Will a “Stick-on” Hip Protector Improve Patient Compliance in Wearing Protectors in the Hospital Environment?

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In-Hospital Falls

• Falls are the leading cause of injury among individuals over age 65 [Scott, 2010]

• Falls account for 38% of all in-hospital patient incidents [Briggs, 2007]

• Nearly 1 in every 1,000 elderly patients suffer a hip fracture during their admission to a Canadian acute care hospital
In-Hospital Hip Fractures

- Decreased independence and quality of life
- Increased mortality
  - 50% die within 1 year of the fracture [Johal, 2009]
  - Longer lengths of stay [Hill, 2012]
- Increased health care costs
  - Approximately $40,000 to treat a single hip fracture [Woolcott, 2012]
Hip Protectors

- Promoted in Fraser Health for high-risk populations
- Reduce risk for hip fracture by up to 80% if worn at time of falling [Cameron, 2003]
- Reduce risk by 18% in LTC based on intent-to-treat [Gillespie, 2010]
- Conflicting results likely due to:
  1. Poor adherence (<50% in clinical trials)
  2. Lack of regulations on quality or design
Conventional Hip Protectors

Barriers:

- Poor user compliance
  - Averages 20% within hospital
- Staff workload
- Cost
- Lost garments/damaged garments
  - Supplies decrease by 80% in 3 months
Conventional Hip Protectors

Benefits:

- Pad inserted into pockets and not attached to skin
- Minimal skin side effects reported
- Increase patient confidence and independence
- Comfortable
- More familiar than stick-on pads
Potential benefits of novel adhesive hip protector pad:

1. Increase force attenuation
2. Pad secured in place
3. Continuous protection
4. Decrease staff workload
5. No laundry requirements
6. Not patient specific
7. Lower unit cost
Study objectives

1. Develop a low-cost disposable adhesive (stick-on) hip protector

2. Compare patient compliance with conventional versus stick-on hip protectors through a prospective study in two intensive care units at Surrey Memorial Hospital
Biomechanical testing

Percent Attenuation of Peak Trochanteric Force

Percent Attenuation (%)

A  B  C  D  HP1  HP2

0  5  10  15  20  25  30  35  40
Feasibility testing - Methods

- Patients offered to wear prototypes for 7 days
- Hypoallergenic medical adhesive tape used to adhere pad to skin
- Nursing staff removed pads daily to inspect skin and adhesive stickiness
- Nursing staff reported daily on use issues based on direct observation and patient feedback
# Feasibility Testing - Results

<table>
<thead>
<tr>
<th></th>
<th>Patient A</th>
<th>Patient B</th>
<th>Patient C</th>
<th>Patient D</th>
<th>Patient E</th>
<th>Patient F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>90</td>
<td>91</td>
<td>87</td>
<td>82</td>
<td>79</td>
<td>76</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td>Female</td>
<td>Female</td>
<td>Female</td>
<td>Female</td>
<td>Female</td>
<td>Female</td>
</tr>
<tr>
<td><strong>Reason for Admission</strong></td>
<td>Right Tibia plateau Fracture</td>
<td>Right Hip Fracture</td>
<td>Failure to Thrive</td>
<td>Right Hip Fracture</td>
<td>Left Tibia Fracture</td>
<td>Confusion</td>
</tr>
<tr>
<td><strong>Accepted wearing Hip Protectors</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Number of Days wearing Hip Protectors</strong></td>
<td>7</td>
<td>7</td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>None – however patient found them uncomfortable to wear at night</td>
<td>None – no complaints of any discomfort</td>
<td>None – no complaints of any discomfort</td>
<td>Stiffness in right hip and does not like wearing them, but wore them anyways</td>
<td>Patient larger in size, hip protectors fall off easily on her</td>
<td>Previously refused traditional garment</td>
</tr>
</tbody>
</table>
Patient/ staff feedback from feasibility testing

- No adverse effects reported for pad or adhesive tape
- No complaints of pain when removing pad
- Need for tapered edges to avoid catching on clothing
Clinical Trial

Is there a difference in user compliance between conventional (garment) and the stick-on hip protectors?

Garment Hip Protectors

Stick-on Hip Protector
Clinical Trial Objectives

1) Compare patient acceptance and adherence rates between the two hip protector models
   - data documented by nursing staff in patient medical records

2) Conduct staff focus groups to probe barriers and facilitators for each model of hip protector

3) Determine costs associated with purchase of both models
   - Number of garment models used, number lost
   - Number of stick-on models used
## Clinical Trial Timeline

<table>
<thead>
<tr>
<th>Months</th>
<th>Task</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 2</td>
<td>• Education/ 2 week run in</td>
<td>• Patient Acceptance</td>
</tr>
<tr>
<td></td>
<td>• Garment Hip Protector (n=160 patients)</td>
<td>• Patient Adherence</td>
</tr>
<tr>
<td>3 - 4</td>
<td>• Education/ 2 week run in</td>
<td>• Patient Acceptance</td>
</tr>
<tr>
<td></td>
<td>• Stick-on Hip Protectors (n=160 patients)</td>
<td>• Patient Adherence</td>
</tr>
<tr>
<td>5</td>
<td>• Staff Focus Groups</td>
<td>• Barriers &amp; Facilitators</td>
</tr>
</tbody>
</table>
Acknowledgements

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Questions?

Garment Hip Protectors

Stick-on Hip Protector