



# PAIN

## Clinical Updates

INTERNATIONAL ASSOCIATION FOR THE STUDY OF PAIN®

Volume XIV, No. 4

September 2006

### EDITORIAL BOARD

#### Editor-in-Chief

**Daniel B. Carr, MD**  
Internal Medicine, Endocrinology,  
Anesthesiology  
USA

#### Advisory Board

**Elon Eisenberg, MD**  
Neurology  
Israel

**James R. Friction, DDS, MS**  
Dentistry, Orofacial Pain  
USA

**Maria Adele Giamberardino, MD**  
Internal Medicine, Physiology  
Italy

**Cynthia R. Goh, MB BS, FRCP, PhD**  
Palliative Medicine  
Singapore

**Alejandro R. Jadad, MD, PhD**  
Anesthesiology, Evidence-Based  
Medicine and Consumer Issues  
Canada

**Andrzej W. Lipkowski, PhD, DSc**  
Neuropharmacology and  
Peptide Chemistry  
Poland

**Patricia A. McGrath, PhD**  
Psychology, Pediatric Pain  
Canada

**Mohammad Sharify, MD**  
Family Medicine, Rheumatology  
Iran

**Bengt H. Sjolund, MD, PhD**  
Neurosurgery, Rehabilitation  
Sweden

**Maree T. Smith, PhD**  
Pharmacology  
Australia

**Harriët M. Wittink, PhD, PT**  
Physical Therapy  
The Netherlands

#### Production

Elizabeth Endres, Copy Editing  
Kathleen E. Havers, Executive Assistant  
Juana Braganza Peck, Layout/Graphics

### UPCOMING ISSUES

**Cancer Pain**

**Placebo**

**Fear and Pain**

## Psychological Interventions for Acute and Chronic Pain in Children

### *Inadequate prevention and relief of children's pain are still widespread*

Over the last two decades, research into the nature, assessment, and treatment of children's pain has grown exponentially.<sup>1</sup> It is now generally accepted that infants and children can feel pain. Pain assessment instruments with good psychometric properties are available for use in infants, toddlers, and children, including those with communication deficits and other impairments. Numerous drug and non-drug interventions have been developed and tested in a variety of clinical populations and settings. However, inadequate prevention and relief of children's pain are still widespread, a deficiency highlighted during the current IASP Global Year Against Pain in Children. This issue of *Pain: Clinical Updates* focuses on psychological treatment of acute and chronic pain in children, placing special emphasis upon interventions for which a credible evidence base exists. In this article, the word "children" refers to all individuals in the pediatric age range from neonates through adolescents.

### *Physical and psychological responses to pain not only affect children's health directly, but also may predispose them to develop chronic pain in adulthood*

#### Pediatric Pain

All children normally experience pain from sources such as minor bumps, cuts, bruises, occasional headaches, toothaches, "growing pains," fractures, and dental procedures. Pain may also result from a chronic medical condition that involves diagnostic and therapeutic procedures such as lumbar puncture, bone marrow aspiration, or venipuncture. Pain has significant adverse emotional and social consequences for children and their families. Physical and psychological responses to pain not only affect children's health directly, but also may predispose them to develop chronic pain in adulthood.<sup>2-5</sup>

Pain perception in children reflects the complex, moment-to-moment integration of affective, behavioral, cognitive, and physiological components

within a developmental trajectory and a sociocultural context.<sup>6-8</sup> Thus, pain management may be optimized when all components of the child's pain experience are evaluated and addressed. A variety of psychological interventions are described in the research and clinical literatures, including distraction, play therapy, psycho-educational approaches, hypnosis, biofeedback, and guided imagery. The very number of available interventions may be a source of confusion as to which one is best for which child and setting. Selecting the most appropriate treatment not only is proper clinical practice, but also is necessary for cost-effective, evidence-based care.

*It is important to replicate positive preliminary findings with independent trials*

### Evidence-Based Psychological Interventions

A decade ago, the American Psychological Association (APA) Task Force on Promotion and Dissemination of Psychological Procedures<sup>9</sup> recommended that clinical guidelines for treatment interventions be evaluated with respect to how closely they adhere to empirical evidence on treatment outcomes. In pediatric pain management, psychological treatment is defined as a verbal interaction between a health care professional and a child that leads to changes—from a less adaptive state to a more adaptive state—in the child's pain-related thoughts, feelings, and behaviors. Chambless and Hollon<sup>9</sup> proposed an approach to determine when a psychological treatment for a specific problem or disorder may be considered to be efficacious. They assigned the greatest weight to randomized controlled clinical trials or their “N of 1” (single case) equivalent. Such trials of treatment efficacy should be followed by research on effectiveness, i.e., the benefit of applying the treatment in real-world clinical practice including diverse patient populations, as well as by cost-effectiveness research. Chambless and Hollon emphasized the importance of performing independent trials to replicate positive preliminary findings. They described several factors that should be weighed in evaluating whether studies supporting a psychological treatment's efficacy are sound, including the existence of a standardized treatment manual, the training and supervision of therapists, and appropriate statistical analyses. Empirically supported treatments were defined as clearly specified psychological treatments shown to be efficacious in controlled research with a delineated population. In turn, a treatment must show efficacy in at least two randomized controlled trials by independent research teams before it can be labeled *efficacious*. If only a single study supports a treatment's efficacy, or if all of the research has been conducted by one team, the findings are considered promising, and the treatments are considered *possibly efficacious*, pending replication.

### Acute Pain Management

In 1998, when the World Health Organization<sup>10</sup> developed and published guidelines for the management of pain in children with cancer for medical procedures, in all cases the use of a combination of a psychological with a pharmacological approach was supported, and aggressive, preemptive approaches were emphasized. A substantial number of psychological interventions for procedural pain management are in clinical use. These interventions include psychoeducational approaches, deep breathing, distraction, relaxation, play therapy, guided imagery, cognitive therapy, hypnosis, filmed modeling, behavioral rehearsal, and operant techniques that include reinforcement schedules. However, only two interventions—cognitive therapy<sup>11-13</sup> and hypnosis<sup>14-19</sup>—qualify as empirically validated and efficacious according to the APA framework described above.

*Only two interventions—cognitive therapy and hypnosis—qualify as empirically validated and efficacious according to the APA framework*

In terms of postoperative pain management, the need for interventions that reduce children's pain is growing as a result of the continued demand for outpatient surgery, shortened hospital stays, and difficulties with pain management in terms of insufficient resources and drug side effects, both in the ambulatory setting and at home.<sup>20</sup> A recent randomized controlled trial by Huth et al.<sup>21</sup> investigated imagery administered pre- and postoperatively, as a supplement to routine analgesics, for reduction of pain and anxiety after tonsillectomy and adenoidectomy in the ambulatory setting and at home in 73 children aged 7–12 years. After controlling for trait anxiety (i.e. personality-related anxiety) and for opioid and non-opioid analgesic intake 1–4 hours before pain measurement, the investigators found significantly lower self-reported pain and situation-related anxiety 1–4 hours after surgery (but not 22–27 hours after surgery) in the imagery group.

*Children enjoy applying psychological interventions, obtaining relief without destructive or unpleasant effects*

In addition to their intrinsic usefulness in symptom management, psychological techniques are safe, have not been observed to produce adverse effects, and avert drug-drug interactions seen with supplemental pharmacotherapy. Children enjoy the interventions, obtaining relief without destructive or unpleasant effects. There is no reduction of normal function or mental capacity and no development of tolerance to their beneficial effect. Indeed, psychological techniques may be

generalized to other distressing circumstances. Another important clinical consideration is the contribution of psychological methods in restoring these young patients' sense of self-control and efficacy and fostering their active participation in their own care. The goal of psychological interventions is to shift the child from a helpless state of anxious painfulness, in which he or she passively receives pharmacological and other interventions, to a more adaptive state of empowerment and control.<sup>22</sup>

***The goal of psychological interventions is to shift the child from a helpless state to a more adaptive state of empowerment and control***

### **Chronic Pain Management**

Recent narrative reports<sup>23</sup> and systematic reviews and meta-analyses<sup>24,25</sup> suggest that multicomponent cognitive-behavioral therapy (CBT) is effective in the management of chronic pain of young patients, particularly in the treatment of headaches. CBT is a form of psychotherapy that involves recognizing unhelpful or destructive patterns of thinking (with their corresponding ways of feeling and behaving), then modifying or replacing these with more realistic or adaptive ones. Eccleston et al.<sup>25</sup> conducted a systematic review and subset meta-analysis of published randomized controlled trials of psychological therapies for children with chronic pain. Eighteen studies, six conducted in community (school) settings, met criteria for inclusion in the review. Meta-analysis was possible for 12 headache trials and 1 trial of recurrent abdominal pain. For these trials, the odds ratio for a 50% reduction in pain was 9.62, and the number needed to treat was 2.32, indicating that the psychological treatments examined were efficacious in reducing the pain of headache. The authors found that psychological treatments, particularly relaxation and CBT, were highly

***Psychological treatments, particularly relaxation and cognitive-behavioral therapy, are highly effective in reducing the severity and frequency of chronic pain, including headaches, in children***

effective in reducing the severity and frequency of chronic pain in children and proposed that there is a strong case for these treatments to be offered to patients with headache as part of routine care.<sup>26</sup> Unfortunately, the authors also noted that there was insufficient evidence to judge the effectiveness of psychological therapies in improving mood, function, or disability associated with chronic pain in children and adolescents and stressed the urgent need for well-designed and comprehensively reported randomized controlled trials of psychological therapies for non-headache chronic pain.

### **Suggestions for Further Research**

Research on CBT and other psychological interventions such as hypnosis for pain management has significant promise to expand upon and refine current practice. A review of the pediatric pain management literature highlights the importance of creating and delivering interventions that match specific patient characteristics and needs. Several variables, including age, gender, developmental level, and previous pain experience, are critical design components in individualized treatment plans. This information can help clinicians as they design highly focused, often brief, interventions that match the needs of each child and family.

Because of its proven efficacy, CBT will most likely continue to be offered in conjunction with pharmacological interventions. Therefore, further research examining combinations of pharmacological interventions with CBT is needed. Investigators must identify which individual components of complex CBT protocols are most effective and determine the best combinations of these components with specific pharmacological agents. Research on the effect of therapist-administered versus self-administered treatments is also necessary. If children and their parents can successfully implement CBT interventions on their own after suitable training, the cost of these interventions would be less than if they were provided by a clinician.

***Innovations in pediatric pain management need not be “high-tech”***

### **Conclusion**

Psychological interventions for pediatric pain control are increasingly applied in hospitals in most Western countries. However, their availability remains sparse and inconsistent. Pediatric pain is a health care issue that results in significant suffering and financial cost, so we must synthesize the scientific evidence to identify those psychological interventions whose widespread and consistent use is justified. Although controlled clinical studies on psychological analgesia have substantial room for improvement, the available evidence indicates that both CBT and hypnosis are useful in acute and chronic pain. Innovations in pediatric pain management need not be “high-tech.” In most cases, excellent analgesic results can be achieved through application of standard pharmacological and psychological approaches, continuous patient assessment, and patient and family participation in planning and implementing treatment. The time has come for us to give priority to bridging the gaps between theoretical developments, evidence derived from clinical research, and current clinical practice in pediatric pain management.

## References

- 1 McGrath PA. In: Merskey H, et al. (Eds). *The Paths of Pain 1975–2005*. Seattle: IASP Press, 2005, pp 433–446.
- 2 Ross DM, Ross SA. *Childhood Pain: Current Issues, Research, and Management*. Baltimore: Urban & Schwarzenberg, 1988.
- 3 Lioffi C. *Procedure Related Cancer Pain in Children*. Radcliffe Medical Press, 2002.
- 4 Schechter NL, et al. *Pain in Infants, Children, and Adolescents*, 2nd ed. Philadelphia: Lippincott, Williams and Wilkins, 2003.
- 5 Finley GA, et al. *Pain: Clin Updates 2005*; XIII:4.
- 6 McGrath PA. *Pain in Children: Nature, Assessment and Treatment*. New York: Guilford Press, 1990.
- 7 McGrath PJ, et al. *Pain: Clin Updates 1995*; III(2).
- 8 Lioffi C. In: Schmidt R, Willis B (Eds). *The Encyclopedic Reference of Pain*. Springer-Verlag, in press.
- 9 Chambless DL, Hollon SD. *J Consult Clin Psychol 1998*; 66:7–18.
- 10 World Health Organization. *Cancer Pain Relief and Palliative Care in Children*. Geneva: World Health Organization, 1998.
- 11 Blount R, et al. *Behav Modif 1994*; 18:6–31.
- 12 Jay S, et al. *Pain 1995*;62:3–9.
- 13 Powers SW. *J Pediatr Psychol 1999*; 24:131–145.
- 14 Zeltzer L, LeBaron S. *J Pediatr 1982*; 101(6):1032–1035.
- 15 Kuttner L, et al. *J Dev Behav Pediatr 1988*; 9(6):374–382.
- 16 Wall V, Womack W. *Am J Clin Hypn 1989*; 31:181–191.
- 17 Lioffi C, Hatira P. *Int J Clin Exp Hypn 1999*; 47:104–116.
- 18 Lioffi C, Hatira P. *Int J Clin Exp Hypn 2003*; 51:4–28.
- 19 Lioffi C, et al. *Health Psychol 2006*; 25:307–315.
- 20 Broome ME, Huth MM. In: Schechter NL, et al. (Eds). *Pain in Infants, Children, and Adolescents*, 2nd ed. Philadelphia, PA: Lippincott, Williams and Wilkins, 2003, pp 417–433.
- 21 Huth MM, et al. *Pain 2004*; 110:439–448.
- 22 Lioffi C. *Pain Rev 1999*; 6:279–302.
- 23 Holden EW, et al. *J Pediatr Psychol 1999*; 24:91–109.
- 24 Hermann C, et al. *Pain 1995*; 60:239–256.
- 25 Eccleston C, et al. *Pain 2002*; 99:157–165.
- 26 McGrath PJ. *J Pediatr Psychol 1999*; 24:111–112.

*Christina Lioffi, DPsych*  
*School of Psychology,*  
*University of Southampton, Highfield,*  
*Southampton SO17 1BJ, United Kingdom*  
*Institute of Child Health,*  
*Great Ormont Street Hospital,*  
*London, United Kingdom*  
*cliossi@soton.ac.uk*

## IASP GLOBAL YEAR AGAINST PAIN IN CHILDREN

**October 2005 – October 2006**

The IASP Global Year Against Pain raises awareness of a different aspect of pain each year. For information about events and resources related to this year's theme, please visit:

[www.iasp-pain.org/GlobalDay-2005.htm](http://www.iasp-pain.org/GlobalDay-2005.htm)

IASP was founded in 1973 as a nonprofit organization to foster and encourage research on pain mechanisms and pain syndromes, and to help improve the care of patients with acute and chronic pain. IASP brings together scientists, physicians, dentists, nurses, psychologists, physical therapists, and other health professionals who have an interest in pain research and treatment. Information about membership, books, meetings, etc., is available from the address below or on the IASP Web page: [www.iasp-pain.org](http://www.iasp-pain.org). Free copies of back issues of this newsletter are available on the IASP Web page.

Timely topics in pain research and treatment have been selected for publication but the information provided and opinions expressed have not involved any verification of the findings, conclusions, and opinions by IASP. Thus, opinions expressed in *Pain: Clinical Updates* do not necessarily reflect those of IASP or of the Officers or Councillors. No responsibility is assumed by IASP for any injury and/or damage to persons or property as a matter of product liability, negligence, or from any use of any methods, products, instruction, or ideas contained in the material herein. Because of the rapid advances in the medical sciences, the publisher recommends that there should be independent verification of diagnoses and drug dosages.

For permission to reprint or translate this article, contact:

International Association for the Study of Pain, 111 Queen Anne Avenue N., Suite 501, Seattle, WA 98109-4955, USA  
Tel: 206-283-0311; Fax: 206-283-9403; email: [iaspdesk@iasp-pain.org](mailto:iaspdesk@iasp-pain.org); Internet: [www.iasp-pain.org](http://www.iasp-pain.org) and [www.painbooks.org](http://www.painbooks.org)  
Copyright © 2006, International Association for the Study of Pain®. All rights reserved. ISSN 1083-0707.