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Pediatric Pain Letter

Abstracts and Commentaries on Pain in Infants, Children and Adolescents

Table of Contents

Editorial note

The science and practice of pediatric pain is advancing. At the recent American Pain Society meeting in Phoenix pediatric pain was featured in a pre-convention workshop and included in many symposia. Most issues of pain journals and pediatric journals now include papers on pediatric pain. The Joint Commission on Accreditation of Healthcare Organisations (JCAHO) requires pain measurement and management for all patients (infants, children and adolescents included). The pharmaceutical industry is now including pediatric studies in their programs of research. As well, as can be seen in the commentary in this issue on parents and procedure pain, the sophistication of our understanding of different aspects of pediatric pain is moving forward.

Commentary

Parents' behaviour in helping children to cope with painful procedures

Evidence is mixed as to whether parents' presence is helpful during painful procedures (von Baeyer, 1997): it appears to depend on what the parents actually do. Parents' behaviour in the treatment room may account for as much as 53% of the variance in child distress behaviour (Frank et al., 1995).

Research has shown a number of adult behaviours to facilitate child coping and decrease child distress during an acute pain experience. There are clear implications for improved clinical practice in these studies, which demonstrate that non-procedural talk and distraction methods (such as facilitating play with toys, bubble-blowing, party blowers, encouraging the child to watch cartoons), commands to engage in coping, breathing techniques and humour, are associated with enhanced coping by the child (e.g., Blount et al., 1992; Cohen et al., 1997; Felt et al., 2000; Manimala et al., 2000). Moreover, Suls and Wan (1989) highlighted the importance of providing sensory and procedural information before the painful experience.

"...maternal reassurances have even been found to be related to an increase in pain behaviours in infants..."

Parental behaviours which are likely to interfere with a child's coping include: making reassuring or empathetic statements, apologising, criticising, bargaining with the child, providing explanations during the procedure, giving the child control over when to start the procedure,

catastrophizing and becoming agitated (e.g., Blount, et al., 1989; Bush & Cockrell, 1987; Manimala et al., 2000). Interestingly, maternal reassurances have even been found to be related to an increase in pain behaviours in infants during immunization (Sweet & McGrath, 1998). However, correlational analyses should be interpreted with caution as they do not indicate causality: parent behaviours are reciprocally influenced by the child, staff members and other contextual factors.

When investigating the effect of parent behaviour on child pain outcome, it is important to bear in mind that parent self-report is not necessarily an accurate index of their actual behaviour during the child's painful procedure (Cohen et al., 2000). A better alternative would be to use the Revised (Blount et al., 1997) or Short Form (Blount et al.,2001) version of the Child-Adult Medical Procedure Interaction Scale. These behavioural observation scales provide more accurate measures of the behaviours of the parents, staff and children in the treatment room. It is also important to consider a range of child outcomes taken both at the time of the painful event and on subsequent follow-up. These may include a number of self-report measures, physiological indices, length of hospital admission, as well as parent and staff observational ratings of factors such as pain, distress and disruptive behaviour.
The mechanisms by which parent behaviours influence a child's level of distress and coping during their experience of acute pain are not well understood. Some possible mechanisms are the reinforcement of adaptive coping behaviours, modelling and distraction. Suls and Wan (1989) have also suggested that providing sensory and procedural information enables patients to prepare themselves for the painful stressor and may have an impact on the outcome through altering the discrepancy between the patient's expectations and experience.

Several experimental studies have investigated the efficacy of specific parental training programs. Manimala et al. (2000) found that three times more children required restraint during immunization if their parents were instructed to provide reassurance than if the parents received training in distraction techniques. A study by Blount et al. (1992) found that when parents were taught to coach their child to use distraction techniques prior to and during the immunization, they and their children were significantly less distressed during the immunization than those in the no-treatment control group. Moreover, reductions in children's pre-operative anxiety may be associated with better post-operative outcomes (Kain et al., 1999).

In order to facilitate more adaptive parent and child behaviours in the treatment room, it has generally been considered beneficial for the clinician to discuss with the child and parent those strategies which they would feel comfortable in using at various stages of the pain experience (e.g. anticipatory, encounter and recovery), and to allow for opportunities to rehearse these strategies. However, Cohen et al. (1997) have suggested that, in at least some cases, it may be sufficient for staff to model coping-prompting behaviours rather than training each parent, given that training staff is a more cost-efficient method and has been found to cue untrained parents to engage in more coping-prompting behaviours.

In summary, research has identified a variety of ways in which parents can help their children to cope with painful procedures. Many questions remain for further research. How should clinicians choose between direct training of parents versus simply modelling the desired behaviours? Should that choice depend on the severity or frequency of procedures? Are different parental behaviours more or less important at various phases of the pain experience (e.g., anticipatory, encounter and recovery phases)? What is the optimum time for parent and child preparation (in terms of minutes, hours, days or weeks before a procedure)? Does requiring parents to restrain their child during a painful procedure interfere with their role in helping the child to cope with pain? How does optimal parent behaviour differ for chronic as opposed to acute pain management?

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Blount RL, Bunke VL, Cohen LL, Forbes CJ. The Child-Adult Medical Procedures Interacion Scale- Short Form (CAMPIS-SF): validation of a rating scale for children's and adults' behaviors during painful medical procedures. *Journal of Pain and Symptom Management* 2001;22:1-9.

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Sweet SD, McGrath PJ. Relative importance of mothers' versus medical staffs' behavior in the prediction of infant immunization pain behavior. *Journal of Pediatric Psychology* 1998;23:249-256.

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Abstracts

Blount RL, Corbin SM, Sturger JW, Wolfe VV, Prater JM, James LD. The relationship between adults' behavior and child coping and distress during BMA/LP procedures: a sequential analysis. *Behavior Therapy* 1989;20:585-601.

Objective. To assess the effects of the social environment, in terms of verbal interactions with parents and medical staff, on children's ability to cope during painful medical procedures.
Design. Observational.
Setting. Teaching hospital, USA.
Participants. Children (n=23; 14 boys; mean age=117 months, SD=39) diagnosed with acute lymphocytic leukemia, undergoing bone marrow aspiration (BMA) and lumbar puncture (LP) procedures (n=12) or only BMA (n=11), their parents and attending medical staff (one resident and at least 2 nurses). Neither parents nor children were given any coping training.
Main Outcome Measures. Audio-tapes were made of the procedures beginning upon the child's entry into the treatment room and ending 1.5 minutes after the procedure. Mean length of treatment time was 22 minutes (SD=10 minutes). Audio-tapes were transcribed and coded using the Child-Adult Medical Procedure Interaction Scale (CAMPIS). Adult codes included adult to adult and adult to child vocalisations. Child codes included indices of distress, normal talk and coping behaviours.
Results. In a forward lag analysis, the adult behaviours that were most typically followed by child distress were: giving the child control, criticism or apologies (p's<0.0001). Using the analysis in reverse, reassurance was the most frequently occurring behaviour for 7 of 8 children's distress responses (p<0.0001). The probability of child distress was higher following reassurance than commands to use coping strategies (p<0.0001). For coping behaviours, nonprocedural talk to the child was preceded by nonprocedural talk by the child, deep breathing by the child was preceded by commands to engage in a coping strategy and distracting talk by adults facilitated humour-talk by children (p's<0.0001).
Conclusions. Specific adult behaviours are associated with coping or distress responses in children during painful medical procedures. Coping behaviours such as nonprocedural talk and humour by the child were typically preceded by similar behaviour to the child and deep breathing was preceded by commands to engage in a coping strategy. Alternatively, vocalisations of reassurance, criticism or apology were antecedents to child distress. The data indicate that training adults in coping-promoting behaviours may work to reduce distress for children undergoing painful procedures.

Cohen LL, Blount RL, Panopoulos G. Nurse coaching and cartoon distraction: an effective and practical intervention to reduce child, parent, and nurse distress during immunizations. *Journal of Pediatric Psychology* 1997;22(3):355-370.

Objective. To assess the practicality and effectiveness of using animated movies as an intervention technique to decrease child, parent and nurse distress and increase children's coping during immunization.
Design. Randomized control study.
Setting. Health clinic, USA.
Participants. Children (n=92; 48 boys; mean age=4.4 years, SD=0.54) receiving routine immunizations for diphtheria/tetanus toxoid/pertussis and measles/mumps/rubella, their parents and 2 nurses administering the injections.
Intervention. Children and their parents were randomly assigned to one of three conditions. 1) Standard medical care (SMC) control group, no training was provided for parents or children and parents were interviewed for 15 minutes before immunization about their usual method of interacting with their child during medical procedures. 2)

Nurse coach (NC) intervention, nurses were instructed to coach the child to attend to a cartoon movie but the parents and children were given no training. 3) Nurse coach plus train parent and child (NCPC) intervention group, both parents and children were provided the rationale for the movie as well as training on prompts to have child attend to the movie, role playing to practice desired behaviours and the nurse coached the child to attend to the movie.
Main Outcome Measures. Immunizations were videotaped and coded using the Child-Adult Medical Procedure Interaction Scale-Revised (CAMPIS-R). Following immunization, children rated their pain using the 5-point FACES scale. Parents and nurses rated distress for themselves and the child with a 5-point Likert scale.
Results. More coping behaviours were displayed by children in both intervention groups than children in the SMC group ($p<0.001$). Children exhibited more behavioural distress in the SMC condition than either intervention condition ($p<0.001$). Children in the SMC group reported more pain than children in either intervention group ($p<0.001$) and both parents' and nurses' ratings of child distress were higher for children in the SMC group than either intervention group ($p<0.001$). Both parents and nurses displayed more coping promoting behaviours and experienced less stress in both intervention conditions than those in the SMC condition ($p<0.001$).
Conclusions. Both interventions reduced distress on multiple outcome measures when compared with the standard care condition. However, in terms of cost- and time-effectiveness, the nurse coach intervention is most practical, without sacrificing the goal of distress reduction.

Cohen LL, Manimala R, Blount RL. Easier said than done: what parents say they do and what they do during children's immunizations. *Children's Health Care* 2000;29(2):79-86.

Objective. To determine the relationship between parents' self-reported and actual behaviours during their children's immunizations, as well as assessing the impact of those behaviours on children's procedural distress and coping.
Design. Observational.
Setting. Rural health clinics, USA.
Participants. Children (n=55; 30 girls; mean age=4.68 years, SD=0.56) who were receiving routine immunizations (diphtheria/tetanus toxoid/pertussis and measles/mumps/rubella) and their parents.
Main Outcome Measures. Measures included a parent interview consisting of 10 questions designed to assess parents' typical behaviour during children's painful procedures. Questions were identical to the parent coping- and distress-promoting codes of the CAMPIS (Child-Adult Medical Procedure Interaction Scale) and assessed the following; apology, commands to cope, cognitive distraction, criticism, empathy, humour, information provision, nonprocedural talk, praise and reassurance. Parents rated their use of these strategies on a scale of 0 (never) to 4 (always). Immunizations were videotaped and coded using the CAMPIS.
Results. Parents reported using reassurance most frequently followed by praise; they reported using criticism least frequently. CAMPIS scores indicated that parents employed low levels of all assessed behaviours. Most frequently observed behaviours were reassurance and nonprocedural talk, occurring for only 10% and 8% of the 5-second coding intervals respectively. There was no relationship between parents' reported behaviours and actual behaviours. There was no relationship between parents' reported behaviours and children's coping or distress. However, observed parental behaviours of apologising, empathising and reassuring were positively related to child distress ($p's<.001$).
Conclusions. Parental self-report, prior to a painful procedure, is not a valid measure of actual behaviour during painful procedures, nor does it predict child distress. Observation of actual parental behaviour using a coding tool such as the CAMPIS provides a better index for determining the extent to which training is necessary in order to assist parents to facilitate their child's coping with painful procedures.

Felt BT, Mollen E, Diaz S, Renaud E, Zeglis M, Wheatcroft G, Mendelow D. Behavioral interventions reduce infant distress at immunization. *Archives of Pediatrics & Adolescent Medicine* 2000;154(7):719-724.

Previously abstracted in the Pediatric Pain Letter, Vol. 4, No. 4; p. 42. **www.pediatric-pain.ca/pplet/v4n4c.PDF**

Kain ZN, Wang Sm, Mayes LC, Caramico LA, Hofstadter MB. Distress during the induction of anesthesia and postoperative behavioral outcomes. *Anesthesia and Analgesia* 1999;88(10):1042-1047.

Previously abstracted in the Pediatric Pain Letter, Vol. 4, No. 2; p. 20. **www.pediatric-pain.ca/pplet/v4n2c.PDF**

Manimala MR, Blount RL, Cohen LL. The effects of parental reassurance versus distraction on child distress and coping during immunizations. *Children's Health Care* 2000;29(3):161-177.

Objective. To examine the impact of parental distraction versus reassurance on child behaviour during immunization.
Design. Randomized, non-blinded, control study.
Setting. County Health Department, USA.
Participants. Children (n=82; 44 boys; mean age=5.02 years, SD=0.35 years) receiving immunizations and their parents.
Intervention. Parent-child dyads were randomly assigned to one of three groups: distraction group (parents were trained in distraction activities and were instructed to teach their child to use a party-blower prior to, during and at any sign of distress throughout immunization); reassurance group (parents were trained to employ various reassurances); control group (parents received no special instructions). In both intervention groups role-playing was performed by two research assistants and was observed by parents. Children observed training sessions.
Main Outcome Measures. Following training, parents rated their expected distress and the extent to which they believed they could help their child deal with the procedure on a 10-point VAS. Children rated their fear of the upcoming procedure using a faces scale. Immunizations were videotaped and coded using the Child-Adult Medical Procedure Interaction Scale – Revised (CAMPIS-R). Behaviours coded included those up to 3 minutes prior to arm sterilization and 2 minutes following needle removal. Child codes used were coping and distress; adult codes used were coping-promoting and distress-promoting. In addition, the "restraint of the child" measure from the Observational Scale of Behavioural Distress – Revised (OSBD-R) was employed. Following immunization, parents rated their distress during the procedure on a 5-point Likert scale.
Results. Reassurance group parents had higher expectations of their ability to help their children during immunization (reported after training/prior to immunization) than distraction group parents ($p<0.10$) or control group parents ($p<0.03$) and expected to be less upset during immunization than control group parents ($p<0.06$). However, reassurance group parents also reported being more upset following the immunization than either distraction or control group parents ($p's<0.01$). Children in the reassurance group required more physical restraint than children in the distraction group ($p<0.04$) and exhibited more verbal fear than children in the other two groups ($p's<0.05$).
Conclusions. Reassurance produces more child distress, relative to distraction or standard care practices. Parental training programs should not only focus on coping-promoting behaviours but also highlight the importance of eliminating reassurance and other distress-promoting behaviours.

von Baeyer CL. Commentary: Presence of parents during painful procedures. *Pediatric Pain Letter* 1997;1(5):56-59.

Available on-line at **www.pediatric-pain.ca/pplet/v1n5c.PDF**

Recent Articles

Altintas F, Bozkurt P, Ipek N, Yucel A, Kaya G. The efficacy of pre- versus postsurgical axillary block on postoperative pain in paediatric patients. *Paediatric Anaesthesia* 2000;10(1):23-28.

***Objective*.** To compare the effectiveness of pre- and postsurgical axillary block as preemptive analgesia for pediatric patients undergoing upper limb surgery.
***Design*.** Double-blind, randomized study.
***Setting*.** Pediatric hospital, Turkey.
***Participants*.** Fifty-five children, randomized into 1 of 2 groups (presurgical group: 16 male; mean age=5.2 years, SD=2.6 years; postsurgical group: 16 male; mean age=5.3 years, SD=2.8 years), undergoing elective hand and forearm surgery under general anesthesia.
Intervention. The presurgical group received an axillary block after induction of general anesthesia but 20 minutes prior to incision, and the postsurgical group received an axillary block after completion of the surgery and reversal of neuromuscular blockade.
***Main Outcome Measures*.** Speed of recovery (discontinuation of general anesthesia until patient opened his/her eyes and obeyed a simple command) was assessed following surgery. Patient self-report (for patients age 5 and over) or nurse report (for patients under 5 years of age) of pain using the Faces Pain Scale (FPS) was recorded in the recovery room and 2, 4, 6, 8, 10 and 24

hrs after surgery. Post-operative pain was quantified with 3 measures; analgesic duration (time from block until time patient requested additional analgesic), cumulative pain scores and cumulative analgesic requirements for the first 24 hours following surgery.
Results. Extubation and recovery times were significantly more rapid in the presurgical group ($p<0.05$). For the first 8 hours following surgery FPS scores were similar between both groups. At 10 hours post-op FPS scores were significantly greater in the presurgical group ($p<0.05$). No difference was seen at 24 hours post-op, however the pre-surgical group had higher cumulative FPS scores in the observation period following surgery. For the first 24 hours after surgery 8 children (32%) of the pre-surgical group and 20 children (83.3%) in the post-surgical group, did not require additional acetaminophen.
Conclusion. Although no firm conclusion of the superiority of preemptive analgesia by presurgical axillary block was reached it was shown that the children who had the preoperative block woke up faster and had a fairly pain free postoperative course. This suggests that the other benefits of preoperative block should be considered to help make the operative experience as stress free as possible for the pediatric patient.

Balbi C, Musone R, Menditto A, Di Prisco L, Cassese E, D'Ajello M, Ambrosio D, Cardone A. Influence of menstrual factors and dietary habits on menstrual pain in adolescence age. *European Journal of Obstetrics Gynecology and Reproductive Biology* 2000;91(2):143-148.

Objective. To investigate the prevalence of primary dysmenorrhea (PD) and its relationship with menstrual factors and dietary habits.
Design. Survey.
Setting. Educational institute, Italy.
Participants. Females (n=356; age range 14-21 years) with a menarche age range of 10-16 years. Subjects with secondary dysmenorrhea were excluded from further analyses.
Main Outcome Measures. During an interview a questionnaire was used to collect demographic data, personality descriptors (Minnesota Multiphasic Personality Inventory - MMPI), menstrual history (age at menarche; mean duration; quantity; rhythm), dietary habits (frequency of consumption of pasta, meat, fruit, eggs, fish and wine) and information about pain (VAS for intensity; location; when it began in relation to menstruation; duration; presence of pain at end of menstruation; presence during each cycle). All subjects underwent an abdominal ultrasound and any suspicious cases were given hormone treatments.
Results. Prevalence of dysmenorrhea was 85% (293 primary; 9 secondary; 54 without pain). Pain was experienced with 75% of menstrual cycles and for 83% of subjects the location was anterior abdomen. Predominantly, pain was precedent or coincident with menstruation (70% of subjects) and lasted for 2 days (>60% of subjects). Early menarche was significantly associated with an increase in severity of PD. Mean duration of menstruation was 6 days (range 3-11 days). For durations =4 days frequency of PD was 17% and for durations =5 days it was 58%. Increased menstrual flow was associated with increased severity of PD. Those with PD consumed less fruit, fish and eggs than those without ($p<0.05$).
Conclusions. There is a high prevalence of dysmenorrhea in adolescent girls and associated risk factors include early menarche, long and heavy menstrual flow and lower consumption of fruit, fish and eggs. Further study is required looking at a wider range of food items and eating habits to elucidate the effect of diet on PM..

Calam RM, Jimmieson P, Cox AD, Glasgow DV, Larsen SG. Can computer-based assessment help us understand children's pain? *European Journal of Anaesthesiology* 2000;17(5):284-288.

Objective. To develop and pilot a computer-based pain assessment tool.
Design. Instrument development and pilot survey.
Setting. Children's hospital, England.
Participants. Two groups of children (age range 4 -18 years), group 1 was admitted for breaks, fractures and surgery and group 2 included children who had no known organic cause for their pains. Inclusion criteria were healthy status, no premedication and parental consent.
Main Outcome Measures. Groups of 11-13 year old children were asked to draw pains and write a description of what had happened in order to develop an image palette to represent different pains A menu of facial expressions was developed by piloting a variety of facial icons to represent emotions. These were incorporated in a computer-based tool that included body maps and 2 scales to indicate the size of the pain and its intensity. Sets of pages for each child enabled the creation of a cumulative pain record and allowed collection of retrospective data.
Methods. . The entire package was piloted with patients to determine its utility.

Results. Children's pain reports were consistent with their injuries. In some cases they reported concurrent pains that healthcare staff were previously unaware of. The non-verbal response mode of the tool makes it much more applicable to children with language or hearing difficulties. The tool effectively described intensity, position and nature of the pain. Children were able to respond at their own pace and did not have to respond directly to a healthcare provider. Group 2 children were able to identify other factors (e.g., bullying) that may have contributed to their pain reports.

Conclusions. This is an effective tool for compiling a long history of the location, nature and intensity of pains. Further research is required to determine it's validity and reliability and in what situations it may be most helpful.

De Mey JC, Strobbe J, Poelaert J, Hoebeke P, Mortier E. The influence of sufentanil and/or clonidine on the duration of analgesia after a caudal block for hypospadias repair surgery in children. ***European Journal of Anaesthesiology*** **2000;17(6):379-382.**

Objective. To determine if analgesia by caudal block using bupivacaine is prolonged by the addition of clonidine, sufatanil or both.

Design. Blinded, prospective, randomized study.

Setting. University hospital, Belgium.

Participants. Boys (n=60; age range 8 months -13 years) admitted for the same type of hypospadias repair surgery. Inclusion criteria were healthy status, no premedication and parental consent.

Intervention. Children were randomly assigned to one of 4 groups: group 1 received only bupiovacaine 0.25%; group 2 received bupivacaine and 1µg/kg clonidine; group 3 received bupivacaine and 0.5 µg/kg sufentanil; group 4 received bupivacaine, 0.5 µg/kg clonidine and 0.25 µg/kg sufentanil. All children were anesthetized using a facemask to administer halothane in oxygen and, after IV canula placement, a bolus of non-depolarizing muscle relaxant was injected to facilitate intubation. A 22-gauge needle was used to administer 0.5 ml/kg of medication into the caudal space. Rectal paracetamol or propacetamol IV was administered if pain ratings exceeded 40 mm on the VAS or 6 on the CHEOPS.

Main Outcome Measures. Blood pressure and heart rate were monitored during surgery and for 24 hours post-operatively. The same physician assessed analgesia at 2, 4, 6, 8 and 12 hours postoperatively using VAS (children > 5 years) or CHEOPS (children < 5 years). Records were also kept for additional analgesic doses, quality of night rest, appetite and frequency of vomiting.

Results. There were no significant differences between groups for all outcome measures.

Conclusions. Results indicate that addition of clonidine and/or sufentanil to bupivacaine for caudal blocks provides no additional clinical benefit. Using plain local anesthetics reduces the risk of contamination or miscalculation during preparation.

Duarte MA, Goulart EMA, Penna FJ. Pressure pain threshold in children with recurrent abdominal pain. ***Journal of Pediatric Gastroenterology and Nutrition*** **2000;31(3):280-285.**

Objective. To examine pressure pain threshold in regions of the body surface in a group of children with recurrent abdominal pain (RAP) and a group of children with chronic or recurrent disease but with no pain.

Design. Cross-sectional survey.

Setting. University outpatient clinics, Brazil.

Participants. The RAP group consisted of children (n=100; 45 boys; age range 5-15.8 years) with a history of pain lasting at least one year, 56 were diagnosed with functional RAP and 44 had an associated disease (chronic intestinal constipation, gastroesophageal reflux, chronic gastritis, lactase deficiency, duodenal ulcer, celiac disease, periportal fibrosis, giardiasis, nodular lymphoid hyperplasia of the gut and chronic, pulmonary disease). The control group consisted of children (n=100) matched on age and sex with a history of chronic or repeated disease without pain (asthma, chronic intestinal constipation, chronic diarrhea, congential heart disease, recurrent cystitis, microscopic hematuria, allergic rhinitis, cyclic vomiting, glycogenosis, growth disorders, Fanconi anemia and obesity) lasting at least one year.

Main Outcome Measures. Pressure pain thresholds (PPT) were measured with an algometer at 17 anatomic sites (trapezius, deltoid, supraspinous muscles, nine areas on the abdominal wall and the median part of the tibias).

Results. In comparison to the control group, children with RAP had lower median PPT values (p's<0.0001) at each of the 17 anatomic sites. Children with functional RAP had lower median PPT values (p's<0.0001) at each of the 17 anatomic sites than the control group. Children with RAP with an associated disease had lower median PPT values (p's<0.0001) at each of the 17 anatomic sites than the control group. Overall, the median PPT's for all of the body regions combined was 1.6 kg/cm^2 for the RAP group and 2.2 kg/cm^2 for the control group.

Conclusion. Children with recurrent abdominal pain have

reduced pressure pain thresholds in regions of the body surface. This reduction was not influenced by the presence of organic or functional disease. Low PPT's in children with RAP may be due to alterations in the central nervous system perception of pain as a result of repeated pain.

Gil KM, Porter L, Ready J, Workman E, Sedway J, Anthony KK. Pain in children and adolescents with sickle cell disease: An analysis of daily pain diaries. *Children's Health Care* 2000;29(4):225-241.

Objective. To assess patterns of pain, medication use, healthcare use and activity reduction among children and adolescents experiencing sickle cell disease (SCD) pain.
Design. Prospective diary study.
Setting. SCD clinics in North Carolina, USA.
Participants. Children and adolescents (n=34; 18 female; mean age=11.1 years, SD=3.4) and their parents (mean age=36.0 years, SD=2.4)who were participating in a longitudinal SCD study. Children aged 6-12 years old (n=25) were not required to keep diaries separate from their parents'. Adolescents (n=8; one adolescent did not keep a diary) were required to keep a diary in addition to their parents'.
Main Outcome Measures. The Daily Pain Diary (Gil; 1994) assesses, over a 14-day period, pain intensity (on a 10-point scale), medication use, activity reduction (school, social and chores), healthcare use (emergency room visits, hospital admissions, physician contact or clinic visit) and disease severity (measured by phenotype and number of acute and chronic complications).
Results. A majority of parents (65%) reported at least one painful episode for their child in the previous 14 days. Children experienced pain a mean of 2.5 days (SD=1.5),the mean pain intensity rating was 5 (SD=2.4) and 63% of parents and 62% of children reported medication use on pain days. Younger children were more likely than older children to use analgesics ($p<0.05$), as were children with more complications ($p<0.01$). Thirty-five percent of children had a healthcare contact in the 14-day period; of those 35%, 15% were emergency room visits, 15% were hospitalizations, 29% were physician visits and 15% were telephone contacts. However, for 66% of all pain days reported no healthcare contact was made. Children missed school on 40% of the pain days reported and cut back on chores and social activities 47% and 41% of the time, respectively. Where adolescents and parents completed diaries independently, agreement was generally good.
Conclusions. Increase in pain levels was associated with increased narcotic use, healthcare services use and activity reduction. The Daily Pain Diary is an efficient way to collect important information from SCD patients and can provide specific information to further enhance treatment programs.

Grimmer K, Williams M. Gender-age environmental associates of adolescent low back pain. *Applied Ergonomics* 2000;31(4):343-360.

Objective. To assess the relationship between low back pain and gender/age-related variables (backpack load, amount of time carrying load, time sitting and time playing sport).
Design. Cross-sectional survey.
Setting. High schools, South Australia.
Participants. Students (n=1193; 612 male) in academic year level 8, 9, 10, 11 and 12 (mean ages=12.9, 13.8, 14.8, 15.8 and 16.8 years) who consented to participate in the study.
Main Outcome Measures. Students, their backpacks and backpack contents were weighed with a digital electronic scale. Student's height was measured and body mass index (BMI) was calculated. A questionnaire was used to collect reports of low back pain over the previous 2 weeks and to determine. the amount of time per day spent carrying backpacks, participating in sports and sitting in school.
Results. Most students (94%) wore backpacks and 6% used other types of school bags. Consistency of backpack loads was evident across academic level and 20% of students at each academic level carried more than 10% of their body weight, exceeding the recommended maximum load for adults. At all levels, more girls than boys reported low back pain ($p<0.05$). For all but 3 groups, low back pain was associated with heavier loads relative to body weight. Level 8 boys carrying more than 6% of their body weight were at particular risk for low back pain. There was no relationship between low back pain and BMI. Sitting for long periods of time after school was associated with elevated risk for low back pain, particularly for girls in level 10 ($p<0.05$). Longer times spent carrying backpacks showed the most consistent pattern of low back pain reported among both boys and girls and regular participation in organized sport showed to be protective of low back pain for most of the students.
Conclusion. Gender and age related variables such as load carrying and sitting times are risk factors for low back pain in high school children. Adolescents should be aware of the possibility of suffering from low back pain due to these factors and should be encouraged to decrease

backpack load if possible, decrease sitting time and participate in sporting activities to help reduce low back pain.

Hershey AD, Powers SW, Bentti AL, deGrauw TJ. Effectiveness of amitriptyline in the prophylactic management of childhood headaches. *Headache* 2000;40(7):539-549.

Objective. To determine the effectiveness of a standardized dose of amitriptyline in the prophylactic treatment of childhood headaches.
Design. Prospective, non-blind, non-placebo controlled study with regular follow-up.
Setting. Pediatric headache clinic, USA.
Participants. Children (n=279; 170 female; mean age = 11.7 years, SD=3.2) presenting with more than three headaches per month. Headache types included migraine (60.6%), migraine with aura (7.9%) and tension-type headache (10.4%). Some children had multiple headache types and 25.1% could not be classified according to IHS criteria.
Intervention. Incremental doses of amitriptyline were administered to 192 children, starting at a low of 0.25 mg/kg /day to minimize possible side effects. The dosage was increased by 0.25 mg/kg/day every 2 weeks until a final dose of 1mg/kg/day was reached, at which time patients were re-evaluated. Administration of amitriptyline was gradually discontinued if any of 4 pre-determined exit conditions was met. Children not receiving amitriptyline (n=141) were either given a different prophylactic medication (11.5%), weaned off their current medication (1.4%) or they declined to use any prophylactic medication.
Main Outcome Measures. Children and their parents provided detailed information, via screening questionnaire, about triggers, symptoms, pain quality, severity, duration and frequency of headaches. Depending on the child's age, a 10-point likert or 5-point faces scale was used to assess self-report of headache severity. Information and impact on school attendance/performance were also recorded. During follow-up evaluations, headaches were again characterized via questionnaire that included assessments of children's perceptions of response to treatment, headache duration, frequency and severity, as well as associated symptoms, any side effects and school absences.
Results. Seventy-six percent (n=146) of the patients receiving amitriptyline were seen for the first follow-up evaluation 67.3 days (median=58 days, SD=32.3 days) after inception of prophylactic treatment. Of these, 84.2% indicated that their headaches had improved. From first to fourth follow-up, mean frequency of headaches decreased from 17.1 to 7.1 days/month; mean duration diminished from 11.5 to 9.1 hours; and mean reported severity of headache decreased from 6.8 to 4.3 on a 10-point scale. School absenteeism was reduced to 0.8 days/semester from 5.3. Patients reported minimal side effects and exhibited good compliance to treatment.
Conclusion. Amitriptyline appears to be to be an effective agent in the prophylactic treatment of childhood headaches when administered in a standardized dosing regimen to large groups of children. The authors note that health practitioners and parents who are reluctant in using medications might consider amitriptyline because of its minimal side-effect profile and the improved compliance with a once-a-day medication as compared to more frequently administered alternatives.

Holloway VJ, Husain HM, Saetta JP, Gautam V. Accident and emergency department led implementation of ketamine sedation in paediatric practice and parental response. *Journal Of Accident & Emergency Medicine* 2000;17(1):25-28.

Objective. To evaluate the use of ketamine sedation for painful, short procedures in an accident and emergency department .
Design. Retrospective chart and telephone survey.
Setting. Accident and emergency department of a district general hospital, UK.
Participants. Children (n=100; 56 male; age range 0-12 years) who presented with injuries (i.e., primary closure/repair, exploration to remove foreign bodies) and their parents (n=61). Inclusion criteria were injuries that required the child to remain still during treatment, where attempts to use local anesthetic failed, where the parents did not want their child restrained and parental consent
Intervention. EMLA was applied to injection site 1 hour prior to injection. Ketamine (mean dose=5.54 mg/kg, range 3.65-8.91; 5 children required a second dose to achieve adequate sedation) was administered via intramuscular injection to the buttocks or thigh of all children by experienced emergency medicine physicians with 2 doctors and a nurse present during the procedure. Children received oxygen by facemask and a nurse monitored vital signs and pulse oximetry until recovery. Some children also received atropine (n=5: administered orally (30 mg/kg) or intramuscularly (10-20 mg/kg)) to prevent ketamine associated hypersalivation.
Main Outcome Measures. Pulse, blood pressure, side effects, adverse sequelae and time of discharge or transfer

data was extracted from charts. Parents were interviewed over the phone 1 week to 14 months after the procedure by one interviewer using a standardized questionnaire.
Results. During the procedure there were no changes in pulse or blood pressure and no complications. There were no readmissions due to ketamine effects and 93% of children were discharged that day (1 child was transferred to plastic surgery and 6 were admitted to the ward due to: parental anxiety (n=2), fracture treatment (n=1), deep sleep (n=1), further investigation (n=1) and unknown reason (n=1)). Within 2 hours after discharge vomiting occurred in 14% and agitation/nightmares in 6%. Over the 24 hours after discharge vomiting occurred in 12%, ataxia in 15%, agitation/nightmares in 2% and unusual behaviour in 4%. For the 24 hours post-discharge parents reported vomiting in 20%, loss of coordination in 25%, nightmares in 3%, drowsiness in 11% and unusual behaviour in 6%. Ninety-eight percent of parents would allow administration of ketamine to their child again and 85% said they very satisfied with ketamine sedation.
Conclusions. Results indicate that ketamine may be of use with this population in accident and emergency departments but further research is needed with a larger sample to investigate the relatively high incidence of complications.

van den Brink M, Bandell-Hoekstra ENG, Abu-Saad HH. The occurrence of recall bias in pediatric headache: a comparison of questionnaire and diary data. *Headache* 2001;41(1):11-20.

Objective. To investigate the accuracy of recalling headache frequency, duration and intensity in children and adolescents with recurrent headache complaints and to examine whether recall errors are related to age, gender, headache severity, preferred coping strategy, depression, somatization and trait anxiety.
Design. Retrospective questionnaire and prospective diary study.
Setting. Schools in the Netherlands.
Participants. Elementary and high school children (n=181; 32% boys) aged 9 to 16 years who experienced headaches on a weekly basis.
Main Outcome Measures. Children first completed the retrospective headache questionnaire, which consisted of the Waters' Headache Questionnaire (WHQ), the Abu-Saad Pediatric Pain Assessment Tool (PPAT) and the Pain Coping Questionnaire. Headache frequency and duration were measured by the WHQ on 7-point Likert scales and headache intensity was measured by the PPAT on a 100-mm VAS. Approximately three months later, the children completed the Dutch Depression Questionnaire, the Self-assessment questionnaire, the Children Somatization Inventory and a 4-week prospective headache diary (headache frequency, duration, intensity and severity were recorded four times daily).
Results. Children reported a median frequency of 9 headache complaints over 4 weeks for both the questionnaire and diary. The median headache intensity score from diaries was lower than from questionnaires (37 vs. 65; p=0.00). Headache duration from diaries was also lower than from questionnaires (1-12 hours vs. 12-24 hours; p=0.00). To assess which variables predicted recall bias, proportional scores for headache frequency, intensity and duration were calculated by dividing the respective diary scores by the questionnaire scores. Multiple regression analysis indicated that age (p=0.05), depression (p=0.00) and headache severity (p=0.08) predicted the size of recall error. When answering the questionnaire, older children and depressive children underestimated headache frequency, and children with higher headache severity overestimated headache frequency. Age and headache severity were also related to proportional headache intensity (p=0.07 and p=0.00, respectively). On the questionnaire, older children overestimated headache intensity and children with higher headache severity did not overestimate headache intensity as much.
Conclusion. As compared to a prospective diary, headache intensity and duration assessed by a retrospective questionnaire were strongly overestimated. Pain complaints may be evaluated more negatively when assessed retrospectively than when assessed prospectively. Age, depression and headache severity also influence the size of recall bias. The use of a diary may minimize bias when studying recurrent headache complaints in children.

Review Articles

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

Anand KJ. Consensus statement for the prevention and management of pain in the newborn. Archives of Pediatrics and Adolescent Medicine 2001;155(2):173-180.

This is an important initiative in bringing evidence-based analgesic practice into clinical care. A range of procedures and painful experiences suffered by newborns in Neonatal Intensive Care Units is listed, with clear reference to published evidence for the recommended analgesic interventions. Our only concern is that the (very appropriate) general anesthetic recommended for endotracheal intubation is not classified as such, but is called "analgesia and sedation". This might mislead some readers into thinking that intubation is a less significant procedure than it is (or that thiopental is analgesic). Nonetheless, this is a much needed and welcome publication, and should be posted in every NICU.

Kashikar-Zuck S, Graham TB, Huenefeld MD, Powers SW. A review of biobehavioral research in juvenile primary fibromyalgia syndrome. Arthritis Care and Research 2000;13(6):388-397.

This review is a welcome summary of research on juvenile primary fibromyalgia syndrome. It carefully integrates the existing psychological and biological literature.

Announcements

Meetings

June 26-29, 2001: *2nd World Congress of the World Institute of Pain: Pain Management in the 21st Century, Istanbul Convention and Exhibition Centre, Istanbul, Turkey.* For further information contact Cengiz Topel Mah, Dilan Tur Congress International, Dereyolu Sok. Umut - 2 Apt., 80630 Etiler, Istanbul, Turkey, tel +90-212 257-86-67 (PBX), fax +90-212-265-54-74, email **info@dilan.com.tr**, web-site **www.dilan.com.tr/wip2001**.

October 12, 2001: *Pain - Something to Think About, Ontario Inter-Urban Pain Association Conference at Freeport Health Centre, 3570 King St. East, Kitchener, Ontario, Canada*. Co-sponsored by the Grand River Hospital and the Centre for Applied Health Research, University of Waterloo. Presentations will inlcude: What Really Causes Low Back Injury - A Mechanical Basis; Muscle Fatigue and Pain , Assessment of Muscle Pain ; Employers' Perspective on Pain; Brain Imaging of Pain; Interaction between Anxiety, Depression, Pain and Disability, A Literature Review; Hypnosis and Pain Control; Pain from the Perspective of a Neurosemantic Programmer. For information contact Beverly Brookes, tel 519-888-4567 ext. 6884, email **bbrookes@uwaterloo.ca**.

March 14-17, 2002: *21st Annual Scientific Meeting of the American Pain Society, Baltimore, Maryland, USA.* For more information contact the American Pain Society, 4700 W. Lake Avenue, Glenview, IL 60025, USA, tel 847-375-4715, fax: 877-734-8758, web-site **www.ampainsoc.org/meeting/**.

August 17-22, 2002: *The triennial World Congress on Pain, Convention Center, San Diego, California.* Registration forms will be available and call for abstracts issued in September, 2001. Abstracts require sponsorship by an IASP member. Abstracts can be submitted online, web-site **www.halcyon.com/iasp/02Cong.html**.

June 15-19, 2003: *International Symposium on Paediatric Pain, Sydney, Australia*. The theme will be "The Big Questions in Paediatric Pain". What are the questions and issues that concern you and the community caring for children in pain? The Scientific Program Committee for the Sydney 2003 meeting would appreciate your participation in an open forum to discuss themes that are important from the perspective of pain researchers, health professionals, parents and children. Ideas can be directed to David Champion **dchampion@prvnw1.stvincents.com.au** and/or Belinda Goodenough **b.goodenough@unsw.edu.au**.

Positions

The Pediatric Chronic Pain Management Program, Department of Anesthesia at the Hospital for Sick Children, Toronto is advertising for a **Fellowship** commencing July 2001. Applications are invited from Board eligible (CA-3 completed or fellowship qualification outside of North America) candidates. It would be expected that applicants would have some prior experience of management of pain in children. Individuals trained in anesthesia or other pain allied specialties will be considered. For further information, please contact Stephen Brown MD FRCPC, email **stephen.brown@ sickkids.on.ca** or Hana Zita, email **hana.zita@ sickkids.on.ca**, tel 416-813-7240, fax 416-813-7543.

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

We need your help

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 which 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.

Assistants for this issue: Lynn Breau, Alyson Currie, Bruce Dick, Michael Houlihan and Trudi Walsh.

Editorial Board

Psychology Department, Dalhousie University, Halifax, NS, B3H 4J1, Canada, tel 902-494-1938, fax 902-494-6585, web-site **www.pediatric-pain.ca/pplet/**

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One-year subscription is $25 CDN in Canada, $35 CDN or $25 US in other countries. Payment can be made by cheque (payable to Dalhousie University - *Pediatric Pain Letter*), Visa, or MasterCard. Subscribe by sending payment and mailing address to the Managing Editor.

Note: Over the next few issues we will be modifying the format in an effort to improve the usefulness of the *Pediatric Pain Letter*. Your comments are appreciated.