EDITORIAL COMMENT

Outpatient Percutaneous Coronary Interventions

Hospital and Health System Costs Saving While Maintaining Patient Safety*

Andra M. Popescu, MD, William S. Weintraub, MD

Newark, Delaware

Tremendous improvements in interventional cardiology make percutaneous coronary intervention (PCI) a rather routine procedure, at least in the U.S. and other wealthy countries around the world. Approximately 1 million PCIs are performed annually in the U.S., with health care costs approaching $10 billion. Reducing costs of expensive, frequently performed procedures is a societal imperative. Aging baby boomers, increasing demand on hospital services, and rising costs of health care call for strategies to decrease expenditures. Such strategies, although increasingly popular, must be carefully examined, because cutting cost must be safe while providing financial benefit to both payers and health care providers.

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The cost analysis published by Rinfret et al. (1) in this issue of JACC: Cardiovascular Interventions aims to characterize the economic impact of same-day discharge after uncomplicated transradial PCI. In the clinical outcome report from the EASY (EArly Discharge After Transradial Stenting of Coronary Arteries) trial (2), a total of 1,004 patients were randomized after uncomplicated PCI to either same-day discharge or overnight hospital stay. Those who stayed overnight received a 12-h infusion of abciximab, whereas the early discharge group had solely abciximab bolus during intervention. There was no difference at 30 days after PCI in the primary composite end point (death from any cause, unplanned revascularization, myocardial infarction [MI], major bleeding, access site complications, repeat hospital stay related to PCI, severe thrombocytopenia). There was, however, a statistically significant increase in repeat revascularization in the early discharge group (5 in the early discharge group vs. 0 in the overnight group, p = 0.025). In this cost analysis Rinfret et al. (1) estimated 30-day post-PCI health care cost in Canadian dollars and actual post-PCI hospital cost/patient involved in the EASY trial. Savings associated with same-day discharge were significant ($1,117 ± 1,554 for outpatient PCI vs. $2,258 ± 1,328 for overnight-stay). The mean difference of $1,141 (95% confidence interval: $962 to $1,320), representing a 50% relative reduction in medical costs after PCI, was mainly attributed to the hospital cost for the overnight stay (procedure cost was the same for both groups and not calculated in this analysis). These findings, although extremely enticing, must be considered critically. One potential limitation of the current analysis is that it did not use actual costs for patients enrolled in the EASY trial but rather estimates based on charges from a different hospital. Although it did not use the actual cost for each individual patient, it seems reasonable to extrapolate costs incurred within the same health system. In addition, sensitivity analysis confirmed that by decreasing or increasing the per-hour cost from $65/h/patient used for analysis to as low as $10 or as high as $88 or $167/h/patient, the cost saving remained significant for the overnight group. The 30-day follow-up was critical, because this analysis demonstrated that there were no increased costs after discharge in the early discharge group, although there was an increase in repeat angiography (10 patients in the early discharge group vs. 7 patients in the inpatient group) and increase in subsequent revascularization (5 patients in the early discharge group vs. none in the inpatient group, p = 0.025). At least 2 critical questions are raised concerning discharging patients on the same day after PCI: the first is whether it is safe, and the second is whether it saves money and for whom. Among the first to publish their data, Koch et al. (3–5) proved that patients can be safely triaged to same-day discharge or overnight stay on the basis of independent predictors, such as acute closure, side branch occlusion, unsuccessful PCI, female sex, and unplanned stent. The randomized EPOS trial (Elective PCI in Outpatient Study) published by Heyde et al. (6) in 2007 also demonstrated safety of same-day discharge in selected patients, with 1-year outcome data similar in the 2 groups. The major limitation of these non-U.S. studies is that anticoagulation and antiplatelet therapies were limited to heparin and clopidogrel. Newer agents, such as glycoprotein IIb/IIIa or direct thrombin inhibitors, widely used in the U.S., were excluded from these studies. Nonrandomized studies including newer agents had small sample size and hence limited power (7). Another limitation of most of these non-U.S. studies is transradial vascular access (8–11), rarely used in the U.S. but widely used in Europe with significantly less bleeding risk. Findings of these studies are thus somewhat less pertinent to the current U.S. practice.
The second question raised by the current cost analysis conducted by Rinfret et al. (1) is whether the savings seen in the Canadian health system are truly applicable to U.S. health care. Although it might seem very attractive to the health care system, there might be actually a disincentive for hospitals to move from an inpatient reimbursement to an outpatient same-day discharge reimbursement.

In our hospital, most elective PCIs are reimbursed as outpatient procedures (23-h observation with overnight stay after procedure), considerably less than inpatient PCI (average $7,000 for outpatient PCI vs. $9,000 for inpatient PCI). A significant number of nonelective PCI patients (currently reimbursed as inpatient PCI) could be safely discharged the same day after PCI, according to EASY trial findings. At our hospital, the marginal cost for 1-night observation stay is approximately $400, considerably less than the average $1,140 used by Rinfret et al. (1) in their analysis. If one-half of the almost 1 million PCIs performed annually in U.S. were eligible for same-day discharge (elective PCIs and uncomplicated PCIs in low-risk patients with unstable angina or non–ST-segment elevation MI), health care savings would be between $200 million and $500 million (using marginal cost for overnight observation at our institution vs. average cost for overnight stay in Canada). If the current outpatient PCI reimbursement remains the same, hospitals save at least $200 million by discharging patients the same day. Health system savings can potentially be higher if low-risk patients with unstable angina and non–ST-segment elevation MI (currently reimbursed as inpatient PCI) could be safely discharged the same day and PCI is reimbursed at outpatient level. In addition, an increase in inpatient capacity (potentially 500,000 bed-nights/year) might reflect an increase in hospital revenues. Although this extrapolation from a single center has its obvious limitations, the potential savings must be considered in an era with limited health care resources.

At least 2 other barriers must be addressed to implement same-day PCI as a new standard of care in the U.S. The first barrier is the medicolegal risk that U.S. providers and hospitals might incur by adopting a strategy different from the current standard of care. This is of less concern in the countries where most studies were performed. The second challenge is the likely apprehension of the U.S. public in considering a same-day discharge approach as a safe and preferred strategy. Newly diagnosed cardiovascular disease is a burden for patients, and they might benefit from additional in-hospital targeted education while staying overnight.

Current cost analysis by Rinfret et al. (1) demonstrates a decrease in health care costs with same-day discharge. Patient safety, however, must come first. We believe that larger studies reflecting the accepted U.S. practice (transfemoral access and new pharmacological agents [i.e., direct thrombin or glycoprotein IIb/IIIa inhibitors]) or a U.S. study using transradial approach ought to be available before making major changes in standard of care by discharging low-risk patients on the same day after PCI. Decreased payment by insurers might represent an incentive for U.S. hospitals to participate in safety trials on same-day discharge after uncomplicated PCI.

Reprint requests and correspondence: Dr. Andra M. Popescu, Christiana Care Hospital, Cardiology, 4755 Ogletown-Stanton Road, Room 2E99, Newark, Delaware 19718. E-mail: apopescu@christianacare.org.

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