Assessing a Child's Pain

A review of tools to help evaluate pain in children of all ages and levels of cognitive development.

ABSTRACT: Effective pain assessment is a necessary component of successful pain management and the pursuit of optimal health outcomes for patients of all ages. In the case of children, accurate pain assessment is particularly important, because children exposed to prolonged or repeated acute pain, including procedural pain, are at elevated risk for such adverse outcomes as subsequent medical traumatic stress, more intense response to subsequent pain, and development of chronic pain.

As with adults, a child's self-report of pain is considered the most accurate and reliable measure of pain. But the assessment of pain in children is challenging, because presentation is influenced by developmental factors, and children's responses to certain features of pain assessment tools are unlike those commonly observed in adults.

The authors describe the three types of assessment used to measure pain intensity in children and the tools developed to address the unique needs of children that employ each. Such tools take into account the child's age as well as special circumstances or conditions, such as ventilation requirements, cognitive impairment, and developmental delay. The authors also discuss the importance of proxy pain reporting by the parent or caregiver and how nurses can improve communication between the child, caregiver, and health care providers, thereby promoting favorable patient outcomes.

Keywords: assessment tools, children, pain assessment, pain measurement, pediatric pain

Pain is a common symptom seen in patients of all ages and in all health care settings. In children, however, pain assessment may be hindered both by developmental factors and by the way certain features of pain assessment tools uniquely affect a child's response. Inaccurate pain assessment leaves a child vulnerable to prolonged or repeated acute pain, including procedural pain, and to such associated sequelae as subsequent medical traumatic stress, more intense response to subsequent pain, and development of chronic pain, resulting in interference with sleep as well as with academic, social, household, and extracurricular activities.[1-6] In comparison, children whose acute or procedural pain is sufficiently relieved may be more likely to experience the type of enhanced development seen in children who undergo "posttraumatic growth" and emerge from traumatic experiences with increased resilience and a feeling that the world is a safe place.[7]

Optimal pain management and patient outcomes require the use of valid and reliable pain assessments. As a result of the multidimensional nature of pain, its assessment is complex, and pediatric pain assessment may be particularly challenging, depending on the child's level of cognitive development, ability to communicate, and prior experiences of pain.[8] This article discusses the factors that can influence a child's report of pain, describes components of a comprehensive pediatric pain assessment, reviews appropriate pain assessment scales for children of different ages and levels of cognitive development, and underscores

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A nurse uses the Wong–Baker FACES Pain Rating Scale to help assess her patient's pain. Photo by Gerry Melendez / The State / MCT via Getty Images.

the potential benefits nurses can reap from partnering with the child's parent or caregiver.

INFLUENCES ON A CHILD'S REPORT OF PAIN

To appropriately assess a child's pain, it's necessary to understand the biological, psychological, and sociocultural factors that affect a child's experience and expression of pain, as presented in George Engel's biopsychosocial model.[9] Viewing pain through this lens allows nurses to tailor pain assessment specifically to each child. In addition to physical health, the biopsychosocial model takes into account such factors as the child's age and level of cognitive development, temperament, fear, and previous experiences with pain. All of these factors shape a child's understanding of pain, how they describe their pain, and how they respond to and cope with pain. It is important to note that these influences are not static but dynamic, changing both as the child develops and over the course of a discrete painful experience.

Level of cognitive development, which determines how children perceive the causes and effects of pain, may best be understood through the developmental stages defined by Jean Piaget (see Table 1[10, 11]). For example, infants ages zero to 12 months (defined by Piaget as in the sensorimotor stage) do not understand pain, but they certainly experience it, demonstrate memory of painful experiences, and respond to parental anxiety.[10] It's important that infants in this age range receive optimal pain management to prevent adverse psychological and emotional responses to future painful events. At ages two years and older, children's understanding of pain evolves.

An eight-year-old girl recovering from an appendectomy may, when asked, report that she's not in pain, though she's lying on her side holding her flexed knees against her abdomen. Her age places her in Piaget's concrete operational stage, meaning that she has an increased awareness of her pain and can specify its location, but she also fears bodily harm and death. She may not understand what her surgery entailed and may perceive her pain as signaling impending death. The nurse can provide reassurance and calm her fears by providing an age-appropriate explanation of her surgery, her pain, and its treatment.

Fear and prior painful experiences greatly affect a child's perception of painful events and are the primary influential factors in this model. Previous experiences with pain affect how children react to future events that are painful or potentially painful. Higher levels of fear in children have been correlated with higher levels of reported pain, anxiety, persistence of pain, disability, and avoidance behaviors.[12, 13] The effects of fear based on prior painful experiences are often observed in toddlers presenting to an urgent care center shortly after vaccine administration. When a nurse approaches a recently vaccinated 18-month-old to clean and dress a superficial laceration, the toddler may withdraw or cry, remembering the pain associated with the shots and anticipating similar pain. In this situation, the nurse should ask the parent whether the toddler had any recent painful experiences in a health care setting, explaining that even having received a vaccination over the past few days may influence a child's response to subsequent health care visits. The nurse can then help the parent comfort and reassure the toddler both before and while providing necessary wound care.

Societal expectations, stereotypical assumptions, and familial cultural norms. Children learn how to experience, cope with, and report pain by observing their parents' and caregivers' responses—and those responses are influenced by societal expectations and stereotypes. This is particularly evident in the way that sex-role socialization occurs within the family, with boys who receive parental cues that it is unacceptable to express pain tending to be less likely to report pain.[14] For example, a four-year-old boy recently hospitalized for surgery may fear needles and start to cry when taken to the office of his primary care provider for immunization boosters. If his mother says, "You're a big boy now, and boys don't cry," she reinforces a stereotypical assumption about male behavior that may reinforce sex-role expectations and affect her son's ability to acknowledge, report, and effectively cope with pain.

Given the child's age, which puts him at Piaget's preoperational stage of cognitive development, in which children often perceive pain as punishment, he may plead with his mother, "Don't make me get a shot. I promise I won't get sick again." The nurse administering his injections can then guide the child's mother in distraction techniques that can calm the child's fears and offer him reassurance that shots are not a punishment for being sick but a way to help him stay healthy and feeling well.

Anchor effects occur when the "anchors" (the extremes of a scale) influence the severity of a child's self-reported pain. For example, scales that use a smiling face to depict the bottom anchor ("no pain") or a sad face with tears to depict the top anchor ("most pain") may lead to false-negative or false-positive reports of pain, because children who feel happy are not necessarily pain-free and children in no pain are not necessarily happy.[15] Furthermore, pain assessment tools that anchor the pain experience as "no pain" versus "most pain" are often difficult for young children to understand, because the concept of "most" is abstract and relative, depending largely on the child's previous experiences with pain. Numeric or color anchors can also evoke a child's bias, as young children may not understand the quantitative significance of numbers, even if they know how to count, and color scales are not well researched.[16] A child may be inclined to pick their favorite color or number rather than the color or number that best corresponds with their pain level.

Table 1. The Pain Management Implications of Children's Developmental Stages[10, 11]

Piaget's Developmental Stages	Patients' Understanding of Pain	Nursing Implications
Sensorimotor (birth–24 months)	• Under 6 months: have no understanding of pain • 6–12 months: anticipate a painful event; responsive to parental anxiety	• Provide optimal pain management to reduce psychological and emotional responses to future pain events
Preoperational (2–7 years)	• Understand pain as a physical experience that can magically disappear • Have no concept of cause and effect • Perceive pain as punishment • May hold someone accountable for their pain, striking out physically or verbally	• Help children see the connection between pain treatment and pain relief • Provide reassurance that pain is not a punishment
Concrete operational (7–12 years)	• Can specify location of physical pain • Have increased awareness of their bodies and internal organs • Are developing an understanding of consequences (if they keep ice on an injury, there will be less swelling, for example) • Fear bodily harm and death	• Provide explanations for pain and its treatment • Help calm fears about bodily destruction and death
Formal operational (adolescence–adulthood)	• Begin to problem solve • Value privacy, control, and trust	• Communicate honestly and in a nonthreatening way that promotes learning and trust

Table 2. How to Conduct a Pain History for Children Experiencing Acute Pain

Questions for the Child	Questions for the Parent or Caregiver
Tell me what pain is.	What word(s) does your child use to describe pain?
Tell me about the hurt or pain you have had before.	Describe painful experiences your child has had before.
Do you tell others when you hurt? If you do, whom do you tell?	Does your child tell you or others when he or she is hurting?
What do you do for yourself when you are hurting?	How do you know when your child is in pain?
What do you want others to do for you when you are hurting?	How does your child usually react to pain?
What don't you want others to do for you when you are hurting?	What do you do for your child when he or she is hurting?
What helps the most to take your hurt away?	What does your child do for himself or herself when he or she is hurting?
Is there anything special that you want me to know about you when you are hurt? (If yes, have the child describe.)	What works best to decrease or take away your child's pain?
	Is there anything special that you would like me to know about your child and pain? (If yes, describe.)

Adapted from Hester NO, et al. Putting pain measurement into clinical practice. *Prog Pain Res Manag* 1998;10:179-98. This table has been adapted with permission of the International Association for the Study of Pain (IASP) and may not be reproduced for any other purpose without permission.[17]

ELEMENTS OF A COMPREHENSIVE PEDIATRIC PAIN ASSESSMENT

There is a wide range of factors that affect a child's experience of pain, which is why children may behave and respond differently to the same type of painful experience, be it a broken bone, surgical pain, or the pain of immunizations. To take these factors into account in performing a pain assessment, nurses must obtain the child's history of painful experiences and document any chronic pain conditions or current reports of pain.

The child's pain history not only provides context but may also shed light on circumstances that could influence the child's report of pain. Ideally, the history is gathered from both the child and the parent or caregiver either before or during a painful event (see Table 2[17] for questions to ask when conducting a pain history). For children with a chronic pain condition, nurses need to conduct a more detailed pain history (see Table 3[18]).

PAIN ASSESSMENT TOOLS

After obtaining and documenting the child's pain history, it's necessary to quantify the presence and level of pain, document the need for intervention, and determine the effectiveness of any pain management interventions used.

The following three types of assessment are used to measure pain intensity in children, and a number of tools or scales employ one or more of the three (see Table 4[1, 16, 17, 19-31]):

- physiological
- behavioral–observational
- self-report

Physiological measures of pain include heart rate, respiratory rate, blood pressure, and oxygen saturation. Although embedded in some observational pain assessment tools, physiological measures alone do not discriminate between responses to pain and stress. Additionally, responses to pain measured by these indices wane over time, making their exclusive use an invalid measure of pain.

Behavioral–observational tools allow nurses to monitor observable behaviors that are indicative of pain. They may be used to assess pain in children who are

- too young to self-report.
- distressed.
- restricted by bandages or sedating drugs.
- altering (exaggerating or minimizing) their self-report ratings because of fear.
- sleeping.

Pain assessment should be considered for sleeping children, because children often use distraction (play) to cope with pain but can then become exhausted, fall asleep, and experience persistent pain while sleeping.[10, 32] When assessing pain in a sleeping child, use a validated behavioral–observational scale, as these scales are least likely to disrupt the child's sleep. Behavioral–observational scales include the Children's Hospital of Eastern Ontario Pain Scale (CHEOPS)[26]; the COMFORT Scale[1]; the Face, Legs, Activity, Cry, Consolability (FLACC) scale[27]; and the revised FLACC scale.[25]

Documentation in an established section of the electronic health record should follow each assessment, preferably with a drop-down menu to guide the nurse in scoring.

Self-report measurements of pain are preferred because they provide the most valid measurement of a patient's subjective pain experience and are convenient to use. Their clinical utility is limited, however,

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by the communication skills of the patient. That being said, children as young as four years of age can often provide a self-report of their pain if provided with a tool appropriate for their age and developmental level. There are several self-report tools that can be used in children of varying ages.

Numeric rating scales require patients to gauge their pain severity using numbers, with 0 representing "no pain" and 10 representing "the most pain possible." These scales may be used to assess pain in children ages eight years and older, provided they understand numbers, have the ability to express pain in quantitative terms, and can communicate verbally.[16]

Faces scales present children with drawings or photographs of facial expressions representing different levels of pain intensity. Children are asked to select the picture that best represents their pain. These easily reproduced scales require no quantitative reasoning on the part of the child.[16] Examples include the Wong–Baker FACES Pain Rating Scale, for use by children ages three to 18 years[31]; the Faces Pain Scale–Revised (FPS-R), for use by children ages four years and older[21]; and the Oucher Scale, for use by children ages three to 12 years.[19]

Visual analog scales (VAS) present children with a horizontal or vertical line, most commonly 100 mm in length, with anchors at each end indicating either "no pain" or "worst possible pain." The child makes a perpendicular mark on the line to indicate pain severity.[29] VAS scores demonstrate good interrater reliability and are sensitive to changes in pain following analgesic interventions.[33] These tools are appropriate for children eight years or older[29] and are easily reproduced, though photocopying may distort the line length.

Adjective scales require patients to select a word out of a list of adjectives that describe pain severity. These scales can be used to assess pain in patients with at least a high school level of verbal fluency, but their use in children is not recommended as it has not been widely studied.[16]

Graphic rating scales, such as the Pieces of Hurt tool, which is also known as the Poker Chip Tool, invite children to measure their pain intensity using four colored chips, each of which represents a "piece of hurt."[16, 17] One chip indicates "a little hurt" and four chips indicate "the most hurt" the child could have. This clinical assessment tool is most useful in determining the presence or absence of pain in young children. It was developed for use in children ages four through seven years, but has been used for acute procedural pain in patients as young as three years and as old as 18.[29]

Table 3. How to Conduct a Pain History for Children Experiencing Chronic Pain[18]

Elements of a Chronic Pain History	Questions to Ask the Child and Parent or Consistent Caregiver
Description of the pain	
• Type	Is the pain constant or recurrent?
• Onset	When did the pain begin? What were you doing before the pain started? Was there an injury, trauma, or stress when it started?
• Duration	How long have you experienced the pain?
• Frequency	How often is the pain present? Does it come and go or is it always there?
• Location	Where is the pain—can you point to the part of your body that hurts? Does it go anywhere else?
• Intensity	What is your usual pain level? Does this change with rest or activity? Over the past week, what is the least and worst pain you've had?
• Bothersome/unpleasantness	How much does your pain usually bother you? How unpleasant is your pain right now? Over the past week, how unpleasant has it been?
• Quality	Describe your pain. For example, is it sharp, dull, achy, stabbing, burning, shooting, or throbbing?
Associated symptoms	Are there any other symptoms that occur either before or after the pain (for example, do you experience nausea, vomiting, difficulty walking, tiredness, or dizziness)? Are there color or temperature changes that happen with the pain?
Temporal and seasonal variations	Do changes in the weather or seasons affect the pain?
Impact on daily living	Has the pain led to changes in your behavior or daily activities (for example, sleep disturbances or changes in appetite, mood, school attendance, or social interactions with peers)?
Pain relief measures	What makes your pain feel better? What medications have you taken to relieve your pain? If you have taken medications, did they help? Were there any unpleasant effects of these medications—physical or psychological?

SPECIAL POPULATIONS

Children who are cognitively impaired, sedated, or receiving mechanical ventilation, as well as premature infants and neonates, pose additional pain assessment challenges. On the assumption that pain induces alterations in the autonomic nervous system, physiological indicators are often embedded in the scales used to assess pain in these patients.

Cognitively or developmentally delayed children. These children are at elevated risk for undertreated pain owing to their neurologic impairments and limited ability to self-report pain. In addition to physiological cues, behavioral cues—such as facial expressions, vocalizations, changes in posture or movement, alterations in sleeping or eating patterns, feeding intolerance, and changes in mood or sociability, including irritability or reports of "not acting like themselves"—may be used to identify pain in these children.[34] For this reason, it's important for nurses to work in partnership with children's caregivers when conducting the initial

Table 4. Pediatric Pain Assessment Tools[1, 16, 17, 19-31]

Ages Studied	Assessment Tools
Preterm infants and neonates	**PIPP:** a behavioral–observational tool for both preterm and full-term neonates that includes seven indicators, scored from 0 to 4. **NIPS:** a behavioral–observational tool for both preterm and full-term neonates that includes six indicators, with five scored from 0 to 1 and one scored from 0 to 2. **CRIES tool:** a behavioral–observational tool for full-term neonates, with five indicators scored from 0 to 2.
3–35 months	**N-PASS:** a behavioral–observational tool used to assess both pain and sedation levels in infants 3 to 35 months of age.
2 months–18 years	**FLACC scale:** a behavioral–observational tool that includes five indicators scored from 0 to 2. Goals are to assess pain in children too young, distressed, restricted, or sedated to self-report their pain.
4 months–17 years	**CHEOPS:** a behavioral–observational tool with well-established reliability and validity for assessing procedural and postoperative pain.
3–18 years	**Pieces of Hurt tool (also known as the Poker Chip Tool):** a self-report tool, scored from 0 to 4, which has been validated for assessing acute and procedural pain. It has been translated into several languages. Between uses, cleaning is required. **Wong–Baker FACES Pain Rating Scale:** a self-report tool using six faces ranging from smiling to crying, scored from 0 to 5 with potential anchor effects. **Oucher Scale:** a self-report tool using photos of children's faces on one side and a corresponding numeric scale, labeled from 0 to 100 by tens, on the other. Photographs indicate pain severity ranging from no pain to most pain. On the corresponding numeric scale, 10 to 30 represents "little hurts" and 60 to 90 represents "big hurts," with 0 representing "no hurt" and 100 representing "the biggest hurt."
4 years and older	**FPS-R:** a self-report tool that uses depictions of six neutral faces ranging from no pain to most pain. It has been translated into several languages and is scored from 0 to 10. Because the anchor faces are neither smiling nor crying, the tool avoids the anchor effects that might conflate affective distress and pain.
8 years and older	**Numeric pain scales:** self-report tools requiring communication skills, understanding numbers, and the ability to think and express quantitatively. **VAS:** self-report tools displaying a horizontal or vertical line, usually 100 mm in length, with anchors at each end indicating "no pain" to "worst possible pain." The child makes a perpendicular mark on the line to indicate pain intensity. Problems with the tool include potential errors in the administrator's measurement of the distance from the anchors to the child's mark and possible distortions of the anchored line when the tool is photocopied for use.
Children on mechanical ventilation, all ages	**COMFORT Scale:** a behavioral–observational tool validated for use in children of all ages who are receiving mechanical ventilation. Eight physiological and behavioral indicators of pain are scored on a scale from 1 to 5. Administrator requires two hours of training.
Cognitively impaired patients, 4 to 21 years	**Revised FLACC scale:** a behavioral–observational tool for cognitively impaired children ages four and older that uses five indicators scored from 0 to 2. **NCCPC-R:** a behavioral–observational tool for children with neurologic or cognitive impairments and limited verbal skills. It is used to assess acute, postoperative, and chronic pain and includes seven subscales with a total of 30 items.

CHEOPS = Children's Hospital of Eastern Ontario Pain Scale; CRIES = Crying, Requires Increased Oxygen Administration, Increased Vital Signs, Expression, Sleeplessness; FLACC = Face, Legs, Activity, Cry, Consolability; FPS-R = Faces Pain Scale–Revised; NCCPC-R = Noncommunicating Children's Pain Checklist–Revised; NIPS = Neonatal Infant Pain Score; N-PASS = Neonatal Pain, Agitation, and Sedation Scale; PIPP = Premature Infant Pain Profile; VAS = visual analog scales.

baseline pain history and subsequent pain assessments. Well-validated tools for this patient population include the Noncommunicating Children's Pain Checklist–Revised (NCCPC–R)[20] and the revised FLACC.[25]

Infants and children who are sedated or receiving mechanical ventilation. Numerous factors influence the expression of pain in these children, making it difficult for caregivers to differentiate pain from distress, anxiety, or agitation. The COMFORT Scale, however, is the only tool validated for assessing pain in mechanically ventilated patients ages zero to 18 years and is particularly useful in pediatric ICUs.[1, 35]

Premature infants and neonates. These infants may be assessed with tools that combine behavioral and physiological indicators and are specific to such contextual factors as gestational age and sleep–wake state. These tools include the Premature Infant Pain Profile (PIPP),[28] Neonatal Infant Pain Score (NIPS),[24] Crying, Requires Increased Oxygen Administration, Increased Vital Signs, Expression, Sleeplessness (CRIES) tool,[23] and Neonatal Pain, Agitation, and Sedation Scale (N-PASS).[22]

PAIN ASSESSMENT FREQUENCY AND DOCUMENTATION

When a child is treated in a health care setting, pain should be assessed and documented at all of the following points[36, 37]:

- with any ED or ambulatory clinic visit
- on admission to the hospital or surgical center
- before, during, and after any procedure
- before and after any pain management intervention
- once per shift in an acute care setting, coinciding with routine assessments and patient care

PARTNERING WITH CAREGIVERS

Involving a child's parents or consistent caregivers is an important aspect of pain assessment and management. Since parents and caregivers are most familiar with a child's typical behavioral response to pain, they can often identify behaviors unique to the child and provide valuable "proxy reports" of the child's pain, though such proxy assessments should be combined with other types of assessment when possible.[38] Authors of a small qualitative study that investigated how parents of children with Down syndrome assess pain in their children and intervene to relieve it suggest that it may be even more important to involve parents of children who have difficulties with self-report in interpreting their child's behavior and identifying comfort strategies.[39]

Researchers studying parents' use of the FLACC scale and a 0 to 10 numeric scale to assess pain in their cognitively impaired children made the following observations, which support both construct and criterion validity of parental proxy pain ratings[40]:

- Parental ratings using the FLACC scale correlated well with parental ratings using the numeric scale.
- Parental ratings decreased significantly after analgesics had been given to the children.
- There was a high correlation between parents' and nurses' ratings using both tools, though there was slightly more agreement between parents' and nurses' FLACC ratings.

The Royal College of Nursing's clinical practice guideline, *The Recognition and Assessment of Acute Pain in Children*, defines parental (caregiver) involvement as a principle of practice.[41] It states that children and their families should be viewed as partners in care, involved in shared decision making for individualized pain assessments, and provided with training regarding the use of pain assessment tools.

The effectiveness of educating parents or caregivers in pain assessment and management was demonstrated in a 2003 study that included the parents of 51 children undergoing cardiac surgery.[42] Parents who were exposed preoperatively to educational material on pain assessment and management significantly increased their knowledge in these areas, as measured by improved pretest to posttest scores. By introducing educational materials that promote advocacy for the child and encouraging optimal communication between health care providers and the family, nurses can better involve parents and caregivers in the pain assessment and management processes. ▼

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- Read the article. Take the test for this CE activity online at www.nursingcenter.com/ce/ajn.
- You'll need to create and log in to your personal CE Planner account before taking online tests. Your planner will keep track of all your Lippincott Professional Development (LPD) online CE activities for you.
- There is only one correct answer for each question. The passing score for this test is 14 correct answers. If you pass, you can print your certificate of earned contact hours and the answer key. If you fail, you have the option of taking the test again at no additional cost.
- For questions, contact LPD: 1-800-787-8985.
- Registration deadline is March 5, 2021.

PROVIDER ACCREDITATION

LPD will award 1.5 contact hours for this continuing nursing education (CNE) activity. LPD is accredited as a provider of CNE by the American Nurses Credentialing Center's Commission on Accreditation.

This activity is also provider approved by the California Board of Registered Nursing, Provider Number CEP 11749 for 1.5 contact hours. LPD is also an approved provider of CNE by the District of Columbia, Georgia, and Florida #50-1223. Your certificate is valid in all states.

PAYMENT

The registration fee for this test is $17.95.