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Decreased Hospitalization Rates Found in Older Adults Receiving Home Health Care

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Disciplines
Geriatrics | Occupational Therapy

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Title

Decreased Hospitalization Rates Found in Older Adults Receiving Home Health Care

CLINICAL SCENARIO:

Adults 65 years and older comprise a growing percentage of the U.S. population. Many of these older adults have chronic conditions requiring medical attention which is often funded through Medicare, the nation’s largest health insurer. The majority of Medicare funds are spent on patients with chronic conditions. However, the trust fund financing Medicare Part A, hospital insurance, is projected to become insolvent in the year 2017 if the efficiency of chronic care does not improve (Davis, 2009).

Home health care encompasses a wide range of health care services provided in the home by a multi-disciplinary team including occupational therapists. Home health care is usually less expensive, more convenient than, and just as effective as care received in a hospital or skilled nursing facility (Medicare, n.d.). The majority of home health care clients are older adults over the age of 65.

If home health care clients experience equivalent or better outcomes than clients receiving standard hospital care, incorporating more home health care programs may be one step toward improving the chronic care system.

Hospitalization of older adults is associated with iatrogenic illness, loss of function, and other health risks (Creditor, 1993). In light of this finding, home health care may be as safer alternative for older adults requiring hospitalization for exacerbations of chronic conditions such as COPD and heart disease as well as other acute events such as orthopedic and post-stroke rehabilitation. Not only do clients benefit by the elimination of an initial acute hospital stay, research indicates clients treated in home health care may also experience decreased rates of hospital readmission.

Occupational therapists in home health care work with clients in their natural environment, in conjunction with established habits, roles, routines, and surrounded by that which makes their lives meaningful. Engaging with the client in this setting facilitates greater understanding of and formation of richer client profiles from which to design client centered intervention plans. Working in the home may provide an efficient and effective route to more applicable outcomes in the effort to help people participate in meaningful activities.
FOCUSED CLINICAL QUESTION:
Do older adults receiving home health care for chronic conditions experience decreased rates of hospitalization compared to older adults receiving routine hospital care?

SUMMARY of Search, ‘Best’ Evidence appraised, and Key Findings:
Three databases and one online journal were searched for peer reviewed articles relating directly to the clinical question posed above. Five articles were chosen for appraisal.

A randomized, controlled trial (RCT) by Ricauda, Tibaldi, Leff, Scarafiotti, Marinello, Zanocchi, & Molaschi (2008) was determined to provide the “best evidence” for the following reasons:

- **Hypothesis** – hospital at home for older adults with chronic COPD would result in reduced hospitalization, reduced mortality, and improvements in other medical outcomes.
- **Level of evidence and design** – randomized, single blind, controlled trial
- **Quality** – reliable and valid outcome measures, described randomization, justification of sample, parametric and non-parametric statistical analysis, outcomes reported with 95% confidence intervals.
- **Recent research**

- Ricauda et al. (2008) compared rates of hospital readmission of older adults who had received home hospitalization, to those of participants who received routine hospitalization. They found that home hospitalization participants had significantly lower hospital readmission rates along with lower mortality rates and higher quality of life scores.

- Reuben, Stessman, Ginsberg, Hammerman-Rozenberg, Friedman, Ronen, Israeli, & Cohen (1996) found that home hospitalization decreased rates of routine hospitalization and cost of care, and increased levels of patient satisfaction.

- Boult, Green, Boult, Pacala, Snyder, & Leff (2009) identified 15 healthcare models with evidence of significantly positive effects on health-related outcomes of older adults with chronic illness. Three of the models were home based and were associated with reduced hospitalization, reduced cost, and increased quality of life.

- Hughes, Weaver, Giobbie-Hurder, Manheim, Henderson, Kubal, Ulasevich, & Cummings (2000) found no significant difference in hospitalization rates between a Veterans Affairs (VA) home hospital group and a control group receiving routine VA care services. They did however find significant increases in quality of life and satisfaction ratings.

- Smith, Carusone, Willison, Babineau, Smith, Abernathy, Marrie, & Loeb (2005) found that utilization of acute health care services including hospitalization was high among older adults receiving home health care and found that comorbidity may help predict hospitalization in this population.
CLINICAL BOTTOM LINE:
Home health care provides a promising alternative to routine hospitalization for older adults requiring medical care for conditions such as exacerbation of chronic conditions and rehabilitation following CVA and orthopaedic procedures.

Limitation of this CAT:
Critical appraisal of this topic was performed by a master’s of occupational therapy student and reviewed by a university professor. This paper does not present an exhaustive review of the literature. It is not a peer reviewed document and is not intended to be used as such.

SEARCH STRATEGY:

Terms used to guide Search Strategy:
- Patient/Client Group: older adults (≥65) requiring acute hospitalization
- Intervention (or Assessment): home health care
- Comparison: standard hospital care
- Outcome(s): hospitalization rates

<table>
<thead>
<tr>
<th>Databases and Journals</th>
<th>Search Terms</th>
<th>Limits used</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEDLINE (Sept 2010)</td>
<td>Older adults and home health and outcomes</td>
<td>None</td>
<td>33 returned / refined search</td>
</tr>
<tr>
<td></td>
<td>Older adults and home hospitalization</td>
<td>English, full text None</td>
<td>10 returned / 1 helpful</td>
</tr>
<tr>
<td>AGELINE (Sept 2010)</td>
<td>Older adults and home health and outcomes</td>
<td>None</td>
<td>1118 returned / refined search</td>
</tr>
<tr>
<td></td>
<td>Full text, 1995-2010</td>
<td></td>
<td>225 returned / 2 helpful</td>
</tr>
<tr>
<td>Journal of American Geriatrics Society (Oct 2010)</td>
<td>Searched for specific articles identified in reference lists of articles obtained above</td>
<td>N/A</td>
<td>Retrieved 2 articles</td>
</tr>
<tr>
<td>Cochrane Database of Systematic Reviews (Oct 2010)</td>
<td>Home health care and older adults</td>
<td>English</td>
<td>Returned 7 results / 1 repeat / 0 helpful</td>
</tr>
</tbody>
</table>

Prepared by Reece Vernon, November 19, 2010. Available at http://commons.pacificu.edu/otcats/
INCLUSION and EXCLUSION CRITERIA

- Inclusion: peer reviewed, full text, English language, older adults (≥ 65 years)
- Exclusion: participants under 65 years of age, research beyond 15 years old

RESULTS OF SEARCH

Five relevant studies were retrieved and categorized as shown in Table 1 (based on Levels of Evidence, Centre for Evidence Based Medicine, 1998)

Table 1: Summary of Study Designs of Articles retrieved

<table>
<thead>
<tr>
<th>Study Design/ Methodology of Articles Retrieved</th>
<th>Level</th>
<th>Number Located</th>
<th>Author (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systematic Reviews</td>
<td>1a</td>
<td>1</td>
<td>Boult et al. (2009)</td>
</tr>
<tr>
<td>Randomized Controlled Trials</td>
<td>1b</td>
<td>2</td>
<td>Hughes et al. (2000); Ricauda et al. (2008)</td>
</tr>
<tr>
<td>Prospective Cohort</td>
<td>2b</td>
<td>2</td>
<td>Reuben et al. (1996); Smith et al. (2005)</td>
</tr>
</tbody>
</table>

BEST EVIDENCE

The following study was identified as the ‘best’ evidence and selected for critical appraisal. Reasons for selecting this study were:

- Applicable hypothesis
- Rigorous design
- Reliable and valid outcome measures
- 95% confidence intervals reported
- Recent research

SUMMARY OF BEST EVIDENCE

Table 2: Description and appraisal of a prospective randomized, controlled trial by Ricauda, Tibaldi, Leff, Scarafiotti, Marinello, Zanocchi, & Molaschi (2008).

Aim/Objective of the Study:
A comparison of hospitalization and mortality rates of older adults receiving home hospital care for acute, chronic COPD exacerbations, with hospitalization and mortality rates of older adults receiving routine acute hospital care.
Study Design:
Prospective randomized, controlled, single-blind trial with 6 month follow-up. Data was collected and analysed on an intention-to-treat basis 6 months post treatment.

Setting:
The study was conducted at the San Giovanni Battista Hospital of Turin, a metropolitan city in Northern Italy. The geriatric home hospitalization service (GHHS) at San Giovanni Battista had been in operation nearly 20 years at the time of the study.

Participants:
One hundred four participants were randomly assigned to a GHHS intervention group (n=52) or to a general medical ward (GMW) control group (n=52). Adults aged 75 years and older, admitted to the emergency department (ED) at San Giovanni Battista with acute exacerbation of COPD evaluated in the ED for at least 12-24 hours, with stable clinical conditions, and requiring hospitalization were eligible for the study. Participants meeting eligibility requirements were notified of the study and asked to give informed consent.

Inclusion criteria: Care supervision in the home, telephone connection, and living within the GHHS geographic catchment area.

Exclusion criteria: Absence of family support, severe hypoxemia, severe acidosis or alkalosis, suspected pulmonary embolism, myocardial infarction, severe comorbid illness, severe renal impairment, cancer, hepatic failure, severe dementia.

Intervention and control groups were very similar in demographics and baseline health measurements. The mean age of participants was 80 years in both groups, and males outnumbered females (56% male GHHS and 75% male GMW). Dropouts totalled 11 in the GHHS group (2 to follow up, 9 to death) and 13 in the GMW group (1 to follow up, 12 to death).

Intervention Investigated

Control:
The control group was admitted to the general medical ward of the San Giovanni Battista Hospital of Turin where they received routine hospital care including oxygen therapy, I.V. antibiotics, I.V. steroids, beta-agonist bronchodilators, and anticholinergic bronchodilators based on client need.

Experimental:
The physician-led multidisciplinary GHHS team was comprised of geriatricians, nurses, physiotherapists, social workers, counselors, and skilled therapists including occupational therapists. Care provided included the same interventions as in the control group (oxygen therapy, I.V. antibiotics, I.V. steroids, beta-agonist bronchodilators, and anticholinergic bronchodilators) based on client need. In addition, this group was given a multidimensional geriatric assessment. Patient and caregiver education was emphasized.

Physicians visited daily during the first days after admission and then at intervals of 2-3 days or less thereafter, based on need. Nurses continued to see patients daily. Physicians and nurses met daily to discuss patients’ needs and design individualized
care plans and daily activities. The team operated 7 days a week, cared for an average of 25 patients per day, and was available 24 hours a day for emergencies. GHHS participants had slightly longer mean length of treatment than did the GMW participants (15.5 ± 9.5 vs. 11.0 ± 7.9 days, P=.01).

Outcome Measures
A baseline standard clinical evaluation was completed in the ED for all participants. Participants admitted to GHHS were given a multidimensional geriatric assessment upon admission. Morbidity (e.g. UTI, pressure sores, falls, etc.) was evaluated via chart review at discharge from GHHS or GMW. A 6 month follow-up evaluation was performed in the participant’s home, in the hospital, or in a skilled nursing facility by a postgraduate doctor who was not involved in care and had no awareness of participant allocation.

<table>
<thead>
<tr>
<th>Outcome Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
</tr>
<tr>
<td>Hospital readmission rates</td>
</tr>
<tr>
<td>Mortality rates</td>
</tr>
<tr>
<td>Secondary</td>
</tr>
<tr>
<td>Geriatric Depression Scale (change in depression status)</td>
</tr>
<tr>
<td>Nottingham Health Profile (change in quality of life)</td>
</tr>
<tr>
<td>Katz ADL &amp; Lawton IADL (change in functional status)</td>
</tr>
<tr>
<td>Mini-Mental State Examination (change in cognitive status)</td>
</tr>
<tr>
<td>Mini Nutritional Assessment (change in nutritional status)</td>
</tr>
<tr>
<td>Relatives’ Stress Scale (change in caregiver stress)</td>
</tr>
<tr>
<td>Satisfaction – very good/excellent at discharge (ad hoc questionnaire)</td>
</tr>
<tr>
<td>Costs* per patient per day (P = .002)</td>
</tr>
<tr>
<td>Measured at baseline</td>
</tr>
<tr>
<td>Acute Physiology and Chronic Health Evaluation (severity of illness)</td>
</tr>
<tr>
<td>Cumulative Illness Rating Scale (comorbidity)</td>
</tr>
</tbody>
</table>

Main Findings:
Parametric and non-parametric statistics were used to analyse study data. T-tests were used to compare means within and between groups; Chi-square tests to measure the difference between expected and observed frequencies. Sampling error of p < .05 was considered significant.

Data are reported as mean ± standard deviation (95% confidence intervals) or as percentages.
Original Authors’ Conclusions
For older adults with acute exacerbations of COPD, a well established, physician-led hospital at home program is feasible, and related to reduced hospital readmissions and better patient outcomes at 6 months post treatment. Additionally, the authors suggest that hospital at home may have sustained effects on depression scores and quality of life for older adults.

Critical Appraisal:

Limitations:

The GHHS at San Giovanni Battista was well established having operated for nearly 20 years at the time of the study. Less well-established programs may encounter difficulty with implementation and procedure establishment that could affect outcomes.

Cost analysis was not comprehensive for the GHHS group including only direct health costs of GHHS and not food, laundry, heating, or lighting costs. Consideration of these additional costs would affect the results of cost analysis.

The study was specific to older adults with one condition (COPD) which may decrease generalizability to older adults with other conditions.

Summary/Conclusion:
This study presents a well designed and executed examination of outcomes of home health care for patients with acute exacerbations of chronic COPD. Study limitations are mainly related to generalizability but do not compromise the validity of the results. Although the study focused on one condition, COPD, there is support for the generalizability of study results, based on the prevalence of COPD in the U.S. and in the older adult population specifically. Literature on the topic of home health care outcomes frequently includes COPD as one of the most commonly occurring
conditions in the home health care population and in older adults in general. Another reported limitation, the operationally mature status of the GHHS program, may also be seen as a strength in that it provides insight into the potential for newly developed programs.

Validity

Findings were based on results obtained from a number of well-established, reliable, and valid assessment tools and observations.

Analysis was performed on an intention-to-treat basis to maintain the integrity of the randomized sample and minimize selection bias.

The study was rated 7/10 on the PEDro scale based on the following subtest results:

<table>
<thead>
<tr>
<th>Eligibility criteria</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random allocation</td>
<td>Yes</td>
</tr>
<tr>
<td>Concealed allocation</td>
<td>Yes</td>
</tr>
<tr>
<td>Baseline comparability</td>
<td>Yes</td>
</tr>
<tr>
<td>Blind subjects</td>
<td>No</td>
</tr>
<tr>
<td>Blind therapists</td>
<td>No</td>
</tr>
<tr>
<td>Blind assessors</td>
<td>Yes</td>
</tr>
<tr>
<td>Adequate follow-up</td>
<td>No</td>
</tr>
<tr>
<td>Intention-to-treat analysis</td>
<td>Yes</td>
</tr>
<tr>
<td>Between group comparisons</td>
<td>Yes</td>
</tr>
<tr>
<td>Point estimates and variability</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Note: Eligibility criteria item does not contribute to total score


Interpretation of Results

Results of this study support a conclusion that home health care positively affects outcomes for older adults with COPD in the form of significantly reduced hospitalization rates (P=.001). While this study focused on chronic COPD, similar results may be expected for other chronic conditions requiring periodic acute care. COPD is the fourth leading cause of death in the U.S. according to the U.S. Dept of Health and Human Services (2010). Additionally, throughout the literature, COPD is one of the most commonly treated conditions in home health care/home hospitalization settings. Other studies reviewed for this document support the findings of this research.
### Table II: Characteristics of included studies  
(purpose of study, comparison? intervention, outcomes used, findings)

<table>
<thead>
<tr>
<th>Authors</th>
<th>Purpose, method, intervention, outcomes, results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boult et al., 2009</td>
<td><strong>Purpose</strong>: Sought to identify promising models of comprehensive care to help inform U.S. healthcare reform.</td>
</tr>
<tr>
<td></td>
<td><strong>Method</strong>: Systematic review of high quality research on models of comprehensive care for older persons with chronic conditions.</td>
</tr>
<tr>
<td></td>
<td><strong>Intervention</strong>: Models were categorized by type and outcomes (effects on health status, quality, efficiency) were summarized.</td>
</tr>
<tr>
<td></td>
<td><strong>Outcomes/Results</strong>: Two models of home hospital care were found to be promising. Selection bias is evident in the study in that only studies of models showing positive effects on outcomes were selected. This selection criteria is appropriate in this case however since the aim was to select promising models for further research.</td>
</tr>
<tr>
<td>Hughes et al., 2000</td>
<td><strong>Purpose</strong>: Assessed specific outcomes of Veterans Affairs (VA) team managed home-based primary care (TM/HBPC) of older adults and customary VA care services.</td>
</tr>
<tr>
<td></td>
<td><strong>Method</strong>: Multisite randomized controlled trial</td>
</tr>
<tr>
<td></td>
<td><strong>Intervention</strong>: Comparison of TM/HBPC participants with participants receiving customary VA care.</td>
</tr>
<tr>
<td></td>
<td><strong>Outcomes</strong>: Hospital readmission, cost comparison of TM/HBPC and customary care.</td>
</tr>
<tr>
<td></td>
<td><strong>Results</strong>: The study found no significant decrease in hospitalization in TM/HBPC group. The researchers report roughly 50% of the control group accessed private sector home health care (mainly Medicare) during the study period constituting intervention bias in the form of contamination. This decreases the usability of this study for answering the focused clinical question stated at the beginning of this document. Higher costs were reported for the VA TM/HBPC group however researchers state that findings may not be generalizable to the private sector owing to difficulties encountered within the VA system in implementing the complex (16 sites) model used in the study. Ultimately the researchers conclude that there is a pressing need for further research in the area of home based care and patient outcomes.</td>
</tr>
<tr>
<td>Reuben et al., 1996</td>
<td><strong>Purpose</strong>: A prospective cohort study to compare cost effectiveness of home hospitalization (HH) for older adults (intervention) with that of standard hospitalization (control).</td>
</tr>
<tr>
<td></td>
<td><strong>Method</strong>: Prospective cohort study using data</td>
</tr>
</tbody>
</table>
Comparison and satisfaction questionnaire.

**Intervention:** Comparison between groups and with hospitalization rates in the prior to initiation of HH program.

**Outcomes:** The primary outcome measure was number of annual hospitalization days of sick fund members before and after initiation of a HH program.

**Results:** Hospitalization rates decreased significantly yielding resource savings far outweighing the costs of the HH program. A patient and family satisfaction questionnaire revealed high satisfaction with HH.

**Smith et al., 2005**

**Purpose:** Pilot study assessing utilization of acute care services (mainly hospitalization) in a group of older adults receiving home health care.

**Method:** Prospective cohort study based on telephone interviews.

**Intervention:** Biweekly telephone interviews were to monitor status. Statistical analysis was performed at study end.

**Outcomes:** Number of hospitalizations and ER visits.

**Results:** Researchers found a high rate of hospitalization and ER visits among older adults receiving home health care. This study did not perform a comparison of rates of re-admission in older adults receiving standard hospital care in lieu of home health care.

**IMPLICATIONS FOR PRACTICE, EDUCATION and FUTURE RESEARCH**

**Practice:**
Foundational occupational therapy concepts, such as the importance of context to one’s experience are reinforced by findings such as those presented in this document suggesting that environment plays a part in health outcomes. Occupational therapy holds that contexts, both internal and external influence client performance and satisfaction. Performance and satisfaction provide the sense of meaning that occupational therapy is built on.

Occupational therapy is an integral part of a comprehensive home health care team, thus expansion of home health care services will lead to expansion of occupational therapy practice.

**Education:**
As home health care continues to grow and expand, occupational therapy schools will need to increase exposure to and education on home health care specific procedures and considerations to prepare future therapists for experiences in that setting. This exposure and education may be provided through increased fieldwork opportunities, formal, and informal educational activities.
Future Research:

Research indicates that hospital readmission rates are decreased in older adults receiving home health care; however specific reasons for the decrease remain unclear. Future research should seek to identify specific elements of home health care that contribute directly to better outcomes including reduced hospitalization rates.

Home health care and hospital at home is associated with higher quality of life and satisfaction ratings in patients and caregivers than routine hospital care. Research to pinpoint key aspects of home health care that contribute to quality of life and satisfaction with care will not only highlight the value of home health care but also allow hospital programs to provide a more satisfactory experience for patients and caregivers.
REFERENCES


