

# The Reality of Pain Scoring in the Emergency Department: Findings From a Multiple Case Study Design



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**Study objective:** Documentation of pain severity with pain scores is recommended within emergency departments (EDs) to improve consistency of assessment and management of pain. Pain scores are used in treatment guidelines and triage algorithms to determine pain management and in audit and research to evaluate pain management practices. Despite significant debate of their benefits, there has been limited evaluation of their use in practice. We use naturalistic, qualitative methods to understand how pain scores are used in practice and the mechanisms by which pain scoring may influence pain management.

**Methods:** We undertook a multiple case study design, using qualitative research in 3 EDs in England (the cases). Case studies incorporated 143 hours of nonparticipant observation, documentary analysis, and semistructured interviews with 36 staff and 19 patients. Data were analyzed with thematic analysis.

**Results:** Analysis identified that ED staff used the pain score for 2 conflicting purposes: as an auditable tool for guiding patient management and as a tool for monitoring patient experience. This led to ED staff’s facing conflict between reporting their own judgment of what the pain score ought to be and what the patient said it was. Staff justified recording their own judgment according to concerns of accountability and appropriateness of management decisions. Staff thought that pain scoring had value in raising awareness and prompting action.

**Conclusion:** In practice, pain scoring may not accurately reflect patient experience. Using pain scoring to determine the appropriateness of triage and treatment decisions reduces its validity as a measure of patient experience. Pain scoring should not be central to audit and systems of accountability for pain management. [Ann Emerg Med. 2019;74:538-548.]

Please see page 539 for the Editor’s Capsule Summary of this article.

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## INTRODUCTION

### Background

Validated pain scale assessment tools (pain scores) such as the verbal rating scale or numeric rating scales (score from 0 to 10) are advocated as simple and quick for measuring pain within the context of short patient-clinician interactions within the emergency department (ED).<sup>1-3</sup> Pain scoring is strongly advocated within interventions to improve pain management and at an organizational level as a means to assess patients’ pain, measure improvements in it, and document its assessment.<sup>3-5</sup> A systematic review of interventions to improve pain management reported that almost half of the interventions incorporated pain scoring either as a stand-alone intervention or as part of a multifaceted intervention.<sup>6</sup> The review demonstrated that, although increasing visibility and access to pain scoring tools improved documentation of pain, there was

inconsistent evidence of a corresponding improvement in patient access to analgesia.

Despite recommendations that pain scoring be used within EDs, the theories underpinning pain scoring interventions are not well elucidated within studies and it is unclear how assessment of pain affects its management. Pain scores are variably advocated as useful for enabling consistent pain assessment across different providers, determining the type of analgesia to administer and urgency of pain relief, and enabling recognition of pain.<sup>7-9</sup>

### Importance

In recent years, the use of the 0-to-10 pain score as a useful measure of pain has been questioned, with an increasing realization that pain scores may not be accurate reflections of patients’ pain.<sup>10-13</sup> Reliance on

### Editor’s Capsule Summary

#### *What is already known on this topic*

Assessing pain with a score is common in emergency department (ED) care, but the use of the measure is not well described.

#### *What question this study addressed*

How do ED providers perceive and use pain score data?

#### *What this study adds to our knowledge*

Using a qualitative case vignette–based study of 36 providers and 19 patients in 3 EDs in England, the authors found staff use the scores to guide care and assess patient experience, but often are conflicted about the patient’s reported score and their perceptions of the patient’s pain intensity.

#### *How this is relevant to clinical practice*

Using ED pain scores to assess care quality is fraught with misaligned patient and provider views.

the patient-reported pain score to determine treatment has been partially blamed for the opioid crisis in the United States because of the need for staff to respond to pain scores to comply with departmental goals and concern about patient complaints.<sup>10,12</sup> However, studies worldwide continue to report on the prevalence of pain and oligoanalgesia with pain scores as an objective measure of pain, and pain score is central to many guidelines and protocols for management of pain within the ED.<sup>4,14-17</sup> Pain scoring is also used within audits of appropriateness of pain management and in defining adequate analgesia.<sup>18-20</sup>

Existing research relating to the use of the pain score focuses on its accuracy and defining clinically valid reductions in pain for the purposes of research.<sup>8,21-25</sup> However, there has been limited research exploring how the pain score is actually used in clinical practice that can contribute to understanding the value of pain scoring in improving pain management within the ED.

### Goals of This Investigation

We used qualitative research within EDs to explore barriers and enablers to pain management and to understand the role of pain scoring within ED pain management. Specifically, we used qualitative research methods to explore staff and patient perceptions of the pain score, understand how it is used in practice, and

understand the mechanisms by which the pain score could influence how pain is managed.

## MATERIALS AND METHODS

### Study Design and Setting

We used an inductive, naturalistic methodology, with an exploratory multiple case study design.<sup>26,27</sup> Case study methodology was chosen to enable detailed exploration of contextual factors influencing pain management, using a combination of different data sources. Case study research is different from the study of individual cases in clinical practice. It incorporates multiple sources of evidence and uses a naturalistic design to explain, describe, or explore an event or phenomenon in detail and in its natural context, being particularly useful in answering “how” and “why” questions.<sup>27,28</sup> Case studies incorporated direct elicitation methods (semistructured and informal interviews), unobtrusive data collection methods (documentary analysis), and nonparticipant observation to understand how staff used the pain score within their practice and how this influenced subsequent management decisions. Each source of data offers different perspectives and complementary evidence that help to construct an understanding of the issue under study.

We selected the cases (3 EDs in England) in which to undertake the case studies from national survey data. We selected EDs with different levels of pain management, according to national ED survey patient-reported outcome measures relating to whether patients thought staff did everything they could to manage their pain, and audit data of proportions of patients with fracture neck of femur who received analgesia within 60 minutes, both from 2012.<sup>29,30</sup> EDs were chosen to enable a range of barriers and enablers to be explored. EDs 1 and 2 represented sites with “good” and “poor” pain management, respectively, and site 3 was used initially as a pilot site and then expanded to allow emerging theories to be tested. The study was approved by the National Research Ethics Service Committee Yorkshire and The Humber–South Yorkshire National Health Service research ethics committee. A Patient and Public Involvement user group was set up to support the study.<sup>31</sup> The group advised on documents related to ethical approval, discussions of emerging themes within analysis, and discussions of early drafts of results.

Patients arrive at the ED by ambulance (transported patients) or self-referral (walk-in patients) and are triaged on arrival, with guidelines recommending triage within 20 minutes of arrival. Guidelines recommend analgesia according to a pain ladder, and simple analgesia may be

prescribed and administered by nurses without physician input (see [Table 1](#) for details by ED). At fieldwork, none of the case study EDs allowed nurses to prescribe intravenous opiates. Pain scoring is not mandated at a national level, although guidance on management of acute pain in adults from the Royal College of Emergency Medicine recommends that the pain assessment be undertaken and provides treatment recommendations for patients according to pain score severity, rated 0 to 10 (0=no pain, 1 to 3=mild pain, 4 to 6=moderate pain, and 7 to 10=severe pain). Guidelines suggest that the “experience of the staff triaging will help in estimating the severity of the pain.”

### Selection of Participants

EDs were invited to participate by e-mail, and a key informant at each site was identified to help oversee data collection. Data collection incorporated semistructured interviews with 20 emergency physicians, 16 nurses, and 19 patients. Documentary analysis included anonymized patient notes, audits, guidelines or protocols, patient information leaflets, and any other documentation relating to pain management visible within the department or referenced by staff. Staff interviews were undertaken either by telephone (n=9) or face-to-face within private areas of the department (n=27). Patients were initially approached while in the department, and interviews were undertaken by telephone at a later date, except for one interview that was face-to-face. (See [Appendix E1](#), available online at <http://www.annemergmed.com>, for details of participants.)

### Data Collection and Processing

Topic guides and data collection techniques were developed and tested within a pilot phase. These pilot data were incorporated into the data corpus because pilot data within qualitative research can be valuable as a result of the ongoing process of theory generation. Nonparticipant observation was undertaken by one researcher (F.C.S.) within all areas of the ED, although it was focused around initial assessment areas (triage rooms and ambulance handover), staff bases within the major and minor areas, and resuscitation rooms. Data collection took place between September 2014 and July 2016 and incorporated 143 hours of observation. F.C.S. examined processes for pain management and communication of pain management, and focused on staff-staff and patient-staff interactions relating to how pain management was negotiated and delivered. Informal conversations were used to clarify understanding of observations and to enable more open answers than more formal interviews provide.

Semistructured interviews with both staff and patients were based on topic guides (see [Appendix E1](#), available online at <http://www.annemergmed.com>), but discussions evolved naturally and included unscripted questions to allow exploration of emerging concepts. To ensure representation of different perspectives, staff were sampled purposively to incorporate different roles, sexes, and seniority. Data collection continued until thematic saturation was reached. During semistructured interviews, participants explained how they assessed pain and how they would use pain scoring within their assessment of pain. They also provided explanations of how specific pain scores were decided in informal conversations after observation of pain scores was documented.

Extensive notes were made and typed in detail at regular intervals during and after observation. Reflexive notes were kept alongside the observation notes and a reflexive journal was kept to incorporate initial thoughts and developing findings. All semistructured interviews were audio recorded and transcribed verbatim by a third party. Interview transcripts were read and checked for accuracy against the original recording.

### Primary Data Analysis

Data were analyzed with thematic analysis, following the principles of Braun and Clarke.<sup>32</sup> The process of analysis was ongoing throughout all stages of the research, from the development of the topic guides to the interpretation of analytic themes once data collection had been completed. The concurrent process of analysis is particularly important within case study research to focus data collection and follow up new theories that develop throughout the process of fieldwork.<sup>33</sup> Throughout the process of data collection and analysis, attention was paid to how the data were collected, why particular events were being noted, what was being recorded, and in particular whether aspects of pain management were being missed. Themes that were developed from the data after initial fieldwork were explored within further fieldwork visits at each site, and fieldwork continued until thematic saturation was reached (ie, when new data no longer provided new significant insights).

Transcripts, documentation documents, and field notes were coded in NVIVO (version 10; QSR International, Warrington, UK). Subsets of interview transcripts and observation notes were shared between authors and with 2 members of the Patient and Public Involvement group, and emerging themes were discussed.

Reflexivity was important throughout the process. The principal researcher who undertook the fieldwork (F.C.S.) is a social scientist who had no experience of working within the ED. This enabled a naive stance that was not

overly influenced by previous conceptions of the setting. S.W.G. is a practicing emergency physician and emergency medicine professor and A.O.C. is a social scientist and professor of health services research. Reflexivity was practiced throughout to understand the influence of changing perspectives toward the research to be considered, and to reflect upon potential researcher biases.

A number of cross-cutting themes were developed from the data. This article is based on themes related to pain assessment, treatment, and management decisions and the use of the pain score within the ED.

## RESULTS

The 3 sites were urban type 1\* EDs in England, serving British populations with a white majority (>90%). The broad context of pain management in UK EDs is described

within the “Materials and Methods” section. Further details of ED characteristics, including triage procedures, nurse prescribing, and audits relating to pain management for each ED, are described in Table 1.

\*A type 1 ED is defined as “[a] consultant led 24 hour service with full resuscitation facilities and designated accommodation for the reception of accident and emergency patients” (<https://www.england.nhs.uk/statistics/wp-content/uploads/sites/2/2013/03/AE-Attendances-Emergency-Definitions-v2.0-Final.pdf>).

In accordance with triangulation of data sources, we present 5 overarching themes relating to how ED staff use the pain score.

The first theme is variation in use of the pain score in each ED. The use of nonparticipant observation and documentary analysis demonstrated differences in the processes for pain management and in how pain

**Table 1.** Characteristics of EDs.

ED Characteristic	Case 1	Case 2	Case 3
Setting	Urban, serving population of approximately 200,000	Urban, serving population of approximately 330,000	Urban, serving population of approximately 550,000
Patient population	Mixed adults and pediatrics	Mixed adults and pediatrics	Adults only; <16 y attend specialist children’s hospital <4 miles away
Major trauma center/unit*	Major trauma unit, 5 miles from major trauma center	Major trauma unit, 16 miles from major trauma center	Major trauma center
Annual attendance <sup>†</sup>	60,000–65,000	80,000–85,000	140,000–145,000
Patients >70 y, † %	20	24	22
Triage procedures	Patients brought in by ambulance were triaged by senior nurse coordinator. Walk-in patients were triaged in a separate area by triage nurses.	Patients brought in by ambulance and walk-in patients triaged in the same area by triage nurses	Patients brought in by ambulance were triaged by a senior physician during the daytime and a senior nurse after hours. Walk-in patients were triaged in a separate area by triage nurses.
Nurse prescribing	All triage nurses can prescribe acetaminophen, nonsteroidal anti-inflammatory drugs, and codeine. Nurses also able to prescribe repeated analgesia within the ED.	Some triage nurses can prescribe acetaminophen and nonsteroidal anti-inflammatory drugs. Nurses were not able to use PGDs within other areas of the ED.	All triage nurses able to prescribe acetaminophen, nonsteroidal anti-inflammatory drugs, and co-codamol (acetaminophen and codeine combined)
Clinical audit of pain management	Audits of pain management in triage undertaken every 2 y and results fed back to nursing staff. Copy of audit report provided to fieldworker.	Lead physician referenced an audit relating to pain management, but other key staff had no awareness that an audit had taken place.	Clinical audit undertaken 2 y previously. This highlighted the need to improve documentation of pain and provision of analgesia in triage. Copy of audit report provided to fieldworker.

PGD, Patient group directions.

\*In the United Kingdom, the Major Trauma Network has 27 major trauma centers that manage severe trauma, supported by major trauma units at EDs without a major trauma center.

†Statistics from Health and Social Care Information Centre 2012/13. Provider-level analysis for hospital episode statistics 2012 to 2013.<sup>48</sup>

assessment tools were used and recorded between the different sites (Table 2). Sites differed in whether they recorded the numeric rating scale (score of 0 to 10) or the verbal rating scale (none, mild, moderate, or severe).

There were inconsistencies in how pain score was recorded between EDs, between staff within EDs, and between periods within EDs (ie, how it was recorded at triage and later in the patient’s progress through treatment). Although some staff were observed to document the patient-reported score, others documented their own formulated score, which they described as being based on a combination of factors incorporating patient report, physiologic and behavioral signs, and known painful conditions (eg, fracture).

*Nurse coordinator explaining how she had decided on the pain score for a transported patient who had not been asked for one. “I gave her [pointing to the form] a 3 because she was laughing and joking.” (Observation, case study 1, visit 3)*

At all 3 EDs, some staff were observed to document direct patient report, whereas others documented their own judgment, although the ratio of direct patient report and clinician judgment varied between sites.

The second theme was that the reductive process of pain scoring may not capture pain experience. During observation of ambulance handovers and triage interactions, the pain score documented did not appear to reflect the complex nature of the patient’s pain experience and was often interpreted by a member of staff and documented without any patient input. During brief patient handovers or triage interactions, staff spent little time probing or clarifying details of the patient’s pain at initial assessment. Pain scores were often formulated by “eyeballing” (physician, site 1) the patient, particularly when triage notes were written up after ambulance handovers had been undertaken.

*“I make it up. It’s my best guess from what paramedics tell me, and what [the patients] look like, and what their observations tell me.” (Observation, informal)*

**Table 2.** Procedures relating to pain assessment at case study sites.

Pain Assessment Procedures	Site 1	Site 2	Site 3
Out-of-hospital pain assessment tool	NRS score	NRS score	NRS score
Triage pain assessment tool	NRS score	VRS score	VRS score. NRS introduced during fieldwork.
Documented pain scoring mandatory/optional at initial assessment	Mandatory	Optional	Optional. Mandatory NRS score introduced during fieldwork.
Observations of pain assessment at initial assessment	Patients were rarely asked for their score even though it was mandatory, but walk-in patients were always asked about pain. Patients brought in by ambulance were not always asked about pain if it was not mentioned during patient handover. Staff usually recorded their own judgment.	Patients were not always asked about pain at initial assessment. When patients did not mention pain, staff usually did not ask about the presence of pain. When pain was discussed, staff did not always document pain severity.	After the introduction of the mandatory 0–10 score, staff nearly always asked about pain, often prompted by the computer. They usually (but not always) documented patient-reported pain score and were observed to sometimes check the “unable to assess” option without asking the patient.
Discriminator in triage	Yes. Patients with severe pain (score $\geq 7$ ) allocated higher-priority code.	Yes. Patients with severe pain allocated higher-priority code.	Yes. Patients with severe pain allocated higher-priority code.
Pain assessment tool used within observations charts	NRS score included within early warning score charts and observed to be completed along with other observations. Nursing staff recorded patient-reported score.	NRS score was not included within the main early warning score chart but was available on the reverse of the EWS documentation. It was observed to be rarely completed.	Electronic system introduced during fieldwork, so notes not available to observe

NRS, Numeric rating scale; VRS, verbal rating scale; EWS, early warning score.

*conversation with nurse coordinator, case study 1, visit 2)*

Patients used a variety of terms to describe their pain, usually in terms of functionality, such as “I could hardly move” or “I was struggling to breathe.” When patients were not asked the score, or were unable or unwilling to formulate a score themselves, staff translated descriptions of pain severity, such as “agony,” “sore,” and “really painful,” into what they perceived to be an appropriate score that would “fit” the mandated pain score box within the triage documentation.

*Paramedic handover. Male, 65 years old, fall. Paramedic reads out observations and safeguarding information. The emergency physician at triage asks for the pain score. Paramedic says, “He aches everywhere, but for a pain score?” in a questioning voice, looking at the emergency physician. They both look at the screen and the emergency physician writes “2” in the box. The paramedic looks at it and nods in agreement. (Observation, case study 3, visit 6)*

Similarly, in observations, staff appeared uncertain about how to document more complicated pain than the one-dimensional pain score would allow, such as fluctuating pain (eg, pain coming in waves, worsening on movement). Staff also lacked clarity about whether pain should be recorded at the assessment or at its worst (eg, before out-of-hospital analgesia) and made their own judgment at documentation, often documenting the lowest of the potential scores.

*(Observation at ambulance coordinator station) 5:10 pm Handover. Patient with history of anxiety-related chest pain. Reads out observations. “When she’s not in pain, it’s 1; when it’s high, it’s 7.” Physician enters “1” in the pain score box. (Observation, case study 3, visit 5)*

The third theme dealt with differing staff and patient understandings of the scores. Staff recognized that pain was subjective and difficult to assess but considered there to be a disconnection between staff and patient understanding of pain scores, with patients unable to understand the concept of the pain score sufficiently to provide useful estimates of their pain. Patients were perceived as exaggerating for the purposes of receiving particular analgesia or quicker treatment, or considered to have “genuine” pain but unable to accurately articulate it because of a lack of knowledge of “real pain” to use as a comparator.

*“Well, if it’s a 10, if it’s not a 10, you can see, you know, they’re not in childbirth. If they are a 10, they are tachycardic, pale, sweaty, rolling around in agony. Some*

*people can’t figure it out; they just can’t accurately record what it is.” (Semistructured interview, case study 3, senior nurse)*

Staff and patients both used similar reference points to formulate pain scores, reporting using their own experience of pain (eg, “never known pain like it”) and notional perceptions of what constituted pain that was “as bad as it gets” (eg, childbirth, dying) to formulate a score. Staff perceptions of being able to provide more “accurate” assessments of pain scores appeared to be guided by knowledge of how scores translated into treatment or management decisions (ie, how analgesia requirements mapped to pain scores). Patients did not have this same point of reference and provided pain scores that did not necessarily map to their descriptions of the pain or the recommended treatment for the pain score. For example, the patient represented in the quote below gave a pain score that would be classified as moderate to high pain by staff following pain management guidelines, yet described this as “not that painful.”

*(Observation at triage)*

*9:45 pm Triage patient concerned about a lump in her throat that made swallowing difficult.*

*Nurse: “Pain score out of 10?”*

*Patient: “I would say about 6. It’s not that painful.”*

*Nurse: “Would you like any painkillers?”*

*Patient: “No, I don’t like taking painkillers.”*

*(Observation, case study 3, visit 5)*

Staff appeared to rely on tacit knowledge or intuition when managing pain, particularly when assessing patients’ pain and judging the appropriate level of analgesia to use. They described a tacit understanding of patients’ pain (“you just know”) as an understanding gained from experience. Staff appeared to accept that, with experience, they could “read [the patient’s] level of pain accurately” (site 1, junior physician) and develop an implicit, true understanding of pain severity, independent of patient report. Although they understood the concept that pain levels should be judged by patient report, there was a common perception that these patient-reported scores could not be wholly trusted, as this senior physician reported:

*“Um, on the face of it, it is all down to patients’ perception of their pain, and that will always be the official answer, I guess. The reality is that it is a*

*combination of the patients’ perception of their pain and whether you believe it or not.” (Semistructured interview, case study 3, senior physician)*

The fourth theme was that the implications of the pain score for prioritization and treatment influenced whether staff recorded the patient report or their own judgment. The use of observation and informal conversations alongside semistructured interviews revealed a difference between how staff reported that pain scores were used and how they were observed to be used in practice. The pain score was described within interviews and informal conversations as an important discriminator and central to the triage process, guiding urgency of management and used to guide treatment decisions. However, in practice, when there were consequences to documenting scores that staff perceived to be inaccurate, they were observed to document their own judgment of patient scores rather than patient report. In these instances, documentation of pain score appeared to reflect other concerns or pressures within the department rather than just the patient experience of pain.

When pain scores were used as a discriminator in triage, the documented scores were influenced by other clinical factors relating to perceived urgency of the condition and the availability of beds in the department. In this context, pain scores were adjusted downward when there were perceived negative consequences to inputting a high pain score and concerns that patients overestimating or exaggerating their pain score would be assigned to triage categories inappropriate to the level of care participants considered justified or manageable by the department.

*Triage coordinator explaining how pain scores are coded: “If they say they are a 7, that would put them in the triage category of ‘immediate, prealert,’ so we code as a 4 if the patient isn’t really unwell so as not to increase the triage score.” (Observation, case study 1, visit 1)*

Similarly, patient-reported pain scores were adjusted upward when there were no other obvious discriminators that staff could use to increase the priority of patients who they perceived required more urgent care.

*(Observation of nurse coordinator completing the triage assessment form after handover from ambulance staff)*

*Interviewer: “How did you decide on his pain score?”*

*Nurse: “I put it as a 7 to make sure he was a category 2 as the injury was a bite, which didn’t meet the criteria*

*for a 2 and would probably go into the system as a category 4, which needs to be seen within 3 hours. If I know they have to come in as a P2, then I will get them to come in as a P2.... In some categories, the only way to do it [increase the priority] is to up their pain score.” (Observation, case study 1, visit 3)*

Staff described within semistructured interviews how they used a “mental mapping” (senior physician, site 2) of the pain score and pain ladder (as referenced within pain management guidelines) to guide treatment decisions, yet in practice they were observed to document pain scores to reflect the analgesia staff considered appropriate or feasible. In practice, staff revealed a reliance on tacit understanding of patient’s level of pain and intuitive judgment of pain score rather than the patient report to guide treatment decisions.

*“Um, 9 times out of 10 it will be, whatever score it is—I will go with my gut feeling anyway. I might give paracetamol to an 8 of 10 if I think there’s a lot of exaggeration or I might give morphine to someone with a pain score of 2 of 10 and might think they are being strangely stoic, you know, and I’m worried about their pain. So it tends to be just on judgment.” (Semistructured interview, case study 2, senior nurse)*

Treatment decisions appeared to be made according to a tacit understanding of the analgesia required, incorporating previous analgesia given, interactions with other medications, allergies and patient preference, safety concerns, and practical considerations such as availability of appropriate analgesia or staff to administer analgesia. When treatment decisions were related to pain scores, staff were conscious of not documenting a score that would be inappropriate for the treatment provided.

In the following observation, the patient was showing many of the signs that staff used to judge pain, yet the documented pain score was based on the treatment the nurse could provide rather than patient report.

*(Observation, sitting in triage) 9:33 pm. Female patient presenting with abdominal pain. Describes how she has been to the [physician] earlier and had blood tests. Says she has never been in this much pain, stabbing pain and uncomfortable. Keeps bending over, clutching herself and breathing heavily. The nurse asks her a number of questions about her pain. The patient says she has been having pain around 6 months, but this is worse and not touched by painkillers. She took co-codamol at [8:15 PM]. She reports a pain score of 5 when asked how bad it is at the moment out of 10.*

...The nurse documented a pain score of 2 and allocated triage category 3. She later explained her judgment of her pain score and management was based partly on her having pain for 6 months and partly because the patient had already had co-codamol, so she would only be able to prescribe ibuprofen, which would irritate, so the patient would have to wait for the physicians to see her. (Observation, case study 1, visit 3)

Concerns about drug-seeking behavior also appeared to lead to staff downgrading of patient-reported pain because high scores would require prescription of opioids.

[Chatting with nurse in minor care unit who had expressed concern about a patient asking for codeine] “I asked why the previous patient hadn’t been given codeine and she said, ‘You can’t give codeine for a 3 of 10, which is why I coded him as a 3.’” (Observation, case study 1, visit 1)

The fifth theme was the value of pain scores. The pain score appeared to be useful for raising awareness, prompting action, and understanding changes in patients’ pain. During observations, there was evidence that the patient-reported pain score was being used as a relative measure to communicate improvements in pain after treatment. Staff also thought that the inclusion of mandated pain score at initial assessment acted as a reminder and was considered helpful in raising awareness of patients’ pain.

S3S8: “It’s good that they do pain score on here [pointing to the computer] because it forces you to consider it.” (Informal conversation, case study 3, senior nurse)

Documentation of pain scores was also reported as “difficult to ignore” in terms of prompting action, and documentation of high levels of pain was observed to make staff question why patients had not received analgesia. Staff addressed concerns of “inaccurate” pain scores by using qualifying information to provide justification for treatment.

However, the need for the score to have external meaning led to staff frustration at having to document a score that they perceived to be inaccurate. Throughout fieldwork, staff perceptions of the score appeared to be guided by consideration of the score as an absolute rather than relative measure because of the need for the score to have “meaning” in guiding treatment and management, and being auditable.

(Observation. A staff nurse, an agency nurse, and an emergency physician were standing by the staff base,

discussing a patient in pain whom the agency nurse had just been to see. The emergency physician was writing a prescription for the patient.) [Emergency physician] asked [agency nurse] for the pain score. [Agency nurse] laughed, saying she didn’t know because she hadn’t asked. The staff nurse turned around and pointed out, “That’s what you’re supposed to do.” The agency nurse said she was going to say 9 because the patient was in a lot of pain and crawling about on the floor. The emergency physician interrupted, saying that she had to ask the patient. The agency nurse argued that the patient would say 10, as they always do. The emergency physician replied, “But that’s OK because you can measure it and then you can ask them again later and see if the pain relief is working. The score to us is meaningless but it means something to the patient; you can see if it goes down that way.” The nurses nodded as if to say this made sense, looking interested. (Observation, case study 3, visit 3)

## LIMITATIONS

Threats to validity include the lack of researcher triangulation; fieldwork was undertaken by one researcher, which may be considered a limitation because of the limited field of vision that a single researcher provides. To counter this, samples of fieldwork notes and interview transcripts were shared with coauthors and with members of the Patient and Public Involvement group to discuss interpretation of events and emerging themes.

The EDs within this study were UK National Health Service EDs within busy, urban areas, operating within the context of high demand and pressures to maintain patient flow, which may affect transferability of findings to EDs in rural areas or where there is less pressure to maintain patient flow. The description of the 3 EDs and context of pain scoring in the UK can help others to consider transferability to their setting. Differences in how pain scores were used between sites suggest that the use of the pain score is influenced by processes and contextual factors within each ED. However, the cross-cutting themes relating to how staff conceptualized the pain score, and issues around opioid dependence coupled with other literature on this subject, suggest that findings are likely to be transferable to other settings. Racial disparities in pain management are well documented within the literature but did not arise within this fieldwork, potentially because of the predominantly white populations served by the EDs in this study. Undertaking similar fieldwork within EDs serving more



diverse populations may further understanding of potential racial disparities in pain scoring, particularly when staff use their own judgment of pain scores.

## DISCUSSION

Our analysis suggests that ED staff used the pain score for 2 conflicting purposes: as a tool for measuring patient experience and as an auditable tool for guiding management. These dual purposes of the pain score led to ED staff’s facing conflict between reporting their own judgment of what the pain score ought to be and what the patient said it was. Staff justified documentation of their own judgment of pain score according to concerns of accountability and appropriateness within the context of the wider ED work. By conceptualizing the pain score as an absolute measure that should be accurately reported rather than a relative measure that has no external meaning but enables changes in pain to be monitored, ED staff were documenting scores that may not be appropriate for assessing whether analgesia has been effective. This documentation of staff judgment is particularly problematic within the ED, where pain scores are likely to be recorded by different staff throughout the patient’s progression through treatment.

To our knowledge, this study is novel in using observational qualitative methods to understand how pain scoring is used in practice within EDs. The triangulation of data sources of nonparticipant observation, documentary analysis, and semistructured staff interviews within the multiple case study design enabled a comprehensive analysis of how pain scores were used in practice in 3 EDs in England. The combination of interviews and nonparticipant observation in particular revealed important differences between the rhetoric of how pain scores were used in theory and how staff documented and used them in practice.

A notable finding from the case studies was that staff value their own judgment of pain over patient report when documenting pain scores because of an implicit belief that they can judge the “correct” pain score. Qualitative studies of barriers and enablers to pain management in the ED have also highlighted staff reluctance to accept patient-reported scores when assessing pain.<sup>34-37</sup> Similarly, in their exploration of pain assessment at triage in the ED, Vuille et al<sup>38</sup> concluded that nursing staff cannot suspend their own judgment of patients’ pain when assessing pain. The prevalence of studies reporting differences in how patients and ED staff estimate pain scores and that also report under- or overestimation of pain also supports the notion that an implicitly correct level of pain exists, but that staff and patients differ in their estimates.<sup>8,21,24,39-41</sup>

de C Williams et al<sup>42</sup> explored how patients with chronic pain incorporate multiple factors into their formulated pain scores in an attempt to construct some external meaning that can make their pain level understood. However, within the brief patient-staff interactions of the ED, external meaning is difficult to construct or share. The adjustment of patient-reported scores, coupled with the rapid interaction of pain assessment and reductive process of pain scoring that does not accurately reflect the patient experience, may explain why increasing the use of pain scoring may not routinely lead to improvements in pain management. The pain score is a tool for quantifying a sensation that is fundamentally subjective and unquantifiable; the process of pain scoring may not significantly improve the ability of staff to understand and respond to patients’ pain.

We are not aware of any other studies reporting our finding that staff variably document their own assessment of pain scores and those reported by the patient. However, other studies have reported that physicians and nurses document pain assessment without asking patients about pain, suggesting that documented scores may reflect staff judgment rather than patient report.<sup>43,44</sup> Ambiguity within current guidelines about whether pain scores should be documented according to patient report or a combination of patient report and staff judgment suggests that practice will be variable.

Staff judgment of pain is problematic when triage categories use pain scores as a discriminator. Although triage systems incorporate pain scores in an attempt to provide prioritization on the basis of pain, this research demonstrated how staff documented pain scores to validate their management decisions rather than using patient-reported pain scores to guide their management. Berben et al<sup>37</sup> also identified staff concerns about the effect of intertwined triage and pain assessment, with high pain scores resulting in triage categories that were considered to be inappropriate by staff, suggesting that the need to seek external validity for the score identified within this study was reflected in other settings. Similarly, Bergman<sup>36</sup> reported that nursing staff in an ED documented scores because it was enforced rather than because they were useful, and nurses’ own judgments were used to guide treatment. Solberg et al<sup>45</sup> recommend that measures not be used for service accountability or research purposes (ie, the pain score as an absolute measure) at the same time as for improvement purposes (ie, the score as a relative measure).

The reductive process of pain scoring as a poor proxy for capturing pain experience described within this study is consistent with other qualitative research incorporating ED patients. Smith et al<sup>46</sup> reported that patients wished

physicians would delve deeper into the functional impairment and what pain means for the patient rather than focusing on the 0-to-10 pain scale. Goransson et al<sup>47</sup> reported that ED patients were unsure of the ability of the pain scale to reflect their pain because of subjectivity of pain, difficulty in rating fluctuating pain, missing details of settings or history of pain, and difficulty in imagining what maximum pain would feel like. However, as a reminder to assess pain severity and highlight a need for analgesia, mandating the use of pain scores appeared to be of value in guiding staff to undertake assessment. Jones et al<sup>11</sup> similarly commented on the importance of using pain scores as a method of highlighting the problem: “[T]he patient who is rating pain 11/10 has clearly got a message for us: ‘I need your help.’”

The findings of this study have a number of important implications for future use of the pain score within the ED. By demonstrating how staff documentation of pain scores is influenced by wider concerns of appropriateness and accountability, this research suggests that using retrospectively documented pain score as a basis for accountability and for audit and research may be inappropriate. Pain scores should be considered relative—not absolute—measures, and staff should be encouraged to document patient report to enable changes in pain level to be monitored throughout care. Systems of accountability should not be based on pain scores but on other outcome measures; notably, whether patient expectations of pain management have been met. This should remove existing conflict that arises when triage systems or treatment decisions are audited according to patient-reported scores.

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## REFERENCES

1. Curtis LA, Morrell TD. Pain management in the emergency department. *Emerg Med Pract*. 2006;8:1-28.
2. Karcioğlu O, Topacoglu H, Dikme O, et al. A systematic review of the pain scales in adults: which to use? *Am J Emerg Med*. 2018;36:707-714.
3. Hatherley C, Jennings N, Cross R. Time to analgesia and pain score documentation best practice standards for the emergency department: a literature review. *Australas Emerg Nurs J*. 2016;19:26-36.
4. France J, Smith S, Smith L. *Management of Pain in Adults*. London, England: College of Emergency Medicine; 2014.
5. Doherty S, Knott J, Bennetts S, et al. National project seeking to improve pain management in the emergency department setting: findings from the NHMRC-NICS National Pain Management Initiative. *Emerg Med Australas*. 2013;25:120-126.
6. Sampson FC, Goodacre SW, O’Cathain A. Interventions to improve the management of pain in emergency departments: systematic review and narrative synthesis. *Emerg Med J*. 2014;31:e9-e18.
7. Joint Commission on the Accreditation of Healthcare Organizations. *Standards, Intents, Examples and Scoring Questions for Pain Assessment and Management*. Oakbrook Terrace, IL: JCAHO Department of Standard; 1999:1-11.

8. Baharuddin KA, Mohamad N, Nik Abdul Rahman NH, et al. Assessing patient pain scores in the emergency department. *Malays J Med Sci*. 2010;17:17-22.
9. Jadav MA, Lloyd G, McLauchlan C, et al. Routine pain scoring does not improve analgesia provision for children in the emergency department. *Emerg Med J*. 2009;26:695-697.
10. Green SM, Krauss BS. The numeric scoring of pain: this practice rates a zero out of ten. *Ann Emerg Med*. 2016;67:573-574.
11. Jones LE, Whitburn LY, Davey M, et al. Numeric scoring of pain still has value. *Ann Emerg Med*. 2016;67:679-680.
12. Ducharme J. Why is improving pain care so hard? *Emerg Med Australas*. 2013;25:110-111.
13. Schiavenato M, Craig KD. Pain assessment as a social transaction. Beyond the “gold standard.” *Clin J Pain*. 2010;26:667-676.
14. National Institute of Clinical Studies. *Emergency Care Acute Pain Management Manual*. Canberra, Australia: National Health & Medical Research Council; 2011.
15. Fosnocht DE, Swanson ER. Use of a triage pain protocol in the ED. *Am J Emerg Med*. 2007;25:791-793.
16. Ridderikhof ML, Schyns FJ, Schep NW, et al. Emergency department pain management in adult patients with traumatic injuries before and after implementation of a nurse-initiated pain treatment protocol utilizing fentanyl for severe pain. *J Emerg Med*. 2017;52:417-425.
17. Barksdale AN, Hackman JL, Williams K, et al. ED triage pain protocol reduces time to receiving analgesics in patients with painful conditions. *Am J Emerg Med*. 2016;34:2362-2366.
18. Taylor DM, Fatovich DM, Finucci DP, et al. Best-practice pain management in the emergency department: a cluster-randomised, controlled, intervention trial. *Emerg Med Australas*. 2015;27:447-549.
19. New Zealand Emergency Medicine Network; Shorter Stays in Emergency Department National Research Project Group. National audit of the quality of pain relief provided in emergency departments in Aotearoa, New Zealand: the PRIZED 1 study. *Emerg Med Australas*. 2017;29:165-172.
20. Thornton HS, Reynolds J, Coats T. A week of pain in the emergency department. *Br J Pain*. 2018;12:58-63.
21. Marquie L, Raufaste E, Lauque D, et al. Pain rating by patients and physicians: evidence of systematic pain miscalibration. *Pain*. 2003;102:289-296.
22. Marco CA, Nagel J, Klink E, et al. Factors associated with self-reported pain scores among ED patients. *Am J Emerg Med*. 2012;30:331-337.
23. Stalnikowicz R, Mahamid R, Kaspi S, et al. Undertreatment of acute pain in the emergency department: a challenge. *Int J Qual Health Care*. 2005;17:173-176.
24. Modanloo M, Abdollahi H, Behnampour N. Agreement of pain assessment between nurses and patients in the emergency department. Presented at: Critical Care Conference: 31st International Symposium on Intensive Care and Emergency Medicine; March 22-25, 2011; Brussels, Belgium.
25. Bijur PE, Latimer CT, Gallagher EJ. Validation of a verbally administered numerical rating scale of acute pain for use in the emergency department. *Acad Emerg Med*. 2003;10:390-392.
26. Eisenhardt KM. Building theories from case study research. *Acad Management Rev*. 1989;14:532-550.
27. Yin RK. *Case Study Research Design and Methods*. 3rd ed. Thousand Oaks, CA: Sage; 2003.
28. Crowe S, Cresswell K, Robertson A, et al. The case study approach. *BMC Med Res Methodol*. 2011;11:100.
29. The College of Emergency Medicine. CEM Clinical Audits Fracture Neck of Femur, 2012-13. Available at: <https://www.rcem.ac.uk/docs/Previous%20Audits/CEM6880-CEM-FNOF-Audit-2012.pdf>. Accessed March 13, 2019.
30. Howell E. *Key Findings Report for the 2008 Emergency Department Survey*. Oxford, England: Picker Institute Europe; 2009.
31. Involve. National Institute for Health Research. Available at: <https://www.invo.org.uk/find-out-more/how-to-involve-people/information-for-researchers>. Accessed March 13, 2019.
32. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3:77-101.
33. Merriam SB. *Qualitative Research and Case Study Applications in Education*. San Francisco, CA: Jossey-Bass; 1998.
34. Shaban RZ, Holzhauser K, Gillespie K, et al. Characteristics of effective interventions supporting quality pain management in Australian emergency departments: an exploratory study. *Australas Emerg Nurs J*. 2012;15:23-30.
35. Gorawara-Bhat R, Wong A, Dale W, et al. Nurses’ perceptions of pain management for older-patients in the emergency department: a qualitative study. *Patient Educ Couns*. 2017;100:231-241.
36. Bergman CL. Emergency nurses’ perceived barriers to demonstrating caring when managing adult patients’ pain. *J Emerg Nurs*. 2012;38:218-225.
37. Berben SA, Meijs TH, van Grunsven PM, et al. Facilitators and barriers in pain management for trauma patients in the chain of emergency care. *Injury*. 2012;43:1397-1402.
38. Vuille M, Foerster M, Foucault E, et al. Pain assessment by emergency nurses at triage in the emergency department: a qualitative study. *J Clin Nurs*. 2018;27:669-676.
39. Mills AM, Shofer FS, Chen EH, et al. The association between emergency department crowding and analgesia administration in acute abdominal pain patients. *Acad Emerg Med*. 2009;16:603-608.
40. Pierik JG, Ijzerman MJ, Gaakeer MI, et al. Painful discrimination in the emergency department: risk factors for underassessment of patients’ pain by nurses. *J Emerg Nurs*. 2017;43:228-238.
41. Puntillo K, Neighbor M, O’Neil N, et al. Accuracy of emergency nurses in assessment of patients’ pain. *Pain Manage Nurs*. 2003;4:171-175.
42. Williams ACD, Davies HT, Chadury Y. Simple pain rating scales hide complex idiosyncratic meanings. *Pain*. 2000;85:457-463.
43. Chisholm CD, Weaver CS, Whenmouth LF, et al. A comparison of observed versus documented physician assessment and treatment of pain: the physician record does not reflect the reality. *Ann Emerg Med*. 2008;52:383-389.
44. Cummings J. An ethnography of the culture of pain in a non-pediatric emergency department. *J Pediatr Health Care*. 2013;27:322-323.
45. Solberg LI, Mosser G, McDonald S. The three faces of performance measurement: improvement, accountability, and research. *Jt Comm J Qual Improv*. 1997;23:135-147.
46. Smith RJ, Rhodes K, Paciotti B, et al. Patient perspectives of acute pain management in the era of the opioid epidemic. *Ann Emerg Med*. 2015;66:246-252.
47. Goransson KE, Heilborn U, Djarv T. Patients’ perspectives on the insufficiency of scales to rate their pain in the ED. *Am J Emerg Med*. 2016;34:2246-2247.
48. Department of Health. Accident and emergency statistics. Department of Health 2013. Available at: <https://digital.nhs.uk/data-and-information/publications/statistical/hospital-accident-emergency-activity/2013-14>. Accessed March 13, 2019.