

EMS MEDICAL DIRECTOR'S COURSE -HOT TOPICS

Chemical Restraint and Sedation
in the Prehospital Setting



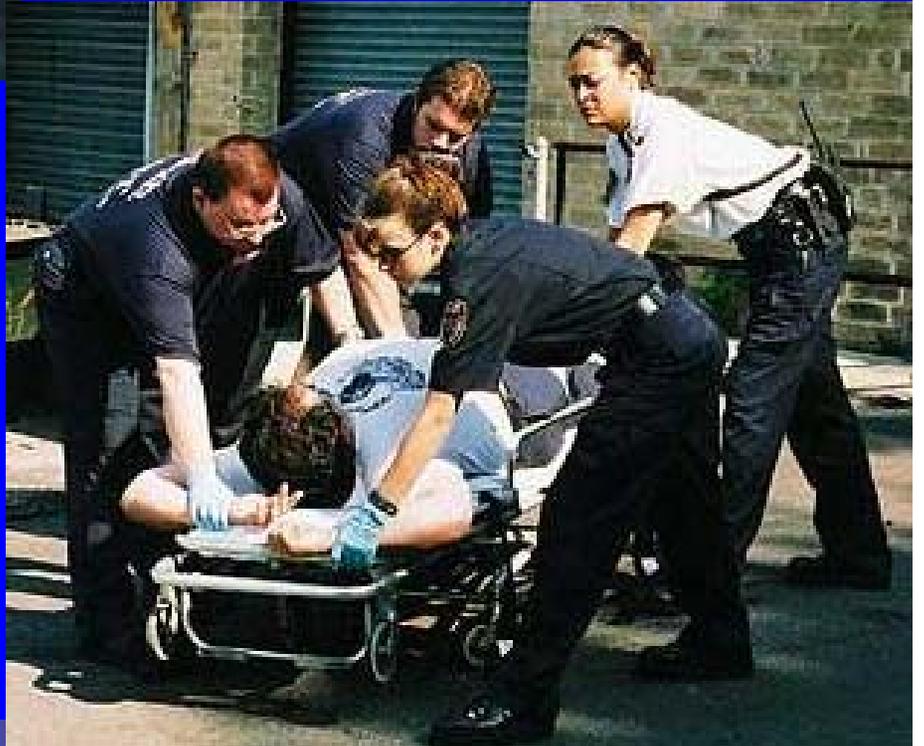
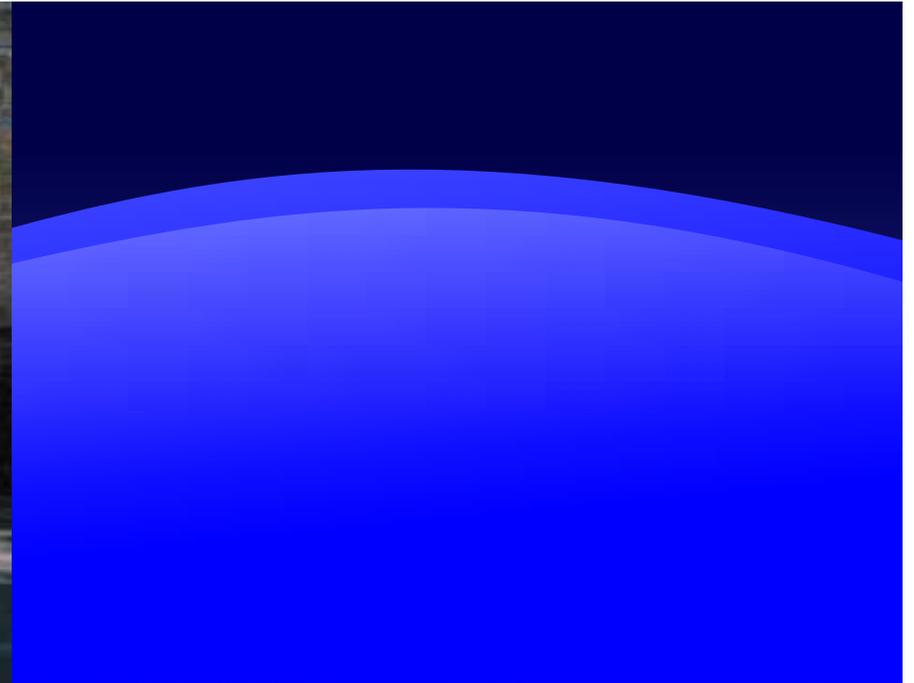
Scott Weir, MD, FACEP, NREMT-P

VIRGINIA EMS SYMPOSIUM

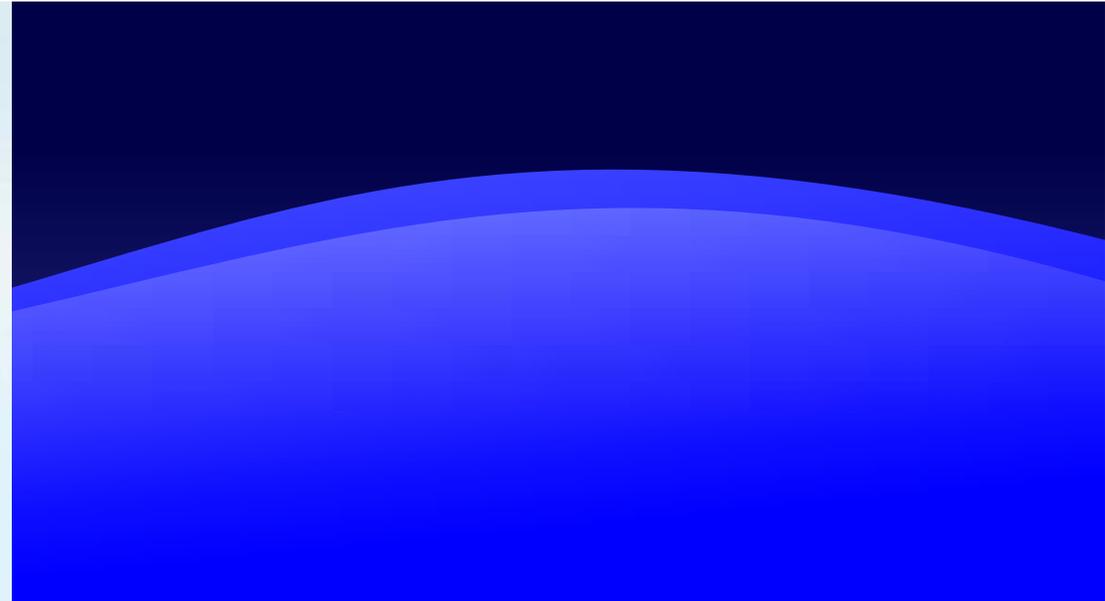
Pharmacologic Restraint of the Violent and Severely Agitated Patient



Scott Weir, MD, FACEP, NREMT-P



Photos Craig Jackson

A promotional poster for the TV show "Breaking Bad". It features two characters in full yellow hazmat suits standing in a desolate, dusty desert landscape. In the foreground, there are three silver barrels with yellow radiation symbols. The background is a dark, stormy sky with dust and debris. The title "Breaking Bad" is written in a stylized font where the letters are connected to a periodic table grid. The word "Br" is in a green box with the number 35 above it. The word "eaking" is in white. The word "Ba" is in a green box with the number 56 above it. The word "d" is in white. At the bottom right, there is text for the new season and the AMC logo with the website amctv.com.

³⁵Br eaking
⁵⁶Ba d

New Season MARCH 21
Sundays 10/9c

amc
amctv.com

Miami police attempt...



EMERGENCY MEDICINE NEWS
AP Photo/Alan Diaz

ExDS Protocol Puts Clout in EMS Hands

SoRelle, Ruth

Emergency Medicine News. 32(10):1,32,
October 2010.

doi: 10.1097/01.EEM.0000389817.48608.e4

Miami police attempt to catch a man who threw rocks, small pipes, and a cup of urine at them. Officers used a TASER and beanbag guns to subdue him.



Wolters Kluwer
Health

Lippincott
Williams & Wilkins

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Miami Zombie



apparently ate bath salts,
which made him hallucinate



Crime scene: cops had to
shoot the zombie several
times



Crime scene: miami zombie
was killed by police



viral image of the alleged
victim. Lesson: don't eat
bath salt socialmediaseo.net

Coroner: 'Excited delirium' caused
death of man in York City police custody

ELIZABETH EVANS The York Dispatch
Updated: 02/07/2012 12:28:15 PM EST

N.Y. Police Chief Says Dead Suspect May Have Suffered 'Excited Delirium'

Bryan Fitzgerald and Cathleen F. Crowley
Times Union, Albany, N.Y.

A 32-year-old man went into cardiac arrest and died after N.Y. officers used a Taser on him four or five times in a gym. The chief says he may have had excited delirium syndrome....

Cocaine, Excited Delirium and Sudden Unexpected Death

Matthew D. Sztajnkrycer, MD, PhD, & Amado A. Baez, MD, MSc

At 5:45 a.m., fire department personnel responded to a call concerning an unresponsive person outside a fast-food restaurant...

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Virginia Man Dies After Being Tasered

SOURCE: WUSA9.COM

null

Created: August 8, 2011

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The Washington Post

Va. man dies after police use Taser

By Isaac Arnsdorf and [Martin Weil](#), Published: August 9, 2011

A 29-year-old Virginia man died over the weekend after Prince William County police tried to subdue him with a Taser, authorities said.

They said an investigation is underway into the death of Debro Lamonte Wilkerson of Manassas, who was involved in a confrontation Saturday with police and rescue personnel in the area of Hiram Court, where a relative lived.

After rescue personnel responded to a medical emergency, they called for police to help them with a combative patient. When police arrived, they were informed that Wilkerson had assaulted several firefighters.

Suspect dies after being tasered at Pentagon City

By *theGrio*

11:01 AM on 01/19/2010

READ MORE: [Arlington](#), [Death](#), [Police](#), [Taser](#), [Virginia](#)

Combative patient flees in ambulance

■ Suspect arrested after crash, foot pursuit on Baldy

Story

Comments (55)

Share  Print  Font Size:  

 Tweet  0

 Like  11

Posted: Wednesday, December 15, 2010 10:00 am | Updated: 11:09 pm, Tue Dec 14, 2010.

By KEITH KINNAIRD News editor |  55 comments

SANDPOINT — A man was arrested Monday night after inexplicably scuffling with Bonner County EMS personnel, commandeering an ambulance despite being shocked by a deputy's Tazer and crashing the vehicle.

The suspect took off into the woods on Baldy Mountain, but was apprehended by deputies following a mile-long foot pursuit over steep terrain and through deep snow.

Virginia Man Dies After Being Tasered

Submitted by [WUSA9 Web Staff](#)
Sunday, August 7th, 2011, 9:47pm

MANASSAS, Va. (WUSA) -- A man who was being "combative" with police died after being tased, Prince William County Police said in a news release.

It happened around 3:30 p.m. on the 11000 Block of Hiram Court in Manassas, Saturday, police said.

Debro Lamonte Wilkerson, 29, of Manassas was being treated for some kind of medical emergency when police say he became agitated and combative with paramedics...

Man Dies in Struggle with Arlington Police

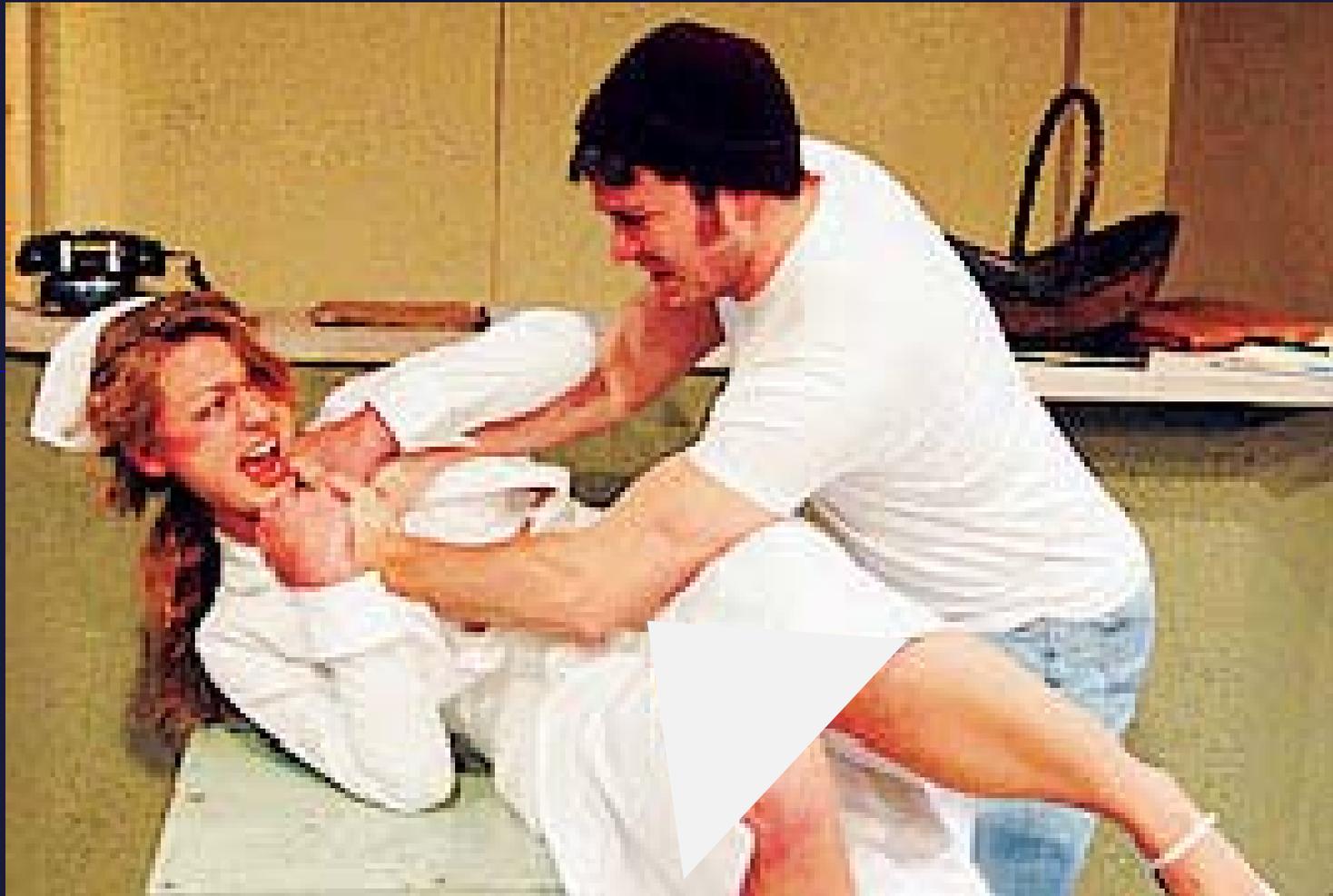
wusa9.com 5:52 AM, Jan 18, 2010

- ◆ ARLINGTON, Va. - An Arlington County Police official says that a man died after a scuffle with officers trying to detain him at the Pentagon City Metro on Sunday, January 17, at approximately 8 PM....

Objectives

- ◆ Review the Evidence, Summaries, Consensus Guidelines and Clinical Policies
- ◆ Agitate and provoke – thoughtful discussion
- ◆ Advocate for analysis of experience
 - ◆ Define successful solutions as well as limitations/pitfalls.







Not Our Objectives

- ◆ Medical-legal aspects
- ◆ Prevention and de-escalation techniques
- ◆ Physical Restraint methods
- ◆ In depth discussion of underlying entities:
 - ◆ Excited delirium, Agitated delirium, Violent and severely agitated patients, Cocaine psychosis, etc



CAVEATS ON SUDDEN DEATH IN VIOLENTLY AGITATED PATIENTS

- Cardiac arrest can occur precipitously and unexpectedly in young and previously healthy individuals who violently struggle against physical restraints.
- Once cardiac arrest ensues, even when witnessed and in the ED, resuscitation is often not successful.
- A marked metabolic acidosis is a common theme and possible precipitating event.
- The cause of death is multifactorial and not solely linked to positioning of the patient.
- Metabolic derangements can occur pre-restraint or be secondary to drug effect, but they can be exacerbated by continuing violent struggle against physical restraints.
- Hyperthermia and rhabdomyolysis are common findings after prolonged struggling while restrained.
- It is human nature to meet force with force on the combative patient and naive to expect patients to calm themselves once arrested or in the hospital.
- The traditional show of force, reasoning, or threats of various interventions do little under these circumstances, and are often counterproductive and waste time.
- Once safety issues are addressed, the clinician should take control of the situation rapidly with the aim of expeditiously calming the patient by any means necessary.
- Chemical restraint (sedation, even muscular paralysis) is often required and preferred to continual prolonged violent struggling in physical restraints.
- Patients do not remember their actions or behavior.
- Deaths under such circumstances are fraught with very charged issues, including police brutality and racial and social issues, and such cases often become headline news.
- The clinician should be very attentive to medical issues and litigation risks when there is potential for a bad outcome.
- The clinician should not be concerned about issues of battery, unlawful restraint, subsequent litigation, or unrealistic restraint laws when time is of the essence to control the patient or personnel in danger.
- The imperative is to provide the safest possible environment to medical personnel and the patient, a goal often difficult to achieve.

Disclaimers/Limitations

- ◆ Limited Data
 - ◆ Small studies
 - ◆ Internal validity
 - ◆ External validity – mostly ED
 - ◆ Exceptions Hennepin droperidol and Israeli ketamine papers
 - ◆ Dosing



Source: EMN August 2007, Roberts

Disclaimers/Limitations

- ◆ Heterogeneity of groups – acute aggressive behavior or VSAPs
- ◆ Difficulty generalizing to the undifferentiated VSA prehospital patient
- ◆ Difficulty in quantifying magnitude of VSA as well as quantifying response

Off Label Use

- ◆ Lorazepam
 - ◆ Labeled use but not at doses recommended
- ◆ Haloperidol
 - ◆ Labeled use and reasonable dose (5mg q 30 min; avg dose req 10-20 mg)
- ◆ Midazolam
 - ◆ Approved for pre-op sedation and conscious sedation
 - ◆ But not “Rapid tranquilization” (& not IN route)

Off Label Use

- ◆ Droperidol
 - ◆ Off label, limited to PONV and most doses are above labeled dose
- ◆ Olanzapine
 - ◆ Labeled for Acute agitation assoc. bipolar or schizophrenia
 - ◆ Off label - Acute delirium, agitation r/t Alzheimer's

Off Label Use

- ◆ Ziprasidone
 - ◆ Labeled for Acute agitation assoc. schizophrenia
 - ◆ Off label for agitation in Alzheimer's
- ◆ Ketamine
 - ◆ Labeled for induction of general anesthesia
 - ◆ Off label sedation/analgesia

Why might this be useful?

- ◆ Acute intoxication
- ◆ Withdrawal Syndromes
- ◆ Psychiatric
- ◆ Behavioral NOS
- ◆ Head Injury
- ◆ Delirium
- ◆ Seizure
- ◆ (Medical other – cause/effect)



Martel AEM 2005 – 144 pts

To Whom?

- ◆ Age = 36.9 +/- 10.9 in all groups
- ◆ Men = 98/144 = 70%

Why?

- ◆ Acute intoxication - 135
- ◆ Illegal Drug - 17
- ◆ Head Injury - 30
- ◆ Psychiatric - 14
- ◆ Delirium - 0
- ◆ Seizure – 1

*Some had more than one indication

When/Where?

- ◆ +/- Anticipatable
- ◆ Location – home, street, place of business, back of unit, in custody
- ◆ 24/7 – like most emergency care

How?

- ◆ Frequently in concert with both physical and chemical restraint

Desirable features of drug to treat aggression

- Buckley J Clin Psych 1999

- ◆ Selective effect
- ◆ Anti-aggressive effect in a broad spectrum of patients
- ◆ Oral (?) and IM
- ◆ Rapid onset
- ◆ Low toxicity
- ◆ Low potential for drug interactions
- ◆ (Wide therapeutic window)

Agents

- ◆ Benzodiazepines
- ◆ Antipsychotics
 - ◆ Typical
 - ◆ Atypical
- ◆ Combination
- ◆ Other agents





Virginia Office of Emergency Medical Services

Scope of Practice - Formulary for EMS Personnel

This SOP represents *practice maximums*.

CATEGORY		FR	EMT	AEMT	I	P
Anesthetics						
	Otic			●	●	●
	General - initiate					●
	General - maintenance				●	●
	Ocular			●	●	●
	Inhaled-self administered		●	●	●	●
	Local			●	●	●
Anticonvulsants				●	●	●
Central Nervous System						
	Antipsychotic				●	●

Benzodiazepines

Lorazepam - labeled use

- ◆ Labeled IM dose - 0.5-1mg IM – really?!
- ◆ Pro: As effective as haloperidol – (J Clin Psych 1991; 52 (4): 177-80 & Int Clin Psychopharmacol 1997; 12 (3): 175-9)
- ◆ Con: Not as good as droperidol (JEM 1998; 16(4):567-73)

Benzodiazepines

Midazolam - Off label

- ◆ Wide dose range reported -2mg to 15mg IM
- ◆ Pro: Midazolam (5mg) better than haloperidol (5mg) or lorazepam (2mg) – (Acad EM 2004;7(11):744-9.)
- ◆ Pro: Midazolam (5mg) c/w ziprasidone (20mg) and droperidol (5mg) – (Acad EM 2005;12(12):1167-72)

Benzodiazepines

Midazolam - Off label

- ◆ Wide dose range reported -2mg to 15mg IM
- ◆ Con: Midazolam (10mg) not as good as droperidol (10mg) or combo (5mg/5mg) – (Ann EM 2010;56(4):392-4010) – but interpret with caution

Antipsychotics - Typical

- ◆ Haloperidol
 - ◆ Most widely used agent, abundant experience
 - ◆ Given in 5-10mg dose q 15-20 min, although manufacturer recommends q 30 min.
 - ◆ Onset within 30-60 min
 - ◆ FDA Advisory Warning 2007 – QTc/TdP
 - ◆ Avoid IV and Do not exceed recommended dose

Antipsychotics - Typical

- ◆ Droperidol
 - ◆ Shorter half-life – duration 6-8 hrs
 - ◆ More rapid onset – 15-30 min
 - ◆ Absence of long-term side effects
 - ◆ Potent sedative properties
- ◆ 2001 Black Box Warning – QTc/TdP even within recommended dose range

Antipsychotics - Typical

- ◆ Haloperidol & Droperidol
 - ◆ Share QTc/TdP risk
 - ◆ Both should be avoided in BZD or ETOH withdrawal, anticholinergic toxicity, pts with Sz
 - ◆ NMS risk and Extrapiramidal Symptoms

Atypical Antipsychotics - SGAs

- ◆ Newer agents with fewer EPS effects and less sedation
- ◆ Time of onset is distinct limitation
- ◆ Still little evidence
 - ◆ None in an EMS setting
- ◆ Still share QTc effects

Ziprasidone - SGAs

- ◆ Revista Brasileira de Psiquiatria 2011
 - ◆ 150 pts
 - ◆ Psychiatric Emergency Setting
 - ◆ First measure at 1 hr, last at 12hrs
 - ◆ All had calming effect, pros/cons
 - ◆ Haldol/midaz “excessive sedation” & wore off at 12hr

Ziprasidone - SGAs

- ◆ Martel AEM 2004
 - ◆ 144 ED pts
 - ◆ Interval measures at 0, 15, 30, 45, 60, 90, 120min
 - ◆ Early sedation only for Midaz - 30 min for drop/zipras
 - ◆ Midaz required rescue medications – seems it wore off
 - ◆ All 3 groups had cases of resp depression
 - ◆ D 4/50; Z 7/46; M 10/48 – $p=0.2$ – “No difference demonstrated”

Olanzapine



NEJM 2006 does not apply

- ◆ BMJ 2007, 335:865
 - ◆ 300 pts in psychiatric emergency setting
 - ◆ Olanzapine v. haloperidol v. haloperidol + promethazine
 - ◆ No differences in effectiveness at 15 min or 4hrs
 - ◆ H+P more likely to be asleep at both intervals
 - ◆ Dystonia not reported

Combination Platter

- ◆ Benzos and first generation antipsychotics used in combination to sedate combative patients.
- ◆ Lorazepam (2 mg IV or IM) and haloperidol(5 mg IV or IM)
 - ◆ More rapid sedation than either drug alone
 - ◆ Reduce side effects.

Combination Platter

- ◆ Half doses should be used in the elderly.
- ◆ Reasonable approach to titration is to give additional lorazepam q 10 to 20 min.
- ◆ Two RCTs - combination of lorazepam and haloperidol more effective than either drug alone

Ketamine – general anesthetic

- ◆ Not traditional
- ◆ Some have voiced support for this agent
- ◆ Ample experience for PSA in ED
- ◆ Limited prehospital experience



"In this laboratory we're always pushing the envelope to the Max."

Ketamine

- ◆ No, seriously.
- ◆ Some literature and even some arguable evidence
 - ◆ Opinion piece and discussion by James Roberts in EMN Dec 2007.
 - ◆ Case report (PEC 2005;9:85-9)
 - ◆ Case series (Eur J EM 2007; 14(5):265-8.)

Ketamine

- ◆ General anesthetic – phencyclidine derivative
- ◆ Dissociative sedative
 - ◆ Trance like state with sedation/analgesia/amnesia
 - ◆ Rapid onset and brief duration of action
 - ◆ Preserves airway tone and protective reflexes, as well as respiratory drive
 - ◆ Quirks about administration

But reported side effects ...

Ketamine

- ◆ Ketamine – Con
 - ◆ Tachycardia, hypertension - mild and transient
 - ◆ Sympathomimetic effects may limit their utility
 - ◆ Emergence phenomenon – 10-20% of adults in meta-analysis of ED PSA pts (Am J Emerg Med. 2008;26(9):985) mitigated by co-administration of BZD
 - ◆ Avoid in psychiatric cases or history of psychosis.

Ketamine

- ◆ Ketamine – Con

- ◆ Laryngospasm

- ◆ In two large ED series peds PSA 0.4% and 0.07% (Acad EM 2005;12:508-13)

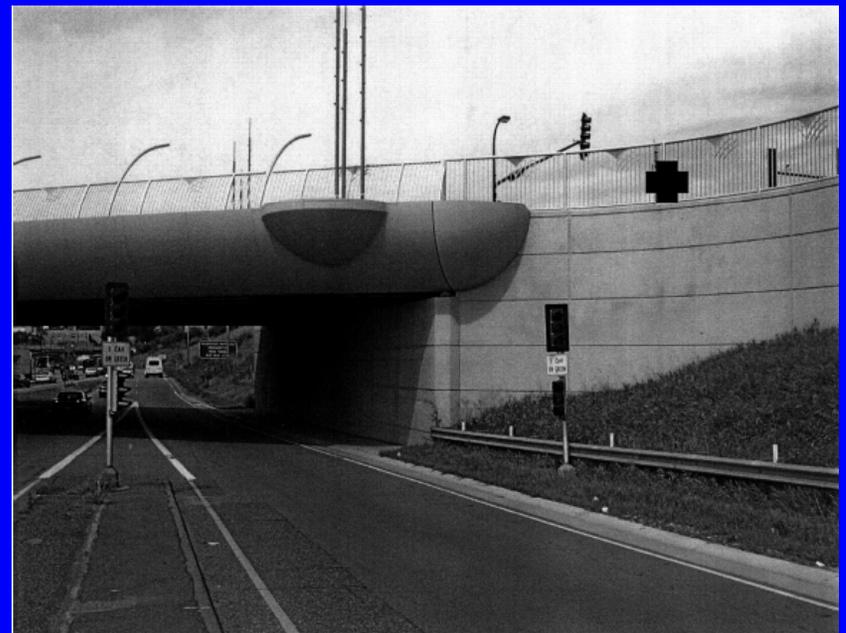
- ◆ Serious laryngospasm req ETT? in 11,589 peds cases est 0.02% of cases (Ann EM 2004;44:460-71)

Ketamine

- ◆ Ketamine – Con
 - ◆ Increased ICP/IOP
 - ◆ OK but Israeli study that followed had TBI pts
 - ◆ Other studies found no effect on ICP (Crit Care 2003;31:711)

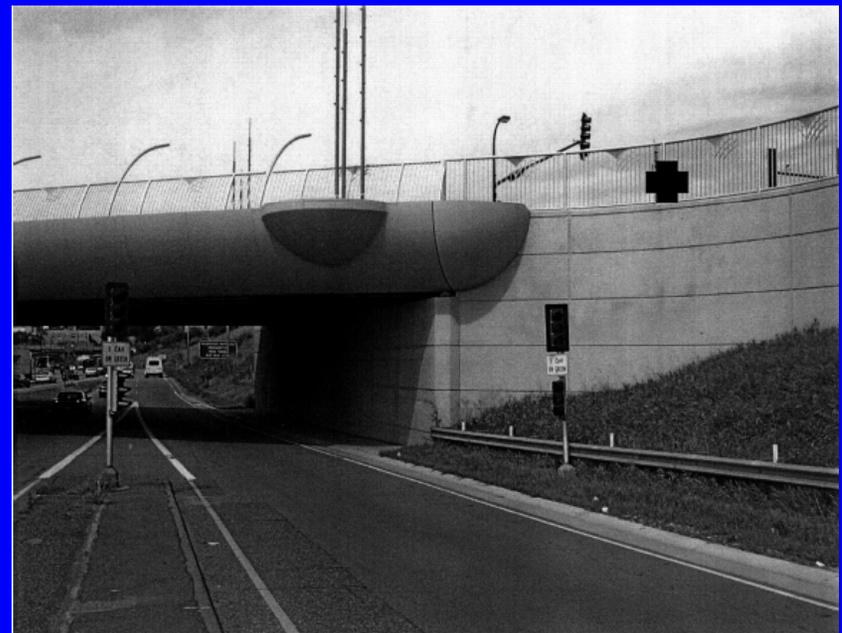
Ketamine - Case Report

- ◆ Hennepin EMS system
 - ◆ 3rd Service Urban ALS system,
 - ◆ 55,000 calls/yr
 - ◆ OMDs with extensive field experience
 - ◆ Multiple deaths from ExDS & Cocaine



Ketamine - Case Report

- ◆ On-duty OMD had self-dispatched on call
- ◆ Limited access to pt
- ◆ Limited ability to manage complications of droperidol or midazolam
- ◆ Immediate threat to self



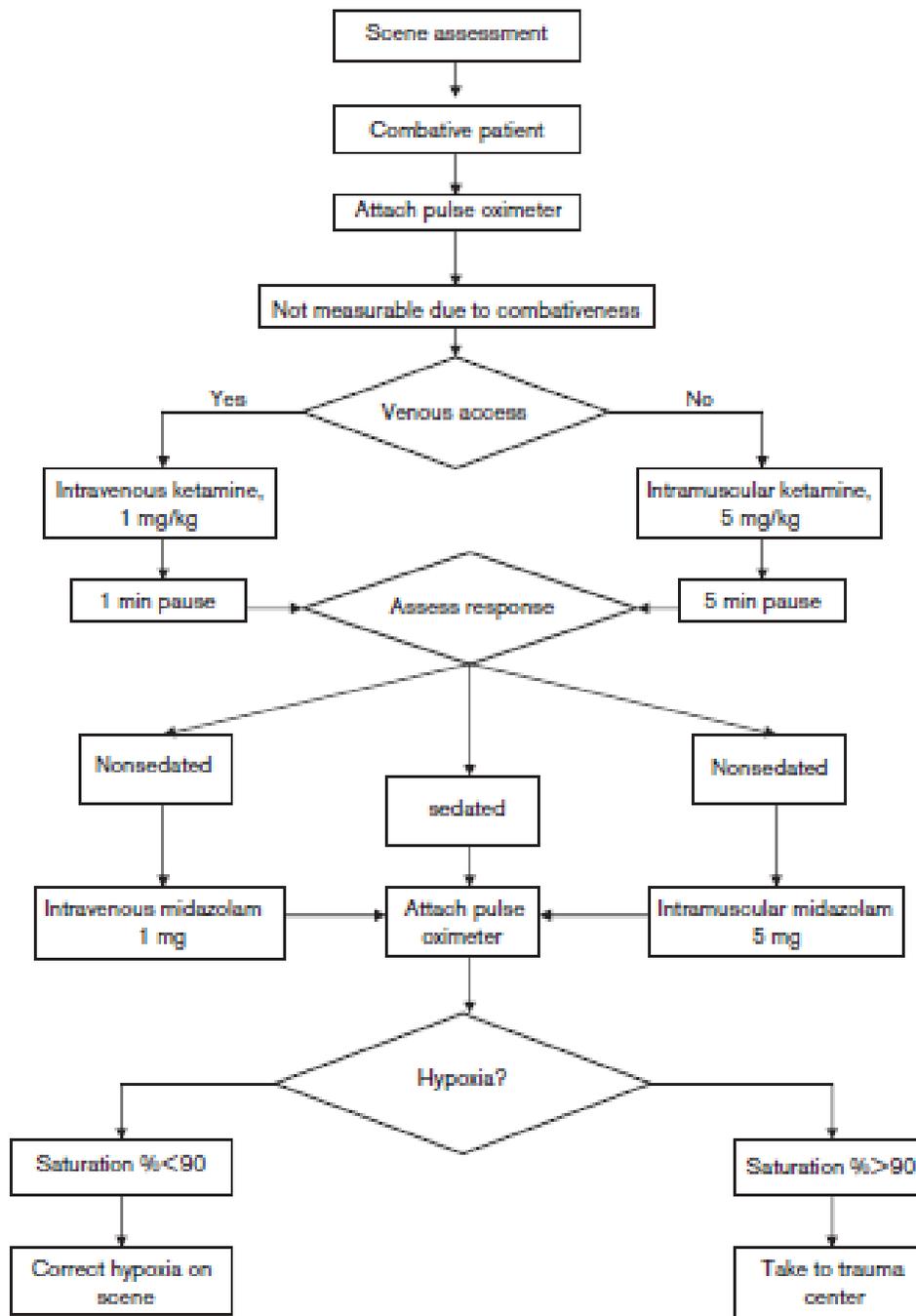
Ketamine retrospective case series

- ◆ Melamed E, et al. Eur J EM 2007;14:265-8.
 - ◆ Jan 2000-Oct 2002
 - ◆ Pts combative p traumatic injury – 11 pts
 - ◆ Age 22.6 (18-36)
 - ◆ Avg ISS 29 (4-75)
 - ◆ 3 Blunt; 6 Penetrating; 2 Blast

Ketamine retrospective case series

- ◆ Melamed E, et al. Eur J EM 2007;14:265-8.
 - ◆ Israeli military medical system – P or MDs
 - ◆ Long transport interval 114 min (38-225min)
 - ◆ 5 received Ketamine +/- midazolam
 - ◆ “No adverse events reported” - Vastly underpowered





A flow chart of the prehospital protocol for a combative patient. Diamonds represent decision points.

Copyright Lipincott
Williams & Wilkins
Eur J EM 2007;14(5)

LARYNGOSPASM AND HYPOXIA AFTER INTRAMUSCULAR ADMINISTRATION OF KETAMINE TO A PATIENT IN EXCITED DELIRIUM

Aaron M. Burnett, MD, Benjamin J. Watters, MD, Kelly W. Barringer, MD,
Kent R. Griffith, RN, EMT-P, Ralph J. Frascone, MD

- ◆ PEC July/Sept 2012
- ◆ Male Agitated Delirium
- ◆ 5mg/kg (500mg)
- ◆ 2 episodes of laryngospasm and hypoxia in ED.
 - ◆ Responded to BVM and airway maneuvers
 - ◆ Electively intubated

THE EMERGENCY DEPARTMENT EXPERIENCE WITH PREHOSPITAL KETAMINE: A CASE SERIES OF 13 PATIENTS

Aaron M. Burnett, MD, Joshua G. Salzman, MA, EMT-B, Kent R. Griffith, RN, EMT-P,
Brian Kroeger, PhD, Ralph J. Frascone, MD

- ◆ PEC Oct/Dec 2012 16(4):553-9.
- ◆ 13 patients
 - ◆ Drug/Etoh 3
 - ◆ Psychosis 4
 - ◆ ICH 1
 - ◆ Sz 1
 - ◆ SI 1
 - ◆ Agitation 1
 - ◆ AMS 1

THE EMERGENCY DEPARTMENT EXPERIENCE WITH PREHOSPITAL KETAMINE: A CASE SERIES OF 13 PATIENTS

Aaron M. Burnett, MD, Joshua G. Salzman, MA, EMT-B, Kent R. Griffith, RN, EMT-P,
Brian Kroeger, PhD, Ralph J. Frascone, MD

- ◆ PEC Oct/Dec 2012 16(4):553-9.
- ◆ Time to sedation
 - ◆ < 5min in 11/13
 - ◆ < 20min in 2/13
- ◆ Level of Sedation on Richmond Agitation Sedation Scale
 - ◆ 5/12 = -5 unarousable
 - ◆ 1/12 = -4 deep sedation
 - ◆ 4/12 = -3 moderate sedation
 - ◆ 2/12 = -2 light sedation

Regions EMS has instituted prehospital administration of Ketamine for select patient populations. As part of our ongoing quality assurance program, we would like your input on a patient you recently cared for who was administered Ketamine by a paramedic under our medical direction.

Date of patient encounter: _____ Patient Medical Record Number: _____

RASS Scale

Score	Term	Description
+4	Combative	Overtly combative or violent and an immediate danger to staff
+3	Very agitated	Pulls on or removes tube(s) or catheter(s) or has aggressive behavior toward staff
+2	Agitated	Frequent nonpurposeful movement or patient ventilator dyssynchrony
+1	Restless	Anxious or apprehensive but movements not aggressive or vigorous
0	Alert and calm	
-1	Drowsy	Not fully alert but has sustained (\geq 10 seconds) awakenings, with eye contact, to voice
-2	Light sedation	Briefly ($<$ 10 seconds) awakens with eye contact to voice
-3	Moderate sedation	Any movement (but no eye contact) to voice

THE EMERGENCY DEPARTMENT EXPERIENCE WITH PREHOSPITAL KETAMINE: A CASE SERIES OF 13 PATIENTS

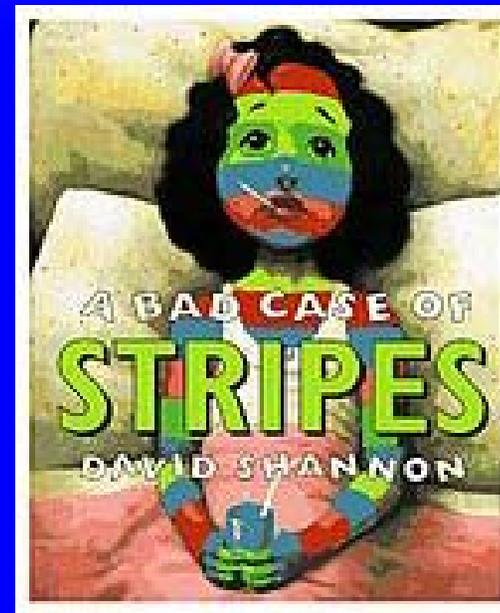
Aaron M. Burnett, MD, Joshua G. Salzman, MA, EMT-B, Kent R. Griffith, RN, EMT-P,
Brian Kroeger, PhD, Ralph J. Frascone, MD

◆ Adverse Events

- ◆ 3/13 Hypoxia – 2 in ED/1 in field – 2 Intubated (d/t recurrent laryngospasm/ICH)/1 jaw thrust alone
- ◆ 1/13 “hypersalivation” – suctioned
- ◆ Of non intubated 11 pts
 - ◆ 3/10 emergence reaction
 - ◆ 5/10 need for add’l sedation

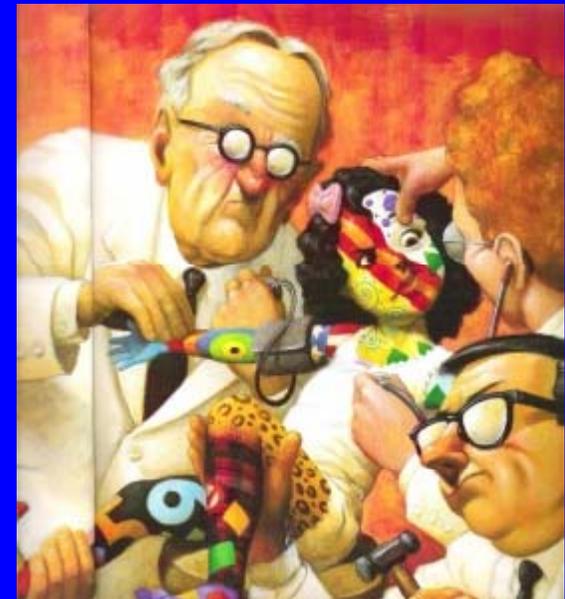
“Expert consensus” – Emergency Psychiatrists

- ◆ J Psych Pract 2005 Nov;
11 Suppl 1:5-108
 - ◆ 61 question survey of 50
subject matter experts
 - ◆ 96% return rate!
 - ◆ Consensus on 78% of
options on 9-point scale



“Expert consensus”

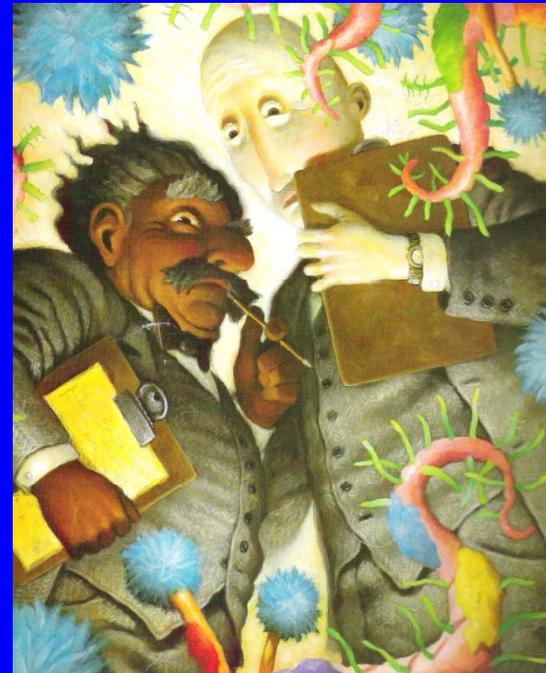
- ◆ For these MDs specific regimens are based on provisional diagnosis and other features
- ◆ Benzos are recommended when no pt data available or if there is a significant chance of drug related process (ETOH)



Specialists
courtesy of Camilla Cream

“Expert consensus”

- ◆ No single SGA preferred over haloperidol.
- ◆ Haloperidol best combined with benzo if pt will tolerate
- ◆ Most would avoid combining benzo with SGAs



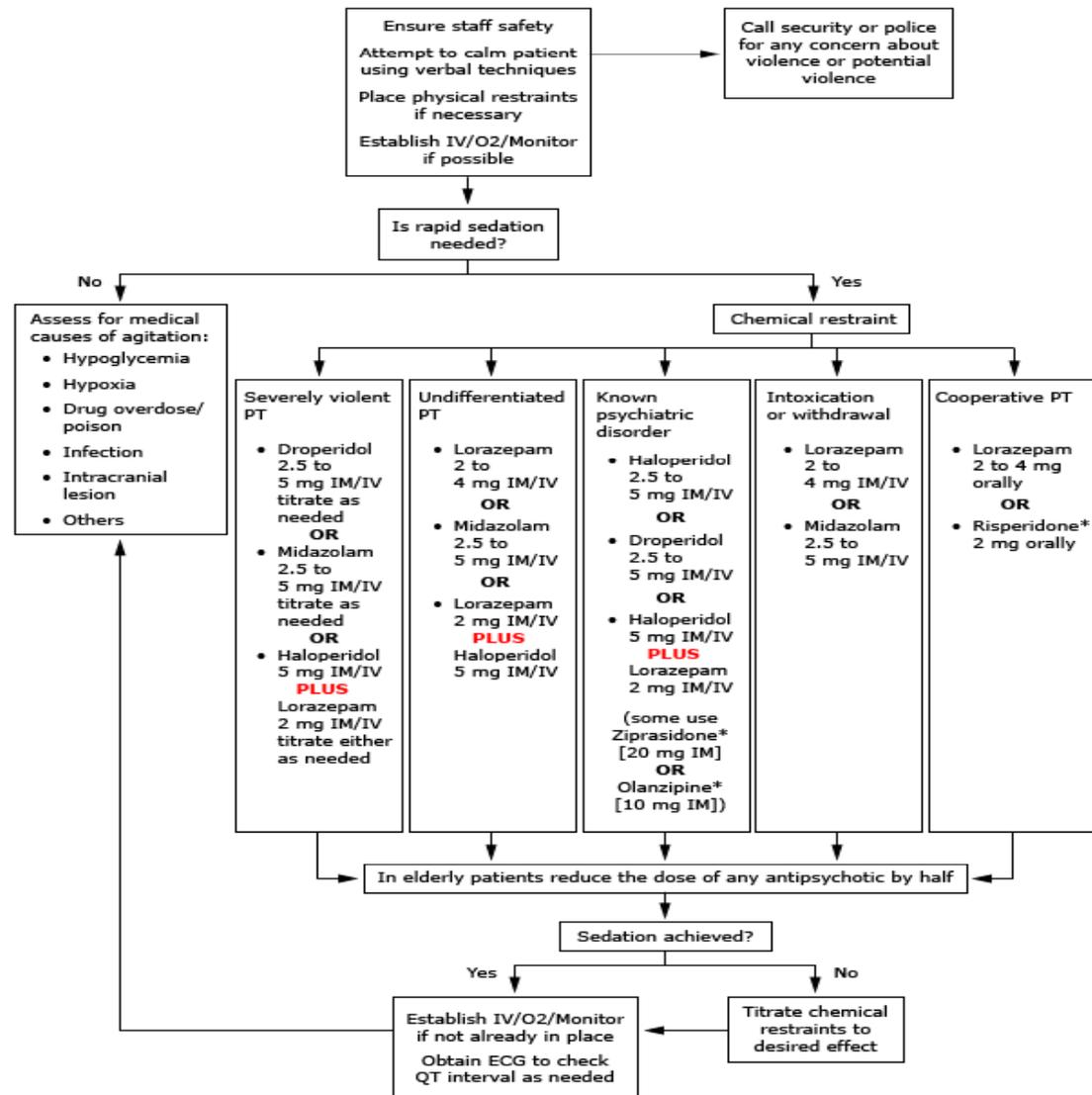
Experts from Camilla Cream

“Expert consensus”

- ◆ Parenteral olanzapine and ziprasidone equally recommended
- ◆ SGAs generally preferred if agitation is from primary psychiatric d.o., benzo preferred in other situations



Management of the severely agitated or violent patient



ECG: electrocardiogram; IM: intramuscular; IV: intravenous; PT: patient.

* The safety of atypical antipsychotics in geriatric patients remains uncertain.

ACEP Clinical Policy 2006

Patient management recommendations: What is the most effective pharmacologic treatment for the acutely agitated patient in the ED?

Level A recommendations

- ◆ None specified.

ACEP Clinical Policy 2006

Level B recommendations.

- ◆ 1. Use a benzodiazepine (lorazepam or midazolam) or a conventional antipsychotic (droperidol* or haloperidol) as effective monotherapy for the initial drug treatment of the acutely agitated undifferentiated patient in the ED.
- ◆ 2. If rapid sedation is required, consider droperidol* instead of haloperidol.

ACEP Clinical Policy 2006

Level B recommendations – continued.

- ◆ 3. Use an antipsychotic (typical or atypical) as effective monotherapy for both management of agitation and initial drug therapy for the patient with known psychiatric illness for which antipsychotics are indicated.
- ◆ 4. Use a combination of an oral benzodiazepine (lorazepam) and an oral antipsychotic (risperidone) for agitated but cooperative patients.

ACEP Clinical Policy 2006

Level C recommendations

- ◆ The combination of a parenteral benzodiazepine and haloperidol may produce more rapid sedation than monotherapy in the acutely agitated psychiatric patient in the ED.

Medications available for use in chemical restraints^a

Medication	Dose	Time of Onset	Half-Life	Contraindications
<i>Benzodiazepines</i>				
Diazepam	5–10 mg PO 2–10 mg IM/IV repeat q 3–4 h PRN	1–2 h PO 20–30 min IM	30–60 h	Liver disease Pregnancy
Lorazepam	1–2 mg PO 0.5–2 mg IM <2 mg/min IV	16 h PO 20–30 min IM 5–20 min IV	~ 14 h PO (end-stage renal disease 30–70 h)	Sleep apnea Severe renal impairment Avoid in pregnancy
Midazolam	5–15 mg IM q 15 min 1–2 mg IV q 2–3 min 1 mg IV (geriatric)	15–20 min IM 1–5 min IV	2–6 h (13 h in renal failure)	Pregnancy
<i>Phenothiazines (typical antipsychotics)</i>				
Haloperidol	5–10 mg PO 5–10 mg IM 1–2 mg IV	2–6 h PO 30–60 min IM/IV	12–18 h	Movement disorder Severe liver disease Breast Feeding
Droperidol	0.625–1.25 mg IM/slow IV q 3–4 h; max of 2.5 mg each dose	30 min IV	2–4 h	Prolonged QTc Caution in alcoholics
<i>Atypical antipsychotics</i>				
Risperidone	1–3 mg PO	30–60 min	20 h	Caution in dementia
Olanzapine	10–20 mg PO 5–10 mg IM q 4 h 5 mg IM (geriatric) Max: 30 mg/24 h	5–8 h PO 15–45 min IM	20–5 h	Prolonged QTc Recent myocardial infarction Diabetes mellitus Elderly (use with caution)
Ziprasidone	10 mg IM q 2 h or 20 mg IM q 4 h Replace with oral as soon as possible	4–5 h PO 60 min IM	14 h PO 4–10 h IM	Prolonged QTc Recent myocardial infarction Diabetes mellitus Elderly (use with caution)
Ketamine	1 mg/kg IV 4–5 mg/kg IM	1 min IV 4–5 min IM	15 min IV 30–60 min IM	Heart disease

Rossi et al., Emerg Med Clin N Am 2010; 28:235-56.



Virginia Office of Emergency Medical Services

Scope of Practice - Formulary for EMS Personnel

This SOP represents *practice maximums*.

CATEGORY		FR	EMT	AEMT	I	P
Anesthetics						
	Otic			●	●	●
	General - initiate					●
	General - maintenance				●	●
	Ocular			●	●	●
	Inhaled-self administered		●	●	●	●
	Local			●	●	●
Anticonvulsants				●	●	●
Central Nervous System						
	Antipsychotic				●	●

One Agency's experience -

Jan 1, 2011-Oct 27, 2011

- ◆ 271 pts received midazolam
- ◆ 195 (72%) for seizure
- ◆ 42 (15.5%) for sedation, TCP, post arrest
- ◆ 34 (12.5%) for chemical restraint

One Agency's experience -

Jan 1, 2011-Oct 27, 2011

- ◆ 34 (12.5%) for chemical restraint
 - ◆ 23/34 (67%) Male
 - ◆ 27/34 (79.4%) IM Route – 1/34 IN route
 - ◆ 23/34 (68%) required single dose
 - ◆ 23/43 (68%) age 14-49

One Agency's Plan 2012

- ◆ Physician Online Medical Direction
 - ◆ AUA – Intoxication – Midazolam 2mg IV or 5mg IN/IM (reduce dose in geriatric and debilitated pts)
 - ◆ VSAP requiring immediate control – Ketamine 4mg/kg IM (requires 2 injections) followed by Midazolam when feasible
 - ◆ Also - Agitated Delirium metabolic syndrome on standing order [Iced saline and Sodium bicarbonate]

Our Obligation & Commitment

- ◆ Real-time awareness and evaluation
- ◆ Efficacy/Adverse Events & safety monitoring
- ◆ Follow emerging literature
 - ◆ Special questions: ETOH, Head injury, Psych and Sz patients, CAD Hx.

Aggressive Behavior Scale²⁴
Agitated Behavior Scale^{13,25}
Brief Agitation Rating Scale^{26,27}
Brøset Violence Checklist²⁸
Clinical Global Impression Scale for Aggression²⁹
Cohen-Mansfield Agitation Inventory^{30,31}
Historical, Clinical, and Risk Management–20
Violence Risk Assessment Scheme³²
McNiel-Binder Violence Screening Checklist³³
Neurobehavioral Rating Scale–Revised^{34,35}
Overt Aggression Scale^{36,37}
Overt Agitation Severity Scale^{38,39}
Positive and Negative Syndrome Scale–Excited
Component^{40–44}
Ryden Aggression Scale^{45–47}

Clinical Therapeutics 2010

TABLE 1. The Altered Mental Status Scale

Score	Responsiveness	Speech	Facial Expression	Eyes
4	Combative, violent, or out of control	Loud outbursts	Agitated	Normal
3	Very anxious, agitated	Loud outbursts	Agitated	Normal
2	Anxious, agitated	Loud outbursts	Normal	Normal
1	Anxious, restless	Normal	Normal	Normal
0	Responds readily to name spoken in normal tone	Normal	Normal	Clear, no ptosis
-1	Lethargic response to name	Mild slowing or thickening	Mild relaxation	Glazed or mild ptosis (less than 1/2 eye)
-2	Responds only if name is called loudly	Slurring or prominent slowing	Marked relaxation (slacked jaw)	Glazed and marked ptosis (> 1/2 eye)
-3	Responds only after mild prodding	Few recognizable words	Marked relaxation (slacked jaw)	Glazed and marked ptosis (> 1/2 eye)
-4	Does not respond to mild prodding or shaking	Few recognizable words	Marked relaxation (slacked jaw)	Glazed and marked ptosis (> 1/2 eye)

Altered Mental Status Scale

Regions EMS has instituted prehospital administration of Ketamine for select patient populations. As part of our ongoing quality assurance program, we would like your input on a patient you recently cared for who was administered Ketamine by a paramedic under our medical direction.

Date of patient encounter: _____ Patient Medical Record Number: _____

RASS Scale

Score	Term	Description
+4	Combative	Overtly combative or violent and an immediate danger to staff
+3	Very agitated	Pulls on or removes tube(s) or catheter(s) or has aggressive behavior toward staff
+2	Agitated	Frequent nonpurposeful movement or patient ventilator dyssynchrony
+1	Restless	Anxious or apprehensive but movements not aggressive or vigorous
0	Alert and calm	
-1	Drowsy	Not fully alert but has sustained (> 10 seconds) awakenings, with eye contact, to voice
-2	Light sedation	Briefly (< 10 seconds) awakens with eye contact to voice
-3	Moderate sedation	Any movement (but no eye contact) to voice

Richmond Agitation Sedation Score

TABLE 1. The Agitation Scale

-
- 5 Extremely combative—continuous, vigorous fighting against restraints.
 - 4 Moderately combative—occasional vigorous efforts against restraints, still agitated.
 - 3 Minimally combative—minimal efforts against restraints, occasional verbal hostility.
 - 2 Resting—no efforts against restraints, awake, may be cooperative.
 - 1 Somnolent—sleeping or sleepy.
-

Agitation Scale

Summary

- ◆ Have a plan to manage such patients
- ◆ Each agent available has pros/cons – likely no “ideal agent” in all circumstances
- ◆ Pick the down side you can manage
- ◆ Reasonable deviation from Consensus Guidelines is reasonable – but evaluate and report

Summary

- ◆ Reasonable and perhaps desirable to have more than one option
- ◆ Plan, Train, Implement and Track! –NY Model @ <http://www.health.ny.gov/professionals/ems/policy/10-04.htm>
 - ◆ Agency: Detailed procurement, inventory and security plan, Quarterly inventory audit
 - ◆ OMD: 100% Review + Comprehensive Annual report

