



SPANISH ASSOCIATION OF PAEDIATRICS

## Positioning document of the Spanish Association of Paediatrics Group for the study of paediatric pain on the Registration of Pain as fifth vital sign<sup>☆</sup>



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Received 30 April 2019; accepted 12 May 2019

Available online 17 June 2019

### KEYWORDS

Children's pain;  
Fifth vital sign;  
Clinical record

**Abstract** The Spanish Group for Children's Pain Study was created in 2017 in an aim to prevent, remove or reduce pain in neonates, infants, children and adolescents. Along with a diagnosis of pain, a paediatric patient may suffer from acute or chronic pain, neuropathic, nociceptive, or mixed pain, as well as pain from procedures, and post-surgical pain. Pain suffering is too often ignored and not diagnosed. As a result of this, pain prevention and pain treatment fails. Acute pain prevalence in scientific literature is estimated to be between 22% (procedures pain) and 77% (pain on patients in emergency departments and in hospital wards). Furthermore, up to 30% of children could suffer from chronic pain during their childhood. Among the barriers detected in pain management are: difficult assesment caused by a lack of unity in pain registry, difficulties due to the choice of an assessment pain scale (according to age and type of pain), and the

<sup>☆</sup> Please cite this article as: Leyva Carmona M, Torres Luna R, Ortiz San Román L, Marsinyach Ros I, Navarro Marchena L, Mangudo Paredes AB, et al. Documento de posicionamiento del Grupo Español para el Estudio del Dolor Pediátrico (GEEDP) de la Asociación Española de Pediatría sobre el registro del dolor como quinta constante. An Pediatr (Barc). 2019;91:58.e1–58.e7.

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absence of training in the management and interpretation of these pain scales. Additionally, in some health areas there is a high workload pressure and generally there are communication difficulties between professionals, and between them and families.

From this AEP working group our clear positioning is expressed in the recommendation of the systematic assessment and recording of pain in all children treated in the health system, thus considering pain as the fifth constant to be determined after the other vital signs.

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## PALABRAS CLAVE

Dolor infantil;  
Quinta constante vital;  
Registro clínico

## Documento de posicionamiento del Grupo Español para el Estudio del Dolor Pediátrico (GEEDP) de la Asociación Española de Pediatría sobre el registro del dolor como quinta constante

**Resumen** El Grupo Español para el Estudio del Dolor Pediátrico (GEEDP) se forma en 2017 con el objetivo de ayudar a reducir o eliminar el dolor de los neonatos, lactantes, niños y adolescentes. Ante un mismo diagnóstico de dolor, los pacientes pueden padecer dolores agudos, crónicos, por procedimientos, postoperatorio, nociceptivos, neuropáticos o mixtos. Sin una adecuada valoración clínica basada en la edad, la enfermedad de base y el tipo de dolor sospechado, este sufrimiento pasa desapercibido con demasiada frecuencia y como consecuencia es infratratado y poco prevenido. La prevalencia del dolor agudo en Pediatría es difícil de estimar y según la evidencia científica actual, podemos determinar que varía entre un 22% (dolor por procedimientos) y un 77% (dolor en los pacientes de urgencias y en las plantas de hospitalización); con relación al dolor crónico, hasta un 30% de los niños pueden padecerlo en algún momento de su vida. Entre las barreras detectadas en el diagnóstico de dolor se encuentran: la dificultad para su valoración por falta de unidad en su registro, existencia de diversas escalas de valoración (según edad y tipo de dolor) y por la ausencia de formación en manejo e interpretación de estas. A esto se puede sumar, en según qué ámbitos sanitarios, la elevada presión asistencial y las dificultades de comunicación entre profesionales y entre estos con las familias.

Desde nuestro grupo de trabajo de la AEP deseamos manifestar nuestro claro posicionamiento en la recomendación de la valoración y registro del dolor de forma sistemática en todos los niños atendidos en el sistema sanitario, considerando así el dolor como la quinta constante a determinar después de las constantes vitales.

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## Presentation of the Group and rationale for its formation

At the beginning of the 21st century, the Sociedad Española de Dolor (The Spanish Society of Pain), in light of the concerning lack of research, evaluation, management and treatment of pain in paediatric patients, posed the question whether paediatric pain was the *great unknown* or *overlooked* issue.<sup>1</sup> Regrettably, 19 years later, despite evident efforts from institutions, societies, hospitals and local professional initiatives, this general state of ignorance and/or oblivion remains.

The Grupo Español para el Estudio del Dolor Pediátricos (Spanish Group for the Study of Paediatric Pain, GEEDP) of the Asociación Española de Pediatría (Spanish Association of Paediatrics) was formed in 2017 to address this patent need. It consists of 10 paediatricians working in coordination with another 16 professionals that include paediatric

anaesthesiologists, paediatric nurses, psychologists and social workers, among others. It advocates for integrative pain management in paediatrics, recommending the application of up-to-date scientific evidence to optimise the diagnosis and management of pain, both acute and chronic, in the different paediatric subpopulations, with the aim of offering standardised solutions to its management, efficacious and applicable in clinical practice, and support for the professionals, relatives, educators and caregivers that live with children suffering from pain.

## Definition and types of paediatric pain

In 1973, the International Association for the Study of Pain (IASP) defined pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage."<sup>2</sup>

**Table 1** Classification of pain.

Type of pain based on:		
Duration	Acute Chronic	
Cause	Nociceptive Neuropathic Mixed	Somatic visceral
Course	Continuous Intermittent Incident Irruptive	
Intensity	Mild Moderate Intense	

Although this definition has remained widely used to present, it has been subject to revisions, criticism and proposals for change during this time. The most recent revision accepted by the IASP was proposed by Amanda Williams and Kenneth Craig in 2016: "Pain is a distressing experience associated with actual or potential tissue damage with sensory, emotional, cognitive, and social components."<sup>3</sup>

This new definition is more comprehensive and, in our opinion, more in line with the concept of total pain, as it describes pain as a distressing and disturbing experience, includes both its emotional and sensory components, and brings up the cognitive and social aspects that had hitherto been missing from the definition.

Williams and Craig highlighted the need to recognise that pain has functional, adaptive value through a broader range of nonverbal behaviours. Macknik and Martinez-Conde<sup>4</sup> have explained how the field of neuroscience has accumulated data on the emotional, cognitive and social dimensions of the experience of pain to the point that the latter could be conceived, rather than as a sensory experience, as a socially shared emotion, taught and learned (thus of a cognitive nature). In other words, while pain generally results from a physical ailment, its primary root is the individual and shared emotion that emerges at the actual or potential presence of tissue damage. This is the source of the substantial diversity and variability that exists in the way that individuals perceive and handle pain. This suggests that while the management of pain can be approached from an organic perspective, for instance with the use of drugs, among other possible interventions, tools for cognitive, psychological and social care are also of vital importance.

Pain in the paediatric population did not start gaining notice until the 1980s, when evidence emerged on the benefits of the intraoperative administration of opiates, compared to non-administration, in the surgical correction of patent ductus arteriosus,<sup>5</sup> and, as is the case in adults, can be classified in different ways depending on the aspect under consideration for its definition (Table 1):

- Duration: *acute pain* is defined as pain of limited duration resulting from a normal and predictable physiological response to a noxious stimulus; *chronic pain* is pain lasting more than 3 months that cannot be attributed to an

identified organic cause; and *procedural pain* is pain secondary to diagnostic or therapeutic procedures.

- Pathogenesis: pain may be *neuropathic* if it results from a direct stimulus on the central nervous system or a lesion in the peripheral nervous system, characterised by sensory abnormalities such as burning sensations, allodynia or dysesthesias, among others; *nociceptive*, which itself can be classified into *somatic*, which develops at the musculoskeletal level, the skin or blood vessels as sharp and localised pain, and *visceral*, which results from the abnormal stimulation of visceral receptors and may radiate beyond the region where it originates; and *mixed pain*, which combines characteristics of neuropathic and nociceptive pain.
- Course: pain is *continuous* if it persists through the day and does not relent; *intermittent* if it comes and goes; *incident* if it develops in association with a specific and avoidable cause; and/or *irruptive* (or perhaps *irruptor*<sup>6</sup>), when there is a transient exacerbation of pain without an identifiable incident cause in a context of adequate pain control.
- Intensity: there is *mild*, *moderate* and *intense pain* classified based on assessment by means of intensity scales validated for the specific age group (Table 1).

However, despite this classification being identical to that of pain in adults, the substantial diversity encompassed in the paediatric age range (from newborns to adolescents) entails a physical and cognitive variability that has a direct impact on the subjective experience of pain. Furthermore, we must take into account that when a painful stimulus persists during critical stages in brain development, the neuroanatomical changes that it may drive could be permanent, predisposing the child to have a lower threshold for pain for life, a phenomenon known in paediatrics as *chronic hyperalgesia*.<sup>1,7</sup>

These are aspects that need to be considered by health professionals that care for paediatric patients with pain in order to initiate pharmacological and nonpharmacological treatment with minimum delay. Furthermore, providers must adapt these treatments to the individual characteristics and previous experiences of each patient. Thus, patients will receive adequate analgesia and be provided with a high degree of comfort in situations where they experience pain, be it mild, moderate or intense.

## Scope of the problem

Determining the prevalence of pain in the paediatric population is a challenge, not only due to its multiple possible presentations (acute, chronic, nociceptive, neuropathic,...), causes (diseases, procedures, surgery) or the broad age range that makes this population so diverse (newborns, infants, school-aged children, adolescents), but also, and more importantly, due to the sheer scarcity of studies focused on paediatric patients in the literature.

We now proceed to summarise prevalence data for paediatric pain classified by aetiology (Table 2).

**Table 2** Prevalence of paediatric pain.

	Percentage	Author and bibliographic reference
<i>Pain in emergency care</i>	30%	Grant PS <sup>8</sup>
	78%	Gaglani A, Gross T <sup>9</sup>
<i>Causes</i>		
Musculoskeletal	27%–42%	Downing A, Rudge G <sup>10</sup>
Headache		Cooper C, Dennison EM, Leufkens HG, Bishop N, van Staa TP <sup>11</sup>
Ear pain		Walker DM, Teach SJ <sup>12</sup>
Painful swallowing		
Abdominal pain		
<i>Procedural pain</i>		
At least one painful procedure during hospitalisation	78%	Baruch S Krauss, Lorenzo Calligaris, Steven M Green, Egidio Barbi <sup>15</sup>
No analgesia	22%	Dowden S, McCarthy M, Chalkiadis G <sup>17</sup>
<i>Pain in inpatients</i>	77%	EM Taylor, K Boyer, FA Campbell <sup>21</sup>
<i>Postsurgical pain</i>	>70%	Cai Y, Lopata L, Roh A <sup>23</sup>
		Emons MI, Petzke F, Stamer UM <sup>24</sup>
<i>Chronic pain</i>	30%	Huguet A, Miró J <sup>25</sup>
		King S, Chambers CT, Huguet A <sup>26</sup>

### Pain in emergency departments

Pain is a common symptom in children seeking care in emergency departments, with the prevalence ranging, depending on the author, from 30% to 78% of emergency visits pooling the data for presenting complaints involving pain secondary to episodic illness, acute injury and exacerbations of chronic diseases.<sup>8,9</sup>

Musculoskeletal injuries are the most frequent cause of pain associated with acute injury<sup>10</sup>; in fact, between 27% and 42% of children have a bone fracture before age 16 years. Other common types of pain are headache, ear pain, throat pain and abdominal pain.<sup>10–12</sup> Furthermore, more than half of these patients report pain of moderate to intense severity.<sup>10,13</sup>

On the other hand, it is important to take into account that being in a noisy and crowded emergency department may be a frightening experience to a child in pain, especially if compounded by the need to undergo a diagnostic or therapeutic procedure.<sup>14</sup>

### Pain during procedures

A recent study in hospitalised paediatric patients found that up to 78% undergo at least 1 painful procedure during their stay, with a mean of 6 procedures or more per child,<sup>15</sup> and despite the increased awareness at present, authors still report that paediatric patients continue to receive insufficient analgesia when they undergo painful diagnostic or therapeutic procedures compared to adult patients,<sup>16</sup> and worse still, that up to 22% of paediatric patients do not receive any type of care for pain prevention.<sup>17</sup>

### Pain in paediatric inpatients

Throughout the years, numerous studies have reported that pain in hospitalised paediatric patients is both frequent and undertreated.<sup>18,19</sup> Recent studies show that this situation has changed very little.<sup>20</sup>

In addition to being a part of the situation leading to hospitalisation in children, pain is an element associated with many interactions of paediatric patients with their health providers (vaccinations, collection of samples for analysis, placement of vascular catheters, diagnostic and therapeutic procedures. . .), and some authors estimate that up to 77% of paediatric inpatients experience pain during hospitalisation.<sup>21</sup>

### Postoperative pain

Adequate management of postoperative pain in children requires a dynamic approach encompassing the perioperative period, any potential pain after discharge and the possible development of persistent pain after surgery.<sup>22</sup> Numerous studies have described the multiple scenarios where this is not the case, and have specifically collected data on the postoperative pain reported by paediatric patients after general and/or urologic surgery, experienced as moderate or moderate-to-intense by more than 70%.<sup>23,24</sup>

### Chronic pain

Chronic pain, as demonstrated by some authors, is also a prevalent problem in the paediatric age group, and it has been reported that up to 30% of this entire population

experiences pain daily.<sup>25,26</sup> The most frequent complaints reported are headache (65.6%), abdominal pain (47.7%), pain in the extremities (46.4%) and back pain (38.6%). In addition, in 35% the pain lasts longer than 6 months, which in itself is evidence of a prevalence of pain as an illness in itself that is greater than expected.

Taking all of the above into account, it is reasonable to surmise that paediatric pain, in any of its forms, is present in a great number of children. We ought to underscore that this is what we have found by reviewing solely the findings of studies specifically designed to identify paediatric pain. Its actual prevalence would probably turn out to be much higher if we assessed for the presence of pain routinely in everyday paediatrics clinical practice (outpatient clinics, primary care, emergency departments...).

Thus, it is a fact that paediatric pain is a very prevalent condition that impacts quality of life in patients and their families. Furthermore, as evinced by some authors, not experiencing pain during illness is of utmost importance for paediatric patients and their families, who rank adequate pain relief as most important in satisfaction surveys second only to an accurate diagnosis.<sup>27</sup>

### **Definition of barriers (awareness, training, myths, heterogeneity of assessment scales...)**

While there has been evident improvement in the management and control of paediatric pain in the past few years and there is an increasing awareness and desire to be trained specifically on this subject on the part of health professionals,<sup>28</sup> there are still numerous barriers and myths that hinder the adequate assessment and treatment of paediatric pain.

Among the barriers, from the Group on Paediatric Pain of the AEP, based on what has been described by physicians and the nursing staff,<sup>29</sup> we would like to highlight the challenges posed by the assessment of pain due to the inconsistency in its documentation, the multiplicity of the scales available based on age group or the type of pain and the lack of training in their use and interpretation. Other reported barriers include a lack of time, excessive workloads and a lack of resources for the implementation of non-pharmacological interventions. In some instances, gaps in information-sharing between professionals can also impact the degree of adherence to pharmacological treatment and contribute to the difficulty reported by family members regarding their ability to assess pain in their children, which results in a decreased involvement of the family in the pain management process.<sup>30,31</sup>

Some of the myths that persist to date are that paediatric patients feel pain less intensely compared to adults, that they may not remember pain depending on the stage of development when it is experienced, or that pain during childhood does not have any future consequences.<sup>32</sup> By now, the concept of chronic hyperalgesia has been recognised, and it is known that the immaturity of the central nervous system of newborns and infants, far from entailing a reduced sensitivity to pain, actually increases their vulnerability to it. Even in preterm newborns delivered at 25 week's gestation, in whom, on one hand, the ascending nociceptive afferent pathways are present and functional, while the

descending inhibitory pathways (which modulate and regulate the input delivered by the ascending pathways) are not functional until several weeks or months post birth, and on the other, they produce fewer concentrations of inhibitory neurotransmitters while the amounts of cortisol and catecholamine secreted in response to stress are the same as those in adults.<sup>1</sup>

To these barriers and myths we need to add the apprehension that inexperienced clinicians feel about prescribing analgesic drugs at doses or for indications that are off-label for the treatment of pain in the paediatric population, as poor management of such medication could result in unwanted and harmful side effects that may be difficult to manage.<sup>32</sup>

In the long term, barriers and myths result in paediatric patients with pain being undertreated, with an increase in morbidity and mortality and a higher frequency of deleterious pathophysiological effects after suffering acute pain compared to paediatric patients with pain that have received adequate analgesia (acute hyperalgesia).

### **Justification of the fifth vital sign: "that which we do not diagnose properly, we do not treat properly"**

With the support of the World Health Organization, many scientific associations are advocating for the recognition of pain relief as a human right, and multiple documents and studies also corroborate the importance of assessing and management of paediatric pain.<sup>33,34</sup> This unquestionably requires the documentation of pain in a prominent space in the health records to make this information visible to all other professionals involved in care, detailing the degree and type of pain of the patient at a given time or through the entire care process, both in outpatient and inpatient care.

This necessity has been set as a priority by different organizations and accreditation programmes. Thus, for instance, Joint Commission for the Accreditation of Health Care Organizations (JCAHO) established standards for pain assessment and management in 2001 and currently requires for hospitals in the United States to have established policies regarding the assessment and management of pain and to ensure that the staff is adequately informed of and adheres to them.<sup>35,36</sup> Similarly, the Statement on Patient's Rights to Pain Management of the Australian and New Zealand College of Anaesthetists (ANZCA), in its third point, affirms that in addition to having the right to pain assessment, patients also have the right to have the results of such assessments recorded periodically.<sup>37</sup>

Thus, pain, in requiring initial and thereafter periodic assessment in the approach to the clinical process, has tacitly become the de facto fifth vital sign documented in clinical charts along with the temperature, heart rate, respiratory rate and blood pressure.

### **Position of the AEP through its working group**

Pain is a reality in the paediatric age group, and its management must be a priority in health care practice.

From the Group on Paediatric Pain of the AEP, in considering health care professionals responsible for the health of paediatric patients and recognising that adequate management of paediatric pain is part of correct and necessary practice, we view the appropriate management of pain in the paediatric age group as a moral imperative. Consequently, we recommend including the assessment of pain as the fifth vital sign in each minor receiving health care of any kind, irrespective of the presenting complaint, underlying disease or care setting.

We also deem it essential to develop health care protocols for the documentation and treatment of pain as the fifth vital sign in paediatric clinics, as has been done in the hospitals that serve as a reference to justify the usefulness of such records and their application in clinical practice.<sup>38</sup>

We propose rating the severity of pain in paediatric patients using a scale applicable to the specific age group and clinical circumstances and that is widely used, and from that point documenting in the chart the nature of the pain according to the following parameters: intensity, location, characteristics and duration of pain. These observations should be recorded at admission and discharge and at least once per shift in inpatient care and once per visit in outpatient care. It would also be convenient for clinical software applications in health care facilities to include a section for recording specific information about pain episodes: side effects, treatment, nonpharmacological interventions, etc.

As asserted in the document published by the Ministry of Health, Social Policy and Equality of Spain, *Unidad del tratamiento del dolor: estándares y recomendaciones* ("The pain management unit: standards and recommendations"): "if these data were recorded routinely, we would be able to establish unified criteria and establish protocols for the management of paediatric pain that could be applied by all professionals and that could be documented and reviewed at any point in care delivery to assess the baseline of pain and the level that is achieved after each intervention."<sup>39</sup>

To conclude, from the Group on Paediatric Pain of the AEP, we propose that, once the charting of paediatric pain is included as the fifth vital sign in health records, indicators be formulated to assess whether the criteria used to define adherence to the protocol are being met.

The strategies discussed will not only help ensure the delivery of comprehensive care to patients in the area of paediatric pain, but will also result in the availability of detailed, accessible, standardised and real information on the condition of patients as regards pain, which will in turn help professionals apply uniform standards in the assessment and management of pain.

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