The Clinical Value of Accreditation as Proven Through Results

Tim Attebery, Consultant; Joyce Froetschel, Accreditation Surveyor, Corazon, Inc.

When choosing an accreditation provider, it is important to consider the value this effort will add to your specialty program. Many accreditation approaches are designed to fulfill state requirements (if in place), but Corazon believes this is just the beginning. Our E3 Accreditation (Evaluate, Enhance, Excel) is uniquely structured to take your program to new heights of clinical quality, financial performance, and operational outcomes. Our qualified team of surveyors is dedicated to validating the best possible patient care and safety while helping clients stand out as market leaders in an increasingly competitive cardiovascular space.

There are many ways in which these goals are accomplished: on-site surveys, case reviews, peer review, attendance in quality meetings, chart reviews, and the list goes on... but how does one measure the value of these services? This is often accomplished through the documented clinical outcomes and the American College of Cardiology-National Cardiovascular Data Registry (ACC-NCDR) outcomes registry results, and then comparing these metrics over time.

The positive influence that accreditation can have on cardiovascular program performance is significant. In fact, for five of the defined ACC-NCDR CathPCI outcomes registry critical metrics, even small improvements can result in big impact. And there can be financial benefits from each as well. The five metrics, presented herein, include:

- Percutaneous coronary intervention (PCI) within 90 minutes;
- Acute kidney injury (AKI);
- Drug-eluting stent utilization;
- Composite discharge medications; and
- Use of the radial approach.

A discussion of each will demonstrate the value of an accreditation effort for your program based on the impact of the quality assurance that comes with accreditation.

Physician leaders, administrative leaders, and the entire hospital C-suite should view accreditation as a vital strategic component of an overall and ongoing performance management system. Accreditation is not a "one and done" event. It reflects the organization's commitment to continuous quality. Accreditation is a strong statement to both internal and external stakeholders, a pledge that the cardiovascular program is dedicated both achieving and maintaining the highest level of performance based upon objective standards and scientific evidence.

METRIC: PCI Within 90 Minutes

Corazon recognizes that many programs set their internal benchmark for achieving a door-to-balloon time (D2B) of 60 minutes versus the current national benchmark of 90 minutes. However, it is important to recognize that maintaining even a <90- or <60-minute D2B time is not always achieved 100% of the time. It may sound counterintuitive, but even if the benchmark is achieved for certain cases, that doesn't mean that EVERY case consistently meets the mark. Programs that have seen their benchmark consistently fall below the 50th percentile must take action in order to understand at what point across the continuum of care the process deviates from a norm that otherwise allows the goal to be achieved.

For example, a 'norm' may be obtaining an electrocardiogram (ECG) within 10 minutes of the patient's arrival or the arrival of the cath lab team within 30 minutes of a ST-elevation myocardial infarction (STEMI) being activated. Although this sounds simple, many programs don't break down their care processes enough to understand each step in the continuum and what it takes to meet each step at a certain time. Programs should continually evaluate and reevaluate policies, procedures, and processes so there is clear understanding of what should happen when in order to meet the benchmark.

Accreditation is not a "one and done" event. It reflects the organization's commitment to continuous quality.

Programs accredited by Corazon have seen significant improvements with D2B benchmarks in particular, and those that fall below the 50th percentile work to recognize opportunities for improvement. Opportunities can emerge from many programmatic aspects such as education and internal drills that can be videotaped, and then through debrief, evaluated for improvement. The execution of updated protocols and/or algorithms can also help.

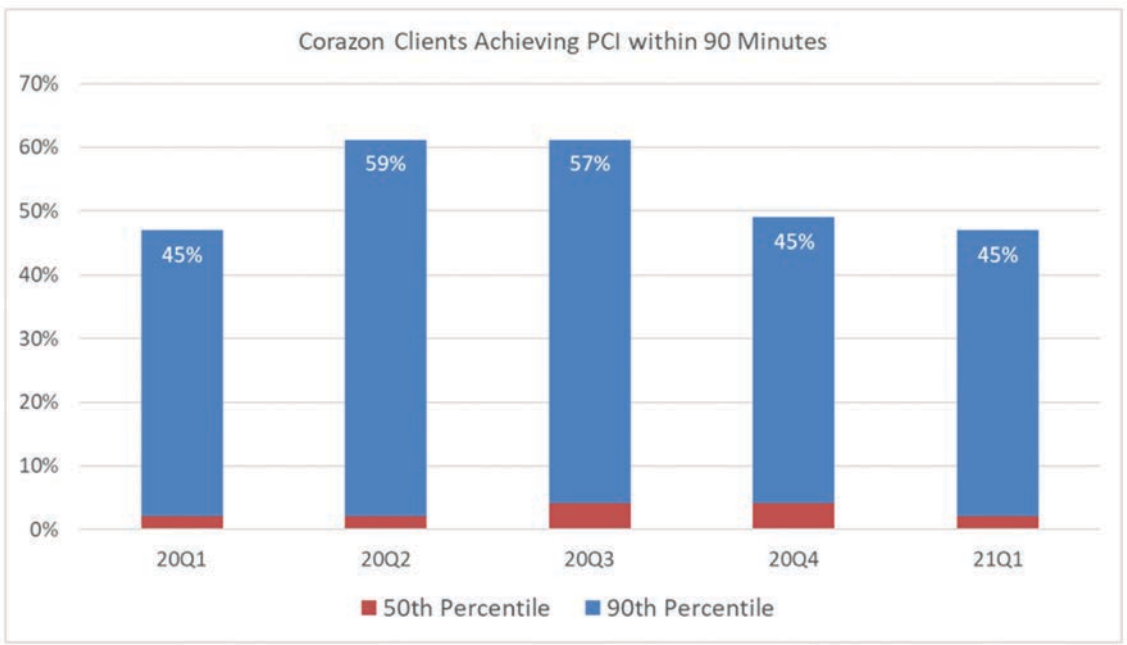


Figure 1. Corazon clients achieving PCI within 90 minutes, start of 2020 through the first quarter of 2021.

Results With Accreditation

Forty-five percent (45%) of Corazon-accredited cath/PCI programs were in the 90th percentile for PCI within 90 minutes in their most recent data submission, meaning 100% of their patients received intervention within 90 minutes (Figure 1). Of these programs, 45% achieved this metric after involvement with Corazon accreditation. This speaks directly to the oversight and review of outcomes data that is facilitated quarterly by Corazon as part of our E3 approach.

Out of all cath/PCI programs accredited by Corazon, 96% have achieved the 90th percentile for PCI within 90 minutes (100% of patients within this timeframe) for multiple quarters following accreditation.

Patient benefits from PCI within 90 minutes are well documented, but what may not be apparent are the monetary gains associated with this metric. To realize the cost benefit, it is necessary to understand the implications of longer D2B time. A 2019 study[1] published in the *Journal of the American Heart Association* evaluated 5243 patients with STEMI for the association of D2B time and 1-year mortality. Results showed that for every reduction of D2B time by 30 minutes, there was a continuous reduction of 1-year mortality (90 to 60 minutes: absolute risk reduction, 2.4%; number needed to treat, 41.9; 60 to 30 minutes: absolute risk reduction, 2.0%; number needed to treat, 49.2).

With a clear correlation between PCI within 90 minutes and 1-year mortalities, the financial aspect has now also been evaluated. Another study[2], appearing in the *Journal of the American College of Cardiology*, researched the 1-year risk-adjusted mortality and cost of PCI. For 19,148 patients in 60 VA hospitals, the median 1-year total unadjusted hospital costs were $46,302 per patient. Table 1 illustrates the calculation of potential savings across an average patient population.

Table 1. When multiplied by the number of ST-elevation myocardial infarction (STEMI) patients/year, regardless of program size, the savings can be substantial, all while improving the health of the community overall and the wellbeing of each individual patient.

Cost for one-year mortality per patient	$46,302.00
Reduction potential of one-year mortality for PCI within 90 minutes per patient	2.0%-2.4%
Possible financial savings per patient	**$926.04 – $1,111.25**

The patient benefits from percutaneous coronary intervention within 90 minutes are well documented, but what may not be apparent are the monetary gains associated with this metric. To realize the cost benefit, it is necessary to understand the implications of longer D2B time.

METRIC: Acute Kidney Injury

This metric can be seen as one of the most challenging for programs, especially since many patients at a greater risk of AKI present as a STEMI, which means in most circumstances, they are taken directly to the cardiac catheterization lab well before their critical lab values are confirmed.

Results With Accreditation

Fifty percent (50%) of cath/PCI programs have been performing in the 90th percentile for acute kidney injury since being accredited, and of those, 36% have been in the 90th percentile for AKI for multiple quarters. Accredited programs tend to take more direct action in managing patients at greater risk of AKI by means of reviewing and revising current hydration protocols, both pre and post procedure when necessary. Further, physician leaders more regularly utilize tools such as an AKI risk calculator so they are prepared in advance for clinical treatment decision-making.

In a study of the economic consequences of AKI, Silver and Chertow[3] reported the following:

"Acute kidney injury is a common complication that affects as many as one in five hospitalized patients, depending on the definition employed.[4-6] In-hospital mortality for patients with AKI has recently been estimated between 20 and 25%[6,7], and critically ill patients with dialysis-requiring AKI experience mortality rates in excess of 50%.[8,9] For patients who survive an episode of AKI, long-term risks include chronic kidney disease[10], end-stage renal disease[10], cardiovascular events[11], and reduced quality of life[12]. In one study of 415 survivors of dialysis-requiring AKI, one in four patients reported health-related quality of life equal to or worse than death[13]."

Silver and Chertow further note that "Patients with AKI incurred median direct hospital costs of $2600, which still exceeded costs for asthma ($1400), gastrointestinal bleed ($2100), pneumonia ($2100), and heart failure ($2200)."

Used to evaluate patients at risk of AKI, the RIFLE (Risk, Injury, Failure, Loss of Kidney, End-stage kidney disease) classification is defined by the following stages:

- **RIFLE-R** = ↑SCr x 1.5 or ↓GFR >25%
- **RIFLE-I** = ↑SCr x 2.0 or ↓GFR >50%
- **RIFLE-F** = ↑SCr x 3 or ↓GFR >75%, or if baseline SCr ≥353.6 µmol/L (≥4 mg/dL) ↑SCr >44.2 µmol/L (>0.5 mg/dL)

RIFLE stages are further broken down into two categories:

1. Loss of kidney function, defined by a complete loss of function for longer than four weeks.
2. End-stage renal disease, defined by a complete loss of kidney function for longer than three months.

Silver and Chertow state that "in a University of Pittsburgh cohort of cardiac surgery patients, relative to age- and APACHE III-matched controls, patients with RIFLE-R AKI yielded an additional cost of $11,234, those with RIFLE-I AKI yielded an additional cost of $20,461, and patients with RIFLE-F AKI yielded an additional cost of $34,155.14"[3] Additional costs are summarized in Table 2.

It can be concluded that the conservative cost estimate for each episode of AKI is approximately $1700, which increases to $11,000 for each episode requiring dialysis.

METRIC: Drug-Eluting Stent Utilization

For Corazon-accredited cath/PCI programs, drug-eluting stent (DES) utilization is trending downward (Figure 2). On average, according to NCDR CathPCI registry outcomes data, programs are using 1.5 stents per lesion, which is considered best practice and a reduction from the initial 1.6 stents average reported in 2019.

Results With Accreditation

Twenty-nine percent (29%) of Corazon-accredited cath/PCI programs are utilizing fewer than 1.5 stents per lesion. Considering that the average cost of a DES is approximately $1500, the savings per patient can be considerable, and for the cardiovascular service line, such savings are critical to maintain margins in today's healthcare environment.

Additionally, a 2012 study[15] analyzed more than 1.5 million PCI procedures, discovering that DES utilization is clinically superior and

Table 2. Additional costs of AKI.

Rifle-R additional cost	$11,234.00
Rifle-I additional cost	$20,461.00
Rifle-F additional cost	$34,155.00

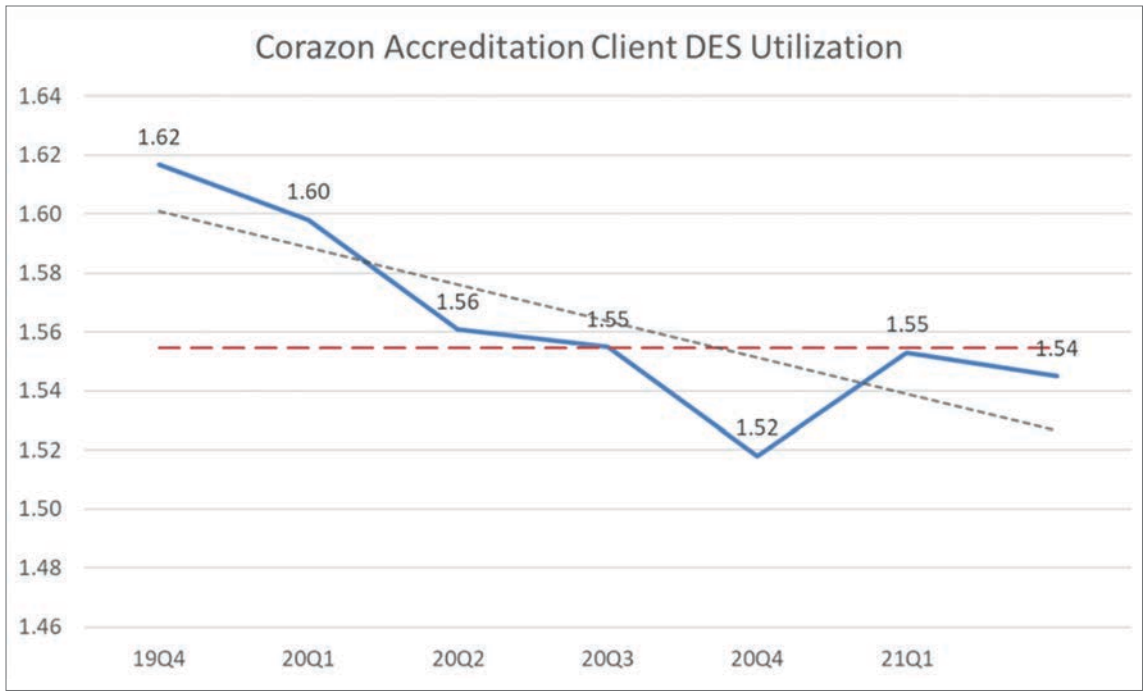


Figure 3. **Drug-eluting stent (DES) utilization from Q4 2019 through Q1 2021 for Corazon-accredited clients.**

more cost-effective for patients who are at a high risk for total vessel revascularization (TVR), which includes bypass surgery. Conversely, it is the opposite when the risk of TVR is low; therefore, it makes good programmatic sense to decrease the use of DES in patients who are at lower risk for TVR.

METRIC: Composite: Guideline Medications Prescribed at Discharge

This metric will be most impacted if/when documentation is not completed at time of patient discharge. Certainly, in any given quarter, this percentile can fluctuate significantly, though consistency is one hallmark result of an accreditation effort. Through our approach, best practice recommendations are given for how to impact this metric for the long term, meaning the assurance of consistent and continuous adherence to a standard process for patient discharge.

Programs with an electronic medical record can work in collaboration with their clinical informatics team to create a "best practice alert" (BPA). The BPA notifies the discharging physician to complete the associated documentation specific to the medications required and should be built into the standardized order set. If a patient has a sensitivity or allergy to a specific medication, the physician must document this within the electronic medical record before moving forward in the discharge care plan. Savvy organizations can develop customized options or drop-down menus as part of the BPA, which also helps with consistency by removing the potential for entry mistakes. And while the cardiologist is often not the discharging physician, peer-to-peer education between the cardiologist and discharging physician (who in many cases is the hospitalist) can boost a program's compliance to 100% in this metric with minimal resource output.

Results With Accreditation

Almost 70% of Corazon-accredited cath/PCI programs have achieved the 90th percentile for medications prescribed at discharge, meaning 100% of their patients are prescribed these medications. This has a positive impact on patient recovery, overall patient health, and reductions in readmissions. Furthermore, since the benefits of dual antiplatelet therapy (DAPT) have been well documented, non-adherence to ordering these medications inevitably leads to increased mortality and readmission rates, which then translates into higher costs.

METRIC: Radial Approach

The radial approach has been an option for cath access for many years, but given the technological advances with smaller access site catheters, the use of diagnostic and guiding catheters to deliver interventional balloons and stents is becoming more common practice within cardiac cath labs across the country. The radial approach has afforded programs more efficiencies in throughput, and shows a clear and direct correlation to patient satisfaction.

Patients having either a diagnostic or therapeutic coronary procedure via the radial approach report not only greater satisfaction with the procedure itself, as they are able to ambulate more quickly, but also, for those patients meeting specific criteria as guided by evidence-based medicine and physician adoption, there is a preference for same-day discharge after their procedure.

There are clinical gains with the radial approach, but scientific literature has also noted the fiscal benefits. The National Institutes of Health confirmed a cost savings of $275/patient when using the radial approach.[16] For a program with an average case load of 200 PCI patients/year, the potential savings can reach up to $55,000 annually, just by simple calculation.

Results With Accreditation

Just over 60% of Corazon-accredited cath/PCI programs have increased their utilization of the radial approach since achieving accreditation. Overall utilization of the radial approach has increased approximately 4% among this group of programs since 2019.

Benefits of the radial approach[17] include:

- Reduction of bleeding and vascular complication rates: 1.7% for radial vs 6.2% for femoral;
- Reduced length of stay: 1.69 ± 1.92 days for radial vs 2.08 ± 1.98 days for femoral;
- Lower rates of all-cause mortality at 3-year follow-up: 3.9 for radial vs 6.9% for femoral;
- Lowered rates for cardiovascular death: 2.1 for radial vs 4.9% for femoral.

Other benefits include:

- An increase in same-day discharge;
- Quicker ambulation;
- Increased patient satisfaction; and
- Availability of femoral site access for other modalities.

Conclusion

When considering the quality of a PCI program, it is imperative to interpret NCDR data and implement a comprehensive process for improvement based on reported metrics. With current staffing trends and a continuous increase in clinical demands, there is often a gap in an existing need and the ability for timely completion. Corazon can help review data, identify areas for improvement, and suggest strategies for implementing lasting and beneficial change. While this frees clinician time for patient care, more focus can also be directed to consistency in delivery.

Corazon's accreditation and E3 approach results in consistent improvement in program performance and outcomes, which directly impacts overall quality, along with patient safety and care improvements. By collaborating with our clients to standardize processes and reduce costs, the patient is the ultimate beneficiary of these efforts.

However, accreditation isn't just about what's WRONG with a program. While the end goal is quality assurance, accreditation can also serve as a means to identify what is working, leading to cross-utilization of certain policies or processes that can be replicated in other clinical areas. Celebrating success through an accreditation process is equally as important as identifying performance improvement opportunities, as we typically find that most programs seeking accreditation are already

Accreditation isn't just about what's WRONG with a program. It can also serve as a means to identify what is working, leading to cross-utilization of certain policies or processes that can be replicated in other clinical areas.

doing much to give their patients the quality care they deserve. Using Corazon as a trusted partner for accreditation builds upon the quality assurance programs already in place, and takes your program to the next level of performance. ■

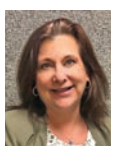
References

1. Park J, Choi KH, Lee JM, et al; KAMIR-NIH (Korea Acute Myocardial Infarction Registry–National Institutes of Health) Investigators. Prognostic implications of door-to-balloon time and onset-to-door time on mortality in patients with ST-segment-elevation myocardial infarction treated with primary percutaneous coronary intervention. *J Am Heart Assoc*. 2019 May 7; 8(9): e012188.
2. Ho PM, O'Donnell CI, Bradley SM, et al. 1-year risk-adjusted mortality and costs of percutaneous coronary intervention in the Veterans Health Administration: insights from the VA CART program. *J Am Coll Cardiol.* 2015 Jan 27; 65(3): 236-242.
3. Silver SA, Chertow GM. The economic consequences of acute kidney injury. *Nephron*. 2017; 137(4): 297-301.
4. Waikar SS, Liu KD, Chertow GM: Diagnosis, epidemiology and outcomes of acute kidney injury. *Clin J Am Soc Nephrol.* 2008; 3: 844-861.
5. Zeng X, McMahon GM, Brunelli SM, et al. Incidence, outcomes, and comparisons across definitions of AKI in hospitalized individuals. *Clin J Am Soc Nephrol.* 2014; 9: 12-20.
6. Susantitaphong P, Cruz DN, Cerda J, et al. World incidence of AKI: a meta-analysis. *Clin J Am Soc Nephrol.* 2013; 8: 1482-1493.
7. Selby NM, Kolhe NV, McIntyre CW, et al. Defining the cause of death in hospitalised patients with acute kidney injury. *PLoS One*. 2012; 7: e48580.
8. VA/NIH Acute Renal Failure Trial Network, Palevsky PM, Zhang JH, O'Connor TZ, et al. Intensity of renal support in critically ill patients with acute kidney injury. *N Engl J Med*. 2008; 359: 7-20.
9. Uchino S, Bellomo R, Morimatsu H, et al. Continuous renal replacement therapy: a worldwide practice survey. The beginning and ending supportive therapy for the kidney (B.E.S.T. kidney) investigators. *Intensive Care Med.* 2007; 33: 1563-1570.
10. Coca SG, Singanamala S, Parikh CR. Chronic kidney disease after acute kidney injury: a systematic review and meta-analysis. *Kidney Int*. 2012; 81: 442-448.
11. Odutayo A, Wong CX, Farkouh M, et al. AKI and long-term risk for cardiovascular events and mortality. *J Am Soc Nephrol.* 2017; 28: 377-387.
12. Villeneuve PM, Clark EG, Sikora L, et al. Health-related quality-of-life among survivors of acute kidney injury in the intensive care unit: a systematic review. *Intensive Care Med.* 2016; 42: 137-146.
13. Johansen KL, Smith MW, Unruh ML, et al. Predictors of health utility among 60-day survivors of acute kidney injury in the Veterans Affairs/National Institutes of Health Acute Renal Failure Trial Network Study. *Clin J Am Soc Nephrol*. 2010; 5: 1366-1372.
14. Dasta JF, Kane-Gill SL, Durtschi AJ, et al. Costs and outcomes of acute kidney injury (AKI) following cardiac surgery. *Nephrol Dial Transplant*. 2008; 23: 1970-1974.
15. Amin AP, Spertus JA, Cohen DJ, et al. Use of drug-eluting stents as a function of predicted benefit: clinical and economic implications of current practice. *Arch Intern Med*. 2012; 172(15): 1145-1152.
16. Mitchell MD, Hong JA, Lee BY, et al. Systematic review and cost-benefit analysis of radial artery access for coronary angiography and intervention. *Circ Cardiovasc Qual Outcomes.* 2012 Jul 1; 5(4): 454-462.
17. Campelo-Parada F, Carrié D, Bartorelli AL, et al; CENTURY II Investigators. Radial versus femoral approach for percutaneous coronary intervention: MACE outcomes at long-term follow-up. *J Invasive Cardiol.* 2018 Jul; 30(7): 262-268.

Sources

1. Mathews R, Peterson ED, Honeycutt E, et al. Early medication nonadherence after acute myocardial infarction: insights into actionable opportunities from the TReatment with ADP receptor iNhibitorS: Longitudinal Assessment of Treatment patterns and Events after Acute Coronary Syndrome (TRANSLATE-ACS) study. *Circ Cardiovasc Qual Outcomes*. 2015 Jul; 8(4): 347-356.
2. Upadhyay S, Stephenson AL, Smith DG. Readmission rates and their impact on hospital financial performance: a study of Washington hospitals. *Inquiry*. 2019 Jan-Dec; 56: 46958019860386.

Tim Attebery, Consultant;
Joyce Froetschel, Accreditation Surveyor,
Corazon, Inc.



Tim Attebery is a consultant and Joyce Froetschel is an accreditation surveyor at Corazon, Inc., offering strategic program development for the cardiovascular, neuro, and orthopedic specialties. Corazon provides a full continuum of consulting, accreditation, recruitment, and interim management services for hospitals, health systems, and practices of all sizes across the country and in Canada. To reach the authors, email tattebery@corazoninc.com or jfroetschel@corazoninc.com

Learn more at www.corazoninc.com or call (412) 364-8200.