Sleep, Rest and Sensory Perception

Week 11  October 27, 2003

Stages of Sleep
- Stages of sleep are determined according to:
  - Brain waves: electroencephalogram (EEG)
  - Eye movements: electrooculogram (EOG)
  - Degree of muscle tension: electromyogram (EMG)
- First four stages are all classified as Non-rapid-Eye Movement Sleep (Non-REM)
- Fifth stage is classified as Rapid Eye Movement Sleep (REM)

NREM Sleep Stages
- Stage 1
  - Light sleep: wakes very easily; floating feeling
  - Rolling eye movements & relaxed muscles
- Stage 2
  - Light sleep: wakes easily; daydreaming
  - Eyes may roll, muscles relaxed
  - Transition to REM occurs from this stage
- Stages 3 & 4
  - Deep sleep, difficult to waken; realistic dreams, enuresis, somnambulism & snoring
  - No eye movement, muscles very relaxed
REM Sleep
- Rapid eye movement sleep
  - Difficult to awaken a REM-sleeper; may have sense of paralysis
  - Characteristic rapid, eye movements give impression sleeper following something with gaze
  - Muscle tone very low (except respiratory muscles); sporadic muscle twitching

Sleep Patterns
- Sleep progresses from stage 1 to 4; back through 3 & 2 before entering REM
- First REM sleep usually occurs 80-90 min after falling asleep; may last 3-4 min
- REM sleep tends to occur 5 times a night, each REM lasts longer with shorter intervals between
- If complete awakening occurs, sleep cycle begins again with stage 1
- If awakening very brief, may reenter at previous stage in cycle
Normal Sleep and Rest Patterns

- Sleep latency: period of time needed to fall asleep
- Sleep duration: length; 6 - 9 hrs is norm
- Position changes: 20 - 40/night is norm
- Night awakenings: 1 - 2, increases with age
- Naps: unusual in US except very young & old
- Circadian rhythms: biologic events occurring at 24 hr intervals such as:
  - Sleep/wake cycle
  - Body temperature fluctuations
  - Hormone secretory cycle

Factors Affecting Sleep

- Nutrition: too little/too much food near bedtime
- Caffeine: long half life; can affect or delay sleep
- Alcohol: shortens sleep onset & rebound arousal
- Smoking: agitation; half life 1-2 hrs, smoking close to bedtime may delay sleep
- Exercise: activity increases REM & NREM sleep but if within 2 hrs of sleep can cause wakefulness
- Disruptions: schedule change, baby, phone etc
- Age-related issues

Factors Affecting Sleep

- Hospitalization: NOT conducive to sleep
- Temperature: extremes impair sleep quality
- Light: problem in hospitals
- Noise: high noise levels assoc with less REM
- Sleep position: back sleepers have more apnea
- Pain: affects sleep latency and duration
- Medications: hypnotics, sedatives, anesthetics all decrease latency; cause wakefulness & anxiety
- Mood: depression & anxiety affect sleep
### Sleep Deprivation S/Sx
- Detrimental effects with loss of NREM/REM sleep
- < 6 hrs sleep/night affects coordination, reaction time & judgment. Can cause headache, anxiety, decreased pain threshold, GI upset, vertigo, irritability, delayed wound healing
- Can occur even if total sleep > 8 hours if frequent interruptions (will to stage 1 after each awakening)
- Awakenings in first 2 hrs causes NREM loss; later will cause REM loss
- Only 2/3 of lost REM sleep ever recovered

### Sleep Problems
- Insomnia: difficulty initiating or maintaining sleep
- Sleep Apnea: temporary absence of breathing during sleep
  - Obstructive sleep apnea: due to obstruction in throat during sleep. Associated with obesity & alcohol consumption before sleep
  - Central Sleep Apnea: delay in signal from brain to breathe. Neurologic problem; may require ventilatory support at night

### Sleep Problems
- Narcolepsy: excessive daytime sleepiness and pathological REM sleep
- Periodic limb movements:
  - Repetitive knee flexion & foot dorsiflexion
  - Restless legs syndrome
- Circadian rhythm disorders: mismatch between sleep schedule and normal patterns
  - Shift-work sleep disorder
  - Time zone change
Sleep Problems

- Somnambulism: sleepwalking
- Night terrors: arousal and agitation during slow wave sleep (sweating, tachypnea, tachycardia)
- Nightmares: bad dreams occurring during REM sleep
- Sleep enuresis: bedwetting
- Bruxism: teeth grinding

Assessment Data

- Sleep history: pt interview regarding sleep patterns
- Sleep diary: pt records sleep patterns, dreams, risk factors
- Physical exam:
  - Behavioral: mood alterations, agitation, confusion
  - Physical: yawning, dark circles under eyes, increased BP, pulse and RR
- Diagnostic tests: sleep studies conducted in sleep lab, home monitoring

Sleep/Rest NANDAs

- Disturbed Sleep Pattern: change in quantity or quality of his rest pattern that causes discomfort or interferes with desired lifestyle
- Sleep Deprivation: prolonged periods of time without sustained, natural, periodic states of relative unconsciousness
- Fatigue: overwhelming, sustained sense of exhaustion and decreased capacity for physical and mental work that is not relieved by rest
Implementation

• Relaxation: deep breathing, baths, back rub, etc
• Sleep restriction: increase # hrs sleep/night
• Reconditioning, bed only for sleep & sex; go to bed only when sleepy, no naps
• Bedtime rituals, warm milk, light snack, music, meditation
• Prepare room: dark, earplugs, phone off, TV off
• Review day’s events before bed, pen/paper @ bedside
• Administer meds: when to take, side effects

Sensory Perception

• Normal sensory perception: 20/20 vision, taste, smell, hearing, touch
• Sensoristasis: optimum sensory input that allows peak performance
• Sensory adaptation: required when sensory input exceeds optimal level

Factors Affecting Sensory Perception

• Environmental stimuli
• Past experience; sensory sensitization
• Lifestyle: ETOH & other drug abuse, smoking
• Illness: can affect neuro & sensory function
• Meds can be ototoxic, CNS depressant
• Sensory overload from overstimulation
  - Internal: e.g., anxiety, pain, lack of sleep
  - Information: TMI
  - Environment: lights, sounds, smells, etc
• Sensory deprivation from too little stimuli
### Alterations in Sensory Perception

- **Cognitive dysfunction:** reduction of mental capabilities; disorientation, confusion
- **Hallucinations/delusions:** seeing or hearing things that are not there/beliefs not based in reality
- **Sensory deficit:** loss of function or perception (blindness, deafness, CVA, spinal cord injuries)
- **Anxiety:** from inability to interact fully with environment due to sensory deficit
- **Depression:** feelings of helplessness & loss of self-esteem (o appetite, apathy, sleeplessness)

### Assessment Data

- **Interview:** Assess mental status, normal level of stimulation, response to change, social situation, lifestyle/habits, risk factors
- **Physical examination:**
  - Look at eyes, ears, nose, mouth extremities
  - Hearing, vision, taste, smell, touch can all be assessed through variety of tests
- **Diagnostic tests:** include electrolytes, blood chemistry, neurological studies, visual & auditory acuity tests, CT scan

### NANDA: Disturbed Sensory Perception

Change in amount, pattern, interpretation of stimuli

**Implementation:**
- **Teach:** eye exams, compensation for deficits
- **Prep for procedures:** to prevent overload
- **Provide appropriate amount of stimulation**
- **Sensory aids:** hearing aids, magnifying glass, glasses, large print, amplified phone, recorded books, etc
- **Safety:** side rails, night lights, inspect extremities, test bath water temp, examine food carefully