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REVIEWS

A PREHOSPITAL PROTOCOL FOR GERIATRIC AGITATION

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ABSTRACT

Approximately 10% of geriatric patients (adults over the age of 65) transported via ambulance will have a mental status altered from baseline, otherwise known as delirium. Many of these patients will be agitated, posing a management challenge for EMS practitioners. Existing protocols for delirium in the pre-hospital setting were designed for younger adults, who have different etiologies and different levels of tolerance for medications than most older adults.

ED-based protocols have already been created to aid in the treatment of patients with this condition. Yet, their applicability is limited, as many involve elaborate diagnostics not available in the prehospital environment. Furthermore, many protocols recommend using medications that are not recommended for older adults. Thus, we created an evidence-based protocol for the prehospital evaluation and treatment of agitated geriatric patients. Our protocol puts specific emphasis on safely avoiding unnecessary administration of and/or high dosages of psychotropic medications. We also emphasize practical management, including non-pharmacologic treatment of this condition in older adults.

INTRODUCTION

One-third of all Emergency Medical Service (EMS) responses in the United States involve adults older than 65, a figure which continues to rise year after year (Duong et al., 2018). Amongst these patients, approximately 10% will suffer from delirium, making it one of the most commonly presenting symptoms in older adult EMS patients (Han et al., 2009; Carpenter & Platts-Mills, 2013).

Delirium is a syndrome characterized by acute "altered awareness mainly affecting attention" (Alzheimer's & dementia: the Journal of the Alzheimer's Association 2023). It can be caused by a multitude of conditions (e.g., infection, trauma, electrolyte disarray) and can be multifactorial. Delirium can lead to agitation, which can be a severe manifestation of delirium and result in increased morbidity and mortality (Shenvi et al., 2020).

Management of agitation in these patients can be difficult even for skilled clinicians. The etiology of delirium is often missed due to focus on treatment of the behavioral disturbance (Reus et al., 2016). Delayed treatment of common diagnoses like infection or trauma further contributes to poor outcomes (Fong et al., 2022). Contrarily, underlying cognitive and sensory decline can result in agitation within the healthcare setting simply due to a change in environment or routine. Further complicating this, patients with dementia (defined as chronic cognitive decline) are at increased risk of suffering from delirium, which can be difficult to discern from their baseline mentation (Alzheimer's & dementia: the Journal of the Alzheimer's Association 2023 & Shenvi et al., 2020). These situations individually, or in concert, can result in clinicians administering sedative mediations in lieu of addressing the etiology of agitation (Hustey, & Meldon, 2002; Bloch et al, 2019).

When sedatives are given to this age group, factors such as preexisting polypharmacy and medical conditions can result in additional harm by causing exaggerated effects from standard dosing (Barron & Holmes, 2013). Oversedation can result in a multitude of negative outcomes, with the most severe being respiratory failure, falls, and cardiac dysrhythmias. These consequences can be particularly dire if combined with other disease processes commonly present in delirium. However, if sedation is withheld unnecessarily, fractures, rhabdomyolysis and other trauma can occur (Baker, 2012), especially if physical restraint is utilized.

Protocols to manage acute agitation in geriatrics have been developed for use in the emergency department (ED) and inpatient setting. The main goal of these protocols is to ensure common and life-threatening causes of agitation are addressed prior to the administration of sedatives. If sedatives are needed, clinicians are encouraged to use lower doses of antipsychotics or benzodiazepines and be cognizant of the changes in metabolism in older adults when choosing a sedative (Baker, 2012).

Unfortunately, there is no analogous protocol in the prehospital setting. Nationally, EMS practitioners' current training and treatment protocols focus on younger adult patients (for whom toxic/metabolic, drug-related, or psychiatric issues are most commonly reasons for agitation), and sedation is typically an early and important intervention (Carter et al., 2018; National Association of EMS Officials, 2022; Shah et al., 2008; Miller, 2016). As such, we have developed a novel Prehospital Geriatric Agitation Protocol for use by BLS and ALS agencies for guidance in treating delirium in the prehospital setting. Our protocol takes into account the complexity of older adults and places sedation at a later stage after other pathology have been ruled out. Additionally, we emphasize a "worst first" framework for the prehospital approach to agitation: agitation may represent delirium from a dangerous medical cause and should be considered by EMS to be delirium until proven otherwise. Lastly, we incorporate best practices in mitigating agitation in patients with delirium regardless of its etiology.

PREHOSPITAL GERIATRIC AGITATION PROTOCOL

The Prehospital Geriatric Agitation Protocol was created as a joint effort between the Office of Medical Affairs for the Fire Department of the City of New York and the Weill Cornell Department of Geriatric Emergency Medicine. The main goal was to incorporate best practices from inpatient settings for use in the prehospital setting.

Optimal Environment

Specific and deliberate actions can be taken to optimize the environment for the geriatric patient during the initial evaluation and treatment. These actions have been shown in other clinical settings reduce the need for clinician intervention (Bray et al., 2004).

When addressing the patient, crews should be face-to-face with their hands in sight. When speaking to the patient, slow, short and simple remarks at an appropriate volume are preferred to make the crews intentions easy to understand (Aguirre, 2010). If English is not their preferred language, interpretation services (with adequate volume), should be employed. If glasses and hearing aids are required, efforts to make these available should be attempted. Frequent repetition of any information that was already provided should be emphasized, including orienting information and the crew's role.

In many cases, family and caretakers, who have an existing relationship with the patient may be on scene. Patients may be more willing to take direction from these bystanders instead of the crew. Involving family, friends, and caregivers in discussions and decision making may ameliorate difficulties with hesitant patients. However, in some cases family members may be the source of agitation. In these circumstances, direct communication with the patient in private may prove beneficial. This may allow the team to develop rapport, as well conduct screening for elder abuse and neglect, as aggression between family members in similar situations has been associated with elder abuse (Ogioni et al., 2007).

Efforts should be made to ensure an optimal transport environment, which includes making the ambulance as comfortable as possible. Attempts to accommodate a patient's preferred (or required) temperature should be made. Minimizing environmental stimuli is critical. The radio's volume should be lowered as much as possible. Lights should be dimmed as to not be blinding. If cardiac monitoring and IV infusions are not required, they should be discontinued (Reus et al., 2016; Rosen et al., 2015).

Focused Evaluation

A focused evaluation should be performed to determine the etiology of the patient's agitation. If an EMS practitioner finds a potential medical or traumatic etiology, continuing to evaluate for all major causes is critical, as it is likely that others are present as well. Frequently, older adults can have sustained an injury unbeknownst to their caregivers, potentially resulting in delirium and agitation. If an injury is found, splinting, motion restriction, and analgesia should be provided as needed, especially prior to manipulation or transport, as pain can also precipitate delirium (Rosen et al., 2015).

Signs of metabolic derangement or infection should also be routinely assessed. Dehydration, fever, hypothermia, and hypoglycemia can all cause agitation and are easily reversible. Volume status may be assessed via skin turgor and mucous membranes. If dehydration is suspected, an intravenous fluid bolus should be considered if IV access can be obtained. If the patient is too agitated to allow for IV placement or IV access is difficult, discussion with medical control regarding next steps should be initiated. Fever and hypothermia can be assessed with a traditional thermometer or through history and skin exam. For treatment of fever, acetaminophen can be administered. For hypothermia, warmed IV Fluids (if available), humidified oxygen, and transfer to a warm area (such as

the back of the ambulance) should be prioritized. For hypoglycemia, fingerstick glucometry can be obtained; if abnormal, oral or IV dextrose can be administered (Rosen et al., 2015).

Other aspects of the evaluation that are less medically complex but just as important include inquiring about the patient's ability to urinate or defecate. Similarly, EMS crew should ask if the patient requires assistance with using the bathroom at the time of their encounter (or if they need assistance with cleaning undergarments). Addressing these complaints as able or discussing with ER staff the need for stat catheter placement can also be beneficial (Reus et al., 2016).

Lastly, a brief medication history should be routinely obtained. Specific emphasis should be placed on determining if patients may have missed meds (particularly psychotropic or Parkinson's medications). Conversely, crews should inquire patients or caregivers whether they may have taken an excess of a particular medication (whether deliberately or by accident). Administration of any medications that may have been missed (particularly psychotropic or anti-Parkinson's mediations) may relieve agitation (Rosen et al., 2015).

Verbal De-escalation

Certain techniques have been postulated for use in successful verbal de-escalation (Flaherty & Little, 2011; Richmond et al., 2012). Only one crew member should interact with the patient. This should usually be the first provider to make patient contact, as communication from multiple staff can be seen as threatening. Crew members should maintain adequate space between themselves and the patient to allow for egress and prevent confrontation (2 arms lengths). EMS practitioners should also be mindful of body language to avoid further escalation, as certain gestures can be interpreted as threatening. Crews should position themselves at an angle to not project their torso at the patient, maintain a neutral facial expression and avoid excessive direct eye contact. Hands should be visible, arms should not be crossed and if the patient raises their voice, avoid matching their volume unless needed for a hearing impairment.

It is critical for EMS crews to ask and or listen to what the patient wants. After this has been elucidated, they should communicate calmly and slowly. Specific discussion should be had on what will be possible during treatment and transport. Additionally, crews should offer multiple alternative options to allay the persons concerns, including offering sedative medication, if indicated.

Physical Restraints

Physical restraints are recommended for use in EMS protocols nationally (Carter et al., 2018). However, in the geriatric population, their use should be restricted. Multiple studies have shown worsening agitation with use of physical restraints in older adults (Bray et al., 2004; Center for Medicare & Medicaid Services, 1986; Evans &Cotter, 2008; Inouye, 2006; Minnick et al., 2007; Maccioli et al., 2003; Mott et al., 2005; Flaherty & Little, 2011.). Injuries from restraints also occur at a higher rate than in a younger population. If chemical restraint is ineffective or unavailable, physical restraint should be utilized for as short a time with the least invasive method possible. We recommend for BLS units with limited ALS availability, if transport time is less than expected ALS rendezvous,

then physical restraint can be considered after discussion with online medical control. If restraints are utilized by BLS, the transporting hospital should be notified to allow for immediate discontinuation upon hospital clinician evaluation and treatment.

If restraints are to be considered after discussion with on-line medical control, additional resources should be requested. Advanced Life Support should be requested first to provide pharmacologic interventions. If unavailable in a timely manner, law enforcement and/or fire should be requested to assist with physical restraint procedures. Four personnel at minimum should participate in the restraint procedure, with each responsible for restraining one limb with as little physical force as possible. Once the patient has been manually restrained, soft restraint devices should be utilized to attach each limb to the stretcher. Patients should be restrained in a sitting or supine position. Extremity neurovascular checks and vital signs should be documented at time of restraint and every 5 minutes thereafter. Prone or hog-tie positioning should not be utilized in geriatric patients (McDowall et al., 2023).

Pharmacologic Interventions

Medications are indicated when a patient is a danger to themselves or others, and other de-escalation techniques have been unsuccessful. Many current treatment guidelines utilize relatively large doses of medications in agitation protocols (National Association of EMS Officials, 2022). Although this management strategy is appropriate for younger patients, older adults can have variable (and often heightened) response to sedative medications. They also are at higher risk for "dose-stacking," where multiple doses of a medication have a compounded and exaggerated response. Thus, low doses of sedative medications should be administered, and re-dosed frequently as needed.

Benzodiazepines are typically listed as a first line therapy (if not the only option) for agitated patients (National Association of EMS Officials, 2022; New York City Regional Emergency Medical Advisory Committee, 2022). However, these medications generally should be avoided in older adult patients. Specifically, there is an increased risk of respiratory depression and falls in older adults in comparison to younger adults. More importantly they have also been shown to worsen and/or prolong delirium. Due to this, they are listed on the American Geriatric Society's Beers Criteria as medications that has risks outweighing the benefits (Meehan et al., 2002).

Thus, in older adults with acute agitation, anti-psychotic medications are preferred over benzodiazepines (unless there is high suspicion of alcohol or benzodiazepine withdrawal). The choice between first and second-generation antipsychotics is more complex. First generation anti-psychotics have high rates of extra-pyramidal side effects in older adults, yet second-generation anti-psychotics may cause life-threatening cardiac side effects (Malone et al., 2022). Due to these issues, there has been debate over which medication is the best for use in older adults.

Olanzapine, a second-generation atypical antipsychotic medication, appears to be the safest of all medications to use in these scenarios. Not only has it been shown to cause less cardiac-related adverse events than other second-generation medications (Duong et al., 2015), it causes fewer extrapyramidal symptoms compared with first-generation antipsychotics (Malone et al., 2022). One study found that olanzapine frequently only requires one dose to achieve sedation, compared with other medications, which frequently

required multiple doses (Meehan et al., 2002). This reduces the risk of dose-stacking and thus reduces the risk of adverse events. Olanzapine is available in intramuscular, sublingual, and oral preparations, which is noteworthy for patients who are not able to tolerate IV placement.

In patients with Parkinson's disease or Lewy Body dementia, there is debate as to whether benzodiazepines should be utilized in lieu of anti-psychotic medications as the dopaminergic blockage from the latter can cause exacerbations of these disease. Dopaminergic blockage has been mostly seen with haloperidol and is much less severe and common with olanzapine. Due to this evidence and to minimize confusion, we still recommend using olanzapine in these patients. However, it is reasonable to solely use benzodiazepines for this population. We recommend 1mg IM of midazolam as an initial starting dose for these patients, repeating as necessary to an initial max of 2.5mg (Bloch et al., 2019).

After initial dosing and an appropriate time has passed for medication to take effect (greater than 10 minutes), discussion with medical control should guide the next steps. Additional doses of medications may be required; however, route and medication choice should be chosen after physician involvement. Specifically, medical control can assist with the risk-vs-benefit analysis of over-sedation and dose-stacking while mixing medications, as well as determination of any other reversible etiologies of agitation. Usually, a repeat dose of olanzapine will suffice, but in a rare circumstance where a patient has had no response to olanzapine, a medication change may be necessary (Malone et al., 2022).

Refusal

A patient, who is agitated and is not a threat to themselves or others, may wish (and be entitled to) refuse transportation and care, termed RMA (Refusal of Medical Aid). Agitation does not preclude an older adult from being able to RMA. Notably, EMS contact and hospital transport may result in or worsen agitation (McDowall et al., 2023). Thus, EMS providers may encounter situations where agitation can be mitigated by an RMA.

In all cases, older adults who are agitated should be evaluated for capacity to refuse assessment, treatment, and transport. When assessing, EMS practitioners should note that agitated older adults may be having a life-threatening traumatic and/or medical emergency (which may be occult). This RMA may be high risk, so there should be a low threshold to involve on-line medical control. In cases which may not be clear cut, assistance from online medical control can determine the best disposition for the patient.

Mindfulness of a patient's advanced directives (including Do Not Hospitalize orders, for example) is essential to integrate into EMS practitioner decision making. Discussion with medical control and family in these situations can assist in developing a safe plan for the patient (Ogioni et al., 2007).

Staff and Patient Safety

Crew safety is of utmost importance. Actions recommended throughout these guidelines should only be performed if the crew and patient are able to do so safely. If the patient presents a danger to others, EMS should remove themselves from the scene and request law enforcement assistance. If the patient represents a danger to themselves but EMS is

able to safely perform an assessment and render treatment, this should be attempted. Compensatory involvement of law enforcement has shown to increase use of force and restraint, which can result in worsening agitation (Carter et al., 2018).

CONCLUSION

We aim for our Prehospital Geriatric Agitation protocol to be adopted in EMS protocols nationally. We believe that widespread use and implementation will reduce unnecessary use of chemical and physical restraint in older adults, thereby improving the care that our EMS services provide. Future studies can focus on potential reduction adverse outcomes associated with sedative medications and physical restraint in geriatric patients with use of this protocol.

DECLARATION OF GENERATIVE AI IN SCIENTIFIC WRITING

The authors did not use a generative artificial intelligence (AI) tool or service to assist with preparation or editing of this work. The author(s) take full responsibility for the content of this publication

Optimal Environment	
• Ensure glasses and hearing aids are available if necessary • Provide orienting information (time of day, location, situation) • Involve family, friends, and caregivers in discussions and decision making	
Focused Evaluation Evaluate for occult medical or traumatic pathology as etiology of agitation	
Injury and pain	• Provide splinting, motion restriction, or analgesia as needed
Dehydration	• Administer fluid bolus as indicated
Bodily functions	• Attempt to determine if patient has to use bathroom • If feasible, assist with procurement of clean undergarments
Fever	• Administer antipyretic as indicated
Hypoglycemia	• Obtain FSBG and administer dextrose as indicated
Hypothermia	• Remove wet clothing • Bring patient to warm area • Consider warmed IV Fluids
Medication	• Obtain brief medication history • Identify potential missed doses of medications (especially psychiatric medications)
De-escalation and Prevention of Further Escalation	
Non-verbal techniques	• Maintain personal space (2 arm's length distance) • Address face-to-face, but avoid directly projecting torso at the patient • Keep hands in sight • Avoid crossing the arms or clenching fists • Only use eye contact while patient is speaking, as excessive eye contact can be interpreted as aggression • Keep a neutral facial expression, avoid furrowing the brow or rolling the eyes
Verbal techniques	• Ensure only 1 person verbally interacts with the patient • Adequate volume • Do not talk over the patient or match their tone • Reassuring tone • Attempt to convey concern and not frustration or anger • Be concise, simple, and provide orientation/reassurance • Repeat as necessary • Listen to the patient's concerns and desires • Discuss limits, offer choices based on patient's concerns and desires

Table 1. Prehospital Geriatric Agitation Protocol. For use and integration in BLS and ALS treatment guidelines. FSBG = fingerstick blood glucose, IV = intravenous, OLMC = On Line Medical Control, BLS = Basic Life Support, ALS = Advanced Life Support, PO = by mouth, IM = intramuscular, RMA = Refusal of Medical Aid.

Physical Restraint	
Should be avoided in most circumstances, and restraint use should be authorized through OLMC	
If BLS only	• ALS should be requested • If ALS is unavailable and transport time is less than expected ALS arrival, physical restraint can be considered after discussion with OLMC, with prehospital notification and discontinuation upon hospital clinician evaluation
Restraint procedure	• Should be performed with 4 crew members • Consider law enforcement and/or fire assistance • Soft restraints should be utilized
Patient positioning	• Patient should be in sitting or supine position • No prone or hog-tie position
Patient monitoring	• Patient should be placed on continuous monitoring or vital signs obtained every 5 minutes • Neurovascular checks every 5 minutes for extremities in restraints
Continuation of Optimal Environment During Care and Transport	
• Make area and ambulance quiet and comfortable, including temperature • Minimize IV and monitoring lines, as condition allows	
Pharmacologic Interventions (ALS ONLY)	
Pharmacologic interventions to be used as a last resort by ALS only	
First line	• Olanzapine 2.5 mg PO/IM
Medical Control Options	• Additional dose of olanzapine 2.5 mg PO/IM (preferred) OR • Midazolam 0.5-1 mg IM/IV
Refusal	
Assess patient's capacity to make decisions (with assistance from OLMC)	
Has capacity	• Follow standard RMA protocol

Does not have capacity	• Obtain collateral information regarding patient's healthcare desires from:
	  • Advance Directive Documentation
	  • Medical Power of Attorney
	• In conjunction with OLMC, determine best disposition for patient, with respect to their prior expressed desires and current condition

Safety	
If the patient presents a danger to staff or themselves, request law enforcement assistance and engage with the patient as safety allows	

Table 1. Continued

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