STAGE 1 of NREM sleep is always the first stage of the sleep process, whether the individual has just fallen asleep or whether he was awakened from a deeper stage of sleep and falls asleep again. In Stage 1, the individual may not even be aware that he has begun to sleep. Still aware of surroundings, the individual is relaxed and drowsy and thinking is less reality-oriented. The individual is less reactive to outside stimuli, but can still be aroused easily. Jerking of the face, hands, or feet may occur at this time. Body temperature and vital signs start to drop as metabolism slows. Stage 1 is a brief stage, lasting 5–10 minutes.

STAGE 2 of NREM sleep is a slightly deeper sleep and is a transition or “door” to deeper NREM stages or to REM sleep. The individual is no longer aware of his surroundings, and is more difficult to awaken. Metabolism and vital signs continue to decrease during this 15- to 20-minute stage. This is the most stable and predominant NREM sleep stage in adults, particularly later in the sleep period when the individual alternates between REM and NREM sleep.

STAGE 3 of NREM sleep is much deeper than that of Stage 2, and the individual is now more difficult to arouse. Snoring may begin to occur because of decreased muscle tone. Vital signs, body temperature, and metabolism continue to decrease.

STAGE 4 of NREM sleep is a deep sleep that lasts approximately 30 minutes during the sleep cycle. During this stage, the individual is very difficult to awaken. The individual rarely moves at this time and vital signs and metabolism are at their lowest.

When people speak of having had a good night's sleep, they are likely referring primarily to Stage 4 sleep, which restores one physically and emotionally. During this stage, the growth hormone is secreted, promoting protein synthesis and tissue healing. The lowered metabolic rate also reduces oxygen consumption and promotes wound healing and tissue restoration. NREM Stage 4 sleep is the most sensitive to advancing age. After one sleep cycle, about every 90 minutes, an individual will return from Stage 4 NREM sleep, back through Stage 3 to Stage 2. Instead of returning to Stage 1 and awakening, the individual may repeat the NREM cycle or progress to a brief episode of REM sleep.

REM SLEEP
REM sleep is a very active stage of sleep with a high degree of cerebral and physiologic activity. REM sleep continues to facilitate tissue healing.
There is increased cerebral blood flow during REM sleep aiding memory storage and consolidation of learning. During REM sleep, large muscles are immobilized and the individual is unable to move. This stage is easily recognized by the rapid eye movements from side to side and the twitching of small facial muscles. Most dreams occur during REM sleep and are thought to be essential in the process of mental restoration and emotional healing. The day's events are reviewed and important information is categorized and integrated, helping to restore one mentally. Problem resolution or a new perspective may result from REM sleep. Hence the saying, "I'll sleep on it", may have genuine merit.

REM sleep can last from 5 to 35 minutes. The smallest amount of REM sleep occurs during the early cycles of sleep and increases with each full cycle during a night of sleep. NREM stages are most prominent during the early hours of sleep and decrease as REM increases in the later hours.

**SLEEP PATTERNS - POPULATION-SPECIFIC CONSIDERATIONS**

Aging contributes to sleep requirements, patterns, and the ability to sleep continuously and soundly. Although the need for sleep varies among individuals, sleep requirements commonly decrease with age. Adolescents may sleep for 9 or 10 hours straight, with about 50% of sleep occurring in Stage 2 of NREM sleep. Stages 3 and 4 and REM sleep, together, comprise approximately 25%. On average, adults require 7 to 8 hours per night and REM sleep comprises about 20% of total sleep time, but decreases with advanced age. Typically, aging adults, require only 5 to 7 hours a night, plus daytime napping. The elderly experience more Stage 2 light sleep. The older person usually takes longer to fall asleep and awakens easily and more frequently.

One factor that is constant, no matter the age of the individual, is that when awakened from sleep, sleep always begins again at Stage 1, regardless of the stage a person is awakened from. If awakened from sleep frequently, the individual may get little or no restorative stage 4 NREM sleep, as well as REM sleep.

**SLEEP DEPRIVATION**

Hospitalized patients often experience a lack of sleep and/or frequent disruptions to their sleep. Sleep deprivation can decrease patients' ability to heal, fight infection, tolerate pain, and cope with stress, further compounding their illness. When sleep occurs, it mainly consists of lighter sleep in stages 1 and 2 of NREM sleep. Environmental noise and lighting, as well as pain and generalized discomfort, are key factors contributing to sleep deprivation in the hospital.

Environmental noise is due to a variety of causes, including ringing phones, beepers, overhead speakers, hospital personnel talking, equipment being rolled in the hallway, emptying of trash cans during the night, and equipment sounds and alarms. Patients located near the nurses' station, as well as storage or linen rooms, are often subjected to more noise and light.

Noise produces physiologic changes similar to what is seen in a generalized stress reaction, including vasoconstriction, elevated diastolic blood pressure, dilated pupils, and muscle tension. Because of adrenalin released by the sympathetic nervous system, these effects prevent the patient from relaxing and falling asleep.

**Lights:** Lighting has also been identified as a factor preventing sleep. The normal light/dark cycles help to regulate the biological clock. Alterations in the light and dark cycles have a major influence on sleep patterns because of melatonin secretion and signaling the body's internal clock that it is time to sleep or be awake. Bright lights from the nurses' station, lights that are not dimmed, and lights that are turned on at night are all very disrupting to patients' sleep.

**Discomfort:** Being in pain or generally uncomfortable, is another reason commonly given for difficulties sleeping in the hospital. Being attached to monitoring equipment, for example, often prevents a patient from sleeping on his stomach, if that is his or her preferred sleeping position. The electrode pads used for monitoring also often cause the skin to become irritated and itchy. Oxygen can be very drying to nasal passages if not humidified. Having intravenous lines, catheters, and/or dressings can be uncomfortable.

Patients often complain about uncomfortable hospital beds. Before a patient goes to sleep, assist them in getting "ready for bed", such as brushing their teeth, washing their face, and voiding. Straightening their bedding, pillow, and any tubing, and adjusting the mattress position until the patient is comfortable, is helpful. If the patient is cold, be certain blankets are provided, and within the patient's reach. Room temperature may adversely affect sleep. During REM sleep, thermoregulation is absent and shivering or sweating cannot occur. When the environment is too cold or too hot, REM sleep will be decreased.

Assess the patient for pain. If pain medication is required, try to give it early enough so that it takes effect before bedtime and the patient will be pain-free and more relaxed. Before leaving the patient's room, make sure there is fresh water and that the call light, is within reach. Also, be certain the intermittent suction machine is turned off, the oxygen tubing is free of water, faucets are not dripping, and the urinal is empty and within reach. Pull the patient's curtain closed to help block out light from the unit. If there is a door to the room, close it somewhat to block out noise. Dim the hallway and nursing station lights.

When assessing the patient, taking vital signs, or performing procedures during the night, do so as quietly as possible. Try to space interruptions to allow a minimum of 2 hours of uninterrupted sleep at a time. If you must awaken a patient, first observe to see if he or she is in the brief, but important stage of REM sleep. If possible, wait until that stage ends before waking him or her.

Sleep is not only a basic human need for survival, as is oxygen and water, but an integral part of physical and emotional well-being. Healthcare providers play a key role in understanding the cycles of sleep, as well as structuring the environment to promote sleep in hospitalized patients.
1. On average, a sleep cycle occurs every:
   a. 5 to 30 minutes.
   b. 15-20 minutes.
   c. 90 minutes.
   d. 120 minutes.

2. Regardless of age, when a patient is awakened from sleep, sleep always begins again at Stage 1, regardless of the stage a person is awakened from.
   a. True
   b. False

3. In a typical night, when an adult patient reaches Stage 2 of NREM sleep, he or she may transition to deeper NREM sleep or to REM sleep.
   a. True
   b. False

4. You enter Mrs. Auten’s room and notice she is beginning to snore and is now more difficult to arouse. Mrs. Auten is most likely in which stage of sleep?
   a. NREM stage 2
   b. NREM stage 3
   c. NREM stage 4
   d. REM sleep

5. When Mrs Auten awakens in the morning, she says, “I had a good night’s sleep.” The healthcare provider knows which stage of sleep is responsible for this sense of well-being?
   a. REM
   b. NREM, Stage 2
   c. NREM, Stage 3
   d. NREM, Stage 4
POPULATION/AGE-SPECIFIC EDUCATION POST TEST

GROWN UP...
Caring For Adolescents, Adults, and Aging Adults

HOSPITALIZATION AND SLEEP DEPRIVATION

6. Most dreams occur during:
   a. REM sleep.
   b. the early hours of NREM sleep.
   c. the first 15 to 20 minutes after falling asleep.
   d. periods of sleep deprivation.

7. A major benefit of REM sleep includes all of the following EXCEPT:
   a. mental restoration.
   b. improved gas exchange.
   c. memory storage.
   d. emotional healing.

8. Metabolism, body temperature and vital signs progressively increase during the sleep cycle.
   a. True
   b. False

9. Sleep deprivation has been shown to have all to:
   a. increase a patient’s ability to fight infection.
   b. negatively affect the healing process.
   c. increase pain tolerance.
   d. decrease a patient’s response to stress.

10. If possible, the healthcare provider should try to space interruptions to allow a minimum of 2 hours of uninterrupted sleep at a time.
    a. True
    b. False