Introduction to Clinical Pharmacology

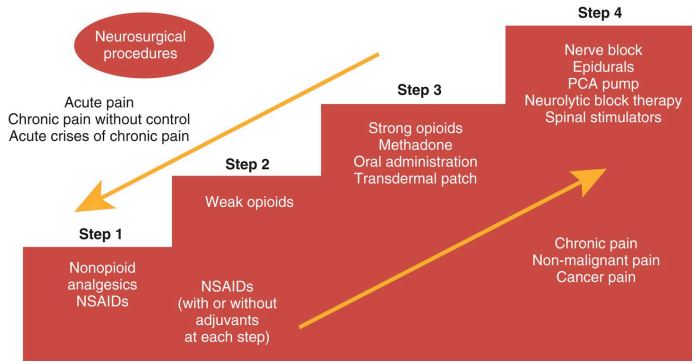
Chapter 15
Opioid Analgesics and Antagonists

Learning Objectives

1. Explain how pain intensity is used to determine treatment using opioids and nonopioid analgesics.
2. Discuss the uses, general drug actions, general adverse reactions, contraindications, precautions, and interactions of the opioid analgesics and antagonists.
3. Distinguish important preadministration and ongoing assessment activities the nurse should perform on the client taking an opioid analgesic or antagonists.
4. List nursing diagnoses particular to a client taking an opioid analgesic or antagonists.
5. Examine ways to promote optimal response to therapy, how to manage adverse reactions, and important points to keep in mind when educating clients about the use of opioid analgesics and antagonists.

Three-Step Analgesic Pain Intensity Treatment #1

- The World Health Organization (WHO) developed a three-step analgesic protocol based on intensity as a guideline for treating pain. The “pain ladder” directs the use of both opioids and nonopioids in the treatment of mild to severe pain.
  - Step 1: Mild pain—nonopioid analgesic sometimes with an adjuvant
  - Step 2: Moderate pain—weak opioid substances
  - Step 3: Severe and persistent pain—potent opioid substances



Three-Step Analgesic Pain Intensity Treatment #2

- Health care providers sometimes use a “4th step” for chronic pain sufferers that develop severe pain using nerve stimulators or blocks with anesthetics or continuous pump infusions

Introduction to Opioid Analgesics

- Controlled substances
- Do not change tissues where pain originates
- Change client's perception of pain
- Treat pain centrally in the brain

Types of Opioid Analgesics

Natural Opioids	Synthetic Opioids
morphine sulfate	methadone
codeine	levorphanol
opium alkaloids	remifentanil
tincture of opium	meperidine

Opioid Analgesics—Actions #1

- Cells within central nervous system
- Mu and kappa receptors produce the analgesic, sedative, and euphoric effects associated with analgesic drugs
- Agonist agents—bind well to the receptors
- Opioid analgesic can be a(n):
  - Agonist
  - Partial agonist
  - Agonist–antagonist

Opioid Analgesics—Actions #2

- Bodily Responses Associated with Opioid Receptor Sites

TABLE 15.1 Bodily Responses Associated With Opioid Receptor Sites

RECEPTOR	BODILY RESPONSE
Mu (μ)	Morphine-like supraspinal analgesia, respiratory and physical depression, miosis, reduced GI motility
Delta (δ)	Dysphoria, psychotomimetic effects (e.g., hallucinations), respiratory and vasomotor stimulations caused by drugs with antagonist activity
Kappa (κ)	Sedation and miosis (pinpoint pupils)

Opioid Analgesics—Uses

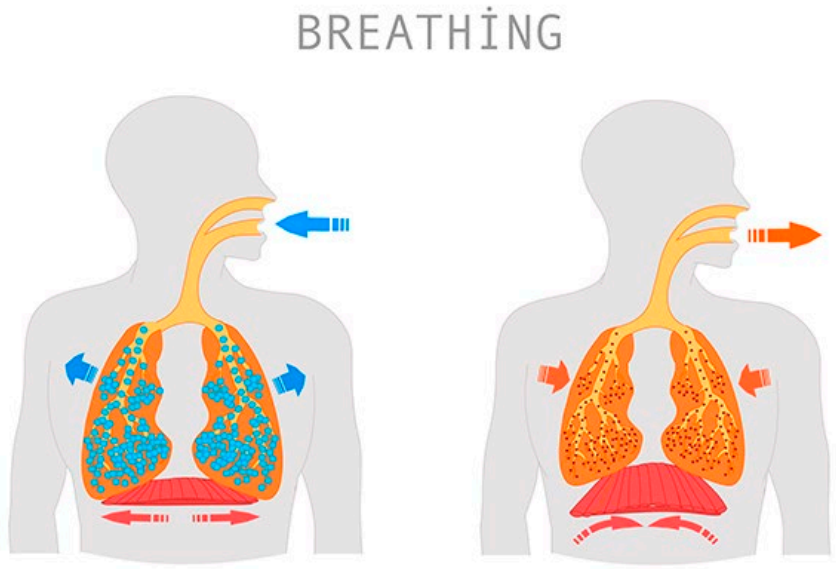
- Treat moderate to severe acute and chronic pain
- Manage opiate dependence
- Decrease anxiety/sedation
- Adjunct to anesthesia
- Promote obstetric analgesia
- Treat pain for an extended time when administered intrathecally/epidurally
- To relieve pain from a myocardial infarction
- Treats severe diarrhea; intestinal cramping; severe, persistent cough
- Treats severe, persistent cough

Opioid Analgesics—Adverse Reactions #1

- Central Nervous System Reactions:
  - Euphoria, weakness
  - Headache
  - Lightheadedness, dizziness, sedation
  - Miosis, insomnia, agitation, tremor
  - Increased intracranial pressure, impairment of mental and physical tasks

Opioid Analgesics—Adverse Reactions #2

- Respiratory System Reactions
  - Depression of rate and depth of breathing

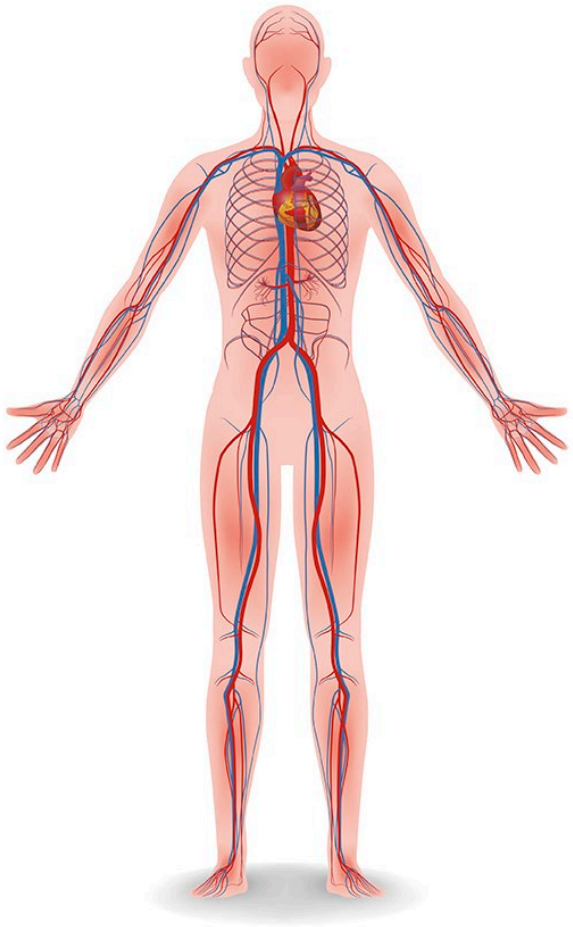


Opioid Analgesics—Adverse Reactions #3

- Gastrointestinal System Reactions:
  - Nausea, vomiting
  - Dry mouth, biliary tract spasms
  - Constipation , anorexia

Opioid Analgesics—Adverse Reactions #4

- Cardiovascular System Reactions:
  - Facial flushing
  - Tachycardia, bradycardia, palpitations
  - Peripheral circulatory collapse



Opioid Analgesics—Adverse Reactions #5

- Genitourinary System Reactions:
  - Urinary retention or hesitancy
  - Spasms of the ureters and bladder sphincter

Opioid Analgesics—Adverse Reactions #6

- Allergic and Other Reactions:
  - Pruritus
  - Rash
  - Urticaria
  - Sweating
  - Pain at injection site
  - Local tissue irritation

Opioid Analgesics—Contraindications

- Contraindicated in clients with:
  - known hypersensitivity to opioids
  - acute bronchial asthma, emphysema, or upper airway obstruction
  - head injury or increased intracranial pressure
  - convulsive disorders; severe renal or hepatic dysfunction; acute ulcerative colitis
  - Pregnancy (pregnancy category B and C drugs) or labor

Opioid Analgesics—Precautions

- Used cautiously in:
  - Older adults
  - Clients considered opioid naïve
  - Clients undergoing biliary surgery
  - Clients who are lactating
  - Clients with undiagnosed abdominal pain, hypoxia, supraventricular tachycardia, prostatic hypertrophy, and renal or hepatic impairment

Opioid Analgesics—Interactions

Interacting Drug	Common Use	Effect of Interaction
Alcohol	Social occasions	Increased risk for CNS depression
Antihistamines	Prevent or relieve allergies	Increased risk for CNS depression
Antidepressants	Alleviate depression	Increased risk for CNS depression
Sedatives	Sedation	Increased risk for CNS depression
Phenothiazines	Relief of agitation, anxiety, vomiting	Increased risk for CNS depression
Opioid agonist-antagonist	Gynecologic or obstetric pain relief	Opioid withdrawal symptoms if long-term opioid use
Barbiturates	Used in general anesthesia	Respiratory depression, hypotension, or sedation

Pharmacology in Practice Exercise #1

- A nurse is caring for a client who is prescribed opioid analgesics. Which of the following is an allergic reaction to opioid analgesics?

  a) Constipation

  b) Urticaria

  c) Palpitations

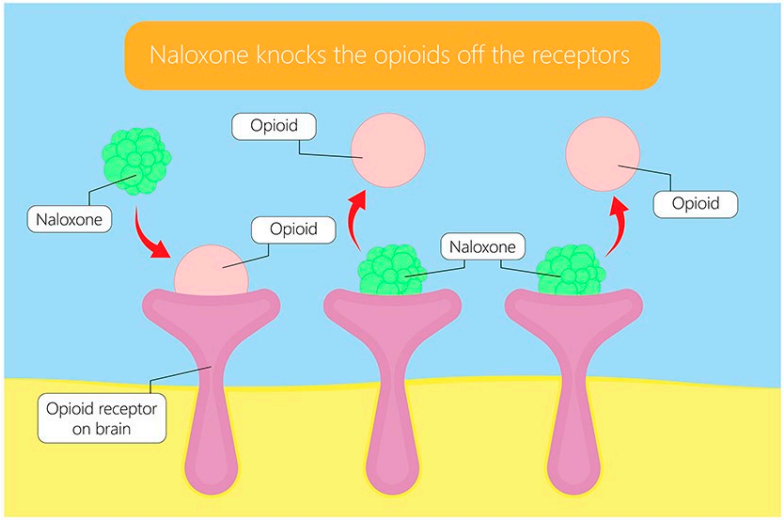
  d) Facial flushing

The Opioid Crisis

- Opioids are addictive
- Pain initiatives launched in several states in the United States that promoted health care providers to recognize and treat pain
- Pain became the 5th vital sign
- Overprescription of opioid analgesics
- Problems with overdose and death from opioid analgesics
- Nurses need to be able to respond to opioid overuse for both immediate rescue and long-term treatment of addiction

Opioid Antagonists—Actions

- Antagonist: greater affinity for opiate cell surface receptors than the opioid drug (agonists); competes for the receptor
- Prevents or reverses all effects; pain will return
- If the client has no opioid in their system, the antagonist has no drug effect



Opioid Antagonists—Uses

- Naloxone
- Postoperative acute respiratory depression
- Opioid adverse effects (reversal)
- Suspected acute opioid overdosage
- Other opioid antagonists are used to treat clients addicted to opiates

Opioid Analgesics—Adverse Reactions

- Generalized Reactions:
  - Nausea and vomiting
  - Sweating
  - Tachycardia
  - Increased blood pressure
  - Tremors

Opioid Antagonists—Contraindications, Precautions, and Interactions

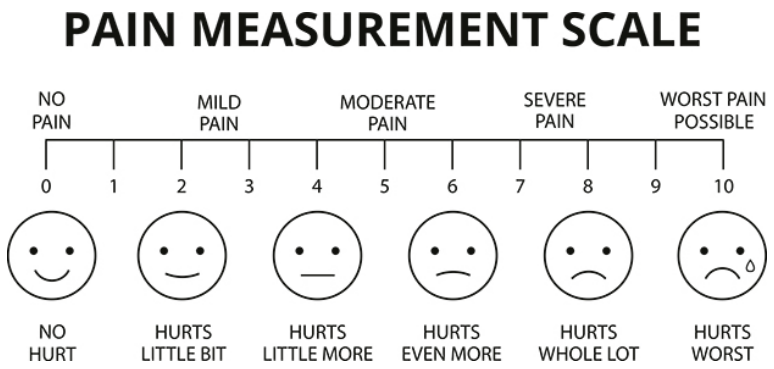
- Contraindicated in:
  - Client with known hypersensitivity to opioid antagonists
- Used cautiously in:
  - Pregnancy (pregnancy category B)/lactation
  - Infants of opioid-dependent mothers
  - Clients with opioid dependency or cardiovascular disease
- Interacts with opioids:
  - May produce withdrawal symptoms in clients who are physically dependent on the drug
  - May prevent the action or intended use of opioid antidiarrheals, antitussives, and analgesics

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #1

- Preadministration Assessment
- Objective Data
  - Assess each different pain
  - Description of site which is the cause of pain
  - Vital signs
  - Medications on EHR if in clinical setting

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #2

- Preadministration Assessment (continued)
- Subjective Data
  - Pain experience (onset, type, radiation, location, intensity, and duration)
  - Type and duration of symptoms
  - History of the pain—is this pain different?
  - Remedies attempted before seeking care
  - Response to previous medications taken for pain relief



Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #3

- Ongoing Assessment
  - Obtain blood pressure, pulse and respiratory rate, and pain rating
  - Pain rating can be taken 5 to 10 minutes after IV medication, 20 to 30 minutes after and IM medication, and 30 minutes after an oral medication
  - Notify primary health care provider if analgesic is ineffective
  - Inquire about details of pain

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #4

- Ongoing Assessment (continued)
  - Nursing judgment: when a change in pain/intensity or location needs to be reported to the primary health care provider
  - Opioid- naïve client: risk for respiratory depression (respiratory rate less than 10 breaths per minute)
  - If being used as an antidiarrheal, document each bowel movement and notify the primary health care provider if symptoms become worse, abdominal pain, or blood in stool

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #5

- Assessment for Opioid Antagonist
  - Preadministration Assessment
    - Assess and document blood pressure, pulse, respiratory rate
  - Ongoing Assessment
    - Monitor for response
    - After client is responsive, monitor vital signs every 5 to 15 minutes
    - Notify anesthesiologist or primary health care provider of adverse effects
    - Continue to monitor respiratory rate, rhythm, and depth; pulse; blood pressure; and level of consciousness until the effects of opioids have worn off
    - A repeat dose of naloxone may be ordered if the opioid seems to have a longer effect

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #6

- Nursing Diagnoses Opioid Agonist
  - Altered Breathing Pattern related to pain and effects on breathing center by opioids
  - Injury Risk related to dizziness or lightheadedness from opioid administration
  - Constipation related to the decreased GI motility caused by opioids
  - Malnutrition: Less Than Body Requirements related to anorexia caused by opioids

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #7

- Nursing Diagnoses Opioid Antagonist
  - Acute Pain related to the antagonist drug displacing the opioid drug cell receptor sites

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #8

- Planning
  - Expected client outcomes depend on the reason for administration of the drug but may include:
    - Relief of pain
    - Management of common adverse drug reactions
    - Understanding patient-controlled analgesia (PCA)
    - Absence of injury
    - Adequate nutrition intake
    - When using an antagonist, adequate ventilation and return of normal respiratory rate, rhythm, and depth
    - Confidence and understanding of the prescribed medication regimen

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #9

- **Implementation**
  - Promoting an optimal response to therapy
  - **Relieving Acute Pain**
    - Use of PCA pump
    - Client can self-administer pain medication when they feel pain
    - Nurse sets the time interval (or lockout interval) between doses

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #10

- Implementation
  - Promoting an optimal response to therapy
  - Relieving Acute Pain (continued)
    - Use of WHO pain ladder for pain management
    - Provider may prescribe a combination opioid and nonopioid analgesic for pain relief (hydrocodone + acetaminophen)
    - Severe pain that is acute or chronic—hydrocodone
    - Severe acute pain—sufentanil

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #11

- Implementation
  - Promoting an optimal response to therapy
  - Relieving Chronic Pain
    - Morphine sulfate is most widely used
      - Available orally, nasally, subcutaneously, IM, IV, and rectally
      - Given around the clock—not PRN
      - Oral route is preferred if the client can swallow safely
    - Controlled-release forms of opioids (oxycodone and morphine sulfate)
      - Taken every 8 to 12 hours
      - Should be swallowed whole and not broken, chewed, or crushed

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #12

- Implementation
  - Promoting an optimal response to therapy
  - Relieving Chronic Pain (continued)
    - When clients are on a long-acting opioid, fast-acting opioids can be given for breakthrough pain (morphine sulfate orally or sublingually)
    - Transdermal (fentanyl) route effective with severe pain associated with cancer
      - Used with caution in the elderly
      - Monitor for adverse reactions
      - Should not be used in opioid naïve clients

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #13

- Implementation
  - Promoting an optimal response to therapy
  - Compounding Medications
    - Brompton mixture—a mix of an opioid analgesic medication and another medication (antidepressant, stimulant, aspirin, acetaminophen, or sedative)
    - Best for clients with multiple symptoms like pain with anxiety or restlessness
    - Teach the client and family how to administer the drug
    - Monitor for adverse reactions

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #14

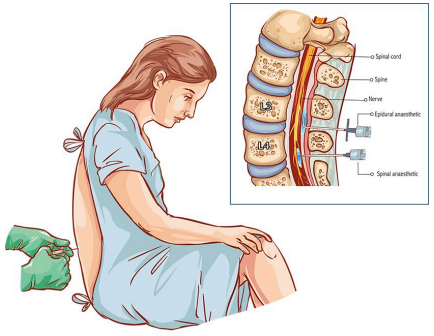
- Implementation
  - Promoting an optimal response to therapy
  - Tolerance Versus Dependence
    - Tolerance—client takes an opioid analgesic over time and the body physically adapts to the drug; greater amounts are needed to achieve the same effects
    - Physical dependence—the client experience adverse effects if the medication is stopped
    - Respiratory depression is usually not a concern in clients on long-term opioid therapy for chronic pain
    - Monitor for adverse effects to GI system and ensure client has a bowel program

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #15

- **Implementation**
  - Promoting an optimal response to therapy
  - **Using Transdermal System Pain Management**
    - Use only one patch at a time—find and remove old patch before applying a new one
    - To discard, fold the sticky sides together so it adheres to itself and dispose per facility policy or in a home setting dispose away from children and pets
    - Date and time the patch for time of application
    - Do not apply over hair and rotate the site of application
    - Use only water to cleanse the area prior to application
    - Press for 10 to 20 sections upon application
    - Remove old patch after 72 hours
    - Alert: heat can increase the absorption of the drug

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #16

- **Implementation**
  - Promoting an optimal response to therapy
  - **Using Epidural Pain Management**
    - Small amount of opioid analgesic is injected into the epidural space by bolus or continuous infusion pump
    - Step 4 of the WHO pain ladder
    - Fewer systemic adverse reactions, lower dose administered, and greater client comfort
    - Used for postoperative pain, labor pain, and intractable chronic pain



Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #17

- Implementation
  - Promoting an optimal response to therapy
  - Using Epidural Pain Management (continued)
    - Monitor for respiratory depression—apnea monitor
    - Vital signs are taken every 30 minutes
    - Monitor for sedation, confusion, nausea, pruritis, or urinary retention
    - Oxygen, resuscitation, and intubation equipment should be readily available as well as an opioid antagonist (naloxone)

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #18

- Implementation
  - Monitoring and Managing Client Needs
    - Altered Breathing Pattern
      - Encourage coughing and breathing deeply every 2 hours
      - Teach client that the coughing and deep breathing are to prevent pneumonia and other problems and are designed to help the body recover
      - Notify the provider of any adverse effects

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #19

- Implementation
  - Monitoring and Managing Client Needs
    - Injury Risk
      - Opioids can cause orthostatic hypotension—dizziness
      - Report changes in vital signs to provider
      - Assist the client with ambulatory activities and teach the client to rise slowly from a sitting or lying position
      - If miosis occurs, teach the client and family to keep the room well lit during daytime hours and advise the client to seek assistance getting out of bed at night

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #20

- **Implementation**
  - Monitoring and Managing Client Needs
    - **Constipation**
      - Assess the medical record to ensure client is on a stool softener or laxative
      - Record bowel movements daily
      - Notify provider of constipation

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #21

- Implementation
  - Monitoring and Managing Client Needs
    - Malnutrition
      - Assess food intake after each meal
      - Weigh client
      - Discuss treatment plans to address continued weight loss with anorexia with provider
      - Administer supplements as ordered
      - Provide comfort measures

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #22

- Implementation
  - Monitoring and Managing Client Needs
    - Impaired Self-Ventilation
      - After the administration of naloxone
      - Cardiac monitoring, oxygen therapy, artificial respiration per provider orders
      - Keep suction equipment readily available
      - Initiate and ensure IV access per provider orders

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #23

- Implementation
  - Monitoring and Managing Client Needs
    - Acute Pain
      - After the administration of naloxone, pain returns abruptly
      - Assess pain level and begin to treat the pain again when the client regains consciousness and breathing returns

Pharmacology in Practice Exercise #2

- A client in a postsurgical recover unit is prescribed a dose of naloxone. Which of the following interventions should the nurse perform during and after naloxone administration when caring for this client? Select all that apply.

  a) Monitor the client for symptoms of hypotension

  b) Make the suction equipment available

  c) Turn and suction the client when needed

  d) Provide oxygen or artificial ventilation if necessary

  e) Monitor hematologic changes

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #24

- Implementation
  - Monitoring and Managing Client Needs
    - Management of Opioid Physical Dependence in Acute Pain Management
      - Delays in medication
      - Drug-seeking behavior
      - Nurse often fears client's dependence
      - Clients with opioid dependence need good pain control/management
      - Drug dependence and withdrawal issues in infants born to opioid-dependent mothers—Withdrawal symptoms

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #25

- Implementation
  - Monitoring and Managing Client Needs
    - Management of Opioid Physical Dependence in Acute Pain Management (continued)
      - Wait 48 hours after the last dose of levomethadyl before administering the first dose of methadone or other narcotic
      - Maintenance therapy is designed to prevent desire
      - Dose and length of time vary
      - Clients on methadone maintenance need to continue therapy when hospitalized

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #26

- Implementation
  - Monitoring and Managing Client Needs
    - Management of Opioid Physical Dependence in Acute Pain Management (continued)
      - Levomethadyl is given three times a week to clients addicted to opioids who were not responsive to other treatments
      - Wait 48 hours after the last dose of levomethadyl before administering the first dose of methadone or other narcotic

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #27

- Implementation
  - Monitoring and Managing Client Needs
    - Management of Opioid Physical Dependence in Acute Pain Management (continued)
      - Detoxification—withdrawing the client from the opioid while minimizing the withdrawal symptoms
      - Methadone is a synthetic opioid used for detoxification
      - Maintenance therapy is designed to prevent desire
      - Dose and length of time vary
      - Clients on methadone maintenance need to continue therapy when hospitalized

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #28

- Implementation
  - Monitoring and Managing Client Needs
    - Management of Opioid Physical Dependence in Acute Pain Management continued

BOX 15.3 Symptoms of the Abstinence Syndrome

Early Symptoms
Yawning, tearing, runny nose, sweating

Intermediate Symptoms
Pupil dilation, tachycardia, twitching, tremor, restlessness, irritability, anxiety, anorexia

Late Symptoms
Muscle spasm, fever, nausea, vomiting, kicking movements, weakness, depression, body aches, weight loss, severe backache, abdominal and leg pains, hot and cold flashes, insomnia, repetitive sneezing; increased blood pressure, respiratory rate, and heart rate

Pharmacology in Practice Exercise #3

- A nurse is caring for a client who has delivered a baby. The client was opioid dependent during her pregnancy. Which of the following withdrawal symptoms should the newborn be monitored for due to the client's dependency? Select all that apply.

  a) Excessive crying

  b) Vomiting

  c) Yawning

  d) Coughing

  e) Sneezing

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #29

- Implementation—Educating the Client and Family
  - Develop a teaching plan for the client and family to include:
    - Inform that drug is for pain relief
    - Provide information on administration of drug and adverse effects
    - Discuss appropriate use and care of PCA infusion pump, transdermal patch
    - Give the family instruction in the parenteral administration of the drug or use of an IV pump

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #30

- Implementation—Educating the Client and Family (continued)
  - Develop a teaching plan for the client and family to include:
    - Avoid alcoholic beverages unless approved by the primary health care provider
    - If GI upset occurs, take drug with food
    - If indicated, teach client and family how to administer naloxone through the single-dose auto injector (Evzio) to the client if experiencing respiratory depression due to overdose

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #31

- Evaluation—Opioid Analgesics
  - Was the therapeutic response achieved? Is the pain relieved or discomfort reduced?
  - Were adverse reactions: identified, reported, and managed?
    - An adequate breathing pattern is maintained
    - No evidence of injury
    - Client reports adequate bowel movements
    - Client maintains an adequate nutritional status
  - Did client and family express confidence and demonstrate understanding of drug regimen?

Nursing Process—Client Receiving an Opioid Analgesic for Pain/Rescue from Respiratory Depression #32

- Evaluation—Opioid Antagonists
  - Client's respiratory rate, rhythm, and depth are normal
  - Pain relief is resumed

Turn and Talk—Case Study

- A 45-year-old is admitted to the hospital for an elective hysterectomy. She is to receive morphine via a patient-controlled analgesia pump postoperatively.

1. How should the nurse instruct the client to use the pump during preoperative teaching?
2. After the surgery, what information should be included in the nurse's ongoing assessment and how often should the assessments be completed?
3. What situations should be immediately reported to the physician?