Removal of Bedrails on a Short-Term Nursing Home Rehabilitation Unit

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Traditionally, bedrails have been used as safety and restraining devices in both nursing homes and hospitals. Unfortunately, rather than ensuring safety, bedrails can also threaten residents' well-being. Residents have sustained serious injuries and some have died while attempting to climb over or around bedrails (Barry, 1986; Catchen, 1983; Miles & Irvine, 1992; Parker & Miles, 1997): They can fall from a greater height than the bed or can become tangled and caught in the bedrails. Bedrails may be indicated when patients are heavily sedated, delirious, or postoperative (Creighton, 1982), although nursing home residents are rarely so medically unstable.

Residents, families, and caregivers worry about safety and the legal issues associated with beds without bedrails (Rubenstein, Miller, Postel, & Evans, 1985). Recent federal guidelines specifically limit the use of bedrails in skilled-nursing facilities. According to the Health Care Financing Administration's guidelines, bedrails are restraints when they restrict freedom of movement and inhibit resident autonomy (Health Care Financing Administration, 1992). However, bedrails are used routinely in hospitals, causing many patients, families, and caregivers to accept them as necessary in the nursing home as well.

A search of Medline for 1988 to 1998 lists 64 articles on physical restraints in nursing homes, but only 7 articles on bedrails. Only one of the seven focused on bedrails in nursing homes and described an individualized approach to assessment (Donius & Rader, 1994); one focused on an American hospital (Rubin, Dube, & Mitchell, 1993); one focused on a British hospital (O’Keeffe, Jack, & Lye, 1996); two presented historical perspectives (Levine, 1994, 1996); and one described deaths resulting from bedrails (Parker & Miles, 1997).

Federal guidelines encourage nursing homes to remove bedrails, yet there have been no prospective American studies examining the consequences, and we found only one retrospective study (Feinsod, Moore, & Levenson, 1997). Our article describes how removing bedrails from the beds of nursing home residents on a short-term rehabilitation unit affected injuries.

Method

The Jewish Home and Hospital is the teaching nursing home affiliated with the Mount Sinai Medical School in New York City. The home has 514 skilled beds, including a 25-bed short-term rehabilitation unit. The study lasted one year and began in March 1994, after the decision was made to minimize the use of
bedrails on the rehabilitation unit. During the study year, 130 residents accounted for 143 admissions to the rehabilitation unit directly from acute-care settings. Nine residents were admitted twice during the study period, and two were admitted three times. Approximately 65% of residents on this unit were discharged back to the community during both the comparison and study periods. The comparison period was the calendar year 1993, when bedrails were used routinely on all admissions to this unit.

During the comparison and study periods, all admissions had rehabilitation potential following hip fractures, strokes, lower extremity amputations, deconditioning due to prolonged hospitalization for cardiopulmonary disease, and surgical procedures. Some residents had gait disorders and others were being treated for cancer. We compared 143 admissions during the study period with 123 admissions in the comparison group (Table 1). These 123 admissions included 116 single admissions and 7 individuals who were admitted twice during the period. All beds had four half rails—two uppers and two lowers.

**Intervention**

**Preintervention Activities**

Several activities occurred prior to the intervention. We developed a bedrail assessment form (available from the corresponding author upon request) using information from the federally mandated Minimum Data Set (MDS) whenever possible. The form assessed the functional capacity of residents in bed-related activities such as bed mobility, bed transfers, sitting and standing balance, and gait. Additionally, the form helped staff collect information about the resident's behavior patterns, use of psychotropic medications, falling history and sleep patterns, thus determining a resident's risk for injury.

Staff were educated about the philosophy and advantages and disadvantages of bedrails. They learned how to do a bedrail assessment as well as ways to reduce bedrail use and to care for residents safely without bedrails.

We notified families through letters and scheduled several educational meetings, some in the evening so that family members could attend without missing work. Staff explained the advantages and disadvantages of using bedrails, answered questions, and became aware of and tried to address families' concerns. The medical director attended the residents' council and explained the new policy.

**Bedside Assessment**

Regular ongoing team assessments were crucial in safely removing bedrails. Within a week of admission, an interdisciplinary team consisting of a geriatrician, unit nursing staff, an administrator, at least one rehabilitation therapist, and a social worker assessed each resident. The social worker tried to schedule the meetings so family members could attend.

The assessment took place at the bedside with input from everyone present, including the resident and family members. Together, the team reviewed risk factors such as the resident's history of falling, cognitive ability, age, diagnoses and use of medications, time of going to bed and getting up, and lifetime sleeping habits and routines. Often, the staff did behavior mapping (form available from corresponding author) for at least 72 hours to assess patterns of behavior such as hitting, wandering, and restlessness (Cohen-Mansfield, 1986). Residents demonstrated bed mobility and transfers. Only after the assessment was completed did the team develop a care plan regarding the use of bedrails.

**Removing Bedrails**

When appropriate, bedrails were removed incrementally. Depending on the team assessment, the lower rails were removed first, either singly or together; the upper rails were almost always removed one at a time. For most residents with weakness on one side, the first lower rail to be removed was the one on the unaffected side. In all cases, residents were monitored closely and assessed weekly by the team.

**Bedrail Alternatives**

At the same time as the bedrails were being reduced, the team suggested individualized alternative interventions. Table 2 lists many frequently used alternatives that allowed residents to sleep safely without bedrails. Most alternatives were inexpensive, although some required good teamwork, altering staff routines and improving communication. Some alternatives involved equipment (e.g., bed alarms, nonslip floors and shoes, transfer rails); some involved individualizing resi-

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**Table 1. Comparison of Demographics and Falls Between Study and Comparison Groups**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Comparison Group (With Bedrails)</th>
<th>Study Group (Without Bedrails)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of residents</td>
<td>116</td>
<td>130</td>
</tr>
<tr>
<td>Total number of admissions</td>
<td>123</td>
<td>143</td>
</tr>
<tr>
<td>Sex (% female)</td>
<td>87%</td>
<td>72%</td>
</tr>
<tr>
<td>Average age</td>
<td>83.1 (SD 7.5)</td>
<td>83 (SD 7.4)</td>
</tr>
<tr>
<td>Age range</td>
<td>62–95</td>
<td>62–97</td>
</tr>
<tr>
<td>Median length of stay</td>
<td>42 (1–264)</td>
<td>40 (0–224)</td>
</tr>
<tr>
<td>Number of bed-related</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fallers</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Total number of falls</td>
<td>19</td>
<td>31</td>
</tr>
<tr>
<td>Multiple fallers (&gt;2 falls)</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>No. residents with</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 fall</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>2 falls</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>3 falls</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4 falls</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>5 falls</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Serious injuries</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Minor injuries</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
falls, never had bedrails. The permanent use of bedrails sustained major injuries following a bed-related incident; residents whose bed mobility and transfers were enhanced by one or two upper bedrails; and rarely, confused residents whose family members demanded bedrails, despite explanations about their adverse consequences.

Table 2. Some Alternatives to Bedrails

- Individualizing daily routines—toileting, positioning, and napping schedules
- Limiting time in bed to sleeping time
- Developing rehabilitation and exercise programs that include teaching both residents and staff safe transfer techniques
- Checking medications, especially diuretics, psychotropics, and sleeping medications to conform to resident routines
- Reducing pain
- Mapping behavior for 72 hours to determine behavior and sleeping patterns
- Using bed alarms—frequently the first intervention for residents with a history of bed falls
- Cleaning promptly after soiling
- Individualizing the bed height for each resident
- Using nonslip floors and appropriate shoes
- Placing mats on the floor beside the bed
- Nursing assistants learning to anticipate and to be present during transfers
- Using wedge pillows
- Using a transfer rail

Bedrails as a Last Resort

Virtually all residents had bedrails ordered upon admission. Some residents, such as those at low risk for falls, never had bedrails. The permanent use of bedrails was recommended as a last resort only after all other alternatives had failed to provide a safe environment. Residents in the following four situations had bedrails: residents who were “multiple fallers” (i.e., those who had three or more bed-related falls); residents who sustained major injuries following a bed-related incident; residents whose bed mobility and transfers were enhanced by one or two upper bedrails; and rarely, confused residents whose family members demanded bedrails, despite explanations about their adverse consequences.

Evaluation

Our evaluation focussed on comparing bed-related injuries and accidents in the comparison and study groups. We defined a fall as any fall from bed and/or any resident found on the floor within 10 feet of the bed. Serious injuries were defined as injuries requiring sutures, fractures, and any injury requiring transfer to the hospital.

We had information from the MDS for all residents in both the study and comparison groups. The functional status of both groups was virtually identical except that the study group had significantly higher eating scores ($p = .012$), suggesting that these residents needed more assistance than the comparison group. The study group had statistically significantly fewer women ($p = .003$) and more multiple fallers than the comparison group (see Table 1).

Two residents from each group sustained injuries as a result of their falls. There was, however, only one serious injury, which occurred when a resident in the study group, who was confused and sedated upon admission, fell out of a bed without bedrails within 24 hours of admission and developed a subdural hematoma. She was transferred to the hospital for treatment.

During the study period, all multiple fallers and the two residents who sustained bed-related injuries during the study were offered bedrails. Twelve additional residents had bedrails: in six (4.6%) cases they were classified as assistive devices, and five (3.8%) residents had both medical symptoms and family requests. One (0.8%) resident, who had multiple seizures and was resistant to all anticonvulsants, was placed in a special bed with four bedrails.

We compared the bed-related fall rates of residents in the study group with diagnoses of hip fractures and strokes. We found that residents with strokes had more falls than residents with hip fractures, (Relative Risk [RR] = 3.6; 95% Confidence Interval [CI]: 1.27–11.5). In the comparison group, stroke residents did not have significantly more falls (RR = 1.5; 95% CI = 0.31–7.2). In comparing the two groups, we found no significant difference among residents with hip fractures (RR = 1.1; 95% CI = 0.34–4.5). Conversely, residents in the study group who had strokes were more likely to have a bed-related fall (RR = 2.0; 95% CI = 0.6–8.5).

Discussion

We found that serious injuries were not associated with the removal of bedrails on this short-term rehabilitation unit, and for most residents, bedrails did not enhance safety. These results are similar to our earlier National Restraint Minimization Project, where we found that serious injuries did not increase when physical restraints were removed (Cohen, Neufeld, Dunbar, Plug, & Breuer, 1996).

Like Donius and Rader (1994), our goal was to assess, individualize, and minimize the use of bedrails. Resident safety was always of paramount concern. We found that residents with recent onset of visual-field deficits and hemiparesis, resulting from strokes, had an increased risk for falls when bedrails were removed. Initially, some of these residents benefitted from bedrails as well as aggressive rehabilitation to help them adapt to their capabilities while staff learn the residents’ behavior patterns.

There are several possible reasons why bedrail use declined dramatically on this unit while injuries did not increase. The unit staff was stable and experienced, the nursing staff had permanent assignments, and they were trained to assess bedrail use and devise alternatives. The unit also had a full-time geriatrician who spent the vast majority of her time on the unit. The assessment process was interdisciplinary and included nursing assistants, family members, and the resident. We reduced bedrail use incrementally, which allowed everyone involved to become comfortable with each bed configuration.
Virtually all residents were admitted from an acute-care setting, where bedrails were used routinely for people older than 65. Accordingly, it was challenging and time consuming to educate wary staff and families, conduct team assessments of residents, and discuss alternatives to bedrails. A few staff, residents, and families remained reluctant and skeptical about removing the bedrails safely despite our best efforts.

Our study supports Catchen’s (1983) finding that when bedrails are removed residents with strokes tend to fall more often. At the same time, residents with hip fractures did not have more falls when bedrails were removed.

This study has limitations. The sample size was small and was from one nursing home, and the study lasted for only a year. Residents on a rehabilitation unit may not represent average nursing home residents who have often limited rehabilitation potential and require long-term placement. A large multicenter study needs to be carried out involving a broad spectrum of nursing home residents. Finally, bedrails for residents who have visual-field defects resulting from strokes need further study.

Another possible limitation involves the data on falls, because the reporting of falls in nursing homes is sometimes unreliable. The study unit had a full-time physician who also served as the principal investigator of this project and first author of this article. Because of her commitment to the project, she systematically and conscientiously tracked and recorded all falls and injuries.

Despite these limitations, the results of this study are encouraging. Most residents admitted to a rehabilitation unit were assessed by an interdisciplinary team and had no bedrails, bed-related falls or injuries. In this small study, the vast majority of residents did well without bedrails, and serious injuries did not increase when bedrails were removed. Rehabilitation units, where many residents return to the community, are ideal units to begin removing bedrails. After learning the process and safe alternatives, staff can use the same process and techniques to reduce the use of siderails among long-term care residents.

References


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