

CORONARY, PERIPHERAL, AND STRUCTURAL INTERVENTIONS

QUALITY IMPROVEMENT PROJECTS

Improving Same Day Discharge Process After Outpatient Percutaneous Coronary Interventions



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ABSTRACT

BACKGROUND Same day discharge (SDD) after outpatient percutaneous coronary intervention (PCI) has been shown to be safe in appropriately selected patients and can improve patient experience while reducing health care costs.

PROJECT RATIONALE Despite this evidence, at the University of Virginia Medical Center, SDD rates following outpatient PCI were significantly lower compared with national benchmarks derived from Biome Analytics peer teaching hospital data.

PROJECT SUMMARY A multidisciplinary team was developed to improve SDD following outpatient PCI while maintaining high-quality outcomes. The team implemented targeted interventions to address discharge barriers throughout the procedural process. Following implementation, SDD rates increased, reaching a performance best of 75%. One safety issue occurred with a patient who did not follow instructions. No additional safety concerns were identified.

TAKE-HOME MESSAGE A structured, multidisciplinary design of the outpatient PCI care pathway can safely and significantly increase SDD utilization, even in the setting of rising procedural volumes. (JACC Case Rep. 2026; 31:109522) © 2026 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Same day discharge (SDD) after outpatient percutaneous coronary intervention (PCI) is an evidence-based practice supported by published literature, including an expert consensus statement in *JACC*, demonstrating safety and efficiency in appropriately selected populations.¹ The benefits not only include patient satisfaction, but reduction in health care utilization and resources.

TAKE-HOME MESSAGES

- A structured, multidisciplinary design of the outpatient PCI care pathway can safely and significantly increase same day discharge utilization, even in the setting of rising procedural volumes.
- Aligning workflows with evidence-based criteria and continuously benchmarking performance enables sustainable improvement without compromising patient safety.

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The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the [Author Center](#).

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ABBREVIATIONS AND ACRONYMS

CTU = cardiac transition unit

PCI = percutaneous coronary intervention

SDD = same day discharge

PROJECT RATIONALE

In calendar year 2023, the University of Virginia Medical Center's SDD rate ranged between 35% and 40%, compared with approximately 65% among peer teaching hospitals.² This variability was not fully recognized because benchmarking data were not readily accessible. Following engagement with Biome Analytics, a multidisciplinary team gained timely access to peer comparison data, identifying performance gaps and opportunities to evaluate current workflow processes based on high-performing institutions.

During the same period, the interventional cardiology program experienced significant growth, including the recruitment of a new medical director and an additional interventional cardiologist. These changes contributed to approximately 20% increase in procedural volume between 2023 and 2025, whereas physical recovery space remained unchanged. As volumes grew, Cardiac Transition Unit (CTU) capacity emerged as a key operational constraint, as the unit serves as a pre-procedure area, recovery space, and overnight stay unit, contributing to throughput bottlenecks. The importance of efficient utilization of this space for patients who need overnight monitoring remains crucial.

The goal of this quality improvement initiative was to evaluate and redesign the PCI care pathway and address system barriers to safely increase SDDs.

PROJECT DESCRIPTION

A multidisciplinary quality improvement team was created that included a project manager, advanced practice providers, CTU nurses, cardiac catheterization lab nurses, procedural schedulers, and an interventional cardiologist.

The team conducted a structured review to identify SDD discharge barriers across the PCI care continuum (Figure 1). Modifiable discharge barriers included late PCI cases (end after 1 PM), patient support and/or willingness for SDD, and unstable pre-procedure comorbidities. Complication types and timing were also analyzed to better define monitoring needs post PCI specific for our institution.

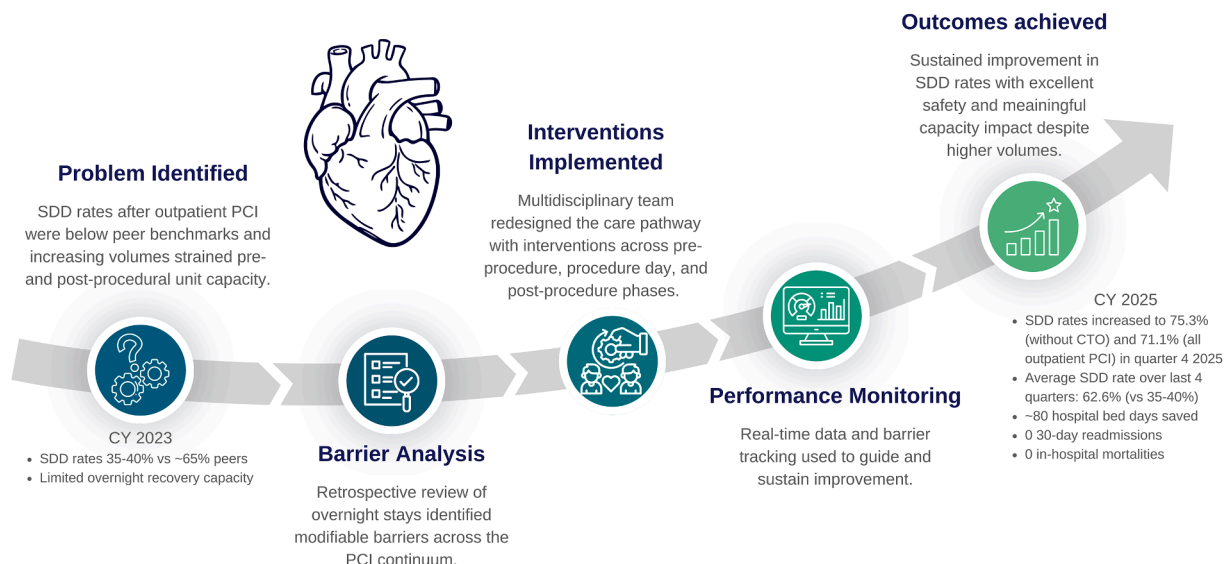
Targeted interventions were then implemented to address barriers throughout the continuum of the procedural process.

PREPROCEDURE INTERVENTIONS.

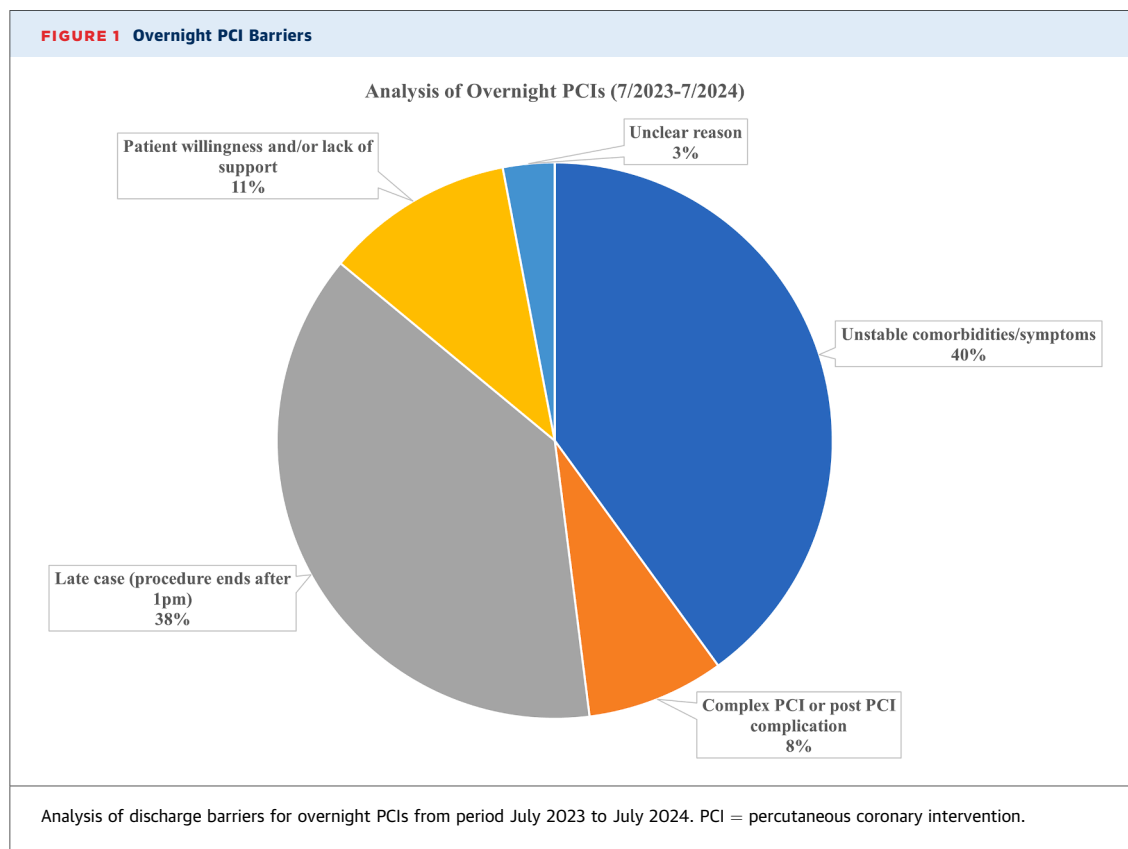
- Early engagement of the interventional cardiology group to establish consensus around a standardized SDD pathway and update pre- and post-procedure eligibility criteria to align with published JACC SDD criteria (Table 1)

VISUAL SUMMARY Quality Improvement Process of Improving Same Day Discharge After Outpatient Percutaneous Intervention

Improving Same-Day Discharge After Outpatient PCI



CTO = chronic total occlusion; PCI = percutaneous coronary intervention; SDD = same day discharge.



- Standardized preprocedure SDD eligibility criteria were used to identify appropriate outpatient PCI candidates before the procedure
- Appropriate outpatient PCI cases were scheduled earlier in the day
- Updates to patient and family education regarding SDD expectations
- Reinforcement of caregiver support requirements
- Utilization of updated hydration protocols to reduce contrast-induced nephropathy as well as orthostatic hypotension commonly seen after bedrest completion

PROCEDURAL-DAY INTERVENTIONS.

- Reduction of post-procedure observation time from 6 to 4 hours for PCIs using radial access and femoral access with a closure device
- Development and implementation of a standardized nursing discharge readiness flowsheet (Figure 2), led by a CTU nurse as part of the multidisciplinary team, to increase nursing ownership of the discharge readiness assessment. The flowsheet was embedded in the discharge navigator used by CTU nurses to integrate

TABLE 1 Pre- and Post-PCI Criteria for Same Day Discharge

Pre-PCI Criteria for Same Day Discharge	Post-PCI Criteria for Same Day Discharge
1. Stable angina on presentation 2. No significant symptomatic/uncontrolled comorbidities present relevant to procedure and recovery (eg, bleeding, CKD, HF) 3. Patient with appropriate home support structure and access to health care facility should unexpected complications develop	1. Fully loaded on P2Y12 inhibitor and prescription verified 2. Patient monitored for appropriate time period with no issues (4 h for radial access or femoral access with 6-F catheter and utilization of closure device, 6 h for all other access) 3. Access site stable and patient ambulates with no issues 4. No ECG changes or increasing angina post PCI 5. Interventional cardiology attending approval 6. Cardiology follow-up scheduled in 4-6 wk 7. Called by APP the following day

APP = advanced practice provider; CKD = chronic kidney disease; ECG = electrocardiogram; HF = heart failure; P2Y12 = purinergic receptor medication; PCI = percutaneous coronary intervention.

FIGURE 2 Standardized Nursing Discharge Readiness Flowsheet

Mobility
Length of Bedrest
Passed Orthostatics
Walked (minimum of 2 times for ambulatory patients)
Intake
Oral intake as recommended
Education
Education started with patient/family (after hemostasis/sheath removal)
Confirmed with LIP all new medications available
Provide stent card
Follow-up
Concerns for SDD
Confirm home support & transportation
Confirmed patient contact information accurate in EPIC

The discharge readiness flowsheet was imbedded within the discharge navigator and completed by nursing staff following completion of post-procedure bedrest. Developed by a nurse in collaboration with the multidisciplinary team, the tool standardized assessment of discharge readiness, increased nursing ownership of the discharge process, and facilitated communication with the advanced practice providers before same day discharge. LIP = licensed independent provider; SDD = same day discharge.

seamlessly into the existing nursing workflow. Education and reinforcement were provided during daily CTU morning huddles until completion of the discharge readiness tool became part of routine practice.

POST-PROCEDURE INTERVENTIONS.

- Standardized advanced practice provider next-day follow-up call to all SDD patients
- Tracking of post-discharge concerns and complications
- Ongoing surveillance of 30-day readmission and mortality outcomes

Interventionalists agreed to follow the standardized pathway for patients meeting established eligibility criteria. Patients who experienced procedural complications or no longer met pre- or post-procedure discharge criteria were removed from the SDD pathway and observed overnight at the physician's discretion. Conversely, when patients had uncomplicated procedures and satisfied all standardized discharge criteria, physicians supported SDD, resulting in consistent application of the pathway across operators.

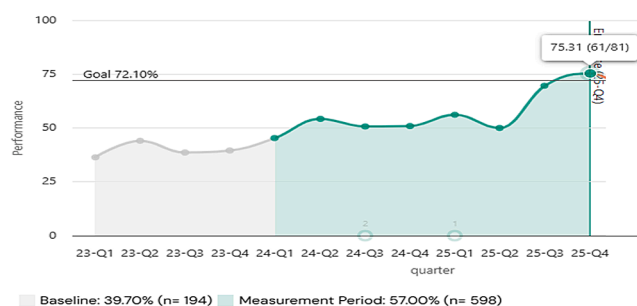
Real-time performance monitoring with independent validation was used to evaluate patient factors and continued discharge barriers, including case end time, access site, distance from hospital, PCI complexity, comorbidities, social support, and post-procedural symptoms.

FIGURE 3 Outpatient PCI Without CTO Same Day Discharge Performance

UVA: Same Day Discharge: Outpatient PCI

Interventional Cardiology
Initiative Cohort: Without CTO

Track your progress



Baseline and intervention tracking of outpatient PCI without CTO same day discharges from January 1, 2023 to December 31, 2025. Baseline data in gray (2023 quarter 1 to 2023 quarter 4) and measurement period is green (2024 quarter 1 to 2025 quarter 4). Historical best performance in quarter 4 of 2025 at 75.31%. CTO = chronic total occlusion; UVA = University of Virginia; other abbreviation as in Figure 1. Source: Biome.

PROJECT DELIVERABLES

The project produced several sustainable operational and clinical deliverables.

CLINICAL DELIVERABLES.

- Standardized pre- and post-procedure SDD eligibility criteria
- Updated observation protocols for eligible patients
- Standardized discharge readiness assessment workflow
- Safety surveillance processes incorporating next-day follow-up, readmission monitoring, and discharge barrier tracking methodology

OPERATIONAL DELIVERABLES.

- Scheduling optimization processes to increase earlier outpatient PCI procedures
- Structured review process for overnight stays
- Revised patient and caregiver educational and expectation materials

PROJECT OUTCOME, IMPACT, AND FUTURE DIRECTIONS/NEXT STEPS

Following implementation of the redesigned care pathway, SDD rates have steadily increased throughout 2025, reaching a performance best of 75.3% in quarter 4 of 2025 for outpatient PCI without chronic total occlusion (Figure 3), and a peak of 71.1% in quarter 4 of 2025, including chronic total occlusion PCI populations (Figure 4).

Over the most recent 4 quarters, the program achieved an average SDD rate of 62.6%, narrowing the gap with peer teaching hospitals where the average SDD rate is 67.3%.² This improvement represents a substantial increase from baseline SDD rates of 35% to 40% in 2023.

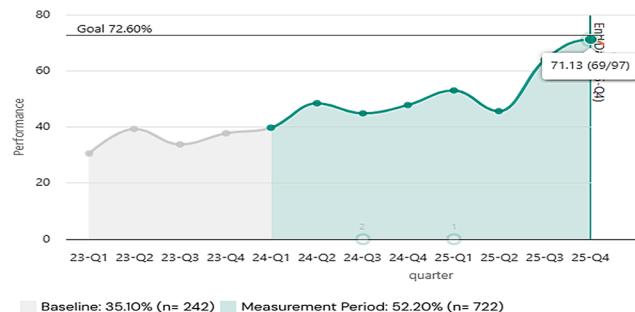
During this period, outpatient PCI procedural volumes increased by nearly 60%, from 248 cases in calendar year 2023 to 395 in calendar year 2025. This growth was driven by expansion of the interventional cardiology program, including the recruitment of 2 additional interventional cardiologists, as well as an enhanced referral pipeline associated

FIGURE 4 Outpatient PCI Same Day Discharge Performance

UVA: Same Day Discharge: Outpatient PCI

Interventional Cardiology
Initiative Cohort: Outpatient PCI

Track your progress



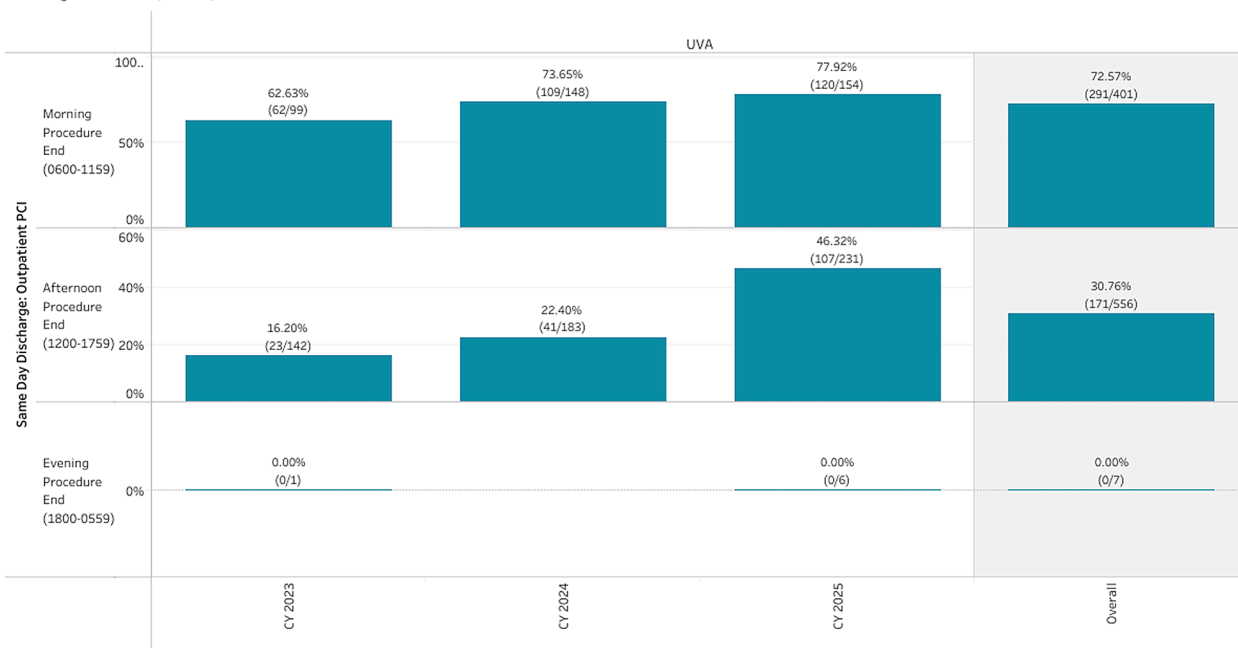
Baseline and intervention tracking of all outpatient PCI same day discharges from January 1, 2023 to December 3, 2025. Baseline data in gray (2023 quarter 1 to 2023 quarter 4) and measurement period in green (2024 quarter 1 to 2025 quarter 4). Historical best performance in quarter 4 of 2025 at 71.13%. Abbreviations as in Figures 1 and 3. Source: Biome.

FIGURE 5 Outpatient PCI Same Day Discharge Volumes by Procedure End Time

Same Day Discharge: Outpatient PCI

Procedure Selected: Outpatient PCI
Benchmark Selected: None
Measure Qualifying Volume: 964
Date Range Included: 23-Q1 to 25-Q4

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Same day discharge utilization increased across both morning and afternoon outpatient procedure end times from calendar year 2023 to calendar year 2025. Morning cases (6:00-11:59 AM) increased to 77.9% and afternoon cases (12:00-5:59 PM) increased to 46.3% in calendar year 2025. Abbreviations as in Figures 1 and 3. Source: Biome.

FIGURE 6 Outpatient PCI Same Day Discharge Volumes by Access Site

Same Day Discharge: Outpatient PCI

Procedure Selected: Outpatient PCI
Benchmark Selected: None
Measure Qualifying Volume: 964
Date Range Included: 23-Q1 to 25-Q4

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Access site also influence same day discharge utilization. Same day discharge rates increased across both radial and femoral access sites from calendar year 2023 to calendar year 2025. Same day discharges where patients had radial access increased to 79.2% and femoral access increased to 45.0% in calendar year 2025. Abbreviations as in [Figures 1 and 3](#). Source: Biome.

with the acquisition of community hospitals in Northern Virginia. Despite a nearly 60% increase in procedural volume, the program successfully scaled the SDD pathway while maintaining favorable patient outcomes. Increased SDD utilization translated to approximately 80 hospital bed days saved during the observation period, improving CTU capacity and operational efficiency.

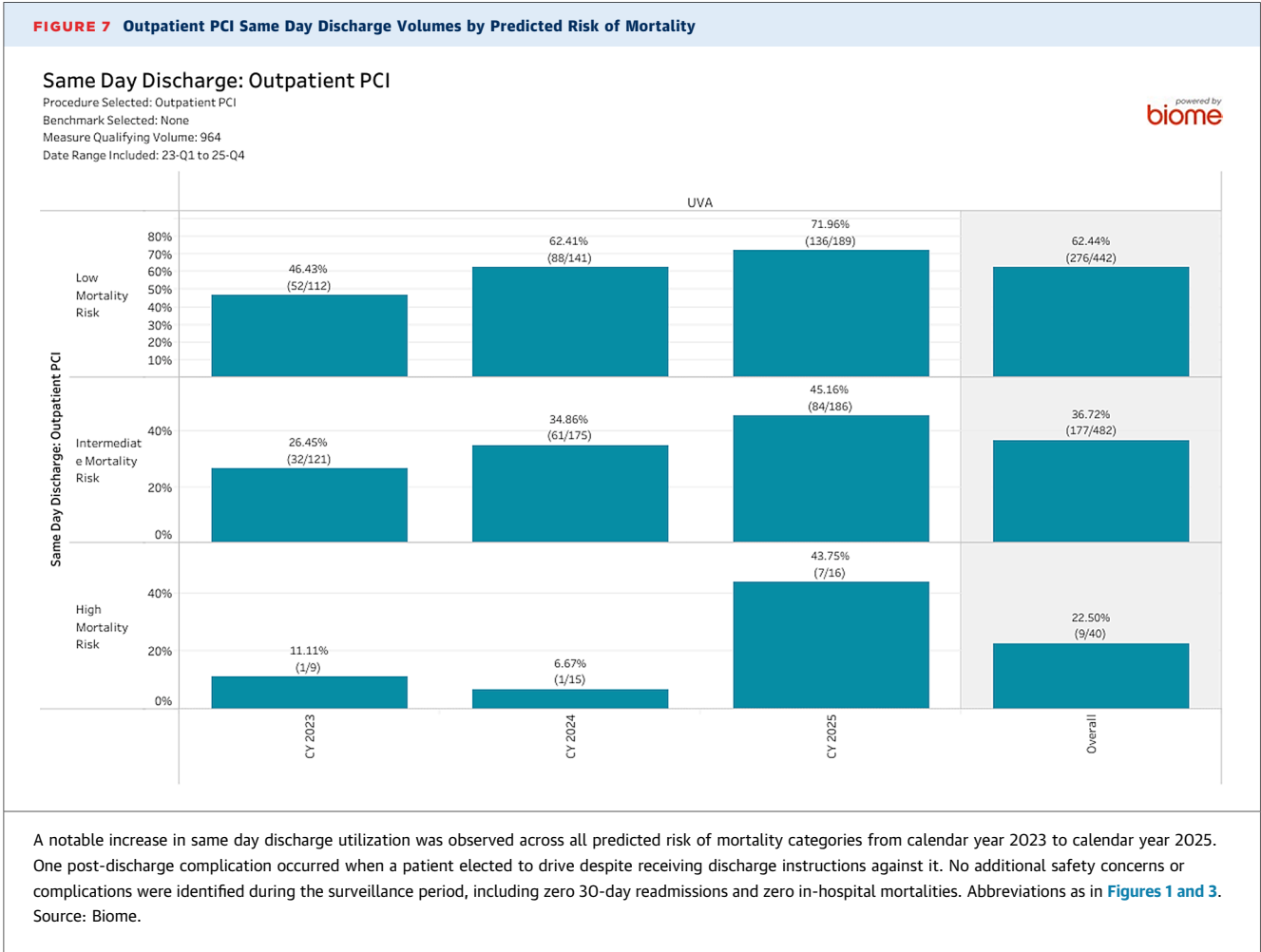
Analysis of SDD performance demonstrated improvement across operational domains. Morning cases (6:00-11:59 AM) increased SDD rates from 62.6% in calendar year 2023 to 77.9% in calendar year 2025. Afternoon cases (12:00-5:59 PM) showed substantial gains in SDD, increasing from 16.2% in calendar year 2023 to 46.3% in calendar year 2025, reflecting improved team confidence and more standardized post-procedure workflows ([Figure 5](#)). Similar improvements were observed across radial and femoral access procedures ([Figure 6](#)) and across predicted mortality risk categories ([Figure 7](#)).

Safety surveillance identified one post-discharge event involving non-adherence to discharge instructions; however, no additional safety concerns were identified. During the monitoring period, zero 30-day readmissions and zero in-hospital mortalities were observed.

Continued focus on procedural scheduling efficiency, cardiac catheterization lab readiness, radial access utilization, and cross-team collaboration will be essential to maintain and further improve SDD rates.

DISCUSSION

This quality initiative demonstrates that significant improvement in SDD utilization can be achieved through a multidisciplinary pathway redesign rather than reliance on a single intervention. The largest remaining intervenable barrier to discharge was late procedural completion, highlighting the



importance of operational factors in successful SDD programs.

Several elements were critical to this success, including interventionalist agreed on standardized eligibility criteria, establishing patient expectation before the procedure, nursing engagement in discharge readiness, and continuous performance monitoring. The use of real-time data allowed the team to identify barriers, validate interventions, and maintain stakeholder engagement throughout implementation.

Improvements occurred despite substantial growth in procedural volumes and space constraints, suggesting that standardized workflows can support both quality and operational efficiency. These findings are consistent with published literature and peer benchmarking demonstrating the safety and value in SDD following outpatient PCI.

The framework developed through this initiative may be replicated by other institutions seeking

to safely expand procedural throughput, optimize resource utilization, and enhance patient-centered care.

CONCLUSIONS AND FUTURE DIRECTIONS

A multidisciplinary, system-based approach to redesign the outpatient PCI care pathway significantly increased safe SDD rates at our institution without compromising patient outcomes or safety. Addressing barriers across the entire procedural continuum, from scheduling and patient education to post-procedure follow-up, was critical to achieving sustained success. In addition, a multidisciplinary team approach, using real-time data to guide continued interventions has been instrumental to maintain success and safety for this quality initiative as well as help identify future opportunities for improvement.

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The authors have reported that they have no relationships relevant to the contents of this paper to disclose.

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KEY WORDS coronary angiography, hemodynamics, percutaneous coronary intervention, stents