SECTION ONE. OVERVIEW AND PRINCIPLES IN EMERGENCY ANALGESIA AND PROCEDURAL SEDATION

1 Emergency Analgesia Principles

James Miner and John H. Burton

SCOPE OF THE PROBLEM

Pain is the presenting complaint for up to 70% of visits to the emergency department (ED). There are a myriad of strategies to treat and diagnose pain. The effective strategies are those with adequate and timely pain relief without adverse effects.

In 1992, the World Health Organization developed a clinical guideline for the treatment of acute pain. This guideline includes basic instructions to select an appropriate pain medication for the patient's pain intensity, individualize the dose by titration of opioids, and concomitantly provides adjuvant analgesic drugs as co-analgesics or to counteract side effects.

It has been shown that patients frequently receive inadequate analgesia in the ED. Oligoanalgesia, the inadequate treatment of pain, frequently occurs in the ED, especially in those patients at the extremes of age and members of minority and ethnic groups.

Treatment of pain is essentially a simple process, and a wide variety of agents and techniques are available that are generally effective. Morphine has been recognized as a basic treatment for pain throughout the modern era of allopathic medicine. It is effective, easy to obtain, and has never been expensive. However, morphine has severe side effects when overused, specifically in the acute setting with respiratory depression, hypotension, and a decreased ability to report worsening symptoms. Issues with the chronic use of morphine, as with all opiates, include suppression of the endorphin system with associated vegetative changes and physiologic dependence. It is partially due to the early success of morphine that further advances in analgesic agents, aside from general anesthesia, have been slow relative to other areas of medicine.

There are a wide variety of approaches to the treatment of pain and very few single approaches that have clearly been demonstrated as superior to others. Developing consistent and effective approaches to the management of a wide variety of painful conditions can optimize a physician's ability to treat patients with pain. In addition, using effective analgesic strategies will allow one to address the analgesic needs of patients while decreasing the potential for side effects.

CLINICAL ASSESSMENT

An accurate recognition and assessment of a patient's pain is the central aspect of effective pain management and is essential to any effective analgesic strategy. This process is subjective and complex with many of the factors involved in an individual's pain experience not fully understood.

Acute pain is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage as well as activation of neurochemical receptor and mediator responses (Table 1-1).

Acute pain is primarily a subjective concept. Objective observations (grimacing, tachycardia) may be present,

Table 1-1. Opioid receptors, activities, and subsequent endorphin responses to acute pain

Receptor	Activity	Endorphin
Mu1	Euphoria, supraspinal analgesia	Beta-endorphin
Mu2	Respiratory depression, CV, and GI effects	Beta-endorphin
Delta	Spinal analgesia	Enkephalin
Kappa	Spinal analgesia, sedation, feedback inhibition	Dynorphin
Epsilon	Hormone	Beta-endorphin
Gamma	Psychomimetic effects, dysphioria	

Table 1-2. Pathway/barriers to effective pain assessment and treatment

Phase	Barrier
Complaint/assessment	Patient communication Physician bias Patient and physician concerns about the consequences of treatment
Treatment	Patient medical condition Physician knowledge of treatment modalities Adverse events
Plan for ongoing treatment	Physician knowledge of treatment modalities Patient compliance Adverse effects of medications

but these signs are often absent. As a consequence, patient pain assessment remains an indirect estimation by the treating physician. It is, therefore, important to use a consistent vocabulary in describing an assessment of a patient's pain. This process will allow patient findings to be communicated accurately and precisely while a systematic treatment practice is implemented.

Because pain is assessed almost completely through patient report, patients who have difficulty communicating are at risk of oligoanalgesia due to underappreciation of their pain. Groups at risk include infants and children, patients whose cultural background differs significantly from the treating physician's, and patients who are developmentally delayed, cognitively impaired, under severe emotional stress, or mentally ill.

Unfamiliar or unrecognized attempts by the patient to express pain may be misinterpreted by the physician, leading to a poor interaction and an unclear assessment of the patient's pain (Table 1-2). The accurate assessment of pain in the face of cultural differences is a difficult, yet important challenge to overcome in order to treat pain adequately.

It should also be noted that many physicians have encountered patients who have altered a prescription, have lost pain medications, seem to have pain out of proportion to their illness or injury, or who ignore follow-up clinic appointments and return to the ED repeatedly. These experiences can make it easy to view a patient's report of pain with skepticism. Such observations and experiences, like the physician's assessment of patient pain, are significantly dependent on verbal and nonverbal subjective communication between the physician and patient. This reality creates a substantial potential for inaccurate interpretations of patient motives in clinical conditions where the patient pain experience is largely subjective (e.g., back pain) with minimal opportunity for objective clinical assessment with modalities such as radiographic imaging or laboratory testing.

PAIN CONSIDERATIONS

Acute pain follows injury and usually resolves as the injury heals. Acute pain may be, but is not always, associated with objective physical signs of autonomic nervous system activity such as tachycardia, hypertension, diaphoresis, mydriasis, and pallor. When the cause of acute pain is uncertain, establishing a diagnosis is the priority of the emergency physician. Symptomatic treatment of pain should be initiated while the diagnostic evaluation is proceeding. In general, it is inappropriate to delay analgesic use until a diagnosis has been made. It is unlikely, and unproven in medical literature, that treatment with 0.1 mg/kg of morphine, or another analgesic equivalent, will mask signs or symptoms of progressive disease such that the effective treatment of pain will confound the diagnostic approach.

Chronic pain is pain that has persisted after the usual time of tissue healing has passed. This is clearly a vague definition with a great deal of ambiguity between acute and chronic pain states. Chronic pain is uncommonly associated with signs of sympathetic nervous system activity.

The treatment of acute and chronic pain is different, and confusion between the two leads to poor management of patients. Acute pain should be approached with the intention of providing relief to a limited degree, individualized to each patient, with a plan to taper medications as symptoms improve. Chronic pain assumes a baseline level of pain that is best treated with a consistent approach to minimize baseline discomfort and minimize the adverse effects of both pain and pain treatment on the patient's lifestyle.

ED personnel commonly identify patients who are thought to seek pain medications, usually opioids, for illegitimate purposes. Drug addiction and prescription abuse occur throughout medicine specialties, and the true prevalence of addiction and drug-seeking behaviors in the ED population is unknown.

When patients are undergoing treatment with opioid medications, the physician should be aware of the

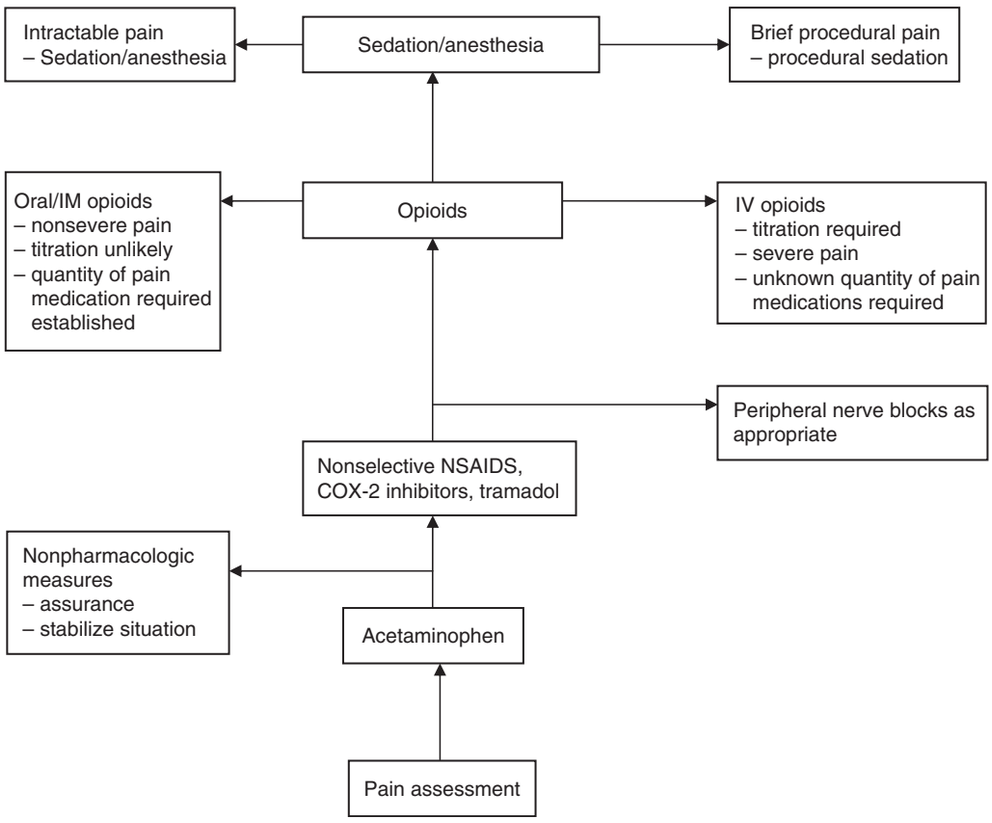

Figure 1-1. A generalized approach to the treatment of acute pain.

potential for development of physical dependence and/or tolerance. The clinician should be cautious, however, not to label the patient as an "addict" who is merely physically dependent or tolerant of medications. Such scenarios have been characterized with the term iatrogenic pseudoaddiction. These patients have opioid doses that are either too low or spaced too far apart to relieve pain, and subsequently develop behavior resembling psychological dependence.

PAIN MANAGEMENT

A generalized approach to the treatment of acute pain should be consistently applied to patient encounters (Figure 1-1). Such an approach will optimize the potential for effective analgesia across a broad range of painful conditions.

For injured patients whose pain progresses past the initial acute phase and in patients with chronic pain, close follow-up with a single practitioner can be an important aspect of their ongoing care. This practice allows for the adoption of consistent approaches and the systematic trial of various strategies to determine a strategy that best suits a given patient.

It is common for patients in the midst of ongoing primary care to present with pain in the ED, or for patients who have conditions warranting follow-up with a single practitioner to seek care from multiple sources including the ED. If possible, these patients should be provided with a short course of medication and have close follow-up arranged. In patients who are unwilling or unable to obtain follow-up with a single physician, the clinician should emphasize the development of a consistent patient analgesic strategy with clear expectations to minimize both undertreatment and the adverse effects of long-term opioid use.

SUMMARY

Pain is the most common complaint in the ED. Having a consistent, integrated, and well-planned approach will optimize the experience for patients as well as medical providers.

BIBLIOGRAPHY

1. Pain management in the emergency department. *Ann Emerg Med* 2004;44(2):198.
2. Rupp T, Delaney KA. Inadequate analgesia in emergency medicine. *Ann Emerg Med* 2004;43(4):494–503.
3. Fosnocht DE, Swanson ER, Barton ED. Changing attitudes about pain and pain control in emergency medicine. *Emerg Med Clin North Am* 2005;23(2):297–306.
4. Jones JS, Johnson K, McNinch M. Age as a risk factor for inadequate emergency department analgesia. *Am J Emerg Med* 1996;14(2):157–160.
5. Friedland LR, Kulick RM. Emergency department analgesic use in pediatric trauma victims with fractures. *Ann Emerg Med* 1994;23(2):203–207.
6. Green CR, et al. The unequal burden of pain: Confronting racial and ethnic disparities in pain. *Pain Med* 2003;4(3):277–294.
7. Miner J, et al. Patient and physician perceptions as risk factors for oligoanalgesia: A prospective observational study of the relief of pain in the emergency department. *Acad Emerg Med* 2006;13(2):140–146.
8. Bartfield JM, et al. Physician and patient factors influencing the treatment of low back pain. *Pain* 1997;73(2):209–211.
9. Cooper-Patrick L, et al. Race, gender, and partnership in the patient–physician relationship. *JAMA* 1999;282(6):583–589.
10. Merskey H. The taxonomy of pain. *Med Clin North Am* 2007;91(1):13–20.
11. Thomas SH, et al. Effects of morphine analgesia on diagnostic accuracy in Emergency Department patients with abdominal pain: A prospective, randomized trial. *J Am Coll Surg* 2003;196(1):18–31.
12. Bijur PE, Kenny MK, Gallagher EJ. Intravenous morphine at 0.1 mg/kg is not effective for controlling severe acute pain in the majority of patients. *Ann Emerg Med* 2005;46(4):362–367.
13. Weissman DE, Haddox JD. Opioid pseudoaddiction – an iatrogenic syndrome. *Pain* 1989;36(3):363–366

2 Emergency Procedural Sedation Principles

John H. Burton and James Miner

SCOPE OF THE PROBLEM

Procedural sedation and analgesia (PSA) in the emergency department (ED) is a common component of the modern practice of emergency medicine. The concepts inherent to PSA, however, are not new to emergency care for the sick and wounded.

Medical accounts from authors as early as Hippocrates have included descriptions of painful procedures, such as orthopedic dislocation and fracture reduction, in their accounts of the stabilization of patients with acute medical and traumatic conditions. Along with these descriptions, physicians have often described the use of certain techniques or adjuncts to assuage the pain associated with therapeutic procedures.

Historical depictions of procedure patients have frequently included images of caregivers providing alcohol or inhalational agents to alleviate procedure-related pain and suffering. These concepts have become inherent to our collective view of the role of medical caregivers as both prescribing treatment as well as relief of pain and suffering throughout history.

The rationale for administration of analgesic and/or sedative agents has generally relied upon the reduction of pain and suffering. Modern medical practice recognizes the importance of PSA as being equally important for the provision of a number of additional elements including relaxation of affected muscle groups and tissues adjacent to injured structures, reduction of patient anxiety, and as a means to improve the broad experience of the procedure encounter not only for the patient but also for patient family members and health-care providers alike.

More recently, the understanding and practice of ED PSA has benefited from a great deal of interest from researchers and clinicians. This interest has produced a substantial amount of disseminated research, empiric observations, and practical experience that have advanced the collective understanding of the roles and benefits of procedural sedation.

Minimal, moderate, and deep sedation have all been described in the ED setting. Emergency patients frequently have conditions that require pain and complex procedures. Unlike most patients who are undergoing sedation in other settings, patients in the ED have unpredictable NPO status, often have concurrent, severe systemic disease, and usually are in severe pain before the procedure begins. In addition, concurrent events and time/bed constraints cannot be predicted in the ED. As a consequence, ED PSA has evolved into a specialized practice, responding to these many challenges, with unique approaches not common to other settings and patients.

Table 2-1. PSA practice policy components

- Medical provider scope of practice and credentialing
- Patient PSA consent
- Standardized patient assessment, monitoring, and preparation practices for intended depth of consciousness
- Suggested PSA drug dosing strategies
- Patient history and physical examination documentation prior to procedure
- Documentation of medical procedure and patient monitoring data
- Discharge criteria following PSA
- Standards for routine reporting of adverse PSA-related events

PSA VS CONSCIOUS SEDATION

The term "procedural sedation and analgesia" has supplanted the often misused and misinterpreted historical expression "conscious sedation." In clinical practice, the concepts implied with the use of PSA are less misleading to both the patient and the medical provider. In addition, the use of the term PSA in clinical practice more accurately captures the intent of this practice: sedation and/or analgesia for an acute medical intervention with the depth of sedation and analgesia largely dependent on factors dictated by the patient's needs.

Locations for PSA Practice

There are many locations within health-care facilities where PSA may take place. The areas with greatest activity are typically located within the hospital and would include the ED, outpatient surgery units, radiology, gastroenterology, and the intensive care unit (ICU).

Each PSA site will have its unique patient population and procedures in addition to a unique set of caregivers delivering care within this setting. The principles for PSA practice should not be fluid across any collection of health-care sites. Rather, procedural sedation practice should be promulgated within a predetermined set of clinical guidelines and requirements that emphasizes patient PSA needs, patient safety, and provider training specific to the intended level of consciousness depth as well as the procedure (Table 2-1). PSA practice policies should specifically address provider credentialing, documentation, patient consent, monitoring, and discharge criteria for PSA patients in all areas.

The PSA Depth of Consciousness Spectrum

Many health-care locations will organize PSA clinical practice guidelines based on categorical assessments of expected sedation depth. PSA practitioners should recognize that a spectrum exists for the depth of patient sedation during any PSA encounter. This spectrum can be categorically characterized with levels that would typically include minimal, moderate, and deep sedation (Figure 2-1). The distant end of the sedation depth spectrum would be occupied by a general anesthesia level of consciousness.

Minimal sedation generally refers to a patient who retains a near-baseline level of alertness with the ability to follow commands in an age-appropriate fashion. Minimal sedation is usually performed for procedures that require compliance but are typically less painful with the use of local anesthesia. Typical light sedation procedures might include procedures such as lumbar puncture, evidentiary exams, simple fracture reductions in combination with local anesthesia, and abscess incision and drainage. During minimal sedation, cardiovascular and ventilatory functions are usually maintained, although patients should be monitored for inadvertent oversedation to deeper levels with oxygen saturation monitors and close nursing supervision. Agents typically utilized for minimal sedation include fentanyl, midazolam, and low-dose ketamine.

As one progresses along the sedation continuum to a moderate sedation depth, levels of impaired consciousness progress with the onset of eyelid ptosis, slurred speech, and delayed or altered responses to verbal stimuli. Moderate sedation is performed on patients who

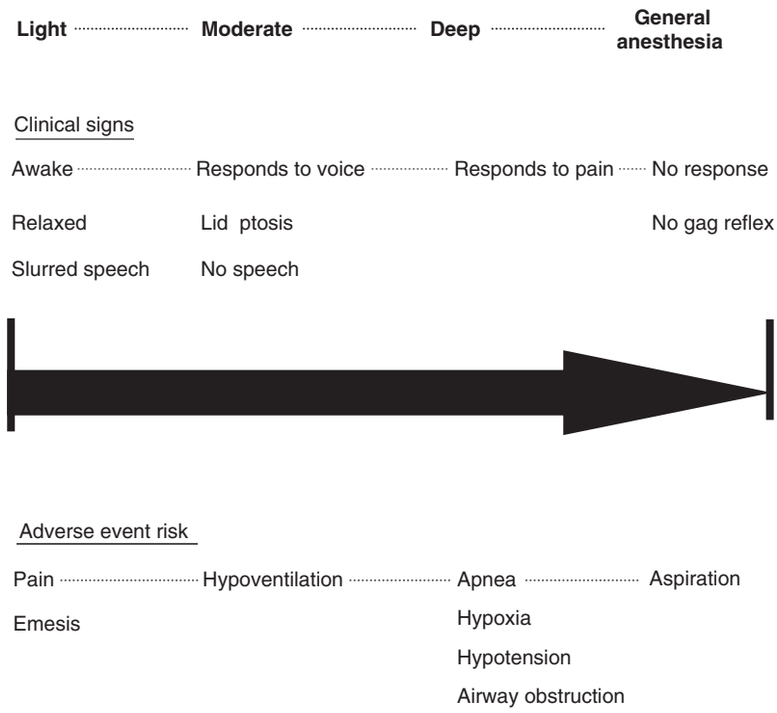

Figure 2-1. The depth of consciousness spectrum for procedural sedation.

would benefit from either a deeper level of sedation to augment the procedure or would benefit from amnesia of the event. Patients usually have an intact airway and maintain ventilatory function without support. As with minimal sedation, inadvertent oversedation to deeper levels can occur and appropriate monitoring including oxygen saturation, cardiac, and blood pressure assessments should be done throughout the sedation with direct observation of the patient's airway throughout the procedure. Agents used for moderate sedation in the ED include propofol, etomidate, ketamine, and the combination of fentanyl and midazolam.

As patient depth of consciousness progresses into a deep sedation, the patient response to verbal commands is substantially impaired with preservation of response to painful stimuli as well as preservation of airway protective reflexes. Deep sedation is performed on patients who would benefit from a deeper level of sedation in order to complete the procedure for which they are receiving sedation. Amnesia of the procedure is similar between moderate and deep sedation, and it is not necessary to sedate patients to a deep level only to obtain amnesia of the procedure. Deep sedation generally is achieved in the ED with the same agents as moderate sedation – the difference being the intended level of sedation. Monitoring for deep sedation is the same as for moderate with oxygen saturation, cardiac, and blood pressure assessments augmented by direct observation of the airway.

End tidal carbon dioxide ($ETCO_2$) has also been described in ED PSA, but its utility over direct ventilation observation remains unclear. Deeply sedated patients can develop respiratory depression but generally maintain a patent airway and adequate ventilation. Patients sedated to this level can progress to a level of sedation consistent with anesthesia and there is some evidence that this may occur more frequently in patients intended to undergo deep sedation than in patients who are going to undergo moderate sedation.

A categorization of general anesthesia depicts a patient unresponsive to all stimuli as well as the absence of airway protective reflexes. Although it is acknowledged that deep sedation can inadvertently result in a level of sedation consistent with anesthesia, this is not typically the goal of ED PSA. Patients who progress to an unintended level of sedation consistent with anesthesia are unable to be aroused with verbal or painful stimuli. The ability to independently maintain ventilatory

function is usually impaired, and patients often require assistance in maintaining a patent airway. Since patients can quickly progress to this level using the agents typical of moderate and deep sedation, physicians performing moderate and deep sedation must be prepared to provide ventilatory support until the patient has regained consciousness.

Recent work with bispectral (BIS) monitoring has added an objective assessment to the traditional understanding of the sedation depth spectrum during PSA and general anesthesia. Although much insight has been attained for the application of BIS findings to the general anesthesia patient, the implications and adaptability of this work to the PSA patient are less clear. Precise levels of consciousness captured by the BIS monitor have varying degrees of correlation with clinically observed moderate to deep levels of consciousness. As a consequence, the application of BIS monitoring technology to PSA practice remains investigative.

CLINICAL ASSESSMENT

PSA guidelines should include a history of present illness and physical examination for each patient. The preprocedure assessment should include consideration of the patient age and any comorbidity that would impact the selection of agents or dosing.

The patient assessment should include consideration of the baseline airway status, including the American Society of Anesthesiologists' (ASA) classification of the patient as potentially uncomplicated or complicated (Table 23-1). The ASA classification and the patient's age may prompt consideration for a more conservative agent selection and/or dosing strategy. The Mallampati score is often employed as an assessment guide to assess the potential for airway complications (discussed in Chapter 23).

An informed consent document should be routinely used for encounters where the expected depth of consciousness will exceed minimal sedation. As PSA consent is obtained, the patient should be informed of any possible risks of the procedure, including potential adverse complications and specific alternatives to the treatment plan. The PSA consent should also assist the patient in understanding that PSA for any given patient may or may not meet the patient's expectations for pain relief, anxiolysis, event amnesia, and sedation. The PSA intervention should be characterized as one with an emphasis on the balance between the intended benefits and the potential for PSA-related complications for any given encounter allowing for the potential that many patients may experience discomfort despite the use of a PSA-augmented approach.

Patient monitoring should be a standardized process for all PSA encounters. Moderate sedation and deep sedation encounters should routinely include blood pressure, heart rate, hemoglobin-oxygen saturation, respiratory rate, and depth of sedation monitoring. Many practices have also begun routine ventilation monitoring with capnography. Capnography offers the benefit of more precise and sensitive monitoring of ventilation depth and rate through $ETCO_2$ detection.

Depth of sedation is best monitored utilizing a standardized sedation assessment scale (see Figure 2-1). The most common and clinically relevant complications during PSA encounters are adverse respiratory events such as apnea, hypoxemia, and airway obstruction. Therefore, the greatest emphasis for health-care provider training and patient monitoring should be directed toward the prevention, detection, and treatment of adverse respiratory events.

PAIN/SEDATION CONSIDERATIONS

With the exception of ketamine, ED PSA sedative medications have minimal to no inherent analgesic properties. As the majority of sedation procedures will involve a substantial amount of pain, most PSA encounters should offer a standardized analgesic approach to ensure proper attention to patient pain prior to, during, and after any ED procedure.

The dosing of analgesic agents should be standardized in a weight-based fashion. A typical approach should include initial dosing of an analgesic agent based upon the patient's preprocedural pain. Typical analgesic agents will include morphine sulfate, hydromorphone, and fentanyl (Table 2-2). Selection of a specific analgesic should take into consideration the patient's prior experience with similar analgesics as well as the desired duration of clinical affects.

Patients who require longer periods of analgesia, such as those with fractures, will benefit from strategies

Table 2-2. Commonly utilized agents for ED PSA

Analgesia agents
• Fentanyl
• Morphine sulfate
• Hydromorphone
Sedation agents
• Midazolam
• Propofol
• Methohexital
• Etomidate
• Ketamine

emphasizing longer-acting agents, such as morphine or hydromorphone. These patients may also benefit from integration of patient-controlled elements such as patient-controlled analgesia (PCA) pumps. Regardless of the analgesic agent selected, the analgesia approach should be a continuous observational process with titration of additional medication in accordance with the ongoing patient needs.

The ongoing titration of an analgesic agent during sedation procedures should be approached with caution. Intravenous analgesics have inherent risks for ventilatory depression as well as hemodynamic compromise. The simultaneous titration of an analgesic and sedative agent adds a compounded risk of these events during procedural sedation as well as an element of confusion as to the agent or combination of agents responsible should an adverse event occur.

Selected procedures such as cardioversion or foreign body removal may be viewed as events in which the addition of an analgesic agent is of limited benefit. In such events, the PSA approach is simplified significantly by the reduction of agents that place the patient at risk for adverse hemodynamic or respiratory events.

PAIN/SEDATION MANAGEMENT

Typical PSA procedures in the adult and pediatric population might include incision and drainage of abscess, fracture and/or dislocation reduction, laceration repair, and foreign body removal. Electrical cardioversion is a procedure commonly undertaken in the adult population. In the ED setting, the most common PSA procedures will be painful fracture and/or dislocation reduction maneuvers. These procedures typify encounters where optimum patient relaxation and analgesia are a benefit to patients as well as providers.

The selection of a proper PSA agent should rely upon the consideration of a number of patient and procedure-related factors. The anticipated degree of muscle relaxation and analgesia required for the procedure should be contemplated. The expected duration of the procedure is of critical importance. Any anticipated positioning or maneuvering of the patient may lend certain agent selections more appropriate. Finally, the expectations of the patient and medical consultants taking part in the procedure should be considered as well.

There remains a great deal of variance in ED PSA agent selection and dosing strategies. Provider experience as well as institution or medical consultant preferences may substantially influence individual approaches. An "evidence-based" approach is now possible in clinical practice given the many reviews and investigations published in the medical literature.

Common ED PSA Agents

Agents commonly utilized for adult and pediatric ED PSA include midazolam, etomidate, propofol, ketamine, and methohexital (Table 2-2).

Until recently, midazolam has been the PSA agent that clinicians are most familiar with. Midazolam offers the benefit of a rapid onset and low incidence of cardiovascular complications in the ED PSA population. However, the utilization of shorter-acting sedative agents has increased substantially, largely as a consequence of physician familiarity with these medications as induction agents in addition to many published investigations in the medical literature.

Short-acting sedative agents, specifically methohexital, etomidate, and propofol, have consistently been demonstrated to confer similar or, in many cases, improved patient and provider experiences in the ED PSA setting. Adverse event rates associated with these latter agents have not been characterized as substantially higher than the risk traditionally attributed to midazolam. The current medical evidence has demonstrated safety profiles associated with these agents comparable to midazolam.

An advantage of midazolam compared to short-acting sedative agents is the relatively light levels of sedation produced with low-dose midazolam. In contrast, methohexital, etomidate, and propofol will confer moderate or deep sedation levels for nearly all encounters. Since most ED-based PSA encounters require levels of sedation in the moderate to deep range, this argument in favor of midazolam likely has little clinical application to the majority of ED patients.

Common arguments expressed in favor of shorter-acting sedative agents promote the view that shorter periods of impaired levels of consciousness confer less relative risk for adverse respiratory events, at the same time offering the benefit of substantially reduced monitoring times. The latter issue has gained a great deal of favor and pertinence with increasing ED patient volumes placing great demands on fixed ED personnel resources.

FOLLOW-UP/CONSULTATION CONSIDERATIONS

A diverse medical provider group should be responsible for development, maintenance, and ongoing review of ED PSA practices for any given site. This approach is of particular importance in locations where moderate and deep levels of patient sedation are frequently utilized. Consultants routinely include providers with expertise in anesthesiology, pediatric, and radiology services. Additional contributing services might include individuals with orthopedics, plastics/reconstructive surgery, and cardiology expertise. The goal of such a multidisciplined group should be to enable a process of ensuring patient safety as well as ongoing performance and evolution of PSA practices.

Selected patients may be deemed inappropriate for ED PSA. These individuals may be considered to have an elevated risk for adverse events to such a degree that an alternate approach of delaying or relocating the intervention and sedation to an alternate time or location may be deemed in the patient's best interests. General guidelines and participation in a planned approach to these patients is another benefit of a multidisciplined oversight process for ED PSA.

SUMMARY

ED providers and patients benefit from standardized institutional and ED PSA practices. Concerns for patient safety should remain foremost in the provision of ED PSA services. Medical providers responsible for PSA practice encounters, particularly practices that routinely confer levels of deep sedation, should be vigilant in their training and preparation for adverse hemodynamic and respiratory events.

BIBLIOGRAPHY

1. American Society of Anesthesiologists, Task Force on Sedation and Analgesia by Non-Anesthesiologists. Practice guidelines for sedation and analgesia by non-anesthesiologists. *Anesthesiology* 2002;96:1004–1017.
2. American Academy of Pediatrics. Committee on Drugs, Section of Anesthesiology. Guidelines for monitoring and management of pediatric patients during and after sedation for diagnostic and therapeutic procedures. *PEDS* 1992;89:1110–1115.
3. Clinical policy for procedural sedation and analgesia in the emergency department. American college of emergency physicians. *Ann Emerg Med* 1998; 663–677.
4. Green SM, Krauss B. Procedural sedation terminology: Moving beyond ''conscious sedation.'' *Ann Emerg Med* 2002;39(4):433–435.
5. Agrawal D, Manzi SF, Gupta R, Krauss B. Preprocedural fasting state and adverse events in children undergoing procedural sedation and analgesia in a pediatric emergency department *Ann Emerg Med* 2003;42:636–646.
6. Joint Commission on Accreditation of Healthcare Organization. *Standards for moderate and deep sedation and anesthesia hospital accreditation standards*. Oakbrook Terrace, Illinois, 2002; Tx:2–Tx.2.4. 1, pp. 108–111.
7. Miner JR, Biros MH, Seigel T, Ross K. The utility of bispectral index in procedural sedation with propofol in the emergency department. *Acad Emerg Med* 2005;12:190–196.