

Assessment of Patient Outcomes of Rehabilitative Care Provided in Inpatient Rehabilitation Facilities (IRFs) and After Discharge: Study Highlights for Stroke Patients

Background: Stroke is a leading cause of long-term disability in the United States according to the American Heart Association (AHA). The AHA estimates that 795,000 people each year experience a stroke, of which approximately 247,000 require formal rehabilitation services in either an inpatient rehabilitation facility (IRF) or skilled nursing facility (SNF).¹ Studies suggest that IRF rehabilitated stroke patients generally experience better clinical outcomes than stroke patients treated in SNFs. According to these studies, IRF-placed stroke patients require fewer days of rehabilitation,² demonstrate greater functional and cognitive improvement,^{2,3,4,5} are more likely to be discharged directly to the community,⁶ and have a lower mortality rate one year after rehabilitation⁷ than clinically comparable SNF-placed stroke patients.

Key Findings: Results from our analysis of 16,985 clinically and demographically matched SNF to IRF stroke patients appear consistent with previous research. We observed the average length of an IRF stay for a stroke patient to be less than half that of the average SNF stay (15.5 vs. 32.1 days) ($p < 0.0001$). Following patients' initial rehabilitation stay, our study found that compared to matched SNF discharged stroke patients, the IRF population experienced on average (all statistically significant at $p < 0.0001$):

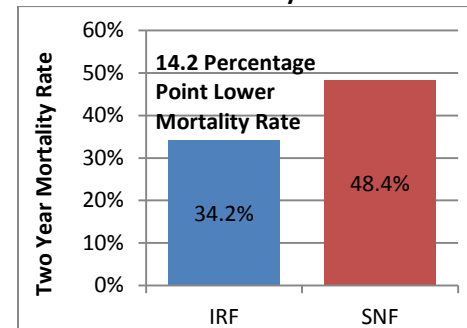
- **29.3 percent lower (14.2 percentage point difference) all-cause mortality rate** over a two-year period
- **96.8 day difference in average days alive** over a two-year period
- **37.1 fewer emergency room visits** per 1,000 patients per year
- **92.0 more days residing at home** (i.e., without receiving facility-based care) observed over a two-year period
- Cost \$16.33 more per day observed over a two-year period

We observed no statistical significant difference in annual readmission rates between IRF and SNF stroke patients.

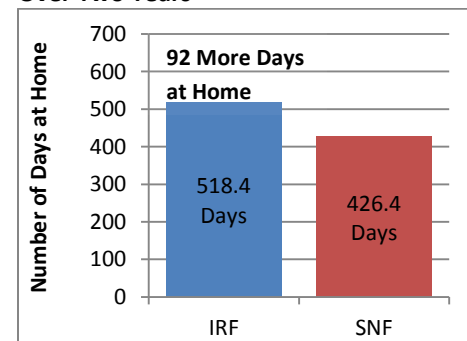
Discussion: Similar to earlier studies, our findings indicate that stroke patients treated in IRFs experience better clinical outcomes than matched stroke patients who received rehabilitation in a SNF (i.e., on measures of length of rehabilitation stay, mortality, emergency room utilization, and home days). Although our study did not investigate the possible drivers unique to IRF and SNF rehabilitation that may have led to the observed differences, some studies have shown that the rehabilitation typically provided to stroke care patients in IRFs^{8,9} – namely, duration and frequency of therapy sessions and use of a multidisciplinary care team – improves rates of community discharge¹⁰ and results in fewer deaths.^{11,12}

Differences in regulatory and accreditation requirements for IRFs and SNFs may also contribute to the superior rehabilitation outcomes observed in IRF discharged patients. For instance, IRFs, but not all SNFs, must maintain a 24-hour RN staff and provide daily physician oversight.¹³

Difference in Mortality Rate between IRF and SNF Stroke Patients Two Years after Initial Rehabilitation Stay

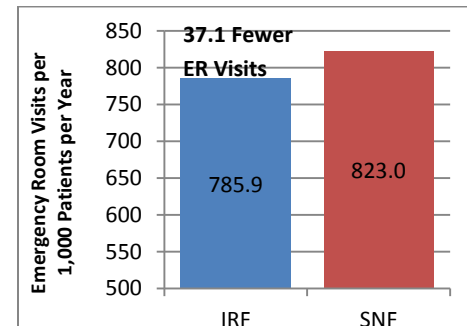


Difference in Number of Home Days* between IRF and SNF Stroke Patients Over Two Years



* Number of days not receiving facility-based care

Difference in Emergency Room Visits per 1,000 Patients per Year between IRF and SNF Stroke Patients



Source: Dobson | DaVanzo analysis of research identifiable 20% sample of Medicare beneficiaries, 2005-2009

¹ Go AS, Mozaffarian D, Roger VL, et al. Heart disease and stroke statistics – 2014 update: a report from the American Heart Association. *Circulation*. 2014; 128:

² Kramer AM, Steiner JF, Schlenker RE, et al. Outcomes and costs after hip fracture and stroke: a comparison of rehabilitation settings. *JAMA*. 1997; 277(5):396-404.

³ Chan L, Sandel ME, Jette AM, et al. Does postacute care site matter? A longitudinal study assessing functional recover after a stroke. *Arch Phys Med Rehabil*. 2013; 94:622-9.

⁴ Buntin MB, Colla CH, Deb P, et al. Medicare spending and outcomes after postacute care for stroke and hip fracture. *Med Care*. 2010; 48:776-84.

⁵ Deutsch A, Granger CV, Heinemann AW, et al. Poststroke rehabilitation: outcomes and reimbursement of inpatient rehabilitation facilities and subacute rehabilitation programs. *Stroke*. 2006; 37(6):1477-82.

⁶ Kramer A, Holthaus D, Goodrich G, et al. A study of stroke postacute care costs and outcomes: final report. Washington, DC: Office of Disability, Aging, and Long-term Care Policy, US Department of Health and Human Services; Dec., 2006.

⁷ Kane RL, Chen Q, Finch M, et al. Functional outcomes of posthospital care for stroke and hip fracture patients under Medicare. *J Am Geriatr Soc*. 1998;46(12): 1525-33.

⁸ Keith RA. Treatment strength in rehabilitation. *Arch Phys Med Rehabil*. 1997; 90: 1269-1283.

⁹ Harvey RL. Inpatient rehab facilities benefit post-stroke care. *Manag Care*. 2010; 19(1):39-41.

¹⁰ Langhorne P, Duncan P. Does the organization of postacute stroke care really matter? *Stroke*. 2001; 32:268-74.

¹¹ Organized inpatient stroke unit care after stroke. *Cochran Database Sys Rev*. 2000; 2:CD000197.

¹² Dobkin BH. Rehabilitation after stroke. *N Engl J Med*. 2005; 352:1677-84.

¹³ Buntin MB. Access to postacute rehabilitation. *Arch Phys Med Rehabil*. 2007; 88:1488-93.