

# Pain as the neglected patient safety concern: Five years on

Journal of Child Health Care  
2016, Vol. 20(4) 537–541  
© The Author(s) 2016  
Reprints and permission:  
sagepub.co.uk/journalsPermissions.nav  
DOI: 10.1177/1367493516643422  
journals.sagepub.com/home/chc



Alison Twycross<sup>1</sup>, Paula Forgeron<sup>2</sup>, Jill Chorne<sup>3,4</sup>,  
Chantal Backman<sup>2,5</sup> and G Allen Finley<sup>3,4</sup>

## Abstract

Five years ago, we published a commentary in the *Canadian Medical Association Journal* arguing that inadequately managed pain in children should be considered an adverse event, a harmful patient outcome. We argued that inadequately managed pain meets the definition of an adverse event and further hypothesized that treating pain as an adverse event may improve care by raising health care administrators and quality improvement experts' awareness of this issue. In this article, we reflect on the progress made in both moving this proposition forward and testing out the concept. We then move on to look at what still needs to be done to ensure that children's pain is managed effectively.

## Keywords

Pain management, adverse event, children, paediatrics

Patient safety is an on-going priority in healthcare. The World Health Organization (WHO) and international experts on patient safety drafted an international classification framework for patient safety to improve the 'description, comparisons, measurement, monitoring, analysis and interpretation of information to improve patient care' (World Health Organization, 2009). In this WHO document, patient outcomes are classified according to the type and degree of harm as well as the social and economic consequences of this harm. Inadequately managed pain is cited as a harmful outcome.

<sup>1</sup> Department for Children's Nursing, London South Bank University, London, UK

<sup>2</sup> School of Nursing, Faculty of Health Sciences, University of Ottawa, Ontario, Canada

<sup>3</sup> Departments of Anesthesia, Pain Management and Perioperative Medicine and Psychology and Neuroscience, Dalhousie University, Halifax, Canada

<sup>4</sup> Centre for Pediatric Pain Research, IWK Health Centre, Halifax, Canada

<sup>5</sup> Clinical Epidemiology Program, Ottawa Hospital Research Institute, Ottawa, Ontario, Canada

## Corresponding author:

Alison Twycross, Department for Children's Nursing, London South Bank University, 103 Borough Road, London, SE1 0AA, UK.

Email: a.twycross@lsbu.ac.uk

Five years ago, we published a commentary in the *Canadian Medical Association Journal* arguing that inadequately managed pain in children should be considered an adverse event (Chorney et al., 2010), a harmful patient outcome. We argued that inadequately managed pain meets the definition of an adverse event and further hypothesized that treating pain as an adverse event may improve care by raising healthcare administrators, and quality improvement experts' awareness of this issue.

## **Negative outcomes of inadequately managed pain**

Unrelieved pain has undesirable physiological and psychological consequences that can affect the child at the time and later in life, as identified in numerous studies. For example, infants have been found to display increases in pain behaviours with subsequent needle punctures when they do not receive topical anaesthetics (Taddio et al., 2002). Children with cancer who were in the placebo group of a randomized control trial also had consistently higher mean pain ratings during each subsequent painful procedures (e.g. bone marrow aspiration, lumbar puncture) compared to those treated with oral transmucosal fentanyl (Weisman et al., 1998). Further, Saxe and colleagues found that children hospitalized for burns and treated with higher doses of morphine had greater reductions in post-traumatic stress disorder symptoms over the next six months (Saxe et al., 2001). Thus, negative outcomes can be negated with proper pain management.

Regardless of age, pain and associated tissue injury cause a cascade of hormonal, neurochemical, and electrophysiological responses that affect physical outcomes such as wound healing, cardiac ischemia and immobilization (Carr and Goudas, 1999). Under-managed pain can also result in central sensitization (Woolf, 2011). Central sensitization is used to describe heightened function of neurons and circuits of the nociceptive pathways, such as an increase in membrane excitability of neurons and synaptic efficacy, which contribute to changes in the central nervous system that enhance pain sensations in both acute and chronic pain types (Latremoliere and Woolf, 2009). There is also evidence that under-managed acute pain can lead to the development of clinically significant chronic (persistent or recurrent) pain in a significant proportion of children, and this chronic pain interferes with school, social and extracurricular activities, as well as children's sleep long after surgery (Fortier et al., 2011), demanding that action is taken on reducing unnecessary pain.

It is also well documented that children continue to experience moderate to severe unrelieved pain whilst in hospital for which they desire treatment (Birnie et al., 2014; Kozlowski et al., 2014; Twycross and Finley, 2013) despite the guidelines summarizing the evidence to guide practice in relation to acute and procedural pain (Association of Paediatric Anaesthetists, 2012) and prolonged disease pain (World Health Organization, 2012) being readily available. In England, for example, national acute pain management recommendations are not followed in more than a quarter of hospitals (National Confidential Enquiry into Patient Outcome and Death, 2011). Similar guidelines exist in other countries, yet the pain prevalence data identifies poor implementation of guidelines (Birnie et al., 2014; Kozlowski et al., 2014). Even in low- and middle-income countries, studies suggest that education and policy development alone are insufficient to improve paediatric pain management (Finley et al., 2008; Forgeron et al., 2009). Clearly, additional approaches to improving pain management are needed. Taken together if we apply the findings from paediatric pain management studies to the definition of an adverse event, it is evident that inadequately managed pain needs to be considered a harmful patient outcome and thus a patient safety priority.

## **Pain and patient safety links**

Since 2010, several studies have considered pain as a quality indicator or inadequately managed pain as a harmful outcome, suggesting that our argument may be taking hold. One study set out to identify indicators of quality nursing care in an Australian Children's Hospital using a Delphi technique (Wilson et al., 2012). Pain management was the quality indicator that ranked top in the third round of the study. We have also developed a list of harmful patient outcome indicators for postoperative and procedural pain which include a pain score >4 (out of 10) being recorded and no action being taken post-operatively, and the child not being prepared for a painful procedure (Twycross et al., 2013). Although both of these studies represent advances in adding pain to the quality agenda, we are challenged by the fact that inadequately managed pain often represents errors of omission (e.g. lack of administration of analgesics) rather than commission and thus are more difficult to identify via chart review. Moreover, pain management does not feature in a list of paediatric adverse events developed in Canada (Matlow et al., 2011). Indeed, a recent review of the literature in relation to quality indicators in the emergency department identified a gap in relation to children's pain management noting that none of the indicators were specifically developed for children and adolescents (Stang et al., 2014), suggesting that inadequately managed pain in this age group may go unnoticed.

Since 2009, the Australian Commission on Safety and Quality in Health Care has recognized the importance of inadequate pain control as an early warning sign of clinical deterioration and has included pain scores as part of their recommendations (Australian Commission on Safety and Quality in Health Care, 2010). However, this analysis was derived solely from adult patient data and thus paediatric patients remain vulnerable to inadequate pain treatment not being recognized as an indicator for deteriorating status.

## **Quality improvement strategies to improve pain globally**

Despite the evidence to support effective pain management, including the development of standards, guidelines, and educational programmes, improvements globally have been modest. From a systems perspective, future work is needed to evaluate the implementation and sustainability of these evidence-informed pain management resources and tools. Standard mechanisms such as electronic triggers, surveillance systems, or prevalence surveys are needed to systematically monitor and report on outcome and process measures related to pain management (Sollecito and Johnson, 2013). Agreement is needed on the standard definitions for these measures which can include but is not limited to the percentage of patients with moderate to severe pain, documented pain assessments, individualized pain management plans, and documented pain education. Goals for these defined measures must also be established to drive targeted improvement efforts. Further, specific guidelines on how and when to report inadequately managed pain as a harmful patient outcome need to be developed and implemented. Inclusion of inadequately managed pain must be integrated into hospitals' continued quality improvement and patient safety processes.

## **Conclusion**

Inadequately managed pain clearly fits the definition of a patient safety issue and on the face of it we have not moved very far in the past five years. A review identified significant time lag (up to 17 years) between research findings being disseminated and change in practice (Slote Morris et al., 2011).

However, children are suffering from unnecessary pain now, which behoves us to be more active in addressing this issue. It may be that in local contexts various quality improvement initiatives have been successful. However, since many local quality improvement initiatives are not reported in the literature, it is difficult to know if particular strategies are more effective than others and in what contexts. More research is needed. Although the development of adverse event reporting processes are complex (especially those that are the result of omission vs. commission), we must find a way forward. We believe that by working with experts from paediatric pain management, quality improvement, and healthcare administration, we can take the next steps to keep children safe and improve the quality of their pain care. Pain care is a human right (International Association for the Study of Pain, 2004), yet the most vulnerable humans are at risk of their pain, remaining an unacceptable harmful patient outcome.

### Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Jill Chorney has received salary support provided by a Canadian Institutes of Health Research New Investigator Award.

### References

- Association of Paediatric Anaesthetists (2012) Good practice in postoperative and procedural pain management, 2nd ed. *Pediatric Anesthesia* 22: 1–79.
- Australian Commission on Safety and Quality in Health Care (2010) *The Development of the Adult Deterioration Detection System (ADDS) Chart*. Queensland: Australian Commission on Safety and Quality in Health Care.
- Birnie KA, Chambers CT, Fernandez CV, et al. (2014) Hospitalized children continue to report undertreated and preventable pain. *Pain Research and Management* 19: 198–204.
- Carr DB and Goudas LC (1999) Acute pain. *Lancet* 353(9169): 2051–2058.
- Chorney JM, McGrath PJ and Finley GA (2010) Pain as the neglected adverse event. *Canadian Medical Association Journal* 182: 732.
- Finley GA, Forgeron PA and Arnaout M (2008) Action research: developing a pediatric cancer program in Jordan. *Journal of Pain and Symptom Management* 35: 44–454.
- Forgeron PA, Jongdomkarn D, Evans J, et al. (2009) Children's pain assessment in northeastern Thailand: perspectives of health professionals. *Qualitative Health Research* 19: 71–81.
- Fortier MA, Chou J, Maurer EL, et al. (2011) Acute to chronic postoperative pain in children: preliminary findings. *Journal of Pediatric Surgery* 46: 1700–1705.
- International Association for the Study of Pain (2004) Pain Relief as a human right. *Pain: Clinical Updates* 12: 1–4.
- Kozlowski LJ, Kost-Byerley S, Colantuoni E, et al. (2014) Pain prevalence, intensity, assessment and management in a hospitalized pediatric population. *Pain Management Nursing* 15: 22–35.
- Latremoliere A and Woolf C (2009) Central sensitization: a generator of pain hypersensitivity by central neural plasticity. *Journal of Pain* 10: 895–926.
- Matlow AG, Cronin CMG, Flintoft V, et al. (2011) Description of the development and validation of the Canadian paediatric trigger tool. *BMJ Quality and Safety* 20: 416–423.

- National Confidential Enquiry into Patient Outcome and Death. (2011) *Are We There Yet?* London: National Confidential Enquiry into Patient Outcome and Death.
- Saxe G, Stoddard F, Courtney D, et al. (2001) Relationship between acute morphine and the course of PTSD in children with burns. *Journal of the American Academy of Child and Adolescent Psychiatry* 40: 915–921.
- Slote Morris Z, Wooding S and Grant J (2011) The answer is 17 years, what is the question: understanding time lags in translational research. *Journal of the Royal Society of Medicine* 104: 510–520.
- Sollecito WA and Johnson JK (2013) *Mclaughlin And Kaluzny's Continuous Quality Improvement In Health Care*. Burlington: James and Bartlett Learning.
- Stang AS, Hartling L, Fera C, et al. (2014) Quality indicators for the assessment and management of pain in the emergency department: a systematic review. *Pain Research and Management* 19: e179–e190.
- Taddio A, Shah V, Gilbert-MacLeod C, et al. (2002) Conditioning and hyperalgesia in newborns exposed to repeated heel lances. *JAMA* 288: 857–861.
- Twycross A, Chorney J, McGrath PJ, et al. (2013) A Delphi study to identify adverse event indicators for pediatric post-operative and procedural pain. *Pain Research and Management* 18: e68–e74.
- Twycross A and Finley GA (2013) Children's and parents' perceptions of postoperative pain management: a mixed methods study. *Journal of Clinical Nursing* 22: 3095–3108.
- Weisman SJ, Bernstein B and Schechter NL (1998) Consequences of inadequate analgesia during painful procedures in children. *Archives of Pediatric and Adolescent Medicine* 152: 147–149.
- Wilson S, Hauck Y, Bremmer A, et al. (2012) Quality nursing care in Australian paediatric hospitals: A Delphi approach to identifying indicators. *Journal of Clinical Nursing* 21: 1594–1605.
- Woolf CJ (2011) Central sensitization: implications for diagnosis and treatment of pain. *Pain*: 52(3 Suppl): S2–15.
- World Health Organization (2009) *Conceptual Framework for the International Classification for Patient Safety Version 1.1*. Geneva: WHO.
- World Health Organization (2012) *WHO Guidelines on The Pharmacological Treatment of Persisting Pain in Children with Medical Illnesses*. Geneva: WHO.