

The Pediatric Perspective

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Children's Healthcare of Atlanta: Institution Overview

- 474 staffed beds in 3 hospitals
- 17 satellite locations throughout metro Atlanta
- >6,800 employees
- 558,620 patient visits (2006)
 - 228,000 unique patients
 - 22,700 hospital admissions
 - 35,550 surgical



Wounds

Cancer Pain

Tape

Tubes



Fear

Surgery

Needles

Sickle Cell Pain

Center For Pain Relief

Mission :

To create and conduct a comprehensive program to improve the prevention & management of pain in children through a multi-disciplinary approach involving education, advocacy, institutional improvement and research.

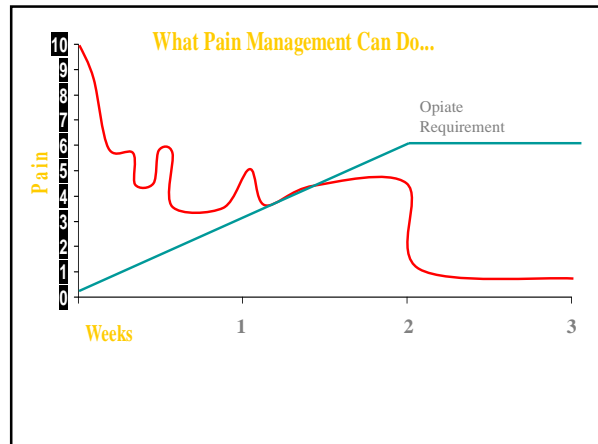
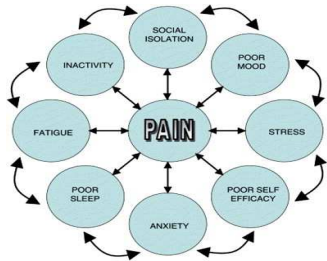
Center For Pain Relief

- 24/7 in-patient consultation service
- Out-patient chronic pain clinic
- Interventional procedures
- Education & advocacy re pain management

Common Chronic Pain Diagnoses

- Migraines/Headaches
- Sickle Cell Pain
- JIA
- CRPS
- Chronic Abdominal Pain
- Fibromyalgia
- Cancer Pain

Cycle of Pain



Undertreatment of Children's Pain ...

- Patients & families
- Societal factors
- Health care professionals

The Case of Jeffrey Lawson

"Jeffrey had holes cut on both sides of his neck, another cut in his right chest, an incision from his breastbone around to his backbone, his ribs pried apart, and an extra artery near his heart tied off. The operation lasted hours. Jeffrey was awake through it all. The anesthesiologist paralyzed him with pavulon, a drug that left him unable to move, but totally conscious. When I questioned the anesthesiologist later she said Jeffrey was too sick to tolerate powerful anesthetics. Anyway, she said, it had never been demonstrated to her that premature babies feel pain."

Lawson, JR Birth 1986;13:124-5

Challenging the Standard of Care

Webb : "With regard to that ... most of these babies do not need halothane. All they need is a little ventilatory support. They do not need much agent at all. A little bit of adhesive tape holds them down."

Ward : "May I just mention that in no animal laboratory in the world could you get away with anesthetizing a puppy with adhesive tape. Some of us feel that perhaps the infant is worth at least the same amount of care as a puppy."

Ward RJ et al, Anesth Analg 1970; 49: 767-772

Continuing to challenge

" ... it continues to happen .. A trip through the NICU in almost any hospital on any given day will find infants paralyzed for ventilation without anesthesia or sedation, traipse through the well newborn nursery in your hospital & observe newborn circumcision, if provided by an OB the odds are overwhelming that the infant is being restrained and circumcized without nerve blocks or topical anesthesia ..."

Myron Yaster MD

Communication in 'pedpainlist' March 2004

Current Trends

- Increased awareness & understanding of pain in children
- Recognition of needle pain & distress
- Use of multi-modal approaches to pain management

Increased Awareness & Understanding

Effects of pain & stress on neonates

- Pain leads to increased morbidity & mortality
- Unmanaged pain can lead to central sensitization
- Poorly managed pain can affect development

Increased Awareness & Understanding

Anand, Hickey, et al, NEJM, 1987

- Improved analgesia/anesthesia associated with reduced complications, shorter stays, decreased mortality after cardiac surgery.

Anand, Grunau, et al, Child Adolesc Psych Clin 1997

- Early repetitive pain assoc. with ↑ neurologic & cognitive deficits, poor motor skills, & psychosocial problems

Recognition of Needle Pain & Distress

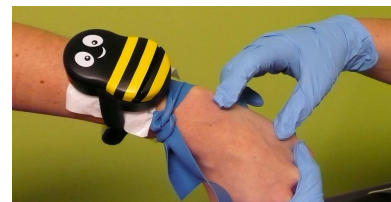
- Venepuncture reported by children as the worst aspect of healthcare/hospitalization
- Some data suggests avoidance of immunization & avoidance of healthcare encounters in general
- Volume of procedures involving needles

Relief of Needle Related Distress : Principles of Care

- Intervene early
- Be safe
- Be developmentally appropriate
- Combine behavioral and pharmacological interventions
- Use good technique and equipment
- Evaluate outcomes

Something new ...

- Secure in place with velcro or tourniquet
- Tourniquet for blood draw may be placed before or after
- Buzzy4shots.com.



Procedural Pain

- Pain is a subjective phenomenon
- Memory
- Anticipatory anxiety
- Temperament
- Parental influences

AAP Committee on Psychosocial Aspects of Child and Family Health. APS Task Force on Pain in Infants, Children, and Adolescents. *Pediatrics*. 2001;108:793-797; Zempsky WT, Cravero JP. *Pediatrics*. 2004;114:1348-1356; Finley GA et al. *Pain: Clinical Updates*. 2005;XIII:1-6; Infusion Nurses Society. *J Infus Nurs*. 2006;29 (1Suppl):S1-S92.

A Multimodal Approach

- Physical environment
- Use of language
- Positioning for comfort
- Physical techniques
- Sucrose
- Behavioral interventions
- Parent and caregiver roles
combined with ...
- Pharmacologic interventions

Physical Environment

- Calm, quiet place
 - Noise may increase stress and anxiety
 - Noise interferes with relaxation and distraction techniques
- Avoid the child's bed when possible
- Child-friendly décor
- Furniture that facilitates positioning for comfort and parental involvement



Hébert S, Lupien SJ. *Int J Hyg Environ Health*. 2008; Feb1 [Epub ahead of print]; Moore MM et al. *Am Surg*. 1998; 64:894-899; White RD. *J Perinatol*. 2007;27 (Suppl 2): S4 - S19.

Parental Presence

- Children want their parents with them during medical procedures
- Parental behavior during procedures influences the degree pain/distress children experience
- Behaviors that promote child coping include use of humor, commands to use coping strategies, and non-procedure-related conversation with the child
- Behaviors associated with increased distress include use of empathy, criticism, apologies, reassurance and giving control to the child

Blount, RL et al 2001 Validation of a rating scale for children's & adults behaviors during medical procedures; *Jo Pain & Symp Mgt* 22, 591-599

Frank NC et. al *J Pediatr Psychol*. 1995;20:277-289; Blount RL et al. Management of pediatric pain and distress due to medical procedure. *Handbook of Ped Psychology* 3rd ed. Guilford Press. 2003:216-233.

Use of Language

Before procedure :

- Convey information at appropriate time interval
- Use simple, developmentally appropriate words and phrases; avoid words that may provoke anxiety or be misunderstood
- Describe what will happen, how it will feel, and coping strategies the child can use

During procedure :

- Designate a coach for the child; others should be silent
- Avoid "I'm sorry...", "It's OK ...", "If you aren't still ..."
- Use phrases such as "I want you to blow these bubbles ...", "Good job ..."

After procedure:

- Praise
- Reinforce what child did well

Multi-modal Approaches To Pain Management



- Preparation
- Positioning For Comfort
- Parental Presence & Role
- Attention to Temperament

Research Support For Positioning For Comfort

- Sparks L et al, 2007, *Parental Holding & Positioning to Decrease IV Distress In Young Children : A Randomized Controlled Trial* *Journal Of Ped Nurs* Vol 22 No 6
- Research Questions
 - Does Positioning For Comfort reduce procedural (IV) distress in young children ?
 - Does Positioning For Comfort increase parental satisfaction ?
 - Does Positioning For Comfort affect IV insertion success ?
 - How satisfied are nurses with Positioning For Comfort ?

Parental Holding & Positioning to Decrease IV Distress in Young Children Sparks A, Jo Ped Nurs '07

- Study conducted in Level 1 trauma ER in pediatric hospital
- 118 children 9 mths – 4 yrs randomized to being held upright by a parent or lying flat
- All children received a skin anesthetic
- Procedures videotaped , analysed by blinded observers
- Children's distress scored using Procedural Behavior Rating Scale – Revised (PBRS –R) before, during & after procedure
- Parent satisfaction measured using 1 -5 rating scale
- Nurse satisfaction measured using 1 -5 rating scale

Parental Holding & Positioning to Decrease IV Distress in Young Children Sparks A, Jo Ped Nurs '07

RESULTS

- Mean distress scores significantly lower lower in experimental group in all 3 periods
- Total mean score for control group 9.4; experimental group 6.4 (p = .000)
- Parents in experimental group reported greater satisfaction with the procedure
- Nurses less satisfied with experimental approach
- No significant difference in # iv attempts between groups
- 76/118 children received no local anesthesia

Parental Holding & Positioning to Decrease IV Distress in Young Children Sparks A, Jo Ped Nurs '07

“ Parental holding and upright positioning decrease IV distress in young children, increase parental satisfaction and do not significantly impact IV success. This is a safe, simple, cost-effective measure that may help children and families cope with the frequent experience of having an IV inserted.”

Cognitive-Behavioral Techniques...

- Desensitization
- Modeling
- Relaxation training
- Hypnosis
- Behavioral rehearsal
- Distraction
- Guided imagery

Distraction and Guided Imagery

- May reduce pain via descending nonnociceptive pathways that interfere with ascending painful stimuli
- Cognitive attention to alternate stimuli will affect the processing and perception of pain
- Most effective for children < 7 years of age
- Approaches include use of bubbles, stories, toys, movies, etc
- Unclear whether interactive methods decrease children's pain more effectively

DeMore M, Cohen LL. *J Clin Psych Med Sett.* 2005; 12: 281-291.
MacLaren J, Cohen LL. *J Pediatr Psychol.* 2005; 30: 387-396.

Using Distraction and Guided Imagery

Selecting the stimulus:

- Age and cognitive level of the child
- Temperament
- Cost, time, and space
- Patient/parent preferences
- Clinician level of comfort

Getting started :

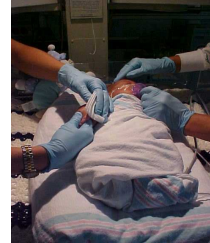
- Engage the child
eg. "I know a trick that has helped other children ..."



Kutner L. *A Child in Pain: How to Help, What to Do*. Vancouver: Hartley & Marks, 1996.
Pediatric Pain Management : A Professional Course. Michigan State University, 1998.

Behavioral Techniques With Infants

- Minimize external stimuli
- 4-handed care, support infant in a flexed position
- Facilitate hand-mouth contact
- Skin to skin/kangaroo care
- Facilitated tucking
- Offer sucking — use sucrose pacifier



Anand KJ et al. *Arch Pediatr Adolesc Med*. 2001;155:173-180.

Sucrose

- Highly effective in reducing procedural distress in neonates
- Mechanism of action unclear
- Randomized, controlled trials suggest single doses 0.05 - 2.00 mL 12% -50% sucrose ~ 2 min before painful stimulus safe and effective
- Recent studies have shown efficacy in older infants receiving immunizations at 2, 4, and 12 months of age
- Repeated use outside the realm of procedural pain management is not recommended

Hatfield LA et al. *Pediatrics*. 2008;121:e327-e334.
Thyr M et al. *Acta Paediatrica*. 2007;96:233-236.

Multi-modal Approaches To Pain Management

Transcutaneous Electrical Nerve Stimulation (TENS)

- Safe, non-invasive, inexpensive
- Stimulates large diameter fibres inhibiting pain transmission

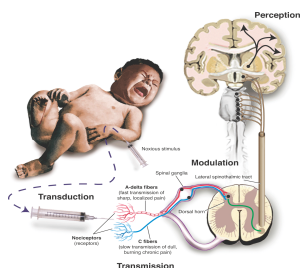
Biofeedback

- Measurement & response of physiologic responses associated with decrease in pain/relaxation

Acupuncture

- Activates 'anti-nociceptive' system to modulate pain transmission & response

Normal Pain Transmission



Biopsychosocial Model of Pain

