

# Pain Assessment in *Journal of Athletic Training* Articles 1992-1998: Implications for Improving Research and Practice

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**Objective:** To examine, evaluate, and summarize the techniques used to assess pain in all the Original Research articles published in the *Journal of Athletic Training* from 1992 through 1998. A second objective was to determine whether any of the Original Research investigations that did not assess pain were on topics that included a pain component. A third purpose was to make recommendations for assessing pain in a clinical athletic training setting.

**Data Sources:** Every Original Research article published from 1992 through 1998 was reviewed independently by 2 of the authors to determine whether a pain assessment was included in the investigation and, if so, to evaluate the pain assessment technique used.

**Data Synthesis:** A total of 23 (12.5%) of the 184 Original Research articles included some type of pain assessment. Most of these articles addressed the topics of delayed-onset muscle pain (43.5%), knee pain (17.4%), or pain resulting from cryotherapeutic procedures (17.4%). Most of the articles that included some type of pain measurement focused on the assessment of pain intensity using a category scale (17/23, 73.9%). In a substantial percentage of studies, a pain assess-

ment tool that either lacked published supportive validity evidence (8/23, 34.8%) or was poorly constructed (because pain affect and pain intensity were confounded within a single scale) (7/23, 30.4%) was used. In a small number of articles on a topic directly relevant to pain (4/184, 2.2%), pain was not assessed, even though it could have provided useful information.

**Conclusions/Recommendations:** Pain is a construct of interest to those conducting athletic training research. Pain measures were included in approximately 1 of every 8 Original Research articles published in the *Journal of Athletic Training*. However, investigators have too frequently measured pain in a limited fashion, often focusing only on pain intensity. Measuring other components of pain could provide additional opportunities for learning more about the relationships between pain and athletic training procedures. We recommend that athletic trainers involved in research, as well as those engaged in clinical practice, consider systematically employing valid, multidimensional measures of pain to better understand the relationships between pain and athletic training outcomes.

**Key Words:** athletes, emotions, injury, pain, pain measurement

Pain is the principal symptom prompting athletes to seek medical attention. Reports about pain are a primary tool that athletic trainers use to assess injuries and monitor rehabilitation. Thus, it is important for athletic trainers to understand basic concepts about pain, to measure pain adequately, and to keep abreast of the sports medicine literature on pain, such as the recent studies documenting analgesia during and after both vigorous exercise and athletic competition.<sup>1-3</sup>

Adequate treatment and monitoring of rehabilitation require that pain be quantified. The measurement of pain seems simple at first: just ask the athlete where and how much it hurts. However, there is an emerging consensus that beyond pain intensity, useful information can be obtained in clinical settings by measuring pain in a multidimensional manner. This means, for example, obtaining reports not just about the location and intensity of the pain, but also about the cognitive and affective components of the pain. The most commonly used multidimensional pain measures, such as the McGill Pain Questionnaire<sup>4</sup> or the Brief Pain Inventory,<sup>5</sup> were designed primarily for

use with chronic pain patients, not for athletes suffering from acute injuries. Also, the McGill Pain Questionnaire and the Brief Pain Inventory may be too lengthy to be of practical use by athletic trainers in a busy athletic training room or sports medicine clinic.

Since there appears to be no current consensus on the best method for measuring pain in collegiate athletic training settings, we thought that a useful first step in deciding what measures to consider using would be to systematically examine what athletic trainers conducting original research use to measure pain. To that end, we examined pain assessment methods reported in Original Research articles published in the *Journal of Athletic Training* from 1992 through 1998. Thus, 1 purpose of our present study was to summarize and evaluate the techniques used to assess pain in all the Original Research articles published in the *Journal of Athletic Training* from 1992 to 1998. A second purpose was to determine whether any of the Original Research investigations that did not assess pain were on topics that included a pain component. A third purpose was to recommend valid pain measurement tools for use in a clinical athletic training setting.

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## METHODS

Two of the authors (P.J.O. and R.M.M.) completed an independent, systematic search of the Methods and Results sections of every Original Research article published during the 7-year period from 1992 through 1998. Discrepancies about which papers were "related to pain but did not measure pain" emerged in the 2 independent search results. Subsequently, the raters jointly decided which papers best fit this categorization (ie, were related to pain), and cases with any uncertainty were removed from this category (ie, a conservative approach was taken).

## RESULTS

A total of 23 (12.5%) of the 184 articles published in the Original Research section of the *Journal of Athletic Training* included some type of pain assessment. Most of these articles concerned the topics of delayed-onset muscle pain (43.5%), knee pain (17.4%), or pain resulting from cryotherapeutic procedures (17.4%). Two articles included a description of a method to measure pain, but then failed to report any pain data.<sup>6,7</sup>

Most of the studies that included some type of pain measurement focused on the assessment of pain intensity using a category scale (17/23, 73.9%). In a substantial percentage of the studies that included some type of pain measurement, a pain assessment tool that either lacked published supportive validity evidence (8/23, 34.8%) or was poorly constructed (eg, pain affect and pain intensity were confounded within a single scale or pain intensity and exercise behavior were confounded within a single scale) (7/23, 30.4%) was used. Pain assessment techniques with published supportive validity evidence that were used included the McGill Pain Questionnaire (4/23, 17.4%), the visual analogue scale (3/23, 13%), and pain ratings made in response to pressure algometry (1/23, 4.4%).

Investigators usually did not report in detail the instructions given, and in only a few instances were instructions on the use of the various pain scales described well enough to be replicated by others. In 1 case, pain data appeared to be misinterpreted by the authors: Byerly et al<sup>8</sup> interpreted higher pain scores for a nonadherent group as reflecting more pain in the Discussion section, but Table 1 indicated that higher scores were indicative of a rehabilitation program being less painful.

A small percentage (4/184, 2.2%) of the total number of published Original Research articles were judged to be on a topic with direct relevance to pain (eg, patellofemoral syndrome or temperature changes with modalities such as ultrasound or cryotherapy), but did not include a measure of pain.

## DISCUSSION

Our primary finding is that investigators publishing Original Research in the *Journal of Athletic Training* frequently measured pain in a noncomprehensive or inadequate way. One concern is the uncertain validity of some of the pain measures employed<sup>8,9</sup>; while some of these measures may possess face validity, such evidence is recognized as inadequate for establishing the validity of an instrument in a compelling way. A number of methods for assessing pain are available that have substantial published evidence to support their validity<sup>10-13</sup>; however, many of the reviewed studies either did not use techniques with established validity or failed to provide a reference to such evidence.

A second concern is the over-reliance on measures of pain intensity alone. Pain experts have reached a consensus that pain involves more than the experience of a sensory intensity, and it also includes affective and cognitive components. The implication of this consensus is that pain should be measured in a multidimensional way.<sup>10-13</sup> A simple approach involves adding a measure of pain affect (ie, how unpleasant the pain makes a patient feel or how much it bothers the patient). The distinction between pain intensity and pain affect is potentially important since some treatments (eg, antianxiety medications, such as diazepam, or hypnosis) influence affective responses to pain to a greater extent than they do pain intensity.<sup>10</sup> Athletic trainers who obtain information about the affective component of pain might find athletes who report a low pain intensity, but who also indicate that the pain is highly unpleasant or bothersome. In other clinical settings, pain affect scores have been found to be better than pain intensity scores at identifying patients with comorbid psychological or psychiatric problems.<sup>14</sup> Hence, the additional information about pain affect may help athletic trainers with certain treatment decisions: for example, whether it would be useful to refer an athlete for counseling to assist in the psychological adjustment to the injury. Moreover, it is possible that some athletic training procedures initially result in a rapid and dramatic improvement in the affective component of pain without a large change in pain intensity. This type of beneficial outcome may go unrecognized if pain affect is not measured. The affective component of the pain experience may be an important determinant of an individual athlete's rehabilitation behavior and outcome, and collecting data on this aspect of pain may help athletic trainers learn which aspects of pain are most important to monitor during rehabilitation. Most of the reviewed studies (73.9%) failed to use a multidimensional pain measure.

A third observation was that a small percentage (2.2%) of articles were on topics that, in our admittedly subjective yet purposefully conservative judgement, included a pain component, but the investigators failed to actually assess the pain component. In our view, an opportunity to gather potentially useful information is being lost in those few cases in which pain reports are not obtained in studies that address pain-related questions.

Although the most direct implication of our results is that athletic training researchers should consider including valid multidimensional pain measures as dependent variables in their research, the findings do have several clinical implications. The primary clinical implication is that it is useful for athletic trainers to measure pain in field settings as comprehensively and accurately as possible to provide additional information related to each athlete's injury. These data will provide a baseline from which to assess the efficacy of various interventions employed in the treatment of a variety of injuries and provide additional information with which to estimate the severity of injury. Also, by obtaining multiple measures of pain during the injury-healing process, the athletic trainer could evaluate treatment effectiveness and thus choose and modify modalities and other therapeutic measures used in the treatment program. Moreover, during the rehabilitation process, assessment of pain could lead practitioners to be more or less aggressive in their rehabilitation procedures. Thus, an opportunity to document the progress and effectiveness of athletic training treatments is being missed when athletic trainers do not include valid pain assessments in their documentation.

## RECOMMENDATIONS

Based on this review, we recommend that investigators conducting athletic training research with a pain component (a) employ valid measures of pain in their experiments, (b) provide details about the instructions given so that others can replicate the work, and (c) consider obtaining more than a simple pain intensity measure. Some widely used research instruments that have published evidence supporting their validity as multidimensional measures of pain include the McGill Pain Questionnaire,<sup>4,11</sup> the Brief Pain Inventory,<sup>5</sup> and the Descriptor Differential Scale.<sup>12</sup> Comprehensive texts are also available to assist investigators in deciding on the appropriate pain assessment tool for research purposes.<sup>13</sup> Also, we recommend that athletic trainers in clinical practice consider always quantifying the location, intensity, and affective components of pain to monitor and document the efficacy of athletic training rehabilitation procedures. We present a suggested method for measuring these aspects of pain in a clinical athletic training setting in the Appendix.

## APPENDIX

### Suggested Pain Assessment Tools for Clinical Athletic Training Settings

**Rationale.** Pain is an internal event that cannot be directly observed. Consequently, assessment of pain is based on self-reports. The 3 most commonly measured aspects of pain are pain location, pain intensity, and pain affect. All 3 pain components are potentially useful to athletic trainers who wish to document treatment effectiveness. Strengths and limits are associated with any pain measure, and the following tools are suggested both because they possess published supportive evidence of validity and because of their simplicity and ease of use and scoring.

**Pain Location.** It is recommended that pain drawings be used to document the sensory distribution of the pain. One template for a pain drawing is illustrated (right), and athletic trainers can devise more detailed drawing of body areas, such as the shoulder or the knee, to suit their particular clinical needs. Regardless, patients are instructed to shade in the areas of their body that are "in pain." Research with the drawing illustrated has shown that scores equal to the total number of regions shaded by patients are correlated with key pain-related behaviors such as medication use and time spent being inactive. These scores also have been shown to be independent of ratings of pain intensity and affect. More information about the drawings illustrated here can be obtained from Margolis et al.<sup>15</sup>

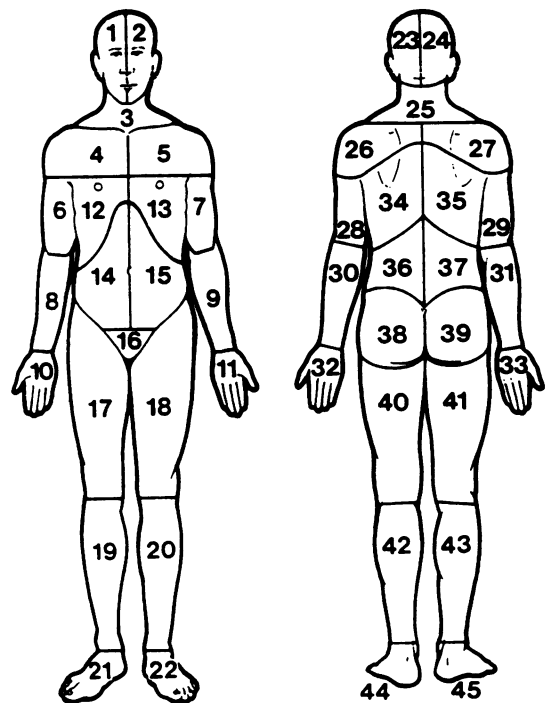
**Pain Intensity.** The 0 to 10 (11-point) Numerical Graphical Rating Scale is recommended to assess pain intensity. Athletes should be instructed to rate the intensity of their pain on a 10-centimeter horizontal scale as illustrated (right). Athletes should be instructed that 0 represents "no pain" and that 10 represents the "highest possible pain intensity." For use in clinical athletic training settings, we recommend this intensity scale over the commonly used visual analogue scale because the numerical format makes it easier for athletes to use and athletic trainers to score. More information about this scale can be obtained from Turk and Melzack.<sup>13</sup>

**Pain Affect.** The 0 to 10 (11-point) Numerical Graphical Rating Scale is also recommended to assess pain affect. Athletes should be instructed to rate the degree to which their

pain is unpleasant on a 10-centimeter horizontal scale as illustrated (below). Athletes should be instructed that a score of 0 means that the pain is "not unpleasant" and that a score of 10 means that the pain is "as unpleasant as possible." If athletes have difficulty distinguishing between pain intensity and unpleasantness, they can be told that the task is similar to listening to music and reporting both how loud the music is (ie, how intense) and how it makes them feel (ie, good or bad, pleasant or unpleasant). More information about this scale can be obtained from Turk and Melzack.<sup>13</sup>

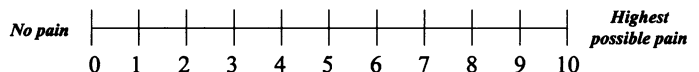
### Clinical Pain Assessment Tool

**Where Does It Hurt?** Draw on the figure to indicate the locations on your body where you currently feel pain.



Reprinted from *Pain*, 24, Margolis, Tait, and Krause. A rating system for use with patient pain drawings, 57-65, 1986, with permission from Elsevier Science.

**How Much Does It Hurt?** Use the scale below to indicate the intensity of the pain you are feeling. A score of 0 represents "no pain" and a score of 10 represents the "highest possible pain intensity" that you can imagine.



**How Unpleasant Is The Pain?** Use the scale below to indicate how much the pain is bothering you. A score of 0 represents "no unpleasantness" and a score of 10 represents a pain that is "as unpleasant as possible."



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