# Preventing the Rebound

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American health care is the costliest in the world and one of the most inefficient. The Centers for Disease Control estimate that $2.34 trillion were spent in 2008 in health care.[1] Hospital care is the most expensive part of our medical system, accounting for one third of total health care expenditures (Figure 1). Moreover, the costs of hospital care have increased by 4.5% to 7.8% annually throughout the last decade. About 2.2 million hospital discharges in 2009 were labeled with neurological diagnoses (Table 1), or roughly 1 out of every 18 patients treated in hospitals.[2] Hospital readmissions may have a negative impact on clinical outcomes, annulling any gains made during the previous hospitalization. Readmissions are also costly, as the average cost[2] of a hospitalization for a neurological problem is $38 559. These figures represent both a challenge and an opportunity for neurohospitalists. Yet, the available medical literature offers scarce guidance regarding the main causes of clinical deterioration post-discharge.

In the current issue of *The Neurohospitalist*, Nahab and colleagues survey the causes of readmissions of patients with a diagnosis of cerebrovascular disease to an academic hospital. Overall, the authors found the readmission rate to be 6.4%, of which about half were considered "avoidable" under the authors' definition. Multivariate analysis identified length of hospital stay as the only factor associated with readmission. The principal reason for readmission was for procedures that could not be scheduled during the initial hospitalization, followed by inadequate plans for outpatient follow-up and an incomplete diagnostic workup.

However, it is not entirely clear that most readmissions for a procedure are unwarranted. In many institutions, operative room schedules and preoperative workup may be difficult to arrange. Under such circumstances, it may be preferable to discharge patients and have the service in charge of the procedure to arrange for the readmission, instead of holding patients in the hospital for a workup that may prolong hospital stay for several days, particularly when patients are fully ambulatory with a Rankin score of 0. Nahab and colleagues do not clarify whether their readmissions were due to availability issues (ie, weekends or holidays) or full/inflexible operating room schedules. On the other hand, some delays are the product of traditional habits rather than evidence. For instance, many surgeons still prefer to wait several weeks after a stroke to perform a carotid endarterectomy.

One of the strengths of this study is the checklist of items provided by the authors to reduce avoidable 30-day readmissions. Checklists can be easily instituted and modified in a hospital system and can improve performance and reduce errors.[3] It is presently unclear whether it would be of greater benefit (and potentially more cost effective) to target some of the items to a subpopulation of patients who are high risk for readmission, for example close follow-up appointments (ie, 1 week post-discharge) for those patients with a long length of stay. This targeted intervention could be studied further in well-designed randomized controlled trials.[4]

As the authors note, the avoidable readmission rate of 6.4% is likely an underestimate of the true 30-day readmission rate, as this figure does not account for patients who are admitted to other hospitals. This is a particularly relevant issue for tertiary-care referral centers, which typically receive patients from a large surrounding area. This readmission rate also does not reflect post-discharge emergency room visits which tend to be expensive. Finally, it is also important to account for and explore the reasons for "unavoidable" readmissions, as the definition used in any particular study leads to wide variation in what is deemed "avoidable" versus "unavoidable."[5] In many cases, readmissions are due to medical complications (ie, aspiration pneumonitis, skin and soft tissue infections, and deep vein thrombosis [DVT]) that may have been avoidable had the proper precautions been taken. In other cases, readmission may be due to factors beyond the control of the hospital (ie, patient's lack of adherence to the treatment plan).

While controversial, using the 30-day readmission rate as a marker of quality of care is a first step in improving the transition from the hospital to the outpatient setting

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| ITEM | $ (Billions) |
|---|---|
| Hospital Care | 718.4 |
| Physician and Clinical Services | 496.2 |
| Other Professional Services | 65.7 |
| Dental Care | 101.2 |
| Other Personal Health Care | 68.1 |
| Home Health Care | 64.7 |
| Nursing Home Care | 138.4 |
| Prescription Drugs | 234.1 |
| Other Medical Products | 65.5 |
| Administration Government and Private Health Insurance | 159.6 |
| Government Public Health | 69.4 |
| Medical Research | 43.6 |
| Investment Structures and Equipment | 113.9 |

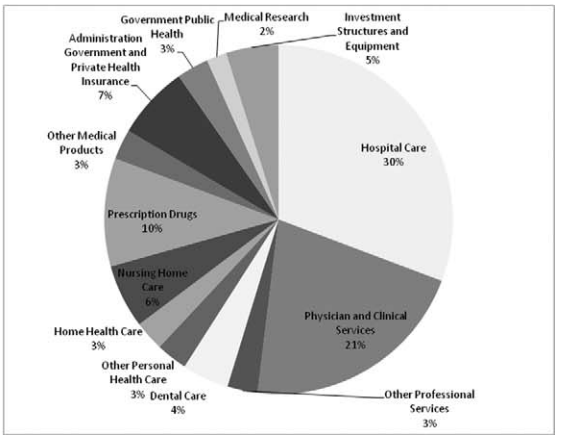


**Figure 1.** National health care expenditures, 2008.

**Table 1.** Outcomes and Total Costs by Neurological Disorders, Year 2009[a]

| | Disorders of the Nervous System | Standard Errors |
|---|---|---|
| Total number of discharges | 2 210 056 | 62 611 |
| LOS (length of stay), days (mean) | 4.9 | 0.1 |
| Charges, $ (mean) | 38 559 | 1338 |
| Costs, $ (mean) | 11,156 | 242 |
| In-hospital deaths | 81 615 (3.69%) | 2878 (0.09%) |

[a] Weighted national estimates from Healthcare Cost and Utilization Project Nationwide Inpatient Sample (NIS), 2009, Agency for Healthcare Research and Quality (AHRQ), based on data collected by individual states and provided to AHRQ by the states. Total number of weighted discharges in the United States are based on HCUP NIS which is 39 434 956.

by identifying risk factors and assessing the impact of targeted interventions.

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