



EXCITED DELIRIUM

Emergency Services Implementing a unified plan with LEO and EMS

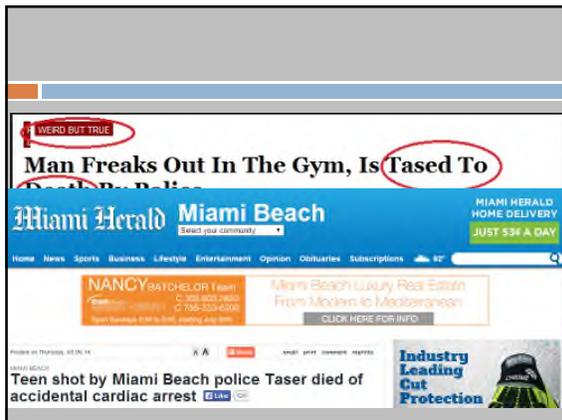
AKA

- SICDS – Sudden In Custody Death Syndrome
- Positional Asphyxia
- Stimulant Psychosis
- Electroshock Weapons Syndrome
- Neuroleptic malignant syndrome

Factoids

- Police officers armed with tasers are less likely to be injured by violent subjects
- Violent subjects are less likely to be injured by police who use tasers
- Tasers have caused injuries, but most Taser related injuries are minor





There is no scientific evidence to date of a cause and effect relationship between Tasers and in custody deaths

Typical Scenario

- Male subject creating a disturbance
- Triggers 911 call
- Obvious to police that subject will resist
- Struggle ensues with multiple officers
- Physical restraints applied
- Continued struggle against restraints
- Subject appears to suddenly cease resisting
- Subject dies

Typical Scenario

- Resuscitation efforts are futile
 - LA County EMS Study
 - 18 ED deaths witnessed by paramedics (all restrained)
 - All failed resuscitation

Source: Am J Emerg Med; 2001;19(3), 187-191

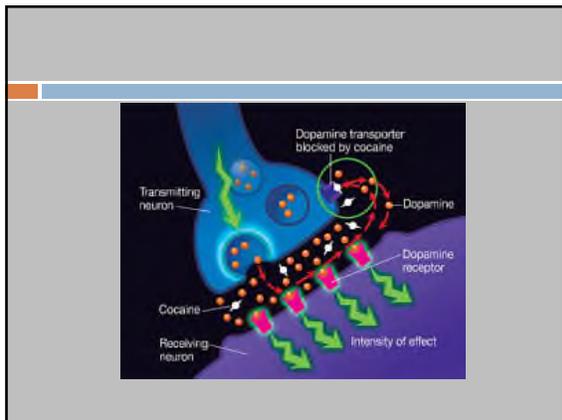
Take Home Message

- If you learn nothing else today.....
- Excited delirium is an imminently life threatening medical emergency, not a crime in progress

Excited Delirium—The basics

- Autopsies reveal elevated levels of dopamine.
- Cocaine blocks re-uptake of dopamine resulting in elevated levels.
- Many ED patients have psych history as well.
- The combination basically leads to a runaway train effect where the body's metabolism increases to the point acidosis and other imbalances cause respiratory and cardiac arrest.

<http://www.jems.com/article/patient-care/excited-delirium-strikes-witho>



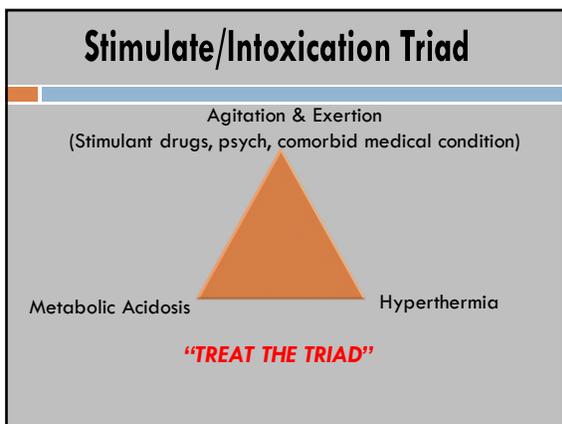
Dopamine

- Neurotransmitter/Hormone
- In the Brain:
 - Increased Cognitive Ability
 - **Movement**
 - **Hypothalamic Function**
 - Positive Behavioral Reinforcement/Reward
 - Arousal
 - Sexual Gratification

Dopamine Regulation Illness Examples

- Parkinsons Disease-(LOW DOPAMINE)
 - Loss of Dopamine secreting hormones in the Midbrain
- Schizophrenia -(HIGH DOPAMINE)
 - Highly Altered Levels of Dopamine





- ### The presentation
- Psychotic behavior
 - Aggressive behavior
 - Hyperthermia
 - Sweating
 - Screaming or Roaring
 - Remember mnemonic NOT A CRIME

"N-O-T- A- C-R-I-M-E"

- • **Naked** = stripping off clothing and sweating profusely
- • **Objects** = recall violence against objects, especially glass, shiny objects
- • **Tough** = the person is very strong, unstoppable, seemingly endless endurance, and a diminished pain or insensitivity to pain
- • **Acute onset** = You are told the person "just snapped"
- • **Confused** = The person is unsure who (s)he is, where (s)he is located, why (s)he is there, and lacks perception
- • **Resistant** = The person cannot or refuses to follow commands to stop his or her behavior.
- • **Incoherent speech** = The person is shouting; bizarre content
- • **Mental health issues** or Makes you feel uncomfortable
- • **Early EMS request**, back-up request, and supervisor request.

Psychotic Behavior

- **Impaired**
 - Thought processes
 - Orientation
 - Memory
 - Emotions
 - Perception of the environment
 - Speech
 - Confusion and bizarre behavior
 - Agitation or excitement



- **Hallucinations and paranoia**
- **Violence directed at objects**
 - Especially glass
- **Insensitivity to pain**
- **Superhuman strength**



Hyperthermia

- Temps 105 – 113° F
 - Drug affect on temperature control center in brain (hypothalamus)
- Signs
 - Profuse sweating
 - Undressing – partial or complete

Hyperthermia

- Aggravated by;
 - Increased activity
 - Violent struggle with police
 - Warm humid weather
 - Dehydration
 - Certain therapeutic medications

Metabolic Acidosis

- Potentially life threatening
- Aggravated by
 - Increased activity, violent confrontation
 - Dehydration
- Elevated blood potassium level???
- Starts of the Rhabdo cycle
- May require dialysis

Typical Causes

- #1 cause: stimulant drug abuse
 - Cocaine, meth, PCP
 - Binging for several days
 - Acute intoxication triggers the event
- #2 cause: noncompliance with medications to control psychosis or bipolar disorder
 - ??withdrawal?? Some people think maybe

Typical Co-morbid Medical Conditions

- Obesity
- Diabetes
- Heart disease – CAD, drug induced cardiomyopathy
- genetics

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Cardio Toxicity

- Pre existing CAD appears to account for many EXD deaths
 - 2006 Study found that 1/2 of fatalities had some degree of cardiovascular disease
- Cocaine abuse contributes
 - cardiac hypertrophy, microangiopathy, cardiomegaly, and myocardial fibrosis
 - ^^ these add to limited O2 to myocardium

Genetics

- Out of a study of 60 victims of EXD
 - All were predominantly cocaine abusers
 - 4 pts had no trace of toxin in their labs
- Compared to non-psychotic cocaine overdose victims, fatal EXD victims have been shown to possess alterations in neuroanatomy and neurophysiology that may represent a subtype of patient with an altogether unusual genotype and/or phenotype; one characterized by high dopamine levels and a hyperactive autonomic nervous system

Outcomes

- 2/3 of EXD victims die at the scene or in transport by EMS/LE
 - Respiratory Arrest
 - Fatal Dysrhythmia
- Post Mortem exams show severe pulmonary and cerebral edema

- In hospital deaths are attributed to:
 - DIC, Rhabdomyolysis, renal failure



- ### Initial Contact
- Dispatch info
 - Formulate a plan
 - Scene size up
 - Immediate actions required
 - Resources quickly available
 - Maintain your safety
 - Maintain surrounding public safety
 - Maintain subject safety
 - Plan of action

- ### Initial Contact
- Do you have to act immediately?
 - Can there be any other causes for the behavior?
 1. Blood Glucose abnormality
 2. Simple Psychosis
 3. Simple Drug use
 4. Alcohol
 5. Trauma
 6. Other?

Action

- Verbal--"Talk them down" (will not work with ED)
 - Try talking to the person and see if you think there is any possibility of gaining compliance.
- Talk to bystanders; friends, family, co-workers. Determine if there is any possibility they can help gain compliance.
- Don't hesitate to move to restraint and sedation if escalating or not responding.

Action



About to break knuckles

Probably not going to remember anything. Will wake up in jail or ER.

Should have syringe!

Protecting firearm!

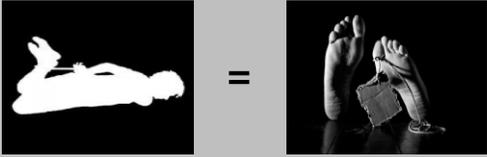
Action

- Physical-- Restraint
- Ideally 5 People
- Position of disadvantage
- One person for each extremity
- Paramedic to administer sedative
- Restrain SUPINE on Scoop Stretcher



Action

www.exciteddelirium.org



Action

- Assessment
- Look for signs of trauma or other causes for Pt behavior
- Reassess and CLOSELY MONITOR
- Document Q 5min vital signs



Notice hand placement. This works well for muscle isolation but if you place a spit hood on them that right hand can pull it off... Consider using the bilateral chest straps (5point type) to keep the upper body on the cot and the spit hood on!

Media Story on ED



Action

- Chemical– Restraint
- Administer chemical restraints as soon as possible



Action

- Drugs commonly used
- Side effects
- Place on Cardiac monitor and Capnography ASAP
- Watch for rhythm disturbances
- Consider Sodium BiCarb



Drugs Commonly Used

- Neuroleptics (major tranquilizers i.e. Navane or Mellaril)
- Antipsychotics
 - Haldol, Droperidol
- Atypical antipsychotics
 - Geodon, Zyprexa
- Benzodiazepines
 - Midazolam, Ativan, Valium
- Dissociative sedating (anesthetic) agents
 - Ketamine

The "Ideal" Drug

- Rapid effective tranquilization
 - No repeat dosing needed
- No significant adverse affects
 - Respiratory depression
 - Cardiovascular depression
 - Neurological adverse affects
- Easy to administer (I/M)
- Allows easy assessment of neurological status on ED arrival

Does it exist?

Benzodiazepines

- Effective (if enough given)
- Potential drawbacks
 - May require high or repeat doses
 - Can cause respiratory depression
 - Over sedation is a potential problem

Ketamine

- Very rapid onset of action (<5 minutes)
- Highly effective in a single dose
- Favorable safety profile healthy patients
 - Supports heart rate and blood pressure
 - Preserves respiratory drive
 - Some neurological concerns (ICP)
- Limited data for this application

Ketamine Goals of Therapy

- Quickly and effectively gain compliance with a single dose
 - 5 mg/kg IM (2-4 mg/kg is typical)(10mg/kg has been suggested)
 - 2 mg/kg IN
 - 1-2 mg/kg IV
- Prevent violent struggle with police and ongoing struggle against restraints
- Ensure EMS crew safety

Adverse Effects of Ketamine

- "The usual suspects"
 - Laryngospasm, drooling, nausea and vomiting
- Worrisome
 - Possible drug interactions
 - i.e. EtOH, Narcotics, Benzos, Meth, Cocaine, psych meds, etc
- Intubation necessity due to "over sedation"
 - How many would have been intubated anyway?



Caveats

- Never place an agitated and combative patient in your ambulance without four-point physical restraints
- Never transport a patient in handcuffs (without an officer present)

Action

- Transport to appropriate facility
- Continue reassessment and monitoring
- Notify receiving facility of pt condition and your differential diagnosis



Documentation

- Get witness statements if possible (LEO)
- Chart observations
- Chart behavior
- Chart interventions and Pt response

Online Resources

- JEMS.com search "excited delirium"
- ExcitedDelirium.org
- ipicd.com
- <http://www.ncbi.nlm.nih.gov>

References

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- This article originally appeared in February 2011 JEMS as "Without Warning: How to effectively treat excited delirium patients."
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