

Do Major Teaching Hospitals Provide Better Care to Patients with Cardiovascular Disease?

Polanczyk CA, Lane A, Coburn M, et al. Hospital outcomes in major teaching, minor teaching, and nonteaching hospitals in New York state. *Am J Med* 2002;112:255–61.

Study Overview

Objective. To determine the effect of a hospital's teaching status on in-hospital mortality, use of invasive procedures, length of stay (LOS), and charges in patients admitted with myocardial infarction (MI), heart failure, or stroke.

Design. Retrospective administrative database analysis with risk adjustment.

Setting and participants. The authors analyzed a New York State claims-based hospital database containing information on 388,964 consecutive patients admitted with heart failure ($n = 173,799$), MI ($n = 121,209$), or stroke ($n = 93,956$) from 1993 to 1995. 248 participating acute care hospitals were classified by teaching status (major, minor, or nonteaching) based on their membership in the Association of American Medical Colleges (AAMC) and affiliation with accredited residency programs.

Main outcome measures. The primary outcomes were the standardized in-hospital mortality ratios amongst the 3 groups of hospitals, adjusted for patient demographics, admission type, and comorbidities. Utilization of invasive procedures, LOS, and total hospital charges also were compared between the 3 groups of hospitals. LOS was adjusted for demographics, admission type, comorbidities, discharge disposition, and the use of invasive cardiac procedures. Total hospital charges were adjusted for demographics, admission type, and LOS.

Main results. Adjusted in-hospital mortality ratios were significantly lower in major teaching hospitals compared with nonteaching hospitals (odds ratio [OR], 0.976 for heart failure, 0.945 for MI, and 0.958 for stroke; $P < 0.001$ in all 3 cases). In-hospital mortality was significantly higher for stroke patients admitted to minor teaching hospitals compared with nonteaching hospitals (OR, 1.06; $P < 0.001$) but not for patients admitted with heart failure or MI. Compared with nonteaching hospitals, use of invasive cardiac procedures and adjusted hospital charges were significantly greater in major and minor teaching hospitals for all 3 conditions. The adjusted

LOS was shorter for MI patients in major teaching hospitals and longer for stroke patients in minor teaching hospitals.

Conclusion. Patients admitted to major teaching hospitals for heart failure, MI, or stroke suffer significantly less in-hospital mortality compared with nonteaching hospitals. This benefit comes at a significantly increased cost, at least partially accounted for by the higher utilization of invasive cardiac procedures in major teaching hospitals.

Commentary

The recently published report from the Institute of Medicine [1] has highlighted the issue of health care quality for patients and providers alike. While major teaching hospitals often are considered to be centers of excellence [2], there is only limited evidence to justify these claims [3] or the higher cost of care at these institutions [2]. This study, therefore, adds much to the debate about the cost-effectiveness of teaching hospitals.

Polanczyk et al showed that patients admitted to major teaching hospitals for heart failure, MI, or stroke had significant reductions in adjusted in-hospital mortality, ranging from 2.4% to 5.5%. If the increases in adjusted costs were taken into account, this mortality reduction would come at a cost of about \$77,000 to \$186,000 per life saved. By most standards, this represents good value for the money.

This conclusion, however, needs to be evaluated in light of a few methodologic problems. First, the classification of teaching status based on membership in AAMC and affiliation with residency programs may be imprecise compared with other methods that utilize the number of residents per bed. This classification method, in turn, may have been responsible for the somewhat contradictory finding that stroke patients admitted to minor teaching hospitals suffer greater mortality than similar patients admitted to nonteaching hospitals.

(continued on page 239)

"Outcomes Research in Review" is edited by Harvey J. Murff, MD, Stephen D. Persell, MD, Josh F. Peterson, MD, and Eric G. Poon, MD, all from the Department of Medicine, Brigham and Women's Hospital, Boston, MA; and David R. Spiegel, MD, Dana-Farber Cancer Institute, Boston, MA.

(continued from page 236)

Second, while risk adjustment techniques were used to account for differences in case-mix among the 3 groups of hospitals, these techniques are far from perfect [4]. Many important clinical factors, such as reasons for transfer, relative contraindications to invasive procedures (eg, dementia), patients' do not intubate/do not resuscitate status, and other preferences, cannot be ascertained from an administrative database. These factors could easily have biased the authors' results towards showing a benefit for patients admitted to the teaching hospitals, as previous studies have found that patients may prefer nearby community hospitals when near death and desiring comfort care [5].

Even if we accept that major teaching hospitals confer significant mortality benefit, we still have to explain the reason for this quality gap. To accomplish this goal, we would need further studies investigating the processes of care, such as the appropriateness of invasive procedures, timely administration of proven life-saving medical therapies, and adequacy of staffing levels. Additionally, other dimensions of quality besides mortality are relevant; long-term survival, recovery of function, and patient satisfaction also are important outcomes. As the editorial in the same issue discusses [6], we should not rely on vague concepts of "teaching status" to evaluate the quality of care. Instead, we need to dissect the findings outlined by the authors of this article in order to understand the causal pathways to good health care.

Applications for Clinical Practice

Patients admitted to major teaching hospitals for heart failure, MI, or stroke may be less likely to die during their hospital stay compared with patients treated in nonteaching hospitals. However, contributors to this mortality benefit remain undefined and the choice of a health care facility should not be based solely on its "teaching status."

—Review by Eric G. Poon, MD

References

1. Institute of Medicine. Crossing the quality chasm: a new health system for the 21st century. Washington (DC): National Academy Press; 2001.
2. Epstein AM. US teaching hospitals in the evolving health care system. *JAMA* 1995;273:1203–7.
3. Rosenthal GE, Harper DL, Quinn LM, Cooper GS. Severity-adjusted mortality and length of stay in teaching and nonteaching hospitals. Results of a regional study. *JAMA* 1997; 278:485–90.
4. Iezzoni LI. Major teaching hospitals defying Darwin [editorial]. *JAMA* 1997;278:520.
5. Iezzoni LI, Shwartz M, Moskowitz MA, et al. Illness severity and costs of admissions at teaching and nonteaching hospitals. *JAMA* 1990;264:1426–31.
6. Showstack J. Assessing hospital outcomes: it's time to get inside the black box [editorial]. *Am J Med* 2002;112:314–5.

Copyright 2002 by Turner White Communications Inc., Wayne, PA. All rights reserved.