) system. Few studies have examined sleep problems reported by patients suffering with IBS. IBS has been linked with lower sleep quality, reduced light sleep, and significant sleep disturbance. One study revealed that patients diagnosed with IBS did not show differences in areas such as total time asleep, how long it takes to fall asleep, or the amounts of sleep in each stage. However, patient-reported sleep troubles were more common in the IBS group.

A study was conducted to compare IBS patients to those without IBS. This showed that IBS patients more commonly reported trouble with sleep. Additionally, self-reported sleep trouble has been shown to be an indicator of “next-day” abdominal pain, anxiety, and tiredness. This data suggests that sleep is linked with the perception of pain in IBS patients, and highlights the importance of quality sleep in an IBS treatment plan.

Shift work is linked with both sleep trouble and IBS. In a study of “rotating shift” versus “daytime only shift” nurses, the rotating shift nurses were more likely to have IBS compared to the daytime only nurses. Another study looked at nurses with varying shifts and showed that self-reported sleep trouble was linked with IBS. A study involving physicians who perform 24-hr on-call shifts showed that 16% reported IBS, and poor sleep quality was predictive of developing IBS.



### Other conditions affecting sleep quality and IBS symptoms

**Sleep Apnea:** Sleep apnea is a sleep disorder that affects about 20% of the population. This condition is linked with breaks in the sleep pattern which can reduce sleep quality. Common sleep apnea symptoms include snoring, witnessed temporary episodes of not breathing at night, and waking with a dry mouth. One study of 200 patients who underwent a sleep study compared the frequency of IBS among patients with and without sleep apnea. Researchers found that patients with sleep apnea were more likely to have IBS compared to patients without sleep apnea. However, increasing severity of sleep apnea was

not linked with IBS. This evidence highlights the importance for patients to:

- 1) follow their treatment plans for diagnosed sleep apnea, and
- 2) discuss symptoms of sleep apnea with a healthcare provider to determine if they should be tested for sleep apnea.

**Hormones** are molecules that help regulate the body and send messages between organs.

**Microorganisms** are living things that are too small to be seen by the naked eye. They include bacteria, viruses, and fungi.

**Gut microbiota** includes all the bacteria in the intestines. This is necessary for healthy digestion.

**Visceral hypersensitivity** describes feeling pain within the inner organs (viscera) at a level that is stronger than normal

**Mood Disorders:** Mood disorders are commonly linked with IBS. Sleep troubles are a classic feature of mood disorders. Psychiatric and mood disorders likely play an important role in the link between sleep disturbances and IBS. Psychiatric includes treatment and conditions relating to the mind, emotions, and behaviors. Uncontrolled psychiatric symptoms can be both a cause and a result of poor sleep and IBS symptoms. Some common psychiatric symptoms include feeling withdrawn, nervous, unable to focus, and changes in mood, appetite, and sleep. It is important to address uncontrolled psychiatric symptoms. This is especially important when working to improve sleep quality and IBS symptom control. A cycle of sleep trouble, increased mood symptoms, and increased IBS symptoms is often experienced. It is important to target therapies toward all three concerns. Each area can cause and/or increase the seriousness of the other two symptoms.

**Melatonin:** Melatonin is hormone produced by the brain and helps prompt sleep. There is new evidence that melatonin may affect more than sleep. A study looked at the effect of IBS patients taking melatonin supplements. This study showed that 3 mg of melatonin at bedtime decreased abdominal pain. However, improvement in sleep trouble or psychological suffering was not seen. Another study found higher levels of melatonin in the morning in patients eating or drinking a probiotic. A probiotic contains live microorganisms that are taken to benefit the body in some way. These are often in the form of a pill and are naturally present in yogurt and kombucha. The researchers suggested that probiotics may alter melatonin creation through changes in the gut bacteria. This then may affect sleep and IBS symptoms. It is stressed that this is very early work and additional follow-up studies are needed. However, this evidence will hopefully encourage further investigation into the link between IBS, the gut microbiome, and sleep.

### Summary

The above information highlights the link between IBS and sleep trouble. Sleep trouble in IBS patients is likely due to multiple causes, including changes in the sleep cycle, different views of sleep quality, and the presence of other medical problems linked with poor sleep (sleep apnea, mood disorders, etc.). Although many questions remain unanswered at this time, it is reasonable to think that 1) IBS symptoms can cause poor sleep quality and 2) poor sleep quality can cause IBS symptoms. There is also growing evidence regarding the link of sleep trouble and changed pain view and visceral hypersensitivity. If sleep troubles are experienced, it is important to discuss the sleep concerns with a healthcare provider. In addition to ruling out treatable conditions such as sleep apnea, healthcare providers can target therapies and recommendations to the identified sleep issue (i.e. trouble falling asleep, trouble staying asleep, trouble getting back to sleep after waking).

Sleep is key to human survival and should be a health and wellness priority. Sleep troubles are frequently not mentioned by IBS patients or asked about by healthcare providers. To further research into the connection between sleep and IBS, patients, providers are encouraged to openly discuss sleep concerns to help promote a multi-faceted approach to IBS symptom management.

### Sleep Tips

- Limit daytime naps to 30 minutes.
- Avoid stimulants such as caffeine and nicotine close to bedtime.
- Exercise for at least 20 minutes per day, with avoidance of activity in the couple hours prior to bedtime.
- Ensure to get enough exposure to natural light during the day, and darkness at night.
- Optimize the sleep area, including comfortable bedding, “white noise”, blackout curtains, and avoid the use of electronic devices/television.
- If snoring or apnea (temporarily stop breathing) are witnessed during sleep, seek medical advice regarding sleep apnea or sleep disordered breathing evaluation.
- Discuss sleep concerns with a healthcare provider, including trouble falling or staying asleep.
- Discuss uncontrolled mood symptoms with a healthcare provider.

### Sleep Resources

- <https://www.cdc.gov/sleep/resources.html>
- <https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Understanding-Sleep>

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