

Clinical and Discharge Management of the Transradial PCI Patient

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Gary Clifton, Vice President, Terumo Business Edge, talks with Amit P. Amin¹, MD, MSc, Duane S. Pinto², MD, MPH, Sunil V. Rao³, MD, and William A. Rollefson⁴, MD.

We reached out to Dr. Amin this month and asked him to consult with his colleagues about their opinions and clinical practices centered around same-day discharge and the complexity of procedures. These physicians are experienced interventional cardiologists who utilize transradial access as primary access as a part of their everyday practice. Overall, it would appear that complexity of cases does not mutually exclude patients being ineligible for same-day discharge. — Gary Clifton, Vice President, Terumo Business Edge



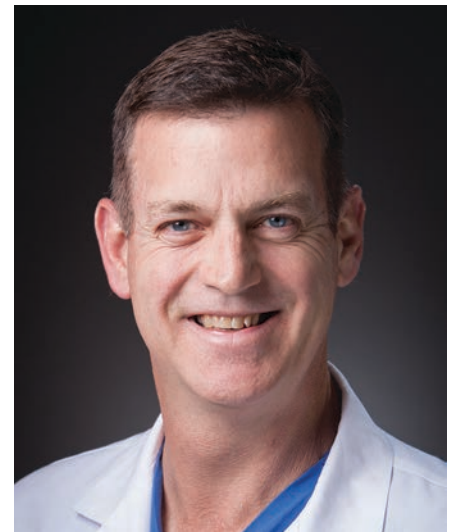
Amit P. Amin, MD



Duane S. Pinto, MD



Sunil V. Rao, MD



William A. Rollefson, MD

What defines complexity of a procedure? Is it just anatomy or do comorbidities play a role? What are your clinical criteria for classifying a patient or procedure as complex?

Amit Amin: I don't think there is any formal definition of complexity. But interventionalists can readily identify 'complexity'. To me, 'complex' is usually an elderly and frail patient with comorbidities and complex anatomy. Personally, between anatomic complexity and comorbidity burden, I think interventionalists are more comfortable dealing with complex anatomy — it is what they are trained to do. But it is the comorbidities such as chronic kidney disease, peripheral vascular disease, cerebrovascular disease and heart failure, and frailty that greatly impact a patient's ability to withstand a procedure and their post procedure course. Through the American College of Cardiology (ACC), Society for Cardiovascular Angiography and Interventions (SCAI), and National Cardiovascular Data Registry (NCDR) organizations, we have risk models that capture most of this "complexity" such as the bleeding risk model, mortality risk model, SYNTAX score for anatomic complexity, etc.

Sunil Rao: It is tough to define, but to paraphrase the words of Justice Potter Stewart — most interventionalists know it when they see it. It involves not only a high risk for procedure failure, but also a high risk of procedural outcomes (bleeding, ischemia, death), and is driven by both coronary anatomy, left ventricular (LV) function, and patient comorbidities.

Duane Pinto: I would agree that the definition of complexity varies by provider and patient, but in the current era, it refers to the comorbidities that we must consider in managing the patient before and after the procedure (anticoagulation, associated medical conditions, ventricular function) and the technical aspects of the procedure. We also consider

Sunil Rao: SDD is about the patient, the procedure, and the program. The patient should have a successful procedure, have social support at home, and be part of a SDD program that includes mechanisms to obtain appropriate secondary prevention medications (including dual antiplatelet therapy [DAPT]), counseling, and follow-up.

“We must have a formal same-day discharge (SDD) program in place to ensure a successful and uneventful transition to home after SDD. To me, a major concern is access site complications or oozing or bleeding, and I prefer transradial over transfemoral.”

— Amit Amin, MD

William Rollefson: Anatomy AND comorbidities contribute to case complexity. However, “complexity” doesn't necessarily correlate to same-day discharge (SDD) eligibility. Each case is different, and on occasion, a “low” complexity case turns into a highly complex case.

mundane things that are really “complexities” after a procedure, like who will take care of the patient while at home, obtain their medications, and get them home from their procedure.

What do you look for, clinically and otherwise, to guide you in your discharge criteria?

Amit Amin: Although SDD is safe, as shown in numerous randomized trials, we must have a formal SDD program in place to ensure a successful and uneventful transition to home after SDD. To me, a major concern is access site complications or oozing or bleeding, and I prefer transradial over transfemoral. Once patent hemostasis has been achieved in the cath lab, I can be assured the patient is not going to have a complication. Another concern is risk of ischemic complications. A successful intervention, well-sized and well-expanded stents, no side branches lost nor dissections, use of appropriate anticoagulation, and ensuring effective P2Y12 inhibition is absolutely necessary prior to considering SDD. For patients with uncontrolled hypertension and diabetes, we also up titrate medications to control blood pressure and sugar, respectively, in the holding area of the cath

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“Just like we adopted a ‘radial first’ strategy, we have a ‘SDD first’ policy at our institution. In fact, the operator actually identifies patients for overnight stay, as opposed to SDD. Our main criteria are similar to published recommendations, but primarily focus on case outcome, home support, and time of day.”

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lab prior to discharge. In addition, there are patient-related factors as well, such as social support, and ability to comply with our verbal and written recommendations and comply with a next-day phone follow-up and an in-person clinic visit within a week. We also use a “mobile pharmacy” to ensure that patients get DAPT prior to discharge. We have a full-time employee dedicated to these processes. Thus, a SDD program needs to have all these processes aligned, and a “patient navigator” or “troubleshooter” for tracking and rapidly mitigating any patient concerns or problems that may arise after discharge.

William Rollefson: Just like we adopted a “radial first” strategy, we have a “SDD first” policy at our institution. In fact, the operator actually identifies patients for overnight stay, as opposed to SDD. Our main criteria are similar to published recommendations, but primarily focus on case outcome, home support, and time of day. I don’t send elderly folks home at 10pm if they have a 2-hour drive home. But, if they live in town, I will let them go home if they are willing. It’s really just common sense and asking yourself how you would treat your family member.

Duane Pinto: We look to see that the patient is prepared for a safe discharge and post-procedure follow-up. This begins with education and setting expectations during intake. Our nurses explain that most patients go home the same day once we have ensured that there is stability after several hours of monitoring. We then ensure that the patient can appropriately take their medications and understand how to deal with the possible but infrequent complications. We have a 24/7 hotline that patients can call if they have questions and this is staffed by a knowledgeable nurse practitioner. The patients are reassured by the availability, the calls are infrequent, and we avoid trips to the local emergency department for simple issues.

Can a patient receive an elective PCI and be discharged the same day even after a complex procedure or in the presence of comorbidities?

William Rollefson: Absolutely. We do it daily. To date, we have had ZERO returns to the hospital in our SDD patient experience.

Sunil Rao: It depends on the factors mentioned above. Procedural complexity alone is not an exclusion criterion for SDD.

Amit Amin: We are discharging patients with anatomy such as bifurcations, bypass graft PCI patients, and even some selected left main or CTO-PCI cases. Obviously, meticulous care and planning is required for the more complex cases. It just depends on the interventionalists’ gestalt of the case and the patient, and if all risks of complications were addressed and resolved. Going ‘radial first’ certainly helps.

Duane Pinto: Initially, we introduced procedural and patient complexity measures as a screen-out for patients for SDD, but rapidly recognized that these patients are not substantively predictive of late complications, so these have been removed.

Are you using any risk-based tools to evaluate the likelihood of procedural complications (bleeding avoidance, AKI avoidance, etc.)?

Duane Pinto: Presently, we do not utilize risk-based tools in our evaluation. We are in the process of automating these to serve as flags to the treating clinicians.

Sunil Rao: Yes, we use the SCAI Risk Assessment app regularly. The challenge with risk tools is that they are rarely used, because the onus to use them is on the care team. Once we integrate these tools into the electronic health record so that they are automatically calculated on

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every case, then we can really use them to guide care decisions.

William Rollefson: The clinical decision tools can potentially help, but they’re similar to Society of Thoracic Surgeons (STS) scores. They aren’t completely predictive. We have certainly learned this in fact in our structural mission. Personally, I hate cookbook medicine and don’t use any tools.

Amit Amin: We too are routinely using the NCDR CathPCI risk prediction models in the cath lab and have successfully integrated these tools in our EMR using a health IT solution called ePRISM, so that physicians and fellows review these patient-specific risks before every case. What is interesting is that it has helped us focus our attention on all complications, not just bleeding. Bleeding and ischemic complications are no doubt the important outcomes, but acute kidney injury, vascular complications, and readmission after PCI are also equally important adverse outcomes that matter to patients, physicians, and hospitals. By using these risk prediction models at the point of care, we have been able to integrate the explicit recognition of risks and its successful mitigation for same-day discharge planning, which in turn has helped in facilitating earlier discharge in the more complex patients.

Care variation has been identified in numerous surveys of hospital administrators as the single biggest opportunity to reduce healthcare costs. Are there considerations that clinicians who perform PCI should be thinking about to standardize PCI?

Sunil Rao: I don’t think we should completely standardize PCI. Every patient is different and in the era of precision medicine, attempting to standardize PCI into a “one-size-fits-all” recipe is taking the field backward.

William Rollefson: Every case is different, and trying to fit each patient into a category is a challenge. In regards to SDD, we have been applying it to around 70% of our PCI patients. Yet another major facility in Little Rock utilizes SDD <10%. Education and training are the best ways to “standardize” care.

Duane Pinto: It is difficult to fully standardize PCI, given the uncaptured confounding factors inherent to each patient or procedure, but there are substantial opportunities to operationalize standardization in domains such as arterial access, anticoagulation choices, preprocedural anticoagulation management, and discharge criteria, to name a few. We are unlikely to enter a world where we standardize approach to bifurcation lesions, wire utilization, or referrals for CABG, etc., where the opportunity is lower and consensus is unlikely to be found.

Amit Amin: Standardization to me means establishing standards for delivering high quality care, excellent outcomes, and patient satisfaction. I agree with others that it is impossible to have a “cookbook” or do the exact same thing for every case, as every patient is unique. Some examples of standardization in the cath lab could include use of bleeding avoidance strategies for patients with a high risk of bleeding. But within this standardization, which specific bleeding avoidance strategy to use in terms of anticoagulation and access site choice could depend on the patient’s clinical characteristics and physician preference. Another example is standardizing processes for preventing acute kidney injury, with minimal use of contrast or hydration. However, patients with heart failure or valve disease would not receive hydration or little hydration, commensurate with their clinical condition. Thus standardization would exist, but it would allow “patient-centered” variation as required by patients’ clinical condition. ■