

Quality of Care and Outcomes of Older Heart Failure Patients: Is the United States Doing a Better Job Than Canada?

The Issue

Despite similar culture, economy and geography, the United States and Canada have very different methods of financing and delivering healthcare. The U.S.' market-oriented system with limited governmental control is in sharp contrast to Canada's single-payer system covering the majority of physician and hospital services and prescription medications for seniors (Iglehart 2003; Detsky and Naylor 2003). Per capita healthcare costs are considerably lower in Canada than in the U.S., but Canadian budgetary constraints have resulted in limited access to specialized care such as invasive cardiac procedures and physician specialists. In contrast, the supply of specialized healthcare is greater in the U.S., but there are many challenges there including a lack of healthcare access for many uninsured patients and a lack of prescription drugs for the elderly and chronically ill.

Little is known about the care and outcomes for chronic conditions with substantial public health impact. Heart failure (HF) is an important condition to study because it affects millions of Canadians and Americans, and the long-term outcomes of HF patients are extremely poor, with one-year mortality rates after hospitalization estimated to be 25% to 40% (American Heart Association 2005). Evaluating the patterns of care and outcomes of HF patients treated in both countries may provide insights about the relative performance of these two health systems.

Study and Findings

Through international collaborative efforts, ICES scientists compared processes of care, 30-day and one-year risk-standardized mortality rates among 28,521 U.S. Medicare beneficiaries and 8,180 similarly aged patients in Ontario, Canada, hospitalized with HF from 1998 to 2001. The mean age of HF patients in both countries was 80 years. On average, U.S. patients

had a shorter length of stay (median five days vs. six days). In the U.S., patients underwent left ventricular ejection fraction (LVEF) assessment, a test to assess heart function, during hospitalization at a higher rate than those in Canada did (61.2% vs. 41.7%, $P < 0.001$). At discharge, patients in the U.S. were prescribed beta blockers (28.7% vs. 25.4%, $P < 0.001$) more frequently than Canadians were, but angiotensin-converting enzyme (ACE) inhibitors (54.3% vs. 63.4%, $P < 0.001$) were prescribed less frequently (Exhibit 1). After adjusting for the fact that Canadian patients had higher risk characteristics on admission than American patients had, 30-day risk-standardized mortality was still significantly lower for the U.S. patients (8.9% vs. 10.7%, $P < 0.001$), but one-year, risk-standardized mortality was not significantly different (32.2% vs. 32.3%, $P = 0.98$) (Exhibit 2).

Exhibit 1. Processes of care and medications at hospital discharge*

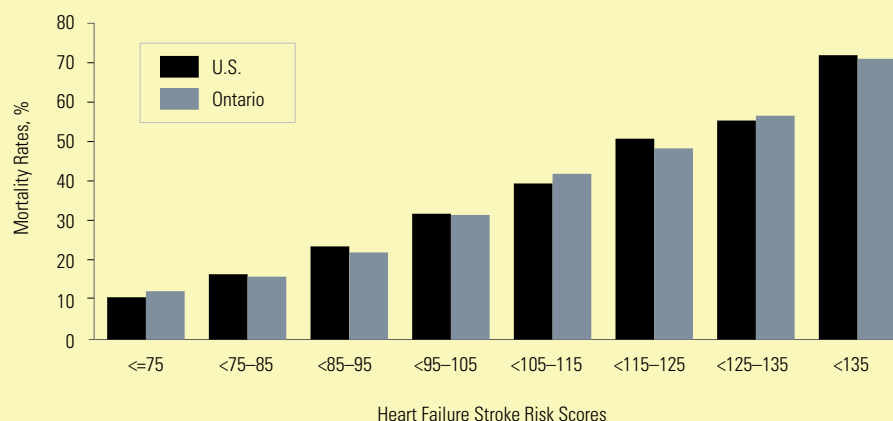
Characteristics	United States (n = 28,521)		Ontario (n = 8,180)		P Value
In-Hospital Cardiovascular Procedures (n, %)					
LVEF assessment	17,459	61.2	3,414	41.7	<0.001
Cardiac catheterization	1,589	5.6	48	0.59	<0.001
Percutaneous coronary intervention	163	0.57	4	0.05	<0.001
Coronary artery bypass grafting	118	0.41	3	0.04	<0.001
Prescribed Medications at Hospital Discharge (n, %)[†]					
Aspirin	10,790	39.7	2,908	40.0	0.70
Beta blockers	7,803	28.7	1,849	25.4	<0.001
ACE inhibitors	14,756	54.3	4,614	63.4	<0.001
ARBs	2,152	7.9	423	5.8	<0.001
ACE inhibitors or ARBs	16,908	62.2	5,014	68.9	<0.001
Lipid-lowering medications	4,525	16.7	1,094	15.0	<0.001

*ACE, angiotensin-converting enzyme; ARB, angiotensin receptor blocker; LVEF, left ventricular ejection fraction; n, number; SD, standard deviation.

[†]Patients who did not survive to hospital discharge or who were transferred out were excluded from this analysis.

This table compares the use of in-hospital cardiac procedures and medications at hospital discharge among 28,521 heart failure (HF) patients in the United States and 8,180 HF patients in Ontario.

Exhibit 2. Mortality rates at one year in the United States and Ontario, stratified by heart failure risk scores



This graph shows mortality rates at one year in the United States and in Ontario, stratified into approximate deciles based on heart failure risk scores. Mortality rates between the U.S. and Ontario within each risk category were not statistically different.

What Do these Findings Mean?

Heart failure (HF) patients hospitalized in Canada had higher illness severity, indicating worse predicted outcomes on average, compared with HF patients in the U.S. It is well recognized that hospital downsizing during the 1990s due to federal budget deficits created a strain on the Canadian healthcare system (Detsky and Naylor 2003). As a result, Canadian physicians, who are more likely to face chronic hospital bed shortages, may rationalize each admission decision, depending on local bed availability. Similarly, it has been demonstrated that LVEF assessment is more likely to be performed in hospitals with advanced cardiac capabilities. Therefore, fewer LVEF measurements in Canadian HF patients might be explained by resource limitations. Substantial differences in the overall prescription of life-saving therapies such as beta blockers or ACE inhibitors were not observed; however, a considerable number of elderly patients in both countries were prescribed neither therapy despite proven benefits (Hunt et al. 2001). This observation suggests a great opportunity to improve the care of HF patients, both in Canada and the U.S. Finally, differences in healthcare delivery in the two countries may partly explain the observed mortality trends. It is plausible that better short-term outcomes in the U.S. may relate to the intensity of hospital care and the similar long-term outcomes between the countries may reflect better access in Canada to outpatient follow-up and prescription drugs, which are universally covered in the Canadian healthcare system.

Where Do We Go from Here?

This study represents one of the most comprehensive comparison studies of nationally representative HF patients in the U.S.

and Canada. One of the most important findings of the study is the fact that life saving therapies such as ACE inhibitors and beta blockers are substantially underused in both countries. The first step to improve outcomes of HF patients is simply to improve efforts to increase the prescribing of evidence-based medications. HF patients hospitalized in the U.S. were also found to have significantly better short-term mortality but equivalent long-term mortality compared with HF patients in Canada. The observed mortality pattern cannot be fully explained because the processes of HF care, besides medical therapy, that are associated with improved HF outcomes are not well understood.

Given the poor long-term outlook for HF patients, further efforts are needed to gain additional insights to improve the care and outcomes of HF patients in both countries.

References

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About the Author

Dennis Ko, MD received his MD from the University of Ottawa and postgraduate training at the Cleveland Clinic Foundation and Yale University School of Medicine. He was recently awarded the prestigious Elizabeth Barrett-Connor Young Investigator Award in Clinical Epidemiology at the American Heart Association. His work uses methods of clinical epidemiology and health services research to generate knowledge to improve the health and healthcare of persons with or at risk for cardiovascular disease. Dr. Ko is an assistant professor at the University of Toronto, an interventional cardiologist at Sunnybrook and Women's Health Sciences Centre and a research fellow at the Institute for Clinical Evaluative Sciences in Toronto.