Management of the Violent Patient

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Abstract

Emergency medical services (EMS) providers must often manage violent or combative patients. The data regarding violence against EMS personnel are poor, but according to studies conducted thus far, between 0.8% and 5.0% of incidents to which EMS personnel respond involve violence or the threat of violence. Physical or chemical restraint is usually the only option available to emergency care providers to control violent patients. Physical restraint, however, can lead to sudden death in otherwise healthy patients, possibly as a result of positional asphyxia, severe acidosis, or a patient's excited delirium. Chemical restraint has traditionally consisted of either neuroleptics or benzodiazepines, but those drugs also have drawbacks. Haloperidol and droperidol, the neuroleptics most frequently used for restraint, can cause serious side effects such as extrapyramidal symptoms or QTc (QT interval corrected for heart rate) prolongation. The Food and Drug Administration recently issued a black box warning regarding the use of droperidol, because the QTc prolongation associated with the drug has led to fatal torsades de pointes in some patients. Benzodiazepines are also associated with adverse effects, such as sedation and respiratory depression, especially when the drugs are mixed with alcohol. The atypical antipsychotics, a new option that may be available soon, are less likely to cause such effects and therefore may be preferred over the neuroleptics. Liquid and injectable formulations of various atypical antipsychotics are currently in clinical trials. Because few options are currently available to EMS personnel for managing violent patients outside of the hospital, more research regarding violence against emergency care providers is necessary. **Key words:** physical restraint; chemical restraint; prehospital care; violent patient.

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Emergency medical services (EMS) providers often must manage violent or combative patients. Some of these patients may themselves be victims of violence and consequently direct their anger toward an EMS provider. Because the causes of violence are diverse among these patients, EMS personnel must consider a complex differential diagnosis that includes biological causes, such as hypoxia, hypoglycemia, diabetic crisis, or brain tumor; mental illness; and substance abuse. The patients who are most likely to be violent or aggressive are mentally ill patients[1] and those who are intoxicated on alcohol or other drugs, such as PCP.[2]

Because the underlying causes of violent behavior are diverse (Table 1), several different approaches to the management and restraint of violent patients have been used. Emergency medical services providers must be able to choose among these options properly to avoid harming both patients and themselves. This discussion addresses the problem of violence against EMS personnel and focuses on the use of physical and chemical restraints in the field.

Violence against EMS Providers

The magnitude of violence against EMS providers has been investigated only recently, since a series of violent attacks on EMS personnel in the late 1980s and early 1990s.[3–5] Few published studies have addressed the problem. The first study that examined the frequency of violence committed against EMS personnel was a convenience survey of 32 persons registered at the 1992 meeting of the National Association of EMS Physicians in Pittsburgh, Pennsylvania.[6] When asked whether their EMS agency had protocols for managing the violent patient in the field, 47% of the respondents indicated that their agency had an established protocol, and 50% reported that their agency had a protocol regarding the use of restraints. However, despite the relatively low number of attendees reporting such protocols, 69% of the respondents had actually used restraint in the field—most commonly leather restraints (50%). Ninety-seven percent of the respondents had called upon law enforcement to help manage a violent patient and 44% had sought involuntary commitment for their patients. Thirty percent of the respondents reported carrying protective equipment such as bulletproof vests and helmets. Sixty-seven percent of the respondents reported that an EMS provider had

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been injured by a violent patient within the previous year. Although 67% of the attendees had been trained in violence management in the field, only 9% had undergone training by law enforcement officers and only 25% considered themselves adequately trained to make assessments regarding potential violence. In another arm of their study, Tintinalli and McCoy reviewed 4,200 ambulance reports and found 33 (0.8%) reports of actual or potential violence in the field.[6] Furthermore, a review of the ambulance report narratives revealed that four (12%) of the violent patients had weapons (three knives and one club). Law enforcement officers were present at the scene in 82% of cases of violence to which EMS responded and they were present before EMS arrival 70% of the time. Fourteen (42%) of the patients required restraints. Three of these violent patients were insulin-dependent diabetics who were hypoglycemic. The Tintinalli study had several limitations. First, it was a survey with a very small sample size, and it did not clearly identify the respondents. In addition, the ambulance report review was retrospective and conducted with documentation not designed for the purpose.

In a second study, medical students in Nashville participated in a prospective, observational case series in which they rode with EMS personnel in 12-hour shifts and documented what happened on their calls.[7] They observed 297 ambulance runs, of which 16 (5%) involved violent patients, a proportion significantly higher than that reported in Tintinalli and McCoy's study. Of the 281 nonviolent calls, 14% were cases of violence that led to the summoning of EMS but ended before they arrived and 81% were truly nonviolent. These results suggest a frequency of one violent episode for every four 12-hour shifts of an EMS provider, or one episode for every 19 runs. Of the 16 violent cases, 11 involved violent patients and five involved violent nonpatients. Violent patients tended to be younger than nonviolent patients (mean age 32.5 ± 8.1 years versus 44.3 ± 23.9 years, respectively) and were more likely to have been using alcohol or other drugs. They were more likely to refuse treatment, but when transported, they were more likely to require emergency transportation. The violent behavior exhibited on the scene as documented by the medical students consisted of verbal aggression (50% of patients), physical aggression (13%), and a combination of verbal and physical aggression (38%). In describing or identifying the cases involving violent incidents, dispatchers in 62% of the runs used codes that indicated violence was imminent. At the same time, in 10% of the nonviolent incidents, dispatchers suggested there might be violence on the scene when in fact there was none. Police were on the scene before the arrival of EMS personnel 44% of the time, but they didn't respond to 37% of the calls. The interventions that the EMS personnel used to calm the patients consisted of verbal intervention (69%) and physical restraint (50%); the police were required to arrest two persons (13%). Of note is that only 31% of the ambulance report narratives of the runs actually mentioned the violence that the medical students had recorded on the scene, which suggests that direct observation and recording of events by a third party offers a more complete method of data collection than a retrospective review of ambulance reports.

In a third study, a group of 490 EMS providers in California was surveyed about their training and experience in managing violent patients. Collectively, the group had a median of ten years of experience and reported a median of three assaults per provider during the course of their careers.[5] Twenty-eight percent of the providers reported having formal training in managing violence; 61% had been assaulted while on the job; and 25% had actually been injured as a result of an assault. Ninety-two percent of the respondents had used restraints on violent patients, but only 49% had been trained in the proper use of those restraints. Seventy-three percent used protective equipment, such as helmets and vests, on the job. Nineteen percent of the providers reported carrying a weapon, usually a knife (45%), on the job; however, 22% of those with

TABLE 1. Agitation in the Different Clinical Disorders: An Overview of Underlying Pathophysiologic Mechanisms*

Disorder	Mechanism
Agitated depression	Increased serotonergic responsivity; decrease in GABA†
Mania	Increase in dopamine
Panic disorder and generalized anxiety disorder	Increase in norepinephrine; decrease in GABA
Dementia	Decrease in GABA
Delirium	Multiple underlying causative mechanisms
Substance-induced agitation	Increase in dopamine
Acute psychosis	Increase in dopamine
Akathisia	Decrease in dopamine; increase in norepinephrine
Aggression	Increase in norepinephrine; decrease in serotonin

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†GABA = gamma-aminobutyric acid.

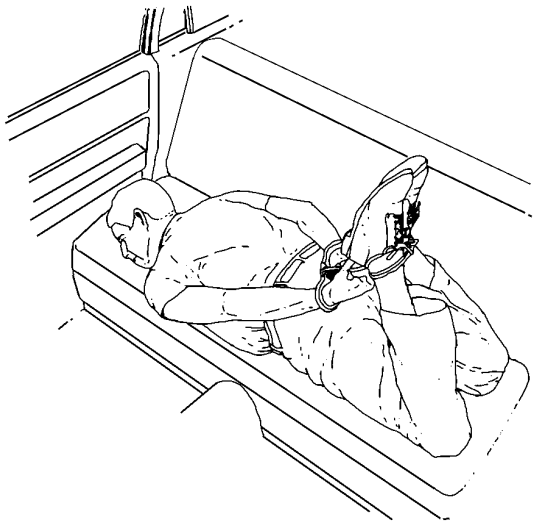

FIGURE 1. Example of a hobble ("hog-tie") restraint. Reproduced with permission from: Reay DT, Fligner CL, Stilwell AD, et al. Positional asphyxia during law enforcement transport. Am J Forens Med Pathol. 1992;13:90-7.

a weapon reported carrying a gun while they were working.

In 1996 and 1997, 2,224 EMS providers from both the Boston and Los Angeles metropolitan areas were surveyed to determine how often patients carried weapons.[8] Even though only 42% (39% from Boston, 46% from Los Angeles) of the providers reported searching their violent patients routinely, 62% (51% and 76%, respectively) of them had actually found weapons. Furthermore, only 20% of the providers had received formal training in searching for weapons. Patients with weapons are, therefore, a common problem for EMS personnel, and most providers believe they are inadequately trained to handle it.

In review, the data regarding the problem of violence against EMS personnel are poor: only three descriptive surveys, one retrospective chart review, and one useful observational study have been conducted so far. According to those studies, between 0.8% and 5.0% of incidents to which EMS personnel respond involve violence or the threat of violence. The data also show that EMS providers routinely restrain their patients but usually are not adequately trained to do so and that between 25% and 67% of them have been assaulted and injured during their careers. Emergency medical services personnel also frequently report finding weapons (between 12% and 62% of cases involved them) and, equally disturbing, some EMS personnel have even reported carrying weapons themselves. Finally, the information that dispatchers give to EMS personnel is often poorly predictive of violence on the scene. Until more is understood about violence against EMS providers, the approach to managing violent patients will vary greatly and perhaps inadvertently increase the risk of injury and death to both patients and EMS providers.

WHEN RESTRAINT IS NECESSARY

The threat and frequency of violence in the field make the issue of restraint of violent patients an important one to EMS providers. Restraint can be accomplished either physically or chemically, but as Shanaberger warns, EMS providers must keep in mind that "infringing on the liberty of another person should never be done without good cause, deliberate caution, and respect" for the patient.[9] Violent patients should be restrained only when their violence is uncontrollable and they represent a danger to themselves and others. Mentally incompetent violent patients may require restraining to avoid possible injury to themselves.[10] Before resorting to the use of restraint, EMS personnel should try other, less forceful tactics to control or subdue a violent patient. By approaching the patient nonthreateningly and attempting to communicate with him or her, the emergency care provider can assess the patient's mental health or determine whether a correctable medical problem such as hypoglycemia or hypoxia may be part of the problem.

PHYSICAL RESTRAINTS

Hobble Restraints

The literature on the use of physical restraint focuses primarily on the bad outcomes associated with the practice and discusses what must not be done to restrain patients, but very little information is available that addresses how patients should be properly restrained. The known hazards of physical restraint include strangulation, as caused by a vest restraint; aspiration; impaired circulation; nerve damage; psychological injury; and sudden death.[11]

A commonly used means of restraint is the hobble restraint, often referred to as the "hog-tie" (Fig. 1), in which a person is held prone with the hands restrained behind the back in handcuffs, which are linked to leg restraints. One of the features of the hobble restraint is that the shoulders are usually pulled and held off the ground, a position that is maintained during the course of transport. The first reports of sudden death associated with this means of restraint appeared in the 1980s and involved agitated persons, usually cocaine abusers.[12–14] These in-custody deaths commonly involved young, usually male, persons who exhibited bizarre, wild, violent behavior that attracted the attention of the police.

In 1992, Reay et al.[15] reported three in-custody deaths that the investigators attributed to hypoxia caused by positional asphyxia. In each case, the person was held in a hobble restraint in a confined space, a combination that led to respiratory compromise, which produced positional asphyxia.

In 1993, O'Halloran and Lewman reported 11 in-custody deaths and suggested three possible contributing causes: catecholamine stress on the heart, which can be caused by agitation and a physical struggle, as with police; increased oxygen demand, as may occur during a physical struggle; and impaired respiration caused by a hobble restraint.[16] In their study, the authors recommended that the vital signs of persons held prone in hobble restraints should be closely monitored.

Stratton et al. reported in 1995 the first two deaths of patients who were in the care of EMS providers.[17] One of the patients, who had a cardiac monitor attached, initially exhibited tachycardia, which within a minute deteriorated to asystole. Stratton recommends that patients held in hobble restraints should be placed on their side to reduce stress on the body and to allow better monitoring of their respiratory status. The investigator also emphasizes that there should also be sufficient slack in the restraints to allow for ventilatory motion of the rib cage.

In 1997, Chan et al. performed a crossover study in which healthy volunteers underwent pulmonary function testing while in four different positions: sitting, supine, prone, and the hobble restraint position.[18] When comparing subjects held in hobble restraints with those in a seated position, Chan and colleagues observed a restrictive pulmonary function pattern, indicating a small, statistically significant but clinically insignificant impairment of pulmonary function. Serial arterial blood gas, pulse rate, and oxygen saturation measurements were also obtained from these subjects after two periods of exercise. After the first exercise period, the participants were placed in a seated position during recovery and then in hobble restraints after the second exercise period. Hypoxia was not observed in any of the subjects. Thus, Chan et al. suggested, in-custody deaths of patients held in hobble restraints might be due to reasons other than just positional asphyxia.

Ross reviewed 61 cases of in-custody deaths of persons who had exhibited symptoms of excited delirium.[19] Most were young males and 69% of them had ingested cocaine, which is a stimulant that can produce excited delirium or impaired consciousness. The syndrome of excited delirium has four components: hyperthermia, delirium with agitation, respiratory arrest, and death. Rectal temperatures were measured in 70% of the cases and ranged from 100°F to 108°F (mean, 104°F). All the patients had been physically restrained; however, only 38% were in hobble restraints. Seventy-seven percent of the patients died at the scene or during transport. Ross suggested that perhaps the syndrome of excited delirium was more related to the sudden deaths than to the restraint position, because apparent positional asphyxiation during restraint accounted for only 20% of the deaths.

Upon observing severe acidosis in five patients in a case series, Hick et al. suggested that extreme acidosis could also be a contributor to in-custody deaths.[20] In view of their findings, the investigators recommended that chemical restraint be used instead.

Another cross-over study examined subjects who were placed in a seated position or in a hobble restraint after they performed stressful exercise.[21] Eighteen police recruits, organized in pairs, participated in a role-playing exercise in which one member of a pair, playing an officer, first chased the other member, or "perpetrator," across a long distance up and then down a flight of stairs and then engaged in a physical struggle with him or her for 1 minute. At that point the perpetrator was restrained either in a hobble restraint or in a seated upright position. The perpetrator then struggled against the restraints for an additional 30 seconds. The subjects seated upright and those in a hobble restraint demonstrated no clinically significant difference in oxygen saturation or heart rate recovery measurements. In this study, the subjects who were in hobble restraints were not prone but rather placed on their side, which at that time was the method police officers from that department used for restraining patients. The authors concluded that healthy persons are at little risk when held in the hobble restraint and placed on their side.

Stratton et al. reviewed 18 cases of restrained patients in excited delirium who died suddenly while in the care of the paramedics who were monitoring them.[22] All of the patients, who were held prone in hobble restraints, struggled against their restraints for a prolonged period before suffering sudden asystole and dying unexpectedly. Seventy-eight percent of the patients had evidence of stimulant use at autopsy, 56% had a chronic disease, and 56% were obese.

In summary, the cause of in-custody deaths of patients in physical restraints is not completely clear. These deaths could be due to positional asphyxia, severe acidosis, a state of excited delirium, or any combination of these factors. It is clear, however, that patients who struggle and require a restraint are at risk for sudden death and should therefore be managed as a medical emergency and continuously monitored. Patients in hobble restraints should be positioned on their side, and a chemical restraint should be considered as necessary for further control and to terminate their struggling.

TABLE 2. Desirable Characteristics of a Drug to Treat Aggression*

Selective anti-aggressive effect
Anti-aggressive effect in a broad spectrum, i.e., efficacy across different patient groups and pathologies
Availability in oral (tablet and liquid) and intramuscular (short-acting and long-acting forms)
Rapid onset of action
Low toxicity
Low potential for drug–drug interactions

*Reproduced with permission from: Buckley PF. The role of typical and atypical antipsychotic medications in the management of agitation and aggression. J Clin Psychiatry. 1999;60(suppl 10):52-60. Copyright 1999, Physicians Postgraduate Press.

CHEMICAL RESTRAINTS

As an alternative to physical restraints, drugs are often used to manage agitated patients. The ideal drug for chemical restraint should be injectable and have a rapid onset but short duration of action and a negligible adverse effect profile (Table 2).[1] At present, the two possible choices for EMS personnel are the neuroleptics and the benzodiazepines.

Neuroleptics

Among the neuroleptics used for chemical restraint, the most common examples are haloperidol and droperidol, both of which belong to the class of butyrophenone derivatives. More documented experience has been associated with haloperidol because that drug has been available longer, and it is approved by the Food and Drug Administration (FDA) for the management of psychotic disorders. The onset of action for intramuscular (IM) haloperidol is in the range of 30 to 60 minutes.[23] Droperidol, first characterized in vivo in 1963 and released to the market soon thereafter, is approved by the FDA only as an adjunct in anesthesia; however, it is widely used to control agitation. Droperidol is more potent than haloperidol, has a faster onset of action, is metabolically eliminated more quickly, and is more likely to produce sedation.[24]

Droperidol and haloperidol operate as antagonists of the dopamine receptors in the subcortical regions of the brain, midbrain, and brain stem reticular formation.[25] The most common adverse effects associated with droperidol and haloperidol are mild-to-moderate hypotension, tachycardia, dystonia, akathisia, and hallucinations (Table 3). Less common adverse effects include prolonged QTc (QT interval corrected for heart rate) and sudden death. Droperidol has long been known to cause QTc prolongation and thus could potentially cause torsades de pointes (a life-threatening ventricular tachycardia).[26] The first case report of torsades de pointes in a patient using this class of medication appeared in 1979. The patient in that report received a fairly large dose of haloperidol.[27]

A few studies have directly compared the two butyrophenone neuroleptics. In 1992, Thomas et al. compared their levels of effectiveness in the emergency department, in a randomized, double-blind trial of 68 patients who received either droperidol or haloperidol intramuscularly or intravenously, at the discretion of the attending physician.[28] At 10, 15, and 30 minutes after administration, IM droperidol was noted to control agitation faster than IM haloperidol ($p = 0.03$). The only differences noted between the two drugs occurred during intravenous (IV) administration, and those differences were considered slight and nonsignificant. The only adverse effects noted were mild hypotension, which occurred in four patients who received IM droperidol, two patients who received IM haloperidol, and two patients who received intravenous haloperidol, and a dystonic reaction that occurred in one patient who received IM haloperidol.

Rosen et al. conducted a randomized, double-blind, placebo-controlled trial comparing IV droperidol with saline in 46 patients (23 in each treatment group) receiving EMS care.[29] The investigators found that droperidol reduced agitation scores by 71% during a 10-minute period. Saline, interestingly enough, reduced the agitation score by 30% during the same time, a finding that suggests a calming approach may be effective as well. There was one report of akathisia in the droperidol group, and no serious adverse effects, including hemodynamic instability, were reported.

In 1995, Frye et al. reported three men who received droperidol drips at 5 to 20 mg per hour to treat agitated delirium.[24] As a result of this therapy, the patients' QTc intervals were lengthened by an average of 17%. The longest interval reported was 560 milliseconds, but arrhythmia did not occur. Nevertheless, the authors suggest continuous cardiac monitoring is necessary for patients receiving droperidol infusion.

In 1994, Lischke and colleagues observed dose-dependent QTc prolongation associated with droperidol.[30] Forty surgical patients undergoing general anesthesia were randomly assigned to receive one of three different doses of droperidol: 0.100, 0.175, and 0.250 mg/kg. Within 1 minute after the drug was administered, QTc prolongation occurred (mean prolongation interval, 37, 44, and 59 ms, respectively).

In a review of the adverse effects associated with droperidol, Chambers and Druss examined data from nine clinical trials and found several reports of dystonia, akathisia, and hypotension but no reports of sudden death or torsades de pointes.[26]

Droperidol was voluntarily removed from the U.K. market on March 31, 2001, owing to concerns about the risk of QTc prolongation associated with the drug and its potential for causing sudden death.[31] On December 4, 2001, the FDA issued a black box warning regarding droperidol—the most serious warning for an FDA-

approved drug.[32] In that warning, QTc prolongation or torsades de pointes had been observed in patients who were administered the recommended or smaller-than-recommended doses. Some instances occurred in patients with no known risk profile for QTc prolongation, and some cases were fatal. The FDA recommends that droperidol be reserved for those patients for whom there is no other treatment. Furthermore, they recommend that a 12-lead electrocardiogram be obtained before droperidol is administered. In addition, they suggest that when the QTc is longer than 440 ms in male patients or 450 ms in female patients, droperidol should not be used. In cases in which it is used, patients should undergo electrocardiographic monitoring for two to three hours after the drug is administered. These recommendations are obviously impractical for managing violent patients in the field. Horowitz and colleagues have recently questioned the scientific rationale behind the FDA's warning.[33]

Benzodiazepines

The benzodiazepines are frequently used to treat agitation because their efficacy for this purpose is well established and they are tolerated well. The drugs work by increasing the effects of gamma-aminobutyric acid (GABA) on the chloride channel associated with the $GABA_A$ receptor and thus produce a decreased cellular excitability. Lorazepam is the benzodiazepine of choice in emergency psychiatry and its effects are evident within 15 to 30 minutes after it is administered intramuscularly.[23] The known adverse effects of the benzodiazepines are excessive sedation, memory impairment, and respiratory depression,[1] which causes the greatest concern when the drugs are mixed with alcohol or other recreational drugs, a common practice among a significant portion of violent patients in the field. Lorazepam is commonly used in combination with haloperidol for the rapid tranquilization of agitated patients. Standard protocols at many institutions in the United States call for the IM administration of 5 to 10 mg of haloperidol and 1 to 2 mg of lorazepam.[23] At this time, no studies have yet been conducted that examine the use of benzodiazepines in managing violent patients in the field.

TABLE 3. Side Effects of the Neuroleptics Haloperidol and Droperidol

More Common	Less Common
Mild to moderate hypotension	Anaphylaxis
Tachycardia	Prolonged QTc interval
Extrapyramidal reactions (dystonia, akathisia)	Sudden death (torsades de pointes)
Hallucinations	

Future options for chemical restraint may include the atypical antipsychotics, such as clozapine, risperidone, olanzapine, quetiapine, and ziprasidone. In clinical trials, these drugs have been as effective as the neuroleptics in the treatment of psychosis in various patient populations, but they are generally better tolerated.[34] The anti-aggressive properties of atypical antipsychotics are linked to the drugs' function as serotonergic- and dopaminergic-receptor antagonists. However, the use of atypical antipsychotics in emergencies is limited, because they must be administered slowly to avoid intolerable adverse effects and because an FDA-approved injectable formulation is not yet available. Intramuscular formulations of ziprasidone[23] and olanzapine[35–37] and a concentrated liquid form of risperidone[38] are currently in clinical trials, and their availability in the future may significantly affect the emergent treatment of agitation.

CONCLUSIONS

Because EMS providers frequently encounter violent patients who must be restrained, they must often use physical restraints to control those patients. Such restraints, however, particularly the hobble restraint, have been associated with sudden death in otherwise healthy patients—presumably owing to positional asphyxia, severe acidosis, or a patient's excited delirium. In view of this drawback, chemical restraints may be preferred, particularly for patients who struggle against physical restraints. Neuroleptics and benzodiazepines are the most commonly used drugs for chemical restraint. The neuroleptics haloperidol and droperidol can produce serious adverse effects such as QTc prolongation and torsades de pointes, both of which can lead to sudden death. The benzodiazepines can produce excessive sedation and respiratory depression when they are mixed with alcohol. Atypical antipsychotics, particularly the injectable formulations, are a promising new option and are currently under investigation in clinical trials and may become available soon. At this time, however, few options are available for the EMS provider to manage violent patients.

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CONSENSUS PRESENTATION

Prevention is a very important aspect of management of the violent patient, but when prevention fails, restraint is often necessary. In acknowledging the several reasons why patients may be violent, however, the consensus group agreed and emphasized that EMS providers

must consider a broad differential diagnosis for each patient, including such medical causes as hypoglycemia and hypoxia, before deciding that restraint is necessary.

PREVENTION

For the EMS provider, the key to preventing violence is to recognize the risk for it in each situation and attempt to make the scene safe. In cases of domestic violence, for example, the risk of violence is increased when the perpetrator perceives that too much empathy is directed toward the victim. Emergency medical services providers must therefore approach all involved participants neutrally and without bias.

If a potentially violent patient is otherwise mentally aware and stable, verbal deescalation, such as through negotiation or an appeal to reason, is an obvious first step toward preventing a violent episode, and research has shown that such interpersonal communication is effective in calming agitated patients and preventing escalation. When addressing a potentially violent patient, the EMS provider should respect the patient's "interpersonal space," avoid direct eye contact, and speak in a calm and reassuring voice.[39,40] If a potentially violent patient cannot be controlled quickly, it is often best to remove from the scene all participants or objects that might contribute to his or her agitation or to arrange the surrounding environment so as to limit the patient's access to other persons or objects. Sometimes, a subtle show of force may be enough to keep a violent patient in check, but this approach can also easily produce the opposite result. Emergency medical services providers must remember that there is no safety in numbers and that no scene is ever secure.

PROTOCOL

Because violent patients are highly likely to cause injury to themselves and EMS providers, the consensus participants decided that a necessary element in the management of violent patients is a written protocol that establishes the proper procedure and approach to restraint. In addition, EMS providers must receive proper training to follow such protocols. In considering the necessity for a weapons search during the restraining process, the consensus group agreed that although this step is important, it should be delayed until EMS personnel and their patients are in a more controlled environment.

They also concurred on the necessity of monitoring the blood glucose levels of all patients and recommended that other signs be monitored as well, including heart function, oxygen levels, vital signs, mental status, respiratory effort, and airway status.

SELF-PROTECTION

In addressing the issue of self-protection, the group believed that EMS personnel should not carry weapons of any type unless they are members of law enforcement and have had appropriate training in the protection and use of those weapons. The consensus members did agree, however, that other methods of personnel protection such as body armor and helmets are acceptable. They also believed that it is medically appropriate for EMS personnel to delay patient care until they determine the scene is safe.

PHYSICAL RESTRAINTS

In an extensive discussion of the issue of physical restraints, the group agreed that the use of hobble restraints should be strongly discouraged. They also suggested that EMS personnel and law enforcement should devise in advance a plan for managing patients who are already in a hobble restraint before EMS arrives. In cases in which key-lock restraints are used, a law enforcement officer should travel with the patient at all times. The group recommended that soft restraints, made from either leather or cloth, be used whenever possible. They also approved the use of other special equipment, such as a transport hood, that protects personnel from oral secretions or biting but allows them to visualize and monitor a patient's airway.

CHEMICAL RESTRAINTS

The consensus participants discussed the use of chemical restraints and agreed that the current choices of available drugs used for chemical restraint are limited and not completely satisfactory. In administering these drugs, they prefer the IV route, when possible, because it enables a more rapid onset of action. However, the administration of intravenous drugs can be complicated by the difficulty associated with catheter tube placement. Inadvertent needlesticks are also a potential problem associated with both IV and IM administration. In addition, IM injection can increase the risk of overdose if multiple injections are given before the drug takes effect.

One drug that the consensus group recommended was diphenhydramine, which is commonly used in air medical transport. This drug may have prophylactic use when patients are transported between facilities. They also recommended the benzodiazepine lorazepam, because it could be administered intravenously, intramuscularly, or orally and does not require refrigeration.

In choosing between the neuroleptics, the consensus group stated a preference for haloperidol, particularly in consideration of the FDA's black box warning regarding droperidol, which they did not recommend. The consensus group pointed out, however, that because haloperidol and droperidol are both butyrophenones, they are likely to produce similar adverse events.

The consensus group suggested that oral medications such as the

atypical antipsychotics could be considered when patients are transported between facilities and when long transport times are involved.

RECOMMENDATIONS

The consensus participants concluded that restraint is appropriate when a violent patient poses a risk to EMS personnel or to themselves or others. They recommended that chemical restraints be used for patients who continue to struggle against physical restraints. Finally, the consensus group decided that a multidisciplinary approach involving law enforcement, psychiatric institutions, or emergency departments as well as EMS providers was essential to the safe management and transport of the violent patient.

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