Objectives

1. Describe the physiology of pain and related theories of pain management, including substance abuse.
2. Compare individual factors that influence perception and responses to pain, including cultural diversity.
3. Differentiate between acute and chronic pain, including stress adaptation.
4. Describe pharmacologic and nonpharmacologic approaches to pain management.
5. Describe the nursing management of the patient experiencing pain, including ethical issues.

Nature of Pain

- Pain is key to the survival of an organism.
- Pain is a conscious perception that results from environmental stress.
NATURE OF PAIN

Definitions
- Medical: "that sensory experience evoked by stimuli that injures or threatens to destroy tissue, defined introspectively by every man as that which hurts."

NATURE OF PAIN

Definitions (continued)
- Psychological: an abstract concept which refers to: a) a personal, private sensation of hurt; b) a harmful stimulus that signals current or pending tissue damage; c) a pattern of responses to protect the organism from pain.

NATURE OF PAIN

Definitions (continued)
- Nursing: “whatever the experiencing person says it is and existing whenever the person says it does” (McCaffery, RN 1966).
Physiology of pain

- Pain receptors are found in all parts of the body.
- They are called nociceptors.

Types of nociceptors

- Thermal
- Chemical
- Mechanical
Physiology of pain

- Types of fibers and their functions
  - A-delta receptors: small, myelinated fibers, transmit acute, sharp pain signals from peripheral nerves to spinal cord.
  - C receptors have larger, unmyelinated fibers that transmit pain at a slower rate, transmit long-lasting, burning pain sensation.

- A-beta receptors respond to non-painful touch, such as gentle rub or pressure.
Physiology of pain

- Pain producing substances - released into tissues after tissue damage
  - Bradykinin
  - Serotonin
  - Histamine
  - Prostaglandins
  - Leukotrienes
  - Substance P

Transmission of pain

Temporal and Spatial Summation

Temporal summation
  - Summation from one neuron over time

Spatial summation
  - Summation from several neurons active simultaneously
Pain Transmission

When a toe is stubbed, cells called nociceptors sense damage (1) and send an impulse via a sensory nerve (2) to the dorsal horn (3) region of the spinal cord. This processes the signal, and sends another signal down the leg via a motor nerve (4) causing leg muscles (5) to pull away from the source of injury (6). The dorsal horn sends a second impulse to the brain, reaching nerve endings (7). These release neurotransmitters to further carry the message. The brain processes the impulse as an unpleasant sensation (8). © Microsoft Corporation. All Rights Reserved.
Gate Theory of Pain

- Neurons not involved directly involved in the afferent pain transmission are stimulated and help to regulate transmission of nociceptor transmission.
- The non-nociceptor sensory receptors for vibration are used in the TENS unit

BARRIERS TO PAIN CONTROL

- Healthcare Professionals- Inadequate knowledge of pain management
- Poor assessment of pain
- Concern about regulation of controlled substances
- Fear of client addiction
- Concern about side effects of analgesics
BARRIERS TO PAIN CONTROL

- Clients- Reluctance to report pain
- Concern about distracting MDs from treatment of underlying disease
- Concern about not being a good client
- Reluctance to take pain medication
- Fear of addiction
- Concern about becoming tolerant

BARRIERS TO PAIN CONTROL

- Health care system- Low priority given to cancer pain treatment
- Inadequate reimbursement
- Restrictive regulation of controlled substances
- Problems of availability of treatment or access to it

Perception of pain-conscious

- Fast pain- precise localization on the body
- Slow pain- much less precise, may be referred from C fibers of the same dermatome.
Perception of pain

- Interpretation is individualized
- Does not depend solely on the degree of physical damage
- Pain tolerance- amount of pain a person is willing to endure
- Pain threshold- lowest intensity of a painful stimulus that is perceived by a person as pain.

Perception of pain

- Person’s past history of pain

  - Multiple factors-anxiety, experience, attention, expectation, and meaning of the situation

Perception of pain

- Sympathetic autonomic response-
  - “flight or fight response”
  - Increased pulse
  - Increased respiratory rate
Misconceptions & Myths

- **Myths**
  - Addiction occurs w/ prolonged use
  - Nurse is best judge
  - Wait for pain before medicating
  - Real pain has cause
  - Sleeping person has no pain
  - Same stimulus-same pain

- **Facts**
  - Incidence of addiction is <0.1%
  - Only client can judge
  - Unrelieved pain creates problems
  - Pain of psychological origin is just as real
  - Sleep can be escape mechanism
  - Intensity, duration, distress vary

Addiction

- Addiction- a behavioral pattern of drug use
  - obsessive use and securing supply of drug
  - tendency to relapse after withdrawal
  - actual opioid addiction occurs less than 0.1%

Dependence

- Psychological dependence-
  - is a pattern of continual craving for opioid drugs when not experiencing pain.

- Physical dependence-
  - is seen when a client is abruptly taken off of opioids. The client has anxiety, chills alternating with hot flashes, irritability, vomiting, abdominal cramps and insomnia.
Negative effects of pain

- Unrelieved pain affects major organs
- GI, pulmonary, CV, immune, endocrine
- Increased costs due to prolonged stays
- Prevent ambulation- DVT, PE
- Release of catecholamines, stress hormones
- Decrease immune system

Neuronal Plasticity

- Nervous system changes in
  - Neurons of different types and functions
  - Increased activity of neurotransmitters, receptors, ion channels
  - Depression of pain inhibiting systems
- Increased pain
  - Injury, inflammation, and disease are no longer
  - Produces short-term and permanent changes
  - Involved in the development of hypersensitivity or inflammatory pain
- Painful N2 in mouse's brain becomes more sensitive to inflammatory stimulation

How Does Acute Pain Become Chronic?

**Peripheral Sensitization**

- Tissue damage releases sensitizing “soup” of cytokines and neurotransmitters
- COX-mediated PGE2 release
- Sensitized nociceptors exhibit a decreased threshold for activation and an increased rate of firing
- Plays an important role in central sensitization, hyperalgesia, and allodynia
Standards and guidelines

- Agency for Health Care Policy and Research
  - Help individual and professional work together to relieve pain
- American Pain Society
  - Set the standard for pain management
- JCAHO
  - Standards for organizations

Types of pain

- Acute pain- less than 6 months duration, reversible, predictable duration
- Chronic pain- long period of time, hard to treat, defined in vague terms
  - Chronic nonmalignant - continuous, has no foreseeable end, hard to determine cause
  - Chronic malignant - has qualities of both of acute and chronic, neuropathic, visceral, and bone pain.
  - Chronic intermittent - recurrence of chronic condition, pain occurs at specific times.

Sources of pain

- Cutaneous pain- abrupt onset, sharp, stinging quality.
  - Easily localized by dermatome.
  - Each dermatome is served by one spinal nerve
- Deep somatic pain- poorly localized, may produce nausea, sweating, BP changes.
Sources of pain

- Visceral pain- coming from body organs
  - Diffuse, poorly localized, vague dull pain.
  - Nerve fibers innervating body organs follow the sympathetic nerves to the spinal cord. Autonomic manifestations- diarrhea, cramps, sweating, hypertension.

Sources of pain

- Referred pain-
  - Felt in an area distant from the site of the stimulus
  - Inflammation
    - Associated with stressors, such as heat, cold, trauma. Symptoms such as redness, swelling, heat, and pain.

Sources of pain

- Neuropathic pain- caused by damage to the nerve fibers in the periphery or CNS
  - Felt as numbness, burning, stabbing, "needles", alldynia
  - Difficult to manage. No obvious injury, problem can be at the spinal cord level.
Sources of pain

- Phantom limb sensations
  - Nerve fibers extend to the periphery, ending at the incision site. They continue to mediate sensations associated with their original location. These are perceived as presence of the missing limb.
  - Sensations can be itching, pressure, numbness, painful

Sources of pain

- Headache- most common type. Mostly intracranial and extra cranial structures.
- Malignancy- occurs 40-70% of people with solid tumors. 90% of cancer pain can be controlled with oral medication
- HIV- GI, abd. Pain, peripheral neuropathy, pleuritic pain, oropharyngeal pain,

Assessment of pain

- Data collection
  - McGill-Melzack Pain Questionnaire
  - Visual Analog Scale
  - Faces Pain Rating Scale
Documentation of pain

- Intensity - use of scale
- Location - verbal or marking a drawing of the body.
- Quality - descriptive adjectives
- Duration - time of onset, duration, interval, pattern, constant, steady, intermittent, brief
- Distress - psychological reaction

Medications to control pain

- Anesthetic agents - abolishes pain but also causes loss of feeling and sensation
  - Local anesthesia - use a restricted part of body
  - General anesthesia - loss of consciousness and reflexes along with amnesia
- Analgesics - diminish or eliminate pain without producing unconsciousness

Analgesics

- Pain ladder - Fig. 22-10-
- Used in care of patients with acute pain not just in cancer pain.
Step one
- Non-opioid drugs
  - Salicylates
  - NSAIDS
  - Acetaminophen
  - Adjuvant drugs

Step two
- Opioid- agonist drugs- moderate or mild persistent
  - Codeine
  - Oxycodeone
  - Propoxyphene
  - Hydrocodone
  - Meperidine (low doses)
  - Pentazocine HCL (Talwin)-opioid agonist-antagonist
Step three

- Opioid for moderate to severe pain
  +/- Non-opioid
  +/- Adjuvant
  - Oral continuous release
  - Fentanyl patch
  - Hydromorphone
  - Morphine IV
  - Methadone

Pharmaceutical considerations

- Ceiling effect: maximum effective dose; increasing dose cannot increase pain relief but may increase side effects.
- Pure opiates DO NOT have a ceiling effect
- Tolerance: can be managed by adding non-opioid to the dose or switching to alternate opioid.

Pharmaceutical considerations

- Dependence: symptoms associated with termination of medication include anxiety, irritability, chills, lacrimation, rhinorrhea, nausea and vomiting, and abdominal cramps.
Adverse effects

- Constipation - number one problem
- Nausea and vomiting
- Respiratory depression
- Circulatory depression
- Urinary retention

Adjuvant medications

- Tricyclic antidepressants
- Antidepressants
- Anti-anxiety agents
- Anticonvulsants
- Corticosteroids
- Local anesthetic agents
Principles of pain management

- Use adequate doses
- Prevention
- Total pain relief is primary goal, then treat side effects
- Do not use placebos
- Believe the client
- Only the client can determine the amount of pain experienced

Methods of administration

- Nurse-administered Analgesia - Demand
- Patient-controlled analgesia
- Oral route
- IM route
- IV route
- Rectal route
- Transdermal/transmucosal route

Titration

- Titrate up after 24 hours if pt. needs more than 3 break through doses
- Add all break through doses in 24 hour period and divide by 2 and then add that to the 12 hour med. Dose.
Addictive potential

- Clients with addictive disease have the right to receive quality pain management
- Involve patient in making pain management plan and in making informed choices about medications
- Taper slowly when pain decreasing

Nonpharmacologic management

- Cutaneous stimulation - activates large-diameter (A-beta) fibers.
- TENS - Transcutaneous electrical nerve stimulation - electrical bursts through the skin to superficial and deep nerves.
- Massage - cutaneous stimulation
- Heat/cold application - Activate A-beta fibers.

Nonpharmacologic management

- Acupuncture - practiced for centuries in the Asian cultures.
- Acupressure
- Music
- Progressive relaxation training
- Deep breathing for relaxation
- Guided imagery
Nonpharmacologic management

- Rhythmic breathing
- Meditation
- Hypnosis
- Humor
- Biofeedback
- Therapeutic touch
- Distraction

Evaluation

- Evaluation- is best when it is unified throughout a healthcare agency.
- Key items-
  - Client satisfaction- with pain management and its impact on quality of life
  - Responsible party for pain mgmt.
  - Systematic assessment of pain
  - Effectiveness of pain mgmt options
  - Prevalence and severity of side effects

Evaluation continued

- Evaluation of the process of pain mgmt as well as the outcome should be done
Documentation

- Flow sheet works best to allow visualization of client’s pain experience
- Pain diary

Discussion

- An 80 year old client, Mrs. Parker, is terminally ill with cancer. An opiate analgesic has been prescribed for her pain. She is being cared for at home by family members who are concerned about pain control for their loved one. What should the client and family be taught about complications associated with use of opiate analgesia? Who would be the ideal person to assess and coordinate the client’s response to dosing of med or combination of med?