

Choices and Tradeoffs: Decreasing Costs or Improving Hospital Mortality Rates

Ann E. Tourangeau

The Issue

There is wide variation in risk- and case mix-adjusted hospital 30-day mortality rates for acutely ill medical patients across Ontario hospitals, and mean risk-adjusted hospital mortality rates for these patients increased between 1999 and 2003 (Table 1). In 1998/99, this rate for acutely ill medical patients (those with acute myocardial infarction [AMI], stroke, pneumonia, and septicemia or blood poisoning) was 15% and in 2002/03, the mean mortality rate for this same patient population was 17.4%. The span or variation of mortality rates in 2002/03 was 9.9% to 28.3%. Known reasons for variation in mortality rates include patients' own characteristics and their associated risk factors as well as structures and processes of hospital care (quality). But once patients' characteristics and their associated risks have been accounted for, as in the rates identified in Table 1, why does wide variation in rates persist across hospitals? It is reasonable to suspect that much of the remaining variation is related to the quality of hospital care – the structures and processes of care. Because nurses provide most of the ongoing care to hospitalized patients, it is reasonable to also suspect that hospital nursing structures and processes are related to quality indicators such as mortality rates.

Previous Canadian Research

Previous research by the Institute for Clinical Evaluative Sciences (ICES) has found that three hospital variables explained 32% of variance in Ontario teaching and community hospital risk-adjusted 30-day mortality rates for acutely ill medical patients throughout 1998–1999. Lower hospital mortality rates were associated with a higher proportion of registered nurses (RNs) in the nursing staff mix (as opposed to licensed/registered practical nurses or unlicensed assis-

tive personnel), more years of nurse experience on the current medical unit and more missed shifts by nurses (increased sick time). A similar study in Alberta found that a nursing staff mix richer in RNs was associated with lower 30-day mortality rates and that hospitals with a higher proportion of baccalaureate or university-educated nurses caring for acutely ill medical patients had lower mortality rates.

The Current Study

In the most recent study, ICES and University of Toronto scientists investigated the association between hospital quality (structures and processes of care) and risk-adjusted 30-day mortality rates for the same population of patients throughout 2002–2003. They surveyed nurses working in medical and

Table 1. Hospital 30-Day Mortality Rates for Acutely Ill Medical Patients in Ontario Hospitals*

Fiscal Year	Mean	Range
1998–1999	15%	10.5–21.5%
2002–2003	17.4%	9.9–28.3%

*n = 75 teaching and community hospitals.
Adapted from Tourangeau et al. (2007).

Table 2. Description of Study Patients by Diagnosis Group

	AMI	Stroke	Pneumonia	Septicemia	All Patients
Number of cases	19,475	11,160	13,433	2,925	46,993
Mean age (yr)	69	74	72	70	71
% male	63	50	49	48	55
Crude mortality rate	13	21	16	31	16.9

AMI = acute myocardial infarction.
Adapted from Tourangeau et al. (2007).

combined medical-surgical units in 75 Ontario teaching and community hospitals between February and May 2003. The scientists linked these nurse survey data with data on 46,993 patients admitted to hospital with AMT, stroke, pneumonia and septicemia between April 1, 2002, and March 31, 2003, in order to determine nursing-related elements that impact 30-day mortality. Table 2 describes patients included in this study by diagnosis group.

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Eight variables explained 45% of variation in Ontario hospital mortality rates. Lower 30-day mortality rates were associated with (1) a higher proportion of RNs in the nursing staff mix, (2) a higher proportion of university-educated nurses, (3) higher nurse-reported adequacy of staffing and other resources, (4) increased use of care maps/protocols to guide patient care, (5) lower total dose (number) of nursing personnel, (6) higher nurse-reported quality of care, (7) lower nurse-reported manager ability and support and (8) higher nurse burn-out. Specifically, a 10% increase in proportion of RNs providing care to acutely ill medical patients was associated with six fewer deaths per 1,000 discharged patients. A 10% increase in university-educated nurses caring for these patients was associated with an additional nine fewer deaths per 1,000 discharged patients. And, a 10% increase in nurse-reported adequacy of staffing and other resources was associated with 17 fewer deaths per 1,000 discharged patients.

Discussion

These findings point to at least three ways that hospital quality can be improved to lower mortality rates. Yet risk-adjusted mortality rates are increasing rather than holding steady or decreasing for this patient group in Ontario hospitals. Why is this so? Why have hospitals decreased their proportions of RNs in their nurse staffing mix (75% in 1999 and 66% in 2003)? There are a number of possible explanations.

First, hospitals are not routinely held accountable for quality outcomes such as mortality rates to the same extent that they are held accountable for financial outcomes. Because it has been difficult for hospitals to calculate their own risk-adjusted rates, this outcome often remains invisible. Consequently, some hospitals may choose to ignore the evidence and continue to substitute RNs with less expensive nursing personnel. Others might argue that we are in the midst of an acute and persisting shortage of RNs. This shortage is related to baby boomer retirement, inadequate replacement of retirees with newly educated

nurses (recruitment), increasing demand for RNs (e.g., for an increasingly aging population with more healthcare needs) and, more recently, difficulty retaining new nurses in hospital work environments that are less than optimal.

If hospitals have goals of minimizing unnecessary patient death for their acute medical patients, they should maximize the proportion of RNs providing direct care, aggressively seek to hire and retain university-educated nurses and make a significant investment in the development, use and systematic updating of care maps or protocols to guide patient progress throughout hospitalization. **HQ**

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About the Author

Ann E. Tourangeau, RN, PhD, is an adjunct scientist with the Institute for Clinical Evaluative Sciences and an associate professor at the Lawrence S. Bloomberg Faculty of Nursing at the University of Toronto, Toronto, Ontario. She holds a Career Scientist award (2003–2008) from the Ontario Ministry of Health and Long-Term Care. For more information, contact Ann Tourangeau at ann.tourangeau@utoronto.ca.



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