

National Law Enforcement Training Center
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In-Custody Death

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Case No 1

History:

30 year old male standing in the middle of traffic, in a downtown street.

A police officer offers to help the subject. The subject seems to ignore to officer. The subject punches the officer, when touched. The subject and the officer struggle, and the subject is restrained.

The subject is brought to the hospital by the police for medical clearance.



Case No 1

Diagnosis:

Hypoglycemia

Diabetes mellitus

The subject's mental status returns to normal after receiving sugar in the emergency department. The subject apologizes to the officer. No charges are brought.

Graham v. Connor: Graham was suffering from hypoglycemia. Officers believed he was drunk, and refused to give him some sugar.



Case No 2

30 year old female who is found agitated in a street by the police.

EMS is called by the police. The subject is brought to the emergency department for confusion and hallucinations. She is cleared by the medical resident despite a low-grade fever (100.6 °F). The psychiatrist diagnoses a delusional disorder, calms her down with oral Haldol. The patient is discharged with a follow-up appointment.



Case No 2

Three hours later, EMS brings her back for a more severe agitation. She is given an injection of Haldol.

Then, the vital signs:

Heart rate: 100

Blood pressure: 90/50

SaO₂: 75% (normal > 95%)



Case No 2

Chest X-ray: lobar pneumonia

Diagnosis:

Pneumonia (*Streptococcus pneumoniae*)

Septicemia

Septic shock

The patient was intubated in the emergency department, and admitted to the intensive care unit. She was given high doses antibiotics, but died 6 hours later.



Case No 3

30 year old male arrested for selling drugs.

He is brought to the emergency department for medical clearance.

No prior medical history.



Case No 3

Vital signs:

HR 140

BP 220/130

RR 28

T 103.2

Patient is very agitated. No other findings in the physical exam.



Case No 3

The patient now admits to swallowing several bags of cocaine approximately 3 hours ago, when he was arrested.

The patient receives nitroglycerin and benzodiazepines, activated charcoal and polyethylene glycol. The patient subsequently develops generalized seizure activity, increasing hyperthermia, rhabdomyolysis, and intracranial hemorrhage. He expires 24 hours after admission.

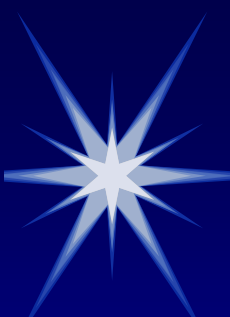


Causes of In-Custody Death -

1

Diseases with disturbed behavior:

- ▶ Excited delirium
- ▶ Intracranial bleeding
- ▶ Encephalitis/Meningitis
- ▶ Seizures
- ▶ Complications of diabetes (hypoglycemia and hyperglycemia)
- ▶ Hypoxia
- ▶ Toxic coma
- ▶ Metabolic coma




Causes of In-Custody Death - 2

Exacerbation of pre-existing diseases:

- ▶ Cardiovascular disease
- ▶ Intracranial hemorrhage
- ▶ Seizures
- ▶ Asthma
- ▶ Sickle cell trait

Role of stress? (Lecomte, Forensic Sci Int
1996)



Causes of In-Custody Death - 3

Injuries:

- ▶ Suicide
- ▶ Accident
- ▶ Homicide (including asphyxia by neck compression or thoracoabdominal compression)



In-Custody Death & Excited Delirium



Drugs of Abuse

DEA Classification:

- ▶ Narcotics
- ▶ Depressants
- ▶ Stimulants
- ▶ Cannabis
- ▶ Hallucinogens
- ▶ Anabolic Steroids



Drugs of Abuse

Narcotics:

- ▶ Heroin
- ▶ Morphine
- ▶ Codeine

Effects of overdose include coma and death



Drugs of Abuse

Depressants:

- ▶ Barbiturates
- ▶ Benzodiazepines (Valium)

Effects of overdose include coma and death



Drugs of Abuse

Stimulants:

- ▶ Cocaine
- ▶ Amphetamine/Methamphetamine
- ▶ Methylphenidate (Ritalin)



Drugs of Abuse

Cannabis:

- ▶ Marijuana
- ▶ Tetrahydrocannabinol
- ▶ Hashish



Drugs of Abuse

Hallucinogens:

- ▶ LSD
- ▶ Mescaline
- ▶ Psilocybin
- ▶ MDMA (Ecstasy)
- ▶ Phencyclidine (PCP)



Drugs of Abuse

Anabolic Steroids:

- ▶ Testosterone
- ▶ Nandrolone



LSD (lysergic acid diethylamide)

Absorption:

- ▶ Oral (most commonly)
- ▶ Snorting
- ▶ Injection
- ▶ Smoking
- ▶ Conjunctival instillation

Duration of effects: 6-12 hours



LSD (lysergic acid diethylamide)

Complications:

- ▶ Seizures
- ▶ Panic attack
- ▶ Excited delirium
- ▶ Stroke (cerebral vasospasm)



Phencyclidine

(PCP - phenylcyclohexylpiperidine)

Absorption:

- ▶ Smoking (most commonly), often mixed with marijuana
- ▶ Snorting
- ▶ Injection
- ▶ Oral



Phencyclidine (PCP)

Complications:

- ▶ Agitation
- ▶ Hyperthermia
- ▶ Rhabdomyolysis and renal failure
- ▶ Seizures
- ▶ Excited delirium
- ▶ Coma

Anticipate sudden violent acts:

“Results showed that PCP use was related to increased levels of hostility...” (McCardle, Addict Behav 1989)



MDMA (Ecstasy)

3,4-methylenedioxyamphetamines

Absorption:

- ▶ Oral (most commonly)
- ▶ Snorting
- ▶ Injection

Commonly used at rave parties



MDMA (Ecstasy)

Complications:

- ▶ Agitation
- ▶ Dehydration with hyponatremia (diuretic effect)
- ▶ Hyperthermia
- ▶ Seizures
- ▶ Excited delirium



Amphetamines

Types:

- ▶ Racemic amphetamine
- ▶ Dextro amphetamine (Dexedrine)
- ▶ Methamphetamine (crank, crystal, speed, ice)
- ▶ Over 14 different known drugs



Amphetamines

Absorption:

- ▶ Oral (most commonly)
- ▶ Injection
- ▶ Smoking
- ▶ Snorting

Duration of effects: 2-4 hours



Amphetamines

Complications:

- ▶ Agitation
- ▶ Hyperthermia
- ▶ Rhabdomyolysis
- ▶ Excited delirium
- ▶ Cardiomyopathy



Cocaine

Absorption:

- ▶ Oral (most commonly)
- ▶ Injection
- ▶ Smoking
- ▶ Snorting
- ▶ Body packer

Duration of effects: 1-2 hours



Cocaine

Cocaethylene:

- ▶ Potent active metabolite of cocaine + ethanol
- ▶ Duration of effects: up to 6 hours
- ▶ More active and more dangerous than cocaine



Cocaine

Complications:

- ▶ Agitation
- ▶ Hyperthermia
- ▶ Rhabdomyolysis
- ▶ Excited delirium
- ▶ Seizures
- ▶ Coma
- ▶ Cardiac complications



Cocaine

Sensitization

- ▶ Heightened response with chronic use (dopaminergic dysfunction)
- ▶ Probably the explanation of fatal excited delirium with “non-lethal doses” of cocaine

(Ruttenber, J Forensic Sci 1997)



Cocaine

Mechanism of death:

- ▶ Excited delirium and hyperthermia
- ▶ Myocardial infarction
- ▶ Arrhythmia
- ▶ Seizures
- ▶ Coma
- ▶ Exacerbation of pre-existing diseases:
 - Cardiovascular disease
 - Intracranial hemorrhage



Combination of Drugs

In a large London hospital A&E department, 50% of the patients who had taken Ecstasy also took another illicit substance, mainly amphetamines and cocaine.

“The more serious complications of delirium, seizures, and profound unconsciousness (coma) were commoner when MDMA was used in combination with other substances.”

(Williams, J Accid Emerg Med 1998)



Delirium

Definition:

Acute change in mental status characterized by impairment of attention.

Diagnostic Criteria for Delirium (as defined by DSM-IV)

A. Disturbance of consciousness (i.e., reduced clarity of awareness of environment) with reduced ability to focus, sustain, or shift attention.

B. A change in cognition (such as memory deficit, disorientation, language disturbance) or the development of a perceptual disturbance that is not better accounted for by a preexisting, established, or evolving dementia.

C. The disturbance develops over a short period of time (usually hours to days) and tends to fluctuate during the course of the day.

Diagnostic and statistical manual of mental disorders, 4th ed.



Excited Delirium

Definition:

Delirium with continuous agitation



Excited Delirium

Causes:

- ▶ Toxic

 - Cocaine

 - Amphetamines

 - Ecstasy

 - PCP

 - LSD

- ▶ Drug withdrawal

- ▶ Psychosis (psychiatric disorder)



Excited Delirium

Complications:

- ▶ Hyperthermia
- ▶ Rhabdomyolysis
- ▶ Hyperkalemia
- ▶ Metabolic acidosis
- ▶ Renal failure
- ▶ Hypoxia
- ▶ Sudden death (arrhythmia)

Comparable to the neuroleptic malignant syndrome



Excited Delirium

Early Management:

- ▶ CPR and defibrillation if necessary
- ▶ Sedation
- ▶ Cooling
- ▶ Restraints if necessary

Increased mortality if patient is restrained
(without adequate sedation).



Excited Delirium

Treatment:

- ▶ Sedation (benzodiazepines)
- ▶ Oxygen
- ▶ Cooling
- ▶ Hemodialysis



Positional Asphyxia & In-Custody Death



Definitions

Asphyxia:

- ▶ Extreme decrease in the amount of available oxygen in the body

Two types:

- ▶ Mechanical
- ▶ Chemical (e.g., carbon monoxide)



Definitions

Mechanical Asphyxia:

- ▶ Strangulation (application of force to the neck, not resulting from the weight of the victim's body)
- ▶ Hanging (application of force to the neck, resulting from the weight of the victim's body)
- ▶ Suffocation
- ▶ Positional asphyxia
- ▶ Drowning (death due to submersion)



Suffocation

Definition:

Failure of oxygen to reach the blood



Suffocation

Five types:

- ▶ Depletion or displacement of oxygen and carbon dioxide accumulation (e.g., sealed container)
- ▶ Smothering (obstruction of the nose and mouth -- e.g., plastic bag)
- ▶ Choke (obstruction of the internal airway by a foreign object)
- ▶ Compression asphyxia (breathing hindered by external chest compression)
- ▶ Laryngeal edema (e.g., allergy)



Positional Asphyxia

Body upside down, flexed neck

Usually associated with alcohol or drug intoxication



Sudden Death & Restraints - 1

Excited delirium

Increased risk of sudden death if restrained (without sedation)

Pollanen, CMAJ 1998

Pudiak, Life Sci 1994

Ross, Mod Pathol 1998



Sudden Death & Restraints - 2

- ▶ Compression asphyxia

Do not sit on the chest of a subject!

- ▶ Strangulation

Bar arm choke hold



Hogtie Position & Positional Asphyxia

- ▶ Does hogtying kill?
- ▶ Is it “positional asphyxia”?



Hogtie Position & Positional Asphyxia

Parkes (Med Sci Law 2000):

- ▶ Longer recovery time (heart rate) in a face-down position
- ▶ No significant changes in oxygen saturation

Schmidt (J Emerg Med 1999):

- ▶ Comparison between hogtie and sitting positions after physical exertion.
- ▶ No significant differences in recovery heart rate and oxygen saturation between the two positions.



Hogtie Position & Positional Asphyxia

Chan (Ann Emerg Med 1997):

- ▶ Comparison between hogtie and sitting positions after physical exertion.
- ▶ Minor decline in pulmonary functions tests in the hogtie position.
- ▶ No significant difference in heart rate recovery, oxygen saturation and PCO₂ between the two positions.



Hogtie Position & Positional Asphyxia

Hogtying does not appear to cause significant respiratory compromise.

Hogtying does not constitute “positional asphyxia”.

Sudden deaths in the hogtie position are probably caused by excited delirium.



Taser and In-Custody Death

Kornblum (J Forensic Sci 1991):

- ▶ Review of 16 deaths “associated with the use of the Taser”.
- ▶ All subjects were drug users.
- ▶ The responding officers believed the subjects were under the influence of PCP (disturbed behavior).



Taser and In-Custody Death

Kornblum (J Forensic Sci 1991):

Cause of death:

- ▶ Overdose of drugs (cocaine, PCP, amphetamine) - 11 cases
- ▶ Gunshot wounds - 3 cases
- ▶ Heart disease and Taser shock - 1 case
- ▶ Undetermined - 1 case

“The conclusion reached after evaluation of these cases is that the Taser in and of itself does not cause death, although it may have contributed to death in one case.”



In-Custody Death Prevention



Subjects at Risk

- ▶ Obese
- ▶ Elderly
- ▶ Prior medical condition

- Sickle cell trait

- Asthma

- Diabetes

- Cardiac diseases

- ▶ Intoxication

Ed Nowicki: 60% of subjects resisting arrest are under the influence of alcohol or drugs (probably underestimated).



In-Custody Death Prevention Guidelines

Training:

- ▶ Be aware of excited delirium and other deadly medical problems.
- ▶ Know when to call EMS and do not hesitate to do it.

Medical training:

- ▶ CPR and first aid -- Mandatory!
- ▶ Police AED (automated external defibrillator) program
- ▶ First responder certification (40 hours)
- ▶ Additional training for jail personnel?



In-Custody Death Prevention Guidelines

Restraints:

- ▶ Probably better to avoid the hog-tie position
- ▶ Have other types of restraints available
- ▶ Do not compress the chest
- ▶ Sit the subject as soon as possible, if level of consciousness is normal



In-Custody Death Prevention Guidelines

Excited delirium:

- ▶ Extreme agitation
- ▶ Naked subject

IACP criteria (Granfield, International Association of Chiefs of Police 1994):

- ▶ Bizarre and/or aggressive behavior
- ▶ Shouting
- ▶ Paranoia
- ▶ Panic
- ▶ Violence towards others
- ▶ Unexpected physical strength
- ▶ Sudden tranquility



In-Custody Death Prevention Guidelines

When to call EMS:

- ▶ Signs of distress (loss of consciousness, difficulty to breathe, chest pain...)
- ▶ Unusual agitation (excited delirium)



In-Custody Death Prevention Guidelines

Transport the subject to the hospital:

- ▶ Disturbed behavior
- ▶ Intoxication
- ▶ If the subject requests it
- ▶ According to a written procedure (use of non-lethal rounds, LVNR, OC)
- ▶ Medical clearance for every arrest?

Transportation by EMS preferred (depending on local constraints)



In-Custody Death Prevention Guidelines

Documentation:

- ▶ Level of consciousness (AVPU scale)
- ▶ Subject on medication?
- ▶ Orientation
- ▶ Quality of speech

...



In-Custody Death Prevention

Speech is perhaps the most sensitive indicator in differentiating between organic and psychiatric disease. Patients with an organic alteration of mental status generally have globally slowed speech patterns. There are often problems with articulation, particularly in toxic-metabolic encephalopathies. Speech that is rapid, well articulated, and well enunciated indicates that the vast majority of the nervous system is functioning normally. Even patients with severe psychiatric disorders often speak rapidly, clearly, and without any obvious hesitation.

(G. Henry, in Harwood-Nuss: The Clinical Practice of Emergency Medicine, 1997)



In-Custody Death Prevention

Segest (J Forensic Sci 1987):

Review of 19 deaths in police custody in
Denmark

Most frequent causes of death:

- Alcohol intoxication

- Drug poisoning

- Intracranial hemorrhage

“A physician had been consulted but had not diagnosed the seriousness of the condition in 42% of the deaths.”