



ΣΥΓΧΡΟΝΟΙ ΤΡΟΠΟΙ ΜΕΙΩΣΗΣ ΟΞΕΟΣ ΠΟΝΟΥ



ΝΙΚΟΛΑΙΔΟΥ ΒΑΣΙΛΙΚΗ ΜΑΡΙΑ ΝΟΣΗΛΕΥΤΡΙΑ ΠΕ, MSc
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ΩΝΑΣΕΙΟ ΚΑΡΔΙΟΧΕΙΡΟΥΡΓΙΚΟ ΚΕΝΤΡΟ

ΓΕΝΙΚΑ:

- ❖ **Η ανακούφιση από τον πόνο στα παιδιά αποτελεί ένα διεθνώς ανθρώπινο δικαίωμα.** (WHO, 1999)
- ❖ Ο πόνος αποτελεί μια αισθητική και συναισθηματική προσωπική εμπειρία, γεγονός που καθιστά την εκτίμησή του εξαιρετικά περίπλοκη (Melzack & Wall, 1965)
- ❖ Ως πόνος ορίζεται κάθε δυσάρεστη αίσθηση ή συναισθηματική εμπειρία, η οποία σχετίζεται με πραγματική ή δυνητική καταστροφή του ιστού ή περιγράφεται ως τέτοια. (International Association for the Study of Pain: IASP)
- ❖ Η Διεθνής Ένωση για τη Μελέτη του Πόνου (IASP) το 2007 προσέθεσε μια σημαντική σημείωση στον ορισμό του πόνου: **« Ένα άτομο μπορεί να βιώνει πόνο παρά την απουσία λεκτικής επικοινωνίας. Ο πόνος είναι πάντα υποκειμενικός. »**
- ❖ Τα παιδιά διαθέτουν επαρκώς ανεπτυγμένο νευρικό και ενδοκρινικό σύστημα ώστε να ανταποκρίνονται στον πόνο, να αντιλαμβάνονται τα επώδυνα ερεθίσματα και να απαντούν με μια σειρά αντιδράσεων.
- ❖ Ο πόνος ταξινομείται σε δυο κατηγορίες: στον οξύ και στον χρόνια πόνο ανάλογα με την ένταση, την εντόπιση, τη διάρκεια και την αιτία του.



ΟΞΥΣ ΠΟΝΟΣ:

- Οξύς πόνος ορίζεται η φυσιολογική απόκριση του οργανισμού σε ένα βλαπτικό χημικό, θερμικό ή μηχανικό ερέθισμα (L. Brian Reedy/W. Thomas Edwards, Management of Acute Pain: A practical guide, JASP PUBLICATION, 1992)

Acute Pain

Why Acute Pain?

In the United States alone, nearly 100 million surgeries take place annually. More than 80% of these surgical patients report postoperative pain. Over 70% of emergency department visits are due to pain; acute headache alone accounts for 2.1 million of these visits. Despite substantial advances in pain research in recent decades, inadequate acute pain control is still more the rule than the exception. Numerous studies show that fewer than half of postoperative patients receive adequate pain relief. Patients arriving at emergency departments with significantly painful conditions fare no better, as emergency medicine physicians tend to underuse pain medications. Acute pain is also a common problem in family practice, sports medicine, and especially in internal medicine.

Though adequate acute pain treatment can improve patient quality of life and satisfaction with care, as well as enhance clinical resource management and reduce long-term costs of care, acute pain remains undertreated. The Global Year Against Acute Pain campaign aimed to raise understanding of acute pain among the general public and bring to light the challenges clinicians face when treating acute pain.

Global Year Against Acute

PAIN

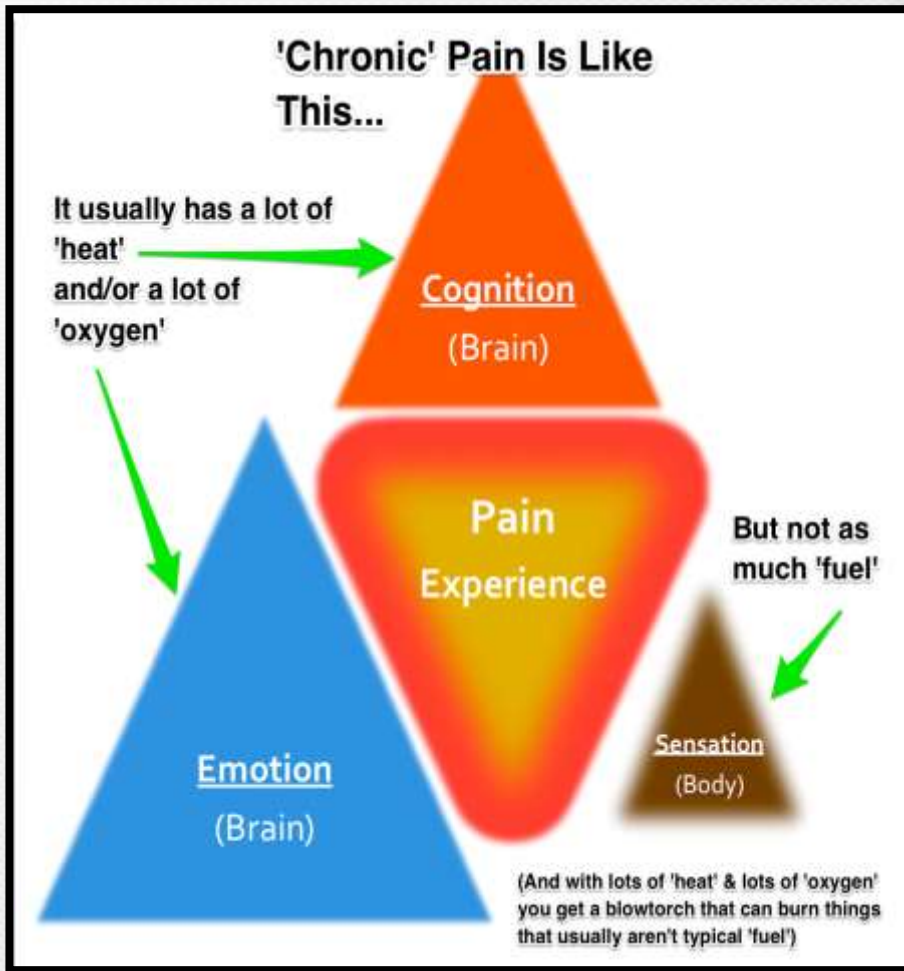
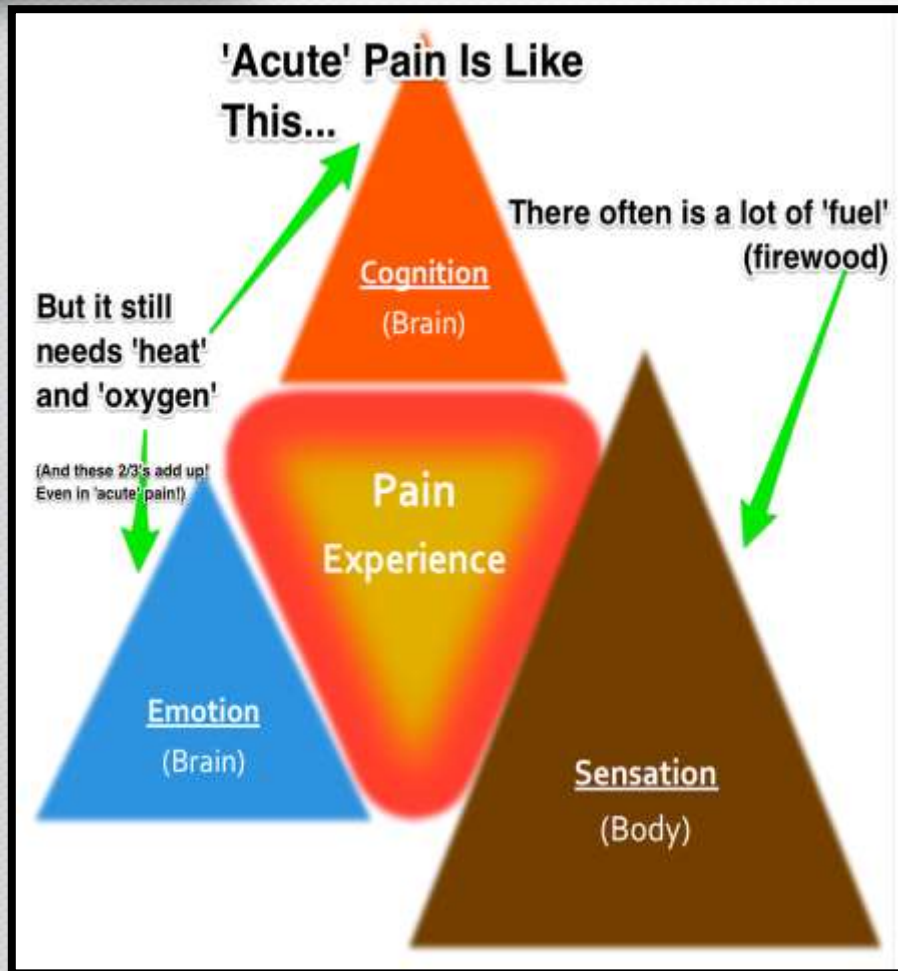
OCTOBER 2010 – OCTOBER 2011

ται σε τραυματισμό



- Εμφανίζει λιγότερες ψυχολογικές επιπτώσεις σε σύγκριση με τον χρόνιο πόνο

ΟΞΥΣ ΠΟΝΟΣ – ΧΡΟΝΙΟΣ ΠΟΝΟΣ:



Epidemiology and management of painful procedures in children in Canadian hospitals

Bonnie J. Stevens RN PhD, Laura K. Abbott MSc, Janet Yamada RN MSc, Denise Harrison RN PhD, Jennifer Stinson RN PhD, Anna Taddio PhD, Melanie Barwick PhD, Margot Latimer RN PhD, Shannon D. Scott RN PhD, Judith Rashotte RN PhD, Fiona Campbell MD, G. Allen Finley MD; for the CIHR Team in Children's Pain

ABSTRACT

Background: Children being cared for in hospital undergo multiple painful procedures daily. However, little is known about the frequency of these procedures and associated interventions to manage the pain. We undertook this study to determine, for children in Canadian hospitals, the frequency of painful procedures, the types of pain management interventions associated with painful procedures and the influence of the type of hospital unit on procedural pain management.

Methods: We reviewed medical charts for infants and children up to 18 years of age who had been admitted to 32 inpatient units at eight Canadian pediatric hospitals between October 2007 and April 2008. We recorded all of the painful procedures performed and the pain management interventions that had been implemented in the 24-hour period preceding data collection. We performed descriptive and comparative (analysis of variance, χ^2) analyses.

Results: Of the 3822 children included in the study, 2987 (78.2%) had undergone at least

one painful procedure in the 24-hour period preceding data collection, for a total of 18 929 painful procedures (mean 6.3 per child who had any painful procedure). For 2334 (78.1%) of the 2987 children who had a painful procedure, a pain management intervention in the previous 24 hours was documented in the chart: 1980 (84.8%) had a pharmacologic intervention, 609 (26.1%) a physical intervention, 584 (25.0%) a psychological intervention and 753 (32.3%) a combination of interventions. However, for only 844 (28.3%) of the 2987 children was one or more pain management interventions administered and documented specifically for a painful procedure. Pediatric intensive care units reported the highest proportion of painful procedures and analgesics administered.

Interpretation: For less than one-third of painful procedures was there documentation of one or more specific pain management interventions. Strategies for implementing changes in pain management must be tailored to the type of hospital unit.

Competing interests:

Anna Taddio has received clinical trial grant from Gebauer; has received drugs for clinical trials from Hawaii Medical, Farnham Laboratories and Gebauer and has received honoraria for workshop presentation from Wyeth. G. Allen Finley has served as a consultant on study design for J&J Research & Development (for an unrelated study). No competing interests declared by Bonnie J. Stevens, Laura K. Abbott, Janet Yamada, Denise Harrison, Jennifer Stinson, Melanie Barwick, Margot Latimer, Shannon D. Scott, Judith Rashotte and Fiona Campbell.

This article has been peer reviewed.

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ORIGINAL ARTICLE

Painful procedures and analgesia in the NICU: what has changed in the medical perception and practice in a

Pain in the NICU: what has changed in ten years?

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Table 4 Characteristics of professionals working in four units assessed together, their knowledge of the pain routine in their units and their opinions about the potentially painful procedures (lumbar puncture, intubation, mechanical ventilation, and minor and major postoperative).

	2001	2006	2011	p
Professionals that answered the Q	68 (96%)	58 (91%)	62 (91%)	
Age (years) ^a	38 ± 8 (27–67)	39 ± 7 (27–54)	40 ± 8 (29–60)	0.345 ^b
Female	49 (72%)	46 (79%)	49 (79%)	0.542 ^c
Years since graduation ^a	13 ± 8 (4–42)	14 ± 7 (4–28)	15 ± 9 (4–35)	0.286 ^b
Years in NICU	10 ± 6 (1–28)	11 ± 7 (2–25)	12 ± 7 (2–25)	0.197 ^b
Professionals that know pain routine	54 (79%)	40 (69%)	57 (92%)	0.007 ^c
Use NFCS to assess pain	19 (28%)	23 (40%)	40 (64%)	<0.001 ^c
Use NIPS to assess pain	21 (31%)	31 (53%)	45 (73%)	<0.001 ^c
Procedures – Lumbar puncture (LP)				
Pain intensity attributed to LP	5 ± 2	5 ± 2	5 ± 2	0.894 ^b
Professionals think LP is painful and indicate analgesia	27 (40%)	28 (48%)	29 (47%)	0.579 ^c
Procedures – Tracheal intubation (TI)				
Pain intensity attributed to TI	6 ± 2	6 ± 2	6 ± 2	0.526 ^b
Professionals think TI is painful and indicate analgesia	24 (35%)	32 (55%)	45 (73%)	<0.001 ^c
Mechanical ventilation (MV)				
Pain intensity attributed to MV	4 ± 2	4 ± 3	2 ± 2	0.001 ^b
Professionals think MV is painful and indicate analgesia	38 (56%)	32 (55%)	16 (26%)	0.001 ^c
Postoperative (PO) minor surgery				
Pain intensity attributed to PO	5 ± 2	4 ± 2	4 ± 2	0.745 ^b
Professionals think PO is painful and indicate analgesia	50 (73%)	39 (67%)	45 (73%)	0.711 ^c
PO major surgery				
Pain intensity attributed to PO	7 ± 2	8 ± 2	8 ± 1	0.001 ^b
Professionals think PO is painful and indicate analgesia	62 (91%)	58 (100%)	62 (100%)	0.004 ^c

Q, questionnaire; NICU, neonatal intensive care unit; NFCS, neonatal facial coding system; NIPS, neonatal infant pain scale.

^a Mean ± standard deviation (range).

^b ANOVA with fixed factor.

^c Pearson's Chi-squared test, Fisher's exact test, or its extension.

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** Study conducted at Faculdade de Ciências Médicas da Santa Casa de São Paulo (FCMSCSP), São Paulo, SP, Brazil; Universidade Estadual de Campinas (UNICAMP), Campinas, SP, Brazil; Faculdade de Medicina de Botucatu (FMB), Universidade Estadual Paulista Júlio de Mesquita Filho (UNESP), Botucatu, SP, Brazil; and Escola Paulista de Medicina (EPM), Universidade Federal de São Paulo (UNIFESP), São Paulo, SP, Brazil.

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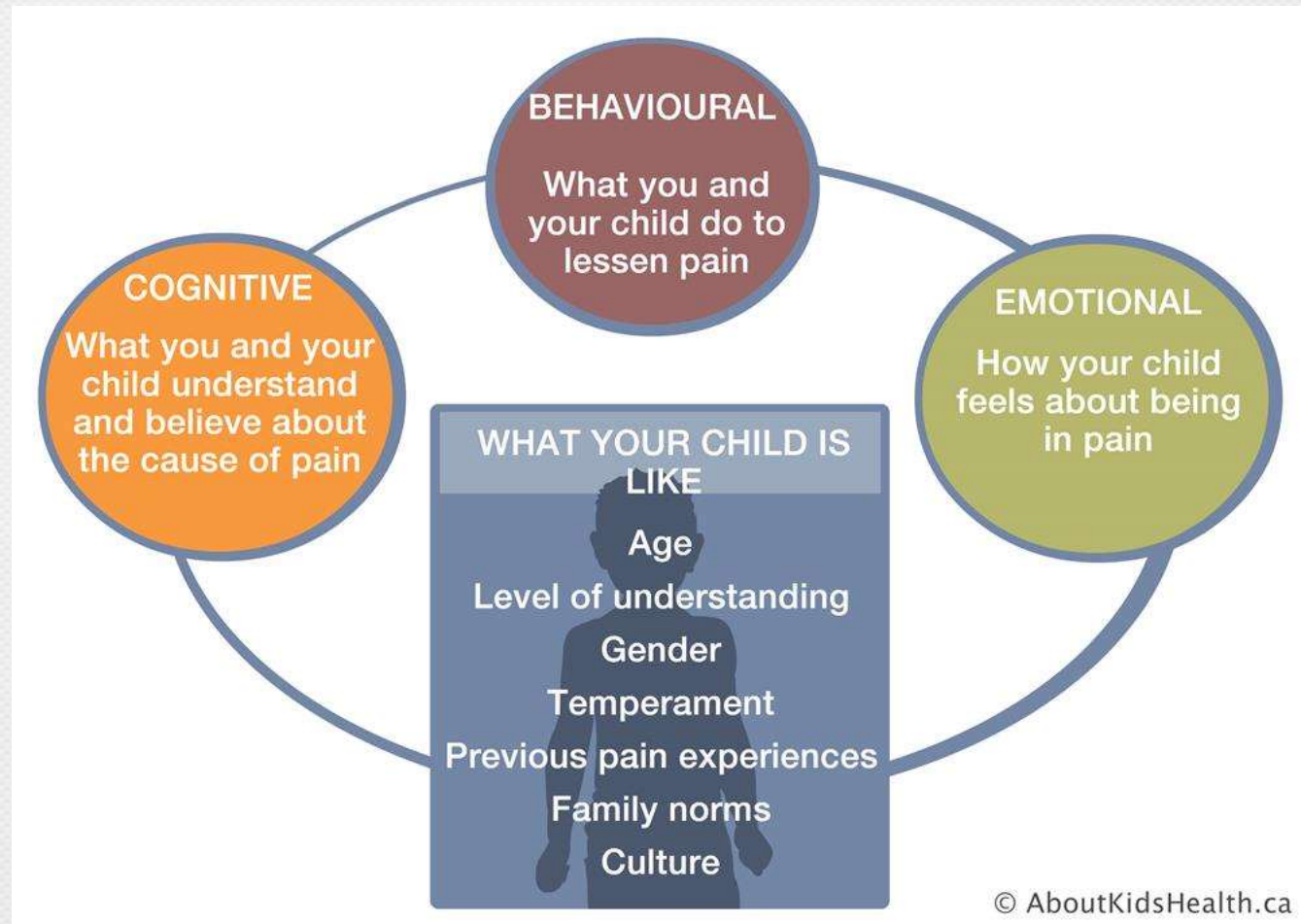
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Children who are being cared for in hospital undergo multiple painful procedures daily. However, little is known about the frequency of these procedures and associated interventions to manage the pain. We undertook this study to determine, for children in Canadian hospitals, the frequency of painful procedures, the types of pain management interventions associated with painful procedures and the influence of the type of hospital unit on procedural pain management.

Το 78,2% των παιδιών είχαν υποβληθεί σε τουλάχιστον μια επώδυνη διαδικασία και μόνο στο 28,3 είχε εφαρμοστεί παρέμβαση σχετικά με την μείωση του πόνου.

The purpose of this study was to determine, for children in Canadian hospitals, the frequency of painful procedures, the types of pain management interventions associated with painful procedures and the influence of the type of hospital unit on procedural pain management.


ΠΑΡΑΓΟΝΤΕΣ ΠΟΥ ΣΧΕΤΙΖΟΝΤΑΙ ΜΕ ΤΗΝ ΕΚΤΙΜΗΣΗ ΤΟΥ ΠΟΝΟΥ:



PAIN

Review

Multidisciplinary Pain Management for Pediatric Patients with Acute and Chronic Pain: A Foundational Treatment Approach When Prescribing Opioids

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Abstract: Opioid therapy is the cornerstone of treatment for acute procedural and postoperative pain and is regularly prescribed for severe and debilitating chronic pain conditions. Although beneficial for many patients, opioid therapy may have side effects, limited efficacy, and potential negative outcomes. Multidisciplinary pain management treatments incorporating pharmacological and integrative non-pharmacological therapies have been shown to be effective in acute and chronic pain management for pediatric populations. A multidisciplinary approach can also benefit psychological functioning and quality of life, and may have the potential to reduce reliance on opioids. The aims of this paper are to: (1) provide a brief overview of a multidisciplinary pain management approach for pediatric patients with acute and chronic pain, (2) highlight the mechanisms of action and evidence base of commonly utilized integrative non-pharmacological therapies in pediatric multidisciplinary pain management, and (3) explore the opioid sparing effects of multidisciplinary treatment for pediatric pain.

Keywords: multidisciplinary pain management strategies; opioid reduction therapy; non-pharmacological therapy; cognitive behavioral therapy; hypnosis; mindfulness-based stress reduction; acupuncture; pain rehabilitation

1. Introduction

Acute and chronic pain are common and often debilitating problems among both pediatric and adult populations according to the Institute of Medicine statement on Relieving Pain in America. The International Association of the Study of Pain (IASP) defines pain as an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage [1]. Acute pain is the expected physiological response to a noxious chemical, thermal, or mechanical stimulus, and usually accompanies surgery, traumatic injury, tissue damage, or inflammatory processes. It is self-limiting and typically resolves over days to weeks, but it can

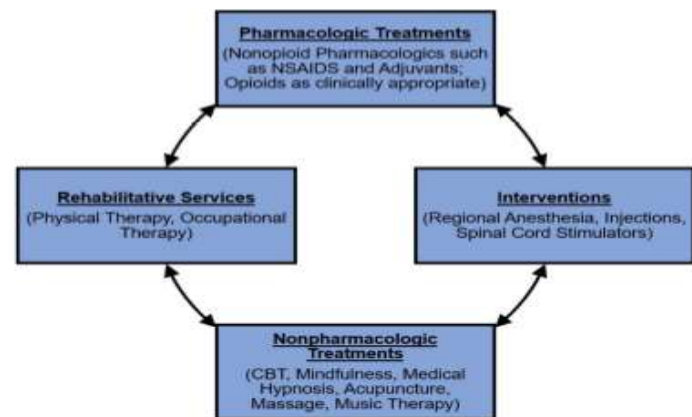


Figure 1. Multidisciplinary pain management treatment: key components in acute and chronic pain management. This figure displays the key treatment components in multidisciplinary treatment for both acute and chronic pain. In the acute setting, in addition to reduction of pain, the efficacy of multidisciplinary treatments is often measured by reduction in needed opioid doses to achieve comfort, while in the setting of chronic pain, the improvements obtained through a multidisciplinary approach are often measured by improvements in function. As is clinically appropriate, in both settings, pharmacologic treatments are combined with regional interventions [26], integrative non-pharmacological techniques, and rehabilitative services as is clinically appropriate to support pain management and improve patients' pain symptoms, functioning and quality of life. Multidisciplinary analgesia treatment aims to ensure patient comfort and wellbeing, while at the same time potentially decreasing the need for opioid use in pediatric populations [25].

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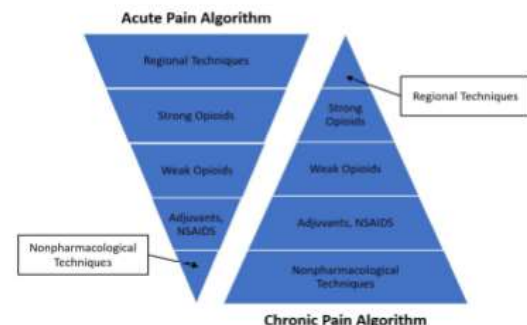
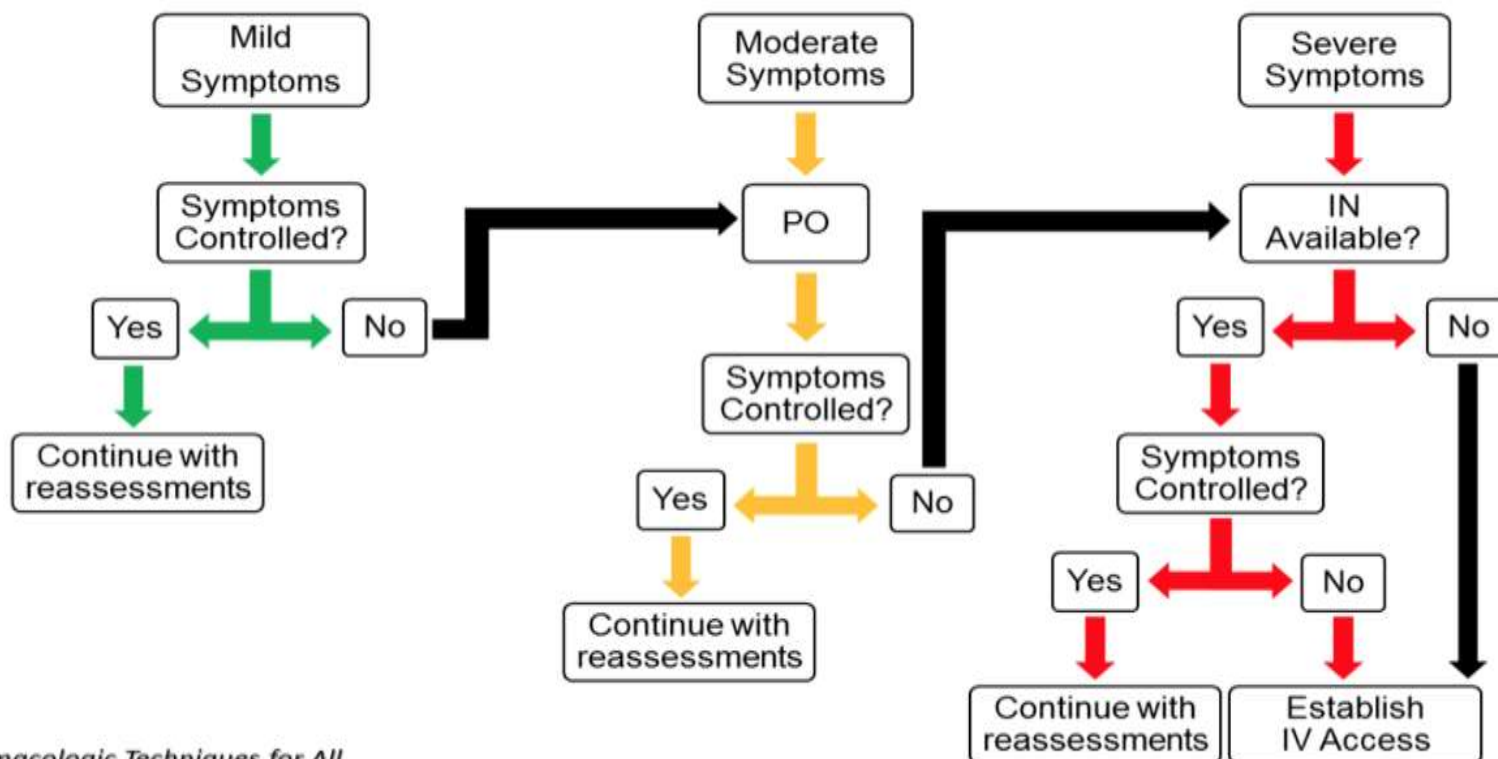


Figure 2. Multidisciplinary pain management: acute and chronic pain algorithms. In acute pain algorithms, the initial treatment begins with regional techniques or intravenous analgesia as a mainstay of therapy. As acute pain improves, therapies are then transitioned as appropriate to varying strengths of PO opioid medications, to adjuvants/NSAIDs, and ultimately integrative non-pharmacological strategies. For situations where severe pain is anticipated, adjuvants and integrative non-pharmacological strategies may be added on at the beginning of treatment, as an opioid sparing strategy, and to increase patient comfort. In chronic pain algorithms, treatment is delivered in the reverse order, beginning with integrative non-pharmacological techniques, then moving to adjuvants, and ultimately progressing to various strengths of opioids and regional techniques and stimulators as clinically appropriate.

ΕΚΤΙΜΗΣΗ ΟΞΕΟΣ ΠΟΝΟΥ:

Figure 2. Starting Route and Analgesic Escalation



**Non-Pharmacologic Techniques for All*

**Start with Acceptably Least Invasive*

Assessment and treatment of pain in pediatric patients.

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Abstract

Pediatric patients experience pain which is more difficult to assess and treat relatively to adults. Evidence demonstrates that controlling pain in the pediatric age period is beneficial, improving physiologic, behavioral, and hormonal outcomes. Multiple validated scoring systems exist to assess pain in pediatrics; however, there is no standardized or universal approach for pain management. Healthcare facilities should establish pediatrics pain control program. This review summarizes a collection of pain assessment tools and management practices in different facilities. This systematic approach should decrease pediatric pain and poor outcomes as well as improve provider and parent satisfaction.

Keywords: Pain, Pain assessment, Pain management, Pediatric patients.

Accepted January 30, 2017

Introduction

According to the International Association for the Study of Pain (IASP) Pain is "an unpleasant sensory and emotional experience associated with actual and potential tissue damage". Pain has also been defined as "existing whenever they say it does rather than whatever the experiencing person says" [1-4]. It is one of the most dreading and devastating symptom commonly propagated in peoples with advanced chronic conditions including cancer patients. Pediatric patients are the most under treated and present to hospital for pain compared to adults; because of the wrong belief that they neither suffer pain nor they remember painful experiences [5]. The quality of life experienced by the patient can greatly reduce, regardless of their basic diagnosis. Thus, if pain will be poorly managed, it can reflect the influence on family and careers causing different which may leads to increased rates of hospital admission [5,6]. Uncontrolled pain has also direct impact on health outcomes and more than a few effects on all areas of life. The emotional, cognitive, and behavioral components of pediatric patient are also important to assess pain and to simplify the management practices [7,8].

A long-term negative effect of untreated pain on pain sensitivity, immune functioning, neurophysiology, attitudes, and health care behavior are supported with numerous evidences. Health care professionals' who care for children are mainly responsible for abolishing or assuaging pain and suffering when possible [5,7,9]. The practice of pediatric pain treatment protocol has made great progress in the last decade with the development

and validation of pain valuation tools specific to pediatric patients. Almost all the major children hospitals now have dedicated pain services to provide evaluation and immediate treatment of pain in any child [10,11].

In pediatric age, it is more difficult to assess and treat pain effectively relatively to adults. The lack of ability to notice pain, immaturity of remembering painful experiences and other reasons are the reflection of persistence of myths related to the infant's ability to perceive pain [12]. However, the treatment of pain in childhood is like the adult management practice which includes pharmacological and non-pharmacological interventions. On the other hand, it critically depends on an in-depth understand of the developmental and environmental factors that influence nociceptive processing, pain perception and the response to treatment during maturation from infancy to adolescence [13,14].

The practice of assessing pain and its management in pediatric patients can show a discrepancy based on the different countries and their respective health institutions. So, this review focused on the contemporary practice and new advances in pediatric pain assessment and its management.

Classification of Pain

Many classification systems are used to describe the different types of pain. The most common classification schemes refer to pain as acute or chronic; malignant or nonmalignant; and nociceptive or neuropathic [15]. Most studies are agreed with the following classification of pain (Table 1).

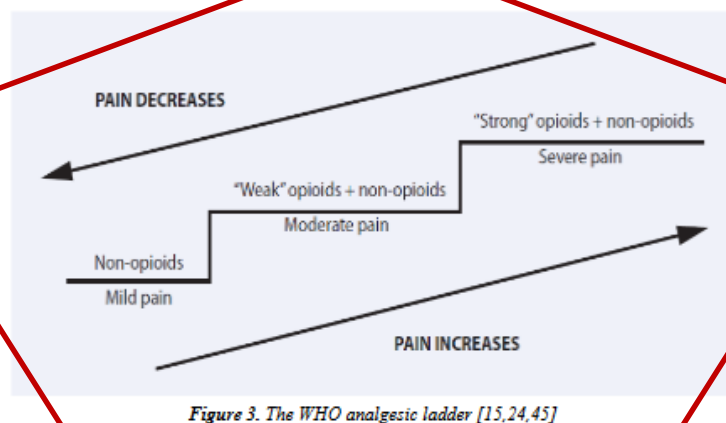


Figure 3. The WHO analgesic ladder [15,24,45]

Table 4. Dosage guidelines for the common non-opioids used in the management of pain in pediatrics [12,48]

Drug	Oral peak time	Usual Pediatric dosage	Usual Adult dosage	Comments
Acetaminophen	0.5–2 h	10–15 mg/kg every 4 h orally 20–40 mg every 6 h rectally	650–1000 mg every 4 h	Lacks the peripheral anti-inflammatory activity of other NSAIDs
Choline magnesium trisilicate (Trilisate)	2 h	25 mg/kg every 12 h	1000–1500 mg every 12 h	Does not increase bleeding time like other NSAIDs; available as oral liquid
Ibuprofen	0.5 h	6–10 mg/kg every 6–8 h	200–400 mg every 4–6 h	Fewer GI effects than other non-selective NSAIDs
Naproxen	2–4 h	5 mg/kg every 12 h	250–500 mg every 6–8 h	Delayed-release tablets are not recommended for initial treatment of acute pain
Ketorolac	0.75–1 h	0.25–0.5 mg/kg IV or IM, every 6 h	30 mg IV loading dose, then 15–30 mg every 6 h	IV or IM use only in children less than 50 kg; should not be used for children with bleeding disorder or at risk for bleeding complications
Celecoxib	3–6 h	1–2 mg/kg	100–200 mg every 12 h	sparing of COX-1 reduces the risk of serious GI side effects and renal toxicity Also, no effects on platelet aggregation

toxic metabolite acetyl-p-benzoquinone-imine (NAPQI) is produced in high quantities. This may lead infants and children to hepatotoxicity. However, rodent study compared weanling to adult rats and suggested that infants produce high levels of sulfhydryl group of glutathione (GSH) to bind NAPQI as a part of hepatic growth and this may provide some protection against the hepatotoxicity produced by overdose [7].

Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)

NSAIDs are commonly used analgesics with less contraindication in relative to opioids. Mainly these are used as analgesic regimen in mild and moderate pain by preventing the conversion of arachidonic acid to prostaglandins and thromboxane. Prostaglandins are

pro inflammatory mediators that sensitize nociceptors to increase afferent nociceptive signal to pain. Diclofenac, ketoprofen and ibuprofen commonly used NSAIDs in pediatric practice [7]. An observational study on the use of non-steroidal anti-inflammatory drugs (NSAIDs) was done in a sample of 51 patients in Italy resulted that ibuprofen was the most (68.6%) used NSAID followed by ketoprofen 9.8% and acetylsalicylic acid 7.8% for pain management of in pediatrics. The use of NSAIDs is now well established in clinical pain management [47].

This show to decrease morphine consumption and improve the quality of analgesia without increasing the incidence of side effects. These drugs are now a standard peri-operative analgesic agent in many pediatric institutions. Ibuprofen mainly used is available in oral suspension, infant drops,

Pain management in children

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Mazur A, Radziewicz Winnicki I, Szczepański T. Pain management in children. Ann Agric Environ Med. 2013; Special Issue: 28–34.

Abstract

The paediatric population is at risk of inadequate pain management, with age-related factors affecting pain management in children. This presented study discusses the complexities of measuring paediatric pain, reviews the most well-known pain assessment scales, and emphasizes the importance of family involvement in situations where children are asked to self-report their experiences. Current recommendations for treatment of pain in children are critically reviewed.

Key words

pain, children, pain management

INTRODUCTION

According to the International Association for the Study of Pain (IASP), pain is defined as 'an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage' [1]. It is important to stress that pain encompasses both peripheral physiologic and central cognitive/emotional components and may or may not be associated with real tissue damage. Pain may exist in the absence of demonstrable somatic pathology. The assessment of pain, therefore, relies largely upon the use of self-report. An even more difficult and complex issue is the identification, measurement, and effective treatment of pain in children [2].

Categories of paediatric pain. Typically, paediatric pain can be divided into three major categories, i.e.: somatic, visceral and neuropathic [3]. Somatic pain is caused by tissue injury or inflammation. Typical examples of somatic pain include burns, fractures, infections, and various inflammatory conditions. When involving skin and superficial structures, somatic pain is sharp and well-localized. Visceral pain is caused by inflammation or injury of internal organs (viscera), usually poorly localized or referred to distant locations. Typical examples include appendicitis, rapidly increasing hepatomegaly, bowel distension or gastritis. Finally, neuropathic pain is caused by injury, inflammation, or dysfunction of the peripheral or central nervous systems, e.g. associated with phantom limb pain, Guillain-Barré syndrome, sciatica, etc.

Pain from the public health perspective. Pain among children and adolescents has been identified as an important public health problem, although little is known about the epidemiology of pain in children. It is estimated that 15–25% of children and adolescents suffer from recurrent or chronic pain. More than 50% of them have experienced a pain episode within the previous 3 months. The prevalence of chronic pain increases with age, and is more common in girls than boys. Girls are significantly more likely to report

multiple health complaints. This tendency was also shown in international studies and proved in almost all countries and regions [4, 5, 6, 7]. Gender differences in prevalence increase with age. In the majority of countries and regions, girls at the age of 15 present a more than 10% higher burden of health complaints than boys. The most common types of complaints are abdominal pains, musculoskeletal pain, and headaches. Health complaints of somatic performance and psychological symptoms, e.g. nervousness or irritability, tend to occur together. Episodes of pain impact on school performance and peer relations. Recurrent pain is a reason for more than a half of short-period (1–6 days) school absences. Children with recurrent pains are at risk to develop additional physical and mental problems, such as functional disorders and anxiety in adulthood. 25–50% of patients with recurrent functional pains in adolescence continue to suffer from this condition in adulthood. Approximately 35% of patients with recurrent pains in childhood develop some psychiatric problems in adulthood [8, 9, 10].

The burden of frequent stress imposes the development of pain complaints. There is much evidence for the association of recurrent pain with family conflicts, experience of violence, bullying, lack of acceptance by peers, and lack of proper support from parents and teachers. In an HBSC study, school has been identified as a protective factor against multiple health complaints. However, low perceived classroom support is related to presentation of headaches and abdominal pains. The presence of recurrent pains in adolescents varies within the social gradient. The family lack of affluence, especially the poor social status predicts more risk of development of pains [4, 11, 12, 13].

Recurrent pain in children is also one of most common reasons for paediatric consultations. However, recurrent pains are in the majority of benign causation, they result in additional diagnostics, specialist consultations, which may elevate anxiety and impression of suffering from a serious condition. In turn, differential diagnostics of recurrent pains may immensely elevate stress in children and parents and aggravate symptoms. There is a need to seek an organic background for the causes of pain, with its increased health expenditure and overtreatment.

Pain assessment. Until recently, many believed that neonates experienced no pain or less pain than adults, children, or

related differences in body composition and protein binding also exist. Newborns have a higher percentage of body weight as water and less as fat compared with older patients. Water soluble drugs, therefore, often have larger volumes of distribution [17, 18, 19]. Newborns, and especially premature infants, have diminished ventilatory responses to hypoxaemia and hypercapnia [18, 19]. These ventilatory responses can be further impaired by CNS depressant drugs such as opioids and benzodiazepines [18, 19]. Except in the newborn period, when the half-life after administration is significantly longer, the pharmacodynamics and pharmacokinetics of nonsteroidal anti-inflammatory drugs (NSAIDs) in children are not much different than in adults [18, 19, 25]. However, the potential for gastrointestinal (GI), renal and other toxicities exist, but the incidence of these problems in young and older children may be less than that encountered during treatment of adults, perhaps due to the uncommon occurrence of the comorbidities and polypragmasia that predispose to problems [18, 19, 25].

Opioids are an essential element in pain management. There is no other class of medicines that is effective in the treatment of moderate and severe pain. The WHO supported the inclusion of morphine in the *WHO model list of essential medicines for children* to substantiate its use in children to relieve moderate to severe pain [50].

In the newborn's age, the elimination half-life of morphine is more than twice as long as that in older children and adults, as a result of delayed clearance [12]. Anand et al. [51] suggest that this appears to be due to several factors, the most important of which is the immaturity of the newborn infant's hepatic enzyme systems. Clearance of morphine is dependent on conjugation of the drug to form the metabolites morphine-3-glucuronide and morphine-6-glucuronide and the latter contributes a substantial fraction of morphine's analgesic effects. Tayman et al. [25] emphasized the role of glomerular filtration, which is reduced in the first week of life and leads to slower elimination of morphine's active metabolites.

These pharmacokinetic differences between neonates and older children must be understood to adjust dosing appropriately and avoid toxicity. Equally important in determining safe opioid dosing in infants is an understanding of the immaturity of the central respiratory control mechanisms [40, 50, 52, 53]. Infants in the first 3–6 months of life have inadequate and sometime paradoxical ventilatory responses to both hypoxia and hypercapnia, which can cause the development of apnea, or periodic breathing, after receiving even small doses of opioids [18, 19, 25].

Cardiorespiratory monitoring and careful observation is recommended whenever opioids are administered to infants less than 2–3 months of age. Premature infants and former premature infants with chronic lung disease continue to show depressed hypoxic drive for several months, and often require careful monitoring after opioid administration up to 5–6 months of age. Optimal use of opioids requires proactive and anticipatory management of side effects [50, 53, 54, 55].

WHO recommendations. Current WHO recommendations for the correct use of analgesic medicines in children relies on the following key concepts [43, 50]:

- using a two-step strategy;
- dosing at regular intervals;
- using the appropriate route of administration;
- adapting treatment to the individual child.

The WHO two-step strategy consists of a choice of category of analgesic medicines according to the child's level of pain severity: for children assessed as having mild pain, paracetamol and ibuprofen should be considered as first options; for children assessed as being in moderate to severe pain, the administration of an opioid should be considered.

In children above three months of age who can take oral medication and whose pain is assessed as being mild, paracetamol and ibuprofen are the medicines of choice. For children below three months of age, the only option is paracetamol. No other non-steroidal anti-inflammatory drug (NSAID) has been sufficiently studied in paediatrics for efficacy and safety to be recommended as an alternative to ibuprofen. Although there is evidence of the superior analgesic properties of ibuprofen versus paracetamol in acute pain, this is considered low-quality evidence because studies were performed in acute pain settings, and because of the absence of long-term safety evidence for its continuous use in persisting pain [43, 50].

Table 1 shows on-opioid analgesics for the relief of pain in neonates, infants and children recommended by WHO [43, 50]. According to WHO recommendations, medicines should be administered to children by the simplest, most effective, and least painful route, making oral formulations the most convenient and the least expensive route of administration [43, 50]. The choice of alternative routes of administration, such as intravenous (IV), subcutaneous (SC), rectal or transdermal when the oral route is not available, should be based on clinical judgment, availability, and patient preference. The intramuscular (IM) route of administration is painful and is to be avoided. The rectal route has an unreliable bioavailability, both for paracetamol and morphine, which limits its applicability [43, 50]. The feasibility of employing different routes of administration depends on the setting.

Table 1. Opioid analgesics for the relief of pain in neonates, infants and children recommended by WHO [43]

Medicine	Dose (oral route)		
	Neonates from 0 to 29 days	Infants from 30 days to 3 months	Infants from 3 to 12 months or child from 1 to 12 years
Paracetamol	5–10 mg/kg every 6–8 hours ^a	10 mg/kg every 4–6 hours ^a	10–15 mg/kg every 4–6 hours ^{a,b}
Ibuprofen		5–10 mg/kg every 6–8 hours	Child: 40 mg/kg/day

^a Children who are malnourished or in a poor nutritional state are more likely to be susceptible to toxicity at standard dose regimens due to reduced natural detoxifying glutathione enzyme.
^b Maximum of 1 gram at a time.

Opioid analgesics. The use of strong opioid analgesics is recommended by the WHO for the relief of moderate to severe persisting pain in children with medical illnesses [50]. The opioid dose that effectively relieves pain varies widely between children, and in the same child at different times, and therefore should be based on the child's pain severity assessment. Large opioid doses given at frequent intervals may be necessary to control pain in some children; these doses may be regarded as appropriate, provided that the side-effects are minimal or can be managed with other medicines [50]. An alternative opioid should be tried if

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The Use of Oral Transmucosal Fentanyl Citrate for Painful Procedures in Children

Neil L. Schechter, Steven J. Weisman, Martin Rosenblum, Bruce Bernstein and Patti Lynn Conard

Pediatrics March 1995; 95 (3) 333-339;

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Abstract

Objective. To investigate the efficacy and safety of oral transmucosal fentanyl (OTFC) in providing analgesia and sedation for painful diagnostic procedures in children

Design. Randomized, placebo-controlled clinical trial.

Method. Forty-eight children referred to the University of Connecticut Division of Pediatric Hematology/ Oncology for bone marrow aspiration or lumbar puncture were randomized to receive either OTFC (15 to 20 µg/kg) or a placebo lollipop. Thirty minutes after administration, the procedure was begun. An anesthesiologist monitored the child's heart rate, blood pressure, and oxygen saturation every 10 minutes. At the conclusion of the procedure, the nurse, the child's parent, and all children over 8 years of age were asked to rate the pain associated with the procedure using a 1 to 10 visual analogue scale. Young children (less than 8) used a modified scale, the Oucher, yielding a 0 to 5 score.

Results. Significant differences in pain ratings between the OTFC and placebo groups were noted on the pain scores of the parents ($P = .005$), nurses ($P = .001$), younger children ($P = .006$), and older children ($P = .013$), and median pain scores in the OTFC group were reduced to tolerable levels. Vomiting ($P = .003$) and itching ($P = .001$) were more common in the OTFC group, but no clinically significant vital sign deviations occurred.

Conclusion. OTFC is safe and effective for use in relieving the pain of pediatric procedures, but frequency of vomiting may restrict its clinical usefulness.

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may not accurately reflect ED patient acuity, ED critical care delivery, or ED critical care education. Future studies may examine alternative metrics to better quantify and describe the ED critical care experience.

164 What is the Incidence of Remediation in Emergency Medicine Residency Programs?

Weisberg M, Silverberg M, Murano T, Smith J, Sauten S/Staten Island University Hospital, Staten Island, NY; SUNY Downstate, Brooklyn, NY; Rutgers-New Jersey Medical School, Newark, NJ; Urown University, Providence, RI; University of Michigan, Ann Arbor, MI

Study Objective: Emergency medicine (EM) residency program directors (PDs) place residents on remediation when they are in need of extra help in achieving residency goals. However, the national incidence and success rates of remediation in EM are not known. The primary objective of this study was to determine the incidence of remediation in EM residencies. Secondary objectives included determining the indications, length, and success rates of remediation across the nation's EM residency programs.

Methods: Design is a prospective survey of PDs. The survey was developed in SurveyMonkey using the literature and members of the CORE remediation task force with attention to content validity. The survey was field-tested on APDs prior to dissemination for response process validity. The survey queried the total number of residents in each program and in the last 3 years, how many residents have been placed on remediation. Details regarding the remediation were queried including indication, length and success. The survey was sent to all ACGME-approved EM residency PDs. Descriptive data are reported.

Results: There were 105/160 responses (66%) obtained; 89.5% of programs had at least one resident on remediation in the last 3 years while 61.9% of programs reported more than one resident in remediation during that time frame. The percentage of residents on remediation in each program ranged from 0%-25% (mean 7.0%). Indications for remediation ranged from difficulties with 1 core competency to all 6 core competencies (mean 1.9). The most common areas of difficulties were medical knowledge (66.4%), patient care (65.7%) and professional/care (34%). Length of remediation ranged from 1 month to >36 months (mean 8.3 months). Successful remediation, as judged by the reporting PDs, was 57%; 19.8% of programs reported ongoing remediation. In 9.1% the remediation was deemed "unsuccessful."

Conclusion: Remediation in EM residencies is extremely common with close to 90% of programs having at least one resident on remediation in a recent 3-year period. The most common areas are medical knowledge and patient care. There is a wide range in length and success of remediation.

165 Health Literacy Regarding Diagnostic Testing in the Emergency Department

Parker B, Martz G, Duncan B, Rockey H/University of Toledo, Toledo, OH; Wright State University, Kettering, OH

Study Objective: Previous studies have demonstrated poor health literacy among emergency department (ED) patients. With a growing number of diagnostic tests being ordered in the ED setting, health literacy regarding diagnostic testing is of increasing importance to ensure patient understanding and satisfaction. This study was undertaken to identify ED patients' knowledge of common ED diagnostic tests.

Method: This prospective convenience sample survey was conducted at the University of Toledo ED between March 2013 and September 2013. Surveys were verbally administered to consenting adults who underwent >3 diagnostic tests. The participant's responses were graded independently by a panel of three emergency physicians using a 3-point health literacy scale. Data was analyzed to identify ED patient literacy regarding diagnostic tests and to identify associations with education and other demographic variables.

Results: Among 183 respondents, health literacy regarding diagnostic tests was poor. The most common diagnostic tests ordered included complete blood count (CBC) (96%), basic metabolic panel (BMP) (80%) and radiographs (59%). Patients were most knowledgeable about radiographs, ultrasound and EKG, and least knowledgeable about BMP, CBC and blood culture. Comparison by education demonstrated patients with some college education had higher levels of health literacy regarding diagnostic tests, including CBC ($P = .003$), BMP ($P = .017$), blood culture ($P = .001$), urinalysis ($P = .005$), EKG ($P = .004$) and X-ray ($P = .044$), compared to patients with only high school education. There was not a statistically significant association between health literacy about knowledge of patient specific diagnostic tests and education.

Conclusion: ED patients demonstrated poor health literacy regarding common ED diagnostic tests. Patients with college education had higher health literacy scores regarding common ED diagnostic tests compared to high school education. Regarding health literacy of patient specific tests, no statistical difference was found between the educational groups.

166 Validation of Pediatric Weight Estimation Methods Using Mid-Upper Arm Circumference

Suh D, Jung SY, Kim DK, Kwak YH/Seoul National University College of Medicine, Seoul, Korea

Study Objectives: The mid-upper arm circumference (MUAC) can be used to estimate weight, and it has far better performance to predict weight than any age-based formula in older children. The goal of this study is to validate the estimating body weights method using mid upper arm circumference in Korean children.

Methods: This is a retrospective observational study of children aged 0 to 14 years. We obtained anthropometric data from the national survey for the Korean Growth Standards in 2005. Using this data, we calculated the weight estimated by the Brodsky method, updated APLS, and Cattermole (weight = (MUAC/10) × 3). We compared measures with mean error (ME), mean percentage error (MPE), and percentage predicted within 10%, 20%, and 30% of actual (P10, P20, and P30, respectively).

Results: A total of 105,072 children's data were enrolled. In overall age, Cattermole was the most accurate (ME: 2.3kg, MPE: 21.4%, P10 32.0%, P20 56.1%, and P30 83.0%) than the Brodsky (ME: 1.2kg, MPE: 4.5%, P10 56.1%, P20 79.2%, and P30 85.3%) and updated APLS (ME: 0.5kg, MPE: 0.9%, P10 37.9%, P20 66.2%, and P30 84.0%). However, for ages 6-14, Cattermole was the most accurate (ME: 0.0kg, MPE: 0.9%, P10 50.3%, P20 82.2%, and P30 94.8%) than the Brodsky (ME: 1.9kg, MPE: -5.3%, P10 46.5%, P20 66.1%, and P30 73.0%) and updated APLS (ME: -0.4kg, MPE: 7.0%, P10 34.5%, P20 56.6%, and P30 75.0%).

Conclusion: We validated the weight estimation method using mid-upper arm circumference. In children aged 6 to 14 years, it is superior to height-based estimation, the Brodsky tape, and age-based formulas for estimation of weight in Korean children.

167 Oral Morphine versus Ibuprofen for Post-Fracture Pain Management in Children: A Randomized Controlled Study

Jeety J, Bhutler G, Lin K, Papari A, Nedouar R, Howard J, Dale M, Muirgrange D, Scotbrook J, Poona N/School of Medicine and Dentistry, Western University, London, ON, Canada

Study Objectives: In the emergency department (ED), fractures are a common painful condition where evidence suggests that analgesia is under-utilized. Codeine has been removed from many pediatric formularies due to safety concerns and the use of a theoretically more predictable drug: oral morphine has increased. However, it has not been studied in the pain management of pediatric fractures. This study was undertaken to determine if oral morphine is superior to ibuprofen in relieving post-fracture pain without an increase in adverse effects.

Methods: Children aged 5-17 years who presented to the ED with a non-operative fracture were randomized to receive either oral morphine 0.5 mg/kg (max 10 mg) or ibuprofen 10 mg/kg (max 600 mg) every 6 hours as needed for pain for 24 hours following discharge. The primary outcome variable was the pre-post intervention pain score.

Results: A total of 131 participants were included in the analysis with a mean age ± SD of 10.7 ± 3.2 years. In both arms, there was a reduction in pain scores following the intervention at each dose, with no significant differences in the change in pain for any of the four doses. However, there were significantly more adverse effects reported in the oral morphine group (55.6% versus 30.9%, $P = .005$).

Conclusion: Both oral morphine and ibuprofen were effective at reducing pain in children with fractures. Although there was no significant difference in analgesic efficacy between the two groups, oral morphine was associated with significantly more adverse effects.

168 Improving Pediatric Asthma Care via Outreach to a Community Emergency Department

Wells T, Hughes N, Fawcett C, Chamberlain J, Brown K/Children's National Health System, Washington, DC; Doctors Community Hospital, Lanham, MD

Study Objectives: To measure the effects of a new partnership with a community emergency department (ED) on the process and outcomes of pediatric asthma care.

MH ΦΑΡΜΑΚΕΥΤΙΚΗ ΑΝΤΙΜΕΤΩΠΙΣΗ ΤΟΥ ΟΞΕΟΣ ΠΟΝΟΥ:

Non-pharmacological approaches to control pediatric cancer pain: nursing team view*

Métodos não farmacológicos no controle da dor oncológica pediátrica: visão da equipe de enfermagem

Mayara Ruiz Chotollí¹, Paula Batista Luíze²

*Received from Cancer Hospital of Barretos, Barretos, SP, Brazil.

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ABSTRACT

BACKGROUND AND OBJECTIVES: A new challenge for pediatric cancer is pain control and it is believed that different professionals should be involved in this process, including the nursing team. So, there is the need for nursing care evaluation with regard to pain in cancer children. This study aimed at identifying pain measurement scales and non-pharmacological methods used by a pediatric nursing team.

METHODS: This is a descriptive, exploratory study carried out with 35 nursing professionals of the Children and Adolescents Cancer Hospital of Barretos, from June to September 2014. A questionnaire with 36 questions was used, added of 4 more for nursing professionals, related to the objective of the study. Data were analyzed by the SPSS v21.0 program.

RESULTS: There has been a small number of eight answers with regard to the adequate use of scales for children from zero to 2 years of age. Only 3 (21.4%) nurses have chosen the Neonatal Infant Pain Scale. Most common non-pharmacological methods were: comfort measures (n=22), massage (n=18), environmental changes (n=16) and heat (n=16). Nevertheless, it was observed that among 15 subjects suggesting other methods, 10 have mentioned drugs. Only 4 (28.6%) nurses prepared nursing pain-related diagnoses and 7 (50%) believed that their care helped in pain management.

CONCLUSION: We have identified the need for training on pain measurement scales according to age, possible non-pharmacological methods used by the nursing team and their association with the nursing process.

Keywords: Child, Nursing team, Nursing team professional, Oncology, Pain management, Pediatrics.

RESUMO

JUSTIFICATIVA E OBJETIVOS: Um dos novos desafios para o câncer infantil é o controle da dor, e acredita-se que diversos profissionais devem estar envolvidos nesse processo, inclusive a enfermagem. Dessa forma, nota-se a necessidade de avaliações do cuidado de enfermagem em relação à dor de crianças em tratamento oncológico. O objetivo deste estudo foi identificar escalas de mensuração da dor e métodos não farmacológicos utilizados por uma equipe de enfermagem da pediatria.

MÉTODOS: Trata-se de um estudo descritivo exploratório, realizado com 35 profissionais de enfermagem no Hospital de Câncer Infância-Juvenil de Barretos, de junho a setembro de 2014. Foi utilizado um questionário com 36 questões, acrescidas de 4 para o profissional enfermagem, relacionadas ao objetivo da pesquisa. Os dados foram analisados com a ajuda do programa SPSS v21.0.

RESULTADOS: Observou-se um número reduzido de acertos em relação ao uso correto de escalas para crianças de 0 a 2 anos; somente 3 (21,4%) enfermeiros escolheram a escala *Neonatal Infant Pain Scale*. Os métodos não farmacológicos mais escolhidos foram: medidas de conforto (n=22), massagem (n=18), alterações no ambiente (n=16) e calor (n=16). Apesar disso, notou-se que entre os 15 sujeitos que sugeriram outros métodos, 10 citaram o fármaco. Verificou-se que somente 4 (28,6%) enfermeiros elaboraram diagnósticos de enfermagem relacionados à dor, mas que 7 (50%) acreditavam que seus cuidados auxiliavam no manejo da dor.

CONCLUSÃO: Identificou-se a necessidade de treinamentos sobre escalas de mensuração de dor conforme a idade, possíveis métodos não farmacológicos utilizados pela enfermagem e sua associação com o processo de enfermagem.

Descritores: Criança, Equipe de enfermagem, Manejo da dor, Papel do profissional de enfermagem, Pediatria, Oncologia.

INTRODUCTION

The number of hospitalized cancer children is increasing every day and with this, new challenges involving the disease and its management are constantly arising¹. Among them, one may mention cancer children pain management². Percentages are alarming because pain in cancer children is approximately 78% at diagnosis, 25 to 58% during treatment, and up to

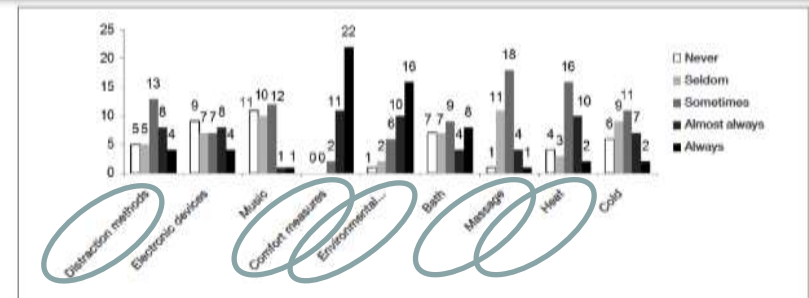


Figure 2. Frequency of approaches, according to a Likert Scale, checked by nurses and nursing technicians of the Children and Adolescents Cancer Hospital of Barretos, 2014

When asked: "Think about a child with pain; at the moment you see this child, can you think of a pain relief strategy different from analgesics?", 27 (77.1%) have answered yes. From these, 15 have suggested other approaches. The frequency of each approach was: 10 (38.4%) for drugs, 9 (34.2%) for distraction, 2 (7.6%) for lap, 2 (7.6%) for affection, 1 (3.8%) for decreasing noise and 1 (3.8%) for therapeutic touch. From respondents, 29 (82.9%) have mentioned more than one professional, different from physicians and nurses, who may contribute for children's pain relief. Among professionals, physiotherapist was mentioned 21 (33.8%) times, followed by psychologist with 12 (19.3%) and occupation therapist with 7 (11.2%).

With regard to nursing diagnosis and assistance prescribed by nurses, 4 (28.6%) have stated that "always" prepare pain-related nursing diagnoses and 5 (35.7%) have stated "almost always". A total of 7 (50%) nurses believed that their prescribed assistance would help improving pain. Major approaches were: patients' comfort n=9 (29.0%) and drugs n=5 (16.2%). Other approaches were: pain evaluation n=2 (6.4%), affection n=2 (6.4%), heat n=2 (6.4%), attention n=2 (6.4%), massage n=2 (6.4%), psychological support n=1 (3.2%), chatting n=1 (3.2%), lap n=1 (3.2%), singing n=1 (3.2%), clap hands n=1 (3.2%), placebo n=1 (3.2%) and environmental changes n=1 (3.2%).

DISCUSSION

Pain evaluation is the first stage for correct decision-making and adequate therapy³. In pediatrics, pain should be measured according to age groups and this is the first and probably the most important step to start any intervention⁴. Pain is a subjective and individual experience so there is no single tool able to measure pain with extreme fidelity; however there are scales which allow nurses to measure pain, provided the professional complements this evaluation with

semiologic pain analysis⁵. Children have different ways to express pain, so it is necessary to understand childhood developmental and behavioral stages⁶. A study has observed that a research has identified difficulty to evaluate pain among infants and preschoolers who expressed themselves exclusively by crying⁷. Our research has shown difficulty of the nursing team in choosing pain measurement scale, especially for children aged 0 to 2 years. This shows the need for training so that professionals are skilled to use adequate scales for each child. A Finnish study has shown that 75% of nurses believe that pain scales are important to be used with neonates, however 60% considered possible to evaluate neonatal pain without scales⁸.

A second study has shown that nurses use more often neonatal pain evaluation scales than physicians, who base their evaluation on behavior, body reactions, vital signs changes, stress and decreased oxygen saturation⁹. Scales should be simple and facilitate the use by all professionals. It is recommended that nurses evaluate which scale should be used for pain measurement in children and record such data, updating them daily¹⁰.

It was noted that the use of pain scales according to children age group and conditions is standardized. Notwithstanding this being a standard, not all respondents answers were adequate and this might be related to the time working with the institution, which was relatively short, approximately 12 months, and to the low number of pediatrics and oncology specialization. A limitation of this study might have been the establishment of working time of "three months or longer".

It was noted that the more qualified is the pediatrics or neonatology professional, there is significant increase in knowledge, especially about pain matters¹¹. A UK study has shown that some professionals (1.5%) disagreed that a premature with less than 28 weeks would feel pain¹². In a different study,

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ΜΗ ΦΑΡΜΑΚΕΥΤΙΚΗ ΑΝΤΙΜΕΤΩΠΙΣΗ ΟΞΕΟΣ ΠΟΝΟΥ:

Non-pharmacological management of neonatal pain: Research and clinical practice in the Neonatal Intensive Care Unit

Manejo não farmacológico da dor neonatal: pesquisa e prática clínica na Unidade de Terapia Intensiva Neonatal

Maria Beatriz Martins LINHARES¹
Cláudia Maria GASPARD¹

Abstract

According to the World Health Organization and the International Association for the Study of Pain, pain is a relevant worldwide problem in the healthcare field. The present study aimed to describe the definition of pediatric pain and the main characteristics, and to examine the findings regarding the impact of pain on the development of the child. The best clinical practices in Neonatal Intensive Care Units should include developmental care and specifically implement pain management, aiming to protect the health and development of the infants. The efficacious non-pharmacological management of neonatal pain includes breastfeeding, skin-to-skin, non-nutritive sucking, facilitated-tucking and swaddling. Sweet solutions also have pain relief effects. Psychologists could actively participate in the implementation of non-pharmacological interventions and in the whole process to sensitize and train the professional teams, to alert parents to protection against pain and to support policymakers in the implementation of pain guidelines in the hospital.

Keywords: Infants; Pain; Pain management.

Resumo

De acordo com a Organização Mundial da Saúde e a Associação Internacional para o Estudo da Dor, a dor é um problema mundial relevante na área da Saúde. O presente estudo teve por objetivo descrever a definição da dor pediátrica e principais características, assim como examinar achados sobre impactos da dor no desenvolvimento da criança. As melhores práticas clínicas devem incluir o cuidado ao desenvolvimento nas Unidades de Terapia Intensiva Neonatal e, especificamente, a implementação do manejo da dor, visando proteger o desenvolvimento e saúde dos bebês. O manejo não-farmacológico da dor neonatal inclui amamentação, leite humano, sucção não-nutritiva, toque facilitador e enrolamento. As soluções adoçadas, como glicose e sacarose, também têm efeitos de alívio de dor. Psicólogos podem participar ativamente das intervenções não-farmacológicas e todo processo de sensibilizar e treinar equipes de profissionais, alertar familiares para proteção contra a dor e dar suporte aos decisores na implementação dos protocolos de dor no hospital.

Palavras-chave: Bebês; Dor; Manejo da dor.

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of neonatal pain mainly includes prevention of pain-related stress experiences in the vulnerable population of preterm and full-term infants. During hospitalization in the NICU, preterm newborns experience an average of six painful procedures daily (Gaspardo, Chimello, Cugler, Martinez, & Linhares, 2008), and additionally suffer other extreme or moderate stressful events, such as, intubation, eye examination, lumbar puncture, heel pricks, and nasogastric tube insertion (Gorzilio, Garrido, Gaspardo, Martinez, & Linhares, 2015). The scientific, evidence-based, non-pharmacological management of neonatal acute pain (Cignacco et al., 2007; Fernandes, Campbell-Yeo, & Johnston, 2011) includes the following: (i) breastfeeding or human milk (as well as the unquestionable nutritional benefits of human milk for the infants, it is a potent pain relief intervention when used with breastfeeding or via oral-gastric tube); (ii) non-nutritive sucking (32 sucking behaviors per minute have an analgesic effect; a pacifier can be used); (iii) facilitated-tucking (placing the arms and legs of the infant near the trunk to maintain a flexed in utero posture, with limbs placed in body midline); (iv) swaddling (wrapping the infants in a sheet or blanket, limbs flexed, head, shoulders and hips neutral without rotation and hands accessible for exploration); (v) skin-to-skin (positioning of clinically stable infants against the breast of the mother allows them to be warmed, facilitates breastfeeding, sensitizes them to attachment, and relieves pain during medical procedures). The skin-to-skin position with the mother for 30 minutes is more effective for the pain relief of infants than 15 or 80 minutes (Cong, Ludington-Hoe, & Walsh, 2011; Cong et al., 2012). In addition, the findings are inconclusive regarding whether the skin-to-skin position with fathers and others caregivers is as efficient as with mothers in relation to protecting infants against pain experiences (Johnston, Campbell-Yeo, & Filion, 2011; Johnston et al., 2012).

It is important to note that all these pain strategies stimulate the infants in relevant developmental systems, such as oral, vestibular, and

motor. In addition, the breastfeeding and the skin-to-skin contact comprise part of a whole process of parenting, taking care of infants, acting for pain relief, and, naturally, promoting the mother-child interactions, which are protective for the emotional development of infants (Craig et al., 2015; Phillips, 2015).

Additionally, a range of sweet solutions, such as sucrose and glucose, are used to prevent acute-procedural pain in the NICU (Matar, Arabiat, & Foster, 2016; Mokhnach et al., 2010; Stevens, Yamada, Ohlsson, Haliburton, & Shorkey, 2016). Studies performed at the Clinical Hospital of Ribeirão Preto, of the Medical School of Universidade de São Paulo, showed that the use of repeated doses of oral sucrose in the NICU was effective in reducing procedural pain and increasing biobehavioral regulation, independent of the neonatal clinical risk level of the preterm newborns, with no clinical side effects detected (Gaspardo, Miyase, Chimello, Martinez, & Linhares, 2008; Linhares et al., 2014; Valeri, 2015). The administration of these solutions should follow the specific recommendation guidelines, which have established the optimum doses and concentration to be efficacious for pain relief. Currently, there is no consensus in the scientific literature regarding whether these solutions should be classified as non-pharmacological or pharmacological neonatal pain management. However, there is a consensus that the administration of these solutions should be prescribed and documented in the medical charts (Committee on Fetus and Newborn & Section on Anesthesiology and Pain Medicine, 2016; Lefrak et al., 2006).

Clinical practice implications

Considering that pain experiences affect the development of the child, the clinical practice of the interdisciplinary health team needs to include protection mechanisms for vulnerable infants exposed to the environment of toxic stress of the NICU. In the developmental care initiative in the

Χορήγηση Γλυκαντικών

- Η χορήγηση γλυκαντικών, έχει μελετηθεί σε περισσότερες από 200 μελέτες.
- Η αποτελεσματικότητά της αναφέρθηκε για πρώτη φορά το 1991 από τους Blass et al.
- Είναι η πιο διαδεδομένη ΜΦΜ μείωσης του πόνου κατά τη διάρκεια πραγματοποίησης επώδυνων παρεμβάσεων στα νεογνά.
- Έχει αποδειχθεί ότι η χορήγηση γλυκαντικών έχει αναλγητική δράση και προκαλεί την ηρεμία των νεογνών
- Σε μια μελέτη με νεογνά με ηλικία κύησης >36 εβδομάδων, η χορήγηση γλυκαντικών ήταν αποτελεσματικότερη στη μείωση του πόνου σε σχέση με τη χρήση μιας κρέμας που προκαλεί τοπική αναισθησία (κρέμα EMLA)



Original article

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The effect of sucrose on infants during a painful procedure

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Purpose: The purpose of this study was to test the efficacy of treating the pain among newborn infants associated with a medical procedure with sucrose with regard to overall physiological and behavioural stability.

Methods: 303 newborn infants were enrolled in this study. The control group ($n=151$) did not receive any treatment. The experimental group ($n=152$) received 2 mL of 24% sucrose solution two minutes before a routine heel stick. The pain was assessed by measurements of physiological changes (e.g. pulse rate, oxygen saturation, salivary cortisol) and behavioural changes (e.g. crying time, crying intensity, and

Η χορήγηση γλυκαντικών κατά την διαδικασία επώδυνων διαδικασιών στα νεογνά μείωσε την διάρκεια του κλάματος από 13 δευτερόλεπτα σε 3,5.

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Introduction

Treating pain in the newborn is essential for many reasons: pain can be harmful due to decreased oxygenation, haemo-dynamic instability, and increased secretory pressure¹. The International Evidence-Based Group for Neonatal Pain recommends that the combination of a variety of pharmacological and behavioural

intervention during painful procedures has synergistic effects². Recent studies have shown that the combination of oral sucrose and a pacifier was the most clinically safe and effective method for the management of painful procedures in neonates^{3,4}.

Safety and efficacy are the major concerns in the selection of an appropriate pain-relieving treatment in infants^{5,6}. According to pain management recommendations⁷, newborn infants over 1/2000

[Abstract Review]

Sucrose for analgesia in newborn infants undergoing painful procedures

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ABSTRACT

Background

Administration of oral sucrose with and without non-nutritive sucking is the most frequently studied non-pharmacological intervention for procedural pain relief in neonates.

Objectives

To determine the efficacy, effect of dose, method of administration and safety of sucrose for relieving procedural pain in neonates as assessed by validated composite pain scores, physiological pain indicators (heart rate, respiratory rate, saturation of peripheral oxygen in the blood, transcutaneous oxygen and carbon dioxide gas exchange measured across the skin), TeiCO_2 , TeiCO_2 , near infrared spectroscopy (NIRS), electroencephalogram (EEG), or behavioural pain indicators (cry duration, proportion of time crying, proportion of time facial actions (e.g. grimace) are present), or a combination of these and long-term neurodevelopmental outcomes.

Search methods

We used the standard methods of the Cochrane Neonatal. We performed electronic and manual literature searches in February 2010. We published randomised controlled trials (RCTs) in the Cochrane Central Register of Controlled Trials (CENTRAL), The Cochrane Library, Issue 1, 2010, MEDLINE (1950 to 2010), EMBASE (1980 to 2010), and CINAHL (1992 to 2010). We did not impose language restrictions.

Selection criteria

RCTs in which were or primary neonates (postnatal age maximum of 28 days after reaching 40 weeks' postmenstrual age), or healthy, normal neonates for procedural pain. Control interventions included no treatment, water, glucose, breast milk, breastfeeding, local anaesthetic, pacifier, pacifier/sucking/consoling or acupuncture.

Sucrose for analgesia in newborn infants undergoing painful procedures (Review)

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ΝΕΟΓΝΑ:

Μητρικός Θηλασμός

- Η συστηματική ανασκόπηση των Shah et al. (2006) περιλάμβανε 20 τυχαιοποιημένες μελέτες και διερεύνησε την αποτελεσματικότητα του μητρικού θηλασμού στη μείωση του πόνου στα νεογνά. Τα νεογνά που θήλαζαν κατά τη διάρκεια μιας επώδυνης διαδικασίας (τρύπημα πατούσας ή τρύπημα φλέβας) **εκδήλωναν καλύτερες αντιδράσεις στη συμπεριφορά και είχαν καλύτερες μετρήσεις στα ζωτικά σημεία σε σχέση με τα νεογνά που δεν θήλαζαν.**
- Η δράση του μητρικού θηλασμού είναι πολυπαραγοντική, περιλαμβάνοντας την άμεση επαφή μεταξύ νεογνού και μητέρας, τη λήψη γάλακτος που έχει ελαφρώς γλυκιά γεύση και την παρουσία ενδορφινών στο μητρικό γάλα.
- Ο μητρικός θηλασμός δεν εξαλείφει πλήρως τον πόνο, αλλά αποτελεί μια αποτελεσματική παρέμβαση μείωσης του πόνου χωρίς καμία επιβάρυνση για τα νεογνά.
- Δυστυχώς, όμως, ο μητρικός θηλασμός δεν εφαρμόζεται με συστηματικό τρόπο στην καθημερινή κλινική πρακτική.
- Ενδεικτικά, οι Johnston et al. (2011) σε μια μελέτη με 582 νεογνά σε ΜΕΝΝ στον Καναδά βρήκαν ότι μόνο στο 0,03% των περιπτώσεων που περιλάμβαναν τρύπημα της πατούσας ή της φλέβας των νεογνών εφαρμόστηκε ο μητρικός θηλασμός.

ΝΕΟΓΝΑ:

ΑΜΕΣΗ ΕΠΑΦΗ ΜΗΤΕΡΑΣ ΚΑΙ ΝΕΟΓΝΟΥ

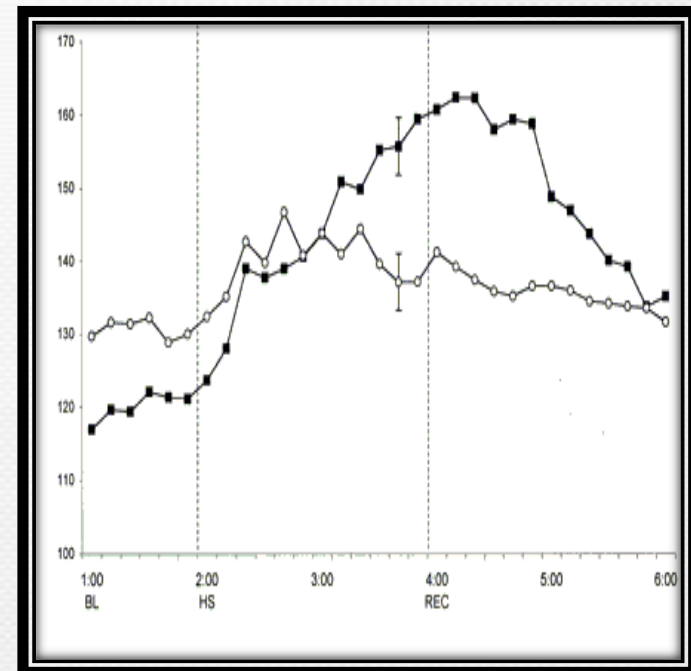
- Αποτελεί την πιο άμεση και ενστικτώδη επαφή μεταξύ των νεογνών και των μητέρων τους
- Η άμεση αυτή επαφή είναι γνωστή ως «**φροντίδα του καγκουρό**» και αποτελεί μοναδικό δεσμό μεταξύ των νεογνών και των μητέρων
- Η μέθοδος αυτή έχει αποδειχθεί αποτελεσματική τόσο σε πρόωρα νεογνά όσο και σε τελειόμηνα, αλλά και ευεργετική για τις μητέρες



ΝΕΟΓΝΑ:

ΑΜΕΣΗ ΕΠΑΦΗ ΜΗΤΕΡΑΣ ΚΑΙ ΝΕΟΓΝΟΥ

- Οι Johnston et al. (2003) πραγματοποίησαν μια μελέτη με 74 πρόωρα νεογνά με ηλικία κύησης >31 εβδομάδων για τη διερεύνηση της αποτελεσματικότητας της άμεσης επαφής, χρησιμοποιώντας την κλίμακα PIPP για την εκτίμηση του πόνου.
- Τα νεογνά που βρίσκονταν σε άμεση επαφή εμφάνισαν σημαντική μείωση στις αντιδράσεις στον πόνο σε σχέση με τα νεογνά που δεν βρίσκονταν σε άμεση επαφή, και στις 3 χρονικές στιγμές της επώδυνης διαδικασίας (30, 60 και 90 δευτερόλεπτα).
- Συστηματική ανασκόπηση των Johnston et al. (2014) στην Cochrane Collaboration περιλάμβανε 19 μελέτες με 1594 νεογνά και είχε ως ερευνητικό αντικείμενο τη σχέση μεταξύ άμεσης επαφής νεογνού και μητέρας και της μείωσης του πόνου κατά τη διάρκεια επώδυνων παρεμβάσεων.
- Σχεδόν σε όλες τις μελέτες βρέθηκε ότι η άμεση επαφή μεταξύ νεογνού και μητέρας συνέβαλλε στη μείωση του πόνου σε παρεμβάσεις, όπως το τρύπημα της φλέβας και της πατούσας και οι ενδομυϊκές ενέσεις.
- Επιπλέον, η καρδιακή συχνότητα στα νεογνά που βρίσκονταν σε άμεση επαφή αυξήθηκε σε μικρότερο βαθμό σε σχέση με τα νεογνά που δεν βρίσκονταν σε άμεση επαφή.



ΠΑΙΔΙΑ:



Γνωστικές-Συμπεριφορικές τεχνικές:

- Ψυχολογική προετοιμασία
- Εκπαίδευση, πληροφόρηση
- Απόσπαση προσοχής(παθητική ή ενεργητική):
Βιντεοπαιχνίδια, τηλεόραση, ταινίες, τηλέφωνο
- Τεχνικές χαλάρωσης(αναπνοή, διαλογισμός κλπ.)

Σωματικές τεχνικές:

- Άνετη θέση(αγκαλιά)
- Μασάζ
- Θεραπεία με τοποθέτηση ψυχρού ή θερμού επιθέματος
- Διαδερμική διέγερση ηλεκτρικού νεύρου (TENS)

ΠΑΙΔΙΑ:

ΨΥΧΟΛΟΓΙΚΗ ΠΡΟΕΤΟΙΜΑΣΙΑ - ΕΚΠΑΙΔΕΥΣΗ ΚΑΙ ΠΛΗΡΟΦΟΡΗΣΗ

- Προετοιμασία του ασθενούς, του φροντιστή ή του γονέα για το τι πρέπει να περιμένουν και να κάνουν κατά τη διάρκεια της διαδικασίας.
- Η προετοιμασία και η εκπαίδευση του ασθενούς και της οικογένειας ενισχύει τη διαδικασία συμμετοχής και μειώνει το άγχος.
- Αφήστε το παιδί και οι γονείς / φροντιστές να ξέρουν τι πρέπει να περιμένουν πριν, κατά τη διάρκεια και μετά την παρέμβαση.

Κατά την παρέμβαση

- **Διευρύνετε** φυσικά επαφή με το παιδί σας. Για παράδειγμα, το αγκαλιάζετε ή του κρατάτε το χέρι ή να κρατάει το δάχτυλό σας. Είναι υπεύθυνη μεγαλύτερη νοσηλεύτρια.
- **Ενθαρρύνετε** το παιδί να συνεργαστεί με τη νοσηλεύτρια/νοσηλό προσωπικό, αλλά παύστε και τότε να αναθαρρύνετε ή να διακόψετε όταν και για τους ίδιους.
- **Ελέγξτε** τον τρόπο και τις μεθόδους που χρησιμοποιείτε για να το καθησυχάσετε. Αν είναι υπεύθυνη/νοσηλό, το μέγεθος και λαμβάνει ότι κάτι απεικονίζεται προηγουμένως να είναι, μπορεί να επηρεάσει αρνητικά στη χρήση και/ή στην επικοινωνία αντανακλαστικής του.
- **Ελέγξτε** τη δόση της συμπεριφοράς και συναισθήματος, αντικαταστήστε τα αρνητικά σκέψεις με θετικές. Όλα είναι καλά. Είναι δυνατόν, μπορεί να αντιμετωπίσει στην κατάσταση.
- **Υποστηρίξτε** το παιδί με τεχνικές αίσθησης προτεραιότητας κατά τη διάρκεια της παρέμβασης, με παρηγορητικές βελόνες ή χρησιμοποιώντας τη φωνή σας.
- **Ενθαρρύνετε** το παιδί σας να είναι βολικό, αλλά επιμένετε και να είστε ότι η ένταση «θα είναι τον πιο μακριά». Αυτό θα το βοηθήσει να χαλαρώσει.
- **Χρησιμοποιήστε** τη φωνή σας και το παιδί σας να χρησιμοποιήσει τη φωνή σας και αυτό το βοηθάει στη διατήρηση του σώματος. Μπορείτε να δείξετε στο παιδί σας πώς να κρατάει καθησυχάζοντας το να φωνάζει ότι βρίσκεται στο κέντρο του μέτρου (π.χ. το σπίτι των παιδιών) ή ότι παρατηρείται στην αγωγή του δραστηριότητας (π.χ. παίχνοντας ποδόσφαιρο).
- **Ζητήστε** και να φωνάζει λεπτομερώς και να παραλάβει δυνατά σε φωνάζει (χρώματα, ήχοι, γεύσεις, μυρωδιές, συναισθήματα).



ΕΡΕΥΝΗΤΙΚΟ ΠΑΙΔΙΑΤΡΙΚΩΝ ΝΟΣΗΛΕΥΤΙΚΩΝ ΕΦΑΡΜΟΓΩΝ
ΤΜΗΜΑ ΝΟΣΗΛΕΥΤΙΚΗΣ
ΕΚΠΑ

ΕΛΛΗΝΙΚΗ ΕΤΑΙΡΕΙΑ ΠΑΙΔΙΑΤΡΙΚΗΣ ΝΟΣΗΛΕΥΤΙΚΗΣ

**Η συμμετοχή των γονέων
στη διαχείριση του πόνου σε
επώδυνες διαδικασίες**

ΕΠΙΣΤΗΜΟΝΙΚΗ ΕΠΙΜΕΛΕΙΑ
ΒΑΣΙΛΙΚΗ ΜΑΓΔΑΛΟΥ
ΠΟΛΥΜΑ-ΕΛΑ ΚΑΛΑΡΑ
ΕΥΦΡΟΣΥΝΗ ΒΑΣΙΛΕΪΔΗ

ΠΑΙΔΙΑ:



ΑΠΟΣΠΑΣΗ ΠΡΟΣΟΧΗΣ

- Η απόσπαση προσοχής είναι ο πιο συνηθισμένος τύπος γνωστικής τεχνικής.
- Πρόκειται για μια παρέμβαση που συχνά χρησιμοποιείται για να κατευθύνει την προσοχή μακριά από τα οδυνηρά ερεθίσματα. Είναι πιο αποτελεσματική όταν προσαρμόζεται στο αναπτυξιακό και γνωστικό επίπεδο του παιδιατρικού ασθενή .
- Δεν απαιτεί εξειδικευμένη εκπαίδευση από το προσωπικό.
- Εφαρμόζεται σε όλες τις ηλικιακές ομάδες. Συμμετέχουν και οι γονείς στην συγκεκριμένη τεχνική.
- Υπάρχουν δυο είδη απόσπασης προσοχής:
 - Παθητική:** Η προσοχή του παιδιού προσανατολίζεται σε ένα ερέθισμα ή ένα αντικείμενο που παρουσιάζεται από έναν νοσηλευτή όπως παιχνίδι, αφήγηση ενός παραμυθιού, ή παιδικά τραγούδια.
 - Ενεργητική:** Περιλαμβάνει τη συμμετοχή σε δραστηριότητες κατά τη διάρκεια διαδικασιών όπως: φουσαλίδες, μπουρμπουλήθρες, παίζοντας επιτραπέζια παιχνίδια, πλαστελίνες και άλλα.
- Οι δύο τεχνικές μπορούν να εφαρμοστούν ταυτόχρονα.

ΑΠΟΣΠΑΣΗ ΠΡΟΣΟΧΗΣ:

Original Article

Distraction Kits for Pain Management of Children Undergoing Painful Procedures in the Emergency Department: A Pilot Study

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ABSTRACT

To assess the feasibility, usefulness, and acceptability of using distraction kits, tailored to age, for procedural pain management of young children visiting the emergency department and requiring a needle-related procedure. A pre-experimental design was piloted. A kit, tailored to age (infants-toddlers: 3 months–2 years; preschoolers: 3–5 years), was provided to parents before their child's needle-related procedure. Data was collected to assess feasibility, usefulness, and acceptability of the kits by parents and nurses. Pain was measured pre-, peri-, and postprocedure using the Face, Legs, Activity, Cry, Consolability scale. A total of 25 infants and toddlers (mean age: 1.4 ± .7 years) and 25 preschoolers (mean age: 4.0 ± .9) participated in the study. Parents and nurses considered the kits useful and acceptable for

cedural period. Addition of more animated and interactive toys to the kits was suggested. In the infants-toddlers group, mean pain scores were 1.6 ± 2.5 preprocedure, 7.1 ± 3.0 periprocedure, and 2.5 ± 2.5 postprocedure. In the preschoolers group, mean pain scores were 1.6 ± 3.0 preprocedure, 4.8 ± 3.4 periprocedure, and 2.0 ± 3.2 postprocedure. The kits were used by parents and emergency nurses. They are an interesting nonpharmacologic option for nurses to distract children, giving them a sense of control over their pain and improving their hospital experience.

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of a pilot study. The research team approached parents of potential participants to obtain informed written consent to the study after (1) registration in the ELL Parents and Children were only recruited during the study itself.

Intervention: Distraction Kits for Infants, Toddlers, and Preschoolers

Distraction kits were developed in collaboration with clinicians in child life specialties, child psychology, and a pain clinic (nurse) working closely with our population of interest. Systematic reviews of toys used to distract young children (0-5 years old) during painful procedures were also used to select appropriate toys for the kits (D'Sa et al., 2010a; Shattuck et al., 2009; 2012; Kline et al., 2010a; 2011; White et al., 2013). We created two distraction kits tailored to our specific age groups. The first kit was developed for infants and toddlers between the ages of 5 months and 2 years and included the following items: rattle, bubble/foaming wand to a soapy liquid bottle, finger puppets, magnetic bead, projector with light, musical toy/horn, windmill, and pop-up book. The second kit, tailored for preschoolers between the ages of 3-5 years, included the following toys: train and work game, box of playing cards, soccer ball stickers, sticker books, ice-ice game, and small balls (Fig. 1). An informative user-friendly illustrated booklet was also developed and included in each kit to inform parents about the toys and how to use them to distract their child. Before the onset of the study, the research nurse and all emergency nurses working on sickle cell shifts participated in a 1-hour training session on the use of the distraction kits. The purpose was to standardize the approach to children during the procedures.

After informed consent was obtained and before their child's procedure, parents were given the appropriate distraction kit and encouraged to become



Figure 1. ■ Distractibility hit for preschoolers (3–4 years old)

familiar with the toys (without handling the toys to their child). During preparation for the procedure, the research nurse prompted parents to put one or more toys from the kit to choose their child. There was no limit to the number of toys parents could use with their child during the recall-related procedure. At the end of the procedure, the child was offered the kit and allowed to continue playing with the toys in the kit.

References

The following statements were used to describe the sample, assess feasibility, usefulness, acceptability, and satisfaction related to the distraction kit, and measure goals.

New York University School of Medicine, New York, New York, USA.

The research nurse filled out a questionnaire on selected sociodemographic and clinical information: age of the child, reason for visit to the ELS indication for the needle-related procedure, and baseline state of the child before the procedure.

Feasibility. Feasibility of the distraction kit was assessed by documenting the duration of the procedure, the child's position during the procedure, the person holding the child, the use of other distraction toys or tools not part of the kit, and the use of pharmacologic interventions.

Usefulness of the Toys. Usefulness of each toy was assessed by the parent using a three-point Likert-type scale (useful, not useful, harmful) tailored for the needs of the current study.

Acceptability. Acceptability of the distraction kit was assessed through a survey sent back for parents and nurses, which included five questions and an open-ended question to provide comments if needed. Questions were as follows: (1) 'What inspired did you find the most useful?', (2) 'Why?', (3) 'Would you have preferred another distraction technique to the kit?', (4) 'If yes, which one?', (5) 'In the future, would you use the distraction kit again?'

Satisfaction of Parents and Nurses. Because a review of the literature did not yield any validated satisfaction questionnaire written in French, assessment of parents' and nurses' level of satisfaction with the distraction kit was performed using questionnaires developed and validated for the current study by one of the authors (SM). Content validity of both scales was established by a group of clinicians consisting of one pediatric emergency physician, two ED research nurses, two ED staff nurses, and two nurse clinician specialists before conducting the study. Parents' satisfaction scale was also reviewed by two parents for content validity (clarity and relevance of each question). Both instruments consisted of 10 items, some of

ΑΠΟΣΠΑΣΗ ΠΡΟΣΟΧΗΣ:



References

Immersive Virtual Reality for Pediatric Pain

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Abstract: Children must often endure painful procedures as part of their treatment for various medical conditions. Those with chronic pain endure frequent or constant discomfort in their daily lives, sometimes severely limiting their physical capacities. With the advent of affordable (consumer grade) equipment, clinicians have access to a promising and engaging intervention for pediatric pain, both acute and chronic. In addition to providing relief from acute and procedural pain, virtual reality (VR) may also help to provide a corrective psychological and physiological environment to facilitate rehabilitation for pediatric patients suffering from chronic pain. The special qualities of VR such as presence, interactivity, customization, social interaction, and embodiment allow it to be accepted by children and adolescents and incorporated successfully into their existing medical therapies. However, the powerful and transformative nature of many VR experiences may also pose some risks and should be utilized with caution. In this paper, we review recent literature in pediatric virtual reality for procedural pain and anxiety, acute and chronic pain, and nurse rehabilitation applications. We also discuss the practical considerations of using VR in pediatric care, and offer specific suggestions and information for clinicians wishing to adopt these engaging therapies into their daily clinical practice.

Keywords: Virtual reality; pediatric pain; procedural pain; nonpharmacological; rehabilitation

1. Introduction

Children have always enjoyed games of "pretend." While immersed in a game, they often become deeply absorbed and able to ignore aversive stimuli. Immersive virtual reality (VR) is a promising and engaging intervention that may help to decrease pain and anxiety for children undergoing painful procedures and suffering from acute pain. In the context of their medical care, children may also reduce chronic pain and discomfort. Because VR makes it possible to transform how patients perceive their bodies, it allows (other, novel interventions that are possible in no other medium. Beyond providing distraction and enjoyment, virtual reality may provide a corrective psychological and physiological environment, and can facilitate rehabilitation for pediatric patients suffering from chronic pain, as well as neurorehabilitation for children suffering from stroke and cerebral palsy. With the advent of inexpensive consumer VR systems, the opportunities to research and deploy VR in the clinic have expanded. However, the powerful and transformative nature of many VR experiences may also pose some risks and should be utilized with caution in developing therapeutic VR interventions [1].

In this paper, we will review recent literature in pediatric virtual reality for procedural pain and



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In an emergency department, nurses and doctors can get too busy to wait for numbing creams for needle procedures. For newly diagnosed diabetic children, the medical community has a history of expecting kids to just get used to needle pain. For shots, for bee stings, for boo-boos, for injected medicines, for all acute pain management, Dr. Amy Baxter and her team developed Buzzy® to put instant pain management in YOUR hands.



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Bee-stractors are quick boredom busters, pain relievers, or tantrum tamers that de-rail downward spirals of distress. The cards can be placed in a slot in Buzzy® to block the view of the needle or they can be held by the child, which ever works best for you.



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Pain relief for immunizations, particularly multiple shots, requires a slightly different technique than needle pain relief for V's. When there is no risk of vasoconstriction, pain control is maximized by cooling the area then moving just proximal during the shot.

Ideally, a parent would put an arm around their child and hold Buzzy® on the site for about 30 seconds before the injection. Even with Buzzy® there will be dull touch sensations (those are transmitted on different nerves that Buzzy® doesn't block) so use distraction questions or Bee-Stractor Emergency Entertainment cards to entertain and pull attention away if the child already has a needle phobia. After 30 seconds move Buzzy® up from the injection spot about an inch, keep pressing Buzzy® onto the skin and perform the injection.



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Effects of Virtual Reality and External Cold and Vibration on Pain in 7- to 12-Year-Old Children During Phlebotomy: A Randomized Controlled Trial

Gülçin Ö. Gerçeker, PhD, RN, Şeyda Binay, RN, Elif Bilsin, PhD, RN, Ayşe Kabraman, PhD, RN, Hatice B. Yılmaz, PhD, RN

Purpose: The aim of this study was to evaluate the effects of the virtual reality (VR) and external cold and vibration methods on pain scores in children aged 7 to 12 years during phlebotomy.

Design: A randomized controlled study.

Methods: The sample of children ($n = 121$) was allocated to the groups (group 1, VR; group 2, external cold and vibration; group 3, control) by blocked randomization. Pain scores were assessed after the phlebotomy using self-report, parent's reports, report from the nurse who attempted the phlebotomy, and researchers' report with the Wong-Baker FACES scale. **Findings:** Pain scores were determined to be lower in groups 1 and 2. Although there was no difference between the groups 1 and 2, a statistically significant difference was found between groups 1 or 2 and group 3 based on all pain scores.

Conclusions: Results suggest that VR and external cold and vibration are effective in reducing the pain in 7- to 12-year-old children during phlebotomy. VR can be used safely for the pain management of children who are growing up in the age of technology.

Keywords: virtual reality, external cold and vibration, phlebotomy child, pain.

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OBTAINING BLOOD SPECIMENS, establishing vascular access, and vaccination are the most frequently used invasive procedures in children. Distraction and hypnosis are the nonpharmacologic analgesic methods, which have the highest evidence level and are used to reduce children's invasive procedure-related pain. These procedures

have been reported to be effective for children younger than 12 years.¹ Nonpharmacologic pain management procedures, in which the pharmacologic methods are not used to treat the pain, include cognitive-behavioral and physical approaches. Such procedures are an integral part of the care provided to children who experience

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The Effect of External Thermomechanical Stimulation and Distraction on Reducing Pain Experienced by Children During Blood Drawing

Sevil Inal, PhD* and Meral Kelleci, PhD†

METHODS

Design

This is a randomized clinical trial.

Setting and Participants

The research consisted of 218 children aged between 6 and 12 years who presented to the deputation room for blood drawing in the children's clinic of a university hospital in Istanbul between May 2 and June 24, 2010. All participants met the inclusion criteria and also agreed to participate in the research. At the beginning of the research, we informed 236 children and their parents about the study and asked if they would volunteer to participate in the study; 218 children and their parents agreed to participate. The children and their parents were further informed about the study when they came to the room for blood drawing. A written consent form was received from the participants. Children were assigned to 4 subgroups through computer-based randomization: group 1 was the control group and children in this group received no intervention for pain relief ($n = 56$), group 2 received external thermomechanical stimulation using Buzzy ($n = 55$), group 3 received distraction using DistrACTION Cards ($n = 55$), and group 4 received both external thermomechanical stimulation and distraction (Buzzy + DistrACTION Cards) ($n = 52$).

The study sample size was determined by power analysis based on previous research,⁸ with a 1.5 SD for the experimental groups and 2.0 for the control group. With a power of 0.80 and an acceptable type I error size of 0.05, each group required a minimum of 50 individuals.

Procedures

At the beginning of the study, we gained permission from the ethics commission, after which we informed the nurses about the study. We informed the children and their parents about the purpose and content of the study and asked them if they wanted to participate in the study. We developed an interview and observation form to collect background information about the children's demographics and medical history. After the group assignment, children and their parents moved into rooms for blood drawing. The preprocedural anxiety level was evaluated using the Children's Anxiety and Pain Scale through self-, parental, and observer reports. Data were obtained by interviewing the children, their parents, and the observer. The observer and parents were blinded to each other's responses. Children's Anxiety and Pain Scale is a fine psychometrics scale that is widely used in anxiety research.¹³ Children's Anxiety and Pain Scale is a 0 to 5 scale with 5 cartoon faces that range from a neutral expression to a frightened face.

The children's pain levels were assessed by themselves and the parents' observations using the Faces Pain Scale-Revised (FPS-R).¹⁴ The children, parents, and the observer scored each response and were blinded to the each others' responses. The FPS-R is a 0 to 10 scale that consists of 6 cartoon faces, which range from a neutral expression (0 = no pain) to a

Abstract: This study aimed to investigate the sole and combined effects of external thermomechanical stimulation and distraction in pain relief of children during blood drawing.

This is a randomized clinical trial. The sample consisted of 218 children aged 6 to 12 years who were randomly assigned to 4 groups: group 1 received no intervention, group 2 received external thermomechanical stimulation using Buzzy, group 3 received distraction via DistrACTION Cards, and group 4 received a combination of both external thermomechanical stimulation and distraction. Preprocedural anxiety was assessed through parents' and observers' observations using the Children's Anxiety and Pain Scale. Children's pain levels were assessed by themselves, observers, and parents, as reported using the Faces Pain Scale-Revised. Preprocedural anxiety did not differ significantly ($P > 0.05$). When the 3 study groups were compared with the control group, all 3 groups had significantly lower pain levels than the control group ($P < 0.001$). The lowest pain level was measured in the combined condition (Buzzy and DistrACTION Cards). The mean score of the device group was lower than the distraction group.

Key Words: external thermomechanical stimulation, the distraction method, nursing, pain relief, needle pain, blood draw, venipuncture

(Pediatr Emer Care 2017;00: 00-00)

Needle sticks are the most prevalent and major sources of pain in hospitalized children.¹⁻³ Pain causes children to be frightened of needles, and this leads children and their parents to be reluctant to undergo procedures, which affects the experience of subsequent treatment and care.⁴ Therefore, nurses should be able to manage painful procedures to reduce the emotional and physical effects in children during medical interventions such as needle-stick procedures.^{5,6}

The provision of nonpharmacologic relief is among the first steps in pain management. Physical and behavioral methods are the most commonly used nonpharmacologic methods. One physical technique is external thermomechanical stimulation.^{7,8} One of the most effective distraction methods is using distraction cards during medical procedures.^{9,10} Although some studies support the use of external thermomechanical stimulation^{7,9} and distraction cards,¹⁰⁻¹² no studies have compared the effect of distraction cards and external thermomechanical stimulation alone and in combination. Therefore, this study aimed to investigate effects of external thermomechanical stimulation and distraction cards, alone and in combination, on pain relief during blood drawing.

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My Pain Toolkit

For young people living with pain



- Does pain stop you from doing the things you enjoy?
- Do you struggle to understand your pain?
- Do you want your pain to stop controlling you?

If any of these questions are true then this Toolkit is for you!

This Pain Toolkit is a simple guide that gives you with some handy tips and skills to help you to better understand and manage pain!



I loved the Pain Toolkit, it wasn't talking at me, but just giving me some tips and ideas others have used to manage their pain. Now I understand my pain better and the Toolkit's ideas worked!



There are two main types of pain:

- **Acute pain** begins suddenly and doesn't last for too long.
- **Chronic pain**, sometimes called persistent or long-term pain, is pain that last longer than three months.

Why do we get pain?

Pain is like a warning, just like the warning light on a car telling us something is wrong and needs a attention. It is our body's way of telling us that we are either **harming ourselves or about to hurt our self**, so that we can do something to stop it. For example, when you touch something hot, the pain makes you move your hand to stop you burning yourself. This is acute pain.

After you have injured yourself (e.g. breaking an arm) your brain keeps sending pain messages for a while. This isn't because your arm is still being damaged, but as a way to stop you moving it too much so that it can heal quickly. When the bone has healed, the pain goes away as your arm doesn't need protecting any more.

Pain is a message created by your brain telling you to protect yourself

So what is long-term pain?

Sometimes, pain sticks around longer than it needs to. The usual medical treatment doesn't work very well for this long-term pain.

Like after breaking an arm, this long-term pain doesn't mean the painful area is still being damaged. In fact, in many cases the area can be completely healed, making it hard to understand why it still hurts. When this happens, **the brain seems to be confused**, sending pain messages when it doesn't need to!

How Does Your Pain Effect You?

Living with pain can be really difficult. Not only can it effect the things you do, it can also effect the way you feel, the way you think, and your relationships with your friends and family.

Below are some of the most common ways that young people say pain affects them. Does your pain have a similar effect on you?



Are there any more that are not listed? List them here:

.....





.....

.....

Tool 2: Get involved and build a support team

As we now know, long-term pain is a bit tricky. Because of this the doctors probably won't be able to fix or solve your pain on their own. Expecting them to is probably not realistic. With long-term pain it is important for YOU to get involved and take steps to managing your pain. You will also need a support team around you.

Who could be in your support team?

-  Your doctor or health care professional
-  Your family
-  Your friends
-  Your teachers



Have you become a 'can't do' person?

A '**can't do**' person is someone who has stopped or given up everyday activities such as playing a sport, going out with friends, taking holidays, going to the cinema, eating out or taking part in family activities because of their pain. When this happens it is usual to lose your confidence and avoid doing even more, just in case you can't. Is this ringing any bells? If so you need to stop and do something about it.

Practising the tools in the Pain Toolkit will help you feel more confident and become a '**can do**' person again; but it could take time so please be patient with yourself!

Tool 5: Setting Goals

Setting yourself clear goals is a great way to help you achieve the things you want, giving you something to work towards. Achieving our goals makes us feel good about ourselves and shows us that change can happen!

Ask yourself what you would like to achieve. This could be anything that is important to you. Make sure your goals are **SMART**:

S

Specific

You're more likely to achieve your goals if they are specific. For example - "I want to be able to exercise" isn't very clear. "I want to start swimming" is easily to work towards.

M

Measurable

It easier to know when you have achieved a goal if it can be measured. Distance, a time limit or the number of times you do it are ways to measure goals. E.g. "I want to swim twice a week".

A

Achievable

It's important to be honest and realistic. Can you goal be achieved? If not, you will set yourself up to fail.

R

Rewarding

The more rewarding a goal is the more likely you will want to do it! Either make sure the goal is something that will make you happy, or give yourself treats for your success.

T

Timed

Set yourself a timescale. If you don't have a plan it makes it hard to get started and stay focused. You can always change your time limits, but make sure you set them.

Pain in Children: Neglected, Unaddressed and Mismanaged

Lulu Mathews

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Abstract

Go to: 

Pain is one of the most misunderstood, under diagnosed, and under treated/untreated medical problems, particularly in children. One of the most challenging roles of medical providers serving children is to appropriately assess and treat their pain. New JCAHO regulations regard pain as "the fifth vital sign" and require caregivers to regularly assess and address pain. Pain being a personal experience, many different terms are used to describe different sensations. Assessment of pain in children is linked to their level of development. Children of the same age vary widely in their perception and tolerance of pain.

Keywords: Pain in children, Neglected and unaddressed, Barriers to pain assessment and management

INTRODUCTION

Go to: 

Every child will experience pain at one time or another, whether it is from everyday bumps and bruises, or due to more chronic conditions such as headaches, gastrointestinal problems, or diabetes. In fact, as many as 40% of children and adolescents complain of pain that occurs at least once weekly, and chronic pain affects at least 15%–20% of children. Just as chronic pain is more prevalent in women than men, girls report more pain than boys.^[1]

Pediatric pain stems from a wide range of chronic conditions- usually muscle, bone, or joint pain, headaches, or abdominal pain- and require pain management. But the medical community has not placed the same emphasis on pain management for pediatric patients as it has for adults and seniors. Each year, 1.5 million children have surgery, and many receive inadequate pain relief and in 20% of cases, the pain becomes chronic. Of children aged 5–17 years, 20% suffer headaches.^[2] More than one-third of children complain of abdominal pain lasting two weeks or longer.^[3] Juvenile arthritis, which causes joint inflammation and aches, affects nearly 250,000 people under the age of 16 years.^[4]

Original Article

Chronic pain in children after cardiac surgery via sternotomy

Mette H. Lauridsen,¹ Anders D. Kristensen,^{2,3} Vibeke E. Hjortdal,⁴ Troels S. Jensen,³ Lone Nikolajsen^{2,3}¹Department of Paediatrics; ²Department of Anaesthesiology; ³Danish Pain Research Center; ⁴Department of Cardiothoracic and Vascular Surgery, Aarhus University Hospital, Aarhus, Denmark

Abstract Introduction: Chronic pain is common after sternotomy in adults with reported prevalence rates of 20–50%. So far, no studies have examined whether children develop chronic pain after sternotomy. **Material and methods:** Postal questionnaires were sent to 171 children 10–60 months after undergoing cardiac surgery via sternotomy at the age of 0–12 years. The children were asked to recall the intensity and duration of their post-operative pain, if necessary with the help from their parents, and to describe the intensity and character of any present pain. Another group of 13 children underwent quantitative sensory testing of the scar area 3 months after sternotomy. **Results:** A total of 121 children, median (range) age 7.7 (4.2–16.9) years, answered the questionnaire. Their age at the time of surgery was median (range) 3.8 (0–12.9) years, and the follow-up period was median (range) 4 (0.8–5.1) years. In all, 26 children (21%) reported present pain and/or pain within the last week located in the scar area. In 13 (46%) out of the 26 children, the intensity was ≥ 4 on a numeric rating scale (0–10). Quantitative sensory testing of the scar area revealed sensory abnormalities – pinprick hyperalgesia and brush and cold allodynia – in 10 out of 13 children. **Conclusion:** Chronic pain after cardiac surgery via sternotomy in children is a problem that should not be neglected. The pain is likely to have a neuropathic component as suggested by the sensory abnormalities demonstrated by quantitative sensory testing.

Keywords: Congenital heart disease; children; sternotomy; chronic pain

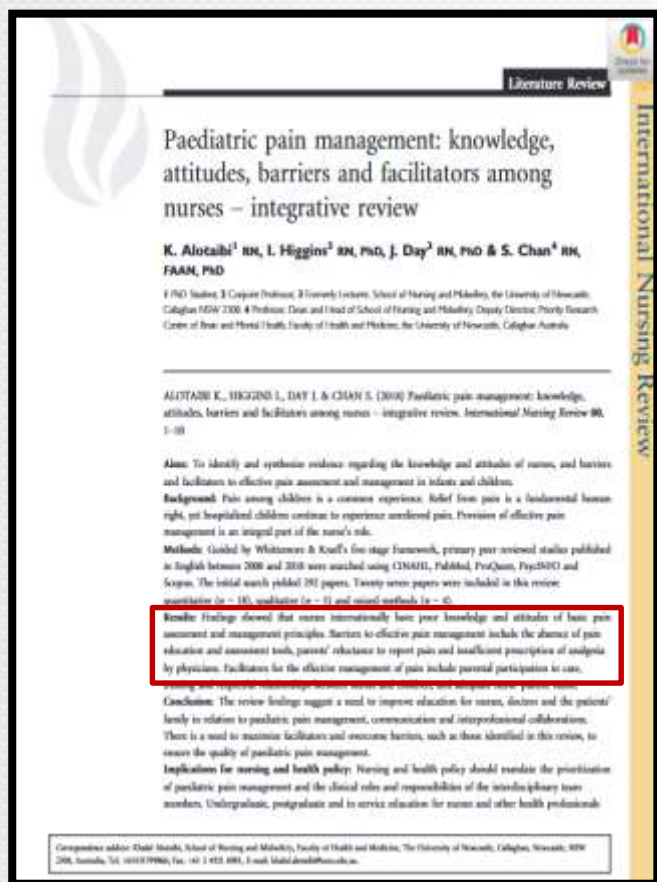
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CHRONIC POST-OPERATIVE PAIN IS GENERALLY accepted as a potential consequence of almost any operation.^{1,2} Prevalence rates vary substantially, depending on the type of surgery; for example, between 50 and 85% of amputees experience phantom pain after amputation, up to 30% develop chronic pain after breast cancer surgery, between 20 and 60% report chronic pain after thoracotomy because of lung cancer, and about 10% develop chronic pain after inguinal hernia repair.^{3–6} The causes of chronic pain after surgery are not fully known, but several risk factors have been identified, including female gender, psychosocial and genetic factors, and pre- and post-operative pain.^{1,2} Nerve injury during surgery is

also an important risk factor, as many patients with chronic post-operative pain present with hyperalgesia and allodynia in the painful area, which are characteristic symptoms of neuropathic pain.^{7,8}

Studies on amputation, thoracotomy and inguinal hernia repair have suggested that young age at the time of surgery may be associated with a lower risk of developing chronic pain.^{9–11} For example, a questionnaire-based study including adults who underwent thoracotomy in childhood because of coarctation of the aorta showed that only three out of 88 (3.4%) had pain 30 years after surgery.¹⁰ Another questionnaire-based study of 98 children who had undergone inguinal hernia repair 3 years earlier showed a prevalence of chronic pain of 5.1%.¹¹ The mechanisms behind this apparent lower risk of developing chronic pain in young patients are not fully known, but may be related to both physiological and psychological factors.

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ARTICLE

Barriers to Pediatric Pain Management in Children Undergoing Surgery: A Survey of Health Care Providers

Monika Bawa, Jai K. Mahajan, Neel Aggerwal, Jegadeesh Sundaram, and K. L. N Rao

ABSTRACT

Το 73% των ειδικευόμενων και το 74% του νοσηλευτικού προσωπικού είχε επαρκείς γνώσεις σχετικά με τις κλίμακες εκτίμησης του πόνου, όμως μόνο το 6,6% των ειδικευόμενων εκτιμούσαν πόνο στα έκτακτα περιστατικά.

Το 56% των ειδικευόμενων χορηγούσε αναλγησία σε μικρές επώδυνες διαδικασίες.

Μόνο το 3,3% των ειδικευόμενων και το 2,8% του νοσηλευτικού προσωπικού είχαν μια επαρκή εκπαίδευση στην διαχείριση του παιδιατρικού πόνου

KEYWORDS analgesia, barriers, opioids, pain, pediatrics, perioperative, survey

Commentary

Becoming a pediatric pain specialist: Training opportunities to advance the science and practice of pediatric pain treatment

Rashmi P. Bhandari, John Goddard, Fiona Campbell, Michael Sangster, and Bonnie Stevens

2018 was the International Association for the Study of Pain (IASP) global year for excellence in pain education (IASP, 2018); at the end of this initiative, it seems apposite to take stock of the current state of training opportunities in pediatric pain. Chronic pain is a biopsychosocial phenomenon and a disease in its own right. In pediatric practice there is an established evidence base for multidisciplinary treatment approaches characterized by a close collaboration of teams, which include anesthesiologists, pediatricians, nurses, psychologists, child life and rehabilitation specialists. Pediatric pain management is a subspecialty, which currently has no standardized guidelines for training and lacks recognition as a distinct specialty by regulatory bodies in most countries, resulting in great variations in the content and quality of training. To facilitate attempts to overcome this concern, this general commentary will highlight examples of existing quality training opportunities both within disciplines and across disciplines and researchers interested in pediatric pain (see Table of programs discussed). The examples will be of use in developing their own training and offer recommendations for pain education and training.

Several programs have been developed to offer interprofessional pediatric pain training through online or intensive workshop approaches. The Online Pediatric Pain Curriculum (The Hospital for Sick Children [SickKids] – OPPC) is a steadily available and free online resource in English for health care professionals, comprising ten educational modules based on the Core Curriculum for Professional Education in Pain of IASP. Modules cover clinical, scientific, and ethical topics and were developed by international pain experts as strategies to bridge the knowledge-to-action gap. OPENPediatrics is an interactive digital learning platform for health care clinicians sponsored by Boston Children's Hospital. It provides free access to documents and videos covering a number of areas of pediatric pain; it also provides accredited training for a fee.

The Canadian Pain in Child Health Initiative (Based at SickKids – PICH) has notably united the global community of pediatric pain research trainees, researchers and clinicians (von Baeyer et al., 2014; von Baeyer et al., 2019). For the past 16 years, PICH has provided learning opportunities including an annual institute. The PICH institutes cover a wide content area such as pain assessment and management, acute and chronic pain, pain ethics, as well as processes to link students with faculty (e.g. networking, mentoring), development or research capacity (e.g. pain research skills development). PICH also supports postdoctoral fellows through institution-based fellowships. Most recently, PICH is sponsoring local PICH2GO

Physiotherapy. The integration of the principles of pain science in general pre-licensure physiotherapy curriculum is lacking (Watt-Watson et al., 2013). As a consequence, there exist significant gaps between the current best evidence in pain science and the clinical arena. The recognition of this major clinical deficiency has fostered the inclusion of the 2012 IASP Pain Curriculum for Physical Therapy into the pre-licensure program in some jurisdictions such as Australia (Hush et al., 2018). Additionally, national associations such as the Physiotherapy Pain Association and the Chartered Society of Physiotherapy in the UK have partnered to develop resource frameworks for physiotherapists who work with people in pain in order to provide a structure for competency development. However, the disparity in pain science training, particularly in pediatrics, remains vast across practicing clinicians and jurisdictions.

Post-professional continuing education provides an opportunity to address the pain education needs for the practicing pediatric physiotherapist. Continuing professional development in physiotherapy encompasses a variety of learning activities post pre-licensure training, including online learning, short courses, and postgraduate academic training (Leahy et al., 2017). Current opportunities for pediatric-focused pain science training for physiotherapists are not widely available. Rather, adult-focused educational opportunities serve as the basis for knowledge acquisition in pain science. Notably, several private continuing professional development providers, including the Neuro-Orthopedic Institute in Australasia (NOI) and the International Spine and Pain Institute in the USA (ISPI) offer pain science training in the form of short courses – Explain Pain and Therapeutic Pain Specialist Certification respectively. However, these learning activities are not formally recognized as specialist training by professional regulatory institutions.

Although not pediatric-focused, traditional academic training in pain science at the graduate level is an emerging opportunity, providing academic rigor in program development. Several academic institutions, for example McGill University in Montreal (McGill University School

of Physical and Occupational Therapy) and the University of Alberta (University of Alberta Faculty of Rehabilitation Medicine) offer graduate certificates in pain management specific to the needs of the rehabilitation professional. Finally, the Canadian Physiotherapy Association offers its membership the opportunity to pursue a self-directed clinical specialist certification in pain science, which recognizes physiotherapists who demonstrate advanced clinical competence, leadership, continuing professional development and involvement in research in this specialty area.

In physiotherapy, there is a paucity of pediatric-specific pain science training opportunities available to practicing clinicians. Clearly, to best serve pediatric patients and their families, a significant effort to bolster pediatric pain training opportunities for rehabilitation professionals is required.

Nursing. Nurses play a key role in pain prevention and management due to their proximity to patients and families within their role in the interdisciplinary management of pain. Nurses with specialized roles focusing on pain (i.e. roles of clinical nurse specialists and nurse practitioners within specialized pain teams), as well as nurses at the point of care, rate pain as a priority within delivery of care. Assessment and pain treatment and prevention guidelines and protocols guide the practice of nursing (American Academy of Pediatrics Committee on Fetus and Newborn and Section on Anesthesiology and Pain Medicine, 2016). Nurses also learn about evidence-based non-pharmacologic pain prevention and treatment strategies in infants and children, particularly those with synthesized evidence from systematic reviews. These include non-pharmacologic strategies such as skin-to-skin contact and breastfeeding (Taddio et al., 2015) and non-nutritive sucking and facilitated hugging for infants undergoing painful procedures (Pillai Riddell et al., 2013), as well as the use of sucrose (Stevens et al., 2016). In older children, across the pediatric age span, distraction strategies (e.g. books, movies, robots, virtual reality) and hypnosis have strong evidence for efficacy (Uman et al., 2013). Some of these strategies have been combined successfully in organizational approaches



ΣΑΣ ΕΥΧΑΡΙΣΤΩ

