



Sedation of Adult Patients in the Emergency Department: Case Presentations

Sedation of patients in the emergency department for procedures or behavioral disorders often is needed but is not without risks. The lecturer will discuss the use of various sedative and ultrashort-acting medications in several “real-world” emergency department cases. There will be an emphasis on indications, contraindications, and pharmacologic interactions. The use of appropriate monitoring equipment and sedation protocols will be addressed.

- Discuss the differences between light, deep, and dissociative sedation; analgesia; neuroleptosis; and general anesthesia.
- Choose the appropriate sedation/short-acting medications in clinical situations that require effective yet short-acting sedation.
- Discuss the risks associated with the use of these drugs in the emergency department, including the use of barbiturates, benzodiazepines, opioids, phenothiazines, propofol, and ketamine.

TH-218
Thursday, October 14, 1999
11:00 AM - 11:55 AM
Room # N247
Las Vegas Convention Center

FACULTY

Kristi L Koenig MD, FACEP

Director, Emergency Medical
Preparedness Office, Veterans Health
Administration, Washington DC

Course Description:

Sedation of patients in the emergency department for procedures or behavioral disorders often is needed but is not without risks. The lecturer will discuss the use of various sedative and ultrashort-acting medications in several "real-world" emergency department cases. There will be an emphasis on indications, contraindications, and pharmacologic interactions. The use of appropriate monitoring equipment and sedation protocols will be addressed.

- Discuss the differences between light, deep and dissociative sedation; analgesia; neurolept analgesia; and general anesthesia.
- Choose the appropriate sedation/short-acting medications in clinical situations that require effective yet short-acting sedation.
- Discuss risks associated with the use of these drugs in the emergency department, including the use of barbiturates, benzodiazepines, opioids, phenothiazines, propofol, and ketamine.

Course Outline

I. Sedation Terminology

1. Conscious vs. Deep Sedation
 - a. Joint Commission requirements - same standard of care in all hospital locations (e.g. ED and OR)
 - b. Hospital privileges - the credentialing controversy (merit badge medicine)
2. Neurolept analgesia (droperidol, haloperidol)
3. General Anesthesia (loss of protective airway reflexes)
4. Dissociative Anesthesia (ketamine)
5. Systemic Sedation and Analgesia

◆ Case 1

A 32 year old male unhelmeted motorcycle rider is brought to your ED after broadsiding a car at low speed. He is intoxicated, combative, and shouting obscenities. Vital signs are remarkable for a sinus tachycardia at a rate of 140. You are concerned for the safety of your resuscitation team.

II. Sedation - Key Concepts

1. Choose the "right" indication
2. Identify the "right" patient
3. Select the "right" equipment
4. Pick the "right" agent -- and TITRATE!

III. Sedation Agent Selection

1. What are you trying to achieve?
 - a. Sedation
 - b. Analgesia
 - c. Anxiolysis
2. Single agent vs. balanced approach
3. How much time do you need?

IV. Indications for Sedation

1. Clinical indications
 - abscess drainage, burn care, chest tube insertion, pediatric laceration, orthopedic reduction, wound debridement, pediatric sexual assault examinations
2. Contraindications
 - a. Clinical instability (hemodynamic/respiratory)
 - b. Refusal by a competent patient

3. Other considerations
 - a. Emergency Department's capabilities
 - b. Patient preparation
 - c. Physician's experience
 - d. Hospital and ED protocols
 - e. Current ED capacity

◆ **Case 2**

A 42 year old IVDU presents to the ED with a left forearm abscess. He has no significant PMH, stable VS, and last ate a meal 4 hours ago. He is drinking a large glass of water as you walk into the room.

V. Patient Preparation

1. Model conscious sedation records - How are YOU documenting?
 - a. Current history: associated injuries, drugs or alcohol, last food or drink, other ED medications given, volume status
 - b. Past history: allergies, current medications, medical problems, past anesthetic history
2. AMPLE history
allergies, medications, past medical history, last meal, events leading up to current presentation
3. Key question: Should this be done in the OR?
4. Preoxygenate
5. Consider premedication (analgesia and/or anxiolytic)
6. Consent - Be careful about coercion (e.g. I'll give you this pain medicine ONLY if you sign this form!)

◆ **Case 3**

An 80 year old woman with a cardiac and COPD history is brought to the ED by ambulance with an SVT of 200, slight diaphoresis, hypotension, and mild confusion. Her last meal was 1 hour ago.

VI. Equipment and Personnel Selection

1. The conscious sedation room
2. Monitoring
Noninvasive monitors (EKG, BP), pulse oximeter, capnograph

3. Resuscitation

Oxygen, airway/intubation equipment, suction, reversal agents
(naloxone, flumazenil)

4. Personnel

CPT billing requires presence of trained observer

5. Recovery

6. Discharge instructions

◆ **Case 4**

A 23 year old previously healthy woman presents to the ED after falling through a glass window and sustaining a large, complex facial laceration. She has no other injuries and no drugs or alcohol on board. Vital signs are stable.

◆ **Case 5**

A 94 year old man presents with ALOC and an open tib-fib fracture with intact pulses after being struck by a car at moderate speed. He has a strong cardiac history and is taking multiple medications.

VII. Summary of Key Points

1. **Ask** yourself what you are trying to achieve
Sedation is a continuous spectrum
Should this be done in the OR?
2. **Wait** until you have adequate personnel
3. **Prepare** the patient (think "preop")
Preoxygenate
Use appropriate monitoring
4. **Know** your drugs
Be familiar with 1 or 2 agents
Titrate to effect

TH-218

Sedation of Adult Patients in the Emergency Department: Case Presentations

Faculty: Kristi L. Koenig, MD, FACEP

Specific Agents

1. Opiates

- a. Long track record, predictable performance, reversible, relatively inexpensive
- b. Usually used as part of a balanced approach
- c. Morphine: onset 1-3 minutes, half-life 3-5 hours
Complications: respiratory depression, hypotension, histamine release, prolonged sedation
Respiratory depression reversible with naloxone
- d. Fentanyl: 100 times more potent than morphine
Duration of action: 30-40 minutes
Minimal hypotension, histamine release
Wide therapeutic index
Rigid chest syndrome in less than 1%--can require paralysis and mechanical ventilation to treat
- e. Meperidine: 1/8 as potent as morphine
Half-life 1½-2 hours
Active metabolite normeperidine may cause CNS toxicity in renal-impaired patients and seizures (especially in sickle cell patients); contraindicated if patient taking MAOI; current role in conscious sedation is limited; removed from some formularies

2. Benzodiazepines

- a. Amnestic properties; no analgesia
Complications: respiratory depression, hypotension
- b. Midazolam: onset 1 minute, half-life 60 minutes
Proven safety/efficacy IF use appropriate monitoring
Pediatrics -- oral, intranasal, rectal
- c. Diazepam: Long half-life
Complications: more respiratory depression, hypotension, and phlebitis than midazolam
No longer commonly used for conscious sedation

3. Dissociate Agents - Ketamine

- a. Amnesia, analgesia, AND sedation
- b. Cardiorespiratory reflexes remain intact
- c. Extensively used in developing countries
- d. Anesthesia duration 15-20 minutes; analgesia lasts about 45 minutes
- e. Emergency phenomena overrated with 0-50% incidence; can mix with midazolam
- f. CAUTION: Push slowly IV over 1-2 minutes

TH-218

Sedation of Adult Patients in the Emergency Department: Case Presentations
Faculty: Kristi L. Koenig, MD, FACEP

- g. Complications: laryngospasm, usually self-limited; hypersalivation -- can use atropine
- h. Contraindications: infants, patients with increased intracranial or intraocular pressure, coronary artery disease, psychiatric patients
- Warn parents about 10% incidence of emesis
- 4. Sedative-Hypnotic Agents - NO analgesia
 - a. Thiopental: ultra-short acting barbiturate, unconsciousness within 10 to 20 seconds, can cause hypotension, avoid if history of bronchospasm
 - b. Methohexital: Similar profile to thiopental, but twice as potent; may cause respiratory depression; avoid in seizure patients
 - c. Etomidate: ultra-short acting imidazole derivative; class of its own; may cause myoclonic jerks, pain at injection site, and cortisol suppression (probably not clinically significant with one dose unless patient is steroid dependent); limited cardiovascular and respiratory depression
 - d. Propofol: "milk of amnesia," unrelated to barbiturates; transient apnea in up to 40% of patients; may be used as an infusion; antiemetic effects
- 5. Neuroleptics – rapid tranquilization
 - a. State of quiescence, reduced motor activity, reduced anxiety, indifference to surroundings, mental clarity
 - b. Butyrophenones
 - Haloperidol: 0.1-1.0 mg/kg q 5 min IV or IM
 - No respiratory depression
 - Occasional hypotension if volume depleted and sympathetically stimulated
 - May lower seizure threshold
 - Delayed dystonic reactions (concomitant benztropine (cogentin) may not make sense)
 - Droperidol: same dose as haloperidol
 - Mild alpha blocker so may cause hypotension
 - Depersonalization reaction may occur
 - c. Phenothiazines
 - Chlorpromazine (thorazine)
 - Formerly used in DPT cocktail for children

TH-218

Sedation of Adult Patients in the Emergency Department: Case Presentations

Faculty: Kristi L. Koenig, MD, FACEP

References

ACEP: Clinical policy for procedural sedation and analgesia in the emergency department. *Ann Emerg Med* May 1998;31:663-677.

ACEP Policy Statement: Use of pediatric sedation and analgesia. January 1997. Available via ACEP on FAX at 800-406-2237 #4135 or <http://www.acep.org>

Rose JR, Koenig KL. Conscious sedation. Lesson 20 June 1996 ACEP Critical Decisions Volume 10, Number 10, 9-16.

Rose JR, Koenig KL, Fernandez W. Conscious and deep sedation practices in academic emergency departments. *Acad Emerg Med* 1997;4(5):405 (abstract).

Koenig KL, Lambe S. A model emergency department systemic sedation record. *Acad Emerg Med* 1997;4(12):1178.

Green SM, Rothrock SG, Lynch EL, et al. Intramuscular ketamine for pediatric sedation in the emergency department: safety profile in 1,022 cases. *Ann Emerg Med* June 1998;31:679-687.

Practice guidelines for sedation and analgesia by non-anesthesiologists. A report by the American Society of Anesthesiologists task force on sedation and analgesia by non-anesthesiologists. *Anesthesiology* 1996;84:459-471.

Drinking before sedation: Preoperative fasting should be the exception rather than the rule. *BMJ* 314:18 January 1998:162.

American Society of Anesthesiologist (ASA) Physical Status Classification*

- ASA I Normal healthy patient
- ASA II Mild systemic disease
(mild diabetes, hypertension, anemia, chronic bronchitis,
morbid obesity)
- ASA III Severe systemic disease that limits activity
(angina pectoris, obstructive pulmonary disease, prior
myocardial infarction)
- ASA IV Incapacitating disease that is a constant threat to life
(congestive heart failure, renal failure)
- ASA V Moribund, not expected to survive longer than 24 hours
(ruptured aortic aneurysm, head trauma with increased
intracranial pressure)

* For emergency procedures, add the letter E before classification.

TH-218

Sedation of Adult Patients in the Emergency Department: Case Presentations

Faculty: Kristi L. Koenig, MD, FACEP

Properties of Sedation Agents

	Morphine	Fentanyl	Midazolam	Ketamine	Thiopental	Methohex	Etomidate	Propofol
Adult Dose	.1-.15 mg/kg	.5-1 ug/kg	.025-.05 mg/kg	.5-1 mg/kg	.5-1 mg/kg	.25-1 mg/kg	.1-.3 mg/kg	.5-1 mg/kg
Peds Dose	.1-.2 mg/kg	1-2 ug/kg	.05-.2 mg/kg	1-2 mg/kg (4-6 im)	4-6 mg/kg	1-2 mg/kg	.3-.4 mg/kg	1.5-3 mg/kg
How Supplied	2 ml tubex, 5 mg/ml	5 ml vial, 50 ug/ml	2 cc vial, 5 mg/ml	5 ml vial 10, 50 , or 100 mg/ml	500 mg powder, 25 mg/ml	500 mg powder, 10 mg/ml	10 ml ampule 2mg/ml	20 ml ampule, 10 mg/ml
Onset	< 60 sec	30 sec	30-60 sec	30 sec	30 sec	30-60 sec	30 sec	30 sec
Peak	15 min	5 min	3 min					
Duration	2-7 hours	30-60 min	15-80 min	5-15 min	3-5 min	5-10 min	3-10 min	5-10 min
Class	opiate	Synthetic opiate	benzo-diazepine	dissociative anesthetic	Ultra-short acting barbiturate	ultra-short acting barbiturate	non-barbiturate hypnotic	non-barbiturate hypnotic
Effects	bradycardia, apnea, hypotension , broncho-spasm, histamine release, chest wall rigidity, GI dysmotility	Bradycardia , apnea, hypotension (less than morphine), chest wall rigidity	hypotension , apnea, skeletal muscle relaxation, anti-convulsant	increased HR, BP, airway reflexes intact, broncho-dilation, increased IOP and ICP, emergence	Hypotension , apnea, decreased ICP, broncho-spasm	hypotension , apnea, seizure potential, broncho-spasm	relative CV and respiratory stability, myoclonus adrenal suppression	hypotension , apnea, antiemetic, myoclonus anaphylaxis with soy and egg allergy
Cost	\$.49/10 mg tubex	\$3.91/vial	\$14.64/vial	\$9.94/vial	\$3.25/vial	\$11.91/vial	\$18.10/ampule	\$10.70/ampule
Comments	reversible with naloxone	Reversible with naloxone	reversible with flumazenil	push slowly over 1-2 min	Mix with 20 cc NS	mix with 50 cc NS		