Feasibility Test of the MedaCube

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Feasibility Test of the MedaCube

Abstract
Poor adherence is a significant barrier to achieve better patient outcomes. Rates of non-adherence approach 40% resulting in 10% of all emergency department visits and 23% of admissions into skilled nursing facilities. Many factors contribute to medication non-adherence including psychological and memory disorders, aging and pill burden. The MedaCube is a medication management system intended to help solve unintentional medication non-adherence. The device is designed to dispense scheduled and as-needed oral medications. The MedaCube provides audio and visual prompts alerting subjects to administer their medications. Caregivers receive notification of missed doses, late doses and refill requests. The null hypothesis is that use of the MedaCube results in no difference in medication adherence when compared with six month prior adherence in individual subjects.

Disciplines
Pharmacy and Pharmaceutical Sciences

Comments
Presented at the American Geriatrics Society Annual Scientific Meeting in Long Beach, California, in May 2016.

Authors

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Introduction

- Poor adherence is a substantial barrier to achieve better outcomes for patients
- Non-adherence results in more than $100 billion spent annually on avoidable hospitalizations

MedaCube

- Bulk-loaded, vacuum-driven, single-patient medication management system programmed to dispense scheduled and as-needed medications
- Can hold up to 16 medications
- Audio and visual reminders to alert patients of dispensing doses
- Adherence-tracking with caregiver alerts
- Availability of online portal
  - Adherence percentage
  - As-needed medication usage
  - Days supply remaining report
  - Expiring medications report
  - Missed pill report
  - Pill taken report
  - Date and timestamp

Purpose

- Determine if use of MedaCube results in increased medication adherence

Methods

- Prospective feasibility study analyzing medication adherence in 21 subject-caregiver dyads over six months
- Inclusion criteria
  - Referred by their physician due to poor medication adherence
  - On ≥ two medications
  - Spoke and understood English
  - Located in the Greater Rochester, NY Area
- Pharmacy records were reviewed and pill counts performed at study enrollment to assess prior adherence
- Prospective medication adherence was assessed using the MedaCube recorded dispensing information
- Paired t-test was used to compare prior and prospective adherence

Results

Table 1: Patient Demographics n = 21

<table>
<thead>
<tr>
<th>Age (mean ± SD)</th>
<th>75.10 (11.41)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female, n (%)</td>
<td>15 (71.4)</td>
</tr>
<tr>
<td>Race, n (%)</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>20 (95.2)</td>
</tr>
<tr>
<td>Black</td>
<td>1 (4.8)</td>
</tr>
<tr>
<td>Insurance, n (%)</td>
<td></td>
</tr>
<tr>
<td>Medicare</td>
<td>12 (57.1)</td>
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<tr>
<td>Private</td>
<td>4 (19.1)</td>
</tr>
<tr>
<td>Medicaid</td>
<td>3 (14.3)</td>
</tr>
<tr>
<td>Other</td>
<td>2 (9.5)</td>
</tr>
<tr>
<td>Marital status, n (%)</td>
<td></td>
</tr>
<tr>
<td>Separated/divorced/widowed</td>
<td>11 (52.4)</td>
</tr>
<tr>
<td>Married</td>
<td>8 (38.1)</td>
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<tr>
<td>Domestic partner/couple</td>
<td>2 (9.5)</td>
</tr>
<tr>
<td>Education, n (%)</td>
<td></td>
</tr>
<tr>
<td>≥ HS</td>
<td>16 (76.2)</td>
</tr>
</tbody>
</table>

Table 2: Caregiver Demographics n = 21

| Race, n (%) |               |
| White       | 8 (38.1)      |
| Black       | 4 (19.1)      |
| Education, n (%) | |
| ≥ HS        | 8 (38.1)      |

Table 3: Health Surveys Baseline 6 mo.

- MOCA (median): 15 vs. 16.5
- GDS (median): 4 vs. 3.09
- Depressed (%): 33 vs. 16
- Lawton-Brody IADL (median): 5 vs. 5
- KPS (median): 80 vs. 85
- Caregiver burden (median): 2 vs. 2

Conclusions

- Use of the MedaCube significantly improved medication adherence rates
- Missed doses were rare and were most commonly due to the medications not being refilled
- Patient’s did not access a dispensed dose on only a few occasions

Limitations

- Small sample size
- Baseline adherence assessed via pharmacy record and pill count at study enrollment

References


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Feasibility Test of the MedaCube
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2University of Rochester Medical Center, Department of Pharmacy, Rochester, NY, USA;
3University of Rochester School of Medicine, Rochester, NY, USA

Dispense but not taken (0.21%): dose dispensed but not accessed

Incomplete dispense (2.79%): MedaCube did not dispense full dose as programmed (i.e. caregiver did not refill MedaCube)

Adherent: 97%

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