RFID Technology: A Novel Observational and Measurement Method in Dementia-Related Wandering

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Introduction

- RFID is presently used in alarm systems in nursing homes to differentiate patients from staff and visitors at exits and to provide selective lockdown. It is well-proven, robust and widely-used technology.
- Most studies of wandering have occurred in nursing homes; much about wandering and wandering-related behavior at home remains unknown.
- Radio frequency identification systems (RFID) represent an innovative approach to studying wandering and wandering-related behaviors in home-based settings.

Background

- Wandering occurs in up to 59% of community-residing persons with dementia. (Source: Cohen-Mansfield J., Weiner R. (1995).) Two studies of pacing in the nursing home. Journal of Gerontology, 28(M7)-38)
- If not located within 24 hours, 46% of those who elope may die. (Source: Rowe, M.A. & Bielert, S. (2003). A look at deaths occurring in persons with dementia in the community. American Journal of Alzheimer’s Disease and Other Dementias, 18(8), 345-346).
- Wandering at home frequently leads to institutionalization of the demented individual as caregivers become stressed and worried about elopement. (Source: Bielert, S., Grossberg, L., & Geisthahf, O.T. (2002). Behavioral and psychological symptoms of dementia as a risk factor for nursing home placement. International Psychogeriatrics, 11: 305-315)

Definitions

RFID - a wireless system capable of collecting 24-hour data on date, time of day, identity of the person entering monitored zones and duration of time spent in the monitored zone.

Wandering - meandering, aimless or repetitive locomotion that exposes a person to harm and is incongruent with boundaries, limits or obstacles.

Lurking - persistent lingering near exits.

Shadowing - closely following or trailing others who seek to exit.

Elopement - a wanderer’s unattended penetration of the perimeter of a care setting.

RFID Components

- Database
- Transmitter/Receiver
- Transponder (worn by the wanderer)

Proposed RFID Methodology

- Studying wandering at home
- Maintaining Baseline on B
- Barrier on A
- Remove Alarm
- Introduce: Alarm on B
- Maintain: Alarm on B
- Introduce: Alarm on B
- Maintain: Alarm on B
- Introduce: Alarm on B
- Maintain: Alarm on B

Hypothetical RF Data: Shadowing, Lurking & Elopement

- The rich level of detail offered by RFID technology can provide increased understanding of wandering and wandering-related behaviors.
- Such understanding can lead to effective interventions and improved elopement risk management.

Table 1

<table>
<thead>
<tr>
<th>Person</th>
<th>Door</th>
<th>Time</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person 1</td>
<td>A01</td>
<td>11:00:04.5</td>
<td>11/01/05</td>
</tr>
<tr>
<td>Person 2</td>
<td>B01</td>
<td>12:43:06.0</td>
<td>11/02/05</td>
</tr>
<tr>
<td>Person 3</td>
<td>C01</td>
<td>12:43:06.5</td>
<td>11/02/05</td>
</tr>
</tbody>
</table>

Hypothetical Single Subject Plot of Wandering in Interior Zones

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