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Effect of acute and chronic alcohol abuse on pain management in a trauma center

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Abstract

The proper management of acute pain has been identified as a primary indicator of quality assurance in US trauma centers. Nearly half of all trauma patients are injured while intoxicated and 75% of these patients have chronic alcohol problems. The management of pain caused by injuries in patients with alcohol problems poses unique challenges. Biases exist regarding the crosstolerance effects of ethanol and opioids and the pain thresholds of patients with substance abuse histories. The purpose of this review is to examine some of the factors that inform our decisions of how to manage acute pain in this population and to review the empirical evidence that exists.

Keywords

alcohol abuse; chronic alcohol abuse; pain management

The issue of how to treat pain is one that has been at the heart of debates in the medical community since the 19th Century. Many well-known authorities in the field argue that patients endure endless suffering because physicians are reluctant to prescribe adequate amounts of pain medication. Yet others argue that the possibility of creating an addiction to narcotics warrants caution in the prescription of such medications. This debate intensifies and becomes even more complex when one is faced with managing pain in patients with acute or chronic alcohol problems.

Historically, this population has not received adequate attention and, without scientific evidence, physicians assumed that these patients' pain could not be treated with traditional methods. This led to one of two conditions: patients with alcohol problems either suffered needless pain or self-medicated with illicit drugs to cope with the pain. Much of the research

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concerning pain management in this population was performed in the 1970s and early 1980s, and was only speculative. The problem of managing pain in this population is one that should not be overlooked as it has implications for treatment and outcome.

Patients with substance abuse problems fall into four main categories. The first category consists of those patients who are injured while intoxicated, for whom the main concern is the interaction between alcohol and opioids. The second group of patients is those who have a chronic history of alcohol dependence. In this group, doctors are concerned with physiological tolerance and whether or not the development of tolerance to one drug affects the reaction that the patient will have to opioids (cross-tolerance). Staff biases exist regarding pain thresholds of patients that fall into these first two groups, which, in turn, affects decisions regarding pain management. The third group of patients are those who may have a history of an addiction to alcohol, but are 'in recovery' or not currently using alcohol. The main concern in this group is neither physiological nor related to drug interactions, but rather conflicting treatment approaches and the fear of returning to previous addictive behaviors when prescribed narcotics. The fourth group identified is those patients who have either a current or prior history of opioid abuse, specifically heroin. There are a number of concerns with this group and they must be treated on an individual basis. Discussion of patients with heroin and other drug addictions is beyond the scope of this review. This review will first focus on the scientific evidence that establishes the link between alcohol and trauma. This will be followed by a discussion of how acute pain is typically managed in a trauma population, including a review of evidence for the undermedication of acute pain. The final section will focus on the three aforementioned groups and the specific challenges to managing pain in these populations.

Alcohol & trauma

There is little question that acute intoxication plays an important role in automobile accidents and other forms of trauma. Recent studies have also begun to examine the frequency of chronic alcoholism in trauma patients and the role that chronic alcohol use plays in their outcome. Rivara *et al.* collected blood alcohol levels to assess acute intoxication, and used the Short Michigan Alcohol Screening Test and two biochemical markers (γ-glutamyl transferase and mean corpuscular volume) to assess the incidence of acute alcohol intoxication and the proportion of trauma patients with histories of chronic alcoholism [1]. Out of 2657 patients, 47% had a positive blood alcohol concentration (BAC). Intoxication was defined as exceeding the legal limit for driving (BAC > 100 mg/dl), and 35.8% met this criterion. Three quarters of intoxicated patients had evidence of chronic alcoholism, indicated by a score of 3 or more on the Short Michigan Alcohol Screening Test. Although no difference was found in morbidity or mortality in those patients admitted with elevated blood alcohol levels, it was concluded that the high prevalence of both acute and chronic intoxication indicates the need to diagnose and properly treat this problem in trauma patients. The authors also warn of recurrent injury if this problem goes untreated.

Jurkovich *et al.* also investigated the impact of acute and chronic alcohol abuse on morbidity and mortality due to trauma [2]. Their subjects (n = 2896) consisted of patients over 18 years of age admitted to the emergency room. They used the same criteria as the previous study to determine chronic and acute alcohol use. Again, almost half of the trauma victims had a detectable BAC, and a third were legally intoxicated. They also concluded that acute alcohol use had no adverse effects on outcome from trauma, including mortality rates and complications. However, chronic alcohol use did affect outcome by increasing the risk of complications (i.e., pneumonia and infection).

Finally, in a review paper, Gentillello *et al.* also found that nearly half of all trauma patients were under the influence of alcohol when injured [3]. They summarized the effects of brief

interventions in in-patient and out-patient settings. They concluded that these brief interventions resulted in a decrease in drinking, and that a trauma can be an effective time to intervene. In a randomized controlled study, the same group showed that trauma recidivism was halved by a brief motivational intervention [4]. These studies also emphasize that, in addition to a thorough history and self-reported questionnaires, biochemical markers are needed to detect substance abuse problems.

Acute pain management

Pain management in the trauma population has been a major focus of attention for the last two decades following studies showing that patients are generally undermedicated for pain and that high rates of pain while hospitalized can lead to poorer outcomes [5,6]. The American Pain Society has developed quality assurance standards for the relief of acute pain [7]. Their standards include the recognition and prompt relief of pain.

Morphine is the safest and most effective painkiller for constant, severe pain and has been used for centuries. Melzack has outlined the evolution of the use of morphine and its opiate derivatives [5]. Today, the use of opiates is generally restricted to two groups of pain patients. It is prescribed for relatively short periods for hospitalized patients who are recovering from surgery or other traumas, and is also given for relatively long periods to patients suffering chronic pain caused by burns or incurable cancer [5]. When treating acute pain in the in-patient setting, doctors typically write a prescription for several types of pain medications and list a dosing range for the patient. These dosing ranges are standard and are prescribed for every patient. Nurses are left with the responsibility of deciding how much pain medication to administer to each patient, usually based on the patient's request for pain medication or his/her report of the severity of the pain. Studies have shown that nurses often start by giving patients doses in the low end of the range and adjust the dose accordingly [8]. The dose ranges are large and, therefore, optimal pain management is an inexact science that is dependent upon numerous factors, including the experience level of the nurses and characteristics of the patient. A patient's perception of their pain is used as the standard for determining dosing. For example, patients are often asked to rate their pain on a 0–10 scale (0 being 'no pain' and 10 being 'the worst pain imaginable') so the medical team can determine how much or how little medication to administer. Although this is the most responsible and effective way to evaluate pain, it further emphasizes the potential for abuse and reinforces the fears of the medical team. Certainly, a patient's experience with alcohol or other drugs will impact the perception of their pain.

Opiates are prescribed in one of three different practices: '*prore nata*' (PRN), on a fixed schedule or through patient-controlled analgesia (PCA). The most popular method in the USA at this time is PRN or 'as needed.' This is the practice whereby the drug is given only after the patient's pain returns (usually requested by the patient). This practice leads to a constant struggle between the patient and medical staff. Typically, an inadequate dose of opiates is given and the staff expect this dose to be effective for the next 4–6 h. When the patient starts to feel pain before that time, and requests more pain medication, the healthcare worker worries about overmedication and addiction, and may refuse or delay the next dose. When the medication is finally given, the pain has become so severe that a large dose is administered, which increases the side effects, such as mental clouding and nausea. Ironically, the PRN approach was developed out of a fear of iatrogenic addiction, but studies have shown that this common method of prescribing analgesics actually leads to an increased rate of addiction [5]. This prescribing practice can also lead to behavior known as 'pseudoaddiction' [9]. Pseudoaddiction develops in three stages. First, there is an inadequate prescription of analgesics (usually by way of the PRN approach) to meet the primary pain problem. Phase 2 begins when the patient realizes that in order to get more pain medication, he must convince the staff that he is in pain. This may lead to more frequent or exaggerated pain complaints, which staff may interpret as

either an addiction to the pain medication or drug-seeking behavior. Phase 3 is the resulting mistrust between the patient and the medical staff. Perry offers an alternative, pharmacological argument for their behavior [10]. Individuals vary enormously in the relief they obtain from a given dose of an analgesic so that the notion of the 'standard dose' is misleading and inadequate. "Just as we do with other medications, narcotics must also be adjusted in accordance with clinical response" [10].

An alternative method of prescribing pain medication is slowly gaining acceptance, and recent studies have shown it to be quite effective. This is called 'scheduled' or 'fixed' dosing and was developed by an English physician who cared for people dying of terminal cancer. In this method, doses are given regularly according to a schedule that has been tailored in order to account for an individual's response to pain medications. Since the pain is controlled continuously, this method prevents the recurrence of the pain [5]. It also prevents a situation where the patient has to either ask for pain medication or display pain behaviors. Researchers have shown that patients use less pain medication and incur fewer side effects with this method. They also report pain less frequently.

Finally, PCA is being used more frequently in in-patient settings. This is a method of intravenous pain control where an electrically controlled pump is hooked up to the intravenous drip, which allows the patient to push a button to release a set amount of pain medication into their system. The pump is programmed so that the patient will not be able to overdose on medication, but they may use enough to experience negative side effects. A 1991 review of studies by Ballantyne *et al.* found that PCAs were associated with significantly better pain relief than conventional analgesia [11]. There were no significant differences between PCA and conventional analgesia in the amount of pain medication used. Patients were also more satisfied with their pain control when given a PCA, possibly due to the sense of control that the patients have. Despite healthcare workers' fear that patients would abuse the drug, studies have shown that patients maintain their doses at a reasonable level and decrease them when their pain diminishes. Investigators have shown that patients actually use less pain medication when they are placed on a PCA [11].

A mutimodal approach to effectively managing acute pain should be emphasized. Owing to the role of anxiety in pain, antianxiety medications are frequently used to aid pain control. In one survey, 40% of US burn centers reportedly used benzodiazepines [12]. It has recently been reported that lorazepam (Ativan®) administration results in an improved analgesic effect of opioids in the burn-injured population, and that anxiety reduction probably contributes to this analgesic effect [6]. Additionally, acetaminophen and NSAIDs can also be used effectively to supplement opiates, thus decreasing the dose of opiates needed to manage pain. In cases of neuropathic pain, neuropathic agents, such as gabapentin, should also be considered. Finally, nonpharmacologic interventions, such as hypnosis, relaxation and distraction, should not be overlooked as adjuncts to opiates for acute pain management. FIGURE 1 provides a visual description of the multimodal approaches available.

Undermedication of acute pain

For decades it has been recognized that patients are undermedicated for acute pain, particularly children, the elderly and substance abusers. There are many reasons given for inadequate pain control, including a concern for unwanted side effects (i.e., respiratory depression), the fear of iatrogenic addiction, an inability to assess a patient's pain, variable perceptions of pain, and stoical beliefs of both the medical staff and patients, leading to the attitude that pain is acceptable. When a patient has a substance abuse problem, either current or past, these factors become even more complicated and the optimal management of acute pain becomes an even bigger challenge.

Perry defined iatrogenic addiction as creating addicts out of patients who previously did not have a problem with substances [10]. Stimmel emphasized that this fear of addiction is specifically related to narcotics [13]. Other mood-altering drugs, such as diazepam, phenobarbital and antidepressants, are widely prescribed. One study even showed that these mood-altering drugs, particularly antidepressants, are prescribed frequently to those who abuse alcohol and other drugs [14]. This fear of iatrogenic addiction has proven to be unfounded. In a study of heroin addicts, only 1.9% of subjects believed that their habits began with prescriptions given for medical reasons [15]. Marks and Sachar showed that in only three out of 1900 cases (0.16%) were the addictions attributed to possible complications of previous medical treatment [16]. In the Boston Collaborative Drug Surveillance Program, only one out of 11,882 hospitalized patients who had no prior history of substance abuse and who received narcotics while in the hospital developed a drug dependency [17]. Finally, in a survey of more than 10,000 hospitalized burn patients who received narcotic analgesics, not one case of an iatrogenic addiction was reported [12]. They did find that 22 patients abused drugs after they were discharged, but all of them had a history of drug abuse. Perry states, “these fears persist even though no systematic studies have ever documented that treating acute pain in hospitalized patients with sufficient narcotic analgesia will increase the risk of substance abuse”.

Another explanation for the undermedication of pain is the communication between the patient and the staff. Staff rely on a patient’s ability to report pain and request pain medications. They are also put in the difficult situation of interpreting patients’ nonverbal behavior when they cannot verbally report pain. Investigators have shown that healthcare workers frequently underestimate the severity of a patient’s pain [12]. This is especially true for estimating procedural pain. They also underestimate a patient’s anxiety, and may misinterpret anxiety as pain, thereby increasing the dose of opioids rather than adding an anxiolytic [18]. One study showed that, as nurses gain experience, they become more aggressive at treating a patient’s pain by giving larger doses of opioids. Experienced nurses also used a multimodal approach to pain management and were able to balance their interventions until effective pain control was achieved [8]. Finally, a study by Ward and Gordon demonstrated that patients might not know what to expect in terms of pain management [19]. They found that the most important factor in patient satisfaction regarding their pain was whether or not the medical staff had communicated to their patient that pain control was a high priority, even if they did nothing to actually control pain. Interestingly, there was no relationship between pain severity and patient satisfaction. These results support previous studies that showed that patients have low expectations regarding pain relief [20,21]. Ward and Gordon concluded, “until patients expect that pain can be relieved, they will be satisfied with pain management even though they are in pain” [19]. The patients’ low expectations directly impact the issue of inadequate pain management because they may not be asking for pain medications when they need them. Staff and patient stoicism toward pain, as well as the staff’s difficulty in assessing patients’ pain, are all contributing to the problem of undermedication.

Acute intoxication

As noted earlier, approximately 50% of the patients admitted to the emergency department have positive blood alcohol levels. Since most of these patients will be in severe pain, the management of pain in this population is of great concern. Few studies have looked at the interaction of alcohol and narcotic medications. In one drug reference book, it is stated that the interaction of alcohol and opiates can lead to respiratory depression because of the additive effects on the CNS [22]. Ethanol is considered to be a CNS depressant. Other agents that depress the function of the CNS, including opioids, augment the effects of ethanol. Ethanol can also interfere with the therapeutic actions of a wide variety of drugs’ metabolism (e.g., phenytoin and acetaminophen). This is an important consideration when prescribing drugs for pain control. One additional concern is that if a person is acutely intoxicated and receives opioid

medication, the combination can lead to problems in monitoring therapeutic or toxic effects of the opioids, as well as effects of the traumatic injury.

It is well-established that the effects of ethanol and opiates are mediated by different mechanisms of action. However, some reports indicate that ethanol could alter the binding of opiates to brain opioid receptors [23,24]. The interaction between ethanol and morphine is less than additive and is not related to phamacokinetic changes induced by their simultaneous administration. No studies have tracked the amount of pain medication administered to acutely intoxicated patients, so we are unsure of how these physiological interactions affect the actual dosing practices. Anecdotally, there tends to be a fear of overdose, best characterized by the aforementioned depression in the respiratory system.

The literature on the effects of acute alcohol intoxication on pain thresholds shows that ethyl alcohol has been used for centuries as an analgesic agent [25]. There are numerous anecdotes of 19th Century doctors and dentists administering alcohol before a medical procedure [26]. Surprisingly, there have been few empirical studies on the effects of alcohol on pain. Only two studies are commonly cited to support the analgesic effect of alcohol. One study is by Mullin and Luckhardt, who used the von Frey hairs technique for studying alcohol's effect on cutaneous sensitivity and found that alcohol caused a "distinct decrease in pain sensitivity lasting 2 to 3 hours" [27]. The second study, by Wolff *et al.*, had the same findings as the previous study using electric heat as the pain stimulus [25]. In addition to these studies being decades old, they are fraught with methodological problems and biases. Two subsequent studies have found an interesting interaction between alcohol use and pain threshold. Cutter *et al.* found that alcohol only acts as an analgesic in chronic alcoholics, but has no effect on pain in nonproblem drinkers [28]. Similarly, Brown and Cutter demonstrated that alcohol decreases pain among problem drinkers, but it increases pain in people who are acutely intoxicated but are not chronic alcoholics [26]. Again, these studies were all conducted in a laboratory setting and may not be generalized to the trauma setting.

Chronic alcohol & drug use

Many medical caregivers have been concerned about the use of opioids with patients who have chronic alcohol problems. Perry noted that, while patients without histories of acute or chronic abuse are undermedicated for pain, the situation is even worse for those with chronic histories [10]. Frosch concluded at the conference on *Developing Guidelines for the Use of Sedatives and Analgesics in the Hospital*, "the problem is most physicians, nurses and other hospital treatment and administrative personnel are not adequately prepared to handle formerly or actively addicted patients on medical and/or surgical services. Such personnel often are either overcautious with appropriate analgesic medication and, hence, refuse medication to patients who are anxious or in pain, or, at the other end of the spectrum, naively gullible to the addict's tricks to get medically inappropriate medication" [29].

There are two major concerns when treating patients for pain who have chronic histories of alcohol and drug abuse. The first concern is the effect of tolerance to the differing medications. Perry argued that patients who are abusing alcohol and other drugs should be getting more pain medication, not less, in order to compensate for their developed tolerance [10]. He also noted that it has been very difficult to know how adequate analgesia might affect addiction patterns, because most of these patients simply do not receive sufficient doses of narcotics. Unfortunately, very few studies have investigated crosstolerance between alcohol and opioids at a practical level or in humans. The only class of drugs known to have a direct crosstolerance with alcohol are the benzodiazepines. There is a high risk of overdose when a person is given both alcohol and a benzodiazepine. Animal research has demonstrated that chronic ethanol exposure can lead to the development of crosstolerance to local anesthetics. However, this has

not been shown in studies on humans, which points to the importance of psychological factors (i.e., anxiety and expectancy effects) on the relationship. Although no studies have clearly demonstrated these findings, some clinicians believe that there is an incomplete tolerance between alcohol and opioids (PAIN RELIEF SERVICE, PERS. COMM.). In other words, the relationship is highly variable across individuals and is affected by a number of other factors, including the stresses placed on the body, the stress of the environment and other medications. Consequently, decisions regarding prescribing pain medications in this population should be made on an individual basis.

The second concern regards the presumption that patients with a substance abuse history are more likely to abuse opioid medications [30]. Although the risk of addiction is relatively small for patients with alcohol and other drug problems, the reaction by physicians is still one of caution when medicating for pain in this population. Millman alluded to anecdotal reports when he described patients with a history of drug abuse that become panic stricken when they feel pain and start asking for medication too frequently, giving in to their 'compulsive-use syndrome' [31]. Their panic and anxiety feed into their previous drug dependency. He argues that, once someone has a chronic history of drug taking or drug-seeking behavior for 'euphorogenic purposes', they will be unable to distinguish between the analgesic effects of the drug and the euphorogenic effects. These conclusions follow the traditional disease model of addiction, that once a person is an addict, he/she will always be an addict. This medical model has been challenged owing to little empirical support [32].

The literature on pain sensitivity in chronic alcohol abusers is small and was mentioned earlier. To summarize, pain thresholds are lowered when chronic alcoholics are sober and pain is induced [26]. In other words, they are more sensitive to painful stimuli. In addition, chronic alcoholics are more sensitive to the analgesic effects of alcohol. Alcohol can help a chronic alcoholic endure discomfort for longer periods of time [33]. Again, these studies have all been conducted in a laboratory setting where pain is induced either by electric shock or a cold pressor task, where the emotional components and environmental stressors associated with trauma pain are removed.

A person's expectations regarding the effects of alcohol have also been shown to have a direct impact on behavior [34]. This may partially explain why alcohol only acts as an analgesic in chronic alcohol abusers and not others. Perhaps chronic alcoholics experience an analgesic effect of alcohol because they expect that it will reduce their pain. An individual's expectations about the effectiveness of a pain-controlling drug have been shown to influence the pain and anxiety that subjects report [35].

Finally, the phenomenon of conditioned tolerance may also provide insight into alcohol use and pain tolerance. Siegel found that, if an animal is placed in a situation in which it anticipates receiving a drug, but does not actually get the drug, the animal has a learned reflex response similar to that which the drug would have produced [36]. For example, anticipating, but not receiving, morphine is associated with an increased sensitivity to pain. Perhaps, if a patient with a chronic alcohol history has conditioned themselves to self-medicate whenever they feel any type of pain, he will experience a lower tolerance for pain if they do not actually get their drug of choice.

To summarize, the literature suggests that patients with a chronic alcohol history will probably respond to pain and opioid medications differently tho those patients with no substance abuse history. This response may be due to physiological crosstolerance, a lowered pain threshold or behavioral factors regarding drug expectancy effects and conditioned tolerance, or, more likely, a combination of the above factors.

Patients recovering from a prior addiction

Wesson *et al.* state that patients who have a previous history of alcohol or drug abuse, but are not currently using, can also be effectively managed with opioids [37]. In reviewing this literature, one study found that patients who had a history of alcohol abuse alone and were active members of Alcoholics Anonymous showed no evidence of opioid prescription abuse [30]. The risk of returning to a previous addiction after using opioids to treat acute pain seems to be relatively low. However, it is a problem in philosophy if both the patient and the physicians involved have a treatment orientation of being completely drug-free and feel that any drugs will increase the risk of drug relapse.

The literature discussed provides insight into the complex relationship between pain management and substance abuse, and points to unanswered questions to guide future research. First, opioids are the drug of choice for pain management in a medical setting. Although they have a high potential for addiction, patients rarely become addicted to opioids when they are prescribed for pain in a medical setting. Despite this, many studies have shown that patients are undermedicated for pain for a variety of reasons, including fear of iatrogenic addiction, fear of overdose and an underestimation of patient pain by healthcare workers. The issue of pain management becomes even more complicated when a patient has a substance abuse problem, whether acute or chronic. It remains unclear how a patient's drug and alcohol status affect the management of pain, and what other factors contribute to the prescription and administration of pain medication. The administration of pain medication is largely controlled by the nursing staff, who rely on patients' reports of pain. The validity of patient reports may be questioned if a patient has a substance abuse problem. Furthermore, alcohol and other drugs may affect a patient's threshold for pain. However, this relationship seems to be mediated by other factors, including alcohol and drug status (acute intoxication vs chronic abuse), genetic risk factors and environmental factors.

Expert commentary

Based on this review, we have several recommendations for managing pain in trauma centers. The first recommendation is to obtain routine blood alcohol level and toxicology screening on trauma patients in the emergency department. Staff may also want to consider collecting other biochemical markers of chronic use, including a γ-glutamyl transferase. Having this information is crucial to providing safe and adequate care. Dosing of opioids will probably need to be altered if a person is either acutely intoxicated or has impaired liver function due to chronic use. This information can also be useful in conducting brief interventions geared toward changing alcohol use. A major trauma is a life-changing event that may be used as an impetus to change addictive behaviors. Several studies have demonstrated the effectiveness of brief interventions to reduce alcohol use in trauma centers. This is a teachable moment that all trauma centers should use to the patient's advantage, and we recommend offering these interventions through acute care.

Our next recommendation is to adequately medicate patients for their pain, regardless of their history of addictive behaviors. We have evidence that patients will seek other means, often illicit, of managing their own pain when pain is not adequately controlled. We can expect that patients with current addictions may have lower pain thresholds and may develop a tolerance to opioids more quickly. Rather than offering them less medication, they may need higher doses than expected to adequately control pain. Medical staff may also want to consider adding an anxiolytic to help manage pain. We know that anxiety will increase perceived levels of pain and this is often overlooked. This may be particularly important for patients with addictions who are not used to experiencing the full range of emotions when sober. We would also recommend avoiding PRN dosing for opiates and, instead, use a fixed-dosing schedule in order

to avoid the cycle of unmanaged pain, followed by significant side effects due to 'catching up' with the pain. Consideration of a PCA for all patients who are having difficulty reaching manageable pain levels is also crucial. This will allow the patient to feel more in control of their environment and they will probably use less medication as a result. Finally, a comprehensive, multimodal approach that includes various classes of medications and nonpharmacological interventions is particularly important when working with patients with substance abuse issues.

Five-year view

There are major gaps to be filled in our knowledge regarding pain management in the context of acute or chronic alcohol problems. For example, health service research is needed to determine whether alcohol-intoxicated trauma patients receive acute pain treatment that is systematically different to that received by nonintoxicated patients. Potential disparities in prescription practice, as well as the actual amount of morphine equivalents delivered by nurses, should be examined. If treatment disparities were proven to exist, there would be more incentive to study and rectify the inequities. The growing use of electronic medical records in major trauma centers should make this type of research more feasible. Similar studies should examine the potential influence of chronic alcohol problems on pain management prescriptions and doses delivered. An interesting question for clinical researchers is whether people with a history of substance abuse or dependence respond differentially to PRN versus scheduled or PCA forms of pain control. Both observational and experimental research could improve our understanding of how to match a pain-management approach to individual characteristics and either confirm or dispute assumptions that, for example, persons with a history of substance dependence would systematically overuse when given access to PCA. Our hope is that, within the next 5 years, pain management for trauma patients with comorbid addiction problems will become less dependent on speculation and clinical lore, and more informed by sound theory and solid data.

Key issues

- More than half of patients admitted to a trauma center will have either acute or chronic alcohol histories.
- It is crucial to get blood alcohol level and other biochemical markers of substance abuse and dependence while the patient is in the emergency department in order to safely and effectively manage pain.
- Brief interventions should be offered to all patients with acute or chronic substance abuse problems.
- Pain must be adequately managed, regardless of past and current addictions, in order to prevent self-medication.
- Consider offering patients a patient-controlled analgesia when pain cannot be adequately managed by other means.
- Use a comprehensive approach that includes various classes of drugs and different nonpharmacological modalities.

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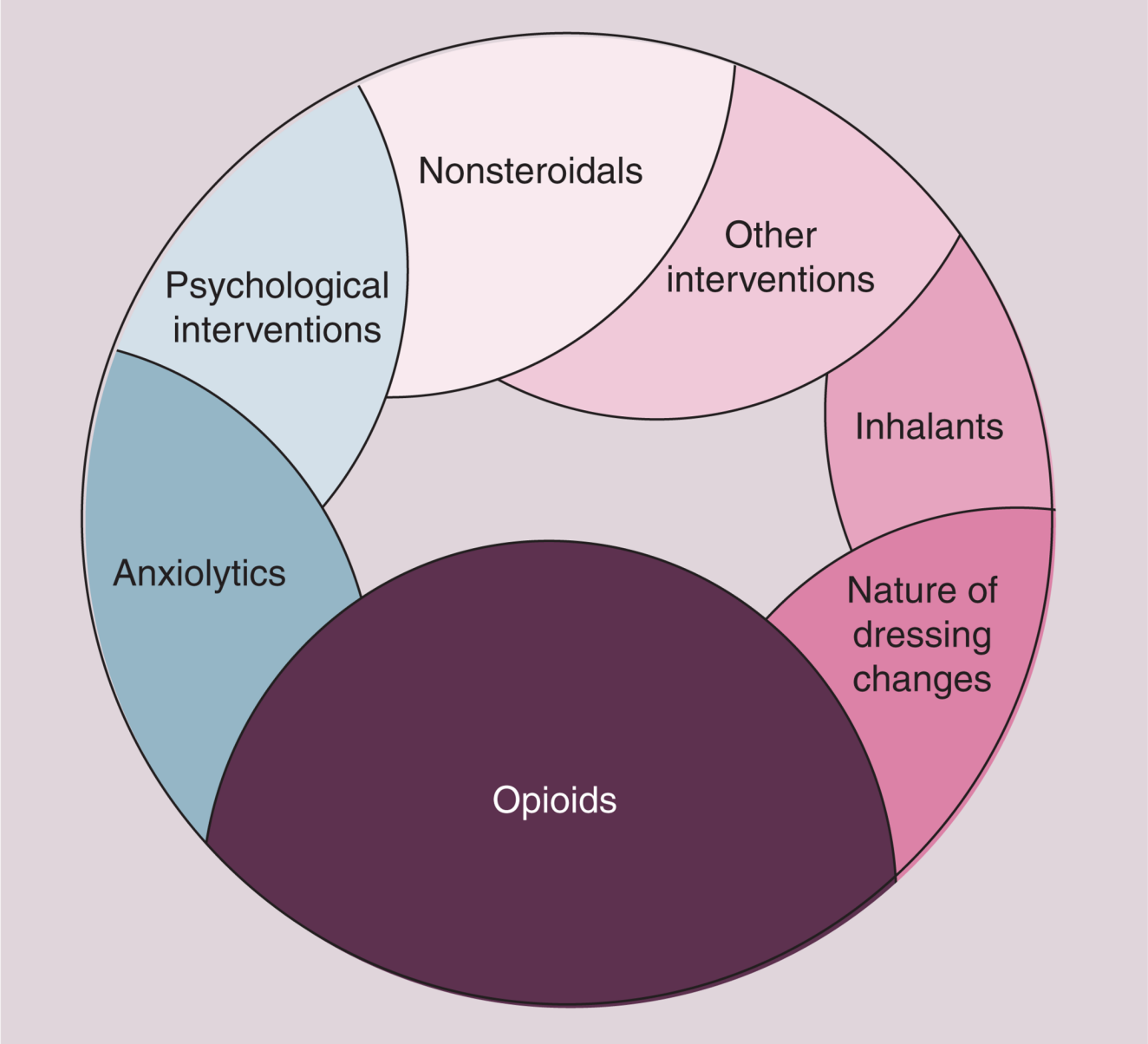

Figure 1.
Multimodal approach to acute pain management.