PedsCases Podcast Scripts

This is a text version of a podcast from Pedscases.com on the "**Pediatric Pain Management**." These podcasts are designed to give medical students an overview of key topics in pediatrics. The audio versions are accessible on iTunes or at www.pedcases.com/podcasts.

Pediatric Pain Management

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Introduction

Hi, my name is Adam Humble, and I am a medical student at the University of Alberta. This podcast was developed in conjunction with dr. dawn Davies, the Medical Director of the Palliative Care Program at Stollery Children's Hospital and also with Kathryn Reid a pediatrics chronic pain nurse practitioner at the stollery children's hospital. Today we will be discussing Pediatric Pain Recognition and Management. The Objectives for this podcast are:

1. Understand the importance of adequate pain management in the pediatric population
2. Recognize and assess pain in the verbal and non – verbal child
3. Manage pain using the 3 p's, that's: physical, psychological and pharmacological methods.

If you are like me, during your pediatrics rotation, you may find yourself walking into the room of a screaming infant and asking yourself, is this child actually in pain? Or are they just hungry? Or do they simply just miss mommy? We hope that this podcast will equip you to recognize pain, and give you an understanding of why and how to treat pain using physical, psychological and pharmacological means.

We'll start by answering this seemingly obvious question: Can infants and children feel pain? And do they feel it to the same degree we do? Most of you would say, yes of course they feel pain. However prior to as recent as 1980 this was not the widely held belief, procedures as invasive as heart surgery were routinely done on infants using only muscle relaxants, and if they were lucky, nitrous oxide. Infants and children do in fact experience pain and it is believed that they may even experience more pain than adults, due to their more robust inflammatory response and decreased neural inhibition. It is also true that untreated pain can have short term physiologic consequences, and long term psychological consequences, such as a lower pain tolerance and heightened health care related anxiety. An interesting study highlighting this compared neonates who were circumcised at birth either with or without analgesia. The infants who were not given analgesia for circumcision showed a heightened pain response to their 2 month

vaccination, demonstrating that inadequate pain management has long term deleterious consequences on pain threshold. Treating pain in a child may also inadvertently treat other issues, such as feeding and sleeping difficulties or tachypnea and tachycardia. So we have discussed why we treat pain, now, how do we recognize it?

Recognition:

Pain assessment in an adult is relatively straightforward because they can verbalize to us details of the quality, location and severity of the pain. However in a child with either a limited or non- existent vocabulary it is much more difficult to assess pain. How you do your pain assessment will depend largely on the age of the child.

Children under 3 years usually won't be able to self report their pain, as they grow older self reporting of pain becomes increasingly reliable. Assessing pain in the non-verbal child requires observation, and there are a few scales and tools out there to help us with this. The most studied and validated observational pain scale in infants and toddlers is the FLACC scale. It has 5 components, Face Legs Activity Crying and Consolobility and each component is given a score from 0 – 2 based on established criteria, these components are then totalled to rate the pain on a scale from 0-10, helping to guide you in the type of treatment you provide.

In children age 4-12 the most commonly used and most studied pain scale is the Revised Version of the Faces Pain Scale. It consists of set of simply drawn ethnically neutral line faces ranging in expression from neutral, to one of intense pain. This set of faces is then shown to the child with the instructions "These faces show how much something can hurt. This face shows no pain. The faces show more and more pain up to this one. It shows very much pain. Point to the face that shows how much you hurt right now." The FLACC and Faces Pain Scale are often found printed on the clipboard of patient charts, and can also be found on common med phone apps such as Med Calc, they are also available in 64 different languages.

For older children with good communication skills, pain assessment is much the same as it is in adults, you want to obtain information on the location, quality and severity of the pain. The visual analogue scale, or simply a 0-10 rating 10 being the worst pain they can imagine, is often the easiest way to gauge severity. A description of the quality of the pain can tell you a lot about where the pain may be originating. Burning and tingling is often associated with neuropathic pain, sharp stabbing pain is often somatic, and dull diffuse pain is often of visceral origin.

We have discussed the basics of how to recognize and rate pain, now let's talk about treating the pain.

Non-Pharmacological pain control.

Not every bit of pain a child experiences needs to be treated with medication. There are a handful of clever non-pharmacological ways that have been shown to be beneficial in managing mild to moderate pain and distress in children.

First and foremost, the physical environment and positioning of the child needs to be considered. The child should be positioned as close to their caregiver as the procedure will allow and the environment should be as low stress and private as possible. It's important that we immobilize a child to complete procedures but we need to ensure we are doing this in a therapeutic manner. Physical restraint should be the last resort, not the first. Children instead should be held in a comfort position, such as on a parents lap, or swaddled.

Now we will consider psychological management of pain. For basic procedural pain the most commonly used method is the distraction method. To distract the child from the discomfort of simple procedures like an ear exam, it is helpful to give the child some interesting object to hold and play with. Other examples are, having the child blow bubbles, or read a new book to the child. While distracted, the brain's pain processing pathways are less active, allowing you to get in and out quickly, with little disruption.

Utilizing rewards is an effective strategy to both distract the child and reinforce positive behaviors. Offering a child a sticker for completing a physical exam can distract the child and also, make the child more willing to cooperate in the future. When on pediatrics, always have a few stickers on hand, Oloff and Dora are huge hits!

For more invasive procedures, such as an IV poke or lumbar puncture there is TootSweet. TootSweet is a 24% oral sucrose solution, it is found in most pediatric wards and emergency rooms. TootSweet can be dripped directly into the mouths of infants or on their pacifier over the course of a procedure for pain management. The addition of sucrose causes an endogenous release of opioids, providing real analgesia for the child for up to 5 minutes and this can be repeated if necessary. The non-nutritive suckling of the pacifier also provides a calming effect.

Non-Pharmacologic therapy should always be considered however there comes a point when pharmacologic therapy needs to be initiated, let's discuss pharmacologic ways to manage pain.

Pharmacologic pain management

In our discussion of pharmacologic pain management we will discuss which drugs are approved and available for pain management in children and how to use them according to WHO guidelines. We will also touch on important side effects and contraindications and also what not to use for pain management.

For procedures involving any type of cutaneous injury, whether an IV poke or lumbar puncture, a topical anesthetic should always be considered, especially for learners who have not yet perfected these procedures. Maxilene is a topical anesthetic cream

containing 4 or 5% lidocaine, a sodium channel blocker. Maxilene should be applied to the skin at the site of anticipated injury 30 minutes prior to the procedure. If Maxilene is not available, a similar cream called Emla cream can be substituted, although note that Emla cream takes 30-60 minutes to take effect.

For mild to moderate pain, our first line agents are simple analgesics like Ibuprofen and Acetominophen. Both have similar efficacy in reducing mild to moderate pain and have similar safety profiles. Acetominophen, also known as Tylenol has analgesic and anti-pyretic effects; however it has no anti-inflammatory component. Unlike Ibuprofren, acetaminophen causes no gastric mucosal irritation, although at high doses acetaminophen can cause hepatotoxicity, exercise caution when treating children with hepatic impairment or metabolic and muscular disease. Recommended Acetominophen dosing for children is 15mg/kg every 4 hours, no more than 5 doses in 24 hours. Ibuprofen on the other hand, has analgesic, anti-pyretic AND anti-inflammatory properties, making it the more suitable choice for pain related to inflammation. Ibuprofen dosing for children is 10mg/kg every 6 hours, not to exceed 4 doses in 24 hours. If treating with Ibuprofen long term, anticipate gastric mucosal irritation and consider treating for this prophylactically with the addition of a proton pump inhibitor. Some parents and doctors will tell you that they like to alternate between Tylenol and Ibuprofen, and there is some evidence to suggest that alternating may be more efficacious in providing pain relief, just be mindful of the daily maximums. If oral administration is not an option, acetaminophen can be given per rectum. Alternatively Ketorolac (Toradol™)is a more potent intravenous non steroidal anti inflammatory with a similar mechanism of action to ibuprofen. Ketorolac is the only commonly used IV NSAID in children. Ketorolac has a high risk of causing GI bleeds, because of this it should not be used for longer than 5 days. At the end of your pediatric admission orders, unless contraindicated, it is always helpful to both nursing staff and yourself to include a PRN order for either acetaminophen or ibuprofen.

We will now discuss treating moderate to severe pain. According to the WHO guidelines, In children experiencing moderate to severe pain, the first line agent is morphine. There is insufficient evidence to recommend any alternative opioid in preference to morphine as a first line agent. Morphine can be given orally or intravenously, however the intramuscular route must be avoided. Morphine comes in a wide array of preparations, ranging from pills to liquids and from immediate to delayed release. Dosing varies between each route so always consult a dosing manual or pharmacist first. If switching routes of administration, IV morphine dosing is roughly half the oral dose. The most commonly experienced side effect from morphine is constipation; this side effect should be anticipated and treated prophylactically with laxatives in any child being prescribed opioids. Transient sleepiness, nausea and itch (pruritis) are also frequent side-effects that patients should be told to expect. Respiratory depression is the most worrisome and dangerous side effect of morphine; therefore, sedation scores and respiratory rate should be assessed hourly for children newly prescribed opioid medicine. If a significant adverse reaction occurs, such as respiratory depression, morphine can be reversed by judicious dosing of opioid antagonist Naloxone (Narcan). If a pediatric patient is given morphine regularly for 7

days or longer, an opioid wean protocol must be initiated before that opioid is stopped. As a rule of thumb, the longer a patient is on opioids, the slower the wean.

You may be asking yourself, why the jump to morphine, why not trial milder analgesics like codeine or tramadol first? Codeine has variable and generally ineffective metabolism in children, therefore Health Canada recommends Codeine not be administered to any patients under the age of 18. The patient to patient variability in codeine metabolism also means lactating mothers shouldn't take codeine, as it could lead to inadvertent overdose in the infant. Tramadol is a relatively new drug with some opioid and some non-opioid analgesic properties, it is considered for treatment of moderate pain. Currently there is insufficient evidence supporting its safety and effectiveness in children, and it is not yet approved for use in children by Alberta Health Services or the World Health Organization. In short, the risks associated with strong opioids are acceptable when compared with uncertainty in codeine and tramadol.

Morphine and other opioids can be an extremely effective tool at managing pain in the pediatric population. Fear of opioid side effects should never be a reason to undertreat a child's pain, which historically has been the case. A thorough discussion should be had with patients and family educating them on the side effects, and the benefits of opioid therapy.

To summarize we have discussed: 1) That infants and children do in fact experience pain to an equal or greater degree than we do, and it is important to treat this pain to minimize complications. 2) How to recognize and rate pain in the non-verbal and verbal patient. 3) How to manage pain using the three P's, that's physical, psychological and pharmacological therapies. We hope that this podcast will help you to better address and manage pediatric pain in both the wards and the clinic. Thanks for listening; I hope it wasn't too…painful for you.

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