

Please Release Me Restraint Reduction Initiative in a Health Care System

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A quality improvement initiative was undertaken to reduce restraint use in 4 acute care hospitals within a single health system. A variety of initiatives and interventions were used including the following: implementation of multidisciplinary rounds on restrained patients, increased availability of restraint alternatives, development of unit-based restraint champions, and education of both staff and health care providers about restraints. The health care system has maintained a quarterly restraint prevalence rate of less than 2.26% with 1 variant. **Key words:** *multidisciplinary rounds, quality improvement, restraint alternatives, restraints, restraint use*

A HEALTH care system set a quality improvement goal of decreasing physical restraint utilization and creating a safer environment for patients. There was close observation of how efforts would possibly lead to unintended consequences such as patient falls, sitter usage, and self-extubations. The purpose of this article is to describe a 2-year

journey to reduce restraint prevalence in an academic health care system consisting of 4 hospitals and more than 1000 licensed beds that cares for adult patients.

BACKGROUND

In 2008, the Center for Medicare and Medicaid Service (CMS) updated regulation requirements on restraint use, staff training requirements, and death reporting requirements. The interpretive guidelines established standards related to patient rights, restraint, and seclusion use: (a) the right to freedom from restraints in the provision of acute medical and surgical care unless clinically necessary, (b) the right to freedom from restraints and seclusion used for behavior management unless clinically necessary, and (c) hospital leadership creating a culture supporting freedom from restraint and seclusion.¹ Quality improvement programs for hospitals should include the ability to assess and monitor the use of restraints or seclusion, while ensuring the physical safety of patients and staff. Center for Medicare and Medicaid Service updated these standards and interpretive guidelines again in March 2014.¹

In 2009, The Joint Commission (TJC) decided to more closely align their standards

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regarding elements of performance with CMS to follow hospitals' conditions for participation with CMS and better maintain its Medicare deeming authority.^{2,3} The revised standards focus on limiting the use of restraints and seclusion, along with greater emphasis on education and training, using the least restrictive devices possible, and removing restraints as soon as clinically safe. Although patient injuries and deaths related to restraint use have been decreasing, according to TJC Summary Data of Sentinel Events 2004-2012, they remain among the top 15 most frequently reported sentinel events.⁴

Evidence suggests that restraint use may increase risk for both patients and staff. In 2011, a legal advocacy organization, Equip for Equality, suggested that the total number of children and adults who die each year as a result of being in restraints is unknown.⁵ The very act of applying patient restraints can place staff at risk of physical injury when a patient's behavior is out of control and they hit, punch, or kick. Risk to the patient as a result of physical restraint can result in direct injuries such as lacerations, bruising, nerve injury, ischemic injury, asphyxiation, or indirect injuries including pressure ulcers, falls with or without injury, inability to return home, or even death.^{6,7}

Description

At the time this project began, the health system consisted of 4 hospitals, with a total of more than 1000 beds, of which 169 beds were designated critical care beds. Systemwide restraint prevalence was high (defined as number of patients in any physical restraint device divided by total patients) averaged 5.87%. Physical restraint prevalence ranged from 8% to 14.8% in the system's hospitals in 2008. Restraint use was counted by the night shift supervisors as they made rounds in each entity and reported in the hospital-level shift report each morning. It was common on supervisor rounds to see restraints used for patients on a ventilator or with altered mental status. Restraints were used most frequently in the intensive care units (ICUs) with prevalence greater than 46% and corresponded

with Mion's findings of 56%.⁸ Sitter usage was frequent on the medical surgical units to decrease fall risk and for patient safety. Concomitant restraints were sometimes ordered by physicians.

Two of the system's hospitals had restraint prevalence percentages that were 3 to 7 times higher than the percentages reported by Magnet hospitals in National Database on Nursing Quality Indicators (NDNQI). The benchmark of reported performance by Magnet Hospitals was the 50th percentile for adult in-patient units.⁹ No prior data were available for the third hospital in the system as it only opened in 2009. The fourth hospital performed well with a prevalence rate of 2.89%, below their benchmark of 3.67%, but in 2008 had increased to 8.45%. As the restraint reduction steering committee prepared to undertake this challenge, it was recognized that the greatest obstacle to reducing restraint use was going to be changing the culture of the staff. Long standing beliefs were held that needed changes: ventilated patients were frequently restrained, and altered mental status patients often had sitters or restraints for protection.

METHODS

An interdisciplinary team was formed across the system to analyze quarterly restraint prevalence data for the years 2007 through 2009. Benchmarks were established at the 50th percentile of Magnet hospitals in the NDNQI database, based on unit type. Roll up targets for each hospital in the health care system were set by calculating the mean of the individual unit targets weighted by an average daily census. A system level restraint prevalence target of 2.71% or less was established for fiscal year 2010. The target population was all patients hospitalized within the health care system.

Senior administrative support

This performance improvement initiative received significant support at all levels in the health care system, even as the quality reporting structure was reorganized to provide

for more hospital-based accountability for outcomes. Hospital-based quality oversight committees were established to assist in removing barriers encountered by teams in pursuing quality initiatives. Members of these oversight committees included the Chief Operating Officers, Chief Medical Officers, Chief Nursing Officers, and Vice-Presidents for Operations. Meetings were held weekly to review progress in all metrics and quality improvement initiatives, and restraint use took its place in the scheduled reporting cycle. Staff received paid time for champion meetings, multidisciplinary rounds, and quarterly reviews for prevalence rounding through a special account set up to support quality projects. Funding was allocated to accelerate purchase of new beds with alarms and chair alarms.

Team development

A system-level restraint steering committee formed in early 2010 to decrease restraint usage. It is an interdisciplinary team consisting of physicians, nurses, respiratory therapists, a rehabilitation therapist, chaplain, social worker, information technology support nurse, and nursing leadership including clinical nurse specialists, administrators, and supervisors.

Hospital leads were identified, who then engaged unit-based staff champions to join the hospital teams. Each team had common goals and followed a standardized approach. All teams used the same data collection tool, the NDNQI Restraint Quarterly Prevalence Tool,⁹ and began gathering weekly data on their respective nursing units.

Monthly hospital champion meetings were held to update staff on successes and improvement opportunities. Champions shared unit based stories including how specific challenges were managed. Weekly restraint prevalence data were mapped into a spreadsheet by each entity lead, with results generated that used green signifying unit restraint use was below target (a positive result), yellow signifying the unit was near target, and red signaling to units that they were not likely to

meet target if they did not immediately reduce their restraint use. This gave a quick visual of how the hospitals were doing as quarterly NDNQI data did not provide data frequently enough to assess how tests of change were working.

Education

Education, both initial and ongoing, is essential when changing a culture in reducing restraint use with management playing a leading role.^{10,11} A subcommittee for education was formed from the steering committee and included representatives from each entity champion team. Essential content was outlined including need for restraints, guidelines to use, legal and ethical issues, types of restraints and application, assessment and maintenance, troubleshooting, first aid measures in emergency situations, alternative measures to restraints, and documentation.¹¹ An electronic online course available in the system was reviewed, and a few additions were added for clarity to correspond with the health care system's policy.

The revised electronic course was accepted for initial and annual staff education (nurses, nurse technicians, respiratory therapists, and rehabilitation therapists). A test was completed by each staff member at the conclusion of the course to establish written competency. Bedside staff members are checked off on application of restraints, monitoring, and documentation on an annual skills competency.

A separate education plan was developed for physicians and affiliate providers (nurse practitioners and physician assistants). The physician colleagues on the steering committee assisted in the development of an educational tool that contained the essential information physicians would need to support efforts at restraint reduction. The education plan included an education handout with content on potential alternatives to try before use of restraints, how to order, and assessment requirements and related articles. Content and questions are included in the annual physician competency requirements.

Multidisciplinary rounding

Each hospital developed a team consisting of members of the restraint steering committee and hospital-based champions to participate in scheduled multidisciplinary rounding. These occurred during dayshift on every unit where a restrained patient was located in the hospital. This was an essential element in changing the hospital culture. The rounds focus on assessment of each restrained patient, effectiveness of medication regimen, identification of delirium, and use of restraint alternatives. The steering committee developed a multidisciplinary rounding tool that evolved as teams at each entity rounded using the form. Information came from both discussion with bedside team and review of chart. Coaching was performed whenever deficits in process noted. This process began as weekly rounds, then moved to biweekly, and then monthly. As data continued to improve, the teams eventually adopted a sustainment plan.

Disciplines that participate in the multidisciplinary restraint rounds include public safety officers, chaplains, pharmacists, physicians, and nurses. Examples of questions on the questionnaire for multidisciplinary restraint rounds include: Why is the patient restrained? What alternatives have been used before restraining the patient? Is the patient close to the nursing station? Are family or significant others visiting or staying with the patient? Has the patient had surgery? Antonelli¹² found that regular rounding involving expert(s) served as a tool to change the culture through direct observation, reinforcement, education, and feedback.

BARRIERS AND STRATEGIES TO REMOVE OBSTACLES

Alternatives to restraints

While updating the restraint policy, it was apparent that there were few restraint alternatives available in the hospitals. Smith et al¹³ identified that education of alternative devices and freedom of restraints decreased overall use of restraints and lowered the time that a

patient remained in restraints. Koczy et al¹⁴ had similar conclusions with a randomized control trial in 45 nursing homes in Germany: there was a reduction in restraint use without a significant increase in falls, medication use, or behavioral symptoms.

After dialogue with several vendors, a number of products were brought in on a trial basis to identify those that would work in the hospitals with the patient populations being treated. Arm sleeve coverings (light and dark colored) were brought in to cover IV sites and arterial lines to diminish “picking” at tubes. Activity aprons were brought in to divert patients’ attention and give them something to do with their hands. Self-release belts were made available. Education was provided by each entity restraint champion team using a restraint alternatives rolling cart. Staff members were also educated on other alternatives identified in the restraint policy (Supplemental Digital Content Table 1, available at <http://links.lww.com/JNCQ/A105>).¹⁵⁻¹⁷

Change in culture

Traditionally, all ICU patients who were ventilated were restrained to prevent removal of endotracheal or tracheal tubes. If a patient had altered mental status with delirium, they were often restrained with limb holders, mittens, or vests. The champion teams needed to educate and mentor staff to think of alternatives before resorting to restraints. Multidisciplinary rounds helped to determine if there was equipment available for staff to use as alternatives and gave time to review on a case-by-case basis every restraint used in each hospital. Sullivan et al¹⁸ concluded that change in culture is a critical element to success.

Intentional rounding

Although multidisciplinary restraint rounds allowed for a random assessment of inpatients who was restrained, each nursing department began to incorporate hourly intentional rounding (every day every patient) in 2011 as an effort to improve patient satisfaction and prevent falls. Meade et al¹⁹ demonstrated

that with rounding patient call lights reduced 37.8%, patient satisfaction increased, patient falls decreased by 50%, and skin breakdown reduced by 14%. Kalisch et al²⁰ demonstrated a positive correlation between patient falls, lower staffing levels, and missed nursing interventions. Hourly intentional rounds benefit not only patient satisfaction but are effective for preventing falls, reducing pressure ulcers, and reducing restraint usage. With the frequent intentional rounds, staff assessed patients more frequently, anticipated patient needs and changing conditions, and were able to prevent or minimize restraint use unless absolutely needed.

Bed and chair alarms

For patients with altered mental status, there is a fear they will abruptly leave the bed or chair and potentially harm themselves through falls or disrupting treatments, invasive lines, or monitoring tools. Alarms on bed and chairs would help alert staff to potential safety issue so that they could respond quickly. Kwok et al,²¹ in a randomized control trial, concluded that pressure sensors might be more effective in lowering restraint use when paired with a comprehensive restraint reduction program. Wong Shee et al found that bed/chair sensor alarms were an acceptable alternative to restraint use in cognitively impaired individuals. Though the alarms may not always prevent falls, they alerted staff to limit and treat for injury early.²²

The beds in 3 of the hospitals were aged and most did not have working bed alarms. A plan to replace the beds across the system over a 5-year period was not meeting the needs for patients and staff to reduce use of restraints and sitters and prevent falls. Working with the administrative oversight committees, the bed acquisition was expedited, and over the year most of the beds were exchanged. There were no chair alarms available in the hospitals when this project started. Several models of chair alarms were reviewed, and a product was found that worked for all the units and purchased.

Delirium screening

Identifying delirium early and starting treatment measures can lower overall delirium and agitation, which often leads to use of restraints to protect the patient from harming self. The critical care units had previously implemented delirium screening of patients every 12 hours. Kratz¹⁵ noted a decrease in fall rates by 62%, decrease in sitter utilization 100%, and decrease in restraint use by 25% with a delirium screening protocol. One of the limitations at this health care system was that patients on medical-surgical units were not screened for delirium. After a successful pilot, the delirium tool Nu-DESC²³ was selected, and education was provided on a delirium treatment plan. The multidisciplinary teams recognize delirium, delirium triggers, and are able to intercede earlier preventing use of restraints.

Invasive procedures and anesthesia

Two of the hospitals have extensive surgical populations, particularly cardiac and neurological. Patients are often admitted directly to the ICU from the operating room while still anesthetized. With the revised CMS and TJC regulations, mechanisms employed during medical, diagnostic, or surgical procedures that are considered a regular part of the procedure are not considered restraints.^{2,3} Working with physician colleagues, parameters were identified for when a patient is considered to be recovered from anesthesia. These parameters were clearly identified in the revised restraint policy as guidelines to consider before removing restraints after surgery or an invasive procedure. Clarity in our policy allowed for better understanding in collecting restraint point prevalence data.

Sustainment

As success was achieved in decreasing restraint usage, data collection on restraint prevalence transitioned to monthly instead of weekly. This recommendation occurred because the teams had stabilized their process and the use of restraints. Multidisciplinary

rounding changed from biweekly to monthly. After 6 months in the sustainment phase, there was a noted increase in the restraint prevalence rate. In response to this, the restraint champions rounded on the high use areas and increased multidisciplinary rounds to biweekly. The sustainment phase has had a prevalence rate below the target.

RESULTS

The initiative began with a prevalence rate of 5.87% and ultimately decreased the rate to 1.73% (Figure). Restraint prevalence has been sustained at less than 2.26% over the past 2 years with 1 variant quarter at 3.55%. The figure is only reflective of the 2 largest hospitals in the system due to the small sample size of the 2 smaller hospitals. The 2 large hospitals have an overall prevalence of 1.96% and 1.78% for FY 2013, respectively. The third hospital in the system is sustaining with an overall prevalence of 0.00% in FY 2013. The fourth hospital has an overall prevalence of 1.95% during FY 2013, representing 1 patient in restraints. It is believed that multidisciplinary restraint rounds as well as champion engagement had the largest impact in creating the practice changes in restraint use. Upgrading the patient beds with func-

tional alarms and adding multiple restraint alternatives also contributed to success.

Impact on falls

A Falls Prevention Team was initiated at the same time the Restraint Reduction Steering Committee was formed. There was concern that falls would increase as restraint usage decreased although the literature did not support that concern.²⁴

The fall rate for the system has remained stable over the same time frame of the restraint reduction initiative (Supplemental Digital Content Figure 1, available at <http://links.lww.com/JNCQ/A103>). The Restraint Reduction Steering Committee partnered with the Falls Prevention Team to review data and determine if efforts were affecting fall rates. There was no correlation between fall rates and restraint usage ($r^2 = 0.054$, Supplemental Digital Content Figure 1, available at <http://links.lww.com/JNCQ/A103>).

Impact on sitter utilization (1:1 observation)

A sitter reduction team was initiated at the same time the Restraint Steering Committee was formed. There were similar concerns that as restraint prevalence was decreased, sitter usage would increase. As can be seen in Supplemental Digital Content Figure 2, available

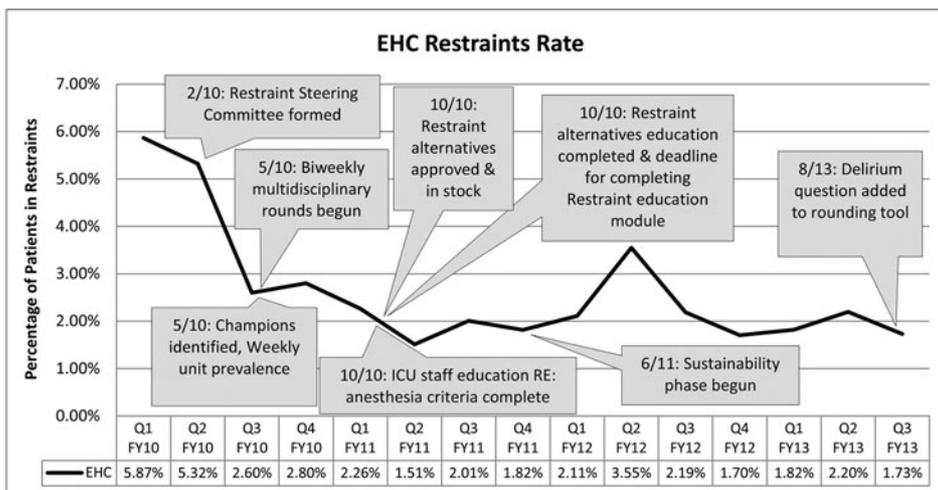


Figure. Percentage of patients in restraints. EHC indicates Emory Healthcare.

at <http://links.lww.com/JNCQ/A104>, there is a correlation between restraint prevalence and sitter usage. As restraint usage decreased, so did sitter usage ($r^2 = 0.604$, see Supplemental Digital Content Figure 2, available at <http://links.lww.com/JNCQ/A104>). Although this seems counterintuitive, it is believed that this is due to the collaborative work of the sitter reduction team and Restraint Steering Committee. This experience and that of colleagues, Adams and Kaplow,²⁵ establishes that with restraint use reduced, there was no impact on sitter usage and no adverse impact on falls.

Impact on Self-Extubations

Measurement of self-extubations is done through the electronic risk reporting system. There was no significant increase in self-extubations during this time period ($r = 0.01$). Two studies completed in 2008 by Chang and colleagues²⁶ and another by Curry and colleagues²⁷ both found that having the patient restrained did not decrease the rate of patient self extubation. Chang et al's²⁶ case-control study found use of physical restraints increased the risk of self-extubation by 3.11 times. Curry's work focused on characteristics associated with unplanned extubations and examined, among other factors, if there was a difference between patients who were restrained while intubated. Among the 31 patients in the study, 87% were restrained at the time of self-extubation.²⁷ Mion et al's²⁸ work found that 74% of patients who self-extubated were restrained. Although further research is needed, it suggests the need for health care providers to explore other indicators beyond only that the patient was intubated.

BARRIERS TO IMPLEMENTATION

During this time frame, there were several systemwide initiatives to improve care in quality and safety for the patients. The efforts were often complementary and yet often were competing for the staff's attention. One of the limitations of this project was that of the 4 hospitals in the system, 2 did not have enough data to be included in the analysis. Further evalu-

ation is needed on multidisciplinary restraint rounds as this appeared to have an impact on restraint reduction, but the reasons are not fully understood. Further study is also needed on the impact of restraint reduction on self-extubation. Occasionally families were reluctant to have restraints removed from the patient particularly when they were faced with confusion and restlessness. Staff partnering with patients' families on use of alternatives to restraints helped. Failure to communicate with patient, family, and among the multidisciplinary team can also lead to unnecessary use of restraints.²⁹

CONCLUSION

Measured outcomes demonstrated a significant decrease in the use of restraints systemwide. It is believed this improvement is multifactorial, but the primary factor was the use of multidisciplinary restraint rounds to increase staff knowledge about restraint alternatives and heighten awareness of restraint use. Measurement was related to the quarterly rounds, chart reviews, and one-to-one discussions with staff during multidisciplinary rounding. Development of a unit-based dashboard allowed staff nurses to see the results on nurse-sensitive indicators and how they were doing in comparison to other units as well as to NDNQI benchmarks for adult inpatient units. Results continued to improve after implementation of restraint education for staff and physicians. An important lesson learned, however, was the need for ongoing focused and intentional work by engaged individuals.

Having other teams engaged in making clinical improvements in care such as falls, intentional rounding, and delirium management also had an impact on restraint reduction. After moving into the sustainment phase, it was recognized that not all processes were sufficiently established, and restraint usage began to increase. With efforts redoubled, unit champions were reengaged; restraint usage trended downward again. Ultimately, the dramatic improvement has been due to an evolving cultural transformation in how staff view and use restraints.

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