

MS #13

Hospitalization in a rehabilitation facility compared with acute care is not necessarily more cost-effective than acute-care hospitalization

Reding, M. J., LaRocca, N., & Madonna, M. (1987). Acute-hospital care versus rehabilitation hospitalization for management of nonemergent complications in multiple sclerosis. *Journal of Neurological Rehabilitation*, *1*, 13–17.

Level IIB3a

Nonrandomized controlled trial, less than 20 participants per condition, low internal validity, high external validity

Clinical bottom line

In this study, the overall cost of treating patients with multiple sclerosis was **not significantly** (*see Glossary*) different between acute care and rehabilitation. However, there was a trend for those who received rehabilitation to have a lower overall cost and fewer subsequent hospital admissions.

The cost of admitting patients with multiple sclerosis to a rehabilitation hospital does not appear to be offset appreciably by savings in the cost of subsequent home care and hospital readmissions. The length of the initial stay in the rehabilitation hospital contributes substantially to the cost equation, offsetting the considerably lower per diem cost at this facility.

These findings suggest that occupational therapists should more thoroughly evaluate the effect of rehabilitation on home care costs.

Sample and Procedures

The researchers compared hospital readmissions and need for assistance from home health aides for patients admitted to an acute-care hospital and patients admitted to a rehabilitation facility.

First, the researchers reviewed the charts of patients with multiple sclerosis admitted to the Hospital of the Albert Einstein College of Medicine (Bronx, New York) in 1981 and 1982 to determine how many might have been managed equally well in a rehabilitation hospital. They identified 94 out of 168, or 56 percent.

Next, the researchers reviewed the charts of patients admitted to the Research and Training Center for Multiple Sclerosis, Albert Einstein College of Medicine, and subsequently admitted either to an acute-care bed at the Hospital of the Albert Einstein College of Medicine or to the Burke Rehabilitation Center (White Plains, New York). From these two pools, the researchers identified 24 pairs of patients: 12 in acute care and 12 in rehabilitation, matched for sex and severity of multiple sclerosis as their sample. All had been failing to make progress as outpatients.

Outcomes

The researchers calculated the cost of the participants' initial hospitalization. They then telephoned all the participants to inquire about the following outcomes: *status on the Incapacity Status Scale, number and cost of subsequent read-missions, need for and cost of home aid, and total cost of follow-up care.* They obtained follow-up data on 20 of the 24 pairs.

Analyses

The researchers compared the rehabilitation hospital group with the acute-care group on all outcomes.

Results

The cost for acute care was \$625 per day for an average stay of 14 days; the cost for rehabilitation was \$364 per day for an average stay of 35 days. Total initial hospitalization costs were \$8,750 and \$12,740, respectively. At follow-up, the average score on the Incapacity Status Scale was 23.93 for the acute-care participants and 25 for the rehabilitation participants. The acute-care participants required an average of \$18,831 in home care per 16-month follow-up interval, compared with \$20,273 for the rehabilitation participants. They experienced an average of 1.36 readmissions, versus 0.86 for their rehabilitation counterparts, at an average cost of \$11,875 per participant, versus \$7,500 per participant. Total follow-up costs were \$30,706 and \$27,773, respectively.

Thus, despite substantially lower per diem costs, the rehabilitation hospital stay resulted in higher initial costs. The savings realized in subsequent hospital admissions over the 16-month follow-up period did not compensate for this cost, so there was no significant difference between the two groups for cost of care. In addition, there was no significant difference between the Incapacity Status Scale.

Significance and **effect sizes (***r***)** (*see Glossary*) for outcome measures comparing the treatment and control groups for Reding et al. (1987)

Outcome	Significance	Clinical effect (r)	Size of effect
Incapacity	Nonsignificant	0.08	Negligible
# of subsequent admissions	Nonsignficant	0.30	Medium
Cost of home aid	Nonsignificant	0.04	Negligible
Cost of subsequent admissions	Nonsignificant	0.30	Medium
Total follow-up care cost	Nonsignificant	0.07	negligible

Limitations

The sample size was too small to show a **significant** (*see Glossary*) difference between the two groups (**sample size bias**) (*see Glossary*). Also, the functional measure (the Incapacity Status Scale) was administered by self-report over the telephone, and participants were reported to be vague in their answers (**self-recall bias**) (*see Glossary*). Further, the participants were selected retrospectively, which can allow researchers to select the best cases. In addition, retrospective analysis can involve analyzing data that was not collected for that specific study. The data may be incorrect, missing, or of poor quality.

Glossary

effect sizes (Cohen's *r*)—An effect size is a measure of clinical significance. It provides information about the magnitude of effect of the treatment. Although related to significance, it is not as influenced by the size of the sample. Therefore, it is possible to have an outcome on which the treatment had a large effect (e.g., the treatment group improved a lot more than the control group) and still have a nonsignificant result. If the results have a large effect but no significance, this means that this effect may be sample specific and not generalizable outside the study. There are many different types of effect sizes. What is reported here is Cohen's *r* can be interpreted in a manner similar to a Pearson's correlation coefficient:

Effect size <i>r</i>	Size of the effect	
<0.99	Negligible	
0.10 - 0.29	Small	
0.30 - 0.49	Medium	
>0.50	Large	

Cohen, J. (1977). Statistical power analysis for behavioral sciences. New York: Academic Press.

nonsignificant or no significance—A statistical term that refers to study findings that are likely to be due to chance differences between the groups rather than to other factors (like the treatment of interest). A nonsignificant result is not generalizable outside the study. Like significance, a nonsignificant result does not indicate the clinical effect. Often studies will show nonsignificant results, yet the treatment group's mean will be better than the control group's. This is usually referred to as a trend in the right direction. Because significance is closely determined by sample size, nonsignificant results would often become significant if the sample size were increased.

sample size bias—Significance is strongly related to sample size. A study that has too small a sample will not show significance (a type II error), even when a treatment effect is present. Some research studies that are nonsignificant demonstrate a trend toward the treatment having the desired effect, suggesting that a larger sample is needed to detect a significant treatment effect. On the other hand, too large a sample can prove just about anything.

self-recall biases—*Obsequiousness bias:* Participants may alter their responses to questions so they match the responses that they perceive that the researcher wants. *Unacceptability bias:* Participants may underreport behaviors that they view as unacceptable or embarrassing (e.g., alcohol consumption, inability to complete basic ADLs, etc.).

significance (or significant)—A statistical term, this refers to the probability that the results obtained in the study are not due to chance, but to some other factor (such as the treatment of interest). A significant result is likely to be generalizable to populations outside the study.

Significance should not be confused with clinical effect. A study can be statistically significant without having a very large clinical effect on the sample. For example, a study that examines the effect of a treatment on a client's ability to walk may report that the participants in the treatment group were able to walk significantly longer distances than the control group. However, if you read the study you may find that the treatment group was able to walk, on average, 6 feet, whereas the control group was able to walk, on average, 5 feet. Although the outcome may be statistically significant, a clinician may not believe that a 1-foot increase will improve his or her client's function.

Terminology used in this document is based on two systems of classification current at the time the evidence-based literature reviews were completed: Uniform Terminology for Occupational Therapy Practice—Third Edition (AOTA, 1994) and International Classification of Functioning, Disability and Health (ICIDH-2) (World Health Organization [WHO], 1999). More recently, the Uniform Terminology document was replaced by Occupational Therapy Practice Framework: Domain and Process (AOTA, 2002), and modifications to ICIDH-2 were finalized in the International Classification of Functioning, Disability and Health (WHO, 2001).

This work is based on the evidence-based literature review completed by Nancy Baker, ScD, OTR, and Linda Tickle-Degnen, PhD, OTR/L, FAOTA.

For more information about the Evidence-Based Literature Review Project, contact the Practice Department at the American Occupational Therapy Association, 301-652-6611, x 2040.



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