



EXPANDING OUR UNDERSTANDING, AND PERHAPS OUR EMPATHY, FOR A PATIENT'S PAIN

The universality of pain in human experience represents one of the few clinical problems that all critical care nurses share with their patients. We have all endured this “unpleasant sensory and emotional experience associated with actual or potential tissue damage”¹ called pain. We have also intentionally or not inflicted it, reacted to it, coped with it, bemoaned its return, and gratefully recognized its relief. Just as our patients, some of us are fortunate to have only experienced pain that is acute, whereas others suffer daily with its chronic form. In clinical interactions with our patients, we regularly invest considerable time and effort attempting to detect, assess, prevent, minimize, and otherwise manage our patients’ pain. Just as our personal beliefs and values may influence our practice of nursing, our personal knowledge and experiences with pain may color our sensitivity and responsiveness to our patients’ pain.

In spite of our personal familiarity with pain, however, our ability to accurately assess someone else’s pain is always challenging, owing to both the subjective and multifaceted nature of pain as well as to the lack of any objective means with which to validly and reliably measure another’s pain. As a result, our ability to effectively elicit, accurately capture, and fully understand a patient’s pain is inherently difficult even when patients are fully alert and able to articulate detailed explanations. When patients are critically ill, however, the occurrence of pain is high² and a wide array of clinical variables (eg, rapid

fluctuations in levels of consciousness and/or hemodynamics, oxygenation, sedation, mechanical ventilation) may alter, distort, diminish, or preclude a patient’s ability to communicate with caregivers regarding the discomfort.

When patients are not able to explain their pain, critical care nurses reach for one or more alternative means to assist in making these appraisals. Some recent announcements from the field of medical genetics now suggest that the pain assessment strategy for critically ill patients may need to make room for genetic variants. Although these findings are preliminary and beg for concurrence, their rapid transmission through the informal scientific community and popular press affords an opportunity to consider how they might be incorporated to better inform our current approaches to pain appraisal in the critically ill. Our sequential approach to pain assessment for critically ill patients might then resemble the basic hierarchical strategy suggested by Puntillo et al³ with a few additional aspects added for your consideration (Table 1).

Primacy of the Patient’s Self-Report of Pain

As McCaffery’s⁴ widely embraced definition of pain so eloquently relates, “Pain is whatever the experiencing person says it is, existing whenever he/she says it does.” The immediate corollaries that derive from this definition are (1) in the pain assessment process, the starting point should always be securing the patient’s description of what he is experiencing, and (2)

...the patient’s self-report of pain remains the gold standard for pain assessment across all patient populations.

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Table 1 Sequential approach to pain assessment for critically ill patients³

1. Make every effort to secure the patient's self-report of pain
 - a. Incorporate salient features traditionally used to distinguish different types of pain
 - b. Assess the person with pain rather than just the pain
 - c. For patients who are able to communicate with caregivers regarding their pain, use standardized and evidence-based approaches to pain assessment, whenever possible, to facilitate self-reports
2. For patients who are unable to participate in pain assessment, adopt tools designed for objective pain appraisal and determine their usefulness for critical care patient population(s)
3. When additional means of pain assessment are warranted, incorporate other empirical approaches to determine their usefulness
4. Always consider the possibility that additional factors blinded from the patient's awareness, the nurse's observations, and the parameters measured in existing instruments could be substantially influencing the patient's pain

among the multitude of indicators that may be available to health care professionals to characterize a patient's pain, the most valid, reliable, and useful index is the patient's own description of that pain. As a result, the patient's self-report of pain remains the gold standard for pain assessment across all patient populations.^{1,3}

Incorporating Traditional Attributes of Pain Assessment

Long before the proliferation of pain measurement instruments developed over the past few decades, clinicians queried patients regarding multiple attributes of their pain in order to accurately characterize the patient's situation and pain. The various dimensions of pain included in these appraisals are listed in Table 2.

These attributes of pain provide a more thorough clinical picture of the pain itself as well as the circumstances under which it arises and dissipates. In addition, whatever device the unit may be employing to assist in pain assessments may incorporate very few of these attributes, so reliance on such tools may neglect important features relevant to therapy. The limitation of including all of these features is that they focus solely on the pain, rather than on the entirety of the pain experience.

Assess the Person With Pain

Although pain often seizes attention as a singular, overwhelming sensory event, it remains a highly personal yet multifaceted phenomenon affected by a mosaic of influences on that experience.

Table 2 Attributes of pain

Location
Onset
Instigating factors
Duration
Temporal pattern
Nature: aching, pulling, sharp, dull, burning, tearing
Intensity/ severity
Accompanying factors
Aggravating factors
Alleviating factors
Response to therapy

Pain as an Experience

When the classic *Textbook of Pain*⁵ first appeared in 1984, physician coauthor Patrick Wall, himself in remission with metastatic cancer, shared a number of insights related to pain. One of his most enlightening conversations explained why the traditional view of pain as purely a sensation was erroneous. Pain, Wall contended, is itself an experience, colored by many influences that include our immediate circumstances, the urgency of competing priorities, observations of how others central to our lives respond, learned and observed gender-related responses, as well as ethnic, cultural, and, at times, geographical differences. As a result, one person severely injured in an automobile crash may silently yet swiftly use fractured extremities to extract their spouse and children from a burning vehicle, whereas another who incurs only superficial physical trauma in a comparable taxi accident with strangers may cry out loudly and continuously in pain, yet remain immobilized by the mere sight of blood splashed on them from another occupant's wounds. This more inclusive perspective of pain recognizes the personalized context within which it is always experienced.

According to the International Association for the Study of Pain,¹ pain is a complex subjective phenomenon uniquely experienced by each person and involving all domains of an individual's life, not just a physical pathology. Understanding and effectively managing pain requires accurate evaluation, not only of any organic pathology that may be responsible for the discomfort, but of any behavioral, psychosocial, demographic, or other factors that may contribute to the person's reported experience.

Factors That May Influence the Experience of Pain

Some of the psychological, behavioral, and demographic elements that affect how a person experiences, interprets, and reacts to pain are familiar to us; for example, our previous experiences with pain, the amount and nature of the discomfort, whether it was successfully treated, and how long it lasted (Table 3). Other factors may be appreciated from our nursing expertise; for example, knowledge of how the location of pain may escalate or minimize our concerns related to its clinical implications. Still other factors such as marital status, employment status, and body weight may be completely unfamiliar, so are never included in our patient assessments.

Standardized and Evidence-Based Approaches for Patients Who Can Communicate

Any patient who is experiencing considerable discomfort, especially for a prolonged period, will appreciate the nurse's assistance in characterizing the nature and extent of his/her pain in a manner that facilitates expeditious and effective amelioration. Numerous devices and approaches have been developed for this purpose. Of these, Puntillo et al³ distinguish 2 that may be particularly useful in assisting critically ill patients to provide self-reports of their pain: the Numeric Rating Scale (NRS) and the Finger Span Scale.

The NRS, the most frequently used of all pain scales, has ratings that range from 0 (no pain) to 10 (worst possible pain). Ratings between 0 and 5 would roughly correspond to nonexistent, mild, and moderate pain, whereas ratings between 5 and 10 would reflect moderate to severe to excruciating pain. At least 2 studies have confirmed the validity and reliability of the NRS for critically ill patient populations, one in a surgical intensive care unit (ICU)¹⁵ and another in a general ICU.¹⁶ As simple as this scale may appear to be, patients may not be able to hear or fully understand the nurse's request, may not be able to clearly see the print version of the scale, or may not understand explanations or instructions if these are provided too quickly or if their cognitive capacity limits their attention span. Therefore, critical care nurses may need to ensure that the NRS is presented to patients slowly, clearly, visually, and deliberately at sufficient volume so that patients are able to provide a reliable report of their pain. A body outline illustration may be included with the NRS to distinguish the location of the patient's discomfort. Patients receiving mechanical

Table 3 Factors that may influence the experience of pain

Nature, location, and intensity of discomfort
Past pain experiences
Duration of discomfort ⁶
Emotional factors such as mood ⁷
General mental health ⁸
Coping ⁹
Tendency to catastrophize pain (describe pain as terrible, horrible, the worst) ¹⁰
Beliefs and values ¹¹
Social and cultural background and upbringing ¹¹
Age ⁶
Gender ^{6,12}
Pain-related expectations and fear ¹⁰
Educational level, life satisfaction, and number of comorbidities ¹³
Body mass index, ⁶ obesity ¹⁴
Employment status ⁶
Marital status ⁶

ventilation may offer their self-report by pointing, blinking, or grasping the nurse's hand for the appropriate numerical rating.

The Finger Span Scale, developed by Merkel¹⁷ for use in young children, may also be adopted for critically ill patients when other approaches to pain assessment are ineffective. To use this scale, the evaluator holds the thumb and index finger of one hand together while relating that this indicates "no pain," then moves these fingers apart at small, moderate, and maximal distances to indicate increasing amounts of pain. Despite lack of validation for its use with adult critical care patients, the simplicity and ease of use of this scale favor reserving a place for this scale in pain assessment toolkits.

For critically ill patients who are able to communicate with care providers regarding their pain, numerous other pain measurement devices are available for potential application,¹⁸⁻²¹ including the familiar Visual Analog Scale²² and the Wong-Baker Faces Scale.²³

Objective Pain Appraisal Devices for Patients Who Cannot Communicate

When critically ill patients are not able to directly communicate about their pain to care providers, a variety of approaches that incorporate behavioral and

physiologic indices of pain (such as heart rate, respiratory rate, blood pressure) can be employed in an attempt to measure pain. Some of the nonverbal/behavioral markers identified as pain indicators include the following types of behaviors^{24,25}:

- Facial grimacing, closing eyes
- Vocal indicators, eg, moans, cries, groans, protests, cursing
- Bodily wincing
- Physical rigidity or bracing such as clutching siderails
- Restlessness or repetitive movements
- Rubbing affected area(s)

Just as verbal pronouncements of pain are widely variable among different patients, behavioral manifestations may also vary, rendering observations of overt behaviors less than reliable.

Three behavioral scales that have been used with critically ill patient populations are the Behavioral Pain Scale (BPS), the Critical-Care Pain Observation Tool (CPOT), and the Pain Assessment, Intervention, and Notation (PAIN) Algorithm. The BPS²⁶ examines a range of 4 behaviors across 3 attributes: facial expression (ranging from relaxed to grimacing), positioning of the upper limbs (ranging from no movement to permanently retracted), and compliance with ventilation (ranging from tolerating movement to unable to control ventilation). Its discriminant validity and inter-rater reliability have been verified,^{26,27} although its sensitivity may be diminished in patients having high NRS scores.¹⁶

Both the BPS and the CPOT were developed for critical care patients receiving mechanical ventilation and appraise comparable behavioral areas: facial expression, body movements, muscle tension, compliance with the ventilator (for intubated patients), or vocalizations. The CPOT²⁸ has demonstrated both criterion and discriminant validity and specificity as well as moderate inter-rater reliability.^{29,30} Although the PAIN Algorithm³¹ offers nurses a systematic structure for organizing and quantifying their appraisals of patients' pain, patients' responses to pain, selection of an appropriate analgesic, and patients' responses to the analgesic, its current format has been judged as too cumbersome and long for daily use in an ICU.

Remaining Options

When the measures already summarized are ineffective for assessing the patient's pain, some remaining options suggested in the literature include the following:

Surrogate (Family Members, Parents, Caregivers, Close Friends) Reporting of Pain and Behavior/Activity Changes.

Intimate familiarity with the patient may enable close family members or care providers to recognize subtle signs that the patient is experiencing pain and, if so, its relative severity.³² Parents and caregivers can be encouraged to actively participate in the assessment of pain in their loved one, but should not be made to feel as though this is their responsibility. Likewise, acting upon surrogates' appraisals in the administration or titration of medications remains the nurse's responsibility. It should also be recognized that some of those closest to the patient may not wish to participate in this aspect of care.

Attempting an Analgesic Trial. For patients who are not able to communicate with caregivers and in whom pain is either suspected or highly likely, an analgesic trial may be used to both confirm whether the patient is experiencing pain and, if so, to establish a baseline for analgesic management.³² When moderate or greater pain is anticipated, a low-dose opioid may be administered and, if no behavioral changes are observed, titrated higher until a therapeutic effect is noted or a maximal dose has been administered. If no desired effects are observed, other potential causes for the behaviors should be considered.

Genetic Influences on the Pain Experience

To reiterate an earlier point, the farther pain assessments are located from the patient's self-report, the less likely they are to be valid and reliable reflections of the patient's actual discomfort. Between the patient's self-report and detached appraisals such as analgesic trials and surrogate judgments lay an array of appraisal sources with diminishing likelihood of offering an accurate capture of the patient's experience. But what about a source originating even closer to the patient—that is, an influence on his/her pain experience that resides in his/her DNA? Should that influence warrant inclusion in a nurse's assessment of a patient's pain and, if so, how could it be accommodated?

Recent announcements in the scientific press heralded the discovery that "Pain perception [is] under genetic influence."³³ What preceded the headline was earlier studies^{34,35} that recognized that a gene named SCN9A, known to be responsible for at least 3 notable pain disorders in humans, plays a role in transmission

of nerve impulses along fibers that transmit pain. SCN9A normally encodes instructions for the sodium channels in pain fibers to open and close, thereby transmitting and then discontinuing pain transmission. Three faulty mutations of SCN9A are known to exist and 2 of these are associated with severe pain: one causes the sodium channels to open too soon, another is associated with the sodium channels not closing, and the third produces a protein that does not function at all, leaving a person without the ability to feel pain.

These findings led researchers at the Cambridge Institute for Medical Research in the United Kingdom to investigate whether single nucleotide polymorphisms (SNPs, small genetic variations that can exist in the DNA sequence³⁶) in the SCN9A gene were associated with varying degrees of pain perception in the general population. Their study examined the DNA of 578 adults with osteoarthritis and noted a number of intriguing findings³⁷:

- In patients with comparable degrees of severity in their osteoarthritis, some reported considerably more pain than others.
- When the genetic properties of SCN9A were examined in these patients, 2 variants of this gene were identified: the more common G (guanine) form and a rare A (adenine) form. (The genetic code is specified by the 4 nucleotide “letters” A [adenine], C [cytosine], T [thymine], and G [guanine]. SNP variation occurs when a single nucleotide replaces one of the other 3 nucleotides.) On average, patients with osteoarthritis who carried the A form reported pain that was more severe than patients who carried the G variant.
- When the study was repeated in other patients with different disorders, the same results were found in 2 groups (195 Finnish people with sciatica and 100 Danish amputees with phantom pain), and clear positive associations (though not statistically significant differences) were found in 2 other groups (179 people following lumbar discectomy for low back pain and 205 people with pancreatitis).
- When the data from all 5 groups (1277 total) were combined, the statistical significance of the A (adenine) variant of SCN9A association with people who experience more severe pain was clear (combined $P = .0001$).

- A final study component confirmed this association in 186 healthy women who were subjected to a set of noxious heat stimuli.

The authors concluded that individuals experience differing amounts of pain on the basis of whether they have the A variant of SCN9A.

As compelling as findings of that nature may sound, however, genetic factors need to be weighed as carefully as any other before reaching conclusions regarding the importance of their effects. A few admonitions worth contemplating include the following:

- Nielsen et al³⁸ caution against generalizing genetic findings across pain modalities because findings differ based on the pain modality used in the study as well as on the pain scales employed, further supporting the validity of subjective pain reports for measuring experienced pain.
- Another admonition from Holliday et al,³⁹ particularly apt for those who minister to critical care patient populations, cautions against attributing genetic influences to pain experiences when these may actually be associated with comorbidities.

Summary

These studies support that there is a growing body of evidence showing that the human experience of pain occurs under some degree of genetic influence and that once the mechanisms involved in these interactions are understood, possibilities open for identifying alternative and more effective avenues for achieving analgesia than are currently available. They also remind us that other factors outside the patient’s awareness, invisible to the nurse’s observations, and not monitored in existing measurement devices may substantially enhance or diminish a patient’s pain experience. When in doubt or bereft of hard data, critical care nurses should look to the patient first, last, and always give him/her the benefit of the doubt. CCI



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Editor's Note

In the April 2010 editorial, "Converting Presentations Into Journal Articles: A Guide for Nurses," Table 6 (Differences between presentations and articles) appeared online only. To consult this resource for converting presentations into manuscripts for publication, go to <http://ccn.aacnjournals.org/cgi/content/full/30/2/8/T6>.