In post-stroke rehabilitation, is domiciliary care more cost-effective with higher positive health outcomes than hospital- or sub-acute inpatient care?

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In post-stroke rehabilitation, is domiciliary care more cost-effective with higher positive health outcomes than hospital- or sub-acute inpatient care?

Disciplines
Occupational Therapy | Rehabilitation and Therapy

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Clinical Scenario: Stroke is a significant health issue affecting people around the world (Anderson, Rubenach, Mhurchu, Clark, Spencer, & Winsor, 2000). Ordinarily, an individual who experiences a stroke will, depending on severity be admitted to hospital or ICU. Common follow up steps include inpatient rehabilitation if the individual is able to tolerate longer therapy sessions or a skilled nursing facility for rehabilitation before discharging home. Alternatives to institutional stays, such as domiciliary care, are becoming more and more common in the treatment of stroke (Anderson et al., 2000 and Kalra, Evans, Perez, Knapp, Donaldson, & Swift, 2000). OT most often plays a role in post-stroke rehabilitation; therefore clinicians have a vested interest in where care may be best provided. As OT intends to provide client-centered, individualized care while attempting to improve the quality of life of our clients, it is important that we understand the research around what environment is best suited for our clients to work towards achieving their rehabilitation goals.

Clinical Question: In post-stroke rehabilitation, is domiciliary care more cost-effective with higher positive health outcomes than hospital- or sub-acute inpatient care?

Clinical Bottom Line: The results of this research suggest that home-based care is possible and cost-effective. Health outcomes have been found to be reasonable and research has shown that it provides a suitable environment for occupational therapy rehabilitation to occur as part of a multidisciplinary team. It also suggests that caregivers require support if a stroke survivor is discharged home. When a person is focused on caring for another individual, one’s own mental health may degress. Finding a balance between care for another adult while sustaining the home and other normal maintenance routines can be difficult. It is within the realm of OT to educate the caregiver and adopt them as a “secondary” client. Support may be provided in finding that balance. Further research should be done on this population.

Summary of Search: Key Findings

- **Domiciliary care is feasible:** Post acute stroke rehabilitation may be provided in the home (Anderson et al., 2000, Kalra et al., 2000, and Gilberston, Langhorne, Walker, Allen, & Murray, 2000)
- **OT in stroke rehab:** Occupational therapy is an important part of multidisciplinary team in stroke rehabilitation (Anderson et al., 2000, Kalra et al., 2000, and Gilberston, et al., 2000)
- **Domiciliary care is cost-effective:** three studies found that home-based care costs less than hospital-based care (Anderson et al., 2000, Gilberston, et al., 2000 and Patel, Knapp, Perez, Evans, & Kalra, 2000)
- **Better care in hospital:** While Kalra et al. (2000) found that care may be provided in the home and is the cheaper alternative, individuals treated in specialized stroke units showed lower rates of mortality and institutionalization and demonstrated higher independence in ADLs (as per Barthel Index and Rankin Scale scores) than the home-based group.
- **Caregiver burden:** Individuals who care for stroke survivors after discharge from the hospital may be negatively impacted by survivors returning home earlier scoring lower in household maintenance on the Adelaide Activities Profile (AAP) and lower mental health status on the 36-item Short-form questionnaire (SF-36) (Anderson et al., 2000).
Limitation of this CAT: The studies included in this topic review were conducted in the U.K. Studies done in the U.S., if they exist, were not explored. This review only includes five appraised articles and is therefore based on limited research. This critically appraised paper has not been externally peer reviewed. It was conducted by a graduate student and not a professional researcher.

Search Strategy: Terms used to guide search strategy
Patient/client: stroke, CVA, aneurism, adults, elders, 65+, aged
Intervention: In-home rehab*, domiciliary, home care, occupational therapy
Comparison: temporary, nursing care, sub-acute, in-patient rehab*
Outcome(s): quick recovery, higher level of independence, cost effective, savings, increased function

<table>
<thead>
<tr>
<th>Databases &amp; Sites Searched</th>
<th>Search Terms</th>
<th>Limits Trialed</th>
</tr>
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<td>English only, full-text avail, humans only, 2000+</td>
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<tr>
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Inclusion & Exclusion Criteria:
Inclusion: cost/minimization, health outcomes, occupational therapy, home- versus hospital-based care, randomized controlled trials

Exclusion: articles published before 2000, not comparative of home- versus hospital-based care, diagnoses other than CVA, less than 30 participants in the sample, focus on only one profession’s involvement (besides OT)

Results of Search: Five relevant studies were located and categorized as shown in Table 1 based on level of evidence

<table>
<thead>
<tr>
<th>Level of Evidence</th>
<th>Study Design</th>
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<tr>
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<tr>
<td>II</td>
<td>2 groups, non-randomized</td>
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<tr>
<td>III</td>
<td>1 group, non-randomized</td>
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<tr>
<td>IV</td>
<td>Descriptive studies</td>
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<tr>
<td>V</td>
<td>Case reports, expert opinion</td>
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<tr>
<td></td>
<td>Qualitative studies</td>
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</tr>
<tr>
<td>Total:</td>
<td></td>
<td>5</td>
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</tbody>
</table>
Best Evidence: The following article was identified as the ‘best’ evidence and selected for critical appraisal. Anderson, C., Mhurchu, C. N., Rubenach, S., Clark, M., Spencer, C., & Winsor, A. (2000). Home or hospital for stroke rehabilitation? Results of a randomized controlled trial: II: Cost minimization analysis at 6 months. Stroke; a Journal of Cerebral Circulation, 31(5), 1032-1037.

Reasons for selecting this paper were:
- It is of the highest level of evidence: a randomized controlled trial
- The sample size was of a decent size (N=86)
- Direct application to occupational therapy services
- How research was conducted and how outcomes were collected, measured, and analyzed was identified and clearly outlined
- Intervention outcomes demonstrated a statistically significant difference between the treatment and control groups in regards to amount of time hospitalized
- Identified need for caregiver support and need for further research in this area
- The two points above have clinical implications for practicing occupational therapy clinicians

Summary of Best Evidence: Description and appraisal of Home or hospital for stroke rehabilitation? By Anderson et al. (2000)

Aim of the study: To examine the effectiveness of early hospital discharge and home-based rehabilitation scheme for patients with acute stroke.

Intervention Investigated: The sample size consisted of 398 patients with stroke at two participating hospitals, 312 were excluded due to death, discharge, refusal to participate, or lived outside the desired area. The remaining 86 subjects were randomly assigned to:
- The control group (N=44) with a mean age of 71(11) 50% of which were male, 59% had partners, 80% were retired, 18% had a history of stroke and 43% had right hemisphere lesions, 36% had left and 20% were brainstem/cerebellum lesions.
- Or the intervention group (N=42) with a mean age of 72(11) 62% of which were male, 57% had partners, 88% were retired, 21% had a history of stroke and 43% had right hemisphere lesions, 48% had left and 10% were brainstem/cerebellum lesions.

After baseline assessments were taken, randomization was completed through a computer-generated program through the hospital pharmacy and was maintained in sealed envelopes. Consent was received from each participant (and/or his/her caregiver).

The intervention was described in detail, contamination was avoided and cointervention was not an issue. The intervention group was treated by a rehabilitation team consisting of a full-time program coordinator (who was an occupational therapist), a consultant in rehabilitation, PTs, OTs, social workers, SLPs and rehabilitation nurses with experience in community therapy. Once a participant was randomized into this treatment group, modifications were made to his/her therapy, home, and other care so that s/he could be discharged from the hospital within 48 hours. The team set goals and individualized sessions were provided in the home. Home exercise programs were provided and use was encouraged between visits. The team met weekly to discuss progress. The coordinator and consultant each reviewed participant’s progress at discharge and made referrals to community resources if necessary. Control group participants received conventional care in a hospital setting which included care in a geriatric acute care ward or on a multidisciplinary stroke unit. Critical pathways were followed and discharge and follow-up planning were conducted as per the hospital’s policy.
Outcome Measures: Baseline data was collected prior to randomization. This included sociodemographic information, clinical features of the current stroke, medical history and risk factors for stroke, details of physical functioning, and use of community services in the pre-morbid period (assessments used included the Barthel Index, Mini-Mental State Exam, 28-item General Health Questionnaire (CHQ-28), the Adelaide Activities Profile (AAP) and a General Functioning Subscale of the McMaster Family Assessment Device (MFAD)). Follow-up was taken at 1, 3, 6, and 12 months after randomization. Interviews were standardized and carried out in the patient’s home by a nurse independent of the research team using the 36-item short-form questionnaire (SF-36), the Nottingham Health Profile (NHP) and other non-standardized assessments that were created for the purposes of this study. Caregivers were questioned at each of these sessions using the MFAD, AAP, GHQ-28, and the Caregiver Strain Index. Outcome measures appear reliable and valid, with the exception of data collected using the non-standardized assessments created for the purposes of this study. Reliability and validity have not been tested on these measures of data collection.

Results: Statistical significance was reported in the form of a p value and effect size. The analysis method seemed appropriate. Length of stay at the hospital was obviously reduced with an average of 15 days spent in institutional care for the intervention group compared to an average of 30 days for the control group (p<0.001). No significant difference was found in use of community services, readmission to hospital, or admissions to residential care at follow-up. Otherwise there was no significant difference in treatment groups (similar scores on SF-36, NHP, AAP, and satisfaction with recovery and services received). A difference can be seen among caregivers ratings of mental health status (p<0.01) on the SF-36 and household maintenance on the AAP (p<0.05). The clinical importance of this is listed as being insightful into how early discharge may negatively impact those who will care for the stroke survivor upon returning home. The authors suggest that future programs created do not solely focus on the care of the survivor but also include an emotional component for caregivers. They also acknowledge the small sample size of caregivers (N=49) which could lead to a Type 1 error and that the scores reported mimic the rates of mental health status among the general public in the location where this study was conducted and therefore may be typical vs. result of care giving. Two of the participants in the intervention group did not complete the study: One died from a recurrent stroke and another from cardiac failure. Their data was eliminated from the study results.

Author’s Conclusions: “This study confirms that such a program can considerably shorten the length of stay in hospital, by [almost equal to] 1-2 weeks on average, without compromising patient safety or functional outcomes for survivors of stroke.” One might determine that providing OT services to a stroke survivor in his/her own home is a legitimate alternative to hospital-based care, especially if attention is paid to the caregiver during these treatment sessions. Limitations include: The participants in this study only represent 22% of all patients with stroke who were admitted to the hospital while research was being conducted- a larger study might provide more substantial results.

Critical Appraisal
Validity:
The selection process when conducting this research was outlined in the journal article. Baseline assessments were selected, consent was received and then the hospital pharmacy was contacted by telephone and the allocation sequence began. Individuals were divided by a computer-generated list and details were sealed in opaque envelopes. No stratification was performed. In the manner in which this study was conducted there should be no bias but the therapists may have been hopeful to find results that support their hypothesis that home-based care is better than hospital care. Comparing domiciliary and institutional care groups seems a valid way to assess efficacy though the individuals treated at the hospital were served at two different hospitals on an acute geriatric ward or a stroke team unit, creating the possibility of variation in the
(Validity continued...) care and outcomes between control group members. Overall, the study appeared effective in comparing home versus hospital based care for survivors of mild to moderate strokes.

Results:
The results were favorable in that they found that those treated within his/her own home experienced no more detrimental effects than those treated in a hospital-based setting. This is of special interest because hospital care is expensive, early discharge frees up bed space for other individuals in need of immediate care, there may be socio-cultural benefits to receiving rehabilitation within one’s own home and OT services provided within the community is on the rise. Also to be considered is that this study may not be generalizable to other populations. Based on the disqualification of participants who were discharged to residential care or who died one might presume that only survivors who have a positive prognosis for recovery may be the only candidates who would benefit from this type of program versus those who are severely disabled by stroke. Qualitative research may have captured the intervention group’s appreciation for receiving treatment in the comfort of their own home.

Implications for Practice/Applicability
OTs practicing in hospital settings can confidently discharge their client’s home as soon as the individual is able and once proper supports are put into place. A referral can be made for Home Health OT. An OT practicing in the community may consider learning more about supporting stroke survivors within the context of his/her own home and ways to educate and support the caregiver so that they may have the best success. An OT in research may consider doing a larger study within the North American population (possibly including and comparing varying levels of severity of stroke) or a qualitative study of stroke survivors and their caregivers to capture the depth of their experiences so practicing clinicians may be better informed on how to best serve them. Studies that compared individuals with mild, moderate and severe stroke impacts with an intervention group receiving domiciliary care versus hospital/institutional-based care (including OT services in both groups) could illuminate what population has the best health outcomes. Qualitative research including interviews of survivors and their caregivers on their respective experiences would illustrate how an clinician might best serve the needs of these individuals, based on evidence.

References:
Article Critically Appraised

Related Articles
Level 1 Evidence