

Pediatric Pain Letter

Abstracts and Commentaries on Pain in Infants, Children, and Adolescents

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Table of Contents

Editorial	37
Abstracts	
Phantom pain and sensations in child amputees	38
Recent Articles	40
Review Articles	45
Book Review	46
Film Review	47
Announcements	47

Editorial

Evidence based psychological treatments of pediatric pain

A recent issue of the *Journal of Pediatric Psychology* (volume 24(2), 1999) featured four papers on empirically supported treatments in pediatric pain. The papers, on headache (migraine and tension headache), recurrent abdominal pain, procedure pain and disease pain were accompanied by commentaries discussing issues raised by each review paper. These papers are part of a broad movement in psychology to identify and promote treatments that have been shown in well designed trials to work. It is not surprising that the *Journal of Pediatric Psychology* featured treatments for pain, as pain has received considerable attention from psychologically oriented researchers.

The schema for rating treatments was modified from the criteria of the Task Force on Promotion and Dissemination of Psychological Procedures (1995) (Spirito, 1999). The rating schema had 3 categories. "Well established" interventions must have at least two good between-group design experiments demonstrating efficacy in comparison with established treatments or placebo controls. Alternatively, two single case experiments must have been completed. Treatments and patients must be well

described and more than one group must have published the studies. "Probably efficacious" refers to treatments that have at least two experiments but the control condition could be a wait list control or the studies could have been done in only one lab. "Promising interventions" have at least one well controlled study and one less well controlled study or two studies done by the same investigator.

The headache review (Holden, Deichmann and Levy, 1999) reviewed 31 investigations published after 1980 and concludes that relaxation/self hypnosis is "well established" as a treatment and that thermal biofeedback alone is a "probably efficacious" treatment. Other treatments that combine cognitive methods with behavioural and biofeedback approaches were seen as "promising".

Janicke and Finney (1999) in their review of 9 intervention studies (only four were controlled group treatments) for recurrent abdominal pain conclude that cognitive behavioural treatment is a "probably efficacious" intervention and that fibre treatment is a "promising" strategy. They found that operant treatments (rewarding healthy and punishing sick behaviour) could not meet even the criteria for a "promising" treatment.

Powers (1999) reviewed 13 treatment outcome studies for procedure pain and found that a package often referred to as cognitive behavioural therapy was "well established" as a treatment. Treatment included breathing exercises, relaxation, distraction, imagery filmed modelling, reinforcement, behavioural rehearsal, and active coaching.

Walco, Sterling and Conte (1999) reviewed the literature on disease related pain. They found that there were few studies, and because of this, no treatment met the criteria for "well established" or "probably efficacious". Cognitive behavioural treatments were rated as promising for a number of disease related painful conditions.

These reviews and the commentaries are valuable because they highlight "treatments that work" and also point to areas where more research is needed. I found the summaries that accompany each article either as a table or an appendix to be very helpful in understanding what was done in each study.

This series is a "must read" for all who are interested in psychological treatments for pediatric pain.

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Abstracts

Phantom pain and sensations in child amputees

Krane, E.J. & Heller, L.B. (1996). The prevalence of phantom sensation and pain in pediatric amputees. *Journal of Pain and Symptom Management*, 10 (1), 21-29.

Objective. To document the incidence of phantom sensations and pain in child and adolescent amputees.

Design. Retrospective survey.

Setting. Two tertiary-care hospitals.

Participants. Twenty-four child amputees aged 5 -19, who lost a limb between 1980 and 1990. Ten children lost a limb due to cancer, 12 to trauma or infection, and 2 had a congenital limb deficiency.

Main Outcome Measures. A 26-question questionnaire modelled after the Varni-Thompson Pediatric Pain Questionnaire addressed the characteristics of phantom sensations and pain, including onset, duration, quality, intensity and treatment. A chart review of the participants' medical records was also conducted to assess documentation of preoperative limb pain, existence, frequency, and description of phantom sensations and pain in the immediate post-operative period and on follow-up visits.

Results. All amputees, except for those with a congenital limb deficiency, experienced pre-operative pain. All of the amputees interviewed reported having phantom sensations. For all but one, the sensations began within days of surgery. Only 4 amputees reported no longer experiencing the phantom sensations. Of those still experiencing the phantom sensations, 67% reported sensation decrease and 14% reported an increase. Sensations included tingling,

discomfort, pins/needles, tickling, and itching. Phantom pain occurred for 92% of the amputees. In all but one amputee, phantom pain began either soon after, or within weeks of surgery. Sixty-four percent of the amputees reported that their pain had improved. For the majority of amputees, phantom sensations and pain began within weeks after surgery and by the interview date, the sensations had decreased or stopped.

Conclusions. Phantom sensations and pain occurred frequently in child and adolescent amputees. These sensations were usually unpredictable, varying in intensity, frequency, and description.

Melzack, R., Isreal, R., Lacroix, R. & Schultz, G. (1997). Phantom limbs in people with congenital limb deficiency or amputation in early childhood. *Brain*, 120, 1603-1620.

Objective. To describe the experience of phantom sensations and pain in amputees missing a limb since birth or before the age of 6.

Design. Retrospective survey.

Setting. War Amps Child Amputee Program and prosthetic clinic at Shriners' Hospital for Crippled Children in Montreal.

Participants. One hundred and twenty-five amputees were eligible to participate. Inclusion criteria were: congenital limb deficiency or amputation before the age of 6; older than 6 at the time of interview; and have experienced continuous or intermittent episodes of phantom sensations and pain.

Main Outcome Measure. A structured interview assessed the age of onset, site, position, sensory descriptors, duration, frequency, and triggers of phantom sensations and pain.

Results. Forty-one (32.8%) amputees had phantom sensations; 15 with a congenital limb deficiency and 26 with an early childhood amputation. Fourteen (11.2%) amputees experienced phantom pain; 3 with a congenital limb deficiency and 11 with an early childhood amputation. Early childhood amputees reported having more phantom limbs with a quick onset and a tense, immobile quality. Early childhood amputees also had more phantom limbs on the right side of the body involving the arm rather than the leg.

Conclusion. Children with a congenital limb deficiency or early childhood amputation developed a phantom in their missing limb. These two amputee groups reported having different experiences of their phantom limb.

Wilkins, K.L., McGrath, P.J., Finley, G.A. & Katz, J. (1998). Phantom limb sensations and phantom limb pain in child and adolescent amputees. *Pain*, 78, 7-12.

Objective. To determine the prevalence and correlates of phantom sensations and pain in child and adolescent amputees.

Design. Retrospective survey.

Setting. Recruitment through the War Amputations of Canada.

Participants. Sixty child amputees (35 boys; mean age=12.55, range 8-18 years). Twenty-seven amputees had a congenital limb deficiency and 33 lost a limb due to surgery or trauma.

Main Outcome Measure. Questionnaire to assess the presence or absence of a phantom limb and characteristics of the sensations.

Results. Twenty-five (42%) amputees had phantom sensations; 2 (7.4%) with a congenital limb deformity and 23 (41.6%) with traumatic loss of a limb. Seventeen (42%) had phantom pain; 1 (3.7%) with a congenital limb deformity and 16 (48.5%) with traumatic loss of a limb. Of the amputees reporting phantom pain, fifteen (88%) had stump pain and six (35.3) had pre-operative pain. Phantom sensations and pain decreased in frequency and intensity over time. Amputees most commonly identified exercise, objects approaching the stump, cold weather, and "feeling nervous" as triggers of the sensations.

Conclusions. Less than half of the amputees experienced phantom sensations and pain. The sensations were most common in amputees with traumatic or surgical loss of a limb. The experience of phantom sensations and pain was unique to each amputee. This included the quality and intensity of sensations and the stimuli that exacerbated them.

Commentary

Phantom limbs are a common outcome after amputation. Phantom limbs result in either non-painful or painful sensations localized in the missing limb (Mitchell, 1866). Phantom limb sensations are typically characterized as tingling, uncomfortable, pins and needles, tickling, or itchy and phantom limb pain is often described as sharp, tingling, stabbing, or uncomfortable (e.g., Krane & Heller, 1995).

For years, it was thought that phantom limbs were mostly of psychological origin, for example, resulting from abnormal personality traits (e.g., Parkes, 1973). Current

theories have proposed a neurophysiological basis for the existence of phantom limbs. For example, Melzack (1989) suggests that the brain continues to generate signals about the missing limb although it is no longer receiving input from that limb. Still others have implicated the remapping of cortical areas (Merzenich, et al., 1984) or changes in sympathetic activity to account for phantom limbs (Katz, 1992 a, b).

There are numerous studies on adult amputees experiencing a phantom limb, yet little research has been devoted to this subject in child amputees. It was once believed that children who lost a limb before the age of six did not experience a phantom limb (Riese & Bruck, 1950), but this does not appear to be borne out by recent research. For example, Melzack et al. (1997) documented phantom limbs in 21% of child amputees who underwent surgical amputation before the age of six and in 12% of the amputees born without a limb.

Research has also focussed on whether phantom limbs occur in children born without limbs and how often they occur in children missing a limb from trauma or surgery. Krane and Heller (1995) conducted a retrospective survey study with 25 child amputees ages 5-16. The results showed that 100% of the amputees reported having had phantom limb sensations and 83% experienced phantom limb pain. But, only 40% of the medical record provided any indication that a phantom limb existed. This suggests that the age myth remains prominent in clinical practice.

Similarly, a field survey by Wilkins et al. (1998) found that the loss of a limb due to a traumatic amputation (e.g., accident) increased the likelihood of a child amputee experiencing phantom limbs. This is not to say that amputees with congenital limb deficiencies did not have phantom limbs, rather they were less frequent than those of amputees with a traumatic amputation. Amputees also identified physical (e.g., exercise or physical contact to stump) and psychosocial stimuli (e.g., meeting new people or writing exams) that triggered these phenomena.

Taken together, these data suggest that phantom limbs are not unusual and even appear to be a significant problem for some children. Yet, despite recent documentation of qualitative and quantitative aspects of phantom limbs, we still need well designed prospective studies to substantiate our understanding of phantom limbs. Distinguishing who will or will not develop phantom limbs may then have therapeutic benefits.

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Recent Articles

Anderson, B.J., Persson, M.A. & Anderson, M. (1999). Rationalising intravenous morphine prescriptions in children. *Acute Pain*, 2(2), 59-67.

Objective. To examine the effects of the introduction of an intravenous opioid prescription protocol on daily morphine doses given, drug prescription efforts and nursing staff satisfaction.

Design. Chart review.

Setting. Children's hospital.

Participants. Medical charts were reviewed for 97 children (mean age=110 months, SD=58 months) who received intravenous opioids during the three-month period prior to the introduction of the drug protocol and 65 children (mean age=94 months, SD=19 months) who received intravenous opioids for a two-month period after the protocol.

Main Outcome Measures. Intravenous opioid prescription information was collected from the medical charts. Six months after the start of the protocol, nursing staff also filled out a questionnaire regarding the usefulness and acceptability of the protocol as well as problems with its

implementation.

Results. No significant differences existed in the demographic information of the children in the pre-protocol and protocol groups. The average daily dose of morphine was not different between groups however a larger proportion of children were given morphine on the first postoperative day in the group in which the protocol was used. No adverse side effects or respiratory depression were recorded in the charts of either group. Administration of paracetamol was carried out for longer in the protocol group and the mean daily dose of this drug was higher on postoperative day 3 in this group. Twenty of 30 possible nurses responded to the questionnaire administered to them, of which 10 reported that pre-protocol prescriptions were unsatisfactory and 8 reported initial reluctance to use the new protocol. At the 6 month review, all 20 respondents did not want to return to the pre-protocol prescribing system and all respondents also reported a high level of satisfaction with the protocol. Fourteen of the respondents reported that the implementation of the protocol improved their understanding of children's pain and its management.

Conclusions. The use of a protocol for intravenous opioid administration improved nurses' satisfaction with the use of these drugs and their confidence in their ability to manage pediatric pain without increasing the amount of morphine prescribed. The use of such protocols may be an important tool in reducing prescribing errors.

Carter, B.D., Kronenberger, W.G., Edwards, J.F., Marshall, G.S., Schikler, K.N. & Causey, D.L. (1999). Psychological symptoms in chronic fatigue and juvenile rheumatoid arthritis. *Pediatrics*, 103(5), 975-979.

Objective. To compare psychological symptoms experienced by chronic fatigue (CF) and juvenile rheumatoid arthritis (JRA) patients to determine if those symptoms in CF may be caused by factors other than physical illness.

Design. Case-control.

Setting. Pediatric Infectious Diseases and Juvenile Rheumatoid Arthritis Clinics in a children's hospital.

Participants. Nineteen children and adolescents suffering from CF (13 female; mean age=13.4 years, SD=3.6 years; 18 white, 1 African American) and 19 age- and sex-matched JRA patients (identical to CF patients except: mean age=13.5 years, SD=3.5 years; mean father education=11.7 years vs. 14.0 years for CF ($p<0.05$)). CF was defined as fatigue in marked contrast to premorbid energy level that resulted in significantly reduced activity.

JRA subjects were evaluated to ensure that the American College of Rheumatology JRA criteria were met. Duration of CF and JRA ranged from 3 to >31 months.

Main Outcome Measures. Youth Self-Report (YSR) for measurement of behaviour problems and social competence; Child Behaviour Checklist (CBCL) for parent report measure of behaviour problems and social competence; Kaufman Brief Intelligence Test (K-BIT) to measure verbal and perceptual-organizational abilities; and a structured interview.

Results. The competence indices for the YSR and CBCL indicate that subjects from both groups were participating in physical and social activities below non-clinical normative levels. For the YSR and CBCL, CF subjects scored significantly higher for Total Problems (YSR $p<0.001$; CBCL $p<0.05$) as well as for all sub-scales (Internalizing (YSR $p<0.001$; CBCL $p<0.01$), Withdrawn (YSR $p<0.01$; CBCL $p<0.01$), Somatic Problems (YSR $p<0.001$; CBCL $p<0.0001$), Anxiety/Depression (YSR $p\leq 0.001$; CBCL $p<0.05$), and Thought Problems (YSR $p<0.05$)) except Externalizing (no significant difference between groups for YSR and CBCL). More than 25% of the CF sample scored in the clinical range for 4 of the YSR and CBCL subscales whereas <15% of the JRA sample scored in the clinical range in any YSR subscale.

Conclusions. The increased psychological symptoms observed in the CF sample indicate that psychological factors may have a more active role in debilitating chronic fatigue than can be explained by the stress of coping with a similar chronic illness (JRA).

Gillies, M.L., Smith, L.N. & Parry-Jones, W.LI. (1999). Postoperative pain assessment and management in adolescents. *Pain* 79, 207-215.

Objective. To determine the impact of postoperative pain in adolescents on maturational adjustment, to discover to what extent health professionals recognize adolescent responses to pain, and to investigate the differences between in-patients and day-patients for all these factors.

Design. Survey.

Setting. Large urban health board.

Participants. Participants were in-patients or day-patients undergoing elective surgeries (e.g. general surgery, ENT, gynaecology, plastics, orthopaedics, oral surgery). Four hundred and sixty-six patients were recruited, 351 took part in the study (63% female; mean age=15.3); 287 were in-patients, 64 were day-patients. Randomly selected health care professionals (76 nurses, 77 physicians) also

participated.

Main Outcome Measures. The Adolescent Pediatric Pain Tool (APPT) and a colour visual analogue scale were used to measure acute postoperative pain in adolescents. The Hospital Anxiety and Depression Scale (HADS) which measures anxiety and depression in a medical setting, and the Offer Self-Image Questionnaire (OSIQ) which measures maturational state as a function of self-esteem were completed by the adolescents after the surgery (day 1 post-op). Semi-structured interviews focussing on pre- and postoperative pain were conducted with the adolescents. Follow-up assessments were made on day 3 post-op via telephone. Semi-structured interviews were also conducted with health professionals to assess attitudes toward adolescent patients and pain assessment/management practices used when treating adolescent patients.

Results. Significant differences were found between in-patients and day-patients. In-patients were more likely to experience moderate or severe pain ($p \leq 0.001$), were given milder analgesics for their pain (NSAID $p = 0.008$; other analgesics $p < 0.001$), and were less well adjusted than day-patients ($p = 0.01$). Both groups showed significantly more anxiety pre- than post-operatively, however in-patients reported more anxiety post-op than day-patients ($p = 0.009$). Psychological adjustment to adolescence was weakly related to surgical intervention ($p = 0.008$) (i.e., patients having rhinoplasty had lower self image scores than those having orthopaedic surgery) and those with a lower total self image experienced more pain and anxiety ($p = 0.02$). Ninety-eight percent of health professionals generally felt that they were accurate in pain assessment of adolescents. However, more than half of the adolescents felt that the nurses did not know when they were in pain. Almost all patients were prescribed postoperative analgesics and 89% of nurses stated that analgesics were given at least every 4-6 hours. Drug records, however, indicated that only a small proportion of patients received analgesics with regularity. Finally, nursing notes made infrequent references to pain and almost 25% of both nurses and physicians indicated fear of drug dependency or overdose in adolescent patients.

Conclusions. Findings suggest that an understanding of adolescent post-operative pain is lacking in the medical setting. Inability to recognize pain, attitudes toward dependency and under-medicating results in unnecessary discomfort in patients whose pain is not being managed properly. Moreover, pain in adolescents appears to affect self-image. Since pain management decisions do not appear to be evidence-based, tools such as the APPT and HADS may serve to benefit the patient.

Goodenough, B., Warwick, T., Champion, G.D., Perrott, D., Taplin, J.E., von Baeyer, C.L. & Ziegler, J.B. (1999). Unravelling age effects and sex differences in needle pain: Ratings of sensory intensity and unpleasantness of venipuncture pain by children and their parents. *Pain*, 80, 179-190.

Objective. To explore how ratings of pain intensity and pain-related affect due to venipuncture vary as a function of age and sex.

Design. Survey.

Setting. Hospital pathology clinic.

Participants. One hundred and fourteen child-parent pairs out of 131 pairs approached consented to participate in the study. Four of the consenting pairs were excluded due to the use of a local anaesthetic cream at the site of the venipuncture. Eleven girls and eleven boys were included in each of the following five age groups: 3 to 5 years; 6 to 7 years; 8 to 9 years; 10 to 12 years; and 13 to 15 years. Eighty-six percent of the parents who participated were the child's mother. All participants were English speakers.

Main Outcome Measures. The faces pain scale (FPS) (Bieri et al., 1990) and a 15 cm, 10-point mechanical Visual Analogue Scale (VAS) were used to acquire pain ratings for intensity. Pain unpleasantness was rated using a 15 cm, 10-point mechanical VAS. Children and their parents completed all three measures. A standardized questionnaire was also administered to the parents in order to collect additional information about the children. The initial portion of the questionnaire collected information from each parent regarding the level of pain they anticipated that the venipuncture would cause his or her child. The second part of the questionnaire asked for post-venipuncture ratings of pain in the child.

Results. Children's pain ratings using the FPS and VAS were moderately to highly correlated across age groups ($r = 0.65-0.90$). Univariate ANOVAs showed a significant main effect of age on ratings of both intensity and unpleasantness. In both cases, rating magnitude decreased with increasing age. No main effect or interaction was found for sex on either measure. A sex difference was found after pain intensity ratings were covaried out and when unpleasantness ratings were averaged across age groups. Girls were found to report higher unpleasantness ratings than boys, particularly in the 8 to 9 year age group. As well, a statistically significant difference was found between ratings of pain intensity and unpleasantness where unpleasantness was rated higher than intensity in children older than eight years of age. This difference was not found

in children seven years or younger. Parents were found to be better at evaluating pain in their children after observing venipuncture than they were at predicting their children's pain prior to venipuncture.

Conclusions. Age-related differences in reports of pain due to venipuncture in children appear to be most pronounced in ratings of sensory intensity. Sex differences may also exist in pain ratings on the dimension of unpleasantness after eight years of age.

Hertzog, J.H., Campbell, J.K., Dalton, H.J. & Hauser, G.J. (1999). Propofol anesthesia for invasive procedures in ambulatory and hospitalized children: Experience in the pediatric intensive care. *Pediatrics*, 103 (3), 657, <<http://www.pediatrics.org/cgi/content/full/103/3/e30>>.

Objective. To describe the use of propofol anesthesia in the pediatric intensive care unit (PICU).

Design. Retrospective chart review.

Setting. Pediatric intensive care unit (PICU).

Participants. One-hundred and fifteen children (mean age=6.4 years, range 10 days to 20.8 years) who, during a 20 month period, had undergone a total of 251 different invasive procedures (e.g. lumbar puncture with intrathecal chemotherapy administration, bone marrow aspiration, central venous catheter placement) with propofol anesthesia. All patients had undergone a medical evaluation prior to procedures and all were required to fast. Throughout the procedures, patient's cardiorespiratory and neurologic status were continually monitored.

Main Outcome Measures. Charts were reviewed for data on patient demographics, procedures performed, doses of propofol used, side effects, induction, and recovery time and length of stay in PICU.

Results. Propofol anesthesia was used successfully in all children. Underlying medical conditions included oncologic, infectious, gastrointestinal, and cardiac disorders. Means for: dose of propofol used for induction was 1.8 mg/kg; total dose used was 8.8 mg/kg; anesthesia induction time was 3.9 minutes; recovery time was 28.8 minutes; and PICU stay was 140 minutes. Hypotension, with a 25% mean decrease in systolic blood pressure, occurred for 50% of the patients and was associated only with the increased age of the patient. Intravenous fluid was administered in 61% of those patients with hypotension. Respiratory depression requiring ventilation (bag-valve-mask) occurred in 6% of the patients and was not associated with dose or length of anesthesia, or patient's age. Ninety-eight percent of the procedures were completely

successful; the 2% that failed were not considered to be a result of the anesthesia.

Conclusion. In this study propofol anesthesia was safely used in the PICU with ambulatory and hospitalized children for a variety of invasive procedures. Propofol is associated with short induction time and quick recovery time. Appropriate monitoring is required where hypotension is common and respiratory depression requiring assisted ventilation a possibility.

Editorial note. Although the authors of this article emphasize some of the potential complications of propofol anesthesia, this small series of 115 patients does not constitute evidence of safety. A much, much larger series would be required to show that propofol is safe in this setting, as the standard of care in anesthesiology results in a mortality rate of less than 1/50,000.

Karwautz, A., Wöber, C., Lang, T., Wagner-Ennsgraber, C. Vesely & Kienbacher, C. (1999). Psychosocial factors in children and adolescents with migraine and tension-type headache: A controlled study and review of the literature. *Cephalgia*, 19, 32-43.

Objective. To determine, from extensive literature review, if psychosocial stressors, housing and family conditions, school problems and peer relations can discriminate between migraineurs, patients with tension-type headache (TTH) and headache-free controls.

Design. Case-control.

Setting. University hospital out-patient clinic.

Participants. Three-hundred and forty-one children and adolescents (age range=4-19 years), of which 151 were migraineurs (79 female mean; age=10.7 years), 94 were TTH sufferers (52 male; mean age=11.5) and 96 were headache-free controls (51 male; mean age=10.4). Those in the headache group fulfilled the International Headache Society (IHS) criteria for migraine and TTH. Exclusion criteria for the headache group were coexisting medical disorders and coexisting migraine and TTH. Migraineurs, TTH patients, and headache-free controls were matched across age, gender, and social status.

Main Outcome Measures. Headache status and psychosocial factors were assessed using semi-structured interviews and questionnaires. All participants were interviewed with an accompanying parent (90% mothers). Headache was diagnosed through a semi-structured interview covering the items required, according to the criteria set by the IHS. Interview items included biographic information, duration of headache history, frequency, and

total number of headaches. Other information collected was duration, location, quality and intensity of headache, influence of physical activity, feelings of nausea, photo- and phonophobia, and the occurrence/duration of neurological symptoms. Psychosocial factors were assessed using a questionnaire that determined housing situation, family conditions and marital status, somatic health of family members, parents' negative life events, peer relations, and schooling conditions.

Results. There were no differences in age, gender, or social status between migraineurs, TTH patients, and headache-free controls. Duration of headache history and frequency of headaches was similar in both headache groups. Logistic regression analyses showed that TTH patients had fewer peer relations ($p=0.04$) and more divorced parents ($p=0.002$) than the headache-free control. TTH patients also had fewer peer relations than migraineurs ($p=0.01$). Patients with migraine were more often absent from school due to headache than TTH patients (mean=9.32 days and 5.38 days respectively; $p<0.05$). More TTH patients than migraineurs did not miss a single day of school in the previous years (59% vs. 40%; $p=0.007$).

Conclusions. Divorce of parents, number of friends, and school absences were the only relevant psychosocial factors that distinguished between the 3 groups. No other factors were significant. Regardless, findings in previous literature, such as school problems and performance are believed to be important. From the clinical perspective, psychosocial factors should be assessed in each individual patient and stressors that can most reasonably be changed should be attended to.

Koutantji, M., Pearce S.A., Oakley, D.A. & Feinmann, C. (1999). Children in pain: An investigation of selective memory for pain and psychological adjustment. *Pain*, 81, 237-244.

Objective. To investigate memory for pain related and neutral information, encoded with respect to either the self or other, in children with juvenile arthritis and a pain-free controls.

Design. Mixed experimental design.

Setting. Hospital.

Participants. Eighteen children (13 female; mean age=13.42 years, $SD=1.86$ years) suffering, for at least 6 months, from juvenile arthritis (mean disease duration=6.28 years, $SD=1.63$ years). The control group was composed of 18 children (11 female; mean age=13.8 years, $SD=1.63$ years). Inclusion criteria for the control

groups were absence of chronic and/or recurrent pain, and absence of pain on the day of participation.

Procedure. A processing memory task was employed involving 1 of 2 26-word lists, with six words each describing the affective dimension of pain (e.g. excruciating), the sensory dimension of pain (e.g. throbbing), and neutral words (e.g. slow). Eight additional neutral word were included as filler. Order of word list presentation was randomized and both lists were matched for similarity, frequency, and number of syllables. Participants were presented with a word list on a computer screen, followed by a 2-minute interference task and a 3-minute free-recall phase. Presentation of the second word list followed the same procedure. In the self-reference condition children were asked to imagine themselves in a situation involving each of the words presented. They were then asked to indicate, by pushing "1", "2", or "3" on the keyboard, how easy it was to imagine the situation. Alternatively, in the other-reference condition children were asked to imagine a situation involving a friend. Participants were exposed to both conditions.

Main Outcome. Measures included in the analyses were proportion of correct recall for each word-type (neutral, sensory, and affective) and processing time.

Results. The pain group recalled significantly more sensory and neutral words in the self-reference condition than did the control group ($p<0.05$ and $p<0.05$, respectively). The interaction between group and reference condition with respect to processing time approached significance. The pain group allocated less time to the processing of sensory words in the self-reference condition than did controls ($p=0.07$).

Conclusions. Findings suggest that children in pain appear to employ specific patterns of cognitive processing for pain-relevant information, particularly sensory information. Moreover, this processing is not a function of psychological disturbance since the pain and pain-free groups did not differ on psychological measures. Special attention should be paid to the potential exacerbating effect of this information processing on the pain experience of children. Further consideration of possible cognitive interventions is suggested.

Sweet, S.D., McGrath, P.J. & Symons, D. (1999). The roles of child reactivity and parenting context in infant pain response. *Pain*, 80(3), 655-661.

Objective. To evaluate the contributions of individual differences, such as temperament and environmental

context (i.e. maternal response), in infant pain behaviour during immunization.

Design. Cohort study.

Setting. University-affiliated health care clinic.

Participants. Participants included 30 infants comprising the 6 month old group (18 female; mean age=6 months, SD=18 days), 30 infants comprising the 18 month old group (19 female; mean age=18 months, SD=15 days) and their mothers (mean age=31.6 years, SD=4.8 years).

Main Outcome Measures. During an interview prior to the immunization, a spectral analysis of vagal tone was taken using the method of Finley et al. (1987) and resting EKG was measured. Vagal tone has been related to aspects of temperament such as vocalization, crying, frustration and intensity of response. Six- and 24-month versions of the Infant Characteristic Questionnaire (ICQ) were completed by the mothers to measure the difficultness of the child. Immediately following the interview, maternal sensitivity was documented by a blind rater using the Pederson and Moran Maternal Behavior Q-Sort, a measure designed to assess mothers' ability to detect, recognize, and respond, both appropriately and promptly, to situations requiring their response. Video recordings of the immunization were coded for maternal behaviour (coping promoting, distress promoting, neutral) using the Child-Adult Medical Procedure Interaction Scale (CAMPIS-R). The recordings were also coded using the Neonatal Facial Action Coding System (NFCS) to measure infant pain response through the assessment of ten facial actions.

Results. A stepwise regression was used to examine infant vagal tone, infant difficulty, ratio of coping promoting to distress promoting maternal behaviour, and maternal sensitivity. The directions of all predicted relations were supported. For the 6 month old group, maternal behaviour and infant difficulty accounted for 44% of the variability in pain response. At 18 months of age, maternal sensitivity and infant vagal tone accounted for 35% of the variability. For the 6 month old group, the regression model including vagal tone and ratio of coping/distress promoting maternal behaviour was significant ($R^2=0.375$, $p=0.006$) with a strong contributing interaction term ($p=0.04$). For infants with high vagal tone, maternal response was unrelated to infant pain response ($r=0.29$, $p=0.29$). The ratio of coping/distress promoting maternal behaviour was negatively correlated with pain behaviour in infants with lower vagal tone.

Conclusions. It was suspected that infants with "vulnerable reactivity" (low vagal tone/high difficulty) would be influenced more by maternal behaviour than infants with

less "vulnerable reactivity". Although results did not support the primary hypothesis, data suggest that there are developmental shifts in the factors important for predicting infant pain response. At 6 months, both individually-based levels of reactivity and parenting contributed to the infant's pain response. Infants with more difficult temperament showed more pain behaviour than those with less difficult temperament. At 18 months, pain behaviour was still predicted by both individual reactivity and parenting context but was more strongly related to maternal responsiveness to pain cues and immediate maternal behaviour than it was to individual reactivity. Findings support the importance of infant reactivity in predicting pain behaviour in early infancy and the importance of maternal responsiveness/behaviour in predicting pain response in later infancy.

Review Articles

The *Pediatric Pain Letter* briefly notes the following recent review articles:

American Academy of Pediatrics, Task Force on Circumcision (1999). Circumcision policy statement. *Pediatrics*, 103 (3), 686-693.

This Policy Statement of the American Academy of Pediatrics is a carefully crafted middle road statement on the topic of circumcision. It extensively reviews the literature and concludes that there are medical benefits to circumcision but these are not sufficient to recommend it. They firmly state that if a decision for circumcision is made, procedural analgesia should be provided. After a review of the analgesia literature, they recommend EMLA, dorsal penile nerve block or a subcutaneous ring block but note that the ring block may provide the most effective analgesia. This policy statement makes it clear that circumcision without appropriate analgesia is unacceptable.

Farkas, V. (1999). Appropriate migraine therapy for children and adolescents. *Cephalalgia*, 19, 24-28.

This brief review of migraine therapy in children and adolescents adequately reviews the pharmacological treatment and briefly discusses the difficulties of applying the International Headache Society diagnostic criteria to children. Unfortunately, there is no mention of the well validated behavioural treatments for migraine in

adolescents.

Puca, F. & de Tommaso, M. (1999). Clinical neurophysiology in childhood headache. *Cephalalgia*, 19, 137-146.

This extensive review of the neurophysiology of headache in children concludes that although there may be promise of clinical utility of various techniques, currently they are not indicated in clinical practice.

Book Review

Dahlquist, L.M. (1999). *Pediatric Pain Management. Clinical Child Psychology Library Series, Roberts, M.C. & La Greca, A.M. (Series Eds.). New York: Kluwer Academic/Plenum Publishers, 182 pp. (paperback), ISBN 0-306-46085-8. (Price: \$38.95 CDN)*

Lynnda Dahlquist is a professor of psychology at the University of Maryland, Baltimore County. In this new book, she has integrated the pediatric pain literature with her own research and clinical experiences working with childhood pain problems. In *Pediatric Pain Management*, Dahlquist describes a comprehensive and systematic way to provide effective treatment for children experiencing pain. She emphasizes the complexity of pain and the importance of unique factors in assessing an individual child. Throughout the book, the emphasis is on chronic pain, although examples of acute pain (e.g., painful injections) are also mentioned. The author presents an hypothesis testing approach to pain management that includes giving consideration to physical, cognitive, emotional, and behavioural contributors to a child's pain. Possible hypotheses could include that the child is not receiving optimal medication or that the pain increases under stressful conditions. Dahlquist describes the management process as ongoing, with hypotheses being continually generated and tested until the child's unique situation is clearly understood. Dahlquist then describes ways of treating the different contributors including medication, distraction, imagery, coping statements, and positive reinforcement. The book culminates with a chapter on implementing the pain management program. The book provides a useful framework with which practitioners may more effectively understand, assess, and treat children who are experiencing pain. For trainees in psychology and other disciplines, such a framework may be particularly valuable.

One of the book's highlights is the articulation of a "systems" approach to pain management. The author emphasizes that everyone involved with the care of a particular child (e.g., parents, nurses, physicians, and psychologists) can unwittingly contribute to sustaining the child's pain problem. Although she stresses the impact of parents, she does not let professionals off the hook. Self-awareness and role comfort are suggested as necessary areas of professional focus. This book is written for a multidisciplinary professional audience, with particular relevance to those working in pain management. The author integrates many practical tips, including consideration of the impact of tone of voice, a caveat about the boundary between psychology and medicine, and ways to obtain information from parents without them feeling judged or scolded. Such information is particularly useful for the beginning clinician.

The author emphasizes the need for thorough assessment, however, due to the comprehensiveness of her description, there is a risk that some therapists might think "I don't have time for all that!". The relative ease of using this approach needs greater emphasis, and the author might have made further suggestions for clinicians whose workload permits only brief contact. Although the author cites outcome studies and provides many case examples, her recommendations would be more complete if they were more strongly evidenced based, that is, if she had provided a more explicit evaluation of the program, as a whole. Further, a somewhat smoother integration of the concepts would have allowed for a more effective presentation of the valuable information offered. Specifically, the ideas presented could have been integrated more fully within, rather than across chapters.

Pediatric Pain Management offers useful guidelines for effectively treating children in pain, as well as interacting with parents and medical staff. The book provides a comprehensive approach to dealing with children's pain and emphasizes both cognitive and behavioural principles that help us to understand and to change children's maladaptive ways of dealing with pain. This book is one that would be useful to have close at hand, especially for those of us still learning the ropes.

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Film Review

Medical Audio Visual Communications Inc. (1998). *Conscious Sedation and Analgesia (Nurse Education)*. Address: 1200 Aerowood Dr., Unit 29, Mississauga, ON, L4R 2S7, Canada, tel 800-757-4868, email dwc@mavc.com. (Price: \$169 CDN)

This 11-minute videotape is directed at nurses, and covers the goal and complications of, and precautions for, conscious sedation, including special considerations for pediatric and elderly patients.

The tape is well made, using illustrative drawings and film. Titles and graphics are, clear and appropriate. All statements made are correct and consistent with current guidelines, and important precautions concerning equipment, monitoring, and recovery are emphasized.

The promotional information for this film gives the impression that it will allow a nurse to safely give conscious sedation. However, the tape is very short, and fails to cover many details. There is no discussion of the drugs used, although images of morphine and lorazepam syringes are used. Specific discussion of pediatric sedation is very superficial – if a practitioner (nurse or physician) is not already familiar with the material in the tape, then they will not learn enough from it to provide safe care.

This video would be useful for nursing students, or for orientation of staff nurses assisting a more experienced nurse or physician who is actually providing the sedation. It would not be an adequate substitute for the in-depth knowledge and experience that is required to give safe and effective conscious sedation.

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Announcements

Meetings

June 18-21, 2000: *ISPP2000, The 5th International Symposium on Paediatric Pain, London, United Kingdom.*

The theme of the 2000 Symposium will be *From Basic Research to Clinical Care*. The meeting will bring together an international delegation of clinical experts and neuroscientists to integrate the clinical management of children's pain with underlying developmental biology. For further information contact Meeting Makers, Jordan Hill Campus, 76 Southbrae Drive, Glasgow G13 1PP, Scotland UK, tel +44 (0) 141-434-1500, fax +44 (0) 141-434-1519, e-mail ispp2000@meetingmakers.co.uk, or visit the web site at <http://www.ich.ucl.ac.uk/pain2000>.

September 3-7, 2000: *Headache World 2000, London, UK.* Organized in association with the British Association for the Study of Headache. The conference aims to be a gathering of professionals from various disciplines as well as individuals who suffer from headache, including migraine, in order to address issues in the widest possible perspective. Topics to be covered include acute and preventative treatments, epidemiology, women and headache, genetics and children and headache. For further information contact the Headache World 2000 Congress Secretariat at MediTech Media Ltd., 125 High Holborn, London, WC1V 6QA, UK, tel +44 (0) 171 404 7151, fax +44 (0) 171 404 6946, e-mail secretariat@headache2000.com, or visit the web site at <http://www.headache2000.com>.

September 28-October 1, 2000: *3rd Biennial International Forum on Pediatric Pain, White Point Beach Resort, Nova Scotia, Canada.* The topic of the meeting will be acute and procedural pain. For further information contact Kate Finlayson of Conventional Wisdom, tel 902-453-4664, fax 902-423-5232, or e-mail katefin@chebucto.ns.ca.

Publications

Cancer Pain Release, a publication of the World Health Organization Collaborating Center for Policy and Communications in Cancer Care has devoted an issue (Volume 12, No.1) to the first consensus guidelines on the management of pain in children with cancer, published by the World Health Organization in December of 1998. This informative issue of *Cancer Pain Release* presents excerpts from the guidelines as well as abstracts of scientific articles on topics relevant to cancer related pain relief and palliative care.

Cancer Pain Relief and Palliative Care in Children. World Health Organization, Geneva, 1998, 76 pp., ISBN

92 4-154512-7 (currently available in English with French and Spanish versions in preparation). Price: \$16.20 US. For ordering information go to: <http://www.who.int/dsa/cat95/zhov.htm>.

Chronic and Recurrent Pain in Children and Adolescents: Progress in Pain Research and Management, Vol.13. McGrath, P.J. & Finley, G.A. (Eds). IASP Press, Seattle, 1998, 288 pp. (hardbound), ISBN 0-931092-27-2. Price: \$43.55 US for IASP members, \$67.00 US for non-members.

Announcement of Special Issue on Pediatric Pain. *Pain Research and Management* is pleased to announce a special issue on Pain in Infants, Children and Adolescents. We welcome data-based articles, review articles and CME articles on any aspect of pediatric pain. We will also accept poetry or art submissions on the topic. The Guest Editors for this issue are Patrick J. McGrath of Dalhousie University and Christine Chambers of the University of British Columbia. The deadline for submission is January 15th. Review will follow the usual policies of the journal and will be rapid. Earlier submission will result in earlier review and acceptance. Accepted articles will be published in the special issue or, if numbers warrant, in other issues of the journal as well. Please submit articles following the guidelines for authors (available in each issue of the journal or through the website <http://www.pulsus.com>) to: Patrick J. McGrath, Guest Editor, Pediatric Pain Issue, *Pain Research and Management*, Psychology Department, Dalhousie University, Halifax, NS, B3H 4J1, Canada.

The ***Pediatric Pain Sourcebook of Protocols, Policies and Pamphlets*** website is now available at <http://is.dal.ca/~painsrc>. This resource provides access to reviewed pain assessment and management material from institutions world-wide. We hope this will improve the dissemination of information to health care professionals and patients and their parents. With your help, new material will continually be added to create a comprehensive database of pain assessment and management documents. We hope the usefulness of the *Sourcebook* will prompt others to submit material. To this end the site includes submission instructions and an online submission questionnaire. Please visit the site and make suggestions via the comments link in the navigation bar. The *Sourcebook* will be constantly evolving and any feedback will help us improve its usefulness. The *Pediatric Pain Sourcebook of Protocols, Policies, and Pamphlets* was conceived by Patrick McGrath

and G. Allen Finley of the Pediatric Pain Lab at Dalhousie University and the IWK Grace Health Centre. Funding has been provided by the Mayday Fund.

Short announcements on pediatric pain events will be published free of charge.

If you would like to participate

Your participation in abstracting and writing commentaries for the *Pediatric Pain Letter* is welcomed. Please send submissions according to the specifications outlined in our Author's Kit. An Author's Kit can be obtained from Jill Hatchette, Managing Editor, *Pediatric Pain Letter*, Psychology Department, Dalhousie University, Halifax, Nova Scotia, B3H 4J1; email jhatchet@is.dal.ca; requests can be made in writing or by email. Abstracts and commentaries on any aspect of pain in infants, children, and/or adolescents are appropriate. We will attempt to use abstracts and commentaries but the editors reserve the right to edit or reject contributions.

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Assistants for this issue: Andrea Gregory and Bruce Dick.