Sleep Physiology

We interviewed a young shift worker who admitted to getting only 5 or 6 hours of sleep each night. He reported that he stayed very busy and felt that sleep was basically a waste of his time. Besides his job, he had a lucrative woodworking hobby and a small farm to manage. Additionally, his forty-minute commute home from the control room took a considerable amount of his time. Sleep was far from a priority for him.

Perhaps this young man really could perform all his tasks well with so little sleep, but I wondered how he might fare if his pattern of accumulating sleep debt continued. Scientific research shows that humans need between 7 and 9 hours of sleep in each twenty-four hour period to meet the body's need for restorative rest. Ignoring the body's sleep requirements can lead to serious health issues such as an increased risk for type 2 diabetes, heart disease, obesity, high blood pressure and a weakened immune system.

Sleep is, in fact, a very active process, which provides restoration of body and mind. Most of our bodily functions slow down during sleep and allow for rest and healing. Following are a few examples of changes that take place during sleep:

- Our breathing patterns change during sleep. When we are awake, breathing is usually quite irregular, since it is affected by speech, emotions, exercise, posture, and other factors. As we progress from wakefulness through the stages of non-REM sleep, our breathing rate decreases slightly and becomes very regular.
- One of the possible functions of sleep is to give the heart a chance to rest from the constant demands of waking life. During non-REM sleep there is an overall reduction in heart rate and blood pressure.
- Kidney function slows and the production of urine is decreased while sleeping.
- Some physiological processes may be increased during sleep. For example, one of the greatest changes induced by sleep is an increase in the release of growth hormone. Growth hormone, in adults, is responsible for muscle growth, building bone density, and maintaining healthy cholesterol levels.
- Certain physiological activities associated with digestion, cell repair, and healing are greatest during sleep.
- The glymphatic system clears waste from the central nervous system during sleep.

Without sleep, humans cannot survive. Like the young shift worker, we all have many important responsibilities but those responsibilities must begin with our own basic care. Sleep must be a priority if we are to thrive and show up for work "fit for duty".