

Bed Alarms: Investigating Their Impact on Fall Reduction and Restraint Use

by Sheila Geffre, RN

Those of us in the Acute Healthcare and Long Term Care professions are well aware of the risks of a patient or resident fall. Those risks include medical, financial, legal, and patient comfort issues. Not so long ago, restraints were still routinely used to prevent falls, but restraints carried some risks of their own: pressure sores, incontinence, cardiac stress, emotional desolation, accidental strangulation, contractures, constipation, agitated behavior, feelings of anger, fear, demoralization, or humiliation, and even death.

Until about 20 years ago, our choices for solutions were quite limited, but with the advent of modern compact electronic technology and software, there are more options today than ever before. Among other options is a bed/chair/toilet alarm system: equipment that alarms if an unattended patient deemed a fall risk attempts to get up without assistance.

One such system is the Bed-Check[®] system, manufactured by Stanley Healthcare Solutions. Here at the St. Alexius Medical Center in Bismarck, North Dakota, we were interested in instituting a fall prevention program incorporating the Bed-Check Model Vr System and measuring its effectiveness. In March 1999, we reached agreement with Bed-Check to do a research study at our facility utilizing this equipment. This article is a review of how the research study was done and of our findings. We will cover:

- a. Purpose
- b. Methodology
- c. Implementation
- d. Results and Conclusions
- e. Discussion

Purpose

This study's purpose was to determine what effect the use of the Bed-Check System would have on the occurrence of falls and use of physical restraints among the adult hospital population. To achieve valid and meaningful results, a scientific statistical method of measurement was created. It is generalized for easier readability, but our actual complete project report is available to anyone interested. (See footnote at end of article.¹)

The basis for the study was the Martha Rogers Science of Unitary Human Beings. Briefly, this model is based on the concept that persons are unified wholes (as opposed to a sum of their parts) identified by behavioral patterns. These patterns are influenced by the individual's surroundings, including personal interactions. Nursing is a part of this environment, and seeks to modify it in the best interest of the patient's wellness, comfort, and safety.

Methodology/Design

The evaluation period extended for a total of 212 days. The first 106 days, falls and restraint use were simply documented, with daily operations continuing as before the study. Then for the second 106 days, a Fall Risk Assessment evaluation was implemented, and when the need was indicated, Bed-Check systems were used. Again falls and restraint use were documented.

The Fall Risk Assessment Tool developed by St. Alexius staff utilized a patient evaluation form, with a point rating system based on: fall history, medications, memory, vision, continence, blood pressure, predisposing diseases, assistive device usage, and mobility. This form was completed for patients (a) at admission, (b) weekly thereafter, and (c) whenever patient status changed. If a patient scored at risk and didn't seek assistance with ambulating or transfer, s/he was then

considered at risk of falling, and the Bed-Check System was implemented.

Thus for the first 106 days, no Bed-Check Systems were used, and for the second 106 days, Bed-Check Systems were utilized when indicated by the Fall Risk Assessment Tool.

The sample population for this study consisted of all patients admitted to the Departments of Medical, Oncology, Surgical, Telemetry, Transitional Care, and Rehabilitation over the total 212 day test periods.

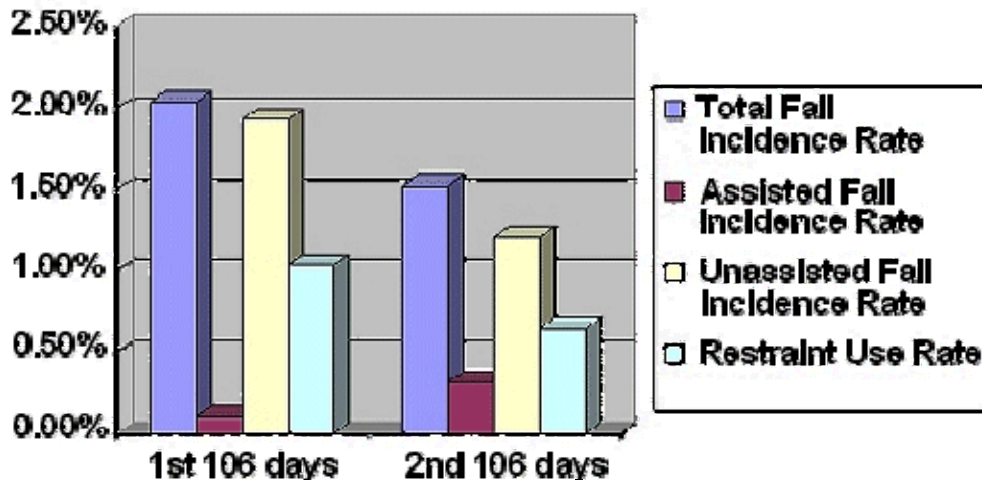
Implementation of the Bed-Check System

The Bed-Check System consists of a Control Unit and a Sensormat® that is applied to the bed and/or chair, allowing the patient free movement within that bed or chair. When the patient attempts to move from the bed or chair, his/her weight is lifted off the BCS Sensormat, triggering an audible alarm in the control unit and/or initiating a nurse call. The system is programmable for alarm sound, intensity, and delay. All systems were programmed identically throughout this study.

Staff education on the Risk Assessment Tool and the Bed-Check System was accomplished by the Fall Risk Assessment design team and a Bed-Check representative. During the second 106 day period, this Assessment Tool was then utilized as heretofore described, with resultant Bed-Check System use as required.

Results: Changes in fall and restraint incidents

		First 106 days	Incident rate ¹	Second 106 days	Incident rate ¹	% change ²
A	# patients observed	2590		2760		
B	# total falls	53	2.04%	42	1.52 %	-25%
C	# assisted	3	0.11%	9	0.32%	+190%
D	# unassisted	50	1.93%	33	1.20%	-38%
E	# of restraints	27	1.04%	18	0.65%	-37%



Discussion and Conclusion

From purely a statistician's point of view, the incident changes observed were considered small enough to be insignificant, possibly due to the low number of overall incidents. However, the changes in rate of incidents cannot be ignored, and they provide consistent conclusions. The rate of overall falls decreased by 25%, the rate of unassisted falls (no caregiver present) decreased by 38%, and the rate of restraint use decreased by 37%. The remaining category, "assisted" falls, is comprised of those falls that occurred even with a caregiver present and attempting to prevent the patient from falling or assisting the patient in a safer fall. This assisted fall category is the only one that went up, and it is not directly relevant to the intended usage of a bed or chair monitoring system (to monitor unattended fall risk patients). It could even be concluded that the reason assisted falls went up was because the Bed-Check System was alerting staff of a potential fall, and therefore the patient was assisted during the fall. An assisted fall, while not desirable, is likely to be a safer fall than an unassisted one. Thus it appears that putting a fall prevention program in place did make a difference in all categories.

We should also note that in this case, rather than utilizing Bed-Check Systems for every patient, we utilized them only when the Risk Assessment Tool indicated the need. This kept costs down by reducing the number of units required, but also incurred costs in the time and effort required of staff for the Risk Assessment process. A comprehensive Fall Prevention Program making use of the Risk Assessment Tool and the Bed-Check System proved to be a practical approach for us at St. Alexius Medical Center.

Summary

To give patients an opportunity to maximize their health potential, it is necessary to provide a fall prevention program. Despite the limitations, this study supports the use of a fall prevention program that includes a bed alarm use as an intervention. It also supports the use of the Bed-Check System as an alternative to restraints. In summary, all falls and restraints may not be preventable, but reduction is possible.

About the author

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