

# Emergency Medicine Grand Rounds

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## “Doctor Strong!”

physical and chemical restraint of the acutely agitated patient

Johnny Gammage was a black motorist who died on October 12, 1995, after being stopped for “driving erratically” by police from the nearly all-white Pittsburgh suburbs of Brentwood, Baldwin Borough and Whitehall in Allegheny County, Pennsylvania. Within just seven minutes, Gammage lay dead. The coroner’s report showed his cause of death to be asphyxiation due to pressure applied to the chest and neck. (Wikipedia article)

### Physical Restraint Methods and *Political* Acceptability

- **CHOKE HOLDS:** Out since 1980’s due to unacceptable number of deaths [Reay 1982].
- **HOGTIE RESTRAINT:** Also known as hobble or prone maximal restraint. “Based on the risk of sudden death, the practice of hogtying and transporting subjects in a prone position should be discontinued.” [Ross DL. An analysis of in-custody deaths and positional asphyxiation. Police Marksman 1996; March/April:16; Stratton 1995; ]. As a result, the recommendation is for *supine* restraint, and in the patient-care setting, the use of one restrainer per limb and one for the head is still standard.
- **TASER:** (Thomas A Swift’s Electric Rifle) New over past 20 years. Fires 2 - 1.4 g darts with fish hook barb on a 1-mm shaft imbedded in metal and plastic cylinder; cylinder is connected to Taser by 4.6m wire [Koscove 1985]. Simplest way to remove darts is grasping with a Kelly clamp or Visegrip pliers and pull directly out. Isolated case reports of injury but opinion fairly universal that is safer than all other



alternatives [Allen 1992, Bozeman 2005; Jenkinson 2006; Ho 2006; Lakireddy 2006,2007; Strote 2006].

- **TRANQUILIZER DARTS:** no literature on human use.
- **PEPPER SPRAY:** Oleoresin capsicum spray devices, also known as pepper mace, OC, capsaicin. Known to be safe in cosmetics and medications, capsaicin sprays have caused corneal abrasions, likely due to the propellant [Holopainen 2003], but are generally regarded as safe. However, law enforcement officers (appropriately) realize that pepper spray has limited effectiveness, especially in excited delirium.

### Positional Asphyxia

There is excellent evidence that severely intoxicated persons sometimes die from positional asphyxia [Bell 1992]. However, despite multiple experimental studies and heated discussions in the medical literature, no solid evidence that this is the primary cause of deaths in restraint [Chan 1997, 1998, 2000; Howard 1998; Reay 1999]. From a political standpoint, hogtie restraints are no longer acceptable. From a scientific standpoint, there is some suspicion that hogtie restraint may contribute to death from excited delirium but is not in itself the primary cause.

### Excited Delirium

[BMJ 1997;315:1107-1108 (1 November)] “Editorials - Acute excited states and sudden death - ‘Much journalism, little evidence’ - Excited delirium is a state of mental and physiological arousal, agitation, hyperpyrexia with epiphora, and hostility. Observers typically emphasise the extreme sweating, bizarre behaviour and speech, and the subject’s extraordinary strength and endurance when struggling, apparently without fatigue. Such states

## Differential Diagnosis of Excited Delirium

- Hypoxia
- Shock
- Heatstroke
- Sepsis
- Meningitis
- Brain tumor or abscess
- DTs
- Psychiatric (e.g., hysteria)
- Rabies
- Tetanus
- Centruroides scorpion bites
- Cocaine or similar OD
- Serotonin Syndrome
- Neuroleptic Malignant Syndrome
- Status epilepticus
- Quinolone antibiotic toxicity

are commonly associated with high blood concentrations of cocaine or other stimulants, though some cases arise in those with histories of schizophrenia or mania and no evidence of intoxication. The same syndrome was, however, described under various names long before drug abuse was prevalent, and was recognised for its high mortality. Such deaths, often in police custody or other highly charged situations, commonly give rise to high profile coroner's hearings and inquiries."

Excited delirium is sometimes conflated with "positional asphyxia" [Karch 1995]—but, despite early reports [Reay 1992] many dying of excited delirium don't show the classic pathological features of asphyxia (petechiae, combined lung weights >900g [Bell 1992]) and Chan [1997] showed that prone restraint, even after exercise, didn't cause "clinically significant" hypoxia or asphyxia in healthy volunteers.

Expert opinion seems to suggest that these deaths are multifactorial, and the mild hypoxia that occurs in normal people who are hogtied may be much more significant in those with a greatly increased metabolic rate, i.e., with mania or heatstroke or sympathomimetic toxicity. [Chan 1998]

Excited delirium as well as death from excited delirium has been known since ancient times [Mann 1986] but now, with our current stable of psychoactive drugs, death from primary psychiatric delirium ("lethal catatonia") is almost unheard of and deaths are more likely from a mixture of recreational drugs and social factors.

## Rapid Tranquilization

Much has been written on the use of different types and classes of drugs for rapid tranquilization of the acutely agitated patient. Psychiatrists prefer the newer agent ziprasidone (e.g., Geodon) because it, despite reactions against its aggressive marketing, seems to calm agitated psychiatric patients yet leaves them more cognitively intact than alternative agents [Lesem 2001].

However, for those with true excited delirium, i.e., those who may have a variety of toxic or recreational ingestions or medical illnesses, other drugs are more common. These include traditional antipsychotics such as haloperidol (e.g., Haldol) and droperidol. As with ziprasi-

done, these lower the seizure threshold, a concern in true excited delirium [Hedges 2003]. Droperidol and haloperidol also both prolong the QT interval and can cause, although rarely, fatal arrhythmias. Benzodiazepines such as lorazepam may cause prolonged sedation and even respiratory depression in large doses, and indeed intramuscular midazolam has been recommended as a shorter-acting agent for acute psychiatric mania [Wyant 1990]. Benzodiazepines also offer some protection against seizures and are the initial drug of choice for agitated serotonin syndrome. Combinations of an antipsychotic and a benzodiazepine have been found effective [Battaglia 1997].

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