

Pain Control in the Intensive Care Unit: New Insight into an Old Problem



The greatest evil is physical pain.

—St. Augustine

Pain is an unwanted and sometimes unavoidable consequence of intensive care procedures. Although some pain is mild to moderate, and hence psychologically manageable for the patient, the personal experience of pain is distinctly subjective. A procedure that is tolerable for one patient may be intolerable for another. Certain procedures, for instance, a lumbar puncture (1), are extremely painful for most patients. At a minimum, extreme pain is highly distressing and may lead to persistent feelings of anxiety and dread that at times warrant a diagnosis of post-traumatic stress disorder. Nearly 25% of patients undergoing surgical treatment of peritonitis developed some post-traumatic stress disorder symptoms (2), as did 33 of 45 patients who demonstrated delusional memories 2 weeks after intensive care unit (ICU) discharge (3). The importance of recognizing, avoiding, and managing procedural pain in the ICU is therefore ethically compelling for medical professionals and of paramount importance to patients and their families.

The report from Puntillo and colleagues (pp. 39–47) in this issue of the *Journal* brings new focus to the problem of procedural pain in the ICU (4). The Europain study was a massive effort that encompassed 4,812 medical procedures in 28 countries and 192 ICUs. In this thoughtfully planned study, the investigators administered patient questionnaires translated into 12 languages, established interrater reliability between procedure observers, gathered data before and after 12 commonly performed procedures, and conducted an audit of the entire database for accuracy.

Numerous results and observations confirm previous findings and common practice. The most painful procedures, as reported by patients, were chest tube removal, wound drain removal, and arterial line insertion, consistent with previous reports from this and other groups (5–7). Although an increase in pain occurred with all procedures, reports of severe pain were rare. Planned procedures allow more pain-prevention preparation than emergency procedures. The investigators discuss and suggest various mitigation efforts commonly used in ICUs, including the administration of opioids, use of preventive local lidocaine injections, and the use of patient education about planned procedures.

The authors found that patients reporting higher pain before a procedure often reported greater pain during the procedure. Emphasis is therefore placed on conducting a preprocedural pain assessment such as the 0–10 numeric rating scale used in the study to help prevent procedural pain. Where reported pain is increased, the most obvious intervention is preemptive use of opiates, typically used with fewer than 50% of ICU patients undergoing procedures (8). Paradoxically, however, preprocedural pain assessment followed by preemptive use of opiates in Puntillo and colleagues' study was associated with *greater* procedural pain intensity. It remains unclear whether focusing on a preprocedural pain assessment actually results in lower procedural pain. The

authors conclude correctly that further research is needed to validate that a preprocedural pain assessment decreases pain intensity or emotional distress. Suggested considerations for more effective preemptive pain mitigation included greater consideration of dose and timing of opiate administration. Further investigation can help determine whether more effective, tailored opiate use can be directed by the preprocedural pain assessment.

Another striking result was the finding that across all procedures, those conducted by a nurse were associated with less pain than those conducted by a physician, respiratory therapist, or physiotherapist. This finding, which presumably does not reflect variance in procedural skills, strongly suggests that patients may have felt more reassured and comfortable with a nurse and highlights the importance of psychological factors in the experience of pain. That heightened anxiety is associated with increased pain perception is well known (9). In turn, caregiver compassion is an antidote to both anxiety and pain (10). A large literature of psychological approaches to pain management is largely focused on children but nonetheless contains lessons for adult pain management. This literature includes emphasis on awareness of events before and during the procedure, with focus on verbal and nonverbal provider behavior (11). A systematic review of 28 trials involving 1,951 children undergoing needle-related procedures found strong evidence for cognitive-behavioral interventions, and more limited but positive evidence for the effectiveness of hypnosis, information/preparation, and distraction in reducing procedural pain (12). Another systematic review including 19 trials and 1,513 pediatric patients reported that listening to music reduced pain in children undergoing oral surgery,

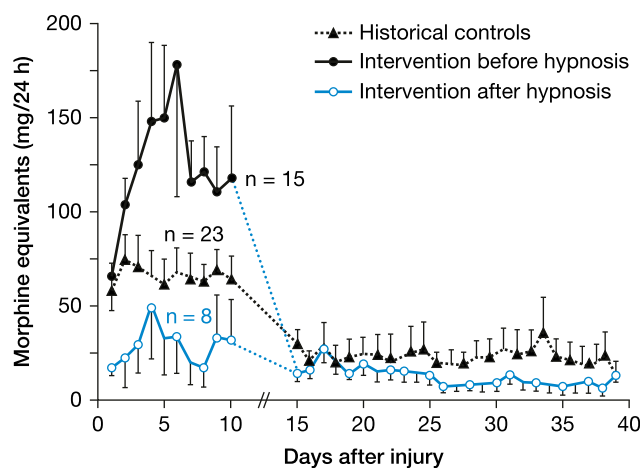


Figure 1. Opioid reduction in patients receiving hypnosis (17).

venipuncture, bone marrow transplant, colposcopy, and burn dressing change (13).

A far smaller literature has focused on complementary, nonpharmacologic procedures that may help reduce procedural pain in adults, including the use of noise-canceling headphones with music to reduce the perception of pain in men undergoing transrectal prostate biopsies (14), and the use of cognitive behavior therapy for chronic pain (15). A systematic review of 14 studies of pain interventions, 5 with ICU patients and most delivered by nurses, reported decreased pain and anxiety resulting from various relaxation strategies (16). Another investigation demonstrated opioid-sparing benefit when ICU burn patients received hypnosis. Twenty-three burn patients underwent hypnosis administered by trained ICU nurses, some immediately and others up to 2 weeks after admission. Compared with matched-control ICU burn patients, those who received hypnosis reported lower pain and anxiety scores, and had shorter hospital stays with reduced cost (Figure 1) (17). Although Puntillo and colleagues do not place primary emphasis on nonpharmacologic pain-reducing strategies, they do note the importance of using a soothing voice, preprocedural education, and inclusion of family members during procedures. The ICU—including its sounds, lights, equipment, multiple providers, and sense of urgency—can be frightening place, which in turn can fuel patient anxiety and pain apprehension. Further investigation of contextual changes, provider behaviors, and specific psychological and complementary interventions along with the use of opioids to reduce procedural pain is clearly needed. ■

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Bruce G. Bender, Ph.D.
The Center for Health Promotion
National Jewish Health
Denver, Colorado

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Humidifier and Environmental “chILD” Risks

Children's interstitial and diffuse lung disease (chILD) is a challenging heterogeneous group of diagnoses with a common presentation referred to as chILD syndrome (1). Presenting findings are nonspecific and can include cough, tachypnea, wheezing, retractions, hypoxemia, and diffuse infiltrates on

imaging. The variety of causes include genetic and developmental lung disorders, systemic disease, immunologic disorders, and, in otherwise normal children, exposure to aspiration, infectious diseases, and environmentally induced disorders (2). In infants and young children, the most commonly recognized causes have been genetic and developmental disorders. In one large retrospective lung biopsy review of children with diffuse lung disease less than 2 years of age in North America, environmental

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