Determining Nurse Aide Requirements to Provide Care Based on Resident Workload: A Discrete Event Simulation Model

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Link:

http://authors.elsevier.com/a/1TwP45QyCpsdVb
Vision

Use a validated method to plan and manage long term care staffing
Background

1. High variability in nurse aide staffing
2. About 25% of nursing homes in the US < 2.1 HPRD
3. No objective method to plan staff based on resident workload
4. No effective method to experiment with management interventions to improve staff efficiency
Discrete Event Simulation

- Systems engineering approach that models realistic work environments
- Recommended by IOM as method to improve health care (2005)1
- Widely used in and outside health care
- First used in NHs to determine staffing in 2001 CMS report on minimum staffing2

Source:
How will this work?

*Kindly refer to Table 2. of the article*

1. **Define Resident ADL Care Needs**
   - MDS identifies residents needing supervision to full assistance in each ADL care area
   - Two-person assists can be considered

2. **Define Schedule of Care**
   - E.g., Incontinence care every two hours for people who require toileting assistance

3. **Define time to provide episode of care**
   - Variability is key factor driving staffing needs *(Table 2)*
How will this work?

*Kindly refer to Table 2. of the article*

4. **Define other work conditions**
   - Random events (e.g. call lights)
   - Travel times
   - Care windows (e.g. 2 hours for meals)

5. **Describe time available to provide care**
   - Number of staff
   - Productivity estimates
   - All time available providing care minus meal breaks
# Activities of Daily Living (ADL) Care Required

<table>
<thead>
<tr>
<th>RESIDENT WORKLOAD CATEGORIES (Prevalence)</th>
<th>WORKLOAD DESCRIPTION</th>
<th>Activities of Daily Living (ADL) CARE REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Incontinent Toileting Assistance</td>
</tr>
<tr>
<td>1 (3.6%)</td>
<td>Lightest</td>
<td>NO</td>
</tr>
<tr>
<td>2 (3.6%)</td>
<td>Light</td>
<td>NO</td>
</tr>
<tr>
<td>3 (1%)</td>
<td>Moderate</td>
<td>NO</td>
</tr>
<tr>
<td>4 (21.2%)</td>
<td>Heavy</td>
<td>YES</td>
</tr>
<tr>
<td>5 (60.2%)</td>
<td>Heaviest</td>
<td>YES</td>
</tr>
<tr>
<td>6 (1.4%)</td>
<td>Moderate</td>
<td>YES</td>
</tr>
<tr>
<td>7 (7.9%)</td>
<td>Heavy (Bedbound)</td>
<td>YES</td>
</tr>
</tbody>
</table>
Time to provide care

Exercise for people with independent mobility

- Triangular distribution 10, 15, 20 minutes
- 3 times per week: people with PT do not receive
- 8 hour care window expires at 10 pm
Define Work Scenario for Specific Home

- Resident workload categories
- Time to provide care (*Table 2*)
- Schedule of care and care window times (*Table 2*)
- # of aides (e.g. 2.4 HPRD)
- Productivity (e.g. No breaks, 7.5 hours providing care)
- No two person assists
• Simulation – 100 replications over 3 week period

• Outcome – Omitted care time

• All care delivered divided by all care scheduled
Applications of this approach

**Consumer Information**

- Quarterly omitted care time for each home based on quarterly staffing and MDS reports
- Other outcomes – waiting times for care in each ADL care, % of tasks completed in each ADL care area
Applications of this approach

Develop Online Management Tool to test

- Different staffing levels
- Different staffing models (e.g. part-time staff)
- Different care schedules
Thank you!

Questions?

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