

The Radial Approach: Redefining Outpatient Care for Interventional Cardiology Patients

By James Burns

For a number of years, an interesting phenomenon has been occurring in the world of interventional cardiology: routine cardiac angioplasty and stent procedures are being classified and reimbursed as outpatient procedures, yet many facilities bed these patients overnight on inpatient units and treat them exactly the same (and expend the same level of resources) as other patients who are classified and reimbursed as true inpatients. For many reasons, this practice was considered the standard, with losses incurred from the additional recovery time being accepted as the cost of being in the angioplasty “business.”

But recently, things have started to change. The use of the radial artery for diagnostic procedures has been around since the beginning of cardiac angiography. In fact, Dr. Mason Sones used a radial cut-down approach to perform the first cardiac catheterization. However, it wasn't until the mid-1990s that the radial artery was accessed for interventional procedures, as the majority were performed using the much more invasive groin approach. Physicians were opting for the risk of bleeding, which many believed manageable, over permanent radial nerve damage, especially for their working-aged patients.

But over time, technology improved. Better imaging has made visualizing smaller vessels much easier, while high-quality supplies have become more readily available in much smaller sizes: stents, catheters, sheaths, and guide wires have now been developed specifically for use with smaller vessels. This “rebirth” and broader adoption of the radial approach to angioplasty and stenting was first seen in Europe, where a revolutionary approach to the recovery of these patients was also unveiled: the radial recovery lounge.

Introduced in Amsterdam, The Netherlands, at Onze Lieve Vrouwe Gasthuis (OLVG) Hospital, this concept was the vision of Dr. Ferdinand Kiemeneij, who envisioned the first lounge for PCI recovery after returning from a trip that included spending time in a KLM airline lounge in a Schiphol Airport.¹ He is considered by many to be the father of transradial PCI.² In addition to proving the procedure to be safe, effective, and cost-saving, he also is credited for using this platform to completely reinvent the recovery process.

This “vision” included patients sitting in comfortable recliner chairs, as opposed to hospital beds, being allowed to ambulate freely (in the absence of a groin puncture site), and having such amenities as snacks and light meals, a selection of hot and cold beverages, and a

workspace equipped with printers and high speed internet.³ But the most beneficial amenity of all is the ability to convalesce in their own clothing, sitting upright, with family or loved ones nearby.

This concept is fast becoming a market differentiator, with overwhelmingly positive patient, physician, and staff satisfaction. Programs are quick to discover that with minimal investment and process redesign, a completely new experience for invasive and interventional cardiology patients can be achieved with the opening of a radial recovery lounge or **CAR (Cardiology Ambulatory Recovery) area**.



FIGURES 1-2: The radial recovery lounge at Onze Lieve Vrouwe Gasthuis Hospital in Amsterdam, The Netherlands.

Both positive clinical and financial data now exists regarding the radial access approach, like the EASY trial⁴, which compared the costs of uncomplicated, radial-approach PCI cases that were sent home the day of the procedure versus those who were kept overnight in observation status. The business and “best clinical practice” argument for converting appropriate patients from the traditional groin access approach to radial access is very strong. Data in the EASY trial, which followed over 1,000 patients, showed that the marked difference between cases was simply the additional costs of the overnight stay. Likewise, the SAFE-PCI trial⁵, sponsored by Duke University and initiated in August 2011, compares the transradial and the transfemoral approach to PCI in women. Approximately 35 centers in the United States participated, with nearly 1,800 cases. The data, reported in fall 2013, revealed a distinct advantage for using the radial approach in terms of less bleeding and fewer vascular complications.⁵

In another study, an estimated 595 bed days were saved through reduced overnight admissions in elective patients. The unit's overall rates of same-day discharge after elective PCI and coronary angiography increased dramatically in the year after the opening of a dedicated radial lounge, directly attributable to its use. Moreover, this approach also favorably impacted inpatient bed capacity as well.⁶

Despite these initial favorable outcomes, not all organizations are well-suited for this approach. Hospitals who serve a predominately indigent population or a disproportionate number of high-risk patients, will need to weigh the benefits verses risk of the lounge recovery approach more carefully, as the time spent in the hospital may be the only time these patients are following the prescribed protocols of care. With these distinctly unique populations, the benefits of an accelerated recovery process may be of detriment to those who are not physically or emotionally equipped, or do not have access to the necessary resources, to manage their immediate care outside of the structure of a hospital. Furthermore, patients with a high probability of developing a post-procedure arrhythmia or reocclusion will definitely need to remain hospitalized throughout the initial recovery period.

However, for the typical elective, low-risk PCI, the lounge concept is the ideal transition model to move patients from procedure to recovery to home in the shortest amount of time.

Clinical benefit

The clinical advantages of the radial approach are based mostly on the access site of the radial artery being a far easier point of entry than the femoral artery via groin access. The access site is smaller in size and patients are in far less discomfort. Faster recovery with the radial approach permits patients to recover in a lounge setting. Additionally, the risks of bleeding and the resulting complications of hematoma and pseudoaneurism are all essentially eliminated with the radial approach.^{7,8}

Financial benefit

There are distinct financial benefits to implementing the radial lounge approach. The cost to develop a traditional prep/recovery area for patient post-PCI care versus creating a lounge recovery area can be significant. Even adding an entire lounge in place of one recovery bay can save upwards of several thousands of dollars in space and equipment costs, as recovery beds can often require close to the same investment as a typical inpatient bed.

Furthermore, recovery is faster; thus transradial patients can be considered true outpatients, typically discharged just 4 hours after their procedure versus over 8 hours later or after an overnight stay with femoral access. Data from the EASY trial and Corazon's internal analyses demonstrate that a savings of up to \$1,300 can be realized for every patient that is discharged the same day when compared to those who stay overnight. Still considered an outpatient, with an outpatient reimbursement via APC 0229 of approximately \$9,600, the financial advantage of a fast recovery in a dedicated space becomes very clear.

Operational benefit

The lounge setting creates operational advantages via maximized space. Lounges can accommodate greater numbers of patients in a smaller area, considering the lack of beds and minimal equipment needed. Further, staffing needs are decreased based on patient condition – patients are much more mobile and self-sufficient, able to use the bathroom and perform personal care independently. Dedicated nurses, experienced in the care and recovery of the post-transradial catheterization/PCI population, observe patients with wireless telemetry as needed until they are ready to go home. Post-procedure care requires only an inflatable wristband (such as Terumo's TR band) that applies light pressure to the area of access, allowing patients freedom to walk around, eat, visit with family, etc.

Marketing benefit

A radial lounge can be a differentiator in a competitive market. As PCI sites expand around the country, patients, eager for a less restrictive experience, will begin to seek out this less-invasive option. However, due to the relatively recent adoption of this procedure and recovery approach, community education and outreach may be necessary, as patients might not even know this option is available. Corazon advises clients to utilize marketing budgets and creativity not only increase awareness and recognition of the procedure, but also to demonstrate market distinction for programs offering the high-end recovery service. Programs have also capitalized on the image of PCI becoming a routine outpatient encounter versus the fear of a high-risk invasive procedure with a lengthy recovery period.

Patient benefit

An improved patient experience may potentially be the greatest benefit of the radial approach. Patients who experience a radial procedure and recover in a radial lounge are able to avoid lying in a hospital bed for hours or

overnight, and instead move/walk around, sit, or recline while taking advantage of the relaxed atmosphere. Patients are typically not as sick or in pain as with the femoral approach, and the overall aesthetics of the specialized recovery area provides a more positive physical and emotional patient experience.

Since this recovery concept is newer to the United States, many early adopters have varying styles of lounges, from the basic addition of lounge chairs in an existing pre/post recovery area to the investment for the creation of a new, distinctive space.

In developing a CAR, Corazon recommends that programs dedicate the space and resources to make a unique and welcoming facility. And, even with the additional investment in amenities and environmental improvements, programs can recognize a rapid return on investment from the increased patient volume due to market awareness and distinction and the significant decrease in the cost of care that was referenced previously. In fact, the cost savings from only 100 PCI procedures can pay for the investment in a high-end radial recovery area, as many of the elements of a well-planned area are not all that expensive.

For Corazon, the ideal CAR should include:

- Dedicated family and patient waiting zones for those accompanying patients to their procedure or patients waiting to begin the preparatory phase of care.
- High speed internet and office/work supplies such as printers, telephones, and private work corrals for those wishing to conduct business or access e-mail or social sites while waiting/recovering.
- Entertainment such as on-demand music, movies, or television. Patient and family educational information can be presented in this method also. Some “high wired” centers can stream this information directly to patient’s tablets, smartphones, or laptops, while others have tablets available to lend to those who do not bring/have their own.
- Small lockers for valuables and personal effects, along with private personal care areas. Some programs have invested in multiple unisex stalls that can be an all-in-one restroom, changing room, and personal care area, and even showers for those who may request them (this inclusion will, most definitely, require physician input, as some Cardiologists do not want their patients showering for at least 24 hours after their procedure).
- Refreshments and snacks are fairly ubiquitous in all radial recovery lounges. Made to order meals and specialty hot and cold beverages are a unique offering some programs have added to their service, with these being outsourced to other providers, such as a Starbucks Coffee kiosk located within the hospital facility.
- Lounge chairs and comfortable resting areas for post procedure patients and loved ones.

While the layout of a radial lounge can differ from facility to facility, there are several hallmark characteristics that form the foundation of this approach to radial recovery. However, it is important to remember that this is still a

procedural recovery area, which needs medical monitoring and patient care equipment. Progressive programs have created an atmosphere that minimizes the aura of a sterile hospital via creative approaches that include:

- Patients are allowed to return to their street clothes as soon as possible. Or, in some cases, facilities have provided t-shirts or loungewear for patients to wear from initial recovery through their trip home. Often, these pieces of clothing are clearly branded as being part of the recovery area concept;
- Concealed nurse supply and documentation areas, which maintain access to emergency equipment, medications, and supplies as needed. Access to adjacent units can also provide for this;
- Monitors, when needed, are visible only to healthcare providers, to decrease the aura of being in a hospital area; and
- Many required care items, such as sphygmomanometers and medical gas access, are integrated into the furnishings of the area to allow the aesthetic to remain uncompromised while also allowing quick and easy access as needed.

Moving the Concept Forward

The first step in moving to this type of program is gaining physician support. While many new Cardiologists are leaving fellowships with sharp radial skills, there are many established physicians who have not had any recent radial access experience. Understanding how this can be integrated into an existing program may present a significant hurdle, which requires political savvy to avoid alienating supportive physicians who have no plans to begin integrating the radial approach into their practice.

Indeed, even if the benefits are clearly demonstrated from various perspectives, the physician(s) will still need to be on board in order to ensure the recovery lounge is fully utilized. The benefits of this approach and the faster recovery can no doubt positively impact the bottom line of a cardiac program, especially if volumes are high and a favorable patient mix are present. Corazon recommends discussions with medical directors and physician executives to understand how this challenge can be addressed. More than likely, bringing radial procedure skills to your facility may require succession planning or additional physician recruitment.

When in a hiring mode for the cardiac program, consider candidates’ capabilities and/or opinions about radial access. Physicians coming out of fellowship will most likely be trained for radial procedures and can become champions of integrating these procedures into a cardiology program, increasing attention to the new service due to all the benefits.

Not currently having a physician skilled in radial procedures should not stop the planning and/or implementation of a new recovery space for these patients. Developing an area that can transition as program capabilities increase will prevent the loss of momentum while waiting for physician support or larger facility investments. This may be a moot point as many

cardiologists are recognizing this emerging preference for the use of radial access and are retraining or seeking opportunities to hone skills by performing these procedures with established clinicians. Business-savvy cardiologists realize that if patients migrate elsewhere to receive this type of care and recovery, they will also seek other physicians who can provide this service as well.

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