

## COMMENTARY

# Revisions to the IASP definition of pain—What does this mean for children?

Bonnie Stevens Lawrence S Bloomberg Faculty of Nursing,  
University of Toronto, Toronto, ON, Canada**Correspondence**Bonnie Stevens, Lawrence S Bloomberg  
Faculty of Nursing, University of Toronto,  
The Hospital for Sick Children (SickKids),  
Toronto M5T1P8, ON, Canada.  
Email: b.stevens@utoronto.ca**Abstract**

The complexity of the phenomenon of pain defies a simple and straightforward definition. Acute, chronic, nociplastic and neuropathic pain account for multiple pathologic mechanisms and forms of expression. Pain varies widely in intensity, duration and nature, often complicating description for those who are experiencing the pain and/ or those who are observing it. Assessment of pain in children can be challenging, especially in those who may be incapable of self-report report due to development immaturity or disability. In these children the responsibility of assessing pain often falls to the professional or lay care provider, whose knowledge, expertise and beliefs influence their judgements. The experience of pain includes not only the physiologic and behavioural indicators most frequently included in pain assessment measures but also encompasses the social and cognitive components that often go unrecognized. The 1979 IASP definition of pain has been praised for its brevity, simplicity and attention to the multidimensional nature of the phenomenon. It has also been criticized for ignoring mind-body interactions, disempowering and neglecting vulnerable populations, paying little attention to ethical dimensions, and excluding cognitive and social factors that are integral to the experience of pain. After four decades, the 1979 definition of pain and the accompanying notes were evaluated and revised by a 14-member IASP presidential task force with representation from basic and clinical research, geographical location and populations served (Pain, 2020, 161, 1976). These revisions resulted in decreasing the emphasis of pain associated with tissue damage in the definition, and, by removing the word 'described', allowing those who were nonverbal to be assessed using other validated pain indicators. Important revisions were also made to the Notes. The revisions that are most relevant for pain in children are discussed.

**KEYWORDS**

children, definition, IASP, pain

[Correction added on 19 July 2021, after first online publication: the Conflict of Interest statement has been added.]

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## 1 | HISTORICAL AND PRESENT CONTEXT FOR THE IASP DEFINITION OF PAIN

Pain was defined in 1979 by the International Association for the Study of Pain (IASP) Subcommittee on Taxonomy chaired by Dr Harold Merskey.<sup>1</sup> This definition was intended to provide clarity to the phenomenon of pain while simultaneously being dynamic and modifiable to accommodate new knowledge as it emerged. Recommendations derived from this definition were meant to enhance rather than constrain future development<sup>1,2</sup>.

The 1979 IASP definition has been widely accepted by clinicians and researchers and adopted by global organizations including the World Health Organization (WHO). However, the 1979 pain definition has essentially remained unchanged for four decades. Several calls for potential modifications to the IASP pain definition have been published.<sup>3,4,5</sup> In light of the increasing demand for revision, the exponential growth in pain knowledge and underlying pain mechanisms, the effectiveness of treatment modalities and the advancement of implementation science to optimize mobilization of evidence to improve practice, a 14-member IASP presidential task force with representation from basic and clinical research, geographical location and populations served was struck in 2018 to evaluate and revise the IASP pain definition and its accompanying notes. The revised definition was published in *Pain* in 2020<sup>6</sup> with input from IASP council, IASP members, experts in the fields of philosophy, bioethics and linguistics, and the public.

## 2 | CHALLENGES IN DEFINING PAIN AND THE IASP DEFINITION

The complexity of the phenomenon of pain defies a simple and straightforward definition. Acute, chronic, nociplastic, and neuropathic pain account for multiple pathologic mechanisms and forms of expression. Pain in children has been categorized<sup>7</sup> in The Lancet Child & Adolescent Health Commission as acute to chronic including procedural, breakthrough, visceral, disease-related, postoperative, and headache across the developmental spectrum from neonates to adolescents. Nociplastic pain also has been described in terms of juvenile fibromyalgia.<sup>8</sup>

Pain is more than a symptom and is rarely presented as a single complaint; individuals often require their pain be managed as a comorbidity of a disease process (eg, arthritis) or treatment (eg, surgery).<sup>9</sup> This issue complicates assessing and treating pain in children with disabilities, where pain from multiple physical (eg, muscle contractions and spasms), psychological (eg, anxiety), and functional (eg, sleep apnea, constipation) perspectives need to be considered.<sup>10</sup> report that children with disabilities have their postoperative pain assessed and treated less frequently than children and adolescents without disability.

Pain is an individual experience that varies widely in intensity, duration and nature, and meaning, often complicating description for the individual who is experiencing the pain and/or those who are observing it. Assessment of pain in children can be challenging if the

child is incapable of self-report report due to development immaturity or disability, and this responsibility falls to the professional or lay care provider, whose knowledge, expertise, and beliefs influence their judgments. The experience of pain goes beyond determining pain intensity and includes not only the physiologic and behavioral indicators most frequently included in pediatric pain assessment measures but also the social and cognitive components that often go unrecognized. Factors related to the context of the child's pain experience (eg, parental distress) need to be considered.<sup>11</sup>

The 1979 IASP definition of pain has been praised for its brevity, simplicity, and attention to the multidimensional nature of the phenomenon. It has also been criticized for ignoring mind-body interactions, disempowering and neglecting vulnerable populations, paying little attention to ethical dimensions, and excluding cognitive and social factors that are integral to the experience of pain.<sup>6</sup>

## 3 | REVISIONS TO THE 1979 IASP DEFINITION OF PAIN

Revisions to the IASP definition are highlighted below:

1979 IASP Definition; An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage

2020 IASP Revised Definition; An unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage.

These revisions resulted in two important considerations—the first, to decrease the emphasis of pain associated with tissue damage, and second, by removing the word “described,” allowed those who were non-verbal to be assessed using other validated indicators. Adding the phrase “resembling that associated with actual or potential tissue damage,” highlights that in many pain conditions, such as neuropathic and nociplastic pain, individuals may report pain in the absence of clinically detectable tissue injury—this could be prevalent in children as well as adults.

Important revisions were also made to the notes. The revisions that are most relevant for pain in infants, children, and adolescents are *italicized* and discussed below.

- Pain is always a *personal experience* that is influenced to varying degrees by biological, psychological and social factors.

The word “subjective” was changed to “*personal*” to minimize potential negative connotations that pain was neither objective or real. If pain is not a reality, the assumption that there is also an absence of need for recognition and treatment could exist; thus, pain could be dismissed or determined to be unimportant.<sup>7</sup> Personal emphasizes that the experience of pain is unique to each individual and can vary based on biological, psychological, and social factors.<sup>5</sup> emphasize that humans are quintessentially social, thus,

considering social factors is essential. The social aspect of environments determines exposure to pain, thoughts, and feelings of the individual in pain, communication of pain to others, and others' experiences and responses. Children's responses to pain are influenced by societal norms from their families and the broader society.<sup>7</sup>

The personal pain experience of a child varies broadly across age and stage of development. Prolonged exposure to repeated acute pain or high pain intensity that is impacted by stress, illness severity, and previous experience can influence pain response in the short and long term. Neuroimaging studies of newborn infants and children have indicated long-term changes in structure and connectivity associated with exposure to multiple painful procedures and stressors experienced during the hospital intensive care period.<sup>12</sup> Furthermore, an older child's or adolescent's pediatric intensive care experience, which is exacerbated by their illness severity and exposure to painful procedures, has been associated with post-traumatic stress symptoms up to six months postdischarge.<sup>13,14</sup> In young children, parent-infant attachment status influences the child's personal experience of pain and its expression and amelioration.<sup>15</sup> reported that higher caregiver sensitivity and greater soothing during infants' 2-month vaccinations predicted higher levels of preschooler avoidance and lower levels of ambivalence at their 4-5-year vaccinations. In addition, higher caregiver sensitivity at the 4- to 5-year vaccinations was related to greater preschooler attachment security. This study highlights consideration of pain within the social and psychological contexts and asserts the importance of health professionals supporting parent engagement with the child during painful events. Older children and adolescents need to have the opportunity to communicate their personal pain experience and to participate in decision making about treatment and treatment outcomes, and their effect on areas deemed important and meaningful to them.

Pain and nociception are different phenomenon. The *experience of pain cannot be inferred solely from activity in the sensory neurons.*

The focus on personal experience reaffirms that pain is a multi-dimensional phenomenon that varies among individuals. The revised IASP definition notes highlight that pain is distinct from nociception, which refers to the activity in the nervous system in response to a noxious stimulus. This difference has implications for pain assessment in infants where findings from studies that assess brain cortical responses such as EEG<sup>16</sup> in response to a painful stimulus (eg, heel lance) indicate poor correlation with clinical infant pain scores. Also, nociceptive-specific brain activity and nociceptive reflex withdrawal, in response to low-intensity noxious stimulation, although highly correlated, did not evoke changes in clinical pain scores.<sup>17</sup> Cortical responses to noxious stimuli play an important role in contributing to our understanding of nociceptive mechanisms in the developing child; however, they are not a replacement for a careful assessment of the child's response to pain in the clinical context and the trained observer's report. We need to know not just about the existence or intensity of pain, but how pain influences a child's physical and behavioral well-being and its impact on functional status. Similarly,<sup>18</sup> report the consensus of an IASP task force that brain

imaging serves to increase our understanding of pain mechanisms, but does not replace verbal report of pain. There is the potential to enhance assessment of pain in vulnerable populations if behavioral and neuroscientist to work together to create a better understanding of nociceptive responses as correlates of the pain experience.

- Through their life experiences, *individuals learn the concept of pain*

For children, life experience accumulates as they grow and develop. Although researchers have articulated the role of pain-related anxiety<sup>19</sup> and sleep,<sup>20</sup> patient experience is often not examined.<sup>7</sup> From studies on pain in infants, we know that the context, in particular the learning environment, in which pain is experienced can greatly influence their pain.<sup>21</sup> reported that newborns of diabetic mothers who were exposed to repeated heel lances in the first 24-36 hours of life learned to anticipate pain and exhibited more intense pain responses during venipuncture than infants of nondiabetic mothers. Similarly, infants who are supported by maternal interventions such as sustained skin-to-skin contact<sup>22,23</sup> and sucrose<sup>24</sup> during repeated painful procedures exhibited less pain than those who did not have this support. As the majority of procedural pain research evaluates single event effectiveness of pain-relieving strategies, and given the impact of pain early in life with alterations in thalamic development<sup>25</sup>, there is a need to further explore the impact of repeated pain over time throughout the child's development. For example, if the pain of multiple childhood immunizations goes untreated, each event can become compounded resulting in significant needle fear in childhood<sup>26</sup>; report that 20%-50% of adolescents have fear of needles.

- A person's report of pain *should be respected*

Respect for the individual's report of pain has important repercussions for children, whose pain reports are often not believed or thought to be unimportant. Pain assessment in children is often based on a composite of observations of responses to painful procedures, personal experience, and adult perception.<sup>27</sup> Adult perception may be highly influenced by the amount of tissue damage or number of procedures, and based on this single aspect, may result in judgments on how much pain the child "should" be experiencing rather than what their behavior or verbal report may indicate they are actually experiencing. Children from the age of 3-4 years can be taught how to use age-appropriate assessment tools. Parent or caretaker proxy report of their child's pain also needs to be respected, taking potential biases into account when the child is either too young, debilitated, or psychologically distressed to respond themselves. School-aged and older children should always be asked to provide their own report of pain, even in the presence of parents or caregivers, given their capacity to do so. The current emphasis is toward ensuring a person-centered approach and focusing on standardized outcomes that are reported by and important to patients. The Patient-Reported Outcomes Measurement Information System (PROMIS<sup>28</sup>) is available for adults and for older adolescents

and young adults, and parent and caregivers as proxy-respondents. Research is progressing on adaptation of PROMIS for children.

- Although pain usually serves an adaptive role, it may have adverse effects on *function and social and psychological well-being*.

Critiques of the 1979 IASP pain definition have highlighted the exclusion of the cognitive and social dimensions of pain.<sup>5</sup> These dimensions are especially important when considering parameters beyond those associated with acute pain. For example, chronic pain in adolescents is associated with fatigue, insomnia, impaired cognition or executive function, physical disabilities, and mood disorders.<sup>14</sup> Viewing pain within its complex psychosocial dimensions advances our understanding beyond the traditional biomedical model. We need to consider pain within social contexts—in developmental stages across the lifespan and within the family unit. We also need to be aware of how pain is expressed by a member of a gender and/or race—and as observed by others. These observations by caregivers and family “are vital to understanding the social dynamic of pain—as observers react to sufferers’ pain, and as these reactions affect those suffering”.<sup>29</sup>

- Verbal description is only one of several behaviors to express pain; *inability to communicate does not negate the possibility that a human or a non-human animal experiences pain*.

The removal of the term “described in terms of such damage” from the IASP definition has important benefits for assessing pain in children. This change acknowledges that there are other behavioral indicators that can be used to determine the existence and severity of pain for those who cannot verbalize their pain experiences. Historically, pain in infants and young children was often discounted until the IASP note was added; the note clarified that the inability to communicate did not negate the individuals’ ability to experience pain.<sup>30</sup> For infants and young children, behavioral responses associated with distress include facial grimacing, gross body movements, and more subtle fine motor actions in hands, fists, feet, and toes have been demonstrated to be valid pain behaviors. Although multiple validated clinical measures exist,<sup>31</sup> most focus on acute pain behaviors from medically required tissue-damaging diagnostic procedures. Assessing pain in infants and children who are severely ill and ventilated, with limited behavioral repertoire, continues to be challenging. Even more challenging is assessing more prolonged pain which frequently defies quantification, occurs less frequently than acute pain, and does not elicit reproducible responses.<sup>32</sup> For children and adolescents capable of self-report, pain can be assessed using numerical rating scales<sup>33</sup> and verbal description to explore pain intensity, quality, duration, affect, interference, and meaning of pain<sup>7</sup> and how this affects their physical, emotional, and social functioning. For younger children or those who are not capable of verbal report, behavioral scales are a useful way to report their pain.<sup>34</sup> For children with severe intellectual and developmental disabilities, there is little consensus on measurement scales; however,

several scales (eg, Pediatric Pain Profile<sup>35</sup>), Non-communicating Children’s Pain Checklist<sup>36</sup> and the Revised Faces Legs Activity Cry Consolability Scale (r-FLACC<sup>37</sup>), have been developed and validated with children. Triangulating multiple assessment methods such as self-report, behavioral, psychophysical methods, and caregiver report may be the most reliable approach to assessing pain in individuals with disabilities.<sup>38</sup>

## 4 | SUMMARY

Within the past four decades, we have moved from negating the possibility of pain in infants and young children, to our current stance where we acknowledge that all children from very preterm infants to older children and adolescents can and do experience pain. Having a clearly defined understanding of what is being measured provides a basis for establishing the quantity and quality of pain that justifies a clinician’s assessment of their patient, suggests validated assessment approaches, and weighs the risks and benefits of targeted interventions. However, as<sup>7</sup> emphasize, transformative action is required to improve pain in children across developmental stages. A key action is to make pain visible, through optimizing existing age-appropriate pain measures, understanding biological correlates, and engaging children and families in determining outcomes that are important to them. Further exploration to determine the total pain burden on the child and care provider beyond pain from procedures is required.<sup>27</sup>

A clear definition also enhances our understanding of the epidemiology of pain across various populations of infants and children, as well as shedding light on the role of psychological, social, and biological mechanisms on expression of pain at different levels of maturity. In research, clear and explicit definitions may enhance homogeneity of the sample in clinical trials thus increasing generalizability of the results.<sup>32</sup> Revisions to the 1979 definition of pain and particularly the notes emphasize important aspects of the complexity of pain in children that were needed to achieve further clarity. Integration of these revisions in practice and research will need to be evaluated over time.

## CONFLICTS OF INTEREST

There are no conflicts of interest to disclose.

## ORCID

Bonnie Stevens  <https://orcid.org/0000-0001-5387-2302>

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