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The making of a pediatric pain psychologist: education, training and career trajectories

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SUMMARY

Currently, there are no standard guidelines for the training of pediatric pain psychologists. This article is intended for pediatric pain medicine trainees and faculty in the USA and Canada, and includes discussion of the professional roles and responsibilities of pediatric pain psychologists, a historical perspective on the role of psychologists in the field of pediatric pain medicine, and career trajectories and recommendations for training of pediatric pain psychologists. The primary aim of this commentary is to provide a starting point for the standardization of training of pediatric pain psychologists in the future.

Perhaps no endeavor has exemplified the benefits of interdisciplinary collaboration more than the field of pain medicine, and pediatric pain medicine in particular. From its recognizable inception some 25–30 years ago, individuals who are trained as anesthesiologists, pediatricians, nurses, psychologists and rehabilitation specialists have all made significant contributions to the advancement of assessing, preventing, and treating pain in children. This article focuses on key issues related to the education, training and practice of pediatric pain psychologists in the USA and Canada, and is primarily intended for trainees as well as faculty mentors. This commentary may also be informative to other healthcare professionals who consult or work alongside pediatric pain psychologists.

What is a 'pediatric pain psychologist'?

By recognizing that all pain has a psychological component and that psychological factors are important for all stages and types of pain, the psychology of pain has been established as an essential component of research and practice in the field. The term 'pain psychologist' refers to the specific roles and responsibilities of psychologists who choose to specialize in pain, ranging from fundamental research to healthcare delivery [101]. Pediatrics is an additional specialization in working with children, youth and families. The defining features of psychologists who specialize in pediatric pain medicine are expertise in the biological, psychological and social factors that contribute to pain in children and adolescents, as well as expertise in psychological assessment, intervention and psychological mechanisms

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involved in pain. Pediatric pain psychologists have expertise in evidence-based psychological pain management interventions, which include cognitive-behavioral approaches such as relaxation training, distraction techniques, cognitive therapy and parent operant training [1,2]. Pediatric pain psychologists may also have expertise in techniques that overlap behavioral and complementary and alternative approaches to pain medicine such as hypnosis and biofeedback. Pediatric pain psychologists may serve in a variety of roles including consultants to medical teams, primary researchers, clinicians and educators.

Psychologists with expertise in pediatric pain medicine serve children who have acute, procedural and/or chronic pain complaints. Acute pain is considered to be time-limited and typically follows events such as surgery, medical procedures, injury or infection. Procedural pain is a type of acute pain that specifically refers to pain and distress experienced prior to, during and after medical procedures associated with potential tissue damage, such as venipunctures, intramuscular injections and burn wound dressing changes. By contrast, chronic pain refers to pain that persists over time and has a more poorly defined onset and termination.

Pediatric pain psychologists work in a range of settings from research to healthcare delivery. Many pediatric pain psychologists are employed in medical centers as part of interdisciplinary pediatric pain medicine teams that often also include physicians, nurses and rehabilitation specialists with focal training in pain medicine. Comprehensive pediatric pain medicine programs generally include inpatient consultation services, outpatient clinics, and in some instances, rehabilitation programs. The pediatric pain psychologist may play a valuable role in assessment and intervention across these settings. Pediatric pain psychologists may also be employed by one or more specialty medical services that treat youths with acute and chronic pain complaints such as orthopedic surgery, hematology/oncology, neurology, gastroenterology or rheumatology.

Pediatric pain psychologists employed in academic medical settings may participate in the education and training of medical students and trainees in other disciplines via didactic instruction and clinical supervision. Pediatric pain psychologists may also be employed in university settings, where they provide education to clinical psychology or health psychology trainees in the form of coursework, research experience and clinical supervision. In addition to clinical and teaching responsibilities, pediatric pain psychologists may have part or all of their time dedicated to research; such psychologists typically hold grant funding to support their research program.

At the most general level, pediatric pain psychologists have a doctoral degree in clinical psychology or clinical health psychology. The field of clinical psychology focuses on understanding psychological, social and biological aspects of human behavior, with an overarching goal to reduce suffering and promote adaptation at all phases of lifespan development as well as across cultures and socioeconomic backgrounds [102]. Clinical psychologists can work in a variety of roles, including clinical practice, research, teaching, supervision, and public policy. Graduate education in clinical psychology typically includes general coursework in areas such as psychopathology, personality, psychological assessment and biological bases of behavior in addition to training in research methods and completion of several clinical practicum experiences. Clinical psychology trainees also typically complete a predoctoral internship year, which is a focused time for intensive clinical training and is often a required program requirement as well as necessary for subsequent professional licensure. Most clinical psychology graduates with aspirations to specialize in pediatric pain go on to complete a 1- or 2-year postdoctoral fellowship, which provides the opportunity for this specialty training as well as accrual of additional clinical hours required for licensure.

Pediatric pain psychologists with degrees in clinical psychology typically specialize in child clinical psychology in graduate school, which involves completing additional coursework in child development and child psychopathology as well as clinical practica in settings that serve children and families. If available in their graduate program, trainees may also complete coursework in pediatric psychology as well as clinical practica in pediatric settings. Child clinical and pediatric psychologists work in a variety of settings including schools, community mental health centers, hospitals and rehabilitation centers. While both child clinical and pediatric psychologists are trained to address mental health in children and adolescents, pediatric psychologists are trained in particular to address psychological and behavioral issues related to having a medical illness and to consider health and health promotion more broadly in children.

Health psychologists have a principal interest in the psychological and behavioral aspects of physical and mental health. As stated by their major professional organization [103], health psychologists “are engaged in academic research, professional practice, and education and training across an array of community, clinical, occupational, and acute healthcare settings.” Health psychologists integrate psychological theory and research targeting the maintenance of healthy lifestyles, avoidance of preventable disease, coping with chronic disease, and rehabilitative services to persons with acute and chronic conditions. Thus, the primary focus is on health issues, typically as related to adults, and weaving in developmental and pediatric concerns follows secondarily.

Pediatric pain psychologists typically have a background in child clinical, pediatric or health psychology, and have sought additional training in pediatric pain medicine. Following a brief discussion of the history of psychologists in pediatric pain medicine, we outline career trajectories for pediatric pain psychologists and recommendations for training.

History of contributions & collaborative roles of pediatric pain psychologists

The field of pediatric pain is recognized to have had its roots in the late 1970s. Eland and Anderson published results of a small descriptive study that showed that children received far less pain medication than did adults who underwent the same surgical procedures and the modal amount of stronger pain medications received by children approximated zero [3]. This pattern was replicated in subsequent studies in other hospital settings [4,5]. The undertreatment of pain in pediatrics gained further attention following a series of seminal studies published by Anand and colleagues, which highlighted the negative consequences of the standard practice of minimal anesthesia during surgery in infants [6–8]. By the early 1990s, increased recognition of the undertreatment of pain in children and adolescents resulted in the release of consensus statements on pediatric pain management practices [9], papers focusing on the ethical implications of poor pain treatment in children [10], and ultimately policy statements from major national organizations [11]. Pediatric specialty services such as hematology/oncology programs began hiring psychologists as members of their interdisciplinary teams to address concerns related to pain management (acute, procedural and chronic) as well as other behavioral health issues related to the child’s medical diagnosis. Publications emerged evaluating the application of psychological strategies for children experiencing procedural pain such as distraction, guided imagery and hypnosis [12–14], which ultimately became part of the standard armamentarium for the treatment of procedural, acute and chronic pain conditions in children and adolescents.

During the same time period, hospitals began to establish interdisciplinary pediatric pain management programs. These programs included psychologists, physiotherapists, and physicians, and primarily served youths with chronic pain in outpatient settings. These

interdisciplinary pain management programs often also provided consultation to inpatient medical services regarding acute and procedural pain management needs. During this time, publications regarding the use of interdisciplinary teams to treat young people with chronic pain began to emerge from pediatric chronic pain programs around the world [15–18]. This evidence base established the use of interdisciplinary pain teams as the standard of care for treating youth with chronic pain. Currently, hospitals continue to employ pediatric pain psychologists as part of interdisciplinary pain management programs as well as within specialty services, and psychologists in both settings serve children with acute, procedural and chronic pain.

Some of the earliest texts specifically focused on pain in children were authored or edited by psychologists or coauthored by psychologists and their physician colleagues, literally published as the field was forming. Included here are the authored texts of *Pain in Children and Adolescents* by McGrath and Unruh [19], *Childhood Pain: Current Issues, Research, and Management* by Ross and Ross [20], *Pain in Children: Nature, Assessment, and Treatment* by McGrath [21], and an edited text by Bush and Harkins entitled *Children in Pain: Clinical and Research Issues from a Developmental Perspective* [22]. Detailed treatment protocols for management of acute, procedural and chronic pain in children using cognitive–behavioral strategies were provided in these seminal texts.

Career trajectories of pediatric pain psychologists

Especially in the early years of the field, psychologists working in pediatric pain medicine arrived in their positions by a variety of pathways. Over the years, the course of education and training has become more predictable, although still a bit diverse. The field of pediatric psychology, including those with a focus on pain medicine, has traditionally emphasized a strong empirical base for assessment and intervention; thus, the scientist–practitioner model prevailed, which emphasizes competency in both research and clinical practice. This is fortunate for pediatric pain psychology, where a range of expertise within distinct career paths is needed to move the field forward including:

- Pediatric pain psychologists who specialize in basic and applied research
- Pediatric pain psychologists who are experts in delivery of evidence-based interventions to children

Clearly, concerted efforts are needed to train individuals to contribute within distinct areas of research and practice. In more recent years, with increasing demands for productivity in clinical settings as well as heightened competition for extramural funding to conduct research, there has been an even greater need to promote and develop the next generation of pediatric pain psychologists along each of these distinct career paths.

It follows that the focus of training in pediatric pain psychology depends upon the career goals of the trainee. Although it is certainly beneficial, if not essential, for the student to be exposed to clinical training and substantial research experience, increased specialization in one path often occurs in the postdoctoral phase of training. Ultimately, trainees in a clinical path will seek positions with primary clinical responsibilities in an interdisciplinary pain medicine team or other medical service providing treatment to children with pain problems. Trainees in an academic research path more often will seek positions in academic medical centers or university settings that place a premium on research productivity.

Recommendations for professional tasks to be accomplished in each phase of training

Currently, there are no standard guidelines for the training of pediatric pain psychologists. Below, we outline recommendations for each phase of training: undergraduate, graduate, the predoctoral internship and postgraduate fellowship. It is possible for trainees to enter at any phase of training, and diversity in the background of trainees at any given phase is to be expected.

Undergraduate

At the undergraduate level, trainees are typically in the beginning phases of planning for a career in clinical or health psychology. Professional tasks to be accomplished at the undergraduate level include exposure to the field of professional psychology through coursework and volunteer experiences in research and clinical settings. Undergraduate trainees who are planning to apply to psychology doctoral programs will benefit from joining a research laboratory in the psychology department at their university or local academic medical center. A research assistantship will provide hands-on training in research methodology, and may also provide an opportunity to complete an independent research project (e.g., honors thesis). Clinical experiences are available to undergraduates through practicum offered by the psychology department at their university, by joining a research laboratory conducting applied research, or by volunteering at an organization that serves individuals with mental health or medical needs (e.g., a hospital-based child life department).

Exposure to research and clinical experiences in the area of pediatric pain medicine may be difficult to find during undergraduate education. Mentorship from faculty with expertise in child clinical, pediatric or health psychology, as well as in pain medicine with adults may be beneficial. If research or clinical training opportunities are not available locally, undergraduate trainees can consider seeking out summer volunteer experiences at other universities or academic medical centers. Undergraduates can also supplement their training by attending conferences that highlight current research in the field of pediatric pain, such as those sponsored by the Society for Pediatric Psychology [104], the American Pain Society [105], the Canadian Pain Society [106] and the International Association for the Study of Pain [107], including the now biennial conference sponsored by the Special Interest Group on Pain in Childhood. Trainees at this phase could also consider joining Pain in Child Health [108], a training consortium sponsored by the Canadian Institutes of Health Research for individuals of any discipline seeking a career in pain in child health. Similarly, membership in the Society of Pediatric Psychology is available to undergraduate students and includes access to the national conference and participation in a special interest group on pain.

Upon completion of the undergraduate degree, trainees may apply for clinical psychology graduate school right away, or may delay their application by 1 or 2 years to pursue additional research training. Those who desire additional research training can seek out a paid position as a study coordinator in a research laboratory at a university or medical center.

Graduate

Professional tasks to be accomplished at the graduate level include clinical practica, research training and coursework in child clinical psychology, pediatric psychology, health psychology and pain in child health. Typically, several practicum experiences are completed during graduate school along with coursework, teaching, and research training experiences. Specific clinical and research training in pediatric pain medicine may or may not be readily

available depending upon expertise of faculty in the graduate program and proximity to a children's hospital. Trainees who are interested in pediatric pain medicine can seek out graduate programs with faculty who have ongoing research projects in this area, and that offer practicum opportunities in pediatric pain clinics or with other related medical services. The graduate phase is an ideal time to apply for membership in professional organizations that focus on pediatric psychology and pain, listed above. Attending annual conferences and training institutes sponsored by these organizations will provide graduate students with interdisciplinary didactics on pediatric pain, exposure to current research trends and networking opportunities.

Internship

An internship is a dedicated time for intensive clinical training. Trainees may enter internships with varying levels of exposure to pediatric psychology in general and pediatric pain medicine in particular. Although not all doctoral programs require a full-time predoctoral internship year for graduation, trainees who have an interest in pediatric pain medicine can seek out predoctoral internship programs that provide training in pediatric psychology and, when available, include rotations focusing on pediatric pain medicine.

Internship programs that provide training in pediatric psychology are typically housed in academic medical centers that have one or more pediatric psychologists on faculty. Relevant rotations for specialty training in pediatric pain medicine during internship could include working as part of an interdisciplinary pain management team or in a specialty clinic that serves youth with pain management needs such as hematology/oncology, gastroenterology, neurology or adolescent medicine. Internship programs may also offer didactics in pediatric psychology and pediatric pain. Although internship is an intense clinical training year, trainees are encouraged to attend professional conferences in order to network with colleagues and gain additional exposure to the field.

Fellowship

A fellowship is a focused time for clinical and health psychology trainees to refine their skills and expertise in pediatric pain medicine. Trainees may enter fellowships with varying levels of exposure to pediatric pain medicine. The emphasis of fellowship training will depend upon whether the trainee's career goals have a primarily clinical or research focus. Fellowship training may emphasize specialization in acute pain management, chronic pain management or both. Fellows who would like to specialize in one or both areas can seek related mentorship and clinical and research experiences.

Trainees in a clinical trajectory require fellowship training that will provide clinical experiences in pediatric pain medicine. Ideally, clinical fellows would be integrated into an interdisciplinary pain medicine team where they would develop working relationships with team members and provide psychological assessment and intervention to children with painful conditions. Clinical training could also include assignment to a specific medical inpatient or outpatient team or clinic providing treatment to children referred for pain complaints such as clinics in gastroenterology or hematology/oncology. Clinical fellows may have some time dedicated to research, and goals in this area can include manuscript preparation and submission of abstracts for presentation at national conferences.

Trainees in an academic research trajectory require fellowship training that will provide intense, focused time for research training. Professional tasks of research fellowship training include development of a specific research niche in the field of pediatric pain, publication of manuscripts using secondary data and newly collected data, and mentored experience in the preparation and submission of grant applications. Research fellows may have dedicated time

to clinical training; however, their mentors must be able to secure enough of their time to achieve research training goals.

If trainees have not joined already, we strongly recommend that fellows become student members of the aforementioned professional societies to foster professional ties to the pediatric psychology and pediatric pain community in preparation for employment postfellowship. Clinical and research fellows will also benefit from additional professional training experiences, such as serving as an *ad hoc* reviewer for journals as well as teaching and supervising psychology students, medical students and residents.

Licensure & employment postfellowship

Working towards professional licensure and employment postfellowship should begin early in fellowship training under the guidance of faculty mentors. Trainees may begin working as well toward certification by the American Board of Professional Psychology. Board certification is routinely used by other healthcare disciplines to document minimum standards in training and expertise in patient care, and is particularly relevant for pediatric pain psychologists who work in hospital settings because it is often requested by hospitals when applying for privileges. Board certification can also facilitate license mobility between states as well as inclusion in health insurance networks. Trainees in this phase may consider applying for clinical staff positions as members of an interdisciplinary pain medicine team or other related medical service. Those interested in an academic research career will interview for positions in academic medical or university settings targeting individuals with research programs focused broadly on pediatric psychology or on pediatric pain specifically. Trainees on an academic research track may also consider writing a grant (such as a mentored career development award) to secure research time as part of their first job.

Mentorship

At all levels of training, mentorship plays an important role in the professional development of pediatric pain psychologists. Beginning in the undergraduate years, appropriate mentors may come from many areas, such as faculty with expertise in child clinical, pediatric or health psychology; anesthesiology, general or subspecialty pediatrics; or adult pain medicine. The mentorship is primarily focused on introducing the field and stimulating future interest. Thus, broad interprofessional mentorship is encouraged. Research experiences often provide the best opportunity for undergraduate exposure to mentors in pain. On the other hand, during graduate training and beyond, mentorship is typically more highly focused on specific research and clinical training experiences where mentors and mentees benefit from each other's collaborative work.

At the postdoctoral level, the intensity of mentorship is increased while the number of mentors is often reduced. This means that one or two individuals will provide primary mentorship to the developing pain psychologist. For this reason, at this stage of training, understanding how to find a good mentor–mentee fit is critical. There are many different qualities of exceptional mentors – for example, see the article in *Nature* on what makes a good mentor [23]. Characteristics such as availability and responsiveness to trainee needs, the ability to develop skills in mentees, networking and demonstrable team building skills all contribute to high-quality mentorship. It is useful to understand former mentees' own career trajectories and personal experiences with the mentor.

Importantly, mentorship should continue across one's faculty career as well. At the faculty level, mentorship may be either formal or informal. Some departments and universities have established junior faculty mentoring programs or specific mentoring groups such as for women faculties. These are important opportunities to cultivate new mentoring

relationships, which at this stage are often focused on helping the mentee with career advancement and promotion and tenure.

Available curricula

Several resources are available to faculty mentors who would like to develop a course in pediatric pain medicine. Of the professional organizations that focus on pediatric psychology and pain mentioned above, Pain in Child Health and the International Association for the Study of Pain offer outlines of curricula on their websites in pediatric pain and specifically in pain psychology [107,108]. These outlines highlight the core topics to be covered such as biological basis of pain, psychosocial factors related to pain, assessment, prevention and intervention, and ethical issues. Principal overview texts include *Bonica's Management of Pain* [24], Schechter *et al.'s Pain in Infants, Children and Adolescents* [25] and Walco and Goldschneider's *Pain in Children: a Practical Guide for Primary Care* [26]. Evidence-based guidance for pediatric pain psychologists is available in Palermo's *Cognitive-Behavioral Therapy for Chronic Pain in Children and Adolescents* [27]. Texts written for parents include Zeltzer and Schlank's *Conquering Your Child's Chronic Pain* [28] and Krane and Mitchell's *Relieve Your Child's Chronic Pain* [29].

Conclusion & future perspective

Currently, there are no standard guidelines for the training of psychologists who wish to specialize in pediatric pain medicine. As a result, there is great variation in the content and quality of training at all phases of professional development. The field of pediatric psychology faces a similar dilemma, and others have called for consideration of accreditation of postdoctoral programs to solidify training guidelines and objectives [30]. Progress towards accreditation at the postdoctoral program level may be most beneficial to clinical psychology trainees, as the bulk of specialty training in pediatric pain medicine typically occurs during this phase. We hope that the recommendations outlined in this invited commentary will contribute to the standardization of training for pediatric pain psychologists in the future.

Psychology training programs in pediatric pain medicine would also benefit from integration of interdisciplinary training at all phases of professional development. Given the importance of interdisciplinary care in pain treatment, training psychologists in an environment that includes trainees from other related fields (e.g., anesthesia and physical therapy) seems essential to establish a truly interdisciplinary culture to carry into research and practice.

The American Pain Society lists just over 30 comprehensive pediatric pain treatment programs in the entire USA. Many of these programs are clinically focused with little active research or organized training programs, limiting the number of training sites with professionals who are equipped to foster the development of the next generation of leaders. This gap is widened by the fact that the field of pain medicine, including pediatrics, has exploded over the past two decades. Clearly, as outlined in the recent Institute of Medicine report on chronic pain [31], a great deal of professional focus on pain is needed to address the deficiencies in our knowledge base of the effectiveness of all forms of intervention (including psychological interventions) for chronic pain management, which has so far resulted in tremendous costs to patients and to the nation. Training models that emphasize contemporary approaches for understanding chronic pain mechanisms, provide instruction in understanding the epidemiology and course of chronic pain, and that provide instruction in the application of evidence-based interventions are needed at all levels of professional education and training of the pediatric pain psychologist.

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References

Papers of special note have been highlighted as:

■ of interest

1. Powers SW. Empirically supported treatments in pediatric psychology: procedure-related pain. *J. Pediatr. Psychol.* 1999; 24(2):131–145. [PubMed: 10361392]
2. Palermo TM, Eccleston C, Lewandowski AS, Williams AC, Morley S. Randomized controlled trials of psychological therapies for management of chronic pain in children and adolescents: an updated meta-analytic review. *Pain.* 2010; 148(3):387–397. [PubMed: 19910118] ■ Most recent meta-analysis demonstrating positive benefit of psychological therapies for pediatric chronic pain.
3. Eland, JMA.; Anderson, JE. The experience of pain in children. In: Jacox, AK., editor. *Pain: a Sourcebook for Nurses and Other Health Professionals*. Boston, MA, USA: Little Brown and Company; 1977. p. 453–473.
4. Beyer JE, Degood DE, Ashley LC, Russell GA. Patterns of postoperative analgesic use with adults and children following cardiac surgery. *Pain.* 1983; 17(1):71–81. [PubMed: 6634214]
5. Schechter NL, Allen DA, Hanson K. Status of pediatric pain control: a comparison of hospital analgesic usage in children and adults. *Pediatrics.* 1986; 77(1):11–15. [PubMed: 2415909]
6. Anand KJ, Sippell WG, Aynsley-Green A. Randomised trial of fentanyl anaesthesia in preterm babies undergoing surgery: effects on the stress response. *Lancet.* 1987; 1(8527):243–248. [PubMed: 20928962]
7. Anand KJ, Aynsley-Green A. Measuring the severity of surgical stress in newborn infants. *J. Pediatr. Surg.* 1988; 23(4):297–305. [PubMed: 3290422]
8. Anand KJ, Hansen DD, Hickey PR. Hormonal-metabolic stress responses in neonates undergoing cardiac surgery. *Anesthesiology.* 1990; 73(4):661–670. [PubMed: 2221435]
9. Zeltzer LK, Altman A, Cohen D, Lebaron S, Munuksela EL, Schechter NL. American Academy of Pediatrics Report of the Subcommittee on the Management of Pain Associated with Procedures in Children with Cancer. *Pediatrics.* 1990; 86(5 Pt 2):826–831. [PubMed: 2216645]
10. Walco GA, Cassidy RC, Schechter NL. Pain, hurt, and harm: the ethics of pain control in infants and children. *N. Engl. J. Med.* 1994; 331(8):541–544. [PubMed: 8041423] ■ Discusses the important ethical issues related to providing pain control to children.
11. The assessment and management of acute pain in infants, children, and adolescents. *Pediatrics.* 2001; 108(3):793–797. [PubMed: 11533354] ■ Key position statement on management of acute pain in children.
12. Jay SM, Elliott CH, Ozolins M, Olson RA, Pruitt SD. Behavioral management of children's distress during painful medical procedures. *Behav. Res. Ther.* 1985; 23(5):513–520. [PubMed: 4051924]
13. Dahlquist LM, Gil KM, Armstrong FD, Ginsberg A, Jones B. Behavioral management of children's distress during chemotherapy. *J. Behav. Ther. Exp. Psychiatry.* 1985; 16(4):325–329. [PubMed: 4086654]
14. Kuttner L, Bowman M, Teasdale M. Psychological treatment of distress, pain, and anxiety for young children with cancer. *J. Dev. Behav. Pediatr.* 1988; 9(6):374–381. [PubMed: 3220958]
15. Alexander M, Richtsmeier AJ, Broome ME, Barkin R. A multidisciplinary approach to pediatric pain: an empirical analysis. *Child. Health Care.* 1993; 22(2):81–91. [PubMed: 10126863]
16. Eccleston C, Malleson PN, Clinch J, Connell H, Sourbut C. Chronic pain in adolescents: evaluation of a programme of interdisciplinary cognitive behaviour therapy. *Arch. Dis. Child.* 2003; 88(10):881–885. [PubMed: 14500306] ■ First published evaluation of interdisciplinary pain rehabilitation therapy with children.

17. Shapiro BS, Cohen DE, Covelman KW, Howe CJ, Scott SM. Experience of an interdisciplinary pediatric pain service. *Pediatrics*. 1991; 88(6):1226–1232. [PubMed: 1956741]
18. Vichinsky EP, Johnson R, Lubin BH. Multidisciplinary approach to pain management in sickle cell disease. *Am. J. Pediatr. Hematol. Oncol.* 1982; 4(3):328–333. [PubMed: 6128939]
19. McGrath, P.; Unruh, A. *Pain in Children and Adolescents*. Amsterdam, The Netherlands: Elsevier; 1987.
20. Ross, DM.; Ross, SA. *Childhood Pain: Current Issues, Research, and Management*. MD, USA: Urban & Schwarzenberg; 1988.
21. McGrath, PA. *Pain in children: Nature, Assessment, and Treatment*. NY, USA: Guilford Press; 1990.
22. Bush, JP.; Harkens, SW. *Children in Pain: Clinical and Research Issues from a Developmental Perspective*. NY, USA: Springer-Verlag; 1991.
23. Leel A, Dennis C, Campbell P. Natures' guide for mentors. *Nature*. 2007; 447:791–797. [PubMed: 17568738]
24. Fishman SM, Ballantyne JC, Rathmell JP. *Bonica's Management of Pain*. 2010PA, USAWolters Kluwer/Lippincott, Williams and Wilkins ■ Most comprehensive textbook available on the topic of pain.
25. Schechter N, Berde C, Yaster M. *Pain in Infants, Children and Adolescents (2nd Edition)*. 2003PA, USALippincott Williams & Wilkins ■ Key textbook devoted exclusively to the topic of pediatric pain.
26. Walco GA, Goldschneider KR. *Pain in Children: a Practical Guide for Primary Care*. 2008Totowa, NJ, USAHumana Press ■ Important book directed toward clinicians in primary care who evaluate and manage children with chronic pain.
27. Palermo TM. *Cognitive-Behavioral Therapy for Chronic Pain in Children and Adolescents*. NY, USAOxford University Press(In Press). ■ Practical and useful book written for psychologists on the delivery of cognitive-behavioral therapy for chronic pain in children and adolescents.
28. Zeltzer, L.; Schlank, C. *Conquering your Child's Chronic Pain: a Pediatrician's Guide for Reclaiming a Normal Childhood*. NY, USA: Harper Collins Publishers; 2005.
29. Krane, EJ.; Mitchell, D. *Relieve Your Child's Chronic Pain*. NY, USA: Fireside; 2005.
30. Drotar D, Palermo TM, Ievers-Landis CE. Commentary: recommendations for the training of pediatric psychologists: implications for postdoctoral training. *J. Pediatr. Psychol.* 2003; 28(2): 109–113. [PubMed: 12556510] ■ Describes an important model for postdoctoral training of pediatric psychologists.
31. Institute of Medicine. *Relieving Pain in America: a Blueprint for Transforming Prevention, Care, Education, and Research*. 2011DC, USAThe National Academic Press ■ Describes the enormous costs of chronic pain to society.

Websites

101. International Association for the Study of Pain: curriculum on pain for students in psychology. www.iasp-pain.org/AM/Template.cfm?Section=Psychology
102. American Psychological Association. Division 12. About clinical psychology. www.apa.org/divisions/div12/aboutcp.html
103. American Psychological Association. Division 38. What is a health psychologist?. www.health-psych.org/AboutWhatweDo.cfm
104. American Psychological Association. Division 54. www.societyofpediatricpsychology.org
105. American Pain Society. www.ampainsoc.org.
106. Canadian Pain Society. www.canadianpainsociety.ca.
107. International Association for the Study of Pain. www.iasp-pain.org.
108. Pain in Child Health. <http://paininchildhealth.dal.ca>

Practice Points

What is a pediatric pain psychologist?

- The term ‘pain psychologist’ refers to the specific roles and responsibilities of psychologists who choose to specialize in pain, ranging from fundamental research to healthcare delivery. Pediatrics is an additional specialization in working with children, youth and families.
- Pediatric pain psychologists have expertise in evidence-based psychological assessment and treatment for acute, procedural and chronic pain in children.

History of contributions & collaboration of psychologists with children experiencing pain

- The undertreatment of pain in children and adolescents was not widely recognized until the 1980s following publication of several seminal studies highlighting discrepancies in pain management practices for children relative to adults and the negative impact of the undertreatment of pain in neonates.
- In response, increased attention was given to pediatric pain including the development of guidelines for pediatric pain management practices. During this time, psychologists were hired as part of interdisciplinary pain management teams and specialty medical services that treated youth with pain complaints. Psychologists contributed significant literature on psychological interventions for acute, procedural and chronic pain management in children.
- Currently, pediatric pain psychologists continue to provide services to children and adolescents with acute, procedural and chronic pain in outpatient and inpatient settings.

Career trajectories of pediatric pain psychologists

- Typically, pediatric pain psychologists specialize in either a research or clinical trajectory within a range of hospital- and university-based settings.

Recommendations for professional tasks to be accomplished in each phase of training

- At the undergraduate level, professional tasks including exposure to the field of professional psychology through coursework and volunteer experiences in research and clinical settings should be accomplished.
- At the graduate levels, professional tasks should be accomplished including clinical practica, research training and coursework in child clinical psychology, pediatric psychology, health psychology, and pain in child health.
- During internships, trainees should seek out predoctoral internship programs that provide clinical training in pediatric psychology and, when available, include rotations focusing on pediatric pain medicine.
- At fellowship levels, trainees in a clinical trajectory should receive clinical experiences in pediatric pain medicine, such as a primary role in an interdisciplinary pain management team. Trainees in a research trajectory should focus on development of a research niche, publication of manuscripts and grantsmanship training.

- To obtain licensure and employment postfellowship, licensure preparation should begin early in the fellowship experience. Clinical trainees will most typically apply for clinical positions in medical centers, and research trainees typically apply for university- or hospital-based positions that require a program of research in pediatric psychology or pediatric pain medicine.

Mentorship

- Mentorship plays an important role in the professional development of pediatric pain psychologists in all phases of training.
- Available curricula from professional organizations are focused on general overviews of pain, focused texts on pediatric pain medicine and evidence-based texts on the psychological treatment of pain in children.

Conclusion & future perspective

- There is a need for standardized training guidelines for pediatric pain psychologists.
- Recommendations in this invited commentary may help to address this need and ultimately contribute to the development of future leaders in pediatric pain medicine.