

# Setting the Stage for Improved Practices During Vaccine Injections

## *A Knowledge Synthesis of Interventions for the Management of Pain and Fear*

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Vaccine injections are the most commonly performed medical procedure worldwide. Pain is a salient feature of vaccine injections and contributes to a negative vaccination experience for individuals being vaccinated and onlookers alike.<sup>1</sup> Concern about pain is also a documented barrier to future vaccine uptake, and vaccine noncompliance increases the risk for outbreaks of vaccine-preventable disease.<sup>1</sup> Managing pain therefore has immediate and long-term implications for the health and well-being of individuals and populations, and is thus highly clinically and scientifically relevant.

Clinical research evidence about managing pain during vaccine injections is continually being generated, which has the potential to significantly improve the vaccination experience and minimize the adverse sequelae of pain. However, this evidence needs to be adopted in clinical practice before it can have an impact. Uptake of research evidence into practice has been described as uneven, slow, and unpredictable across all aspects of health care, creating clinical care gaps.<sup>2</sup> Vaccination pain management is no exception. There are well-documented discrepancies between research evidence and practice, such that the majority of individuals do not benefit from evidence-based pain treatments.<sup>3,4</sup>

This supplement issue of the *Clinical Journal of Pain* is devoted to addressing the clinical care gap in vaccination pain management. It provides a knowledge synthesis of the current global research evidence on this topic. This large-scale knowledge synthesis is an update and expansion of a previous knowledge synthesis undertaken in 2009 by the same authors.<sup>5–7</sup> Help ELiminate Pain in Kids and Adults

(HELPinKids&Adults) is an interdisciplinary group of clinicians, academics, and policy makers from across Canada who joined together in 2008 to undertake knowledge translation activities to improve pain management practices during childhood vaccination. Originally named Help ELiminate Pain in KIDS (HELPinKIDS), this team developed the first ever clinical practice guideline on managing vaccination pain in 2010,<sup>8</sup> including tools (pamphlets and videos). These tools were subsequently customized and implemented in various local, provincial, and national systems, including consumer and health care provider education, clinical practice materials, and health policy.<sup>9</sup>

Since inception, the team has used a collaborative approach that engages key stakeholders involved in vaccination at multiple levels and directions within the health care system to ensure that activities undertaken by the team are relevant.<sup>9</sup> Consistent with this approach, in 2014, a meeting was convened to: (1) review new literature published in the field since the previous knowledge synthesis and clinical practice guideline, (2) review ongoing activities and achievements, and (3) determine next steps. Two factors informed the decision to update and expand the previous knowledge synthesis and clinical practice guideline. First, numerous trials have been published for various pain interventions since the original knowledge synthesis was published, warranting re-examination of original recommendations. Second, feedback from team members and external stakeholders revealed that there was considerable interest in adding new domains (and clinical questions) for guidance to attain a more comprehensive approach to the topic. These additional domains included the management of adults undergoing vaccination, and interventions for individuals with high levels of needle fear. As a result of the expanded scope of its activities, the team name was modified (ie, HELPinKids&Adults).

In the first manuscript included in this supplement, we review foundational issues in the development and assessment of pain and fear across the lifespan as well as their interplay during vaccinations. In the second, we describe the overarching research methodology used to carry out our knowledge synthesis, including how the clinical questions were identified, the search strategy used, and the approach to the analysis of the relevant outcomes. We then present a series of systematic reviews of interventions for pain management during vaccine injections and interventions for high levels of needle fear. The domains of interventions included in these systematic reviews are: (1) procedural interventions, (2) physical interventions, (3) pharmacological interventions, (4) psychological (including information provision) interventions, and (5) process

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interventions (including parent presence during childhood vaccinations and educational interventions). The last manuscript is a review of limitations of the evidence base and research gaps worthy of future investigation. Finally, we invited 2 experts to provide a commentary to highlight the opportunity for this knowledge synthesis to lead to global improvements in vaccination pain management practices by uptake by the World Health Organization.

Some additional information is provided here to further orient the reader to the presentation style utilized for each of the systematic reviews included in the supplement. All of the systematic reviews have been laid out in a consistent and comprehensive manner to facilitate readability, understandability, and interpretability of information. This includes the presence of the following common tables and figures: list of clinical questions, flow of studies, characteristics of included studies, risk of bias assessment, and results summary for critically important outcomes. In addition, a link has been included within each systematic review to supplemental information (ie, forest plots and evidence tables) that is contained separately in Digital Content.

We believe that this supplement contains information that is relevant and interesting to the broad readership of the *Clinical Journal of Pain*. While we expect that the majority of readers will focus on the results of the systematic reviews and identify interventions they want to implement in their practice, we invite readers to also consider the rigorous and comprehensive state-of-the-art methodology used to carry out the knowledge synthesis and to incorporate aspects of our approach in their own knowledge syntheses efforts. In addition, we encourage readers to consider designing and carrying out primary research that addresses identified limitations of previous studies, knowledge gaps, or both.

Notwithstanding these and other important potential applications of this content, this knowledge synthesis served as the evidence base for a revised and expanded clinical practice guideline by HELPinKids&Adults in 2015.<sup>10</sup> Since inception, our vision has been to *change the face of immunization to one without pain*.<sup>11</sup> I am grateful to all of the members of the team, our external stakeholder partners and reviewers, and to the funding agencies (primarily the

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