Implementation of pressure ulcer prevention best practice recommendations in acute care: an observational study

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The problem of pressure ulcers in acute hospitals

- Approximately 2.5 million patients in the US develop pressure ulcers each year (Institute for Healthcare Improvement, 2012)

- Substantial effects on quality of life
  - Emotional and mental impacts
  - Physical impacts
  - Social impacts
The problem of pressure ulcers in acute hospitals

- Accounted for $2.41 billion excess healthcare expenditure in the US between 2005 and 2007 (VanGilder et al., 2009)
- Pressure ulcers cost 4% of the total health care expenditure in the UK (Moore and Cowman, 2008)
- Account for increased yearly public hospital expenditure by $285 million in Australia (Graves et al., 2005)
  - Increases a patients length of stay by more than 4 days
The national standard describes evidence-based systems to prevent and manage pressure injuries:

1. Governance and leadership for the prevention and management of pressure injuries
2. Preventing pressure injuries
3. Managing pressure injuries
4. Communication with patients and carers
Best-practice guideline recommendations

- Pressure injury risk assessment
- Prevention of pressure injuries
- Assessment and monitoring of pressure injuries
- Addressing pain associated with pressure injuries
- Interventions for the treatment of pressure injuries
Results from previous studies

- Studies specifically investigating the impact of ulcer prevention programmes have had mixed findings and highlight variable compliance with best practice guideline recommendations
  - 9 studies reported poor uptake of guideline recommendations in daily nursing care or no change in pressure ulcer prevalence after implementing an evidence-based programme
  - 4 studies identified a reduction in pressure ulcer prevalence after a prevention programme was introduced
The Northern Hospital Pressure Ulcer Prevention Plan (THN-PUPP)

- THN-PUPP pressure ulcer risk assessment tool
  1. Presence of pressure ulcers (score = 3)
  2. Requires assistance to move in bed (score = 2)
  3. Admission to intensive care during current admission (score = 1)
  4. Aged ≥65 years (score = 1)
  5. Reduced sensation (score = 1)
  6. Cognitive impairment (score = 1)
The Northern Hospital Pressure Ulcer Prevention Plan (THN-PUPP)

- THN-PUPP strategies
  - Inclusion of injury prevention nurse leaders and ward champions
  - Use of pressure-relieving equipment (alternating air mattresses, chair cushions and heel wedges)
  - Staff education resources for the risk assessment and management processes.
Study aims

1. To determine whether implementation of an evidence-based pressure ulcer prevention programme has reduced the prevalence of hospital-acquired pressure ulcers
2. To determine if best practice guideline recommendations are being implemented as part of daily patient care at TNH
METHODS
Setting and Design

- Prospective observational cohort study
- The Northern Hospital (TNH)
Study procedures

- Prevalence of hospital acquired pressure ulcers was assessed by conducting point prevalence surveys
  - Trained surveyors assessed inpatients for pressure ulcers
  - Each pressure ulcer was classified as pre-existing (present at hospital admission) or hospital acquired (acquired during their current hospital admission)
  - 1045 adult inpatients from the general wards, critical care and emergency departments completed surveys
Study procedures

- Implementation of best practice guideline recommendations was assessed by three practice metrics:
  1. Nurse compliance with use of a validated pressure ulcer risk assessment and intervention checklist
  2. Accuracy of pressure ulcer risk assessment scoring
  3. Use of prevention strategies
Study procedures

- Practice metric 1: Nurse compliance with pressure ulcer prevention documentation
  - 4368 patient medical record audits on seven medical and surgical wards were conducted between 2003 and 2011
  - Information about the nurse compliance with pressure ulcer prevention documentation was obtained from quality audits
Study procedures

▪ Practice metrics 2 and 3: Accuracy of pressure ulcer risk assessment scoring and use of prevention strategies

– Data were derived from a sample of 270 general medical and surgical patients a 3-week period in December 2008
– The THN-PUPP pressure ulcer risk assessment tool was used to assess patient risk of developing a pressure ulcer
– 2 individual assessors recorded the usual-care nurse pressure ulcer risk assessment scoring, preventative strategies recorded in the patient’s medical record, and strategies that were currently in place for the patient
Prevalence of hospital-acquired pressure ulcers

- Pressure ulcer prevalence **reduced** from **12.6% in 2003** prior to programme implementation, **to 2.6% in 2011**

- Incidence rate ratio = 0.44, 95% CI = 0.28–0.67, P<0.001

### Table 2: Prevalence of hospital-acquired pressure ulcers and usual-care nurse compliance with pressure ulcer prevention documentation

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients surveyed</td>
<td>151</td>
<td>201</td>
<td>–</td>
<td>201</td>
<td>219</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>273</td>
</tr>
<tr>
<td>Hospital-acquired pressure ulcer (N)</td>
<td>19</td>
<td>23</td>
<td>–</td>
<td>16</td>
<td>10</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>7</td>
</tr>
<tr>
<td>Pressure ulcer present on admission (N)</td>
<td>9</td>
<td>8</td>
<td>–</td>
<td>7</td>
<td>5</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>11</td>
</tr>
<tr>
<td>Hospital-acquired pressure ulcer prevalence (%)</td>
<td><strong>12.58</strong></td>
<td>11.44</td>
<td>–</td>
<td>7.96</td>
<td>4.57</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td><strong>2.56</strong></td>
</tr>
<tr>
<td>Documentation compliance (%)</td>
<td>78</td>
<td>75.20</td>
<td>89.14</td>
<td>92.80</td>
<td>96.29</td>
<td>95.00</td>
<td>92.29</td>
<td>88.29</td>
<td>83.69</td>
</tr>
</tbody>
</table>

-, point prevalence survey not completed.
Implementation of best practice guideline recommendations

- **Practice metric 1: nurse compliance with pressure ulcer prevention documentation**
  
  - Compliance with pressure ulcer prevention documentation in TNH acute medical and surgical wards was high (>84%)
Implementation of best practice guideline recommendations

- Practice metric 2: accuracy of pressure ulcer risk assessment scoring

<table>
<thead>
<tr>
<th></th>
<th>Assessors 1 and 2 $\kappa$</th>
<th>Usual-care nurse and Assessor 1 $\kappa$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk classification</td>
<td>0.63</td>
<td>0.46</td>
</tr>
<tr>
<td>Prevention strategies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air mattress</td>
<td>0.69</td>
<td>0.33</td>
</tr>
<tr>
<td>Chair cushion</td>
<td>0.27</td>
<td>0.01</td>
</tr>
<tr>
<td>Repositioning</td>
<td>0.50</td>
<td>-0.01</td>
</tr>
<tr>
<td>Continence aids</td>
<td>0.93</td>
<td>0.93</td>
</tr>
<tr>
<td>Heel wedge</td>
<td>0.58</td>
<td>0.15</td>
</tr>
<tr>
<td>Ear protectors</td>
<td>0.75</td>
<td>0.03</td>
</tr>
</tbody>
</table>
Implementation of best practice guideline recommendations

- Practice metric 2: accuracy of pressure ulcer risk assessment scoring

<table>
<thead>
<tr>
<th>Pressure ulcer risk</th>
<th>Assessor 1 (%)</th>
<th>Assessor 2 (%)</th>
<th>Usual care (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal</td>
<td>64 (23.70)</td>
<td>62 (22.96)</td>
<td>98 (36.30)</td>
</tr>
<tr>
<td>Low</td>
<td>67 (24.81)</td>
<td>56 (20.74)</td>
<td>81 (30.00)</td>
</tr>
<tr>
<td>Medium</td>
<td>40 (14.81)</td>
<td>41 (15.19)</td>
<td>34 (12.59)</td>
</tr>
<tr>
<td>High</td>
<td>99 (36.67)</td>
<td>111 (41.11)</td>
<td>57 (21.11)</td>
</tr>
</tbody>
</table>
Implementation of best practice guideline recommendations

- **Practice metric 3: use of prevention strategies**
  - There was poor agreement between the experienced injury prevention and usual-care nurses for the selection of most prevention strategies.

<table>
<thead>
<tr>
<th>Prevention strategies</th>
<th>Assessor 1 High risk N = 99</th>
<th>Assessor 2 High risk N = 111</th>
<th>Usual care High risk N = 57</th>
<th>( \kappa )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air mattress</td>
<td>72</td>
<td>69</td>
<td>20</td>
<td>0.33</td>
</tr>
<tr>
<td>Chair cushion</td>
<td>69</td>
<td>34</td>
<td>0</td>
<td>0.01</td>
</tr>
<tr>
<td>Repositioning</td>
<td>96</td>
<td>110</td>
<td>56</td>
<td>-0.01</td>
</tr>
<tr>
<td>Continence aids</td>
<td>55</td>
<td>60</td>
<td>39</td>
<td>0.93</td>
</tr>
<tr>
<td>Heel wedge</td>
<td>64</td>
<td>57</td>
<td>11</td>
<td>0.15</td>
</tr>
<tr>
<td>Ear protectors</td>
<td>30</td>
<td>37</td>
<td>2</td>
<td>0.03</td>
</tr>
<tr>
<td>Total prevention strategies prescribed</td>
<td>429</td>
<td>417</td>
<td>146</td>
<td></td>
</tr>
</tbody>
</table>

*\( \kappa \) value for the agreement in strategy selection between the usual-care nurses and Assessor 1.
Limitations

- Not a randomised controlled trial
- Not ‘blinded’
- Single-centre study
- Unable to assess change in use of guideline recommendations as a result of the programme implementation
Conclusions

- Pressure ulcer best practice guideline recommendations are integrated into daily nursing patient care at TNH.
- There was a significant reduction in prevalence of hospital-acquired pressure ulcers and high levels of nurse compliance with use of a validated pressure ulcer risk assessment and intervention checklist.
- Use of the pressure ulcer risk assessment tool and application of prevention strategies could further be improved.
Where to from here…

- Further examination on the barriers to the use of pressure ulcer prevention strategies by nurses in the acute hospital setting is required
Resources