Pushing the Limits on Same-Day Discharge: The Value Proposition of Same-Day Discharge in Patients Undergoing Complex PCI

Amit P. Amin MD, MSc1,2,3, Brandon Rahn, MHA2, Samantha Miller, RN, BSN2, Mary L. Caruso, RN2, and Patricia Crimmins-Reda, RN, BSN2,3

In our ongoing effort to bring greater visibility and understanding to the growing economic opportunities the transradial care pathway can afford when coupled with same-day discharge, we are pleased to introduce Dr. Amin’s original article. His article hits at the heart of any cath lab performing PCI in today’s healthcare environment and it offers real-world solutions that are aimed at achieving the Triple Aim in healthcare.

- Gary Clifton, VP, Terumo Business Edge
Pushing the Limits on Same-Day Discharge: The Value Proposition of Same-Day Discharge in Patients Undergoing Complex PCI

Amit P. Amin MD, MSc1,2,3, Brandon Rahn, MHA1, Samantha Miller, RN, BSN2, Mary L. Caruso, RN2, and Patricia Crimmins-Reda, RN, BSN2,3

In our ongoing effort to bring greater visibility and understanding to the growing economic opportunities the transradial care pathway can afford when coupled with same-day discharge, we are pleased to introduce Dr. Amin’s original article. His article hits at the heart of any cath lab performing PCI in today’s healthcare environment and it offers real-world solutions that are aimed at achieving the Triple Aim in healthcare. - Gary Clifton, VP, Terumo Business Edge

Safety and Feasibility of Same-Day Discharge After PCI

Percutaneous coronary intervention (PCI) is by far the most common cardiovascular procedure, performed in over 500,000 patients in the United States each year.1 Though it is safe and effective, conventionally a period of overnight observation even after elective, uncomplicated PCI is the standard of care, because of the potential risk of peri-procedural complications such as abrupt vessel closure and groin access site bleeding.

This practice of overnight observation after elective PCI, which comes at an added cost and is currently not reimbursed, has persisted despite the rapid uptake of radial access for PCI, and safe and effective anticoagulation strategies that reduce the risk of major adverse complications. Radial access for PCI has reduced the incidence of bleeding, transfusion requirement, asymptomatic hemoglobin drops, and vascular complications to extremely low single digits, and newer intervention- al techniques, along with safe and effective antiplatelet agents and anticoagulants, have reduced ischemic complications.

Prior studies have shown that the vast majority of complications and adverse events occur in the immediate post-procedural period, usually within the first 6 hours after PCI. This implies that perhaps an extended period of observation may be excessive for the majority of elective patients and same-day discharge after PCI may be feasible in selected patients after an appropriate but smaller observation period. This has led to the development of numerous protocols for same-day discharge, and over the past decade, several small, single-center observational studies, and single-center, randomized, controlled trials (RCTs) and meta-analyses have shown favorable outcomes, low complications, low cost, and higher patient satisfaction with same-day discharge after PCI in carefully selected patients.2 Thus, same-day PCI discharge programs have been shown to be clinically safe for low-risk PCI patients with asymptomatic, stable angina and no significant comorbidities. There are now approximately 20 studies that have addressed the issue of same-day discharge; none of these studies have reported any clinical harm in discharging low-risk PCI patients on the same day the procedure is performed. There is a lack of studies on the safety and feasibility of same-day discharge in more complex elective PCI patients.

Patient Satisfaction After Same-Day Discharge

Patient satisfaction is high with same-day discharge. From a patient perspective, early discharge offers patients an opportunity to get back home to their families more quickly and is a key driver for improved satisfaction. Physicians at Mount Sinai and Baylor Medical Center in Dallas found in a trial of 298 randomized patients that 80% of same-day PCI patients and 68% of next-day PCI patients would choose same-day discharge next time, if given the option.3 According to Patricia Crimmins-Reda, RN, BSN, the cardiovascular service line director at Barnes-Jewish Hospital (BJH), “A study at Barnes-Jewish Hospital in St. Louis also found that over 85% of patients reported their care was ‘excellent’ when discharged home same day.” According to Brandon Rahn, MHA, the project manager of the Heart and Vascular Program at BJH, “Same-day discharge after PCI allows patients to recover in the comfort of their homes and with their loved ones.” Samantha Miller, RN, BSN, cath lab manager at BJH, says, “At Barnes, we try to send as many elective PCI patients home same day as we can.”

Costs of Same-Day Discharge After PCI

An accumulating body of evidence now supports that same-day discharge is associated with lower costs of care. In the current climate of health care reform, lower costs of care offers a tremendous competitive advantage to hospitals. There is now a constant and increasing pressure on the U.S. health care system to reduce costs of care, and through various initiatives implemented under the Affordable Care Act, hospitals are increasingly challenged to deliver higher quality care at lower costs. These alternative care models require that hospitals assume both financial and performance accountability for the care of their PCI patients. Current and future health care delivery models such as bundled payments will provide even stronger incentives for hospitals to improve the efficiency of the care they provide. Same-day discharge after PCI is associated with a significantly lower cost of care. In a large national study of over 250,000 elective PCI patients eligible for same-day discharge from Medicare data, Amin et al found that the adjusted cost associated with transradial access for PCI combined with same-day discharge cost $13,389, while the cost associated with the traditional transfemoral access and overnight observation was $17,076, a difference of $3,689 (95% confidence interval [CI] $3,486 to $3,902, P<0.0001).4 Amin et al estimated that shifting current practice of transfemoral access and overnight observation to transradial access and same-day discharge by even 30% could potentially save a hospital performing 1,000 PCIs/year $1M/year and the country $300M annually (Figure 1).5 Thus, reducing length of stay by eliminating the overnight stay, which is the norm for elective PCI, significantly lowers the total cost of the care episode. Other studies have shown similar results. A Canadian study by Rinfret et al that compared same-day discharge after transradial PCI with overnight hospitalization realized a 50% reduction, or about $1,100 per patient, in medical costs in Canada.6 David Wohns, MD, Medical Director at Spectrum Health in Grand Rapids, Michigan, found similar cost savings when analyzing Spectrum’s first 200 same-day PCI discharge patients.6

Current Gaps in PCI Practice

Despite these convincing arguments, overnight observation remains the standard practice in the United States, as none of the prior studies included complex patients and there is uncertainty regarding the safety of same-day discharge in the overall elective population. Despite the changes occurring in clinical practice consensus guidelines and the change in financial incentives for the business of elective PCI over the past few years, relatively few programs across the country have

1Cardiovascular Division, Washington University School of Medicine, St. Louis, Missouri; 2Barnes-Jewish Hospital, St. Louis, Missouri; 3Center for Value and Innovation.

Corresponding Author: Amit P. Amin, MD, MSc; Washington University School of Medicine; Cardiology Division, Campus Box 8086; 660 S. Euclid Avenue; St. Louis, MO 63110; Email: aamin@wustl.edu

Disclosures: Dr. Amit P. Amin is funded via a comparative effectiveness research KM1 career development award (Grant Number 1KM1CA156708-01); an AHRQ R18 grant award (Grant Number R18HS024218-01A1), and is a consultant to the Medicines Company, Terumo and AstraZeneca. Brandon Rahn, MHA, Samantha Miller, RN, BSN, Mary L. Caruso, RN, and Patricia Crimmins-Reda, RN, BSN, report no conflicts of interest regarding the content herein.
The Future of Same-Day Discharge

The ability to predict complications in the higher risk and more complex elective PCI population could potentially enhance the safety and feasibility of same-day discharge, and allow providers to extend it to a broader, less selective population. Some hospitals are currently testing if the existing same-day discharge protocols can be extended to a broader, less selected population. They devised a novel protocol of using personalized medicine implemented via a software solution called ePRISM to identify risk of bleeding, mortality, and contrast nephropathy prior to PCI. Various evidence-based strategies are used to mitigate these risks and if successfully mitigated, same-day discharge is performed even among complex patients.

“It has allowed us to send over 80% of our elective PCI patients home,” says Dr. Amin, adding, “This includes the more complex patients, too, such as those with left main lesions, bifurcation lesions, bypass graft lesions, cases where athrectomy is used, or even those with comorbidities such as CKD [chronic kidney disease], provided AKI [acute kidney injury] risk is mitigated, and those with peripheral vascular disease, provided radial access was used. All risks are proactively reviewed, documented, and successfully mitigated before same-day discharge is performed with consensus of the nurses, and the patient and their families. Obviously, the key to our success has been use of radial access in those with a high risk of bleeding and minimizing contrast in those at high risk of AKI.”

“From an administrative perspective, in addition to the potential resource savings, same-day discharge programs free up additional resources for more complicated cases or high-growth programs. For example, beds that were previously dedicated to PCI patients can now be reallocated towards higher growth opportunities such as transcatheter aortic valve replacement (TAVR) patients, or complex electrophysiology or vascular cases,” notes Patti Crimmings-Reda, RN, BSN.

Conclusions

The literature is now increasingly supporting same-day discharge as the best clinical and financial strategy for outpatient PCI. Clinical or administrative reluctance to embrace a same-day discharge program for PCI is often based on misconceptions regarding reimbursement. Currently, the majority of elective PCI cases are coded as outpatients. With the introduction of the Centers for Medicare & Medicaid Services’ CMS two-midnight rule, which instructs that admission is appropriate only when a physician expects the patient’s hospital stay to span two midnights, the proportion of elective PCI cases that receive inpatient reimbursement rates has reduced. In the current era of healthcare reform, we need to accept the new reality that the vast majority of elective PCI cases receive outpatient, rather than inpatient, reimbursement rates, and that the traditional financial disincentive for hospitals to adopt same-day discharge strategies no longer exists. With reimbursement set at outpatient rates, the best clinical and financial strategy that reduces complications, improves patient satisfaction, and maximizes cost margins associated with elective PCI procedures is transradial access with same-day discharge. These data imply that hospitals and providers should engage with administrators to carefully evaluate and redesign the “PCI care pathway” to optimize clinical outcomes, achieve high patient satisfaction, and reduce resource utilization in the current climate of healthcare reform.

References