Unit 11

Sedatives, Hynotics and Analgesics

Central nervous system (CNS) depressants decrease the activity of the central nervous system

General Nursing Implications of CNS Depressants

- Frequently used for insomnia –short term use
- Avoid alcohol consumption (CNS depressant)
- Avoid Antihistamine and other CNS depressants
- Avoid Caffeine and caffeinated foods (CNS stimulant)
- Contraindicated in pregnancy and lactation
- Avoid dangerous activities and driving until effects have been established
- Avoid abrupt withdrawal (can cause withdrawal symptoms after prolonged use)

General Nursing Implications

- Follow Liver and Renal Function tests
- Watch for CNS effects including increased sedation, dizziness, confusion, hallucinations
- Can suppress respiratory center in brain
- Death can result from overdose
- Keep medication out of reach of children

Sedative versus Hypnotic

- Sedative
  - Depress the CNS to sedate or relax, producing a calming effect
  - Referred to as tranquillizers
- Hypnotic
  - Depress the CNS enough to cause sleep
- Sedative-Hypnotic
  - Produce calming effect at lower dose and sleep at higher dose

Sedatives

- Tranquillizers
- Mostly for sleep and some epilepsy
- Two classes
– Barbiturates (Phenobarbital)
– Non-barbiturates sedative-hypnotics (Benzodiazepines)

• Long duration of action
• Overdose very dangerous
• Withdrawal similar to alcohol

7 Barbiturates
• Powerful CNS depressants
• Used for sedative, hypnotic and anti-seizure effects
• Tolerance develops to barbiturates and cross tolerance to other CNS depressants
• Risk of physical and psychological dependence
• Many are Schedule II drugs
• Significant adverse effects
• Withdrawal syndrome is severe and can be fatal
• Overdose result in respiratory depression, hypotension and shock
• Death due to overdose is not uncommon

8 Barbiturates
• Adverse effects
  – Drowsiness, somnolence, lethargy, ataxia, vertigo, feeling of hangover, anxiety, hallucinations, epigastric pain, N & V, bradycardia, hypotension, syncope, respiratory depression, hypersensitivity reaction
• Contraindication
  – Allergy, previous history of addiction, marked hepatic or renal impairment, severe respiratory dysfunction, pregnancy
• Use with caution
  – in patients with acute or chronic pain as it may mask other symptoms

9 Benzodiazepines
• CNS depressants
• Widely prescribed
• Uses
  – Anxiety
  – Seizures
  – Muscle relaxants
• Abuse not common
• Does not produce life-threatening respiratory depression in excessive amounts
• Often combined by abusers with alcohol – can cause coma and death due to combination of CNS depressants

10 Benzodiazepines
• Adverse effects
  – sedation, drowsiness, depression, lethargy, blurred vision, apathy, light headedness, confusion, dry mouth, constipation, N & V, arrhythmias, palpitations, hypotension, urinary retention, loss of libido
• Contraindication
  – allergy, psychosis, acute narrow-angle glaucoma, shock, coma, acute alcohol intoxication, pregnancy
• Abrupt cessation of drugs
  – can lead to withdrawal syndrome characterized by headache, vertigo, malaise, nightmares
• Use with caution
  – in the elderly or others with hepatic or renal dysfunction
  – effects increase when taken with oral contraceptives
Pain Assessment
- First step in pain management
- Several numerical scales and survey instruments are available
- Need to know
  - Location
  - Severity
  - Type
  - Duration
  - Effect on daily life

Pain
- Subjective experience
- Termed acute or chronic
- Source of pain include:
  - Nociceptor pain - Injury to the tissue
    - Can be somatic – sharp localized
    - Or visceral – generalized dull, throbbing, aching
  - Neuropathic Pain - direct injury to the nerve
    - Described as burning, shooting, numb

Concept Review
- What questions would you ask to identify a patient’s type of pain?
- How would you distinguish between acute pain and chronic pain?
- Which is the most difficult type of pain to treat?

Concept Review
- What client behaviors would be indicative of pain?
- What nursing actions might be associated with relief of pain for client?

Non-pharmacologic Pain Management
1. Acupuncture
   - Biofeedback therapy
   - Massage
   - Heat or cold packs
   - Meditation
   - Relaxation therapy
   - Art or music therapy
2. Imagery
   - Chiropractic
   - Hypnosis
   - Therapeutic touch
   - Transcutaneous electrical nerve stimulation (TENS)
   - Energy therapies
Other Therapies
- Radiation Therapy - shrinks solid tumors that may be pressing on nerves
- Surgery - reduce pain by removing part of or the entire tumor
- Nerve Block - injection of alcohol or other neurotoxic substance into neuronal tissue irreversibly stop impulse transmission along treated nerves

Targets
- Pain transmission processes allow several targets for pharmacologic intervention
- Nociceptors - free nerve endings located throughout the entire body
- Several targets where medications can work
- Two main classes of pain medications
  - Non Opioids - NSAIDs (Nonsteroidal anti-inflammatory drugs), acetaminophen, centrally acting analgesics
  - Opioids - act within the CNS

Opioids
- Uses
  - Severe pain
  - Persistent Cough
  - Diarrhea
- Effects begin within 30 minutes orally
- Addiction occurs rapidly
- Intense withdrawal symptoms

Opioids
- Natural or synthetic morphine-like substance
- Responsible for reducing severe pain
- Narcotic substance - produce numbness or stupor-like symptoms
- Drugs of choice for moderate to severe pain that cannot be controlled with other classes of analgesics

Effects of Opiates
- Positive
  - Severe pain relief
  - Suppress the cough reflex
  - Slowing GI motility
– Sedation
• Negative
  – Respiratory depression
  – Sedation
  – Nausea and vomiting

24 Patient Controlled Analgesia (PCA)
• Delivered with Infusion Pump
• Limits set to prevent overdose
• Patient self-medicates by pushing button

25 Combination Medications
• Opioids and non-narcotic analgesics
• Single tablet or capsule
• Work synergistically to relieve pain
• Dose of narcotic can be kept small
• Minimizes negative effects

26 Popular Combination Analgesics
• **Vicodin** - hydrocodone, 5 mg; acetaminophen, 500 mg
• **Percocet** - oxycodone HCl, 5mg; acetaminophen, 325 mg
• **Percodan** - oxycodone HCl, 4.5 mg; oxycodone terephthalate, 0.38 mg; aspirin, 325 mg
• **Darvocet-N 50** - propoxyphene napsylate, 50 mg; acetaminophen, 325 mg
• **Empirin with Codeine No. 2** - codeine phosphate, 15 mg; aspirin, 325 mg
• **Tylenol with Codeine** - single dose may contain from 15 to 60 mg of codeine phosphate and from 300 to 1,000 mg of acetaminophen

27 Opioid Antagonists
• Substances that prevent the effects of opioid agonists
• “Competitive antagonists”
• Compete with opioid agonists for access to the opioid Receptor site.
• Acute opioid intoxication is a medical emergency. Respiratory depression
• Naloxone (Narcan)

28 Opioids with Mixed Agonist–Antagonist Activity
• Stimulate the opioid receptor causing analgesia
• Withdrawal symptoms/adverse effects
  – Not as intense
  – Partial activity of receptor subtypes

29 Opioids with Mixed Agonist–Antagonist Activity
• Methadone (Dolophine)
  – Treats opioid dependence
• Buprenorphine (Subutex)
  – Newer option
Non-steroidal anti-inflammatory drugs are the drugs of choice for inflammatory pain:

- Antipyretic (anti-fever)
- Anti-inflammatory
- Analgesic (pain-reducing) properties
- Drugs of choice for mild to moderate pain associated with inflammation
- Act by inhibiting pain mediators at the nociceptor level

COX Inhibitors:
- Prostaglandins
  - Formed by cyclooxygenase type one (COX-1) and cyclooxygenase type two (COX-2)
  - Aspirin inhibits both COX-1 and COX-2

COX Inhibitors:
- COX-2 enzyme
  - More specific for cause pain and inflammation
  - COX-2 inhibitors developed for specific pain relief
  - VIOXX (off the market), Celebrex

Acetaminophen:
- Non-opioid analgesics
- Not classified as NSAIDs
- Equally effective as aspirin and ibuprofen
- Also used to reduce fever

Centrally Acting Drugs:
- Clonidine (Catapres)
- Tramadol (Ultram)
  - Weak opioid activity
  - Not thought to relieve pain by this mechanism
- Ziconotide (Prialt)

Mechanisms of pain at the nociceptor level:

Drug Abuse:
- Abused substances belong to many different chemical classes
- All affect the nervous system
- Natural Sources
  - Opium, Marijuana, cocaine, nicotine, caffeine, alcohol
- Synthetic – designer
- Legal drugs abused as well
Addiction
- Addiction depends on multiple, complex, and interacting variables
- The progressive and chronic abuse of a substance

Variables to Addiction
- Agent or drug of abuse
- User factors
- Environment

Physical Dependence
- Altered physical condition
- Caused by nervous system adapting to substance
- Body "tricked" into thinking altered state is normal
- Withdrawal symptoms occur when stopped

Psychological Dependence
- No signs of physical discomfort when stopped
- Overwhelming desire to continue to use
- Often responsible for relapse

Withdrawal
- Withdrawal results when an abused substance is no longer available
- May be severe
- Best done in a facility
- Other drugs are often used
- Group treatment helpful – AA, NA

Tolerance
- Tolerance occurs when higher and higher doses of a drug are needed to achieve the initial response
- Biological condition when the body adapts to the substance
- Higher doses needed to produce effect
- Different rates for different drugs
- Tolerance to one drug may cause tolerance to similar substances as well