

Chronic Pain

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Physiology of Pain

1. **Transduction** –stimulation of primary afferent fibers involved in pain nociceptors, triggers depolarization (exchange of Na⁺ and K⁺ ions) across neuronal membrane
 - a. Noxious stimuli causes cell damage with the release of sensitizing chemicals
 - Prostaglandins
 - Serotonin
 - Histamine
 - Bradykinin
 - Substance P
 - b. These substances activate nociceptors and lead to generation of action potential.

Physiology of Pain

2. Transmission –involves conduct of the action potential from injury site to spinal cord, brain stem, thalamus, cerebral cortex

a. Action potential continues from

- Site of injury to spinal cord
- Spinal cord to brainstem and thalamus
- Thalamus to cortex for processing

Physiology of Pain

- 3. Perception** – pain sensation is recognized
 - a. Conscious experience of pain

Physiology of Pain

4. **Modulation** – descending system of nerve fibers originating in the midbrain releases substances (serotonin, norepinephrine) that inhibit the ascending pain signal at dorsal horn level
 - a. Neurons originating in the brainstem descend to the spinal cord and release substances (e.g. endogenous opioids) that inhibit nociceptive impulses.

GATE Theory

- Pain is a function of the balance between information traveling into spinal cord through large nerve fibers and small nerve fibers
- Large fibers carry non-nociceptive information
- Small fibers carry nociceptive information.
- More activity in large fibers- less pain.
- More activity in small fibers – more pain.
- Interaction of three systems in spinal cord 1) large & small fibers, 2) brainstem & 3) cerebral cortex

Interventions

1. NSAIDS

- Inhibit prostaglandins
- Block transmission

2. Opioids

- Bind to receptors in dorsal horn & inhibit release of neurotransmitters
- Sub P interferes with transmission of pain message

Interventions

3. Membranes stabilizers

- Block ion channels, prevent action, potential generation (pain signal)

4. Antidepressants

- Inhibit reuptake of serotonin into neuronal fibers-thus makes serotonin available in synaptic area & inhibits nociceptive transmission (pain message)

Definitions & Characteristics

A. General Definition: Plan is whatever the experiencing person says it is, existing whenever the experiencing person says it does.

Definitions & Characteristics

B. Acute Pain

1. See observable signs of discomfort
2. Subsides as healing takes place
3. Brief duration
4. Maybe best treated with *prn* interventions

S/S - \uparrow HR, B/P \uparrow , O_2 need, resp. \downarrow cough-sputum retention, \downarrow gastric emptying, & \downarrow bowel motility

Definitions & Characteristics

C. Chronic Pain

1. Prolonged duration, usually 6 months or longer.
2. Adaptation occurs...may see no observable signs of discomfort.
3. May be best treated with scheduled or around the clock interventions.

Types of Pain

1. **Nociceptive** – injury to tissues/soft tissues, muscles & bones

a. Somatic

- Well localized usually from bone or spinal mets or injury to cutaneous or deep tissues.

b. Visceral

- Poorly localized-stretching, distension, contraction of smooth muscle walls (ischemia of visceral walls)
- Irritation / inflammation

Types of Pain

2. Neuropathic – damaged nervous system abnormal processing by nervous system- usually chronic, long term

a. Nerve Compression

- Throbbing, burning, scrubbing, sometimes deep ache triggered by movement
- Opioids, corticosteroids, radiation therapy
- Burning, shooting, electrical in nature, lacerating

Types of pain

b. Nerve Destruction

- Stinging discomfort, superficial burning, stabbing, sometimes deep ache, lacinating, numbness
- Antidepressants, anticonvulsants, nerve blocks, corticosteroids, TENs radiation, oral local anesthetics, caposen, Baclofen
- Pain experienced at distal site from spinal segment

Factors Influencing the pain Experience

Good pain control depends on:

1. Accurate diagnosis
2. Early intervention
3. Educate patient and family
4. TEAM – approach
5. Multimodalities
6. Patient focused – keep it simple

Assessment Parameters

A. Site (s)

1. “Where does it hurt?” “Where else?”
“Does it hurt anywhere else?”
2. Ask to point to sites or use drawings.

B. Character

1. “What does it feel like?” “Can you describe the pain to me?” “Is this the same or different from the pain in your (hip)?”

Assessment Parameters

C. Onset

1. “How long have you had this pain?” “When did you first notice discomfort?”
2. Compare to patient’s diagnosis, treatment history, and documented sites of metastasis.

D. Duration

1. “How long does it last?” “does it ever go away or seem better?”
2. Differentiate constant from intermittent pain.

Assessment Parameters

E. Frequency

1. “How often do you have this Pain?” “Does it always occur after or during a particular activity or at a particular time of day?”
2. Compare frequency of pain occurrence to medications actually taken; are meds scheduled/taken too infrequently?

Assessment Parameters

F. Intensity

1. “On a scale of 0-10, with 0 being ‘no pain’ and 10 being ‘the worst pain imaginable’, how would you rate your pain?”
2. Remember to rate all pains.
3. Use the scale most meaningful to the patient
 - a. Numerical scales
 - b. Descriptive scales
 - c. Color scales
 - d. Faces scales
 - e. Visual analogue

Assessment Parameters

G. Exacerbating Factors

1. “Is there anything that seems to make the pain worse?”
2. Question about activities, positioning, fatigue, anxiety.

Assessment Parameters

H. Associated symptoms

1. “Do you get any other bothersome or uncomfortable feelings when you have this pain?”

2. Possible associated physical symptoms

a. Nausea

c. Dyspnea

b. Fatigue

d. Weakness

3. Possible associated psychosocial-emotional-spiritual symptoms

a. Anxiety

c. Depression

b. Fear

d. Spiritual distress

Assessment Parameters

I. Alleviating factors

1. “What helps/relieves your pain?”
2. Assess use of medications, positioning, mobilization/immobility, heat/cold, massage, relaxation, distraction, prayer, etc.

J. Impact on quality of life

1. “Is there anything you would like to do that the pain prevents you from doing?”

Educate Patient to Use Scale

1. Show scale to patient and explain purpose.
2. Explain parts of pain scale.
3. Verify that patient understands pain scale.
4. Practice with pain scale (may need to show each visit)
5. Set goals for comfort and function-pain scale.
6. Nonverbal adults may show physical signs- diaphoresis, holding breath, guarding, irregular resp., tachycardia, dilated pupils, facial grimacing.

Physical Dependence/Tolerance/Addiction

- Fear of addiction seems to be major reason for under treatment.
1. **Tolerance** –Involuntary behavior based on physiological changes that occur after repeated administration of opioids. Dosage loses its effectiveness – need to increase dose for adequate relief.

Physical Dependence/Tolerance/Addiction

2. **Physical Dependence** –Involuntary behavior based on physiological changes that is evidenced by withdrawal symptoms that occur abruptly if opioid is stopped. Taper slowly.
3. **Addiction Psychological Dependence-** Behavior evidenced by overwhelming involvement with obtaining and using a drug for psychic effects not approved for medical reasons. Active, compulsive drug seeking.

Principles of Opioid Use

- Steady dose
- Dose adjustment 50-100% for severe pain
20-50% mild to moderate pain
- Time to Onset M.S. & oxycodone – 30 min
Peak plasma I.V. 10 min S.2. 30 min

Principles of Opioids

- Breakthrough dosing – 10% of 24 hour dose (includes breakthrough).
- Not more than 1 P.R.N. (breakthrough opioid)
- M.S. Drip- remember to titrate bolus if increasing basal rate.

Principles of Pain Management

- Begin with mildest drug
- Multidrug approach
- Move up the ladder
- Titrate meds to individual needs
- Consider S.E. of drugs
- Use breakthrough drugs
- Analgesia achieved-assess for anxiety, depression

Drugs to Avoid

- Demerol
- Darvocet
- Mixed agonist-antagonists talwin
- Combined products – watch ceiling effects of Tylenol.

Preferred Routes

- Oral
- S.E.
- Rectal
- Sublingual
- I.V. iv necessary

WHO Analgesic Ladder

Step 4 – Opioid via an invasive procedure such as epidurals or intrathecal administration.

Step 3 – Opioid for moderate to severe pain
= nonopioid analgesic = adjuvant therapy

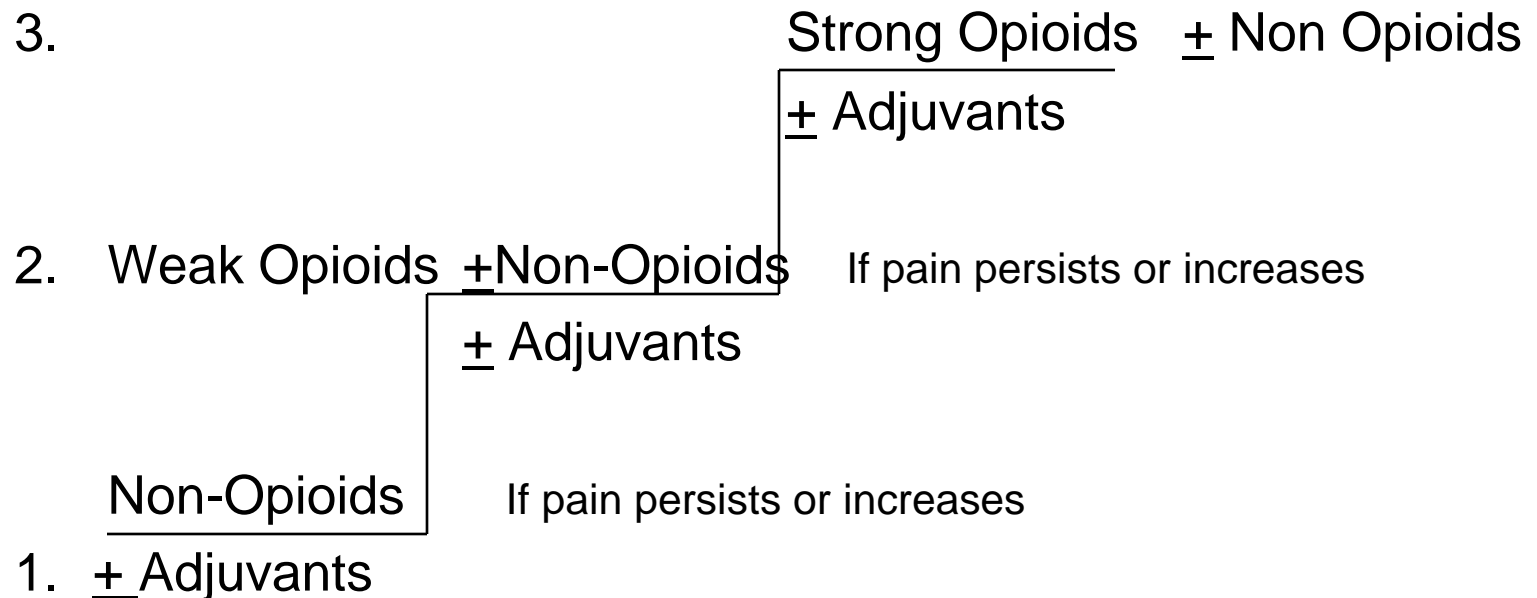
Step 2 – Opioid for mild to moderate pain-
nonopioid analgesic – adjuvant therapy

Step 1 – Nonopioid analgesic-adjuvant
therapy

Pharmacological Interventions for Pain

1. Medication to Manage Pain

A. The WHO analgesic ladder



Pharmacological Interventions for Pain

B. Non-Steroidal anti-inflammatory drugs (NSAIDs)

1. Actions:

a) analgesic

c) antipyretic

b) anti-inflammatory

2. Mechanism of action for anti-inflammatory effect: b locks prostaglandin synthesis, preventing stimulation of pain fibers at the peripheral level.

3. Indications: mild somatic or visceral pain; especially helpful for bone pain.

Pharmacological Interventions for Pain

4. Precautions

a) all have maximum daily dose

* watch combination meds for amount
of NSAIDS

b) potential GI side effects

c) potential for bleeding

Pharmacological Interventions for Pain

5. Example medications

a) aspirin

b) acetaminophen (Tylenol)

c) ibuprofen (Advil, Motrin)

Pharmacological Interventions for Pain

C. Opioids

1. **Action:** Analgesic

2. **Mechanism of action:** binds to opiate receptors in CNS and spinal cord, blocking the transmission of pain impulse.

a) **full agonist:** drug which when bound to the receptor stimulates the receptor to the maximum level

1) do not have a ceiling to analgesic efficacy

* note that although there is no analgesic ceiling, there may be other dose limiting factors.

2) will not reverse or antagonize effects of other opioids

Pharmacological Interventions for Pain

b) **partial agonist:** drug which when bound to the receptor stimulates the receptor to a level below the maximum level

- 1) display a ceiling effect

Pharmacological Interventions for Pain

- c) **Mixed agonist-antagonist:** drug which acts simultaneously on different types of receptors, with the potential for agonist action on one or more types & antagonist action on one or more types.
- 1) have an analgesic ceiling
 - 2) if patient also receiving full opioid agonists, may precipitate a withdrawal syndrome and increase pain-kicks off drug at mu sites

Pharmacological Interventions for Pain

3. Indications: moderate to severe somatic or visceral pain; intensity of pain directs medication selection

4. Side effects:

- Respiratory depression
- Sedation
- Nausea/vomiting
- Constipation

Pharmacological Interventions for Pain

5. Dangers associated with meperidine (Demerol)
 - a) normeperidine, an active metabolite of meperidine, is a CNS stimulant
 - b) Meperidine is NOT recommended for the treatment of chronic pain.

Pharmacological Interventions for Pain

D. Antidepressants

1. **Action:** antidepressant, analgesic

2. **Mechanism of analgesic action:** prevention reuptake of serotonin & norepinephrine, inhibiting transmission of the pain impulse.

- a) tricyclic antidepressants appear to be superior for pain.
- b) the newer SSRI's, while preferred for treatment of depression do not appear to be as effective for pain.

Pharmacological Interventions for Pain

3. **Indication:** neuropathic pain described as dull, aching or burning.

4. **Side effects:**
 - a) drowsiness (dose at bedtime)
 - b) dry mouth
 - c) urinary retention
 - d) orthostatic hypotension

Pharmacological Interventions for Pain

5. Example medication

- a) amitriptyline
- b) nortriptyline
- c) doxepin

6. Titration

- a) may take 5-7 days to reach steady rate

Pharmacological Interventions for Pain

E. Anticonvulsants

1. **Action:** anticonvulsant, analgesic
2. **Mechanism of action:** blocks conduction of the nerve impulses by limiting influx of sodium ions across cell membrane
3. **Indications:** stabbing
4. **Side effects:**
 - a) drowsiness
 - b) nausea
 - c) constipation
5. **Example medications**
 - a) carbamazepine
 - b) gabapentin
 - c) phenytoin
 - d) lyrica

Pharmacological Interventions for Pain

F. Corticosteroids

1. **Action:** anti-inflammatory
2. **Mechanism of action:** suppresses leukocyte activity, decreases capillary permeability, suppresses abnormal electrical activity and anti-inflammatory.
3. **Indications:** bone pain unrelieved by NSAIDs + opioids, headache of increased intracranial pressure, pain of spinal cord compression or nerve plexus infiltration.

Pharmacological Interventions for Pain

4. Side effects:

- a) depression
- b) hypertension
- c) thrombocytopenis
- d) diarrhea
- e) masking of infections
- f) fluid retentions

5. Example medications

- a) dexamethasone (Decadron)
- b) prednisone (Deltasone)

Pharmacological Interventions for Pain

G. Antispasmodics/Muscle Relaxants

1. **Action:** smooth or skeletal muscle relaxation

2. **Mechanism of action:**

a) anticholinergics inhibit the action of acetylcholine, a substance needed for smooth muscle contraction.

b) the skeletal muscle relaxants work in a variety of ways, some of which are not clearly understood.

3. **Indications:** muscle spasm, “grabbing” pains of abdomen, bladder spasms

Pharmacological Interventions for Pain

4. Side effects

a) belladonna alkaloids

1) confusion/agitation

2) dry mouth

3) constipation

4) palpitations

b) skeletal muscle relaxants

1) dizziness

3) drowsiness

2) weakness

4) nausea

Pharmacological Interventions for Pain

II. Using an Equianalgesic List

A. Equianalgesic means having equal pain-killing effect.

1) Used to convert from one route to another or from one opioid to another.

2) Morphine 10 IM is generally the opioid analgesic used as a comparison.

Pharmacological Interventions for Pain

B. Dosing calculations

1. To convert from IV to PO (using morphine as an example)

a) add up the total dosage of opioid used in 24 hours via IV route

b) using data from chart, set up a proportion equation

Pharmacological Interventions for Pain

c) **example:** patient receiving 10 mg morphine
q hour via IV infusion

1) $10 \text{ mg/hr} = 240 \text{ mg/24 hours}$

2) $\frac{10 \text{ mg IV}}{30 \text{ mg PO}} = \frac{240 \text{ mg IV}}{X}$

3) $10x = 7200$

4) $X = 720$ of morphine PO in 24 hours

5) $720/2 = 360 \text{ mg PO q 12 h,}$
 $720/6 = 120 \text{ mg PO q 4 h}$

Pharmacological Interventions for Pain

- III. Principles for Using Medications Effectively
 - A. Assessment must be comprehensive and ongoing.
 - B. Select pharmacologic interventions based on the type (s) & intensity of the pain (s).
 1. Use the WHO analgesic Ladder as a guide to pharmacologic interventions.
 2. Use appropriate adjuvants as indicated by assessment.
 3. Use appropriate strength opioids as indicated by assessment.

Pharmacological Interventions for Pain

- C. If the gut works, use it
 - 1. According to most sources, at least 90% of patients can receive good pain control with PO, PR, or SL administration of medications.

Pharmacological Interventions for Pain

2. When the patient can tolerate PO & they are not comfortable, it is due to one of these factors:

- a) dose is inadequate
- b) medications are scheduled too infrequently
- c) the correct adjuvant is not being used.
- d) no allowance is being made for breakthrough pain
- e) the patient falls into the less than 10% of the population who will require parenteral (SQ or IV) or spinal medication or a surgical procedure to control pain.

Pharmacological Interventions for Pain

- D. When scheduling, consult an equianalgesic list or drug reference book to determine duration of action. If the medication is not managing the pain for the stated duration of action, the dose is probably inadequate.

- E. When switching from one opioid to another or from one route to another, consult an equianalgesic list to determine the appropriate dose.

Pharmacological Interventions for Pain

- F. Always have a PRN available for break-through pain; may be called “rescue”.
 - 1. Although many ways persons have calculated this, standard is now
 - a) 10% - 15% of the 24-hour total
 - 2. If the patient is requiring frequent rescue doses, the dose of both ATC dosing and rescue needs to be increased.

Pharmacological Interventions for Pain

3. Ideally, you would use the same drug for rescue as you use for the maintenance dose. If, however, the patient has a big supply of other meds in the home, you may want to use some of those meds, (e.g. Percocet). Just be sure it is the correct equianalgesic dose.
 - a) example: if you need 10 mg morphine equivalent for the rescue dose, use 2 Percocet.
 - b) CAUTION: be sure you are not exceeding the ceiling doses of acetaminophen or aspirin when using combination meds.

Pharmacological Interventions for Pain

G. Titrate to effectiveness

1. Goal is adequate analgesic without intolerable side effects (should be able to manage with simple interventions)
2. If patient consistently requires more than 2 rescue doses in 24 hours, the ATC dose should be increased.
 - a) Add up the dosage of the ATC and all rescue doses to get a 24 hour total and use that as the basis for the new ATC dose; recalculate an appropriate rescue dose.

Pharmacological Interventions for Pain

3. Pain out of control (“pain emergency”)
 - a) if patient is in severe pain (8-10 on 0-10 scale), consider a parenteral route
 - 1) in the opioid naïve patient in sever pain give 10 mg morphine IV/SQ (or equivalent)
 - 2) In the patient on ATC opioids, give a dose 75-100% higher than previous dose

Pharmacological Interventions for Pain

b) after initial bolus, give rescue doses PRN (q 15 minutes for parenteral or q 1 hour for PO)

c) when pain is at satisfactory level, calculate a new ATC and rescue dose

1) use immediate release medications for first 24-48 hours to assure pain is under control at this new dose.

2) when stable, convert to sustained release for convenience

Pharmacological Interventions for Pain

H. Keep It Simple

Summary of Principles of Pain Management

1. The pain assessment data are documented so the pain etiology or syndrome can be identified & appropriately treated.
2. The oral route is used whenever possible. If the patient is unstable to take PO medications, buccal, sublingual, rectal, & transdermal routes are considered before parenteral routes. IM route is avoided. IV route commonly used in the inpatient setting.
3. Constant pain calls for treatment with an around-the-clock scheduled long-acting opioid & a short-acting medication for breakthrough pain

Summary of Principles of Pain Management

1. The pain assessment data are documented so the pain etiology or syndrome can be identified & appropriately treated.
2. The oral route is used whenever possible. IF the patient is unable to take PO medications, buccal, sublingual, rectal & transdermal routes are considered before parenteral routes. IM route is avoided. IV route commonly used in the inpatient setting.
3. Constant pain calls for treatment with an around-the-clock scheduled long-acting opioid & a short-acting medication for breakthrough pain.

Summary of Principles of Pain Management

4. Use an adequate rescue dose for breakthrough pain. APS rescue dose recommendation is 10-15% of the 24-hour dose q 2 hr PRN.
5. Increase the baseline dose if the patient needs more than 3 rescue doses in 24 hours.
6. A higher percentage for breakthrough, or rescue dose, is sometimes used if frequency of breakthrough pain or intensity of pain are at the higher level.

Summary of Principles of Pain Management

7. To calculate rescue dose when Fentanyl (Duragesic) is used, divide the total patch dose by 3 – that is the appropriate dose of MSIR.
8. Intermittent pain calls for treatment with an as needed (prn) medication. Patients & families, however, need to be educated about taking the medication when the pain is first perceived – not when it has become severe or unbearable.
9. Only one analgesic is ordered for breakthrough pain.

Summary of Principles of Pain Management

10. Only one long-acting opioid is ordered for constant pain.
11. Doses of opioids are increased commensurate with the patient's report of pain.
12. Equianalgesic conversions are used when changing medications and/or routes.
13. Adjuvant medications are used for opioid non-responsive neuropathic pain.
14. Non-pharmacologic approaches are always a part of any pain management plan.
15. An appropriate preventative bowel regimen is ordered.

Alternative Routes for the Administration of Opioids

The oral route is the preferred route for all patients. An alternative route of analgesia may be appropriate if:

1. a patient cannot tolerate oral medications;
2. a patient is not obtaining satisfactory pain relief by the oral route and has received maximal dosages at appropriate frequency of administration and has also received appropriate adjuvants in the oral regimen; or
3. a patient is experiencing unacceptable side effects associated with the oral route.

Alternative Routes for the Administration of Opioids

1. Rectal
 - A. Absorption of medications
 1. Blood supply
 - a) lower rectum: middle & inferior rectal veins
 - 1) flows to inferior vena cava to systemic circulation
 - 2) eliminates the first “by-pass effect” of liver
 - 3) theoretically, medications should have efficacy similar to parenteral route

Alternative Routes for the Administration of Opioids

b) upper rectum: superior rectal vein

1) goes through portal circulation & to liver

2) medications should have efficacy similar to PO

2. Uptake is via passive transport

a) feces hinders absorption

b) aqueous solutions are absorbed more quickly than suppositories or tablets.

Alternative Routes for the Administration of Opioids

B. Advantages

1. Available route (can also use colostomy)
2. Many medications can be given rectally without change in formulation.
 - a). Very helpful in emergency/middle of the night situations.
 - b) studies show comparable systemic absorption of PR and PO
 - 1) morphine-most patients require same dose PR as PO

Alternative Routes for the Administration of Opioids

3. Inexpensive

C. Disadvantages

1. Some variability in absorption
2. Presence of feces hinders absorption
3. Some patient and families find the rectal route objectionable, leading to potential compliance issues.

Alternative Routes for the Administration of Opioids

II. Buccal or Sublingual

A. Absorption of medications

1. Sublingual space is highly vascular
2. Absorption via this route eliminates the first by-pass effect of liver.

B. Advantages

1. Available route

Alternative Routes for the Administration of Opioids

2. Although morphine is poorly absorbed SL, liquid or water-soluble tabs of morphine have been given via this route with effectiveness
 - a. The drug is probably slowly swallowed, not absorbed SL
 - b. Use same dose as PO as when swallowed, not bypassing liver.
3. Oral transmucosal fentanyl citrate (Actiq) was approved for breakthrough pain in November 1998, available on market in March 1999.

Alternative Routes for the Administration of Opioids

4. If using PO morphine, route is inexpensive.

C. Disadvantages

1. Loss of swallow reflex in imminent death situation may lead to aspiration of medications.
2. The oral transmucosal fentanyl citrate may be expensive.

Alternative Routes for the Administration of Opioids

III. Parenteral

A. Intramuscular

1. Advantages

a) an alternative if cannot tolerate oral

Alternative Routes for the Administration of Opioids

2. Disadvantages

- a) this route is painful & invasive
- b) suitable injection sites are often lacking in the cachetic patient
- c) requires expertise to give appropriately; difficult to manage in home setting.
- d) short duration of action means frequent injections, this is not practical for chronic pain management
- e) drug absorption is highly variable

Alternative Routes for the Administration of Opioids

B. Subcutaneous

1. Advantages

- a) rapid onset of action, but slower than IV
- b) continuous infusion offsets short duration of action & maintains constant level of analgesia in system.
- c) little difficulty associated with accessing sites.
 1. Recommended sites include abdomen, supraclavicular & anterior chest wall
 2. Sites are changed according to agency policy, usually every 2 to 7 days, or if signs of irritation.

Alternative Routes for the Administration of Opioids

d) continuous infusion avoids repetitive IM or SQ injections.

2. Disadvantages

a) invasive

b) amount of fluid which can be absorbed is limited

c) some patients/families find pumps & lines increase anxiety

Alternative Routes for the Administration of Opioids

C. Intravenous

1. Advantages

- a) rapid onset action
- b) continuous infusion offsets short duration of action & maintains constant level of analgesia in system
- c) easy to titrate
- d) continuous infusion avoids repetitive IM or SQ injections
- e) may program pumps to provide rescue doses

Alternative Routes for the Administration of Opioids

2. Disadvantages

- a) finding a good vein may be difficult
- b) more complicated site care for patients/families
- c) greater incidence of infection than with SQ
- d) some patients/families find pumps and lines increase anxiety.

Alternative Routes for the Administration of Opioids

IV. Transdermal

A. Fentanyl is only opioid commercially available by the transdermal route

1. Fentanyl is a potent, short-acting synthetic opioid.
2. Available in 25, 50 & 100 microgram/hour patches; can use multiple patches to achieve dose
3. Intended to last 72 hours, some persons obtain relief for only 48 hours.

Alternative Routes for the Administration of Opioids

4. Takes 12-24 hours to reach peak plasma concentrations; patient must receive opioid by some other route during this time.
5. Depot of medication remains in skin for 24 hours after patch is removed.
6. For disposal, the patch should be folded so that the adhesive side adheres to itself & the patch should then be flushed down the toilet.

Alternative Routes for the Administration of Opioids

B. Advantages

1. Non-invasive
2. Useful for those whose opioid dose is constant & who cannot or will not take oral meds regularly.

Alternative Routes for the Administration of Opioids

C. Disadvantages

1. Not useful for rapid titration or for patients with changing opioid requirements.
2. Much more expensive than oral morphine.
3. Still must have an alternative short-acting opioid for breakthrough pain.
4. Many have found dosage conversion charts to be conservative, with patients often requiring higher doses of transdermal fentanyl than shown on the charts.

Alternative Routes for the Administration of Opioids

V. Intraspinal Opioids

A. Epidural

1. Epidural space composed of adipose tissue, blood vessels, & connective tissue
2. Medications diffuse across dura to spinal cord.
3. 24-hour epidural dose may be about 1/10 that required IV or IM per 24 hours.

Alternative Routes for the Administration of Opioids

4. Side effects:
 - a) infection
 - b) nausea and vomiting
 - c) urinary retention
 - d) pruritus
 - e) respiratory depression
 - f) myoclonus in high doses

Alternative Routes for the Administration of Opioids

5. Potential risk of catheter migration into intrathecal space causing overdose
6. For chronic pain management recommend:
 - a) continuous infusion vs. intermittent bolus (avoids peaks & valleys)
7. When switching from oral to intraspinal, must taper oral dose gradually to prevent withdrawal symptoms.

Alternative Routes for the Administration of Opioids

B. Intrathecal

1. Medication given directly into CSF
2. 24-hour intrathecal dose may be about 1/100 that required IV or IM per 24 hours
3. Side effects: same as for epidural with higher risks for meningitis & increased incidence of pruritis & respiratory depression; in addition, risk of spinal headache if CSF loss

Alternative Routes for the Administration of Opioids

4. For chronic pain management recommend:
 - a) continuous infusion vs. intermittent bolus (avoids peaks & valleys)
 1. may be connected to an implanted or external pump
 2. implanted pumps are expensive & involve major surgery; life expectancy should be greater than a few months (some state 3-6 months) to even consider an implanted pump.

Alternative Routes for the Administration of Opioids

C. Some other medications given intraspinally for pain management.

1. Local anesthetics

- a) meds selected to block pain impulses without motor dysfunction
- b) bupivacaine used most frequently

2. Clonidine

- a) blocks transmission of pain signals by inhibiting substance P release & dorsal horn firing
- b) may be helpful with neuropathic pain

Syringe Driver Procedure

1. Obtain initial doctors orders
2. Assemble equipment

syringe driver

battery

softset (needleset)

12 cc syringe

MS/Haldol/Robinol

sterile water

betadine

alcohol wipes

transparent dressing

tape

bag

pine

Syringe Driver Procedure

3. Fill syringe with MS, then sterile water, then Haldol, then Robinol if ordered to an amount equal to 10 cc or 12 cc.
4. Purge tubing
5. Inset battery into driver
6. Turn off alarm
7. Set the driver based upon the amount of solution in the syringe.
8. Insert syringe into driver.
9. Tape into place

Syringe Driver Procedure

10. Cleanse skin with betadine & alcohol. If patient is allergic to this, may use Hibaciens.
11. Peel off adhesive backs.
12. Insert plastic catheter at a 90 degree angle & remove needle.
13. Cover insertion site with transparent dressing. Site shall be assessed QD for S/S of redness infection (change site at least every 3 weeks).
14. Tape tubing securely.
15. Start driver

Syringe Driver Procedure

16. Place driver in bag & pin bag to gown

17. Verbalize assessing for signs of infection

To Change Syringe Driver

1. Fill 12 cc. syringe with medication equal to 10 cc or 12 cc.
2. Stop driver
3. Remove old syringe
4. Attach tubing to new syringe
5. Set driver based upon the amount of solution in the new syringe.
6. Insert syringe into driver.
7. Secure the syringe
8. Start the driver

To Change Syringe Driver

9. Insert the driver into the bag
 10. Press button to give bolus
- Assess soft set site each visit at home or each shift in hospital or N.H.

THE END