MEDAXIOM
AN ACC COMPANY

URGENT TAVR CARE

CLINICAL AND OPERATIONAL STRATEGIES TO IMPROVE OUTCOMES

NOVEMBER 2025



CV BUSINESS WHITE PAPER

With Support From: Edwards

This CV business white paper was developed by MedAxiom with support from Edwards Lifesciences and is intended for informational purposes only. The statements and/ or opinions expressed do not represent official American College of Cardiology (ACC) opinions, positions, policies or clinical guidance unless otherwise stated. This CV business white paper does not constitute a guarantee or endorsement of a specific product or therapy by MedAxiom or the ACC.

INTRODUCTION

Determining which hospitalized patients with severe aortic stenosis (AS) require urgent TAVR is challenging. While some patients are too unstable to delay, others can be stabilized, enabling safe discharge and return for elective procedures. Programs that use standardized triage, multidisciplinary decision-making, and strategies such as medical optimization or balloon aortic valvuloplasty (BAV) can often defer less-urgent cases, improving both clinical outcomes and resource use.

Beyond the clinical imperative, stabilizing patients for elective TAVR also supports operational sustainability: urgent inpatient procedures are more resource-intensive and financially burdensome, further reinforcing the value of a deliberate, team-based approach to triage and timing. Deciding when to perform an urgent TAVR is inherently nuanced, requiring expert clinical judgment that balances a patient's stability and personal circumstances, procedural risk, and system capacity. While a "one-size-fits-all" model is not appropriate, implementing structured protocols for evaluation and decision-making offers significant benefits. These include more consistent triage, improved patient outcomes, reduced hospital length of stay (LOS), and effective use of limited procedural resources.

This CV business white paper shares best practices from three leading programs, highlighting methods such as BAV as a bridging strategy, clear escalation pathways, and proactive planning. These tactics support timely intervention when needed and reduce non-elective procedures, enhancing care and sustainability across the cardiovascular service line.



THE "WHY:" CHALLENGES DRIVING THE NEED

Historically, even at high-performing centers, as many as 25% of TAVRs are performed in currently hospitalized patients, not because of a preference for this approach but due to their role as referral centers for higher-acuity cases requiring advanced care.[1] Urgent TAVR cases often reflect late-stage presentations or delayed diagnosis. Recent research found that 25% of urgent aortic valve replacement (AVR) patients had no AS diagnosis in the prior year. Notably, most (80%) of undiagnosed patients had a healthcare encounter in the year prior to their urgent admission.[2] Without timely referrals and systematic follow-up, these patients may deteriorate before treatment options like TAVR or surgery are considered.

25% of urgent AVR patients had no AS diagnosis in the prior year. Notably, most (80%) of undiagnosed patients had a healthcare encounter in the year prior to their urgent admission.[2]

Urgent TAVRs are more resource-intensive, requiring high effort and high cost.[2] They require rapid mobilization of testing, procedural teams, anesthesia and recovery resources, often displacing elective cases and creating capacity strain in catheterization (cath) labs or hybrid operating rooms (ORs). These urgent cases frequently involve patients with higher procedural risk and greater medical complexity, leading to extended hospital stays, higher complication rates, and potentially worsening outcomes. An analysis of the NCDR® STS/ACC TVT Registry™ found that urgent TAVRs were independently associated with increased in-hospital mortality and adverse outcomes compared to elective procedures.[3] Despite advances in TAVR care, more recent data support these findings, noting higher complication rates and mortality in patients receiving urgent TAVR (**Table 1**).[4]

Table 1: Balloon-Expandable Valve Outcomes Based on Procedure Status

Procedure Status	Elective	Urgent	Emergent	Salvage
30-day outcomes				
All-cause mortality	1.3%	5.2%	17.7%	32.1%
Stroke	1.5%	2.4%	4.5%	11.7%
New requirement for dialysis	0.2%	1.0%	4.5%	14.8%
Major vascular complications	1.2%	1.9%	3.2%	1.8%
Life-threatening bleeding	1.2%	2.7%	7.2%	9.5%

Source: NCDR® STS/ACC TVT Registry™ Rolling 4Q ending Q2 2023.

From a financial perspective, the fixed reimbursement associated with Medicare Diagnosis Related Groups (DRGs) for TAVR procedures does not scale proportionally with clinical acuity. While some adjustment for acuity is included when major complications or comorbidities are present (DRG 266), it does not fully account for the extensive care required to stabilize patients prior to the procedure, such as managing acute heart failure (HF) decompensation, or addressing multi-organ dysfunction. As a result, hospitals performing a large proportion of urgent TAVRs may face sustainability challenges due to misalignment between clinical effort and financial reimbursement.

In addition to the failure to recognize AS early in the disease process, gaps in follow-up after initial detection of AS, lack of clear referral pathways, or failure to reassess disease severity can lead to clinical deterioration over time. Asymptomatic patients with severe AS may experience rapid and unpredictable deterioration underscoring the progressive nature of the disease and the narrow window for intervention, according to the results of the Evaluation of TAVR Compared to Surveillance for Patients With Asymptomatic Severe Aortic Stenosis (EARLY TAVR) trial.[6] In some cases, patients are transferred from outside facilities with an expectation of immediate TAVR, often without adequate pre-procedural work-up or stabilization. These situations limit the heart team's ability to make evidence-based decisions and place stress on procedural infrastructure.

Structured triage systems, echocardiographic surveillance, and well-defined communication protocols with referring providers are essential to address these risks and reduce unnecessary urgency. Institutions that implement standardized decision-making using a multidisciplinary heart team approach see improved outcomes and reduced variability in care delivery.[7]

CHALLENGES DRIVING URGENT TAVR



Referral Center Realities[1]

- ✓ High-performing centers act as referral hubs. Higher-acuity transfers contribute to the current state where up to ~25% of TAVRs occur in already-hospitalized patients.



Late Recognition ➡ Higher Risk[2]

- ✓ Urgent cases often reflect delayed diagnosis or unstructured follow-up.
- ✓ One out of four urgent procedures had no prior AS diagnosis in the previous year.
- ✓ EARLY TAVR trial: even "asymptomatic" severe AS can deteriorate quickly.



Clinical Burden of Urgent TAVR[2,3,5]

- ✓ Urgent TAVRs require rapid mobilization of imaging, anesthesia and procedural teams.
- ✓ Patients are sicker, with longer LOS and higher complication and mortality rates.



Operational Strain[7]

- ✓ Urgent add-ons displace elective cases, disrupt throughput, and stress cath lab/hybrid OR schedules.
- ✓ Impacts throughput and procedure scheduling creating case backlogs.
- ✓ More inpatient beds occupied by transfer-in patients awaiting procedures.



Financial Mismatch[8,9]

- ✓ Single DRG payment (e.g., DRG 266/267) often applies despite multiple problems treated.
- ✓ Acuity adjustment rarely covers cost of stabilization (decompensated HF, multi-organ issues).
- ✓ High urgent TAVR case mix threatens sustainability.

SOLUTION TO THE CHALLENGES



Systematic Approach[6,7]

- ✓ Structured triage + heart team consensus.
- ✓ Effective surveillance + clear referral pathways.
- ✓ Standardized communication with referring providers.
- ✓ Stabilize when safe to convert urgent to elective procedures.

BEST PRACTICE HIGHLIGHT

Oregon Health and Science University

- Academic Medical Center, 576 beds.
- Two interventional cardiologists, two cardiothoracic surgeons perform TAVRs.
- NCDR STS/ACC TVT Registry 2024 TAVR volume = 302 patients.

2021 Urgent TAVR = 15/217; 6.9% ➡ 2024 Urgent TAVR =15/302 5.0%

OHSU has built a tightly integrated clinical–administrative framework to ensure timely evaluation and intervention for patients needing urgent TAVR. Patients hospitalized elsewhere are prioritized for expedited workup and procedural planning after transfer. The medical director and service line director jointly monitor cath lab capacity, adjusting schedules or adding procedure days when urgent cases arise. For these patients, diagnostic testing is fast-tracked through close partnerships with noninvasive imaging leaders who participate in daily huddles to review the procedural care unit list and refine patient prioritization. Transfer center coordination further streamlines access for external referrals. The valve coordinator plays a critical role, proactively monitoring discharged patients awaiting TAVR and alerting the team if conditions worsen. This disciplined, relationship-based approach – supported by regular leadership check-ins – has transformed a long-standing capacity challenge into a responsive, patient-centered system capable of balancing urgent needs with operational efficiency.

CLINICAL AND OPERATIONAL STRATEGIES

Reducing the number of urgent TAVRs in hospitalized patients requires a carefully planned clinical and operational approach that supports timely decision-making and efficient use of resources. High-performing programs consistently rely on structured workflows, robust team collaboration, and nimble scheduling processes to ensure patients receive timely and appropriate care.

A cornerstone of these programs is the use of standardized care pathways and referral processes. Many institutions use electronic TAVR consult orders to trigger automated workflows and route the referral to a designated inbox managed by the TAVR coordinator(s). These consults initiate a systematic protocol for workup, including necessary imaging and multidisciplinary evaluation. Interventional cardiologists and cardiothoracic surgeons in the three programs perform structured evaluations within 48 to 72 hours of referral, even for urgent outpatient or inpatient cases.



Unstable patients do poorly. The more we optimize before the procedure, the better the outcomes – **AND THE LONGER OUR PROGRAM WILL SURVIVE."**

John N. Melvan, MD, PhD
Adult Cardiac Surgeon, Memorial Cardiac and Vascular Institute, Memorial Healthcare, Hollywood, FL

THE HEART TEAM APPROACH

The heart team model remains key to this approach. All three organizations leverage weekly multidisciplinary heart team meetings for comprehensive patient discussion and decision-making. These teams include members spanning interventional cardiology, advanced imaging, advanced HF, cardiac surgery, anesthesia and structural heart advanced practice providers (APPs) and nurses. For urgent cases that arise between scheduled meetings, some programs utilize virtual heart team huddles or email-based information sharing to ensure timely patient evaluation.

BEST PRACTICE HIGHLIGHT

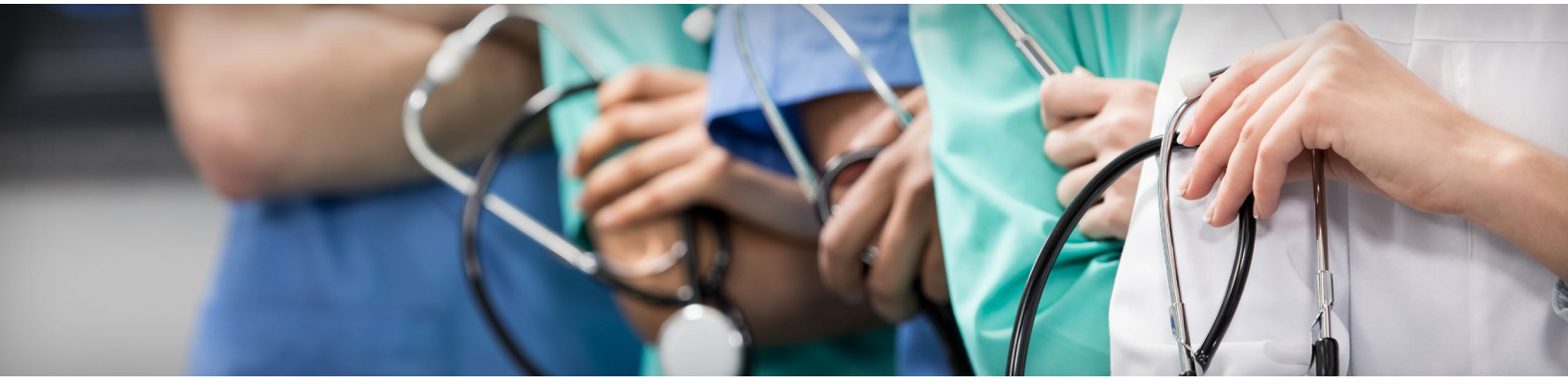
Memorial Healthcare

- Community Teaching Hospital, 797 beds.
- Five interventional cardiologits, three cardiothoracic surgeons perform TAVRs.
- NCDR STS/ACC TVT Registry 2024 TAVR volume = 150 patients.

2021 Urgent TAVR = 22/114; 19.3% ➡ 2024 Urgent TAVR 2/150 = 1.3%

Recognizing the patient and organizational challenges of performing urgent TAVR procedures, Memorial implemented a structured, multidisciplinary approach to ensure that urgent TAVR is performed only in patients for whom discharge is clinically unsafe. Physicians present a comprehensive overview of every hospitalized patient under consideration for urgent TAVR at weekly heart team meetings, including clinical history, surgical and procedural risk, frailty, and barriers to discharge. The team evaluates each case based on patient-centered and procedure-centered risk. Even high-risk patients are not automatically channeled toward urgent intervention. Any consideration for inpatient TAVR is heavily scrutinized, and all relevant means to medically stabilize the patient are reviewed. To reinforce this practice, an escalation protocol requires cross-disciplinary consultation and, when needed, final review by the chief medical officer and cardiovascular institute leadership.

This coordinated approach supports both high-quality patient care and long-term program sustainability. APPs or registered nurses (RNs) working as TAVR coordinators are central to this model, guiding patients through diagnostics, education and follow-up. They monitor patient progress daily during inpatient evaluations and serve as the primary liaison between referring services, imaging and procedural teams, ensuring cases are expedited or deferred appropriately.



THE ROLE OF TAVR COORDINATORS

As described by Michele Slane, vice president of the Cardiac and Vascular Institute at Memorial Healthcare in Hollywood, FL, and Maria Held, clinical nurse specialist and lead TAVR coordinator, Miller Family Heart, Vascular & Thoracic Institute, Cleveland Clinic in Cleveland, OH, the following are among the integral and indispensable duties of TAVR coordinators:

- Guiding patients through the initial assessment and diagnostic testing process.
- Organizing and ensuring effective communication amongst the heart team members regarding patient care plans.
- Advocating patient preferences and concerns with the multidisciplinary team and ensuring their needs are met throughout the TAVR process.
- Optimizing and coordinating steps for the patient to reduce delays in the plan of care.

To handle unpredictable demand, programs have adopted flexible TAVR scheduling models. Most aim to reserve one or two procedural slots per week specifically for urgent TAVRs, which are filled by elective cases if not needed. Some programs also employ late-day add-on options or overbooking strategies in the cath lab to accommodate emergent needs without displacing planned cases. These adjustments require close coordination across departments, including diagnostic imaging, where expedited computed tomography scans or echocardiograms may be required.

PROACTIVE PATIENT IDENTIFICATION

Early and accurate identification of AS is essential to prevent late-stage decompensation and the need for urgent or emergent AVR. Despite knowledge that referral delays, both before and after diagnosis, are directly associated with increased post-procedural mortality,[6] recognition of AS and referral for treatment persist. Even with evaluation by a primary care provider or cardiologist within the preceding year, patients still present with severe AS in need of urgent AVR, suggesting that most cases were missed not because of rapid progression but rather due to under-recognition or lack of surveillance.

Programs are addressing this gap through targeted strategies. OHSU actively engages with referral centers to reduce delays. They review referral patterns to identify physicians who tend to delay referrals and systematically review echocardiographic data to identify patients. Cleveland Clinic has recently employed artificial intelligence (AI) to flag patients with suspected AS and provide feedback to referral centers. Others, like Memorial Healthcare, target referring providers to conduct outreach education to improve awareness of AS progression and timely evaluation for AVR. By combining improved surveillance methods with strengthened communication between primary, specialty and procedural teams, all three programs are working to reduce hospitalization for avoidable, urgent TAVR evaluation and improve patient outcomes.

Early Recognition of AS



✓ **Early recognition of AS prevents late-stage decompensation and the need for urgent procedures.**



✓ **Combine surveillance (echocardiography, AI) with stronger provider and care team communication.**

✓ **Structured referral pathways across primary care, cardiology and valve teams.**



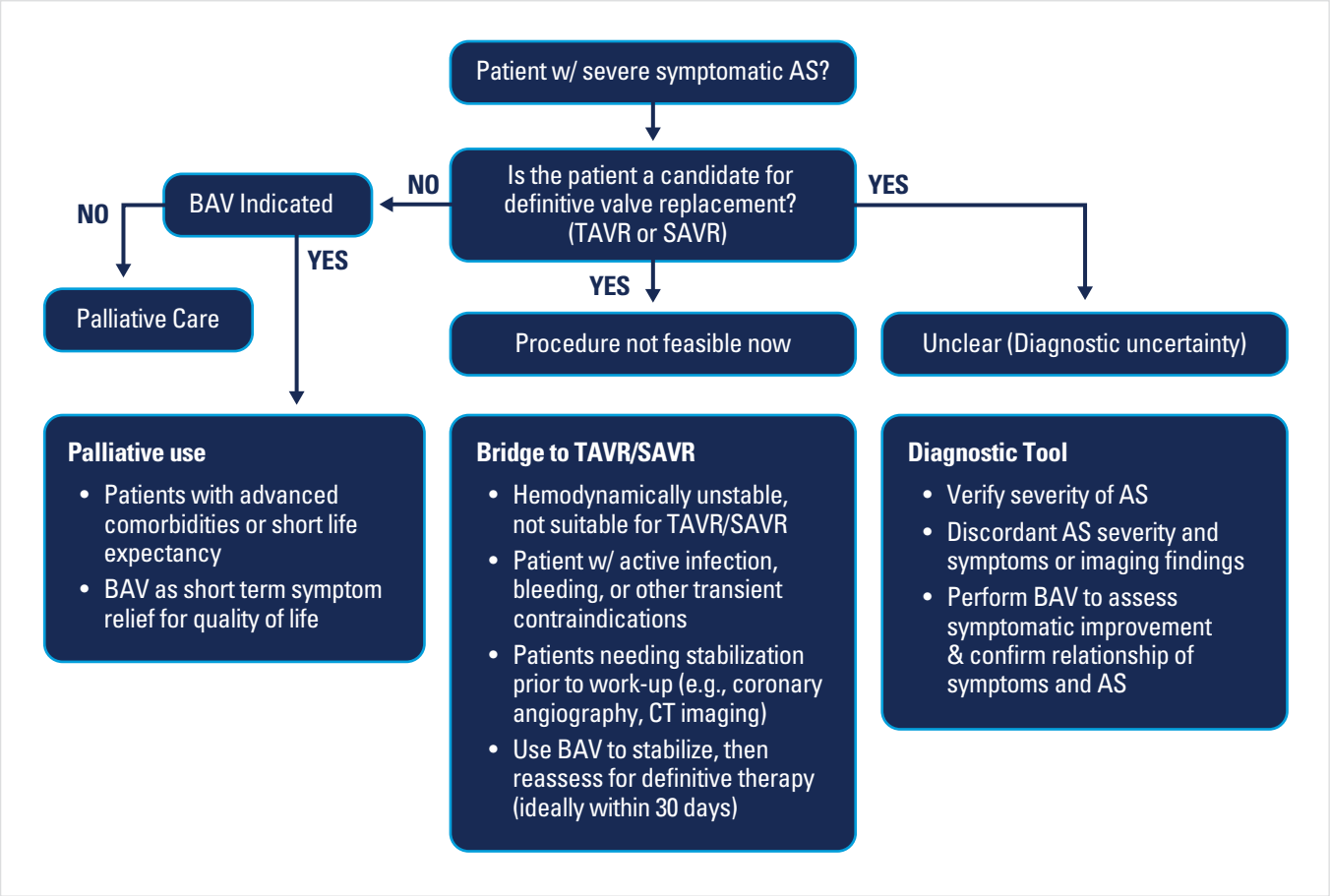
✓ **Reduce avoidable urgent TAVR and improve outcomes.**

BALLOON VALVULOPLASTY AS A BRIDGE STRATEGY

BAV is increasingly used as a bridge strategy for patients who are too unstable or complex to proceed directly to TAVR (**Figure 1**). BAV is especially useful for those presenting with cardiogenic shock, concomitant infections or advanced frailty, as it can provide temporary hemodynamic relief while clarifying a patient's diagnosis and establishing a longer-term plan.[10,11] Programs indicate BAV has effectively enabled safe discharge with best outcomes achieved with elective TAVR within 30 days. A recent study analyzing Medicare data from 2019 to 2023 compared outcomes between patients undergoing urgent TAVR and those who first received BAV followed by a planned, elective TAVR. Findings showed that patients who received BAV prior to TAVR experienced significantly better clinical and economic outcomes. Specifically, they had lower in-hospital and post-procedure mortality, shorter LOS, fewer intensive care unit admissions and days, lower discharge to non-home settings, and reduced hospitalization costs.[12] These results may support the use of BAV as a stabilizing strategy to convert urgent TAVR cases into elective ones, potentially improving survival and resource utilization in high-risk populations.

Patients who received BAV prior to TAVR experienced significantly better clinical and economic outcomes.

Figure 1: BAV Decision Guide[11]



Modified from Zhong J, Kamp N, Bansal A, et al. JSCAI. 2023;2(4):101002.

Adjusted Outcomes for BAV Pre-TAVR vs. Urgent TAVR[12]

In-Hospital Mortality: BAV Pre-TAVR ≤ 1.26% vs. Urgent TAVR = 3.07%

90-Day Mortality: BAV Pre-TAVR = 6.1% vs. Urgent TAVR = 9.8%

Length of Stay (LOS): BAV Pre-TAVR = 3.29 days vs. Urgent TAVR = 10.69 days

BEST PRACTICE HIGHLIGHT

Cleveland Clinic Miller Family Heart, Vascular & Thoracic Institute

- Academic Medical and Research Center, 1,290 beds.
- Five interventional cardiologists, four cardiothoracic surgeons focus on TAVR (total of 15 available for TAVR).
- NCDR STS/ACC TVT Registry 2024 TAVR volume = 601 patients.

2021 Urgent TAVR = 97/654; 14.8% ➡ 2024 Urgent TAVR = 77/601 12.8%

A renowned research center, the Cleveland Clinic has studied the use of BAV to manage patients with severe AS, including patients presenting with a variety of complicating medical conditions that make immediate valve replacement unsafe. For these patients, BAV offers both diagnostic and therapeutic value, clarifying the contribution of AS to a patient's symptoms and providing temporary hemodynamic improvement with lower procedural risk than TAVR. BAV provides a "window" for recovery before definitive valve replacement. They aim to schedule follow-up TAVR within one month of BAV, recognizing that the benefits of BAV generally last only one to three months. Patients are closely followed after discharge, with nurse practitioner clinic visits in the first week and interventional cardiologist review within three to four weeks. Patients also have access to a 24/7 dedicated phone line. The team emphasizes that BAV is a valuable option that supports patient safety, resource stewardship and improved outcomes, especially when applied selectively to those most likely to benefit.



BAV IS A VALUABLE TOOL FOR PATIENTS WHO REQUIRE URGENT TREATMENT OF SEVERE AS.
It can be used as a step toward TAVR, providing a window to determine the likely benefit of TAVR, and helps the organization be good stewards of resources."

Grant Reed, MD, MSc
Program Director, Interventional Cardiology Fellowship; Quality Improvement Officer, Interventional Cardiology Section, Cleveland Clinic, Cleveland, OH

Finally, formal escalation frameworks support consistent decision-making for inpatient TAVRs. In some programs, any case flagged for urgent intervention triggers review by senior clinical and administrative leaders. Algorithms, whether formally documented or culturally ingrained, help the team assess clinical urgency, comorbid risks and system capacity before proceeding. Importantly, optimization may include strategies other than BAV, such as aggressive diuresis for volume overload, adjustment of guideline-directed medical therapy (GDMT), correction of anemia, or stabilization of renal function. These standardized approaches serve as checkpoints to prevent overuse of inpatient resources and maintain alignment with clinical goals and operational constraints (see call-out box below).

COLLABORATION IS KEY.

We routinely discuss the procedural care list and prioritize patients to manage urgent evaluations."

Firas Zahr, MD
Director, Interventional Cardiology,
Co-Director, Complex Heart Valve Program, Oregon Health and Science University,
Knight Cardiovascular Institute, Portland, OR

CLINICAL AND OPERATIONAL STRATEGIES

Standardized Care Pathways and Referral Processes

- Use of a TAVR consult order in the electronic health record (EHR) that triggers automated workflows and alerts TAVR coordinators.
- Structured team-based evaluation by cardiology and cardiac surgery – same-day or within 48 to 72 hours.
- Epic inbox workflow ensures nothing is lost; verbal referrals are backed by formal consult orders.

Role of the Heart Team and TAVR Coordinators

- Weekly multidisciplinary meetings (20+ members) for case review; urgent cases reviewed virtually if needed.
- Coordinators APPs or RNs facilitate every step from work-up to scheduling, education and follow-up.
- Coordinators also identify opportunities to expedite or delay cases appropriately based on readiness.

Operational Flexibility and Capacity Management

- Holding one to two open slots per week for urgent TAVRs; backfilling with electives if unused.
- Cross-department coordination for prioritized testing (CT, echocardiography, MRI).
- Use of overbooking protocols or late-day add-on capacity to handle urgent cases without jeopardizing elective schedules.

Patient Optimization

BAV as a Bridge or Diagnostic Tool

- BAV used for:
  - Hemodynamically unstable patients.
  - Cases complicated by organ dysfunction, malignancy or frailty.
  - Clarifying diagnostic uncertainty.
- BAV creates a clinical window for stabilization and allows for elective TAVR planning.
- Most effective when TAVR follows within 30 days.

Medical Management

- Use aggressive diuresis for volume overload.
- Optimize GDMT.
- Correct anemia.
- Stabilize renal function.

Escalation Frameworks for Urgent TAVR

- Consider use of escalation protocols involving clinical leaders in cardiology, cardiothoracic surgery and administration before scheduling inpatient TAVR.
- Formal or informal algorithms to guide risk stratification and resource decisions.

IMPACT ON OUTCOMES, EFFICIENCY AND PROGRAM SUSTAINABILITY

Programs that have implemented structured triage pathways and pre-procedural optimization strategies for TAVR patients consistently report improvements across patient outcomes, operational metrics and financial performance. These gains reflect the value of proactively managing severe AS within a well-coordinated and data-driven clinical framework.

In addition to improving procedural safety, stabilization allows for more effective shared decision-making and care planning. When clinical urgency is reduced, patients and families can engage more thoughtfully with their heart team, better understand treatment options, and participate in decisions aligned with their preferences and goals of care. Programs consistently noted that this collaborative model fosters trust, improves patient satisfaction, and enhances the likelihood of a successful transition to post-procedural care.

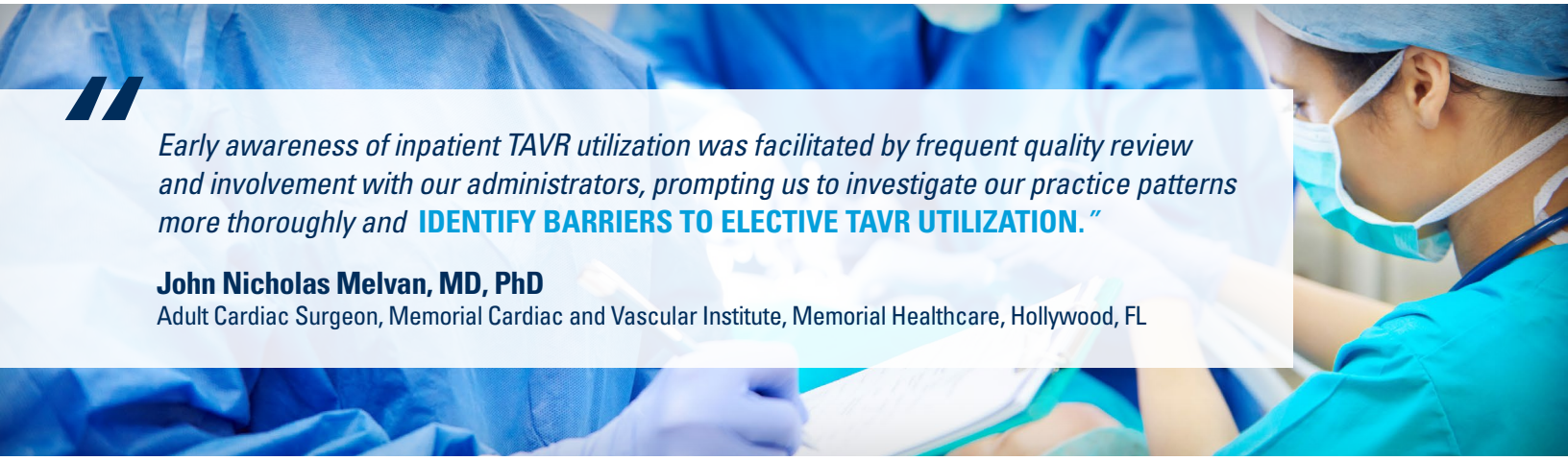
> *We have a comprehensive, deep and systematic treatment pathway.* **WE ARE VERY ALGORITHMIC AND COMMITTED TO QUALITY."**
>
> **Grant Reed, MD, MSc**
> Program Director, Interventional Cardiology Fellowship; Quality Improvement Officer, Interventional Cardiology Section, Cleveland Clinic, Cleveland, OH

OPERATIONAL GAINS

From an operational standpoint, triaging patients to elective procedures wherever appropriate allows for improved predictability and resource use. One program successfully reduced the proportion of urgent TAVRs from 19.3% to just 1.3% by applying structured review criteria and reserving urgent intervention only for those truly unable to be discharged. This reduction in urgent cases created ripple effects across the system, including decreased disruptions to elective case schedules, increased procedural throughput, and better predictability and utilization of resources.

One program successfully reduced the proportion of urgent TAVRs from 19.3% to just 1.3%.

Investments in operational efficiency further enhanced capacity. For example, by refining procedural team workflows and implementing a focused effort to streamline hybrid OR turnover, one center reduced cath lab turnaround time to approximately 45 minutes. These time savings enabled the addition of late-day or add-on cases, improving scheduling flexibility while avoiding overtime or case cancellations. As TAVR programs expand and new technologies such as mitral and tricuspid therapies compete for cath lab access, these gains in efficiency are essential to sustainable procedural volume.



> *Early awareness of inpatient TAVR utilization was facilitated by frequent quality review and involvement with our administrators, prompting us to investigate our practice patterns more thoroughly and* **IDENTIFY BARRIERS TO ELECTIVE TAVR UTILIZATION."**
>
> **John Nicholas Melvan, MD, PhD**
> Adult Cardiac Surgeon, Memorial Cardiac and Vascular Institute, Memorial Healthcare, Hollywood, FL

FINANCIAL SUSTAINABILITY

Urgent TAVRs represent a significant strain on hospital resources without a proportional increase in reimbursement. Payors reimburse TAVR using fixed DRG rates, which fail to account for the additional LOS, intensive monitoring or complexity associated with high-acuity patients. These patients represent a significant strain on hospital resources without a proportional increase in reimbursement. Payors reimburse TAVR using fixed DRG rates, which fail to account for the additional LOS, intensive monitoring or complexity associated with high-acuity patients. Urgent TAVR patients present with higher clinical acuity and are more likely to experience post-procedural complications - events that add incremental hospital costs and extend length of stay by nearly two days per case.[8] In multivariable adjusted analyses of more than 15,000 patients, index hospitalization costs for urgent and emergent TAVRs averaged $16,109 higher when compared with elective cases, reflecting the combined financial impact of complication-related care, longer hospitalization, and intensive resource utilization.[2,9] Collectively, these data illustrate how both clinical risk and operational challenges drive the economic burden of urgent TAVR, reinforcing the importance of proactive triage and patient optimization strategies. Avoiding high-cost, low-margin urgent cases is therefore critical to the long-term financial sustainability of TAVR programs. One of the interviewed programs found their operational improvements led to a nearly 6% decrease in direct cost per case and a nearly 37% reduction in LOS for TAVR patients over a two-year period.

Index hospitalization costs were significantly higher for urgent/emergent vs. elective TAVR, averaging $16,109 more per case.

One of the interviewed programs found their operational improvements led to a nearly 6% decrease in direct cost per case and a nearly 37% reduction in LOS for TAVR patients over a two-year period.

Elective TAVRs are less resource-intensive, more predictable, and associated with higher margins due to shorter LOS and fewer complications. By prioritizing scheduling efficiency and controlling variation, programs can protect margins while also improving patient flow. Moreover, leveraging data from the STS/ACC TVT Registry enables programs to monitor performance over time, identify clinical or operational outliers, and make data-driven decisions that enhance both patient outcomes and system efficiency.

KEY TAKEAWAYS AND FUTURE DIRECTIONS

Efficient urgent TAVR care requires balancing clinical urgency with system sustainability. High-performing programs have demonstrated that many patients presenting with symptomatic severe AS can be stabilized through medical therapy and diagnostic clarity or BAV, and returned for elective TAVR without compromising outcomes. Structured workflows, standardized testing and multidisciplinary triage protocols support this approach.

Institutional culture and leadership enable success. A high-functioning team culture, strong administrative support, and transparent data sharing help drive alignment and accountability.



FUTURE OPPORTUNITIES

Looking ahead, opportunities remain to further improve the triage and timing of TAVR. These include:

- Broader adoption of echocardiography surveillance programs and structured initiatives such as the American Heart Association's Target: Aortic Stenosis[13] to detect progression early.
- Formalized inpatient TAVR decision algorithms that incorporate clinical, logistical and social risk factors.
- Integration of EHR-based alerts and predictive analytics to flag high-risk AS patients before clinical deterioration occurs.
- Monitor patient metrics to understand opportunities for reducing the rate of urgent TAVR.

As programs refine these tools and collaborate through benchmarking networks, the shared goal remains clear: timely, patient-centered and sustainable care for individuals with severe aortic stenosis.

Click here and then click the Download button to access the TAVR Cost-Saving Worksheet.

This streamlined worksheet helps you quickly estimate the potential cost savings of minimizing urgent TAVR.

ACKNOWLEDGEMENTS

MedAxiom wishes to thank the following organizations for their contributions to this CV business white paper:

Miller Family Heart, Vascular & Thoracic Institute, Cleveland Clinic, Cleveland, OH – Grant Reed MD, MSc, program director, Interventional Cardiology Fellowship; quality improvement officer, Interventional Cardiology Section; Amar Krishnaswamy, MD, interventional cardiologist; section head, Invasive and Interventional Cardiology; Maria Held, MSN, RN, CNS, lead TAVR coordinator.

Memorial Cardiac and Vascular Institute, Memorial Healthcare, Hollywood, FL – John Nicholas Melvan, MD, PhD, adult cardiac surgeon; Michele Slane, vice president, Cardiac and Vascular Institute.

Oregon Health and Science University, Knight Cardiovascular Institute, Portland, OR – Firas Zahr, MD, director, Interventional Cardiology, and co-director, Complex Heart Valve Program; Kimberly Smith, MN, RN, nursing director, Heart & Vascular Service Line.



REFERENCES

1. Bansal A, Kumar A, Jain V, et al. Impact of hospital procedural volume on use and outcomes of urgent/emergent transcatheter aortic valve replacement. *J Am Heart Assoc.* 2021;10(9):e019670.
2. Ebinger JE, Gupta A, Huang TY, et al. Differential characteristics and outcomes of urgent/emergent versus elective aortic valve replacement. *J Am Heart Assoc.* 2025;14(11).
3. Kolte D, Khera S, Vemulapalli S, et al. Clinical outcomes of urgent versus elective TAVR in contemporary practice: Insights from the STS/ACC TVT Registry. *JACC Cardiovasc Interv.* 2018;11(12):1175-1185.
4. National Cardiovascular Data Registry STS/ACC TVT Registry Rolling 4Q 2023 Q2.
5. Zhou JY, Nanayakkara S, Johnston R, et.al. Urgent vs elective transcatheter aortic valve replacement in patients with severe aortic stenosis. *JACC Adv.* 2025;4(8):102039.
6. Généreux P, Schwartz A, Oldemeyer JB, et al. Transcatheter aortic-valve replacement for asymptomatic severe aortic stenosis. *N Engl J Med.* 2025;392(3):217-227.
7. Otto C, Kumbhani D, Alexander K, et al. 2017 ACC expert consensus decision pathway for transcatheter aortic valve replacement in the management of adults with aortic stenosis: A report of the American College of Cardiology Task Force on Clinical Expert Consensus Documents. *J Am Coll Cardiol.* 2017;69(10):1313-1346.
8. Culler S, Reynolds M, Kugelmass A, et al. Incremental cost and length of stay associated with complications of transcatheter aortic valve replacement. JACC Adv. 2025;4(9):102107.
9. Prasad S, Lee M, Roy R, et al. Comparing elective vs. urgent TAVR: A national analysis of mortality, predictors, and costs. *J Soc Cardiovasc Angiogr Interv.* 2025;4(5):103330.
10. Bansal A, Kumar A, Kalra A, et al. Temporal trends in the utilization and outcomes of balloon aortic valvuloplasty in the pre-transcatheter aortic valve implantation (TAVI) and TAVI eras. *Am J Cardiol.* 2022;180:91-98.
11. Zhong J, Kamp N, Bansal A, et al. Balloon aortic valvuloplasty in the modern era: A review of outcomes, indications, and technical advances. *J Soc Cardiovasc Angiogr Interv.* 2023;2(4):101002.
12. Dratch A., Murphy S., Kelley M. Reducing urgent TAVR admissions: BAV prior to TAVR. Medicare Fee-For-Service 100% Standard Analytic File, 2019-2023. Edwards Lifesciences; June 23, 2025.
13. Lindman BR, Fonarow GC, Myers G, et. al. Target Aortic Stenosis: A National Initiative to Improve Quality of Care and Outcomes for Patients With Aortic Stenosis. *Circ Cardiovasc Qual Outcomes.* 2023;16(6):e009712.

MEDAXIOM AN ACC COMPANY

ABOUT MEDAXIOM MedAxiom, an ACC Company, is the cardiovascular community's premier source for organizational performance solutions. MedAxiom is transforming cardiovascular care by combining the knowledge and power of hundreds of cardiovascular organization members, thousands of administrators, clinicians and coders and dozens of industry partners. Through the delivery of proprietary tools, smart data and proven strategies, MedAxiom helps cardiovascular organizations achieve the Quadruple Aim of better outcomes, lower costs, improved patient experience and improved clinician experience.

Learn more at medaxiom.com

Edwards

ABOUT EDWARDS Edwards Lifesciences is a global leader in patient-focused medical innovations for structural heart disease, as well as critical care and surgical monitoring. Driven by a passion to help patients, the company collaborates with the world's leading clinicians and researchers to address unmet healthcare needs, working to improve patient outcomes and enhance lives.

Learn more at edwards.com