

**Challenges in Pain Management
for Children and Adolescents
with Solid Tumors**

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And our patients who tell their stories via video clips

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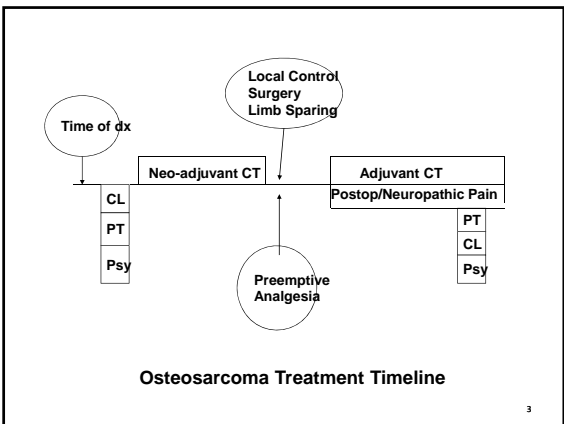
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Why the Challenge?

- Tumor and/or pathological fractures
 - Osteosarcoma, Ewings sarcoma and other solid tumors
- Complex chemotherapy protocol: 2-3 years
 - Delayed wound healing
 - Nausea → poor oral intake of medicines
- Multiple surgeries
 - Primary tumor: Limb-sparing and amputations
 - Metastatic disease such as thoracotomies
- Intense rehabilitation
- End-of-life

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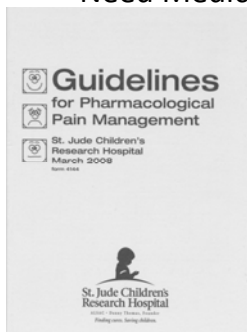


Comprehensive Plan

- Pharmacological: multimodal
 - Opioids: various routes
 - Treatment of neuropathic pain
 - NSAIDS (limited use due to side effects)
 - Neuroaxial use of local anesthetics
- Nonpharmacological
 - Identifying psychosocial issues/pre-existing coping styles
- Other challenges
 - Move between inpatient and outpatient care
 - Coordination to home community/local providers

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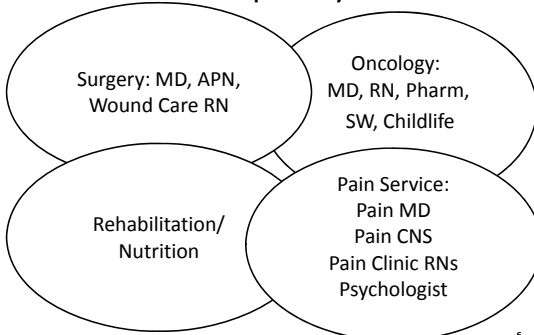
Need Medication Reference



Drug	Equianalgesic Dose (in mg)	
	IV	Oral
Morphine	10	30
Hydromorphone	1.5	7.5
Fentanyl	0.1-0.2	Not available
Oxycodone	Not available	15-30

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Multidisciplinary Team



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Peri-Operative Management

- Gabapentin, started 1-3 days pre-operatively
- Psychologist appointment pre-operatively
- Meet with other amputees pre-operatively
- Initiation of epidural or nerve block catheters pre or intra-operatively
- IV opioids (+/- IV PCA)

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Neuroaxial Pain Management: SJ Experience

- Epidurals at SJ since 1990
 - 2008 62 patients had epidural catheters for 1 to 33 days
- Nerve block infusions: 1995-June 25, 2009
 - 92 total infusions (range of 1 to 83 days)
 - Pt with 83 days of same catheter, out on passes during day
 - 22 pts had at least 1 day outpatient with NBI

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Nerve Block System

- Block sensory with little motor
- Ropivacaine or bupivacaine +/- clonidine
- Use for 7 to 10 days



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Patient Education: Nerve Block Infusions



Do you know...
An educational series for patients and their families

Nerve block injections and infusions

What is a peripheral nerve block injection or a continuous peripheral nerve block infusion?

Medicines can be given around a nerve to lessen pain in that area of the body. One way to do this is to give the medicine as a single injection. This is called a peripheral nerve block injection.

Another way is to place a small catheter (tube), about the size of a fishing line, along the nerve and connect it to an infusion pump. This is called a continuous peripheral nerve block infusion. The pump will give your child a small amount of pain medicine at all times.

Pain is a normal body reaction after surgery. However, severe pain can slow recovery and have other unwanted effects.

Why would my child benefit from a nerve block injection or infusion rather than other methods of giving pain medicine?

When your child receives pain medicines by mouth as a pill or through an IV, some of the drug goes to the brain and can cause him to feel sleepy. When medicines are directed to the pain nerves, the drug does not go to the brain. For this reason, the nerve block injection or infusion may control the pain without making your child too sleepy. We want to reduce or prevent pain so he can breathe deeply, get out of bed, and sleep in comfort. Since your child is more alert, he will know right away if he needs more pain medicine. Being alert and having good pain control makes it easier for your child to cough, sit up, or walk after surgery. All of these movements are crucial for your child to recover from surgery.

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Preparation of the Patient

- Rehearse coping for anticipated pain
- Procedural support
 - Distraction, relaxation, and deep breathing during pre-operative period and anesthesia induction
- Meet with other patients who have experienced similar surgeries

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Challenge: Immediate Post-Operative Period

- Ongoing multidisciplinary communication
 - Can patient follow rehabilitation plan?
 - Is pain preventing activities?
- Reassess pain and opioid requirements
 - Need for neuropathic pain medications
 - Pattern of opioid use
 - Adjustment of neuroaxial medications
- Child life and psychology support
 - Distraction/relaxation/guided imagery
 - Diversionary activities

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Challenge: Rehabilitation Phase

- Sustained release/immediate release opioids
- Outpatient continuation of continuous nerve block infusion with bupivacaine
- Escalation of gabapentin
- Use of tri-cyclic anti-depressants: amitriptyline
- Use of oral methadone

• So how do our patients meet those challenges?

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Patient Perspectives: Their Stories Including Their Voices via Video clips

- JR and the need for multiple surgeries/amputation
- HC and AC: osteosarcoma times two for brother and sister
- DH: Need for pre-emptive nerve block infusion for tumor and pathological fracture
- MC: Extensive disease at diagnosis, complicated social support and end-of-life pain management strategies

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Challenge: JR and Multiple Surgeries

- 12 year old from Puerto Rico with pain in right ankle
- Bone bx: osteosarcoma of R distal tibia
- Started chemotherapy
- Both he and his mother have limited English
- Outlets: bike riding and other sports
- Thoracotomy with epidural
- Amputation
- Outpatient management
- Return to sports including rock wall climbing
- Episode of viral meningitis and PCA management

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Challenge: Osteosarcoma Times Two AC and HC

- HC:
- Dx at 9 years of age
- Left proximal tibia
- Chemo 3 months pre-surgery
- Fever and neutropenia
- Mucositis, platelets 17K
- RBC and platelet transfusions
- Limb sparing surgery requiring gastronemius muscle reconstruciton
- Insertion of expandable prosthesis
- Epidural analgesia
- Inability to swallow whole pills
- Weight and wound healing problems
- Ongoing neuropathic pain

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Challenge: Unplanned Amputation and AC

- AC: 12 year old brother of HC
- Past history of Tetralogy of Fallot
- C/o of pain and swelling of right knee
- Bone bx: osteosarcoma of right proximal tibia
- No other mets
- 8 rounds of chemo
- Limb sparing surgery
- Nerve block infusion
- Complications: thrombus in femoral artery with and injury to popliteal artery requiring amputation
- Adjustment to amputation
- Outpatient with nerve block infusion
- Resolution of phantom pain

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DH: Pre and Post-Operative Pain

- 15 year old with 3 mon hx of left thigh pain and swelling : large mass and fracture; diagnosed with localized osteosarcoma of the femur
- Need for nerve block infusion in outpatient setting
- Chemotherapy
- Surgery: complex reconstruction with total femoral and hinged knee modular prosthesis
- Painful rehabilitation/need for ongoing nerve block infusion; use of CPM machine
- Psychologist role and social issues

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MC: Extensive Disease at Diagnosis

- 20 year old with months of pain in left leg
 - “tendonitis” with steroid injections
 - “pulled muscle” following slipping on a river bank
 - X-ray with large mass arising from midshaft femur and pathologic fracture
- Dx: metastatic osteosarcoma of femur extending into pelvis + multiple pulmonary mets
- Epidural and hydromorphone PCA

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MC: Extensive Disease at Diagnosis

- Surgery: Hip disarticulation with epidural and fentanyl PCA
- Fentanyl patch and oral methadone for severe phantom pain
- Appendectomy, thoractomies, and craniotomy
- Ketamine infusion
- Identifying “realistic joys”
- End-of-life pain control: epidural and PCA and transition to hospice
- Complex family with history of substance abuse
- Role of girlfriend (later wife) and church

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