

## Commentary

# Becoming a pediatric pain specialist: Training opportunities to advance the science and practice of pediatric pain treatment

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2018 was the International Association for the Study of Pain (IASP) global year for excellence in pain education (IASP, 2018); at the end of this initiative, it seems apposite to take stock of the current state of training opportunities in pediatric pain. Chronic pain is a biopsychosocial phenomenon and a disease in its own right. In pediatric practice there is an established evidence base for multidisciplinary treatment approaches characterized by a close collaboration of teams, which include anesthesiologists, pediatricians, nurses, psychologists, child life and rehabilitation specialists. Pediatric pain management is a subspecialty, which currently has no standardized guidelines for training and lacks recognition as a distinct specialty by regulatory bodies in most countries, resulting in great variations in the content and quality of training. To facilitate attempts to overcome this concern, this general commentary will highlight examples of existing quality educational training opportunities both interdisciplinary and within disciplines for clinicians, trainees, and researchers interested in growing their expertise in pediatric pain (see Table 1 for a summary of programs discussed). The authors also hope that these examples will be of use to educators interested in developing their own programs. We also offer recommendations for strengthening pediatric pain education and training going forward.

### Interprofessional education

Several programs have been developed to offer interprofessional pediatric pain training through online or intensive workshop approaches. The Online Pediatric Pain Curriculum (The Hospital for Sick Children [SickKids] – OPPC) is a readily available and free online resource in English for health care professionals, comprising ten educational modules based on the Core Curriculum for Professional Education in Pain of IASP. Modules cover clinical, scientific, and ethical topics and were developed by international pain experts as strategies to bridge the knowledge-to-action gap. OPENPediatrics is an interactive digital learning platform for health care clinicians sponsored by Boston Children's Hospital. It provides free access to documents and videos covering a number of areas of pediatric pain: it also provides accredited training for a fee.

The Canadian Pain in Child Health Initiative (Based at SickKids – PICH) has notably united the global community of pediatric pain research trainees, researchers and clinicians (von Baeyer et al., 2014; von Baeyer et al., 2019). For the past 16 years, PICH has provided learning opportunities including an annual institute. The PICH institutes cover a wide content area such as pain assessment and management, acute and chronic pain, pain ethics, as well as processes to link students with faculty (e.g. networking, mentoring), development or research capacity (e.g. pain research skills development). PICH also supports postdoctoral fellows through institution-based fellowships. Most recently, PICH is sponsoring local PICH2GO

training events, partnering with local children's hospitals and associations to further link researchers, clinicians and educators.

The Pediatric Pain Master Class (Children's Minnesota) offers state-of-the-art education in pediatric pain management from a holistic and interdisciplinary perspective. The four-day program features a faculty of internationally recognized experts who cover pharmacological, medical, psychosocial, and integrative therapies for the management of children's acute, procedural, and complex/chronic pain. Pain assessment and management of somatic, visceral, neuropathic, psychosocial, and spiritual pain (as well as end-of-life management of pain and distressing symptoms) are explored in depth using lectures, interactive presentations, experiential activities, and small-group learning. The master class is primarily designed for physicians and advanced practice nurses to develop their expertise in the field of pediatric pain medicine in a highly interactive seminar format. It is also open to other disciplines that work with children.

Developing knowledge and interest in pain is clearly fundamental in the early stages of training. Written guidelines can be helpful in determining core areas to cover in such training. Fishman et al. (2013) used a consensus approach to develop core competencies for pain management for pre-licensure health professional education. The British Pain Society has recently published "A Practical Guide to Incorporating Pain Education into Pre-Registration Curricula for Healthcare Professionals in the UK". The document provides practical guidance to complement IASP's interprofessional pain curriculum outline, using case studies that demonstrate a range of educational approaches to maximize learning outcomes for pre-licensure students. These are not specifically pediatric, but could be adapted.

It is also possible to implement local training initiatives. To offer an example, the Interfaculty Pain Curriculum (IPC) is a 20-hour interdisciplinary pain curriculum that is offered annually to over 1000 pre-licensure trainees from the faculties of dentistry, nursing, medicine and pharmacy within the University of Toronto. It utilizes multiple learning modalities, including interactive online

learning modules on pain mechanisms, pharmacologic pain management including opioids, real-time patient and health care interprofessional panels, a series of concurrent lectures on key issues in pain, and small interdisciplinary groups that focus on interactive case studies and developing care plans for patients with chronic and acute pain. The IPC may provide a model for other institutions seeking to enhance pain education to professionals across disciplines.

### Profession specific education

**Physicians.** Pediatric pain medicine lacks recognition as a distinct specialty by regulatory bodies in most countries; consequently, training varies widely. Studies have repeatedly shown pain education for medical students is minimal (Briggs et al., 2011; Briggs et al., 2015). Essential Pain Management United Kingdom (EPM UK) is a recent initiative to improve pain training which has been successfully rolled out in many UK medical schools. EPM UK is centered on a three-letter acronym, 'RAT' (Recognize, Assess, Treat), designed to allow rapid recall of a logical, stepwise system for pain management.

In the UK, pediatricians have not traditionally been taught a lot about pain, and acute and chronic pediatric pain services have mostly developed within anesthesia departments. Basic, intermediate and higher pain training are embedded within anesthetic training, but the pediatric component is understandably small.

Worldwide, specific guidance on training for individuals intending to specialize in pediatric pain medicine is scant. Anesthetists in the UK need to complete 3 to 6 months of pediatric pain training in addition to 9 months of adult advanced pain training, and physicians in Canada require 4 weeks of pediatric pain training in a 2-year pain residency. Guidance on competencies for pediatric pain medicine in the UK has recently been updated. This comprehensive guidance contains core competencies and a curriculum for practitioners in pain medicine and competencies and a curriculum for practitioners in pain medicine who are involved in a paediatric pain service or lead transition of adolescents to adult services. The Canadian

objectives of training in the subspecialty of pain medicine contain a specific section on pediatrics.

With regard to qualifications in pain medicine, progress is occurring gradually; most curricula include a pediatric component. In some countries a faculty of the parent College of Anesthetists conducts an examination in pain medicine. In Australia and New Zealand this is open to any medical doctor; in the UK and the Republic of Ireland it is only open to anesthetists. In other places, for example, Hong Kong, the College of Anaesthetists conducts an examination in pain medicine for anesthetists. In Europe, the European Pain Federation (EFIC) has recently commenced a Diploma in Pain Medicine examination that is open to physicians from any background. In Canada, the Royal College of Physicians and Surgeons conducts an examination in pain medicine that is open to specialists certified in a wide variety of disciplines, including pediatrics. In the United States of America (USA), the Accreditation Council for Graduate Medical Education (ACGME) has program requirements for graduate medical education in pain medicine that include assessment of pain in pediatric patients; this is currently open to anesthesiologists, child neurologists and other specialties, but not to pediatricians. The ACGME pediatric anesthesiology program mandates recognition, prevention and treatment of pain in medical and surgical pediatric patients, but does not include any detail; the pediatric program only includes managing pain associated with procedures.

**Pain psychology.** Psychologists who specialize in pediatric pain have expertise in the biopsychosocial contributors to pain in children and adolescents, mental health assessment and intervention, developmental factors, inter-professional competencies, and familiarity with pain conditions and relevant biomedical processes and treatments. Training as a pediatric pain psychologist has not been standardized but general guidelines for opportunities as denoted by Law et al. (2012) are:

- *Undergraduate (postsecondary school):* At this stage, majoring in psychology (developmental, behavioral, child psychology), the student prepares for postgraduate training. They strive for experience in research (via working in a

research laboratory or gaining experience as a research assistant) and clinical experience within a medical or academic institution with a faculty mentor with expertise in pain, at their university or at another institution.

- *Graduate:* At this stage of training coursework in child-focused clinical, research, health psychology, and pain in child health are recommended. Seeking graduate schooling or research collaborations with faculty working in the field of pain medicine may help shape further training. Subspecialty training can be received during clinical practica in pain clinics or after graduating as a psychologist and engaged in advanced training in internships or postdoctoral fellowships.

In depth subspecialty training in the USA, UK, and Canada, can be pursued during postdoctoral fellowships in pediatric pain clinics in a medical facility/academic institution to gain clinical and research expertise in pediatric pain medicine. It is important to note that postdoctoral training programs are not standardized in the type of training they offer: training usually includes working within a pain clinic integrative team and engaging in research (with varied exposure to clinical and research opportunities). Benore et al. (2017) describe the content of a training curriculum proposed for specialized training in pediatric pain psychology. For a list of some of the programs in the USA, refer to Bhandari et al. (2014). Pain psychologists further specialize by receiving training in medical hypnosis, biofeedback, cognitive behavioral therapy for pain management, acceptance commitment therapy, mindfulness, etc.: available at workshops and conferences (e.g. IASP's International Symposium on Pediatric Pain, national pain society annual meetings) or via web-based curriculum such as at IASP. Perhaps a model that can be replicated in other countries and disciplines, a collaborative group of pain programs in academic medical centers in the USA have enabled monthly virtual didactics for pain psychology fellows covering relevant topics and providing opportunity to network and collaborate (Benore et al., 2017).

**Physiotherapy.** The integration of the principles of pain science in general pre-licensure physiotherapy curriculum is lacking (Watt-Watson et al., 2013). As a consequence, there exist significant gaps between the current best evidence in pain science and the clinical arena. The recognition of this major clinical deficiency has fostered the inclusion of the 2012 IASP Pain Curriculum for Physical Therapy into the pre-licensure program in some jurisdictions such as Australia (Hush et al., 2018). Additionally, national associations such as the Physiotherapy Pain Association and the Chartered Society of Physiotherapy in the UK have partnered to develop resource frameworks for physiotherapists who work with people in pain in order to provide a structure for competency development. However, the disparity in pain science training, particularly in pediatrics, remains vast across practicing clinicians and jurisdictions.

Post-professional continuing education provides an opportunity to address the pain education needs for the practicing pediatric physiotherapist. Continuing professional development in physiotherapy encompasses a variety of learning activities post pre-licensure training, including online learning, short courses, and postgraduate academic training (Leahy et al., 2017). Current opportunities for pediatric-focused pain science training for physiotherapists are not widely available. Rather, adult-focused educational opportunities serve as the basis for knowledge acquisition in pain science. Notably, several private continuing professional development providers, including the Neuro-Orthopedic Institute in Australasia (NOI) and the International Spine and Pain Institute in the USA (ISPI) offer pain science training in the form of short courses – Explain Pain and Therapeutic Pain Specialist Certification respectively. However, these learning activities are not formally recognized as specialist training by professional regulatory institutions.

Although not pediatric-focused, traditional academic training in pain science at the graduate level is an emerging opportunity, providing academic rigor in program development. Several academic institutions, for example McGill University in Montreal (McGill University School

of Physical and Occupational Therapy) and the University of Alberta (University of Alberta Faculty of Rehabilitation Medicine) offer graduate certificates in pain management specific to the needs of the rehabilitation professional. Finally, the Canadian Physiotherapy Association offers its membership the opportunity to pursue a self-directed clinical specialist certification in pain science, which recognizes physiotherapists who demonstrate advanced clinical competence, leadership, continuing professional development and involvement in research in this specialty area.

In physiotherapy, there is a paucity of pediatric-specific pain science training opportunities available to practicing clinicians. Clearly, to best serve pediatric patients and their families, a significant effort to bolster pediatric pain training opportunities for rehabilitation professionals is required.

**Nursing.** Nurses play a key role in pain prevention and management due to their proximity to patients and families within their role in the interdisciplinary management of pain. Nurses with specialized roles focusing on pain (i.e. roles of clinical nurse specialists and nurse practitioners within specialized pain teams), as well as nurses at the point of care, rate pain as a priority within delivery of care. Assessment and pain treatment and prevention guidelines and protocols guide the practice of nursing (American Academy of Pediatrics Committee on Fetus and Newborn and Section on Anesthesiology and Pain Medicine, 2016). Nurses also learn about evidence-based non-pharmacologic pain prevention and treatment strategies in infants and children, particularly those with synthesized evidence from systematic reviews. These include non-pharmacologic strategies such as skin-to-skin contact and breastfeeding (Taddio et al., 2015) and non-nutritive sucking and facilitated tucking for infants undergoing painful procedures (Pillai Riddell et al., 2015), as well as the use of sucrose (Stevens et al., 2016). In older children, across the pediatric age span, distraction strategies (e.g. books, movies, robots, virtual reality) and hypnosis have strong evidence for efficacy (Uman et al., 2013). Some of these strategies have been combined successfully in organizational approaches

to pain management, such as The Comfort Promise (Fredrichsdorf et al., 2016).

In common with other disciplines, pediatric-specific pain training is not widely available to nurses. Many universities do provide adult-based graduate pain training with associated qualifications, which may have a pediatric component such as University College, London. National organizations such as the UK Royal College of Nursing have developed frameworks of pain knowledge and skills for the nursing team to assist competency development.

Web-based online educational toolkits and resources that include a wide variety of educational and knowledge translation strategies are being developed to assist with increasing knowledge and changing healthcare professional pain practices, with the ultimate goal of improving pain outcomes. For example, a new multidimensional online interactive toolkit currently being implemented and evaluated is the Implementation of Infant Pain Practice Change (ImPaC) resource that is designed to guide clinical teams through a practice change process to improve infant pain assessment and management.

## Summary

Although it has to be acknowledged that the content of this commentary is skewed by the authors' experience and knowledge, and we apologize for likely omissions, this overview does not identify many pediatric specific curricula. We do however feel that the examples we have identified provide a basis upon which to build and develop training opportunities in pediatric pain. There are examples of pediatric training from outside North America, Europe and Australasia, but they tend to be one-off reports that do not

demonstrate sustainability. Abbasi (2018) reports on an IASP grant-supported initiative to improve acute pediatric pain provision in Karachi, Pakistan, Hush et al. (2015) describe innovations in pain education for physical therapists in Argentina, again supported by IASP grants. Training opportunities for specializing in pediatric pain management around the globe and across disciplines are lagging and would benefit from development of best practice guidelines regarding the structure, length, and key learning objectives and experiences. Sub-specialized training may be enhanced by piloting multi-site training initiatives with technology assistance (e.g. virtual seminars as described under pain psychology), web-based learning opportunities such as OPENPediatrics, and in-person training opportunities organized around key national and international conferences. Support for activities that are web-based is strong: online educational pain resources were demonstrated to significantly improve knowledge in a recent meta-analysis (Lioffi et al., 2018).

We hope this commentary will trigger dialogue among leadership within organizations such as IASP, the American Pain Society and the European Pain Federation, to name a few, with regard to the need for a broad consensus on global standards for pediatric pain education. Interdisciplinary and discipline-specific training in pediatric pain management could be substantially enhanced by encouraging leadership in IASP's Pain in Childhood special interest group to organize a subcommittee focused on education goals. Such a subcommittee could produce international standards and guidelines for training opportunities across and within disciplines, as well as facilitating access to training opportunities.

Table 1  
Examples of educational resources

Resource	Professionals	Population	Where
Online Pediatric Pain Curriculum (OPPC)	Interdisciplinary	Pediatric	Online - <a href="http://www.sickkids.ca/pain-centre/Health-care-Professionals/Online%20Pain%20Curriculum/index.html">www.sickkids.ca/pain-centre/Health-care-Professionals/Online%20Pain%20Curriculum/index.html</a>
OPENPediatrics	Health care clinicians	Pediatric	Online Boston Children's Hospital - <a href="http://www.openpediatrics.org/">www.openpediatrics.org/</a>
Canadian Pain in Child Health Initiative (PICH)	Interdisciplinary	Pediatric	Canada - <a href="http://www.sickkids.ca/PICH">www.sickkids.ca/PICH</a>
PICH2GO	Interdisciplinary	Pediatric	Local hospitals in Canada
IASP curricula	Interdisciplinary	Adult & Pediatric	Online - <a href="http://www.iasp-pain.org/Education/CurriculaList.aspx">www.iasp-pain.org/Education/CurriculaList.aspx</a>
Pediatric Pain Master Class	Physicians & Advanced Practice Nurses (open to enrollment from other disciplines)	Pediatric	Children's Minnesota - <a href="http://www.childrensmn.org/events/11th-annual-pediatric-pain-master-class">www.childrensmn.org/events/11th-annual-pediatric-pain-master-class</a>
IASP curriculum outline on pain psychology	Pain psychology	Adult & Pediatric	Online - <a href="http://www.iasp-pain.org/Education/CurriculumDetail.aspx?ItemNumber=2054">www.iasp-pain.org/Education/CurriculumDetail.aspx?ItemNumber=2054</a>
A Practical Guide to Incorporating Pain Education into Pre-Registration Curricula for Health Care Professionals in the UK	Pre-licensure healthcare professionals	Adult	Online British Pain Society - <a href="https://indd.adobe.com/view/175981e8-79ec-421c-933e-03c0c0e2e74f">https://indd.adobe.com/view/175981e8-79ec-421c-933e-03c0c0e2e74f</a>
IASP Interprofessional pain curriculum outline	Pre-licensure students	Adult	Online - <a href="https://www.iasp-pain.org/Education/CurriculumDetail.aspx?ItemNumber=2057">https://www.iasp-pain.org/Education/CurriculumDetail.aspx?ItemNumber=2057</a>
Neuro-Orthopaedic Institute Explain	Interdisciplinary	Adult	Multiple locations offered worldwide <a href="http://www.noigroup.com/CourseDetails.aspx?CourseTemplateID=4b0c049e-8719-47c5-b5d9-">www.noigroup.com/CourseDetails.aspx?CourseTemplateID=4b0c049e-8719-47c5-b5d9-</a>

Pain Training			<a href="https://doi.org/10.1186/s12909-019-1700-7">c9955ab49aac&amp;langCode=En&amp;dt=Wed%20Nov%202001%202017%2017:01:40%20GMT-0700%20(PDT)</a>
International Spine & Pain Institute. Therapeutic pain specialist certification, 2018	Interdisciplinary	Adult	Online United States of America - <a href="http://www.ispinstitute.com/educational-offerings/course/therapeutic-pain-specialist-tps-certification/">www.ispinstitute.com/educational-offerings/course/therapeutic-pain-specialist-tps-certification/</a>
McGill University Graduate Certificate	Interdisciplinary	Adult	McGill University, Canada (offered in French & English) - <a href="http://www.mcgill.ca/spot/programs/online-graduate-certificates/chronic-pain-management">www.mcgill.ca/spot/programs/online-graduate-certificates/chronic-pain-management</a>
University of Alberta Graduate Certificate	Interdisciplinary	Adult	University of Alberta, Canada - <a href="http://www.ualberta.ca/rehabilitation/professional-development/certificate-programs/certificate-in-pain-management">www.ualberta.ca/rehabilitation/professional-development/certificate-programs/certificate-in-pain-management</a>
University College London Pain management MSC	Interdisciplinary	Adult	University College London, United Kingdom - <a href="http://www.ucl.ac.uk/prospective-students/graduate/taught-degrees/pain-management-msc">www.ucl.ac.uk/prospective-students/graduate/taught-degrees/pain-management-msc</a>
Guidance on competencies for paediatric pain medicine, 2017. Faculty of Pain Medicine of the Royal College of Anaesthetists	Physicians	Adult & Pediatric	United Kingdom - <a href="http://www.rcoa.ac.uk/system/files/FPM-GuidancePPM_0.pdf">www.rcoa.ac.uk/system/files/FPM-GuidancePPM_0.pdf</a>
Objectives of training in the subspecialty of pain medicine, 2018. The Royal College of Physicians and Surgeons of Canada Pain Residency	Physicians	Adult & Pediatric	Canada - <a href="http://www.royalcollege.ca/cs/groups/public/documents/document/mdaw/mday/~edisp/002213.pdf">www.royalcollege.ca/cs/groups/public/documents/document/mdaw/mday/~edisp/002213.pdf</a>
European Diploma in Pain Medicine	Physicians	Adult	Europe (European Pain Federation)
ACGME Program requirements for graduate medical education in pain medicine	Physicians	Adult	United States of America. Accreditation Council for Graduate Medical Education - <a href="http://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/530_pain_medicine_2017-07-01.pdf?ver=2017-11-02-110830-610">www.acgme.org/Portals/0/PFAssets/ProgramRequirements/530_pain_medicine_2017-07-01.pdf?ver=2017-11-02-110830-610</a>

(Anesthesiology,  
Child Neurology,  
Neurology or  
Physical Medicine  
and  
Rehabilitation),  
2017

Implementation of Infant Pain Practice Change (ImPaC)	Nurses	Pediatric	Online (Canada) The Hospital for Sick Children (SickKids), <a href="http://www.lab.research.sickkids.ca/stevens/impac-resource">www.lab.research.sickkids.ca/stevens/impac-resource</a>
UK Royal College of Nursing Pain Knowledge and Skills Framework	Nurses	Adult	Online United Kingdom - <a href="http://www.rcn.org.uk/professional-development/publications/pub-004984">www.rcn.org.uk/professional-development/publications/pub-004984</a>
Children's Comfort Promise	Nurses	Pediatric	<a href="http://childpain.org/ppl/issues/v18n3_2016/v18n3_friedrichsdorf.shtml">http://childpain.org/ppl/issues/v18n3_2016/v18n3_friedrichsdorf.shtml</a>
Prevention and Management of Procedural Pain in the Neonate: An Update	Nurses	Pediatric	<a href="http://pediatrics.aappublications.org/content/137/2/e20154271">http://pediatrics.aappublications.org/content/137/2/e20154271</a>
Canadian Physiotherapy Association Clinical Specialist Certification	Physiotherapists	Adult & Pediatric	Canada - <a href="https://physiotherapy.ca/clinical-specialist-program">https://physiotherapy.ca/clinical-specialist-program</a>
UK Physiotherapy Pain Association Framework, 2014	Physiotherapists	Adult	Online United Kingdom - <a href="https://ppa.csp.org.uk/system/files/framework_final2014.pdf">https://ppa.csp.org.uk/system/files/framework_final2014.pdf</a>
Interfaculty Pain Curriculum	Pre-licensure trainees in dentistry, nursing, medicine and pharmacy	Adult	University of Toronto, Canada - <a href="http://sites.utoronto.ca/pain/research/interfaculty-curriculum.html">http://sites.utoronto.ca/pain/research/interfaculty-curriculum.html</a>
Essential Pain Management UK	Pre-licensure doctors	Adult	United Kingdom - <a href="http://www.rcoa.ac.uk/faculty-of-pain-medicine/essential-pain-management/epm-uk">www.rcoa.ac.uk/faculty-of-pain-medicine/essential-pain-management/epm-uk</a>
IASP - Pain Curriculum for Physical Therapy	Pre-licensure physiotherapists	Adult	Online - <a href="http://www.iasp-pain.org/Education/CurriculumDetail.aspx?ItemNumber=2055">www.iasp-pain.org/Education/CurriculumDetail.aspx?ItemNumber=2055</a>

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