

PRN Program: Analgesics



Materials: Participant guide and additional journal articles to be provided to participants at least 1 week in advance.

- Flip chart or Whiteboard and Markers

Room Setup: In tables of 4 or 6-8 depending on number of participants

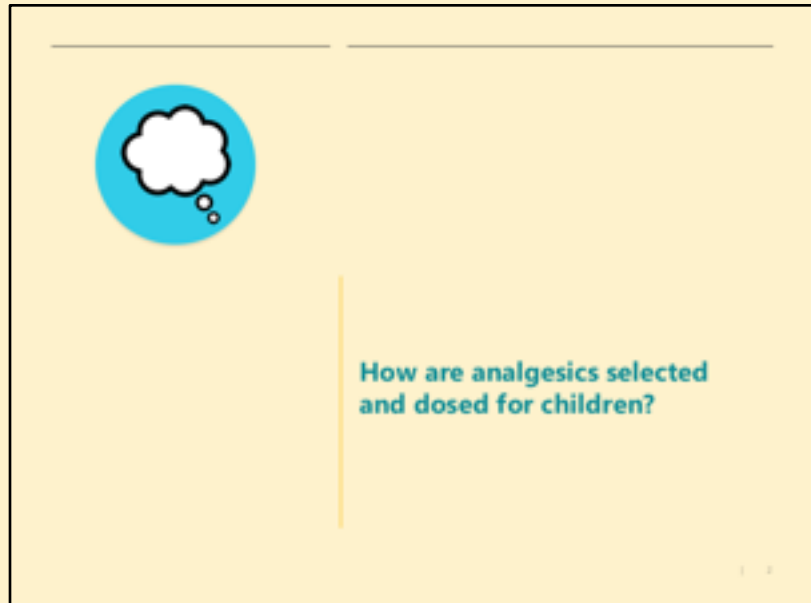
- Display slide as participants walk in
- This session is **60 minutes**

Welcome & Introductions: *Introduce facilitator if necessary.*

READ: The learning objectives for this content are to:

- Explain principles for treating children's pain with pharmacologic therapies.
- Describe how developmental differences influence use of non-opioids, opioids, co-analgesics and adjuvant medications in pediatric pain treatment plans
- Develop pediatric multimodal pain treatment plans that demonstrate knowledge of age-related considerations, mechanism of action, indications, route, contraindications, and adverse effects of pharmacological therapies

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ASK: How are analgesics selected and dosed for children as compared to adults?

Select participants willing to share their answers to this question.

Write on flipchart or whiteboard
[Limit discussion to 3 minutes]

[5 MINUTES of 60 minute session is complete]

PRN Program: Analgesics

Key assessments for developing a pain treatment plan



Past/current pain control methods and their effectiveness

- Pharmacological
- Physical
- Psychological
- Complementary and alternative medicines

Assess for multiple sites, causes, and types of pain

Obtain a comprehensive medication and pain treatment history


Identify drug-related fears

READ these Key points (if not included by participants):

- Treat pain based on cause, type, site, and severity
- Assess for multiple sites, causes, and types of pain
- Assess past and current pain control methods and their effectiveness
 - ✓ Medications and non-drug treatments tried
 - ✓ Their efficacy & adverse effects, including allergies
 - ✓ Concurrent treatments and potential drug-drug interactions
 - ✓ Identify drug-related fears that may lead to inadequate or under-treatment of pain or poor treatment adherence
- Give adequate doses
 - ✓ Pediatric patient doses are based on weight, age, and sometimes body surface area
- Reassess pain regularly and document assessment
 - ✓ Nurses should administer analgesics at intervals consistent with durations of analgesia. Because of variability of individual drug responses, nurses should determine the duration of analgesics by evaluating patient response and being vigilant for the return of pain.
- Evaluate treatment efficacy and document evaluation

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Develop a pain treatment plan



Cure sometimes, treat often, comfort always. –Hippocrates

Treat pain based on cause, type, site, and severity

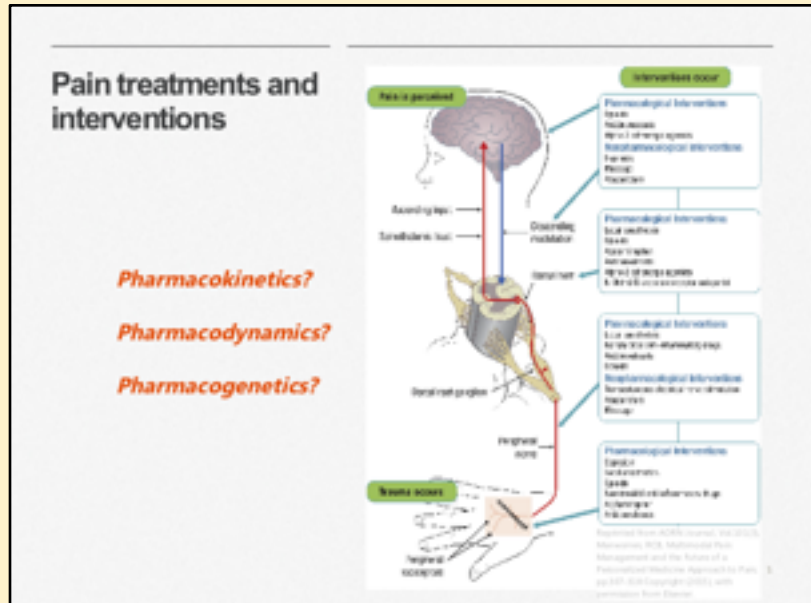
Develop realistic pain treatment goals

Develop an age and developmentally-appropriate multi-modal pain treatment plan

READ:

- Develop realistic pain treatment goals. Focus on:
 - ✓ Pain relief or reduction and Functional recovery or restoration
- Develop an age and developmentally-appropriate multi-modal pain treatment plan
 - ✓ Both now and in the future, **self-report** of pain, pain location, quality, and severity will provide additional guidance in developing individualized treatment plans for patients who are able to self-report.
 - ✓ Cause of pain, disease, treatments, and procedures, including surgery, provide guidance for developing pain treatment plans.
 - ✓ This may be the only guidance available to help manage pain in critically ill, pre-verbal, and nonverbal neonates, infants, and children.
 - ✓ In the future, genetics of pain sensitivity and pharmacogenetics may also provide predictive guidance for planning individualized pain treatments.

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READ: The effect of analgesics and biobehavioral interventions is indicated along the nociceptive pain pathway to illustrate its mechanism of action.

ASK: What are pharmacokinetics, pharmacodynamics, and pharmacogenetics? Do these alter individual treatment plans?

Select participants willing to share their answers to this question.

Write on flipchart or whiteboard

[Limit discussion to 3 minutes]

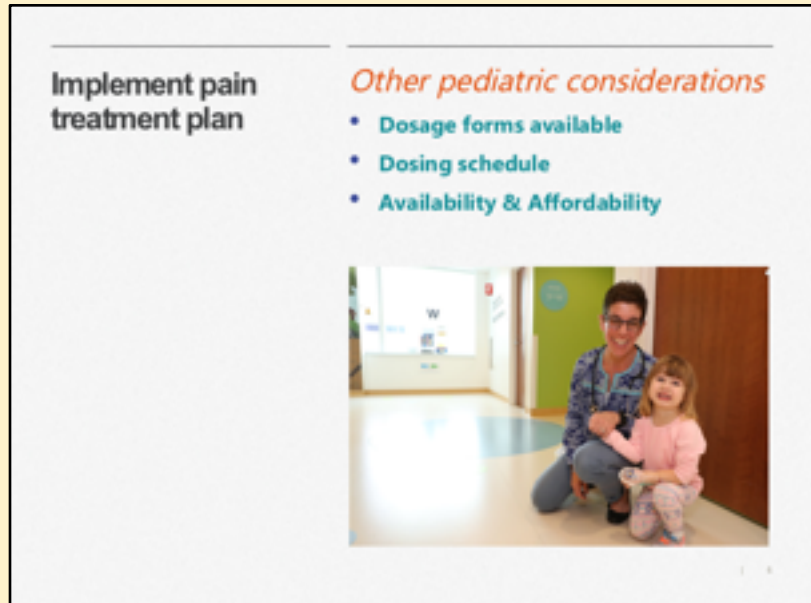
READ these Key points (if not included by participants):

- Pharmacokinetics is what the **body** does to the **drug**.
- Pharmacodynamics is what the **drug** does to the **body**, and
- Pharmacogenetics is the influence of **individual allelic** differences and associated variability in medication responses.

READ: Thus, one size does not fit all, and the treatment plan may need to be adjusted to address individual variability in pain experience and analgesic efficacy.

[10 MINUTES of 60 minute session is complete]

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ASK: What do you do when a child refuses to take a liquid analgesic?

Select participants willing to share their answers to this question.


Write on flipchart or whiteboard

[Limit discussion to 3 minutes]

READ these Key points (***if not included by participants***):

- Since medications are dosed based on weight, a tablet or capsule is may be “one size fits all”.
- Consider the dose being prescribed as well as whether the patient will take the liquid form of the medication.
- Bitter medications can often be masked by citrus, so mixing in orange juice can help. Chocolate syrup is another agent that can be helpful for some children. Consider whether there are other forms of the drug the child will tolerate.
- Consider frequency and challenges to schedule adherence like school, sleep, and timing around meals.
- Some prescription medications and most over-the-counter medications are not covered by insurance, so they may be cost-prohibitive
- Many oral suspensions are not readily available and may need to be extemporaneously compounded

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Patty

What is your multimodal pain management plan?

Consider both analgesics and biobehavioral interventions.

Patty is a non-verbal, 3 year old female (14kg) with cerebral palsy, g-tube, and recent diagnosis of non-hemorrhagic pancreatitis. She is NPO and has the following orders:

- Morphine IV every 4 hrs PRN,
- Acetaminophen IV every 6 hrs PRN, and,
- IV ketorolac every 6 hrs.

She is on her last dose of a total of 48 hrs of ketorolac. Her parents report that Patty is in constant abdominal pain

READ: Patty is on her last dose of a total of 8 of ketorolac. Her parents report Patty is in constant abdominal pain, not sleeping at night, and gagging. Patty is comfortable only in the fetal position or when being held. Her rFLACC scores range from 4-8/10

This is a 10 minute case, with your **table** discuss your answers to the questions on the slide. You will have 5 minutes to discuss the case and prepare to share your plan with the group

[Give groups 5 minutes to discuss case. During their discussion:

Write age, weight, and medication orders on flipchart or whiteboard]

Select participants willing to share their group's answers.

[LIMIT discussion to 1-2 mins/group, max of 5]

Write changes to the plan on flipchart or whiteboard

READ these Key points **(if not included by participants):**


- Consider changing the morphine to as often as every 1-2 hours and giving the morphine and acetaminophen around the clock.
- To ascertain if continuing the IV ketorolac is contraindicated, obtain a BUN and creatinine. If these labs are in acceptable ranges, continue the IV ketorolac for a maximum of 20 doses.
- Nonpharmacological interventions include positions of comfort, but continue to change positions, adapt environment as guided by family's past experiences with Patty's pain.
- Provide distraction type activities, music, and if possible, consult a child life specialist

[25 MINUTES of 60 minute session is complete]

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Implement pain treatment plan

Non-opioids	Opioids	Co-analgesics or Adjuvant Analgesics	Other Adjuvants
<ul style="list-style-type: none">• Ceiling of analgesia	<ul style="list-style-type: none">• Historically considered not to have a ceiling of analgesia	<ul style="list-style-type: none">• Analgesia may or may not be the primary indication for these drugs• Ceiling of analgesic effect or adjuvant effect	<ul style="list-style-type: none">• Used to treat related problems, such as insomnia, depression, and anxiety• Used to treat analgesic adverse effects, like opioid-induced constipation



READ:

The mainstays of analgesia are non-opioids and opioids. However, there are many other medications commonly included in patient treatment plans to treat pain, associated symptoms and conditions, and analgesic adverse effects. These medications may or may not have analgesia as a primary treatment indication.

You will now have 1 minute to write down every medication you can think of that may be appropriate for a pediatric pain treatment plan.

Ready, set, go!

ASK: Who has over 10 medications written down? 15?

*[Identify participants with the most and have them read their lists and then compare them with the list **shown on the next slide**]*

[Limit discussion to 2 minutes]

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Medications	Non-opioids	Opioids
	Acetaminophen NSAIDs <ul style="list-style-type: none">• Aspirin• Choline magnesium trisalicylate• Ibuprofen• Naproxen• Ketoprofen• Indomethacin• Meloxicam• Ketorolac• Diclofenac• Celecoxib	Full Agonist <ul style="list-style-type: none">• Codeine• Fentanyl• Hydromorphone• Hydrocodone• Levorphanol• Morphine• Meperidine• Methadone• Oxycodone• Oxymorphone Partial Agonist <ul style="list-style-type: none">• Buprenorphine Mixed <ul style="list-style-type: none">• Nalbuphine Antagonist <ul style="list-style-type: none">• Naloxone• Naltrexone Dual Action <ul style="list-style-type: none">• Tramadol• Tapentadol

READ: How do you manage dosing of pediatric patients?

- Based on the type of medication, you might use weight, age, or body surface area.
- Many medications have not been studied in pediatric patients and dosing may be empirical or extrapolated from recommendations for adults
- Medications may need to be adjusted based on individual patient response and adverse effects

In general, drug dosing assumes patients are extensive metabolizers (EM), since this is the largest proportion of the population.

[30 MINUTES of 60 minute session is complete]

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Patty, continued

What are the advantages and disadvantages of these treatment plans?

- Oral/G-tube hydromorphone
- Oral/G-tube oxycodone
- Oral/G-tube methadone

READ: Patty has been receiving IV hydromorphone for 3-4 weeks. Dosing has increased to a total daily dosage of 3mg or 3000mCg/day. She is tolerating G-tube feedings and is not sedated.

ASK: What are some advantages or disadvantages to the suggested oral/g-tube opioid(s) for her discharge home?

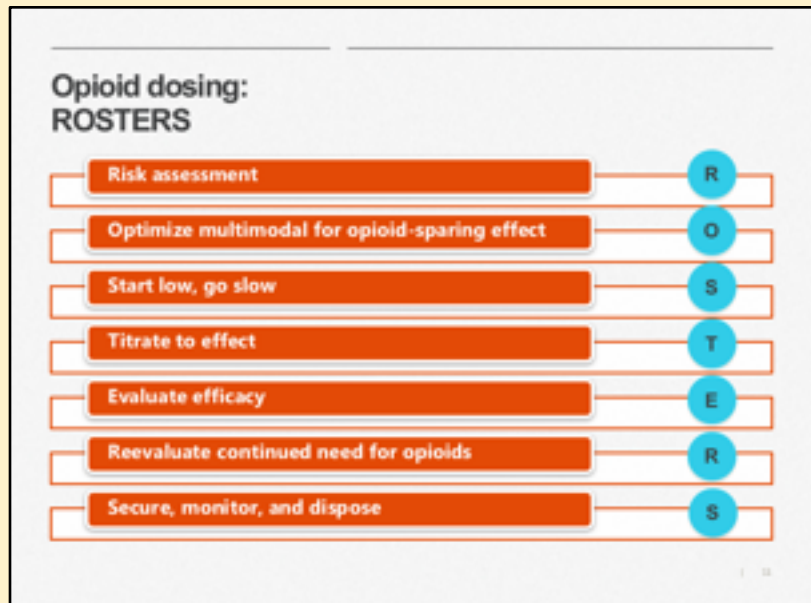
Select participants willing to share their answers to this question.

[Limit discussion to 3 minutes]

READ these Key points (if not included by participants):

1. Liquid hydromorphone:
 - Is it available from family's home pharmacy?
 - How much needs to be given and since it needs to be given every 3-4 hours, will the schedule be convenient for the family
 - Educate family about: Weaning schedule, withdrawal assessment, storage of medication, and disposal of any remaining medication.
2. Liquid oxycodone: same as above.
3. Liquid Methadone: same as above and
 - May take several days to find the best dose. Monitor for both sedation and withdrawal.
 - Obtain ECG prior to start due to potential for prolongation of QTc (cardiac).
 - Adherence with methadone every 12 hours may be easier for the family than every 4 hours for short-acting opioids

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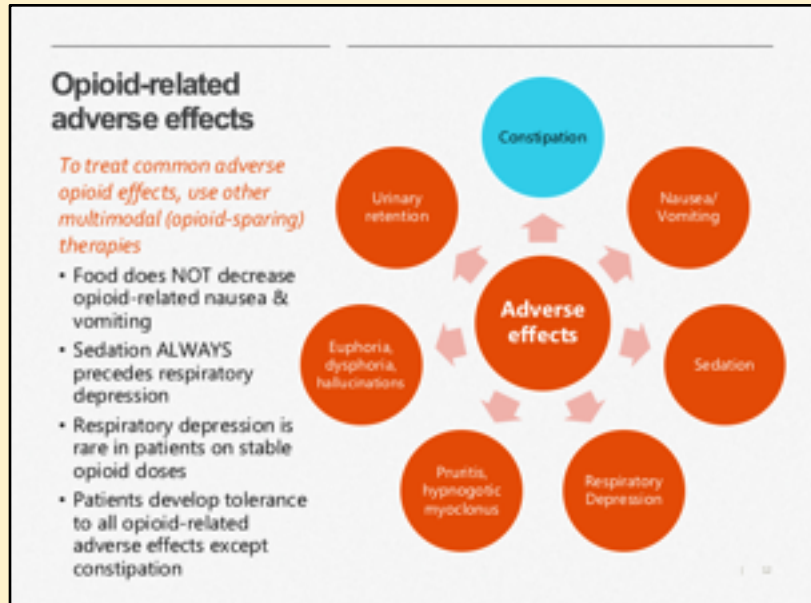
READ:

ROSTERS is an acronym of steps for opioid prescribing and monitoring your “rosters” of patients prescribed opioids for use at home

READ: *slide*

[35 MINUTES of 60 minute session is complete]


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READ: To treat common adverse opioid effects use other multimodal (opioid-sparing) therapies. Remember:

- Taking opioids with food does NOT decrease nausea/vomiting
- Sedation always precedes respiratory depression
- Respiratory depression is rare in patients who have been on stable opioid doses
- Patients develop a tolerance to opioid-related side effects with continued use, except constipation.

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Sangeeta

What kind of pain does this child have?

What pharmacologic and biobehavioral interventions would you consider for this patient?

Sangeeta is a 9 year old female who presents in a walking boot on LLE and ambulating with crutches. She was stepped on during a soccer game 6 weeks ago and has had ongoing burning pain since that time.

- X-rays and MRI are negative.
- Orthopedics recommended physical therapy and gradual return to activity.
- She has been unable to participate in physical therapy secondary to pain

READ: Sangeeta has been unable to participate in physical therapy secondary to pain. She is unable to walk without boot or crutches. Sleep and school attendance have been poor. Physical exam reveals trophic changes, swelling, muscle atrophy, weakness, and allodynia. She expresses extreme anticipatory fear and pain with physical exam. Based on Budapest Criteria, she was diagnosed with CRPS.

This is a 10 minute case, with your **table** discuss your answers to the questions on the slide. You will have 5 minutes to discuss the case and prepare to share your plan with the group

[Give groups 5 minutes to discuss case]

Select participants willing to share their group's answers.

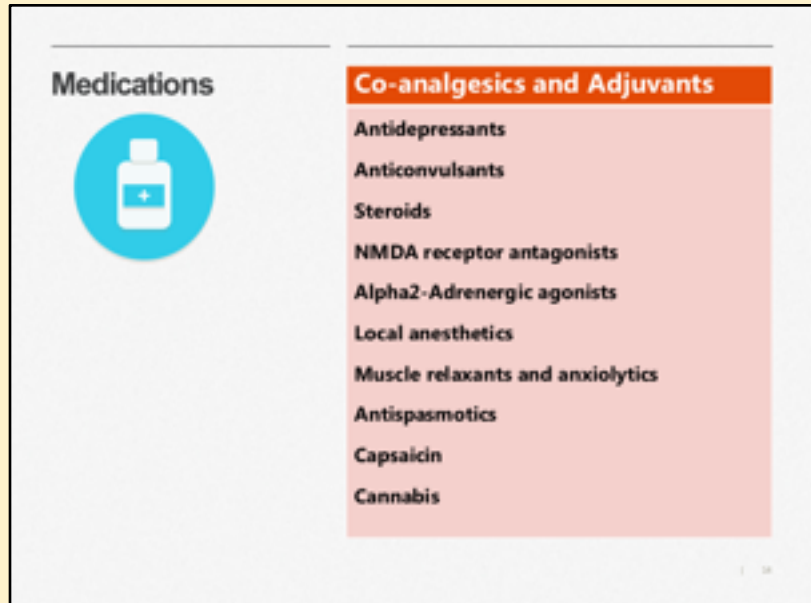
[LIMIT discussion to 1-2 mins/group, max of 5]

Write changes to the plan on flipchart or whiteboard

READ these Key points (if not included by participants): Pain education is the essential first step of treatment. Her treatment goal is full functional restoration. Her treatment plan should be interdisciplinary, with the gold standard combination of

- physical therapy (to progress through graded motor imagery and address physical impairments),
- pain psychology (to address pain, fear, and other psychosocial and family factors using cognitive behavioral interventions, mindfulness, skills training), and
- Pharmacologic. Possible considerations for her neuropathic pain are:
 1. Gabapentin 3 times/day @ 8-35mg/kg/day – start low & taper up or pregabalin twice/day @ 75mg BID up to max of 300mg BID.
 2. Lamotrigine or duloxetine (Cymbalta®) if she has a mood disorder.
 3. Muscle relaxant, like baclofen 30-60 mg/day. Benzodiazepines are not the 1st choice for chronic pain.
 4. Alendronate to address or prevent bone loss.
 5. Compounded ketamine creams
 6. Vitamin C&D supplementation
 7. NSAIDS or corticosteroids for inflammation

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READ: Review your 1 minute list.

ASK: Which of these was not on your list and not mentioned, but may be appropriate to treat Sangeeta's pain?

[Select participants willing to share their answers].

[Limit discussion to 2 minutes]

[50 MINUTES of 60 minute session is complete]

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Let's evaluate the literature . . .

- Which topical anesthetic is best?
- What are the risks of using ketorolac after surgery?
- PCA with or without continuous infusion?
- Why were codeine and tramadol taken off the formulary?

READ: You were provided with published studies about these topics.

ASK: Based on these published studies, what are your conclusions?

[Select participants willing to share their answers to these questions].

[Limit discussion to 8 minutes]

[58 MINUTES of 60 minute session is complete]

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*Please refer to the
online assessment
tool.*

- How would you rate your ability to determine risks and benefits of different analgesic pain treatments for children of all ages?
- What resources do you need to review with your team?
- What is your next step for advancing pharmacologic treatments for children?

ASK: Are there any questions?

[60 MINUTE SESSION COMPLETE]