

Costs and Rehabilitation Utilization of Stroke Patients:

A Retrospective Study of Medicare Beneficiaries

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Objective: Long-term economic impact of stroke and stroke-related hemiparesis has not been well characterized. Utilization of physical therapy and rehabilitation (PTR) among these patients is not well understood. The aim of our study is to examine the costs and PTR utilization in patients with stroke and stroke-related hemiparesis during a 3-year period following their first stroke onset.

Methods: Patients with newly diagnosed stroke who were discharged from hospital were identified from a 5% national random sample of all Medicare beneficiaries. These patients were followed from 2003 to 2005, and their Medicare claims were linked from different claims databases. Patients were classified with regard to development of hemiparesis during the study period. Overall Medicare reimbursements, and PTR utilization and reimbursements were analyzed in each year.

Findings: We identified 1,849 patients with newly developed stroke in the first quarter of 2003. Among them, 1,070 subsequently developed hemiparesis and 779 did not. Cumulative average Medicare payments were \$75,793 for the hemiparesis cohort and \$44,544 for the non-hemiparesis cohort during the 3-year period ($p < 0.01$ each year). The hemiparesis cohort incurred significantly higher costs than the non-hemiparesis cohort across nearly all care settings during the 3-year period. For the overall cohort, total hospital inpatient care incurred the highest costs, followed by physician care and skilled nursing care. Significantly more financial resources for PTR were expended by

patients in the hemiparesis cohort (\$37,208) than those in the non-hemiparesis cohort during the 3 years (\$18,388, $p < 0.01$ in each year). While most costs of PTR incurred in a hospital inpatient setting (\$8,032) or skilled nursing facilities (\$7,716) in 2003 for the hemiparesis cohort, the costs of PTR shifted to skilled nursing facilities (\$7,728) and home health agencies (\$5,911) in 2004 and 2005.

Conclusions: Long-term care and rehabilitation services, especially for stroke patients suffering from hemiparesis, constitute a significant proportion of total medical costs. Costs other than those incurred in hospital inpatient setting must be taken into account when organizing management of post-stroke patients.