The Use of Physical Restraints in Neurologic Patients in the Inpatient Setting

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ABSTRACT

Neurologists are commonly asked to make decisions concerning the use of physical restraints on hospitalized patients. These decisions are determined within the context of medical risk to the patient, including falls and the disruption of medical therapies (eg, self-extubation, removal of nasogastric tubes), risk to the caregivers, and the wishes of patients and their families. Familiarity with the medicolegal issues involved, including regulations of the local hospital and governmental agencies, as well as current evidence concerning the efficacy and harms that can occur with these interventions, is paramount to determining whether to use devices designed to restrict patients’ freedom of movement in order to control their behavior.

Case

Note: The following is based on an actual case.

A 71-year-old woman presented to the hospital emergency department with a 2-day history of fever and headache, accompanied by behavioral changes and visual hallucinations. She had a temperature of 39.4°C (103°F); blood pressure, 136/72 mm Hg; heart rate, 98; and respiratory rate, 24. No evidence of nuchal rigidity was present. She was alert, mildly agitated, oriented only to person, had an inconsistent ability to follow simple commands, and had impaired short-term memory. She was having active visual hallucinations. No papilledema or retinal hemorrhages or exudates were present. Cranial nerve examination was otherwise normal. No extremity weakness was present.

Her complete blood cell count revealed a leukocytosis value of 15,300 white blood cells (WBCs)/µL with 90% polymorphonuclear (PMN). A noncontrasted CT scan of the brain demonstrated patchy edema with petechial hemorrhages in the right temporal lobe. A lumbar puncture was performed, with initial results of 80 WBCs/µL (80% PMN), 280 red blood cells/µL with a protein level of 86 mg/dL, and glucose of 60 mg/dL with a serum glucose level of 120 mg/dL.

She was placed on broad-spectrum IV antibiotics and acyclovir and admitted to the neurointensive care unit (neuro ICU). After arrival to the neuro ICU, she became increasingly agitated and restless and attempted to climb out of bed despite the use of bed rails. She began pulling at her IV sites, successfully removing them. The neuro ICU nurse contacted the attending neurologist on call and received an order to administer 2 mg lorazepam and apply hand mitts and wrist restraints.
DISCUSSION

The use of physical restraints on hospitalized patients is a common practice in many countries. Physical restraint can be defined as any limitation of a patient’s freedom of movement using devices such as a geriatric chair with table, chest vests with ties, lap belts, ankle and wrist restraints, hand mitts, bed rails, helmets, or “tent beds.” Between 33% and 67% of hospitals utilize physical restraints. In neuro ICUs, restraints reportedly have been used in 268 of 1000 patient days.

The safe use of medical devices (eg, endotracheal tubes, nasogastric tubes, urinary catheters, IV/arterial lines) and the prevention of falls are the most common reasons given for placement of physical restraints. Predictors for the use of physical restraints include cognitive impairment, high dependency on others for performance of activities of daily living, poor mobility, and the placement of a nasogastric tube. The effectiveness of these approaches, however, has come into question over the past 2 decades. Evidence points to significant adverse events that have occurred as a result of using physical restraints.

Current US federal regulations concerning the use of physical restraints, the consequences of using physical restraints in an inpatient setting, and discussion concerning alternatives to using physical restraints are discussed in this article.

REGULATIONS

In August 1999 (interim final rule) and January 2007 (final rule), the Centers for Medicare & Medicaid Services (CMS) made effective regulations for the use of “restraint for acute medical and surgical care.” These rules apply to all patients in hospitals that participate in the Medicare and Medicaid programs and are highlighted by the following:

1. The definition of a restraint is any manual method that immobilizes or reduces the ability of patients to move their arms, legs, body, or head freely.
2. The standard for use of physical restraint includes:
   a. Use to ensure the patient’s safety.
   b. Use only when less restrictive interventions have been ineffective in preventing harm to the patient or others.
   c. Use the least-restrictive effective method.
   d. Implement with safe and appropriate techniques determined by hospital policy and state law.
   e. Discontinue at the earliest possible time.
3. The use must be in accordance with the order of a physician or licensed independent practitioner who is responsible for the care of the patient.
4. The time limit of the order cannot extend beyond 24 hours.
5. After the order is instituted, face-to-face assessment must occur within 1 hour by the ordering physician, licensed independent practitioner, attending registered nurse, nurse practitioner, or physician assistant who has been trained according to requirements.
6. The treating facility is to determine the intervals for reevaluation after the first hour.
7. Staff training must occur with demonstration of competency with reevaluation with appropriate documentation.

The Joint Commission and the US Food and Drug Administration (FDA) have emphasized the minimization of physical restraints in patient care settings.
These regulations prohibit the use of restraints for the purpose of discipline, staff convenience, or to prevent wandering. Physical restraints are to be used to treat medical symptoms, and patients, if deemed competent, have the right to refuse restraints. Restraints are used only if alternatives are ineffective or absolutely necessary to ensure the safety of the patient, other patients, or staff.\textsuperscript{11}

The hospital may risk the loss of Joint Commission accreditation if it fails to comply with these requirements. Reports from the Joint Commission survey of the inpatient care facility are forwarded to CMS. If the facility or treating health care provider is found to be in violation of CMS regulations, the hospital may be fined, and the treating health care provider may be found guilty of fraud and face significant penalties.\textsuperscript{9-11}

\section*{CONSEQUENCE OF THE USE OF RESTRAINTS}

Evidence concerning the potential benefits of using restraints in the acute care setting is inconsistent. Unless physical restraints provide measureable benefits while minimizing harms, they have limited medical or moral validity.\textsuperscript{8}

Some studies have reported that the use of bed rails and chair tables have resulted in a reduction of serious harm to the “at-risk” inpatient population.\textsuperscript{7,12} Other studies claim no significant relationship between the use of physical restraints and the likelihood of a patient falling.\textsuperscript{6} A systematic review highlighted the potential danger of using physical restraints, which may increase the risk of death, serious injury, and increased length of hospitalization.\textsuperscript{13} Enforced physical immobilization is associated with increased weakness and falls, new pressure ulcers, joint contractures, and new-onset incontinence.\textsuperscript{14}

The use of physical restraints can also have adverse psychological and social consequences for older adults.\textsuperscript{15} Their use is an independent predictor of delirium, depression, and demoralization. Even when physical restraints are used in the hospital to prevent therapy disruption, high failure rates (31\% to 91\%) with self-extubation and removal of nasogastric tubes have been reported.\textsuperscript{14}

\section*{DECISION MAKING}

The decision to use physical restraints on neurologic patients in the acute inpatient setting is a very common practice in the United States.\textsuperscript{1,4} The primary reasons for ordering this intervention are to prevent falls and therapy disruption.\textsuperscript{1,12} Unfortunately, several observational studies suggest that physical restraints are not effective in preventing either therapy disruption or falls and, in fact, may result in an increased number of adverse events.\textsuperscript{1,4,8,13-15} Reducing the number of physical restraints does not lead to an increased number of falls or fall-related injuries.\textsuperscript{13} Interestingly, relatives and patients appear to be in favor of physical restraints more than health care professionals, with 51\% of patients and relatives believing restraints are necessary compared to 10\% of health care professionals.\textsuperscript{16}

Although the evidence in many studies shows a trend toward poor efficacy and potential harm from physical restraint use, the strength of this evidence is very low, leading to uncertainty concerning the value of physical restraint use in select cases. Several strategies can be used to minimize restraint use, including bed alarms, motion devices, floor mats, hip protectors, increased observation by nursing staff and family members, toileting programs, therapies designed to increase...
strength and improve balance, and interventions targeted to specific patient risk factors such as poor vision and orthostatic hypotension. Alternate strategies to prevent the disruption of medically necessary therapies include continuous reevaluation of the need for the medical device; consideration of alternate routes for administration; anchoring tubes or devices; camouflaging devices and tubes; and using the least restrictive forms of restraint (eg, mitts, elbow splints) first. Legally, competent patients cannot be restrained against their will, even when their desires appear to be unwise. Exceptions to this rule are those situations in which the act of restraint will prevent immediate harm to the patient or others. In addition, failure to comply with federal regulations concerning the use of physical restraints (CMS, FDA) can result in significant financial penalties to the health care provider and the facility.

**SUMMARY**

In the case presented, it was felt by the treating physician that the use of physical restraints (hand mitts and wrist restraints) in this cognitively impaired patient was in her interest and necessary to facilitate the delivery of appropriate medical care. The restraints selected were deemed to be the least restrictive effective methods at the time of implementation.

The restraints were successful in preventing the removal of the patient’s IV access lines so effective therapies could be delivered without interruption. The patient eventually had CSF PCR studies positive for herpes simplex virus type 1, and the immediate administration of IV acyclovir likely resulted in her eventual recovery to a normal cognitive status and an independent lifestyle. The restraints were removed as soon as her cognitive status improved to the point where she was no longer at risk for removal of her IV sites.

The use of physical restraints in this case was conducted in accordance with CMS regulations. An understanding of the indications, benefits, potential harms, and regulations concerning the use of this physical intervention is paramount to ensure patient safety and improve health outcomes. Future well-designed studies are needed to clearly define the risks, benefits, and alternative approaches to the use of physical restraints in the acute care setting.

**REFERENCES**


