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Guidelines for Monitoring and Management of Pediatric Patients During and After Sedation for Diagnostic and Therapeutic Procedures: Addendum

Committee on Drugs

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Committee on Drugs

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ABSTRACT. The purpose of this addendum to the 1992 policy statement is to clarify some of the terms used in that document and to more thoroughly delineate the responsibilities of the practitioner when sedating children.

ABBREVIATION. COD, Committee on Drugs.

INTRODUCTION

In 1992, the American Academy of Pediatrics Committee on Drugs (COD) published a revision of the policy statement, "Guidelines for Monitoring and Management of Pediatric Patients During and After Sedation for Diagnostic and Therapeutic Procedures."¹ Subsequently, the statement had been reaffirmed in 1995 and 1998. Sedation-related accidents continue to occur.²⁻⁴ This addendum to the 1992 statement is meant to clarify some of the terms used in that document and to more thoroughly delineate the responsibilities of the practitioner when sedating children. Regardless of the intended level of sedation or route of administration of sedative, sedation of a patient represents a continuum and may result in loss of the patient's protective reflexes; a pediatric patient may move easily from a level of light sedation to obtundation.¹

The COD continues to emphasize that sedation of children is different from sedation of adults. Sedatives are generally administered to gain the cooperation of the child. The ability of the child to cooperate depends on chronologic and developmental age. Often, children younger than 6 years and those with developmental delays require deep levels of sedation to gain their cooperation. Children in this age group are particularly vulnerable to the adverse effects of sedatives on respiratory drive, patency of the airway, and protective reflexes.^{2,3} Because deep sedation may occur after administration of sedatives in any child, the practitioner must have the skills and equipment necessary to safely manage patients who are sedated.

This addendum reaffirms the following principles for the sedation of children:

1. The patient must undergo a documented presedation medical evaluation, including a focused airway examination.
2. There should be an appropriate interval of fasting before sedation.
3. Children should not receive sedative or anxiolytic medications without supervision by skilled medical personnel (ie, medication should not be administered at home or by a technician without medical supervision*).
4. Sedative and anxiolytic medications should only be administered by or in the presence of individuals skilled in airway management and cardiopulmonary resuscitation.
5. Age- and size-appropriate equipment and appropriate medications to sustain life should be checked before sedation and be immediately available.
6. All patients sedated for a procedure must be continuously monitored with pulse oximetry.
7. An individual must be specifically assigned to monitor the patient's cardiorespiratory status during and after the procedure; for deeply sedated patients, that individual should have no other responsibilities and should record vital signs at least every 5 minutes.
8. Specific discharge criteria must be used.

The term "conscious sedation" is confusing and, as used in the 1992 statement,¹ has been misinterpreted as a state in which the patient retains only reflex withdrawal to pain.⁵ In the 1992 statement, conscious sedation was defined as a state of sedation that "permits appropriate response by the patient to physical stimulation or verbal command, eg, 'open your eyes.'" The minimal responses of reflex withdrawal (a spinal reflex) or moaning in response to a needle insertion are not consistent with this definition of conscious sedation. The intention of the COD was to define "conscious sedation" as a very minimal state of sedation in which the patient would make an appropriate response to a painful stimulus, such as crying, saying "ouch," or pushing away the offending stimulus. In older children, an appropriate re-

The recommendations in this statement do not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.
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* The term "medical supervision" refers to supervision by a practitioner who, by virtue of training, education, certification, or applicable licensure, law, or regulation, is qualified to supervise the delivery of medical care. The individual may be a physician, nurse, dentist, or other appropriately trained health professional.

sponse implies that the patient retains the capability to interact with the patient care team. Purely reflexive activity, such as the gag reflex, simple withdrawal from pain, or making inarticulate noises, does not constitute an appropriate response for the purpose of this definition. A sedated child who displays only reflex activity of this sort is in a state of deep sedation, not a state of conscious sedation. The COD recommends that it is more appropriate to recognize the most current terminology of the American Society of Anesthesiologists⁶ and replacement of the term "conscious sedation" with "moderate sedation." The Joint Commission on Accreditation of Healthcare Organizations has adopted revisions to its anesthesia care standards⁷ consistent with the American Society of Anesthesiologists standards, and the COD recommends that the Academy adopt the same language. "Mild sedation" is equivalent to anxiolysis; "moderate sedation" is equivalent to the previously used term "conscious sedation" or "sedation/analgesia."^{8,9}

In the 1992 statement, the COD defined deep sedation as "a medically controlled state of depressed consciousness or unconsciousness from which the patient is not easily aroused. Deep sedation may be accompanied by a partial or complete loss of protective reflexes, including the inability to maintain a patent airway independently and to respond purposefully to physical stimulation or verbal command." The COD stated, "Deep sedation and general anesthesia are virtually inseparable for purposes of monitoring." The guidelines stipulated that these levels of sedation require support personnel whose only responsibility is to monitor the patient (ie, this person should not be assisting with the procedure). In addition, a time-based record of vital signs to allow tracking of trends every 5 minutes was recommended.

Another area of confusion relates to the location in which the guidelines should be applied. Regardless of the medications selected or the route of administration (oral, rectal, nasal, intramuscular, intravenous, inhalation), the potential for serious adverse effects exists.³ Therefore, the skills of the practitioner and the availability of age- and size-appropriate equipment, medications, and monitoring are most important in rescuing the child should an adverse sedation event occur. The COD has concluded that the guidelines apply in all locations and to all practitioners who care for children. At the time the original statement was published, most children sedated for a procedure received sedatives in a hospital. At present, many children receive sedatives in nonhospital facilities, where the guidelines are not always followed. This is unfortunate, because it is in the nonhospital environment that skilled rescue teams may be least accessible in an emergency. Recent information confirms that adverse sedation events that occur in a practitioner's office are more likely to be fatal than events that occur in a hospital or hospital-like setting.² Deaths have also occurred when the sedative or anxiolytic medication (even when administered at recommended doses) was administered at home before a procedure.³

Proper recovery procedures (including strict discharge criteria) in particular are important, because some patients may become more deeply sedated after the stimulus of the procedure is discontinued, whereas others will have prolonged sedation effects because of the pharmacokinetic or pharmacodynamic profile of the medications chosen for sedation or anxiolysis (eg, chloral hydrate, pentobarbital, chlorpromazine). The systematic approach to sedation was intended to provide a uniform guideline for appropriately observing and caring for children requiring sedation for a procedure regardless of where the procedure was performed (office, free-standing medical facility, or hospital).

The COD wishes to emphasize the following recommendations:

1. The "Guidelines for Monitoring and Management of Pediatric Patients During and After Sedation for Diagnostic and Therapeutic Procedures" apply regardless of the settings in which sedatives are administered or the specific training or profession of the practitioners involved.
2. Sedative or anxiolytic medications should not be administered at home as part of a preprocedural sedation plan.
3. Sedative or anxiolytic medications should not be administered by anyone who is not medically skilled or supervised by skilled medical personnel.
4. When children are deeply sedated, at least 1 individual must be present who is trained in, and capable of, providing pediatric basic life support, and who is skilled in airway management and cardiopulmonary resuscitation; training in pediatric advanced life support is strongly encouraged.
5. It is crucial that age- and size-appropriate resuscitation equipment and medications be immediately available.
6. Children who receive sedative medication with a long half-life may require extended observation.
7. On occasion, on the basis of careful, documented review of the medical history, physical examination, and proposed procedure, a practitioner may determine that a hospital is the only appropriate venue for administering sedatives.
8. Third-party payers should respect medical decisions that conform to these guidelines and provide the level of care most appropriate for the patient.

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REFERENCES

1. American Academy of Pediatrics, Committee on Drugs. Guidelines for monitoring and management of pediatric patients during and after sedation for diagnostic and therapeutic procedures. *Pediatrics*. 1992;89:1110–1115
2. Coté CJ, Notterman DA, Karl HW, Weinberg JA, McCloskey C. Adverse sedation events in pediatrics: a critical incident analysis of contributing factors. *Pediatrics*. 2000;105:805–814
3. Coté CJ, Karl HW, Notterman DA, Weinberg JA, McCloskey C. Adverse sedation events in pediatrics: analysis of medications used for sedation. *Pediatrics*. 2000;106:633–644
4. Institute of Medicine, Committee on Quality of Health Care in America. Kohn LT, Corrigan JM, Donaldson MS, eds. *To Err Is Human: Building a Safer Health System*. Washington, DC: National Academy Press; 2000
5. American Academy of Pediatric Dentistry. Policy statement on the use of deep sedation and general anesthesia in the pediatric dental office. In: *Reference Manual 1999–2000*. Chicago, IL: American Academy of Pediatric Dentistry; 1999:31. Available at: <http://www.aapd.org>. Accessed May 25, 2000
6. American Society of Anesthesiologists. Continuum of depth of sedation: definition of general anesthesia and levels of sedation/analgesia. Available at: <http://www.asahq.org/standards/20.htm>. Accessed February 13, 2001
7. Joint Commission on Accreditation of Healthcare Organizations. Standards and intents for sedation and anesthesia care. In: *Revisions to Anesthesia Care Standards, Comprehensive Accreditation Manual for Hospitals*. Oakbrook Terrace, IL: Joint Commission on Accreditation of Healthcare Organizations; 2001. Available at: <http://www.jcaho.org/standard/aneschap.html>. Accessed February 13, 2001
8. American Society of Anesthesiologists, Task Force on Sedation and Analgesia by Non-Anesthesiologists. Practice guidelines for sedation and analgesia by non-anesthesiologists. *Anesthesiology*. 1996;84:459–471
9. 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

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