

An Eternal Challenge: Assessment and Documentation of Acute Pain In the Emergency Setting



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Abstract

Acutely painful injuries and illnesses are frequently under treated in the emergency department (ED), which indicates need for higher level of education and training about the management of acute pain. Assessment comes first in order to manage and alleviate the actual sensation of pain of the patient. Evaluation of pain should be taken as a part of the “standard of care” for EDs worldwide. The patients’ perception of pain should be recorded upon the first encounter with the patient. The efficient management of pain in the acute setting requires proper evaluation as indicated via the patient’s own statements, using a validated pain scale. The objective of this review is to highlight the current status of the assessment of pain with special emphasis on certain techniques of evaluation, difficulties and opportunities thereof. Their use should inform our daily routine and pave the way to necessary improvements in the emergency evaluation and treatment of pain.

Keywords: Analgesia; Pain assessment; Pain management; Pain scale; Acute pain

Introduction

As a unique and subjective individual experience, acute pain is among the commonest chief complaints reported by a majority of patients who are admitted to the emergency department (ED), while its perception and expression have great variations between countries [1]. The International Association for the Study of Pain (IASP) has described it as ‘an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage’ [2]. In the 17th century, poet and artist John Dryden (1631–1701) cited that “pain is the most common symptom reported to physicians; more than 80% of all patients who see physicians do so because of pain” [3]. Within the last two decades, pain management policies put forward by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) have become standard. In these guidelines, implementation of this standard in routine clinical practice comprised the acceptance of pain as the fifth vital sign recorded in the initial assessment; the use of pain intensity ratings; and posting of a statement on the management of pain in all settings.

The manifestation of pain in the acute condition is related to the location, quality and severity of the negative feeling. Some authors supported the utilization of physiological variables to assess the quality of pain. Physiological clues such as tachycardia,

hypertension or restlessness may help determine the requirement for pain management in intubated or agitated/incoherent patients [4]. Additional findings that suggest pain in the unconscious patient may be agitation, sweating, pallor, pupillary dilatation, moaning, grimacing and flinching [5]. Furthermore, abdominal and thoracic pain may result in decline of tidal volume, vital capacity, and finally, alveolar hypoventilation [6]. Pain also stimulates intestinal secretions and increase smooth muscle sphincter tone. Boosted systemic vascular resistance and changes in sympathetic tone caused by pain can disguise volume depletion, thus may hinder adequate fluid resuscitation. In addition, persistent pain stimulates the pituitary-adrenal axis, which can inhibit the immune system and result in protracted wound healing and a propensity to postsurgical infection. Although there seems to be a consensus among medical disciplines to address its importance, one cannot yet claim that all healthcare personnel behave within standards in every real life situations worldwide.

Perception and Assessment of Pain in the Acutely Ill

Pain is what the patient tells it is. On the other hand, a myriad of psychological, sociocultural, time-dependent and conditional variables affects how people feel and describe their pain. Age, sex, ethnicity, associated psychiatric problems and socio-economic status of the patient are some of the factors which

affect the magnitude and quality of an individual expresses his/her complaints. Subjective and multidimensional nature of the pain experience render evaluation of pain really challenging. The patient's perception and description of pain includes the sensory, emotional, psychological, and cultural components of the pain experience, therefore it cannot be defined via the unidimensional tools typically used in practice. Two decades ago, Raftery et al. [7] pointed out that women reported the severity of pain more commonly than males did and therefore received more pain medications [7]. Thus the painful experience is a unique case for each individual, which warrants use of different tools of assessment in the routine practice.

There are at least 3 major foundations for prioritizing pain assessment:

- a. Medical care quality,
- b. Patient satisfaction, and
- c. Compliance with regulatory requirements for assessing and documenting pain levels [8].

Thus, evaluation of pain is thought a part of the "standard of care" for EDs worldwide. In accord with this concept, the Agency for Health Care Policy and Research in the US pointed out that management of pain necessitate cooperation between all members of the health care team throughout the patient's course of treatment [9]. The association between pain severity and treatment requirements can be intervened by many factors inherent in the patient and the disease. Patients, families, nurses, and physicians feel better about pain care when pain levels are assessed [10-12]. Supplemented with regular pain reassessments, the schedule of pain reassessment should be driven by patients' pain severity [10].

When should the patients' pain be queried?

"Pain cannot be treated if it cannot be assessed". Pain should be assessed and documented within a short time after admission. Emergency healthcare personnel should address and record the patient's pain and discuss the plan for treatment whether or not pain is treated. The patients' perception of pain should be documented during the initial assessment of a patient. Current evidence provides a general recommendation that pain needs to be evaluated and managed within 20-25 minutes of initial healthcare provider assessment in the ED [13].

In a prospective, convenience-sample trial of all-diagnosis adults with pain at least 3/10, Lozner et al. demonstrated that ED patients' preference for pain assessment is approximately 15 min, with more frequent intervals preferred when pain is severe [10]. Hatherley et al. [14] reviewed 15 researches to examine best practice related to acute pain assessment, documentation and management [14]. They postulated that mandating pain score reporting, pain assessment and reevaluation within predefined timeframes and analgesia within 30 min of admission would be most appropriate. They also pointed out that a higher incidence

of pain assessment, reassessment and pain score documentation was well correlated with decreased time to analgesia. Nurse-led analgesia protocols are to be encouraged to increase incidence of documented pain assessment and shorten time to analgesia.

Pain scores and documentation of pain

Clinicians should evaluate and record their patients' pain levels, no matter which method or scale one uses to accomplish this task [15]. One definition of measurement is 'the assignment of numbers to objects or events to represent quantities of attributes according to rules' [16]. Children or patients with altered mental status are among these for whom pain assessment can represent a challenge [17]. Special scales developed and validated for patients with difficult communication are available, and ED physicians should have a plan for assessing pain in different case scenarios. Conscious patients are able to express and quantify their pain depending on personal characteristics, educational background, age, sex and other factors. The patient's self-report is the most accurate and reliable proof of the presence of pain and its intensity, and this holds true for patients of all ages, regardless of communication or cognitive deficits [18]. When the patient is capable of reporting pain, the patient's behavior or vital signs should never be used instead of self-report.

In the absence of objective measures, the clinician must depend on the patient to supply key information on the localization, quality and severity of the pain. Although physicians commonly question the reported severity and rely on their own estimates, the value of the patients' description of the location and nature of the discomfort has been proved on the theoretical basis and routine practice [19]. Interestingly, many researchers cited that physicians and nurses mostly underestimate and undertreat the patients' pain. Specific evidence undoubtedly indicates that physicians hardly predict how much pain their patients are feeling [20-23].

Scales devised to estimate and/or express the patient's pain can be evaluated in two groups: Unidimensional and multidimensional measures. It should be noted that unidimensional scales measure only intensity, they cannot be viewed as a comprehensive pain assessment. Comprehensive pain assessment is expected to encompass both the unidimensional measurement of pain intensity and the multidimensional evaluation of the pain perception.

The unidimensional pain intensity scales commonly used bedside are:

- a. Numeric Rating Scale (NRS),
- b. Visual Analog Scale (VAS),
- c. Verbal Descriptor Scale (VDS).

The Visual Analog Scale (VAS): It is the most widely used tool for estimating both severity of pain and to judge the extent of pain relief [24-26]. Healthcare worker asks the patient to select a point on a line drawn between two ends to express how intense he/she perceives pain (Figure 1). The VAS is an easy-to-use

instrument which does not warrant using a sophisticated device. It is also highly sensitive in detecting treatment effects, and its results can be analysed by parametric tests [25,27]. Although this tool is suitable for use with older children and adults, the need for a marking and for being able to visualize and mark the line, can make the VAS impractical to use in the emergency situation.

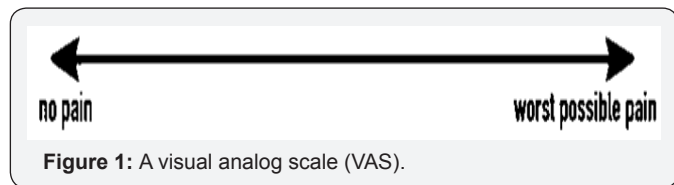


Figure 1: A visual analog scale (VAS).

However, there is a tendency to overestimate the clinical importance of a small difference in VAS score. Since the recorded statistical differences might not represent clinically important changes in pain or truly meaningful differences to patients, considerable emphasis has been put on measuring the “minimum clinically significant difference” (MCSD) in acute analgesia research [24,25,28-30]. The term MCSD is used to describe the change in pain necessary to be perceived clinically by the patient and was measured as 13 mm on a 100 mm VAS, while physician-perceived change was measured as high as 18mm [25]. This phenomenon may suggest physicians are somewhat likely to underestimate the changes of pain in their patients. The MCSD of ED patients with nontraumatic thoracoabdominal pain in Turkey is 24.2 mm and it is not affected by gender, age, level of education, location, or duration of pain [31].

The numeric rating scale (NRS): It is broadly validated instrument across a wide array of patient types. Data obtained via NRS are easily documented, intuitively interpretable, and meet regulatory requirements for pain assessment and documentation [32]. To date, findings demonstrated that even in the chaotic prehospital phase most acute care patients allow evaluation via a simple “zero-to-10 scale” or NRS reliably, respecting their pain levels [33]. Evidence indicated that patients really want to give a pain number, rather than simply relate whether they want analgesia.

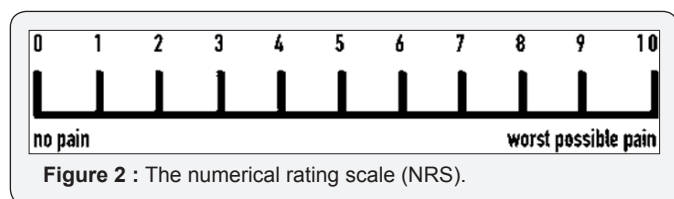


Figure 2 : The numerical rating scale (NRS).

NRS is a commonly used tool necessitating the patient rate his pain on a scale from 0 to 10, with 0 indicating no pain and 10 reflecting the worst possible pain (Figure 2). NRS are often conducted as a scale from 1 to 10 which does not give the patient a solution to indicate no pain at all. It can be used with children who are able to understand numbers. The pain scores are interpreted as:

- a. 0 = no pain
- b. 1-3 = mild pain

- c. 4-6 = moderate pain
- d. 7-10 = severe pain

NRS can be used with most children older than 8 years of age, and behavioral observation scales are required for those unable to provide a self-report [34]. For patients with cancer-related pain, the NRS is the most frequently used instrument to measure pain intensity [35].

Verbal pain scores (VPSs), Verbal rating scales (VRS) or Verbal Descriptor Scales: These tools may discern those patients who suffer from pain but who may not express their discomfort, as well as influence the physician to inquire about the patient’s pain. A prospective study introducing VPSs in an ED revealed that of those trauma patients who had VPS scores documented, 60% received analgesics versus 33% in those who did not have a VPS score documented [36]. Furthermore, those with higher VPS scores were more likely to receive analgesics. Todd et al. [37] disclosed that in patients who were not treated with analgesics, 42% desired them, but only one-third of the sample voiced their concern [37].

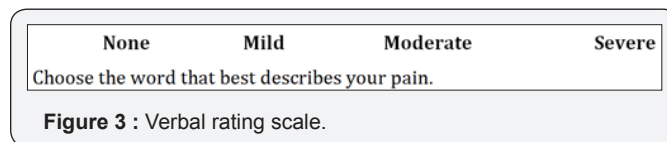


Figure 3 : Verbal rating scale.

Pines et al. [38] reported that ED crowding has been demonstrated to boost time to analgesic administration and death rate. The use of VPS in this setting may identify those individuals in need of more expedient treatment. Verbal rating scales (VRS) or Verbal Descriptor Scales consist of a number of statements describing increasing pain intensities (Figure 3). Patients are told to choose the word which best describes their pain intensity. The number of descriptors used has ranged from four (none, mild, moderate, severe) to 15 [39]. For patients who have limited literacy or cognitive impairment, use of these scales may be difficult, and they do not provide the number of choices available with the VAS or NRS, thus potentially limiting precision [40].

McLean et al. [33] conducted a retrospective cross-sectional study of emergency medical services (EMS) run sheets after the adoption of a universal prehospital pain assessment protocol [33]. Prehospital pain assessment using a VRS and NRS was feasible in this patient population. The greatest risk factor for being unable to assess and record pain levels was altered mental status (39% of those not assessed). Among patients reporting pain, one-fifth completed a VRS but not a NRS.

Some investigators tried to compare pain scales used in the acute care setting and to find out which performed best in the management of the patients. In a recent study Bahreini et al. [41] compared three self-report pain scales in adults with acute pain [41]. VAS, Color Analog Scale (CAS), and verbally administered NRS were found to have strong correlation between each other. The authors concluded that the three scales can be interchangeably

applied for acute pain assessment in adult patients. Likewise, Hjermstad et al. [42] performed a comparison study of unidimensional pain scales as part of the work of the European Palliative Care Research Collaborative on pain assessment [42]. They reported that NRSs had better compliance in 15 of 19 studies reporting pain intensity, when compared to the VAS and VRS, and thus were the instrument of choice in 11 studies on the basis of higher compliance rates, better responsiveness and ease of use, and better applicability relative to VAS and/or VRS. On the other hand, 29 studies yielded no preference.

Non-Verbal Scale

Faces Pain Scale - Revised (FPS-R): It is a self-report measure of pain intensity developed for young children [43]. It was adapted from the FPS to enable scoring and recording the severity of pain on the widely accepted 0-to-10 metric (Figure 4) [44]. The scale consists of six faces showing progressive pain intensities, beginning with a smiling face and ending with a crying face. The scale shows a close linear relationship with VAS between the ages of 4 and 16 years. Main advantages include ease of application and lack of additional requirements for usage except for the photocopied faces and a marker to accomplish the task in the busy ED environment.

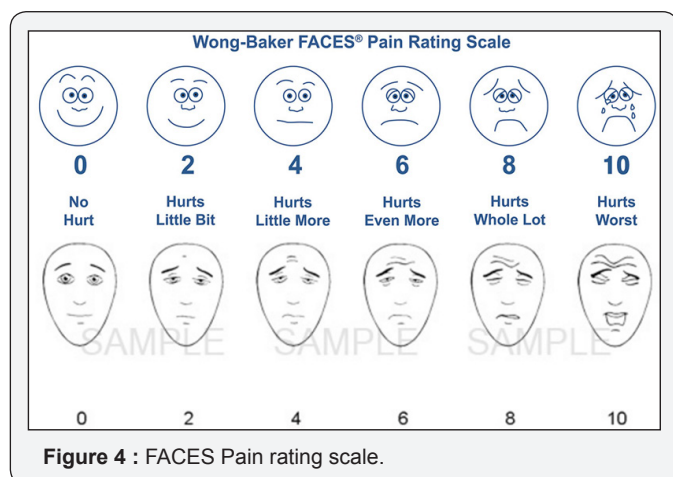


Figure 4 : FACES Pain rating scale.

Moutte et al. [45] conducted a study using a prestructured questionnaire on 75 emergency physicians in Norway [45]. They reported that a pain scale with a VAS had been used by 59% of physicians in patients between 9 to 19 years of age, by 23% in children aged 3 to 8 years, and by 3 % in children below 3 years. Emergency physicians report a need for pain assessment procedures in children and youth. Olsen et al. [46] conducted a study to measure the impact of implementing a pain management algorithm in adult intensive care unit (ICU) patients expressing their pain. The number of pain assessments was higher in the intervention group compared with the control group. Interestingly, duration of ventilation and length of ICU stay decreased significantly in the intervention group compared with the control group. Several outcome variables were significantly improved after implementation of the algorithm compared with the control group. Instruments for behavioral assessment

are helpful in detecting the magnitude of pain and evaluating approaches to treatment.

These scales are of two types:

- Pain behavior scales, and
- Pain behavior checklists.

Some of these scales are scored by identifying the number or intensity of behaviors. However, no research as yet confirms that a pain behavior score is a pain intensity score [47]. Therefore, it is unsafe to use pain behavior scores as pain intensity scores. A patient with only a few behaviors may have as much pain as a patient with many more behaviors. An example of a pain behavior scale is the Behavioral Pain Scale (BPS), developed for use in the critically ill patient in the ICU [48]. It evaluates and scores three categories of behavior:

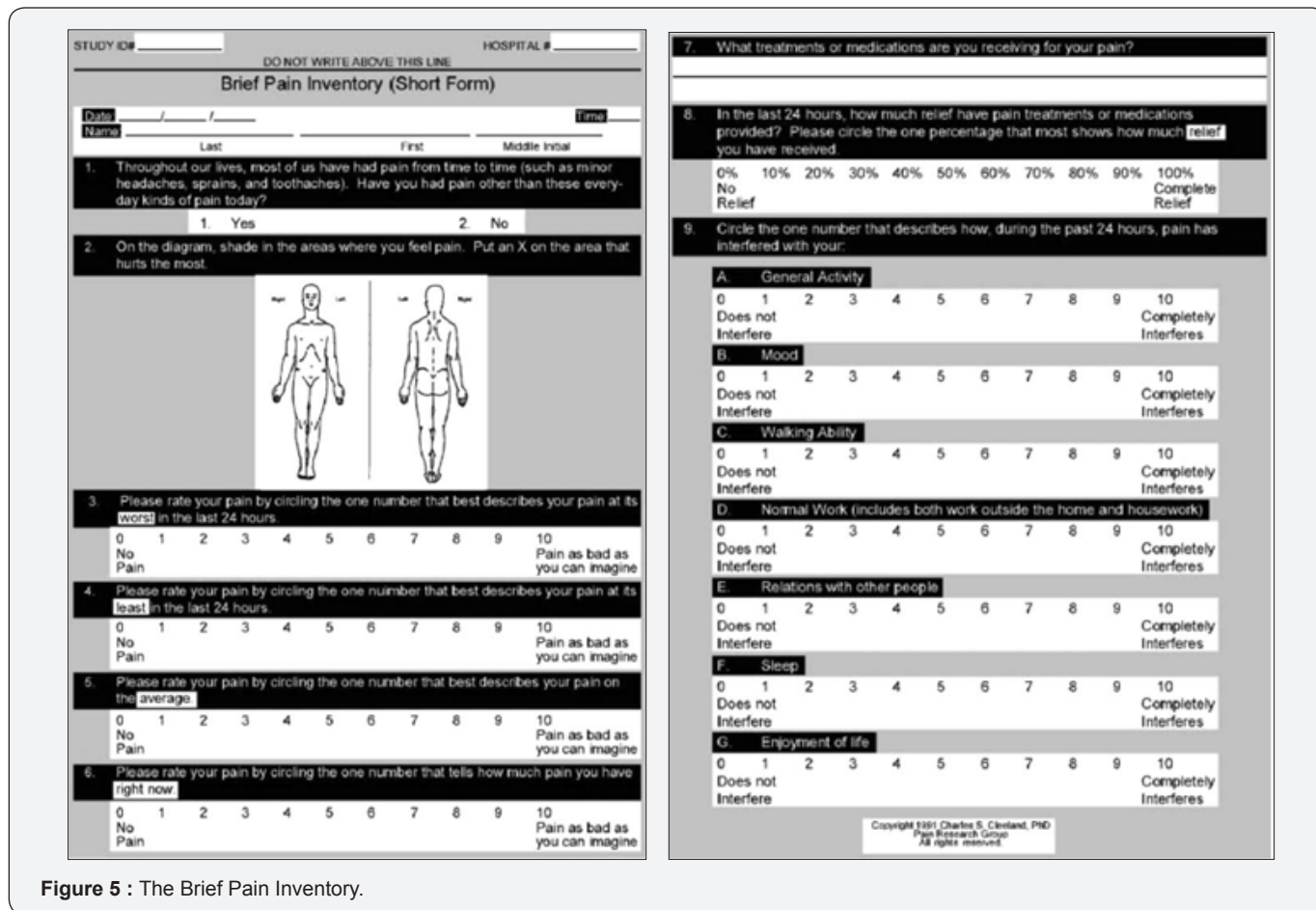
- Facial expression, scores range from 1 for relaxed to 4 for grimacing
- Upper-limb movement, scores range from 1 for no movement to 4 for permanently retracted
- Ventilator compliance, scores range from 1 for tolerating ventilator to 4 for unable to control ventilation

A score above 3 may indicate pain is present and the score can be used to evaluate intervention, but cannot be interpreted to mean pain intensity. For a pain behavior scale to be useful, the patient must be able to respond in all categories of behavior. For example, the BPS would be useless in a patient who is receiving a neuromuscular blocking agent. Brief Pain Inventory (BPI) is a self-administered, validated questionnaire available in many languages and was originally used to assess pain intensity and location as well as pain-related functional interference among cancer patients (Figure 5) [49]. It was also translated and validated in different cultures and disease settings. In a recent study conducted on Thai cardiac patients, Keawnantawat et al. [50] reported that the BPI-T also has good internal consistency (Cronbach's alpha coefficients 0.76 and 0.85) [50]. Pearson's correlation coefficients at 0.35 to 0.70 supported the convergent validity to the NRS.

The functional interference section of the BPI assesses the impact of pain on various aspects of daily functioning. Using a 0 to 10 scale (0=does not interfere, 10=completely interferes), the patient is asked to rate the degree to which pain interferes with seven functions during the past 24 hours: general activity, mood, walking ability, normal work, relations with other people, sleep, and enjoyment of life [51]. Investigators have modified the original BPI interference scale to include additional domains such as recreational and social activities as well as self-care [52,53]. Lapane et al. [54] compared two-factor representation (pain intensity and interference) and three-factor representation (pain intensity, activity interference, and affective interference) of the modified BPI and reported that a two-factor representation of BPI is appropriate among cancer patients [54]. In an analysis involving

data from four countries, the scale displayed internal stability coefficients from 0.86 to 0.91 [55]. Test-retest reliability at 30

minutes was found to be excellent in one German study($r=0.97$) [56].



Cross-cultural and sociodemographic differences in pain assessment: Dale et al. [57] put forward that women had a higher probability of not being inquired about pain, but there was no difference in the ratio of patients asked about pain with respect to age. Additionally, patients with hypoxia and hypotension were less likely to be cared about their pain. They concluded that evaluation and treatment of pain in the ED are insufficient and not fully compatible with the local protocols. A focus on strategies to improve pain treatment in the ED is a necessary aspect of developing sufficient care.

A study on cancer-related pain from Netherlands reported that measurement of “acceptable pain intensity” is feasible and almost half of the patients scored their acceptable pain in the range of moderate to severe [35]. Recent reports launch considerable aid derived from technological advances in the assessment and recording of pain. Kos et al. [58] conducted a cross-sectional observational study using smartphones and tablets to score statements assessing fatigue, pain, anxiety and quality of life on an electronic visual analogue scale (eVAS) [58]. They concluded that eVAS are reliable and useful for people with multiple sclerosis to register their complaints. Arthur et al. [12] conducted a pilot

project to reveal the feasibility of the tablet computer-based automated pain tracker (APT) and to assess patient and nurse satisfaction with the device. All of the subjects indicated the APT was easy to use, and 28 of 30 subjects (93%) thought the APT should be used more frequently in the ED. They concluded that the iPad pain-tracking and reporting-system provided higher patient satisfaction, improved pain care, operational efficiency, and better documentation of pain evaluation and management.

Finally, a very recent systematic review analysed the VAS, the VRS and the NRS to determine the compliance and usability different among scales. The authors pointed out that all three scales are valid, reliable and appropriate for use in clinical practice, although the VAS faces more difficulties than the others. For general purposes the NRS has good sensitivity and generates data that can be analysed for audit purposes [59].

Conclusion

“Pain cannot be treated if it cannot be assessed”. The most important principle is that clinicians should somehow assess their patients’ pain levels, no matter which method or scale one uses to accomplish this task. Special scales developed and validated

for patients with difficult communication are available, and ED physicians should have a plan for assessing pain in different case scenarios. Finally, ongoing research in the area of acute pain management should be conducted.

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