In-hospital fall injuries: Where, when and how do they occur?
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Overview

1. The 6-PACK trial
2. The problem of falls
3. Falls epidemiology study
   a) Aims
   b) Design
   c) Results
      i. Incidence of falls and fall injuries
      ii. Characteristics of fall injuries
      iii. Predictors
   d) Reflections
   e) Where to from here?
Efficacy, effectiveness and cost effectiveness of the 6-PACK falls prevention program

- Comparator → standard care
- 40,000 patients
- 7 hospitals
- 26 acute wards

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TNH fall injury rates

Fall injuries ↓ 50%

Rate per 1000 bed-days

Rate gray, GAMM black, GAMM CI dashed black, upper control limit dashed gray.
Risk Assessment 9-item TNH-STRATIFY + Risk Management 6 simple nurse delivered strategies = Risk reduction 50% reduction in falls injuries*
# Care plan

## FALLS PREVENTION

The Northern Hospital Modified STRATIFY (TNH-STRATIFY)

<table>
<thead>
<tr>
<th>Risk Assessment</th>
<th>Circle Scores here on admission + record daily score in-side</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fall: current admission?</td>
<td>Yes, Patient had a fall during current admission</td>
<td>3</td>
</tr>
<tr>
<td>2. Fall: within 12-months?</td>
<td>Yes, Patient had a fall in the last 12-months (Check pt info on admission form)</td>
<td>1</td>
</tr>
<tr>
<td>3. Mental State?</td>
<td>Yes, Patient is either confused, agitated, intellectually challenged or impulsive</td>
<td>1</td>
</tr>
<tr>
<td>4. Mobility?</td>
<td>Yes, Patient needs supervision or assistance when mobilising</td>
<td>1</td>
</tr>
<tr>
<td>5. Impaired Balance?</td>
<td>Yes, Patient has impaired balance and/or hemiplegia</td>
<td>1</td>
</tr>
<tr>
<td>6. Age?</td>
<td>Yes, Patient is 80 years or older</td>
<td>1</td>
</tr>
<tr>
<td>7. Toileting?</td>
<td>Yes, Patient is in need of frequent toileting</td>
<td>1</td>
</tr>
<tr>
<td>8. Vision?</td>
<td>Yes, Patient is visually impaired to the extent that everyday function is affected</td>
<td>1</td>
</tr>
<tr>
<td>9. Drug / Alcohol?</td>
<td>Yes, Patient presented with drug / alcohol related problems</td>
<td>1</td>
</tr>
</tbody>
</table>

Risk Score / Level: 3 or more = High Risk

## PREVENTION STRATEGIES:

Please focus on strategies outlined in “Falls box” inside this Care Plan

- Risk Score ___ = low / high Risk
  - “Alert” sign above bed
  - Hi-Low bed
  - Bathroom: **Must** supervise pt
  - Bed / Chair Alarm
  - Walking aid near patient
  - Adhere to toileting regime
  - Fall in hosp? → Riskman

- As previous shift
- Altered, as stated below

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**FALLS**

Complete Riskman for each inpatient Fall Day completed:

1) __________
2) __________
3) __________

(Refer to Risk Assessment tool on front page)
The 6-PACK trial

We are here

<table>
<thead>
<tr>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>July</td>
<td>Oct</td>
<td>Jan</td>
</tr>
<tr>
<td></td>
<td>Apr</td>
<td>July</td>
</tr>
<tr>
<td></td>
<td>Dec</td>
<td>Jan</td>
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<tr>
<td></td>
<td>Apr</td>
<td>July</td>
</tr>
<tr>
<td></td>
<td>Dec</td>
<td></td>
</tr>
</tbody>
</table>

Phase 1
Baseline data collection

Phase 2
RCT data collection

Phase 3
Sustainability

6-PACK implementation
Why are falls important?

- Most common incident in the acute hospital setting (approx. 40%)
  
  » Briggs et al., 2007, Rigby et al., 1999

- Costly to the individual and the healthcare system through their impact on a patient’s morbidity and mortality
Healthcare resource utilisation

- ↑ in hospital LOS
  » Bates et al., 1999, Vassallo et al., 2000

- Nurse and health professional workloads
  » Corso et al., 2006

- ↑ diagnostic and therapeutic procedures
  » Nummi et al., 2002

- ↑ need for institutionalisation, rehabilitation, and home care
  » Tinetti et al., 1997, Rizzo et al., 1998

- Up to double the inpatient hospital costs compared with a non-faller
  » Hill et al., 2006
Characteristics of falls in hospital

- Falls are multifactorial in origin
- Consistently reported risk factors
  - Agitated confusion
  - Urinary incontinence/frequency
  - Previous fall history
  - Prescription of psychotropc medication (especially sedatives/hypnotics)

  Oliver et al., 2004, Evans et al., 2001

- Currently there is limited knowledge of why, when and how people obtain an injurious fall in the acute hospital setting
How can knowledge of falls epidemiology help?

- Provide better knowledge of the nature and prevalence of risk factors for falls and fall injuries in hospital inpatients
- Provide greater understanding of where, when and how falls and fall injuries are occurring
- Assist our ability to identify high-risk patients or activities more likely to result in a fall or fall injury
- Provide data for effective knowledge translation and learning
- Inform the development and targeting of falls prevention programs for enhanced effectiveness
Study aims

1. To assess the incidence of in-hospital falls and fall injuries occurring in the acute hospital setting

2. To explore the characteristics (where, when, how) of in-hospital falls and fall injuries occurring in the acute hospital setting
Design, participants and setting

- Data being presented is Stage 1 of the analysis

- Prospective cohort study
  - 7 Australian hospitals
  - 26 acute hospital wards
  - Total 12,820 patients
  - Collected between September 2011 and June 2012 (9 month period)
Methods: Data collection

- Data were prospectively collected as part of the 6-PACK falls prevention project

- 3 sources for measuring falls
  - A trained data collector
    - Daily medical record audit of all admitted patients
    - Daily verbal report from the NUM
  - Extraction of fall incidents from hospital incident reporting database
Methods: Data analysis and Quality control

- Data were triangulated with falls recorded in the hospital incident reporting database.
- Every fall event was recoded by an independent assessor who was blind to the ward that the fall occurred on.
- Quality control audits.
Results: Falls incidence

- From 12,820 patient admissions:
  - 557 patients have fallen during their hospital admission
  - Total of 775 unique falls
  - Mean age of 64.3 years

- Almost 1 in every 15 patients fell during their admission
- With 102 patients having three or more falls
Fall injuries

- From 775 fall:
  - 220 injurious falls were recorded
  - Total of 305 injuries

- More than 1 in 4 falls result in at least one injury
% of falls resulting in at least 1 injury
Fall injuries per ward

- Blue: Bruise
- Green: Skin tear
- Purple: Laceration
- Yellow: Graze

Bar graph showing the percentage of each type of injury for different wards.
Falls resulting in serious injury

- Head injury: 0.8%
- Fracture: 1.6%

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Serious fall injuries

- 2% of all falls resulted in a serious fall injury
  - fractures and subdural haematomas

- Result in a substantial additional healthcare costs
  - 15 day ↑ in length of stay
  - USD$11,706 ↑ in hospitalisation costs
    » Bates et al., 1995
  - CAD$30,696 ↑ in hospitalisation costs
    » Zecevic et al., 2012
Patient characteristics

- More than 1 in 3 injurious falls have occurred when patient was reported to be confused, agitated or disorientated.

“Managing patients with delirium and confusion was consistently identified by nurses as the biggest challenge they face with falls prevention”
Where are do falls occur in hospital?

- Bedroom
- Bathroom
- Other
Where are the fall injuries occurring?

- 2 in every 3 injurious falls occurred in the bedroom
- Almost 1 in every 4 injurious falls occurred in the bathroom
Where are the fall injuries occurring?

- There were a total of 521 bedroom falls
  - With 1 in every 4 resulting in at least one fall injury

- There were a total of 146 bathroom falls
  - With 1 in every 3 resulting in at least one fall injury
  - 74% of all injurious bathroom falls were unwitnessed

“Nurses stated that they were uncomfortable staying in the bathroom with some patients as they felt it compromised their privacy”
How are fall injuries occurring?

- **More than 1 in 3 injurious falls** have occurred in relation to toileting
  - Almost 70% of toileting fall injuries were unwitnessed
How are falls occurring?

- Almost 1 in 3 fall injuries have occurred getting in and out of bed
- There were a total of 274 bed falls
  - With 1 in every 3 resulting in at least one fall injury
  - Injuries sustained by a patient falling from bed cost up to $24,962
    » (IPPS, FY 2009)
Low-low beds

- There were a total of 71 rolls out of a low-low bed
  - Only 1 in every 6 resulted in at least one fall injury
## Falls and fall injuries: other activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Fall</th>
<th>Fall injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dressing</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Showering</td>
<td>3%</td>
<td>5%</td>
</tr>
<tr>
<td>Getting in/out of chair</td>
<td>13%</td>
<td>9%</td>
</tr>
<tr>
<td>Walking</td>
<td>14%</td>
<td>18%</td>
</tr>
</tbody>
</table>
When are falls occurring?

Nursing shifts
- Morning: 30%
- Afternoon: 30%
- Evening: 22%
When are fall injuries occurring?

Nursing shifts

- Evening: 36%
- Afternoon: 21%
- Morning: 29%
What day are falls and fall injuries occurring on?

- There was found to be no difference in falls or fall injuries occurring according to the day of the week.
Reflections

- Bathroom falls result in a high proportion of injuries
- Fall injuries in relation to toileting are common
- More than 70% of falls go unwitnessed
- Patient confusion continues to be an issue
- However rolls out of a low-low bed appear to reduce the risk of injury
Stage 2 of the analysis

- Linking the data to hospital administrative data extracts
- Modelling analysis to determine what factors are associated with in-hospital falls and fall related injuries

Using the data to help drive practice change

Using the data to further develop and explore falls prevention practices within the acute hospital setting
Acknowledgments

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Chief Investigator: 6-PACK falls prevention project
Senior Research Fellow the Centre of Research Excellence in Patient Safety

The seven 6-PACK participating hospital sites

6-PACK site data collectors