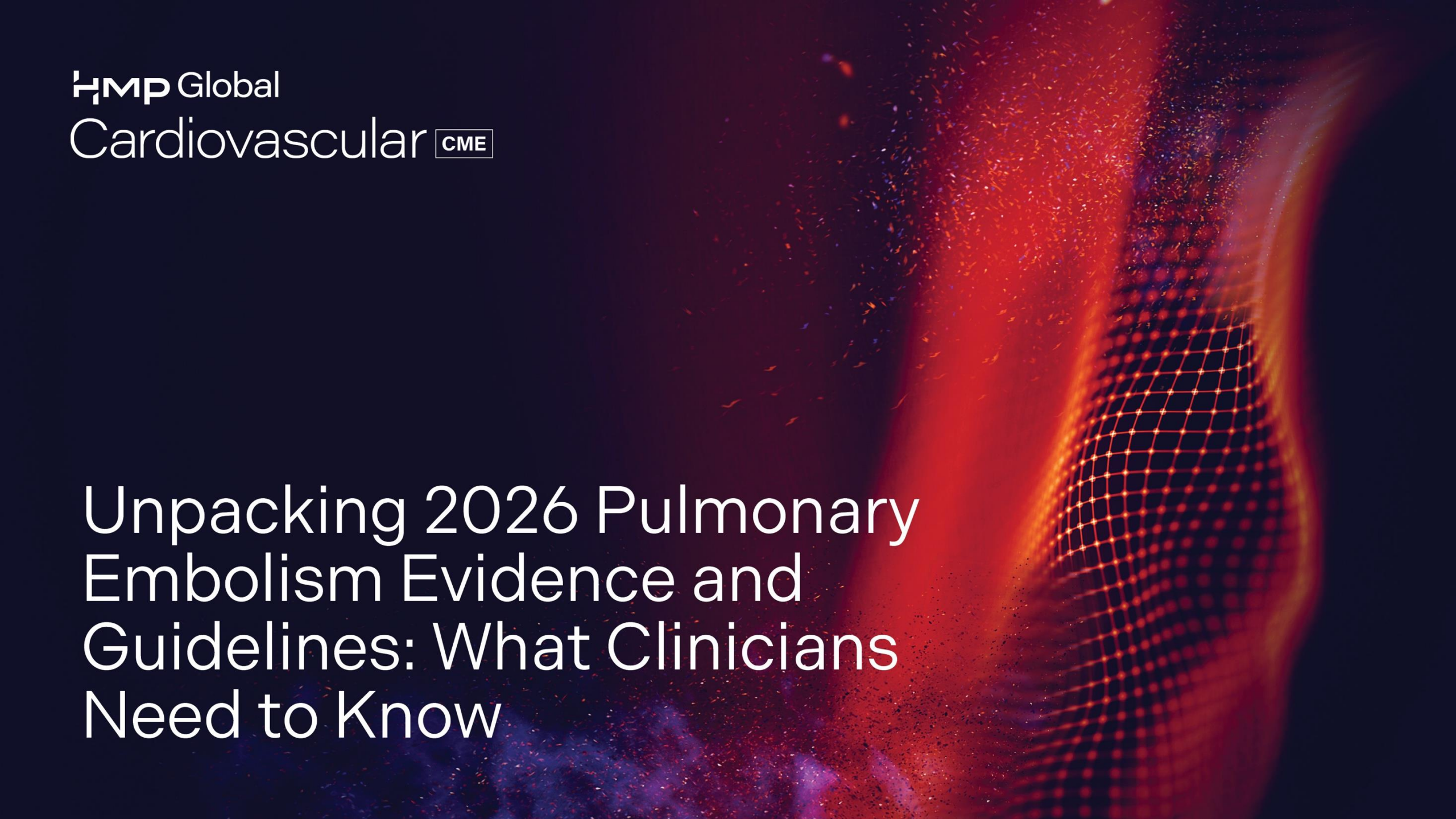
HMP Global

Cardiovascular CME

Unpacking 2026 Pulmonary Embolism Evidence and Guidelines: What Clinicians Need to Know



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Faculty Disclosures

- **Robert Lookstein, MD, MHCDL, FSIR, FAHA, FSVM**: Advisory Board—Boston Scientific, Imperative Vascular; Consultant—Penumbra; Stock Options—Innova Vascular, Thrombolex, Aidoc
- **Rachel Rosovsky, MD, MPH**: Consultant—Penumbra, Boston Scientific, Innova Vascular, Inquis, CSL; Research Funding—Penumbra
- **Suhail Dohad, MD, FACC, RVT**: Speaker—Johnson & Johnson, Penumbra, Boston Scientific, Abbott Vascular, Medtronic; Consultant—Penumbra, Boston Scientific, Abbott Vascular; Research Funding—Penumbra, Boston Scientific, Abbott Vascular
- **Parag Patel, MD, MS**: Advisory Board—Boston Scientific, Becton Dickinson; Speakers Bureau—Penumbra, Gore; Research Funding—Penumbra, Gore

Program Information

- This program is provided by HMP Education, an HMP Global company
- Supported by an educational grant from Penumbra, Inc.

Learning Objectives

- Evaluate the latest clinical evidence supporting current strategies for the diagnosis and management of pulmonary embolism (PE)
- Discuss multidisciplinary approaches that optimize decision-making and improve care coordination for patients with PE
- Understand the most recent clinical guidance for the treatment of acute PE
- Discuss innovative technologies and interventional technique selection for PE treatment

PE = pulmonary embolism.

HMP Global
Cardiovascular CME

PE Evidence Update: STORM-PE Trial

Robert Lookstein, MD, MHCDL,
FSIR, FAHA, FSVM

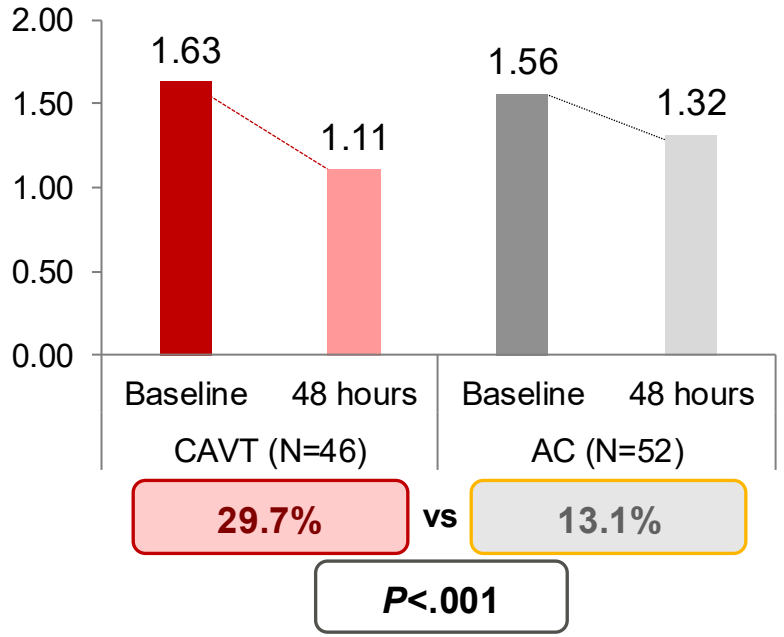
Clinical, Functional, and Quality of Life Outcomes through 90 Days in the STORM-PE RCT for Mechanical Thrombectomy with Anticoagulation vs Anticoagulation Alone in Acute Intermediate-High Risk PE Patients

STORM-PE RCT Results ≤7 Days

In partnership with The PERT Consortium®

First RCT to evaluate **MT (CAVT) with AC vs AC alone** for treatment of acute intermediate-high risk PE

Primary Endpoint: Superior RV/LV Ratio Reduction for CAVT



Greater Thrombus Reduction + Hemodynamic Recovery by 48h for CAVT

Δ RMMS, Reduction	**42.1%** vs 15.6%	*P*<.001
Lower Heart Rate	**80.0** vs 86.4 bpm	*P*=.022
Lower Supp O_2	**0.5** vs 1.4 L/min	*P*=.027
Lower NEWS2	**1.8** vs 2.7	*P*=.034

Comparable Safety ≤7 Days

Composite MAE	**4.3% vs** 7.5%	*P*=.681

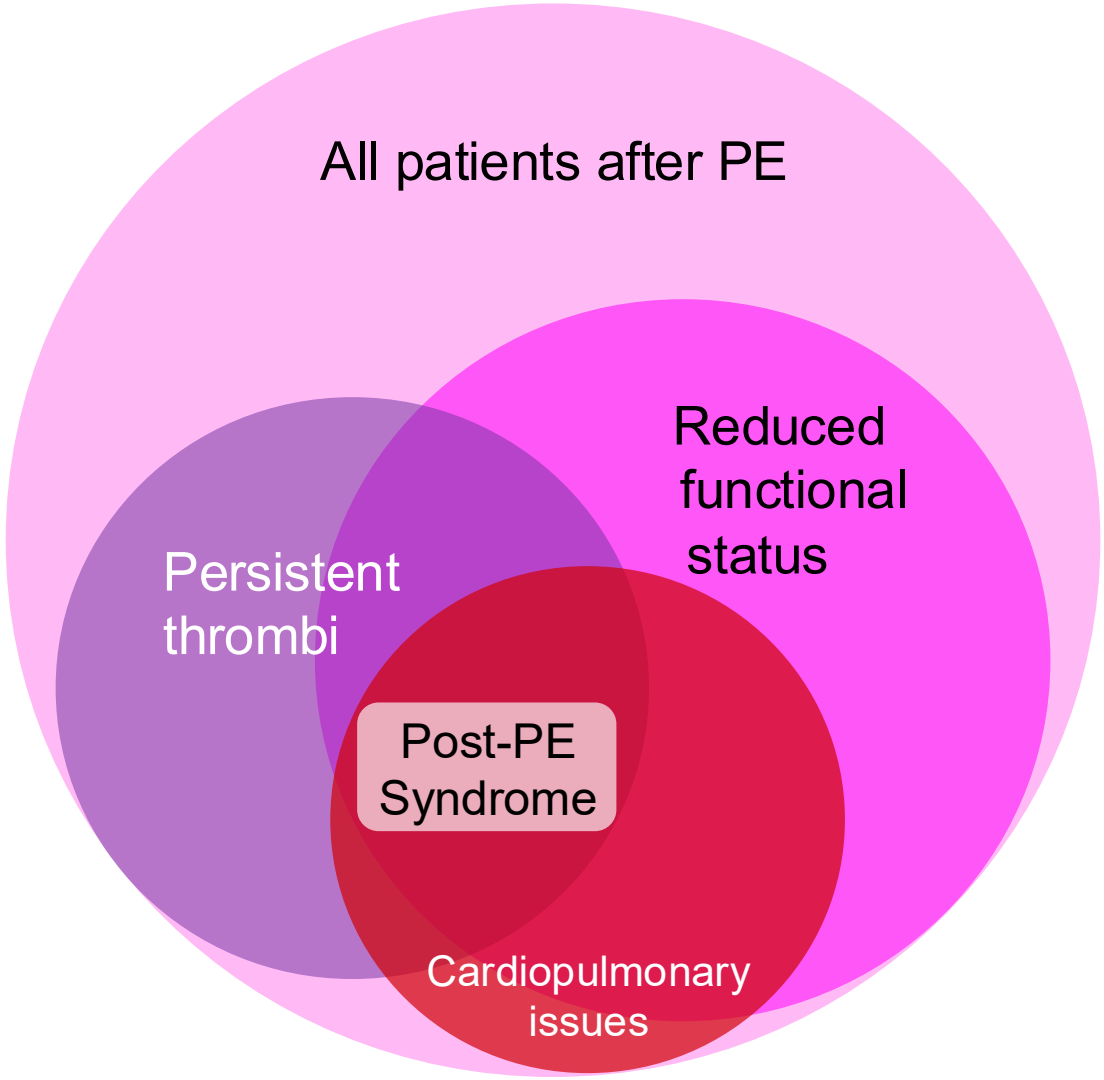
***P*-values are calculated from Fisher's exact test.**

RCT = randomized controlled trial; MT = mechanical thrombectomy; CAVT = computer-assisted vacuum thrombectomy; AC = anticoagulation; RV/LV = right ventricular/left ventricular; RMMS = Refined Modified Miller Score; bpm = beats per minute; Supp O2 = supplemental oxygen requirement; NEWS2 = National Early Warning Score 2; MAE = major adverse event.

Lookstein RA, et al. *Circulation*. 2026;153(1):21-34.

Background: Post-PE Syndrome

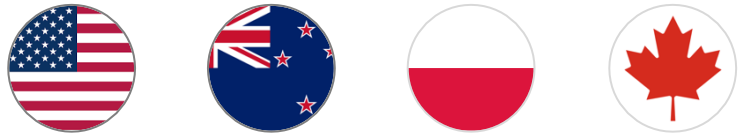
- **Persistent symptoms leading to Post-PE Syndrome**
  - Experienced by up to 50% of patients
- **Growing focus on PE complications**
  - Specifically, functional status and QoL
- **Evidence gap**
  - Advanced therapy impact on Post-PE Syndrome not well-studied



Khan SR, et al. *Am J Med*. 2017;130(8):990.e9-990.e21. Klok FA, et al. *Blood Rev*. 2014;28(6):221-226.

Patient Follow-Up

22 International Sites



100 Acute Intermediate-High Risk PE Patients
Randomized (ITT population)

CAVT + AC
47 Patients

AC Alone
53 Patients

Follow-up completion
45 Discharge
40 30 days (± 7 days)
39 90 days (± 14 days)

Follow-up completion
53 Discharge
50 30 days (± 7 days)
46 90 days (± 14 days)

Baseline Presentation

- ✓NEWS2
- ✓CTPA
- ✓Vitals
- ✓**Functional**
- ✓**QoL**

30 Days

- ✓**Functional**
- ✓**QoL**
- ✓Wearable device

90 Days
Secondary Endpoint

- ✓**Functional**
- ✓**QoL**
- ✓Wearable device
- ✓**Mortality**
- ✓**PE recurrence**

ITT = intent-to-treat; CTPA = computed tomography pulmonary angiography; QoL = quality of life.

Lookstein RA, et al. *Circulation*. 2026;153(1):21-34.

Baseline and Medical History Information

Treatment arms were well-matched across key baseline measures

	CAVT N=47	AC N=53
Demographic Characteristics		
Age (years)	59.5 ± 13.2	61.2 ± 14.2
Female Sex	18 (38.3%)	28 (52.8%)
Race		
White	22 (50.0%)	35 (70.0%)
Black	18 (40.9%)	13 (26.0%)
Other	0 (0%)	1 (2.0%)
Unknown/Not reported	4 (9.1%)	1 (2.0%)
Medical History		
Arterial Hypertension*	21 (44.7%)	35 (66.0%)
Diabetes	9 (19.1%)	9 (17.0%)
DVT	30 (63.8%)	32 (60.4%)
Previous PE	12 (25.5%)	10 (18.9%)

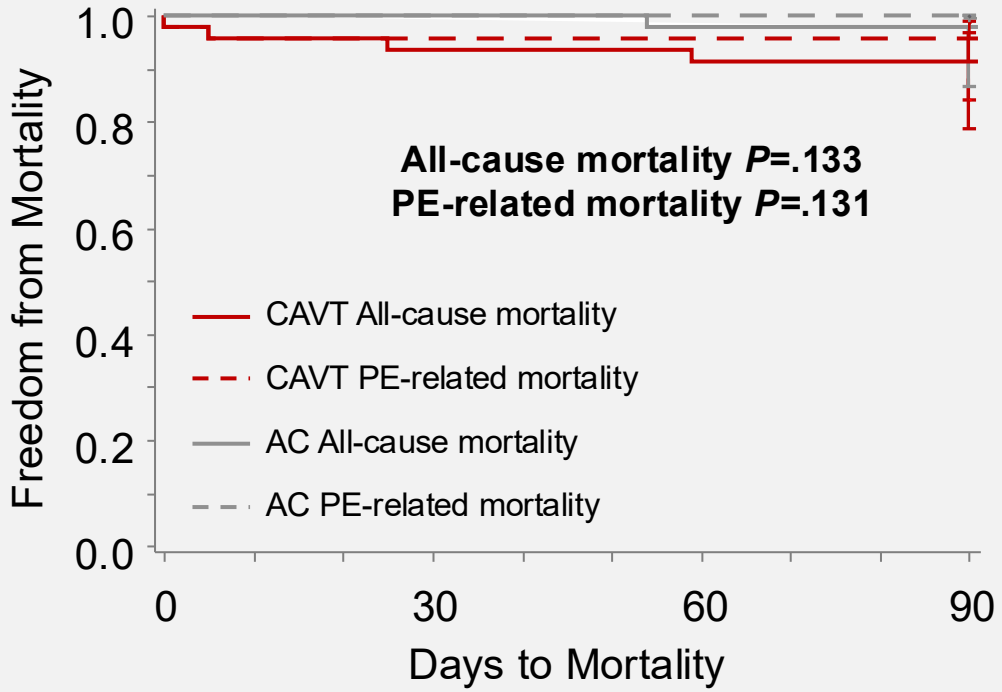
	CAVT N=47	AC N=53
Clinical Parameters**		
NEWS2	3.5 ± 1.95	4.1 ± 2.07
Heart Rate, bpm	93.2 ± 17.4	98.2 ± 15.9
Oxygen Saturation, %	96.0 ± 2.59	95.4 ± 2.44
RV/LV Ratio	1.63 ± 0.36	1.56 ± 0.35
Functional and QoL Assessments		
PVFS	3.0 [3.0-4.0]	3.0 [2.0-4.0]
NYHA Class I (pre-PE)	44 (93.6%)	43 (81.1%)
mMRC ≥ 1	43 (93.5%)	51 (96.2%)
Borg	4.0 [2.0-7.0]	4.0 [2.0-7.0]
PEmb-QoL Overall Score	38.7 ± 22.9	44.8 ± 25.2
EQ-5D-5L Overall Score	0.572 ± 0.387	0.556 ± 0.355
EQ VAS	52.6 ± 24.4	55.3 ± 23.2

Data reported as mean ± SD or number (%) or median [IQR]. *P=.044 Fisher's exact test; **Paired data at 48 hours/discharge for CAVT ranged from N=45-46 and for AC from N=52-53. DVT = deep vein thrombosis; PVFS = post-VTE functional status; VTE = venous thromboembolism; NYHA = New York Heart Association; mMRC = modified Medical Research Council Dyspnea Scale; PEmb-QoL = Pulmonary Embolism Quality of Life questionnaire; EQ-5D-5L = EuroQol 5-Dimension 5-Level Questionnaire; EQ VAS = EuroQol Visual Analogue Scale; SD = standard deviation.

Lookstein RA, et al. *Circulation*. 2026;153(1):21-34.

Safety Endpoints ≤90 Days

	CAVT (N=47)	AC (N=53)
Clinical Deterioration ≤7 days	1*	3
Mortality Details ≤90 Days		
Device- or procedure-related, per CEC	0	NA
Cardiac arrest from hemoptysis during index procedure; no pathological evidence of vascular injury	1* **Day 0**	0
Cardiac arrest during elective DVT thrombectomy (non-CAVT device)	1 **Day 5**	0
Progression of pre-existing cancer	1 **Day 25**	1 **Day 54**
Progression of pre-existing neurologic condition, failure to thrive	1 **Day 59**	0
Recurrence ≤90 Days, per CEC		
Symptomatic recurrent PE	1 **Day 36**	1 **Day 67**



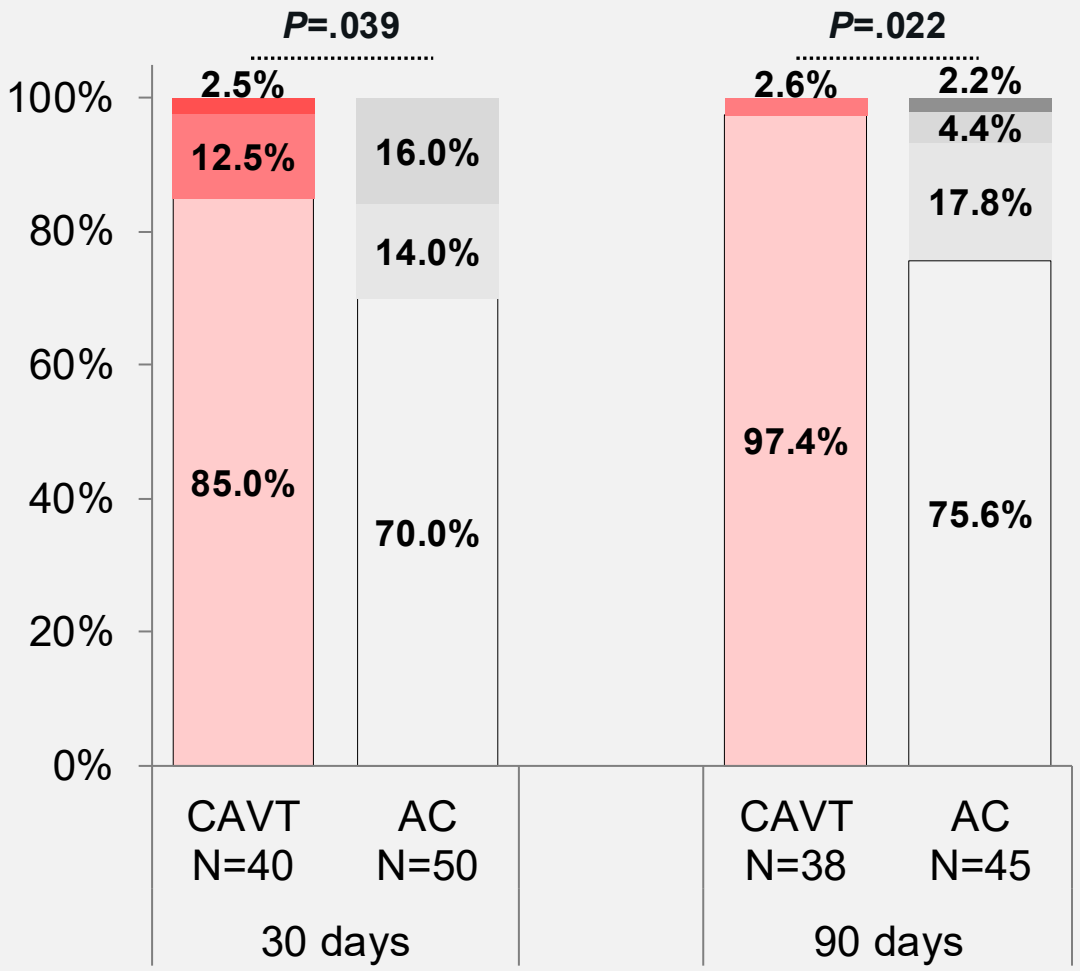
Comparable safety between arms

Vertical bars represent 95% CI using log-log transformation. *P*-values were calculated from the log-rank test. *Patient experiencing clinical deterioration received CPR as a response to a major adverse event (no endovascular rescue therapy) resulting in death.

CEC = Clinical Events Committee; CI = confidence interval; CPR = cardiopulmonary resuscitation.

Lookstein RA, et al. *Circulation*. 2026;153(1):21-34.

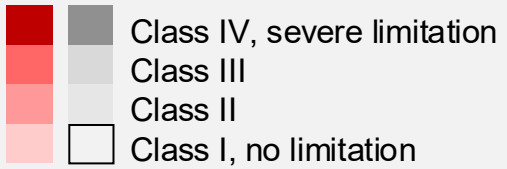
NYHA Functional Class



CAVT patients had fewer limitations on NYHA at both timepoints

and

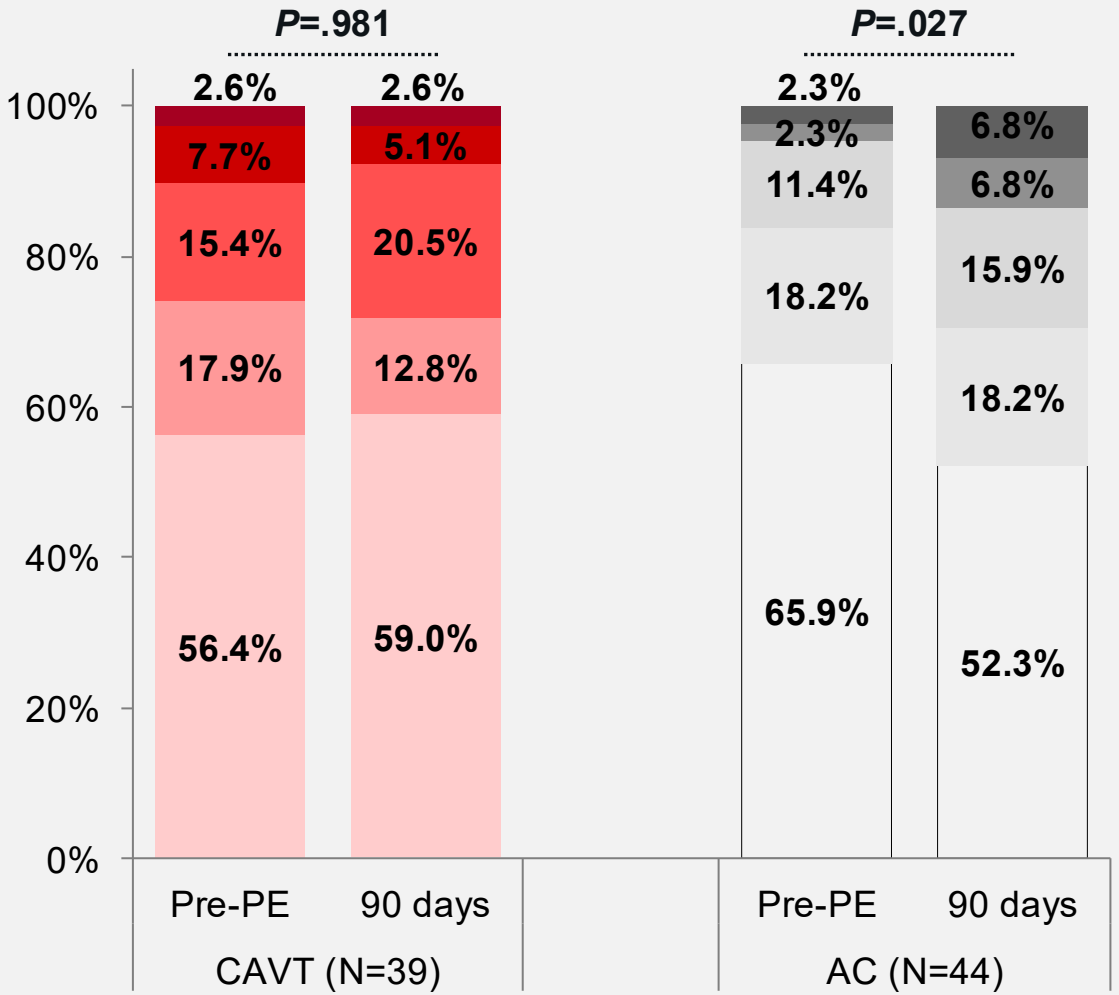
By 90 days, more CAVT patients had no limitations



***P*-values for differences between groups were calculated from the Cochran-Armitage trend test.**

Lookstein RA, et al. *Circulation*. 2026;153(1):21-34.

Post-VTE Functional Status Score Distribution



At 90 days, PVFS distribution for the CAVT group returned to pre-PE status, while AC did not

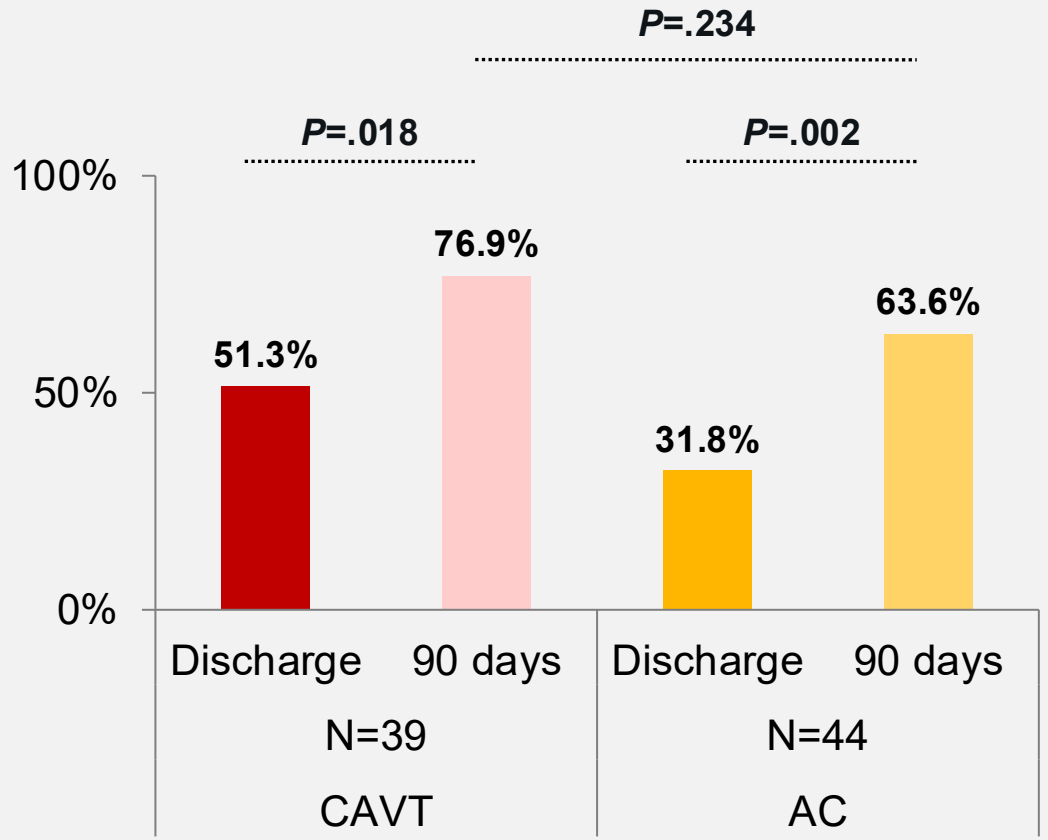
Severe functional limitations
Moderate
Slight
Negligible
No functional limitations

Matched pair data are represented. *P*-values for medians were calculated using the Wilcoxon signed-rank test.

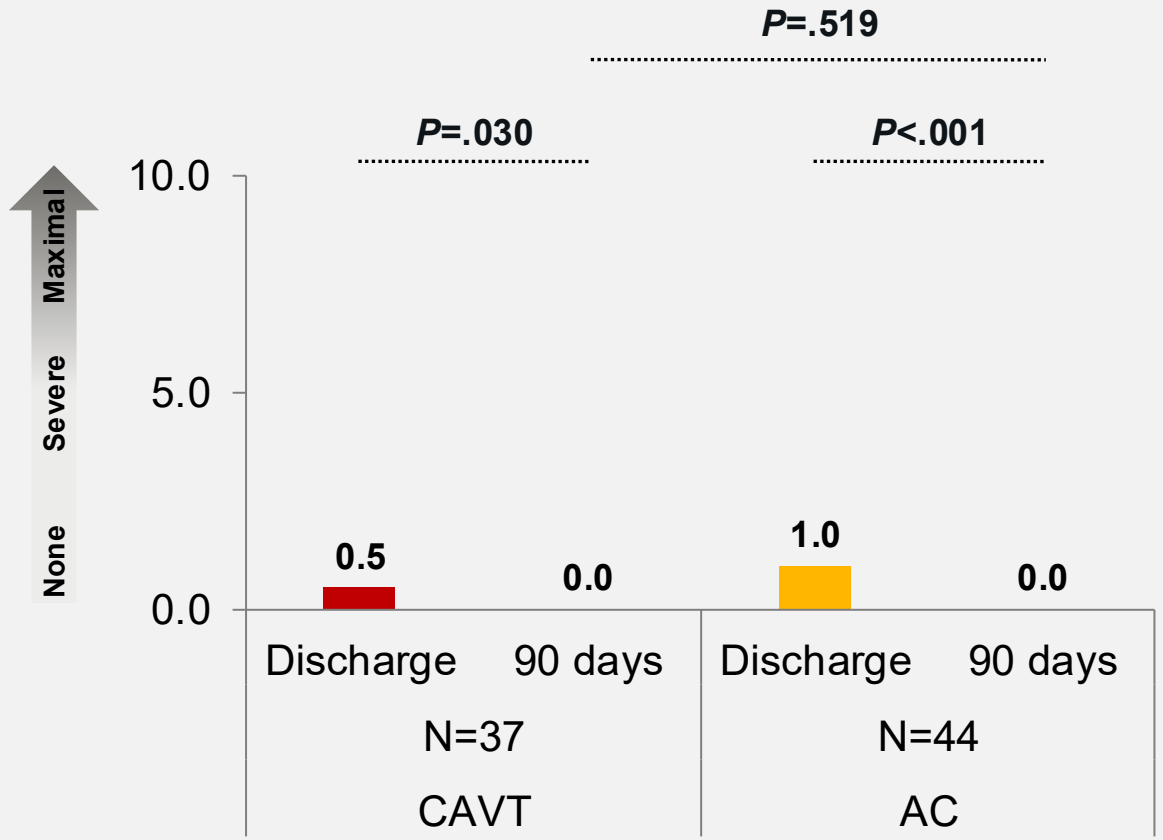
Lookstein RA, et al. *Circulation*. 2026;153(1):21-34.

mMRC and Borg Dyspnea Scales

mMRC % of Asymptomatic* Patients



Median Borg Dyspnea Score

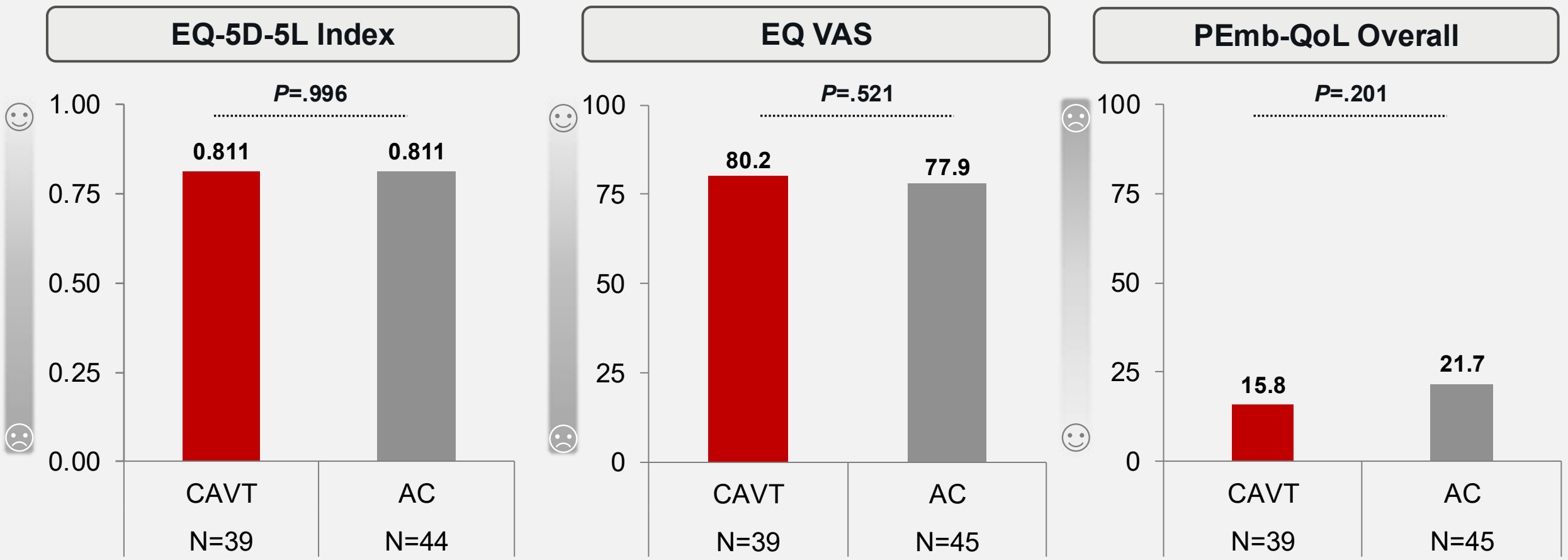


By 90 days, both groups improved with no between-group differences in dyspnea scores

*mMRC=0; *P*-values for proportions (mMRC) used Fisher's exact test. *P*-values for medians (Borg) used Wilcoxon rank-sum test.

Lookstein RA, et al. *Circulation*. 2026;153(1):21-34.

Quality of Life Scores at 90 Days



From presentation to 90 days, QoL outcomes improved in both groups, with no between-group differences

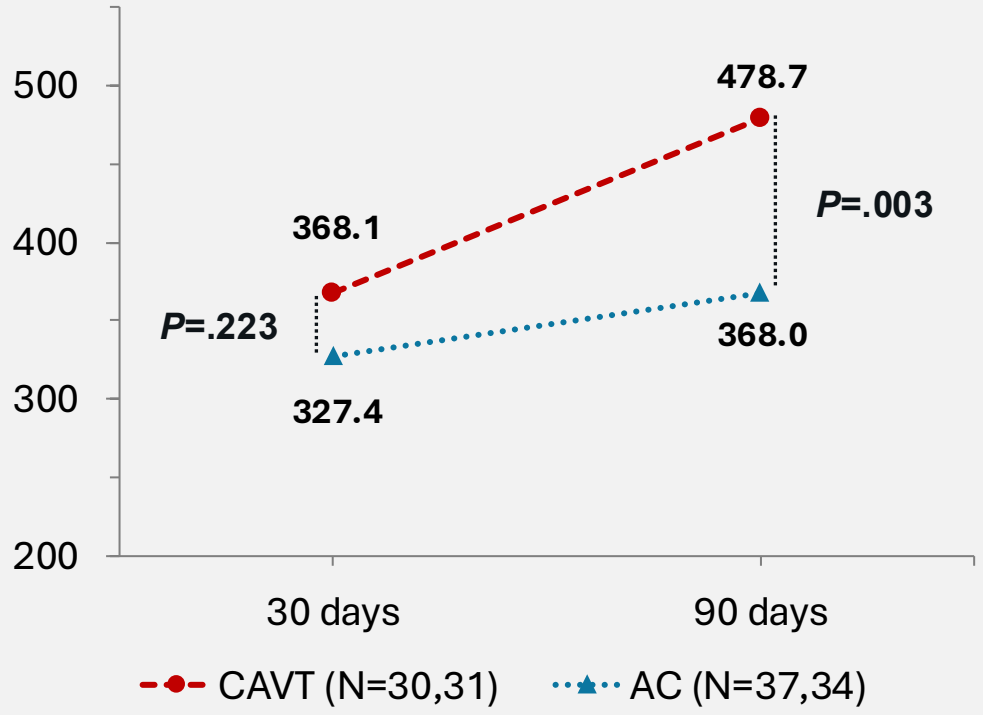
Data presented as mean. EQ-5D-5L all patients scored on U.S. scale. *P*-values for the comparison of means were calculated from the two-sample t-test.

Lookstein RA, et al. *Circulation*. 2026;153(1):21-34.

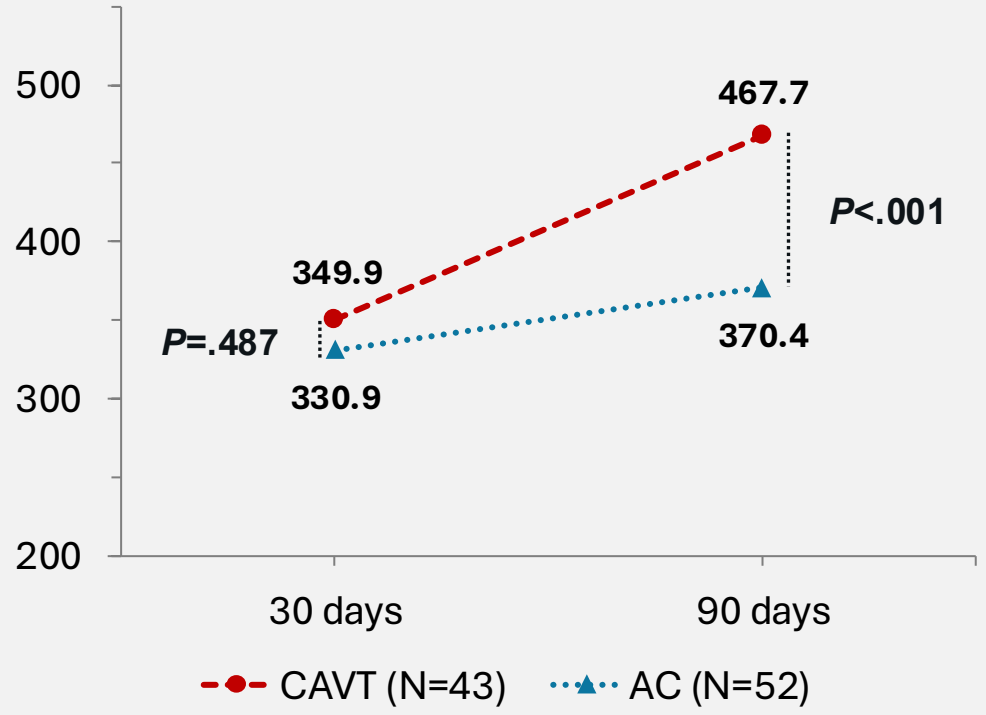
6-Minute Walk Test (6MWT)

Multiple imputation used to account for missing data

Mean 6MWT Distance (6MWD), meters



Mean 6MWD, Imputed, meters



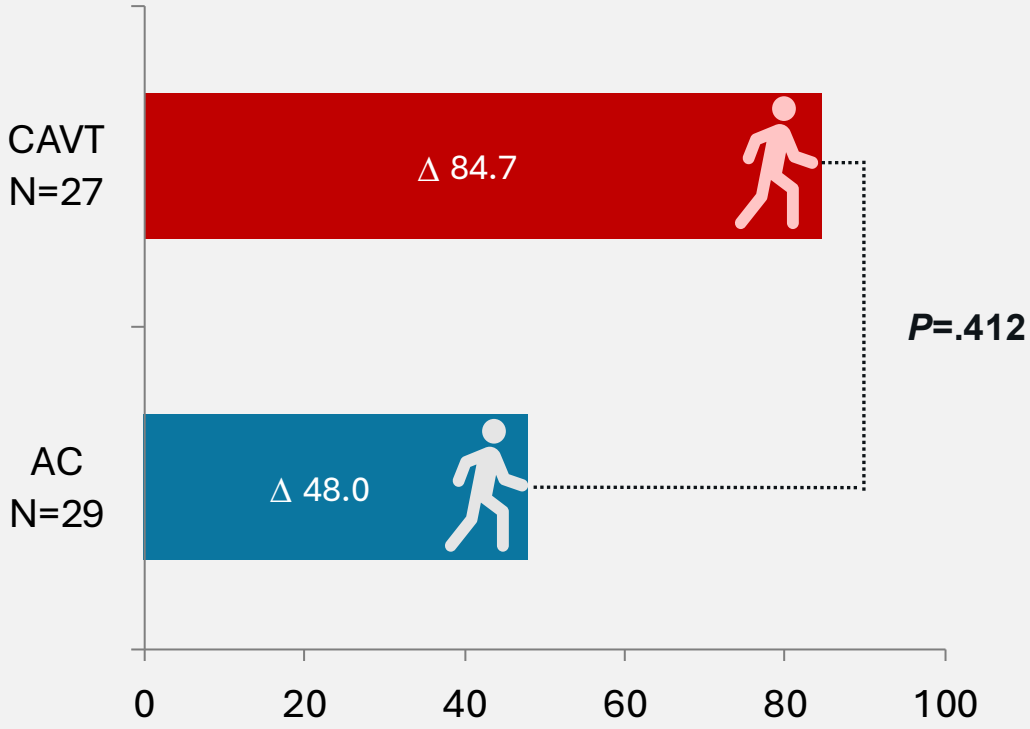
At 90 days, CAVT patients walked significantly farther than AC alone

***P*-values for the comparison of means were calculated from the two-sample t-test. Imputation was carried out separately by assigned randomized group and deaths were excluded.**

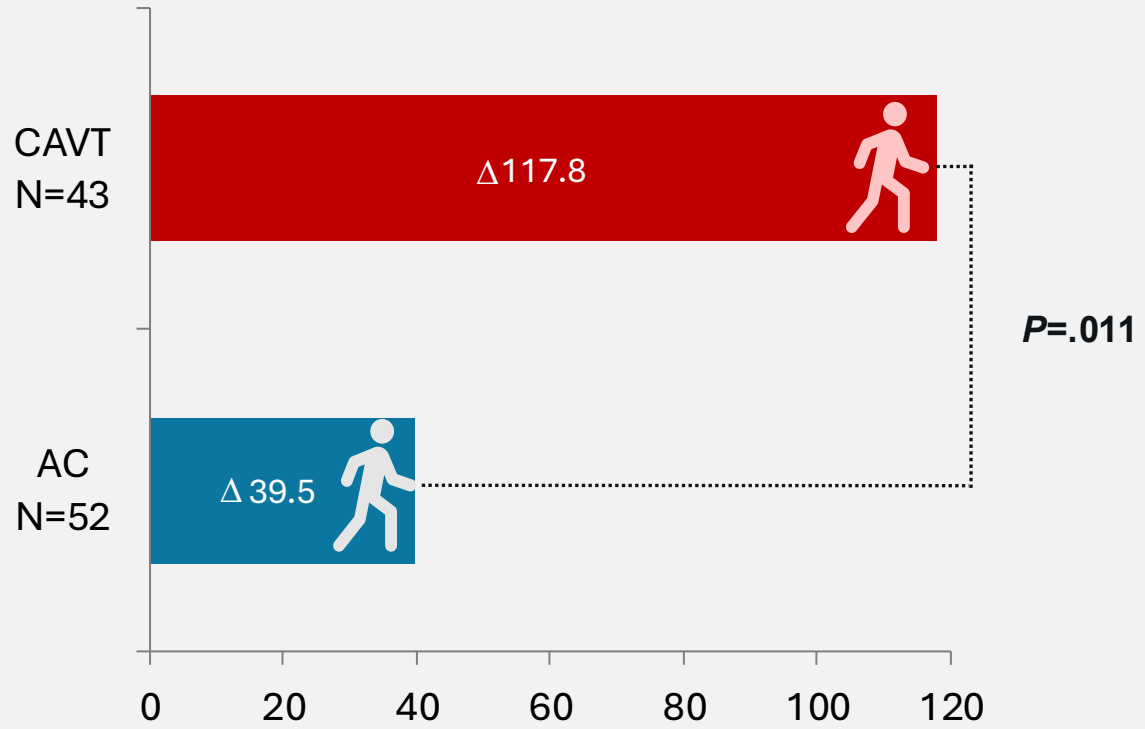
Lookstein RA, et al. *Circulation*. 2026;153(1):21-34.

Δ6MWD between 30 and 90 Days

Mean Δ6MWD, meters



Mean Δ6MWD, Imputed, meters



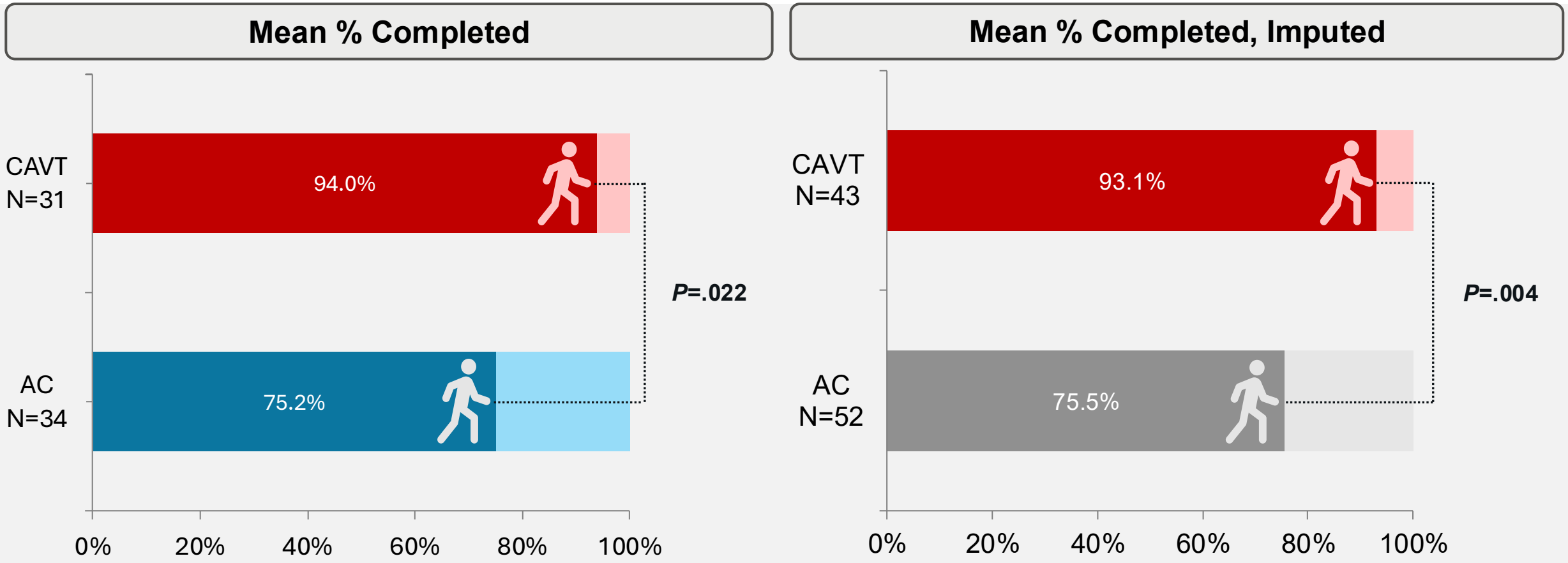
With imputation, change in distance walked was 3-fold greater in CAVT patients

P-values for the comparison of means were calculated from the two-sample t-test. For mean Δ6MWD, matched pair data is represented. Imputation was carried out separately by assigned randomized group and deaths were excluded.

Lookstein RA, et al. *Circulation*. 2026;153(1):21-34.

% Completed of Predicted 6MWD at 90 Days

Predicted walk distance is normalized for sex, age, and body surface area

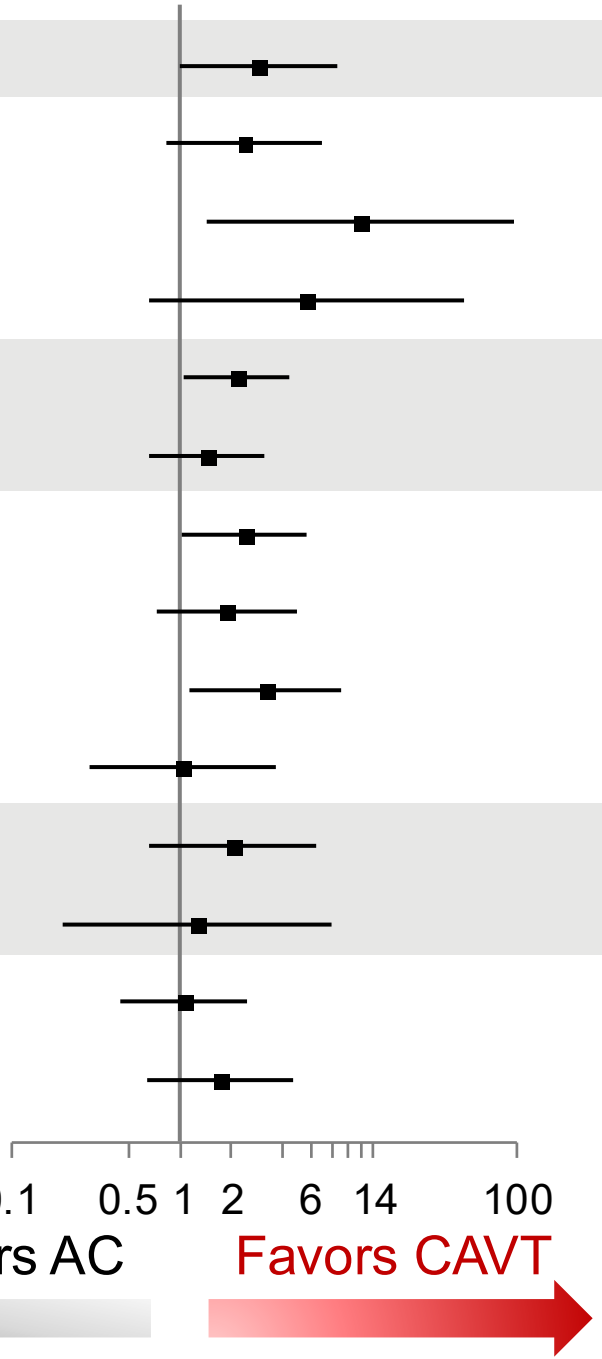


CAVT patients achieved a near-normal walk distance whereas AC patients did not

***P*-values for the comparison of means were calculated from the two-sample t-test. Imputation was carried out separately by assigned randomized group and deaths were excluded.**

Enright PL, et al. *Am J Respir Crit Care Med*. 1998;158(5 Pt 1):1384-1387.

	Outcome	OR (95% CI)	*P*-Value
6MWD	**Imputed 6MWD ≥ predicted distance, 90d (N=95)**	**2.97 (1.01, 8.74)**	**0.049**
NYHA	Class I, 30d (N=90)	2.43 (0.84, 6.99)	0.100
	Class I, 90d (N=83)	**11.96 (1.47, 97.61)**	**0.020**
	Return to Pre-Index PE Class, 90d (N=83)	5.69 (0.65, 49.57)	0.115
PVFS	**Shift toward pre-PE at discharge (N=99)**	**2.20 (1.07, 4.52)**	**0.032**
	Shift toward pre-PE at 90d (N=88)	1.45 (0.66, 3.19)	0.350
mMRC	**Score 0, discharge (N=98)**	**2.44 (1.05, 5.68)**	**0.039**
	Score 0, 90d (N=83)	1.90 (0.73, 5.00)	0.191
	Score ↑ ≥ 1 (MCID), discharge (N=97)	**3.26 (1.16, 9.14)**	**0.025**
	Score ↑ ≥ 1, 90d (N=82)	1.04 (0.29, 3.73)	0.950
Borg	Score 0-2 at rest, discharge (N=98)	2.10 (0.67, 6.57)	0.204
	Score 0-2 at rest, 90 days (N=81)	1.28 (0.20, 8.10)	0.793
QoL	PEmb-QoL ↑ ≥ 15 (MCID), presentation to 90d (N=84)	1.05 (0.44, 2.51)	0.912
	EQ VAS ↑ ≥ 8 (MCID), presentation to 90d (N=84)	1.75 (0.64, 4.76)	0.273



Secondary and exploratory outcomes are not powered for statistical comparisons. OR 95% CI are Wald confidence limits; *P*-values are Chi-Square.
OR = odds ratio.
Lookstein RA, et al. *Circulation*. 2026;153(1):21-34.

Conclusion: STORM-PE 90-Day Results

- In STORM-PE, CAVT patients demonstrated **a greater improvement in functional outcomes** at 90 days compared to AC patients
- CAVT patients **recovered pre-PE functional status**, with less impairment than AC patients
- Dyspnea scores and QoL scores improved in both groups but showed no **between-group differences**
- **CAVT patients walked significantly farther** than AC patients and completed more of their predicted walk distance
- These findings, accompanied by **faster reperfusion** and **enhanced RV recovery** after CAVT, **translate into meaningful patient-centered benefits** and reinforce CAVT as an effective treatment strategy for intermediate-high risk PE patients

Thank You

In partnership with The PERT Consortium®

Sites

Ascension Seton Austin, TX, USA	**Kingwood Hospital** Kingwood, TX, USA	**Rush University Medical Center** Chicago, IL, USA
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Blinded, Independent, Imaging Core Laboratory VasCore, Boston, MA, USA	**Clinical Events Committee (CEC)** NAMSA, Northwood, OH, USA	**Data Safety Monitoring Board (DSMB)** NAMSA, Northwood, OH, USA

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In Loving Memory of Dr. Ido Weinberg

Ido Weinberg, MD, MSc, MHA, FSVM, RPVI
Vascular Medicine
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On behalf of the STORM-PE and STRIKE-PE Steering Committees, Investigators, and Penumbra:

We honor and appreciate Dr. Weinberg's invaluable contributions and his steadfast commitment to improving the lives of all affected by these illnesses.

Dr. Weinberg's unwavering dedication to his patients and his community leaves a profound and lasting legacy.

STORM-PE RCT

STRIKE-PE STUDY

HMP Global
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2026 PE Guidelines Review

Rachel Rosovsky, MD, MPH

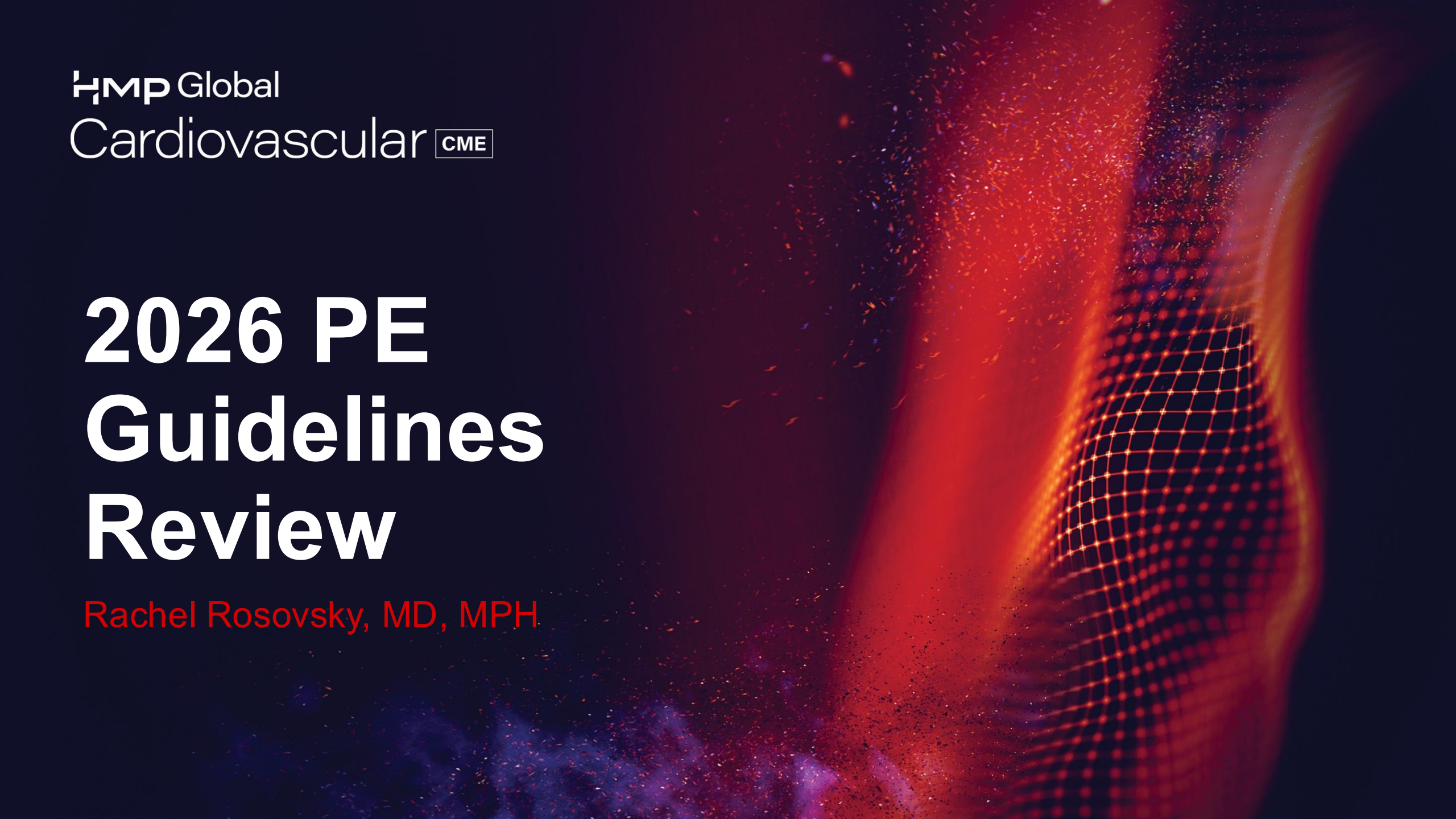


Table 1.
Applying Class of Recommendation and Level of Evidence to Clinical Strategies, Interventions, Treatments, or Diagnostic Testing in Patient Care

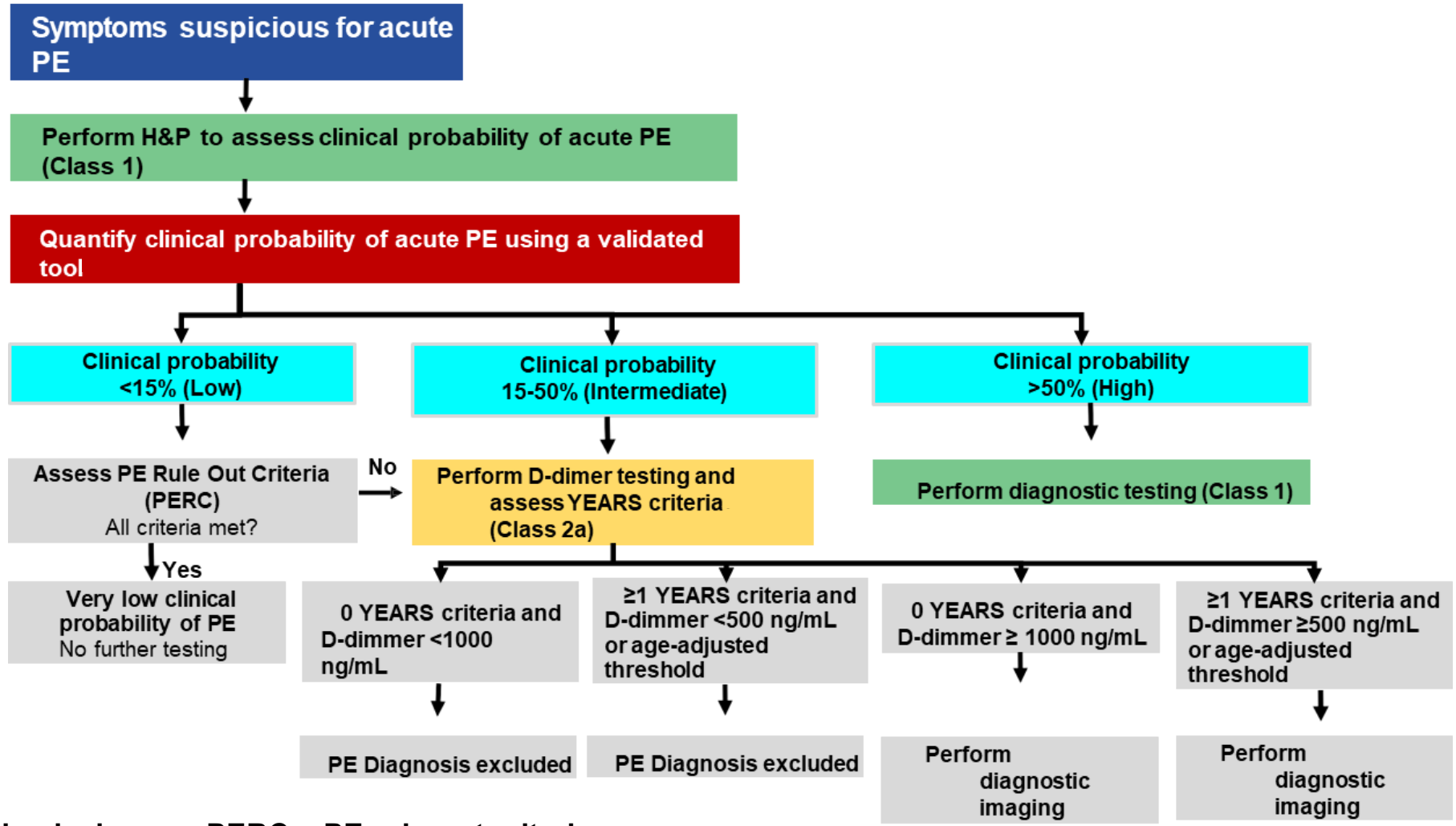
CLASS (STRENGTH) OF RECOMMENDATION	LEVEL (QUALITY) OF EVIDENCE‡
CLASS 1 (STRONG) **Benefit >>> Risk** **Suggested phrases for writing recommendations:** • Is recommended • Is indicated/useful/effective/beneficial • Should be performed/administered/other • Comparative-Effectiveness Phrases†: – Treatment/strategy A is recommended/indicated in preference to treatment B – Treatment A should be chosen over treatment B	**LEVEL A** • High-quality evidence‡ from more than 1 RCT • Meta-analyses of high-quality RCTs • One or more RCTs corroborated by high-quality registry studies
CLASS 2a (MODERATE) **Benefit >> Risk** **Suggested phrases for writing recommendations:** • Is reasonable • Can be useful/effective/beneficial • Comparative-Effectiveness Phrases†: – Treatment/strategy A is probably recommended/indicated in preference to treatment B – It is reasonable to choose treatment A over treatment B	**LEVEL B-R** **(Randomized)** • Moderate-quality evidence‡ from 1 or more RCTs • Meta-analyses of moderate-quality RCTs
CLASS 2b (Weak) Benefit ≥ Risk **Suggested phrases for writing recommendations:** • May/might be reasonable • May/might be considered • Usefulness/effectiveness is unknown/unclear/uncertain or not well-established	**LEVEL B-NR** **(Nonrandomized)** • Moderate-quality evidence‡ from 1 or more well-designed, well-executed nonrandomized studies, observational studies, or registry studies • Meta-analyses of such studies
CLASS 3: No Benefit (MODERATE) **Benefit = Risk** **Suggested phrases for writing recommendations:** • Is not recommended • Is not indicated/useful/effective/beneficial • Should not be performed/administered/other	**LEVEL C-LD** **(Limited Data)** • Randomized or nonrandomized observational or registry studies with limitations of design or execution • Meta-analyses of such studies • Physiological or mechanistic studies in human subjects
CLASS 3: Harm (STRONG) **Risk > Benefit** **Suggested phrases for writing recommendations:** • Potentially harmful • Causes harm • Associated with excess morbidity/mortality • Should not be performed/administered/other	**LEVEL C-EO** **(Expert Opinion)** • Consensus of expert opinion based on clinical experience.

COR and LOE are determined independently (any COR may be paired with any LOE).

A recommendation with LOE C does not imply that the recommendation is weak. Many important clinical questions addressed in guidelines do not lend themselves to clinical trials. Although RCTs are unavailable, there may be a very clear clinical consensus that a particular test or therapy is useful or effective.

***The outcome or result of the intervention should be specified (an improved clinical outcome or increased diagnostic accuracy or incremental prognostic information); †For comparative-effectiveness recommendation (COR 1 and 2a; LOE A and B only), studies that support the use of comparator verbs should involve direct comparisons of the treatments or strategies being evaluated; ‡The method of assessing quality is evolving, including the application of standardized, widely-used, and preferably validated evidence grading tools; and for systematic reviews, the incorporation of an Evidence Review Committee.**
R = randomized; NR = nonrandomized; LD = limited data; EO = expert opinion; COR = Class of Recommendation; LOE = level of evidence.
Creager, MA, et al. *Circulation*. 2026;153(12):e977-e1051.

Clinical Evaluation of Patients with Suspected Acute PE



H&P = history and physical exam; PERC = PE rule-out criteria.

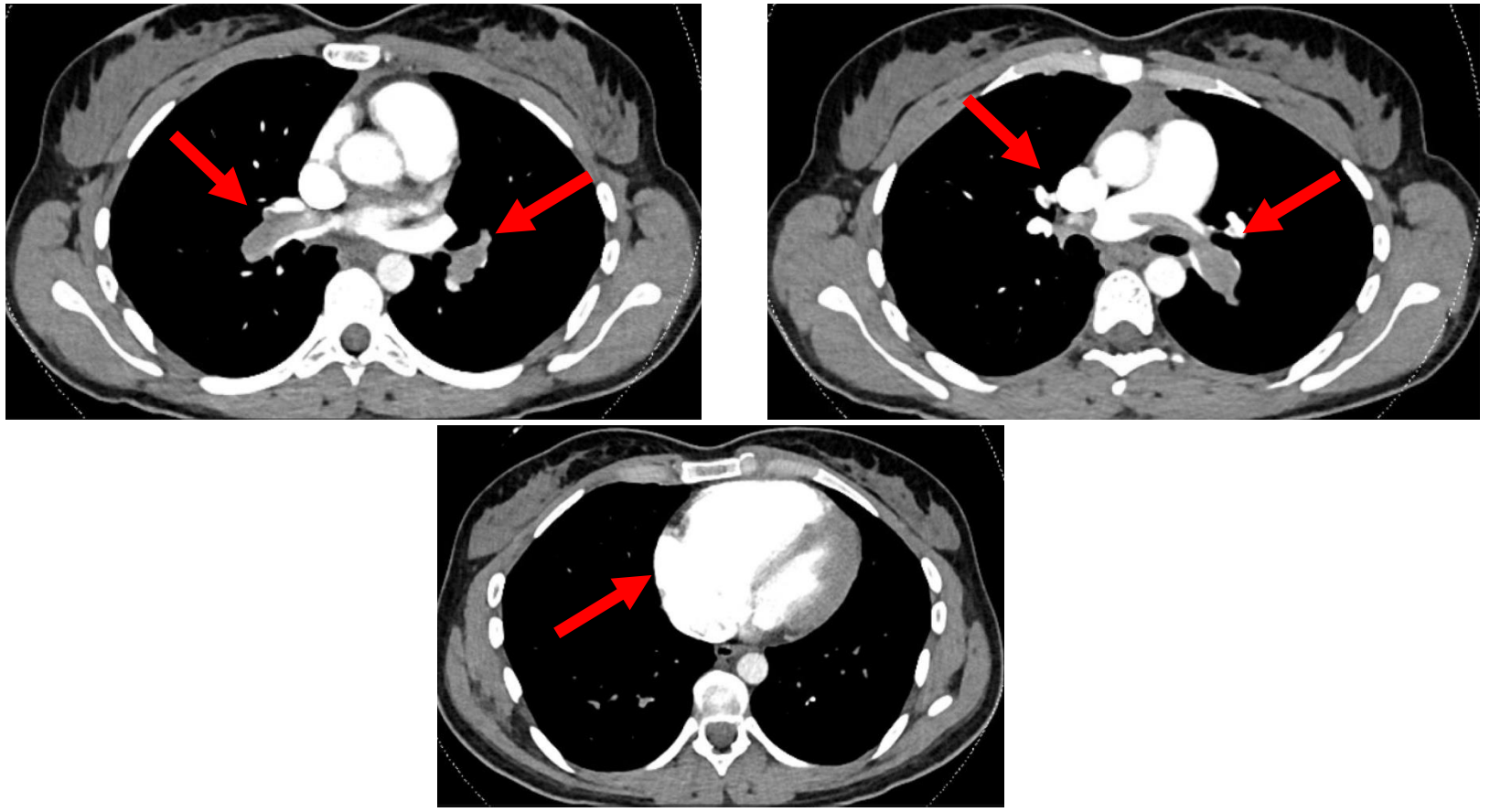
Creager, MA, et al. *Circulation*. 2026;153(12):e977-e1051.

Case

- 27-year-old Female presented with syncope
- Week prior: LLE pain and mild swelling
- EMS: HR 140, BP 110/60, RR 32, SpO2 90% RA
- EKG: ST
- Elevated troponin (350 → 459)
- Bedside echo
- Head CT

LLE = lower left extremity; EMS = emergency medical services; HR = heart rate; BP = blood pressure; RR = respiratory rate; SpO2 = peripheral capillary oxygen saturation; RA = room air; EKG = electrocardiogram; ST = sinus tachycardia; CT = computed tomography scan.

Saddle PE and Right Heart Strain

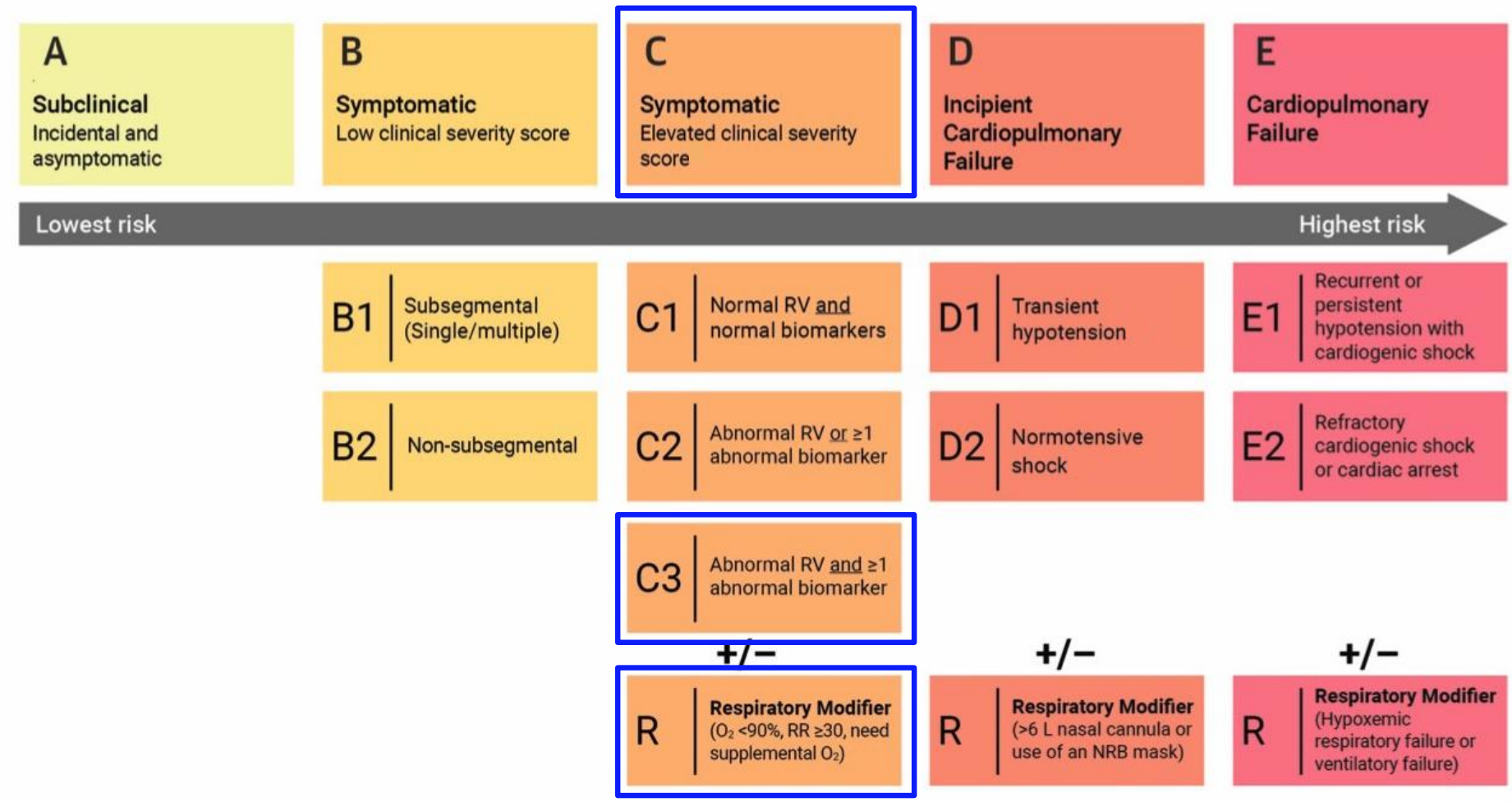


Case

- How should she be treated?
- Need to identify her risk category
  - 2019 ESC: Intermediate-high risk

ESC = European Society of Cardiology.

New Clinical Categories for Acute PE



RV = right ventricle; NRB = non-rebreather.

Creager MA, et al. *Circulation*. 2026;153(12):e977-e1051.

Biomarkers for Risk Stratification

	Recommendations for Risk Stratification of PE Using Biomarkers Referenced studies that support recommendations are summarized in the Evidence Table.	
COR	**LOE**	**Recommendations**
1	**B-NR**	**1. In patients with acute PE and an elevated clinical severity score without features of hypotension or shock (ie, AHA/ACC PE Category C), measurement of at least 1 cardiac biomarker (ie, troponin, brain natriuretic peptide [BNP]) is recommended to assist with risk stratification for short-term complications and/or mortality.**
1	**B-NR**	**2. In patients with acute PE AHA/ACC PE Categories C to E who are undergoing evaluation at an acute care facility, measurement of lactate (either venous or arterial) is recommended to assist with risk stratification for short-term complications and/or mortality.**

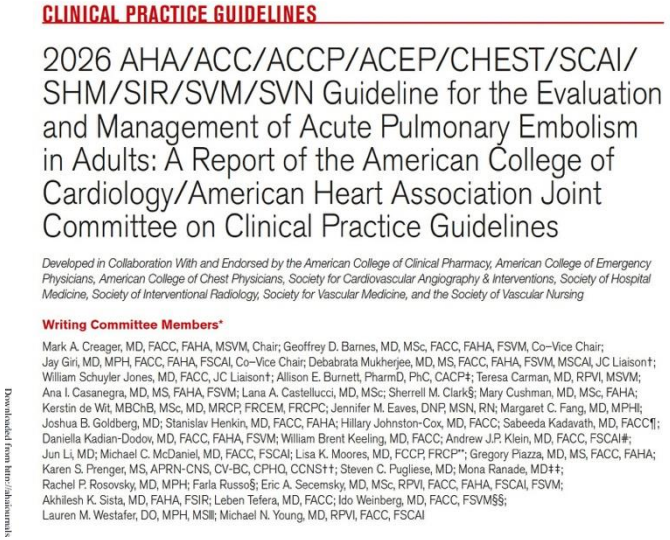
COR = class of recommendation; LOE = level of evidence; AHA = American Heart Association; ACC = American College of Cardiologists.
Creager MA, et al. *Circulation*. 2026;153(12):e977-e1051.

Case

- C3-R; Intermediate high-risk PE

What anticoagulant should she be started on?

LMWH vs UFH



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COR	LOE	GENERAL RECOMMENDATIONS
1	B-R	2. In patients with acute PE in AHA/ACC Categories C1-E1 who require parenteral anticoagulant therapy initially, LMWH is recommended over UFH to reduce recurrent VTE and major bleeding.[2]

LMWH = low-molecular weight heparin; UFH = unfractionated heparin.
Creager MA, et al. *Circulation*. 2026;153(12):e977-e1051.

Case

- She is expeditiously started on LMWH
- Does she need any supportive measures?

Sedation and Ventilatory Strategies

COR	RECOMMENDATIONS
1	In patients with acute PE in AHA/ACC PE Categories C-E who require sedation for intubation, hemodynamic supportive therapies should be available to support the patient in the event the patient becomes unstable.
2a	For patients with acute PE and moderate-severe hypoxia, use of heated HFNC oxygenation rather than standard nasal cannula oxygenation can be beneficial to improve oxygenation.
3 HARM	In patients with acute PE in AHA/ACC PE Categories C-E, deep sedation and mechanical ventilation should not be performed, unless clinically indicated, in order to avoid hemodynamic collapse.

During acute PE:
Heart rate and systemic vascular resistance both increase to maintain systemic and myocardial perfusion due to RV dysfunction.

Anxiolytic and analgesic medications can potentially eliminate the compensatory mechanism, resulting in hemodynamic collapse.

HFNC = high-flow nasal cannula.

Creager MA, et al. *Circulation*. 2026;153(12):e977-e1051.

Hemodynamic Pharmacotherapy

Cardiogenic shock due to PE
AHA/ACC PE Categories **D2-E2**

COR	RECOMMENDATIONS
1	The use of vasopressors and/or inotropes is recommended to improve cardiac output and systemic perfusion.

Concerns for reduced preload based on clinical assessment
AHA/ACC PE Categories **D1-2**

COR	RECOMMENDATIONS
2b	The use of volume management with normal saline or other volume expanders may be considered to improve cardiac output and blood pressure.

In patients with PE
AHA/ACC PE Categories **C2-E**

COR	RECOMMENDATIONS
2b	The use of inhaled pulmonary vasodilators may be considered to reduce RV afterload.

Creager MA, et al. *Circulation*. 2026;153(12):e977-e1051.

Mechanical Circulatory Support

COR	RECOMMENDATIONS
1	In patients with known or suspected acute PE on VA-ECMO, continuation of parenteral systemic anticoagulation is recommended in the absence of bleeding to prevent further thrombotic or embolic complications.
2a	In patients with acute, refractory cardiogenic shock as a result of known or suspected acute PE (AHA/ACC PE Category E2), it is reasonable to institute VA-ECMO, provided appropriate resources are available, to stabilize hemodynamics and improve oxygenation.
2b	In patients with acute PE in AHA/ACC PE Category E2 who are placed on VA-ECMO support, the usefulness of additional advanced therapies is not well established.

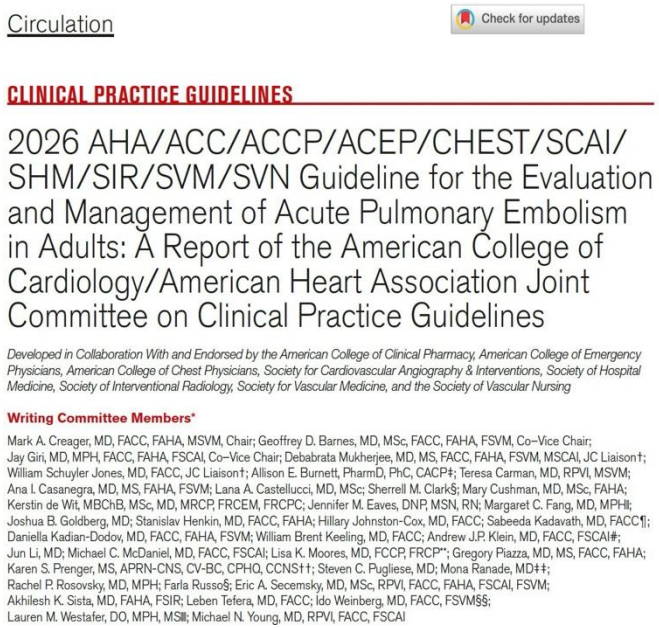
VA-ECMO = veno-arterial extracorporeal membrane oxygenation.
Creager MA, et al. *Circulation*. 2026;153(12):e977-e1051.

Case

- She is expeditiously started on LMWH
- She does not need any additional supportive strategies
- Does she need any advanced therapy?

Who is making that decision?

PERT: AHA/ACC 2026 Guidelines



Circulation

Check for updates

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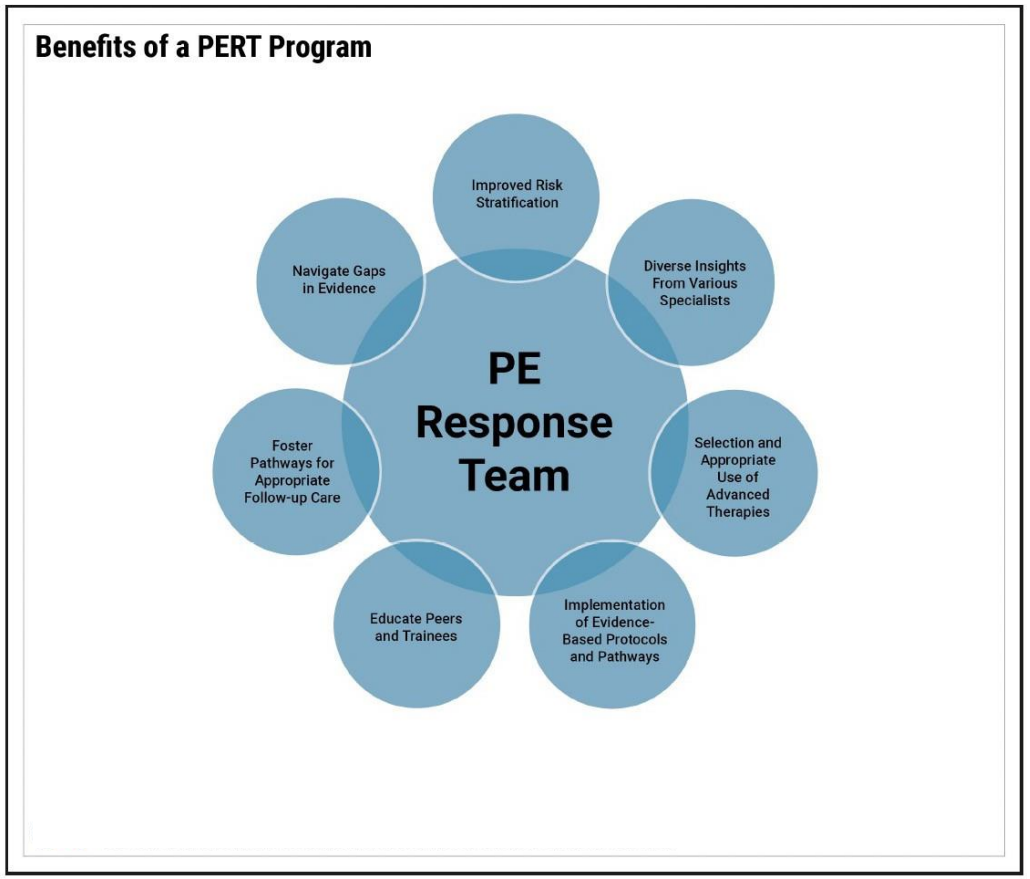
4.1.4. Pulmonary Embolism Response Team

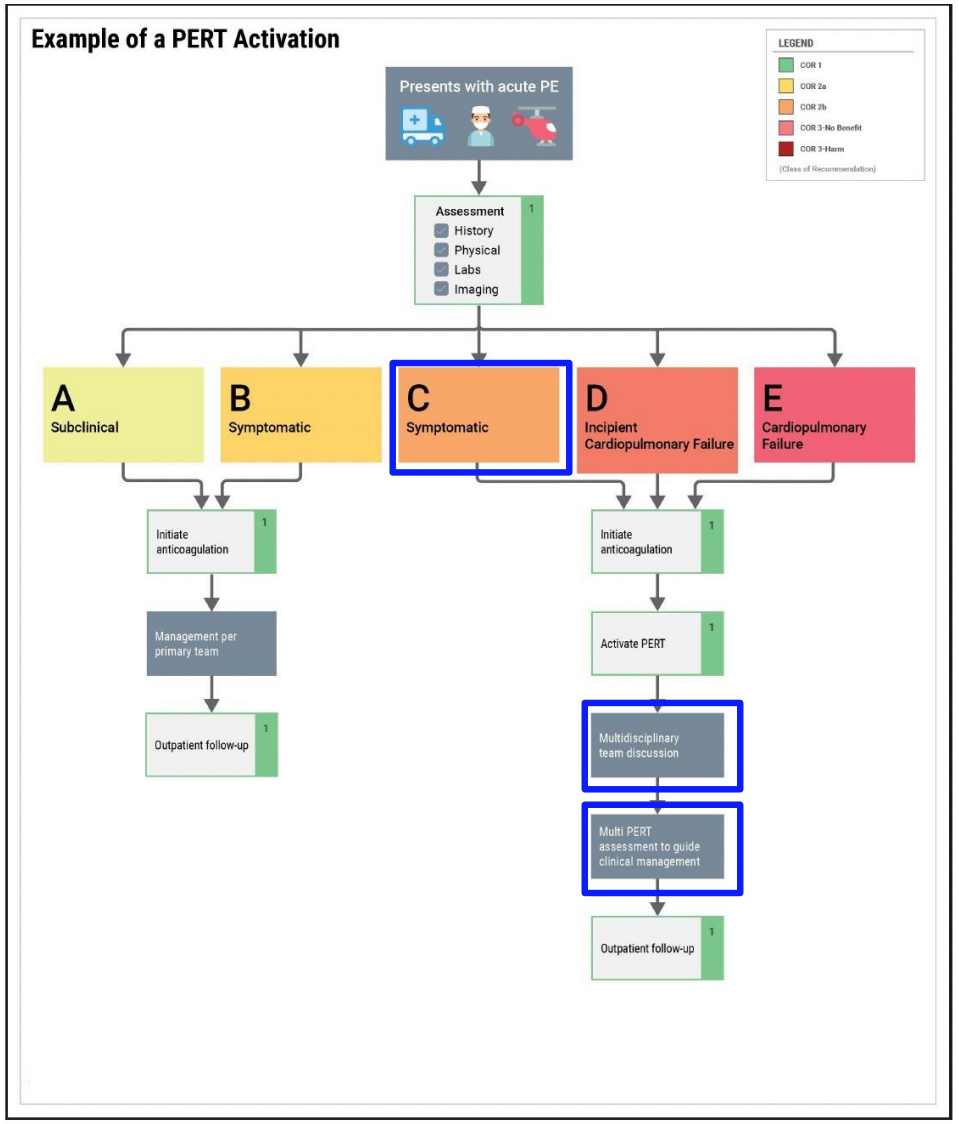
Recommendation for PERT
Referenced studies that support the recommendation are summarized in the Evidence Table.

COR	LOE	Recommendations
1	B-NR	1. In patients with acute PE who are at increased risk of adverse outcomes (ie, AHA/ACC PE Categories C-E)*, a multidisciplinary PERT assessment is recommended to improve in-hospital clinical care delivery.

***AHA/ACC PE Categories A or B with multiple comorbidities may also benefit from a PERT (eg, Category B with intracranial hemorrhage).**
PERT = pulmonary embolism response team.
Creager MA, et al. *Circulation*. 2026;153(12):e977-e1051.

PERT: AHA/ACC Guidelines





Creager MA, et al. *Circulation*. 2026;153(12):e977-e1051.

Case

- Risk: Class C3-R (ESC high-intermediate risk)
- Expeditiously started on LMWH
- PERT called
- What do the new guidelines state in terms of whether she needs advanced therapy?

Table 7. Summary of Advanced Therapy Recommendations (COR LOE)

AHA/ACC PE Risk Outcomes Category	Systemic Lysis	CDL	MT	Surgery
A-C1	3-Harm A	3-NB C-EO	3-NB C-EO	3-NB C-EO
C2	3-Harm B-R	2b C-LD (unclear)	2b C-LD (unclear)	3-NB C-EO
C3	2b C-LD (unclear)	2b C-LD (unclear)	2b C-LD (unclear)	3-NB C-EO
D1-2	2b C-LD (may be considered)	2b B-NR (may be considered)	2b B-NR (may be considered)	2b C-LD (unclear)
E1	2a C-LD	2a C-LD	2a B-NR	2a B-NR
E2	2a C-LD	N/A	N/A	3-NB B-NR

Creager MA, et al. *Circulation*. 2026;153(12):e977-e1051.

Advanced Therapies

- What is happening in practice?

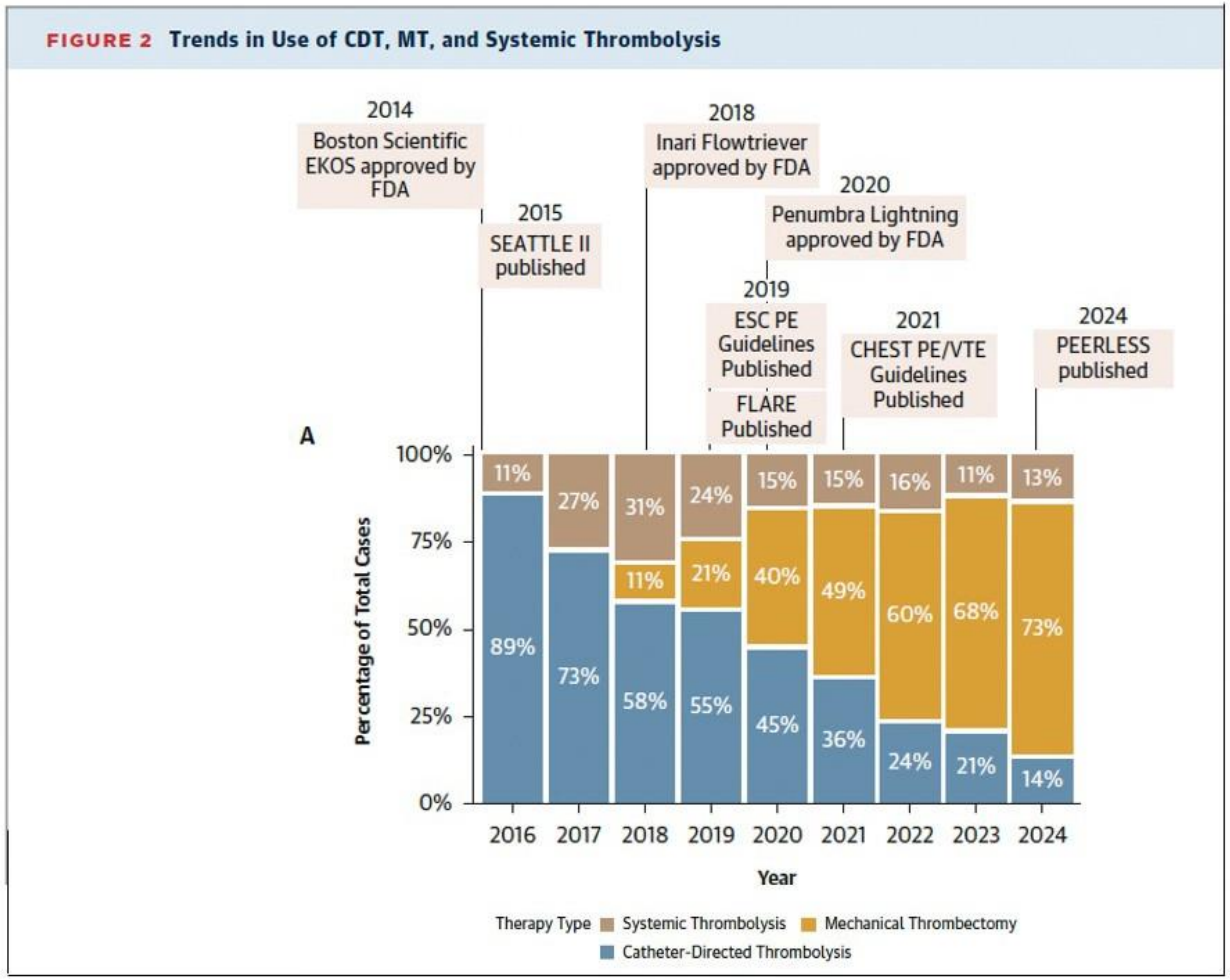
PERT Papers in Guideline Issue of JACC

ORIGINAL RESEARCH

Mechanical Thrombectomy and Catheter-Directed Thrombolysis in Acute Pulmonary Embolism

Trends and Practice Patterns in the PERT Consortium Registry (2016-2024)

Joseph M. Kim, MD, Steven R. Horbal, PhD, MPH, Christian Mewaldt, MD, Abhinay Ramachandran, MD, MS, Robert W. Yeh, MD, MSc, Eric A. Secemsky, MD, MSc, Brett J. Carroll, MD



CDT = catheter-directed thrombolysis.

Kim JM, et al. *JACC*. 2026;87(13):1574-1590.

Two Recent Prospective Randomized Trials in Partnership with PERT Consortium

STORM-PE	
HI-PIETHO	

Case

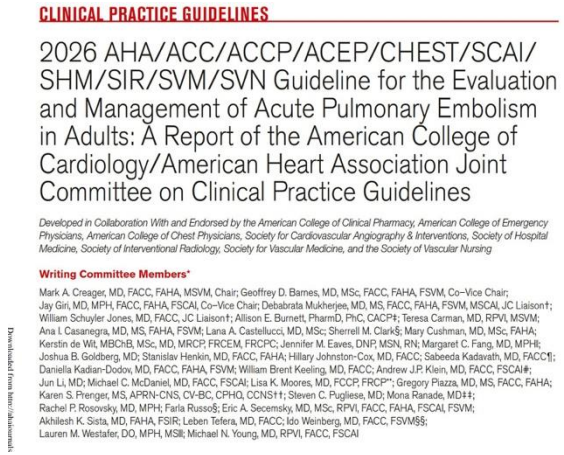
- Risk: Class C3-R (ESC high-intermediate risk)
- Expeditiously started on LMWH
- PERT called

Case

- The following day, she is ready to be discharged

What oral anticoagulant should she be started on?

How to Choose Which Direct Oral Anticoagulant?



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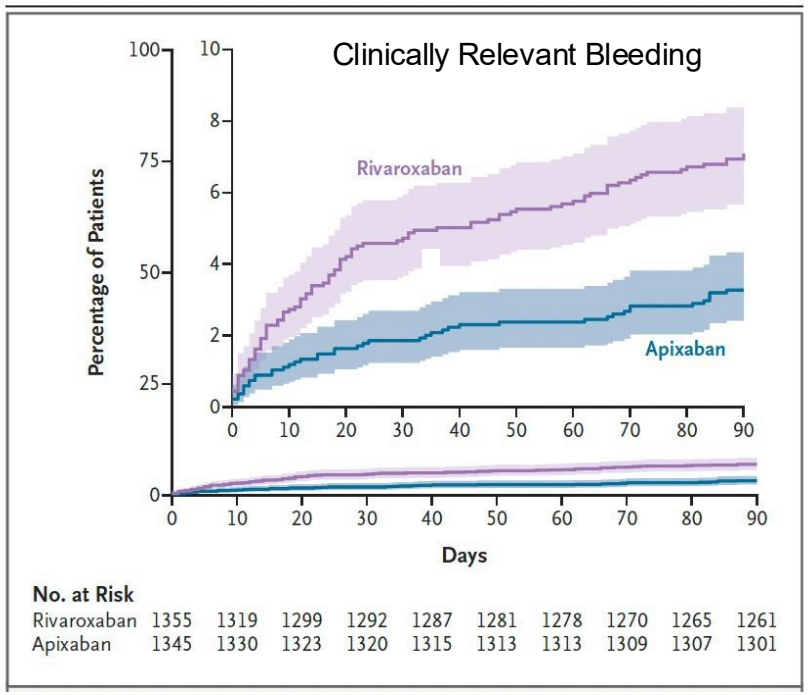
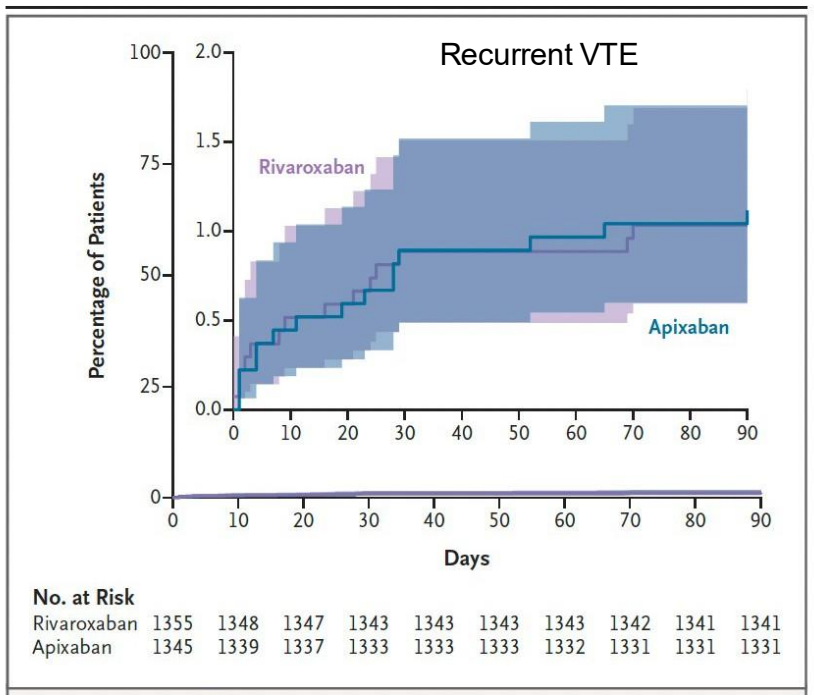
1	B-R	3. In patients with acute PE who are eligible for oral anticoagulation, DOACs are recommended over vitamin K antagonists (VKAs), unless contraindicated, to prevent recurrent VTE and reduce major bleeding.

Is one better than the other?

DOAC = direct oral anticoagulant; VTE = venous thromboembolism.
Creager MA, et al. *Circulation*. 2026;153(12):e977-e1051.

COBRRA Trial





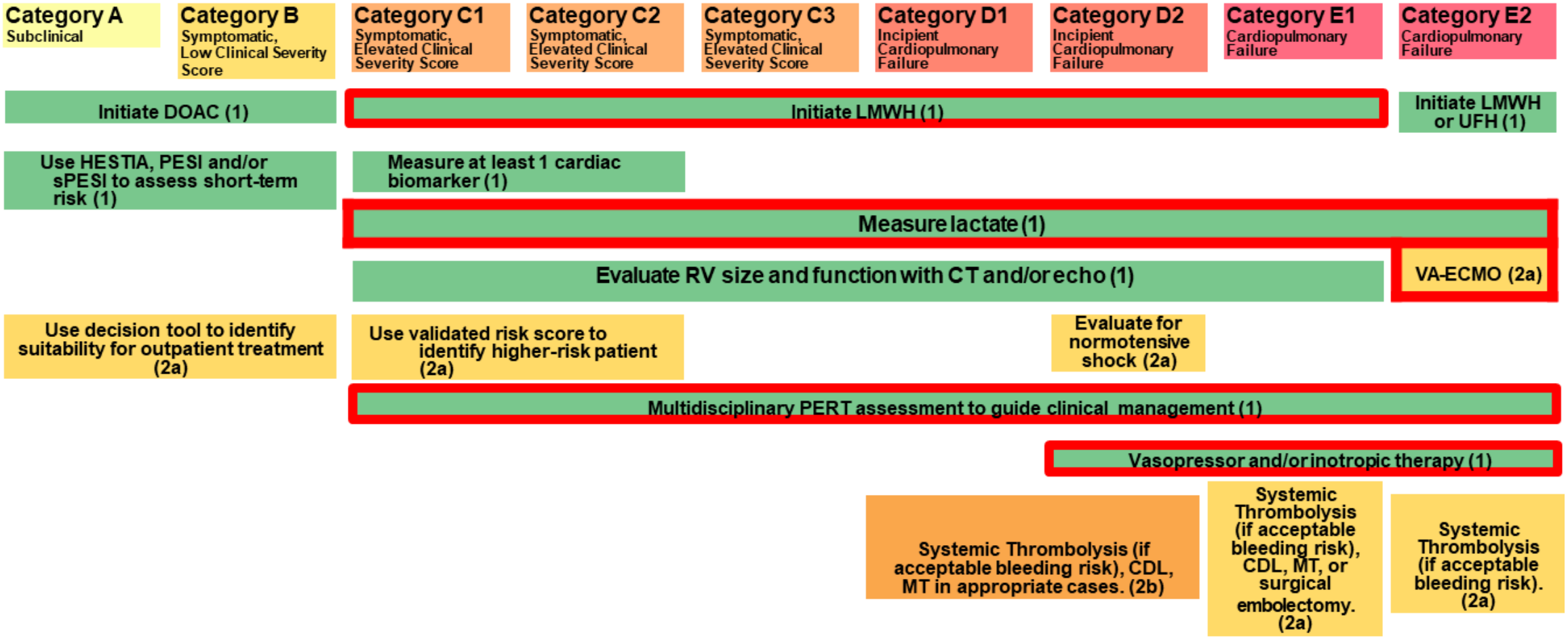
- First RCT comparing apixaban to rivaroxaban for acute VTE treatment
- 3 mos of **apixaban superior to rivaroxaban** in clinically relevant bleeding events

Castellucci LA, et al. *N Engl J Med*. 2026;394:1051-1060.

Case

- She is started on apixaban and discharged home

Initial Assessment and Management by AHA/ACC Acute PE Clinical Categories



HESTIA = Hestia Criteria; PESI = pulomary embolism severity index; sPESI = simplified PESI.

Creager MA, et al. *Circulation*. 2026;153(12):e977-e1051.

HMP Global
Cardiovascular CME

PE Evidence Update: STRIKE-PE Trial

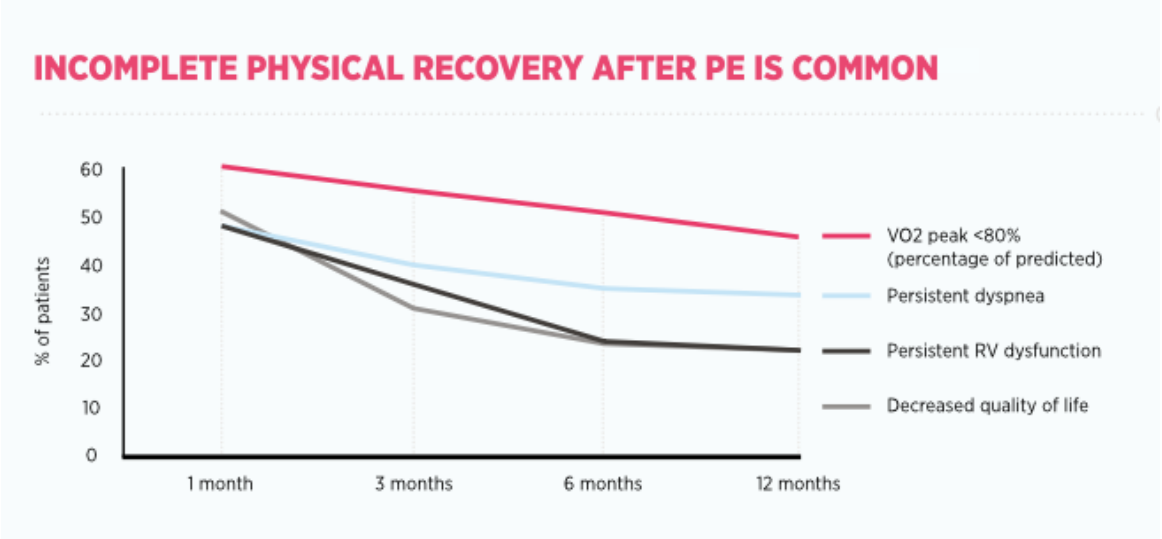
Suhail Dohad, MD, FACC, RVT

Background

- Venous thromboembolism (VTE) is globally the **third most frequent** acute cardiovascular syndrome, behind myocardial infarction and stroke
- Annual pulmonary embolism (PE) incidence is rising; the incidence per 100,000 US adults increased from **62.2** (in 1998) to **112.3** (in 2016)
- Increased use of effective therapy may decrease mortality in the acute PE population

- PE survivors experience diminished functional outcomes and quality of life

Incomplete Physical Recovery Rates After PE



VO2 = volume of oxygen consumption.

Wiener et al. *Arch Intern Med*. 2011;171(9):831-837. Sedhom et al. *Am J Cardiol.* 2022;176:132-138. Konstantinides et al. *Eur Heart J*. 2020;41(4):543-603. Boon et al. *Res Pract Thromb Haemost.* 2020;4:958-968.

Advanced Therapy Evidence in PE

Newest data is bolded in **green**.

Trial1	Device	MoA	Device time (mins)	Percent Reduction in RV/LV Ratio	Percent Reduction in PASP	Mortality (30-day)	Device related SAEs	Major bleeding[a]
STRIKE-PE	**L12/ LFLASH**	**CAVT™**	**30**	**26.8%**	**19.1%**	**1.0%**	**0.7%**	**2.0%**
STRIKE-PE subgroup	**FLASH**	**CAVT™**	**23**	**27.8%**	**24.5%**	**0.0%**	**0.0%**	**1.2%**
EXTRACT-PE	**CAT™8**	**Continuous Aspiration**	**37**	**27.3%**	**7.9%**	**2.5%**	**1.7%**	**1.7%**
FLASH	FlowTriever®	Manual asp.	43	20.3%[e]	23.4%	0.8%	0.0%	1.4%
FLAME	FlowTriever®	Manual asp.	nm	nm	nm	1.9%[b]	22.6%	11.3%
RESCUE	Bashir™	PMCDT	354[c]	33.3%	12%[e]	0.92%	0.9%	0.92%
ULTIMA	EKOS™	UACDT	nm[d]	23.4%[e]	23.7%[e]	0.0%	0.0%	0.0%[f]
SEATTLE 2	EKOS™	UACDT	720-1,440[g]	27.1%[e]	27.2%[e]	2.7%	2.0%	10.0%

[a]Studies used different major bleeding definitions, refer to study source for definition; [b]In-hospital mortality; [c]Device time was calculated by adding 5 hour infusion time to 54 min device time; [d]At 15±1 hours, the rtPA infusion and ultrasound delivery were discontinued; [e]Calculated value from respective study; [f]Overall, there were no major bleeding complications and 4 minor bleeding episodes; [g]If unilateral the treatment was only 12 hrs.

PMCDT = percutaneous mechanical catheter-directed thrombolysis; UACTD = ultrasound-assisted catheter-directed thrombolysis.

Moriarty JM. Presented at: 10th Annual Pulmonary Embolism Scientific Symposium; September 11-14, 2024; Boston, Massachusetts. 2024. Sista AK, et al. *JACC Cardiovasc Interv*. 2021;14(3):319-329. Toma C, et al. *EuroIntervention*. 2023;18(14):1201-1212. Silver M, et al. *Circ Cardiovasc Interv*. 2023;16(10):e013406. Bashir R, et al. *JACC Cardiovasc Interv*. 2022;15(23):2427-2436. Kucher N, et al. *Circulation*. 2014;129(4):479-486. Piazza G, et al. *JACC Cardiovasc Interv*. 2015;8(10):1382-1392.

Expanding the Evidence in Pulmonary Embolism

Growing body of PE evidence, but few studies evaluate all of the following

- Endovascular therapies
  - Even fewer studies with mechanical thrombectomy
- Outcomes ≥6 months
- Functional outcomes and quality of life (QOL)

STRIKE-PE is the first study to provide robust, 1-year follow-up data for patients with acute intermediate-risk or high-risk PE treated with computer-assisted vacuum thrombectomy (CAVT)

- Borg scale
- 6-minute walk test (6MWT)
- NYHA class
- EQ visual analog scale (VAS)
- EQ-5D-5L index value
- PEmb-QoL

Konstantinides et al. *J Am Coll Cardiol*. 2017;69(12):1536-1544. Piazza et al. *Circ Cardiovasc Interv*. 2020;13(8):E009012. Khandhar et al. *J Soc Cardiovasc Angiogr Interv*. 2023;2(4):101000. Sterling et al. *Circ Cardiovasc Interv*. 2024;17(3):E013448. Kong et al. 2023;2(3):100602. Semaan et al. *J Vasc Surg Venous Lymphat Disord*. 2023;11(1):70-81. Rosenzveig et al. *J Soc Cardiovasc Angiogr Interv*. Watanabe et al. *JACC Adv*. 2025:101770.

STRIKE-PE Visit Schedule and Endpoints

Long-Term Patient-Centric Follow-Up

Primary endpoints
- RV/LV ratio
- Composite MAEs

Secondary endpoint
- Device-related SAEs

Secondary endpoints (30 d)
- All-cause mortality
- Symptomatic recurrent PE

Echocardiographic (echo) measures, baseline to 48 hrs*
- Tricuspid annular plane systolic excursion (TAPSE)
- Pulmonary artery systolic pressure (PASP)
- TAPSE/PASP ratio
- McConnell's sign
- Right/left ventricular outflow tract velocity time integral (RVOT/LVOT VTI)

Secondary endpoints: functional outcomes and quality of life
- Borg dyspnea scale
- 6-minute walk test (6MWT)
- NYHA class
- EQ visual analog scale (VAS)
- EQ-5D-5L index value
- PEmb-QoL

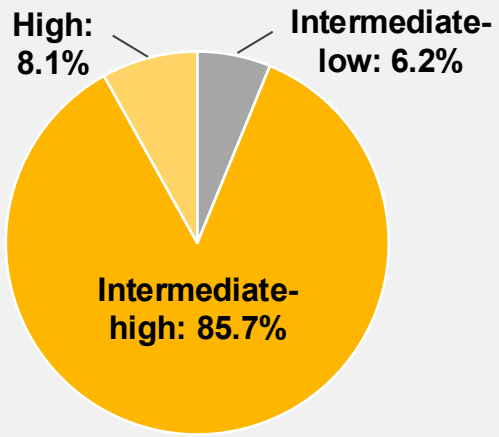
***Core lab–adjudicated echo analyses were obtained on a subset of patients whose sites elected to participate.**
SAEs = serious adverse events.
Moriarty JM, et al. *J Am Heart Assoc*. 2025;14(17):e039975.

Baseline and Periprocedural Data

Demographics*

Mean age	52.9% Male
61.9 y	47.1% Female

PE Risk Classifications*†



* N=595.
† ESC risk classification was confirmed by the Global PIs (for STRIKE-PE, end-organ hypoperfusion was not a prerequisite for obstructive shock classification as those data were not collected).

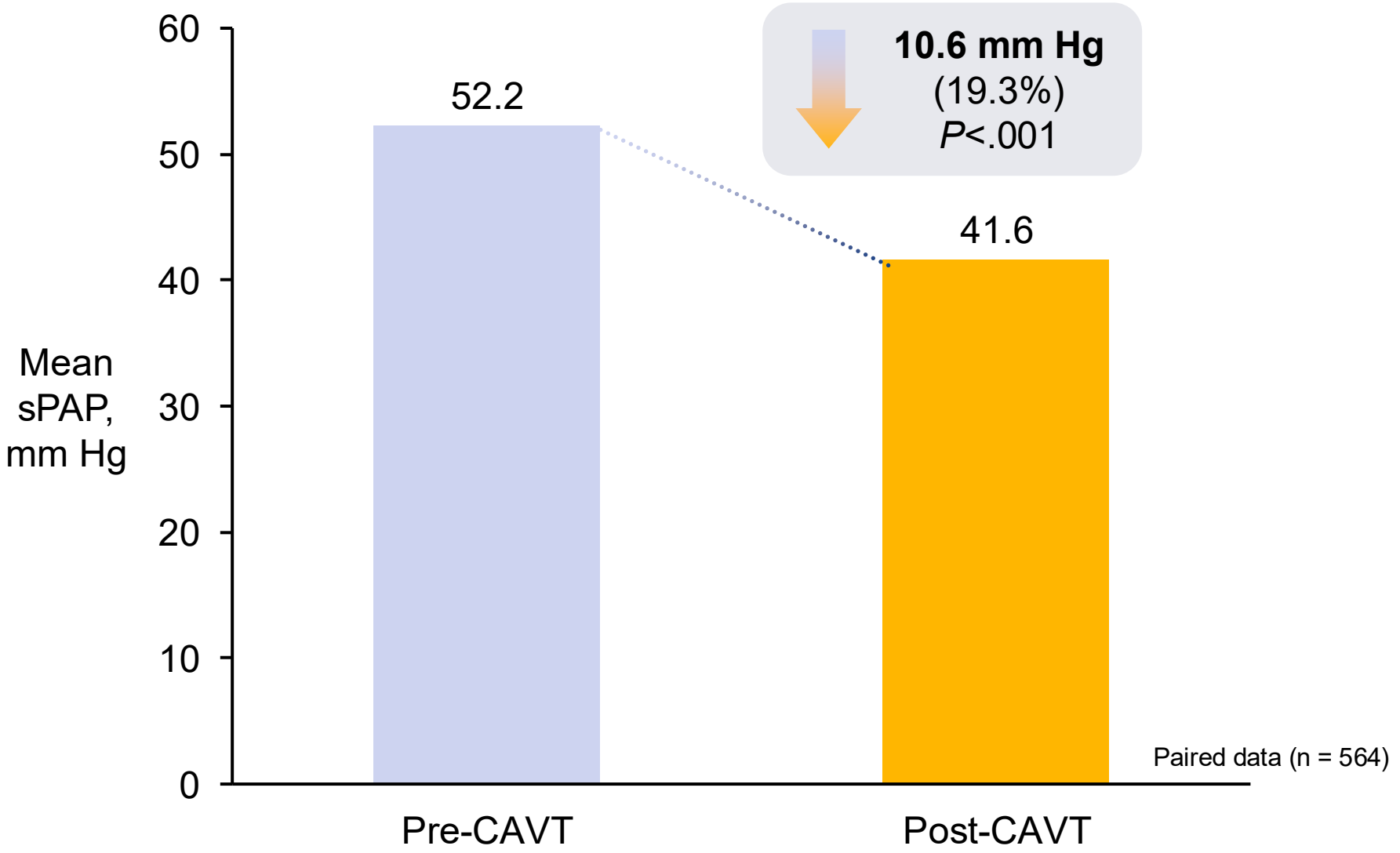
Periprocedural data, N = 595	Median [Q_1–Q_3] or % (n)
Thrombectomy time*	**30 min** [21–42]†
Procedure time‡	**61 min** [47–78]§
Estimated blood loss	**300 mL** [200–400]‖
No ICU stay required	**47.7%** (284)
ICU length of stay after procedure#	**2 days** [1–3]
Hospital length of stay	**5 days** [4–8]

* First CAVT device insertion to last CAVT device removal.
† n=583.
‡ Venous puncture to access site closure.
§ n=590.
‖ n=593.
For the 311 patients admitted to the ICU.

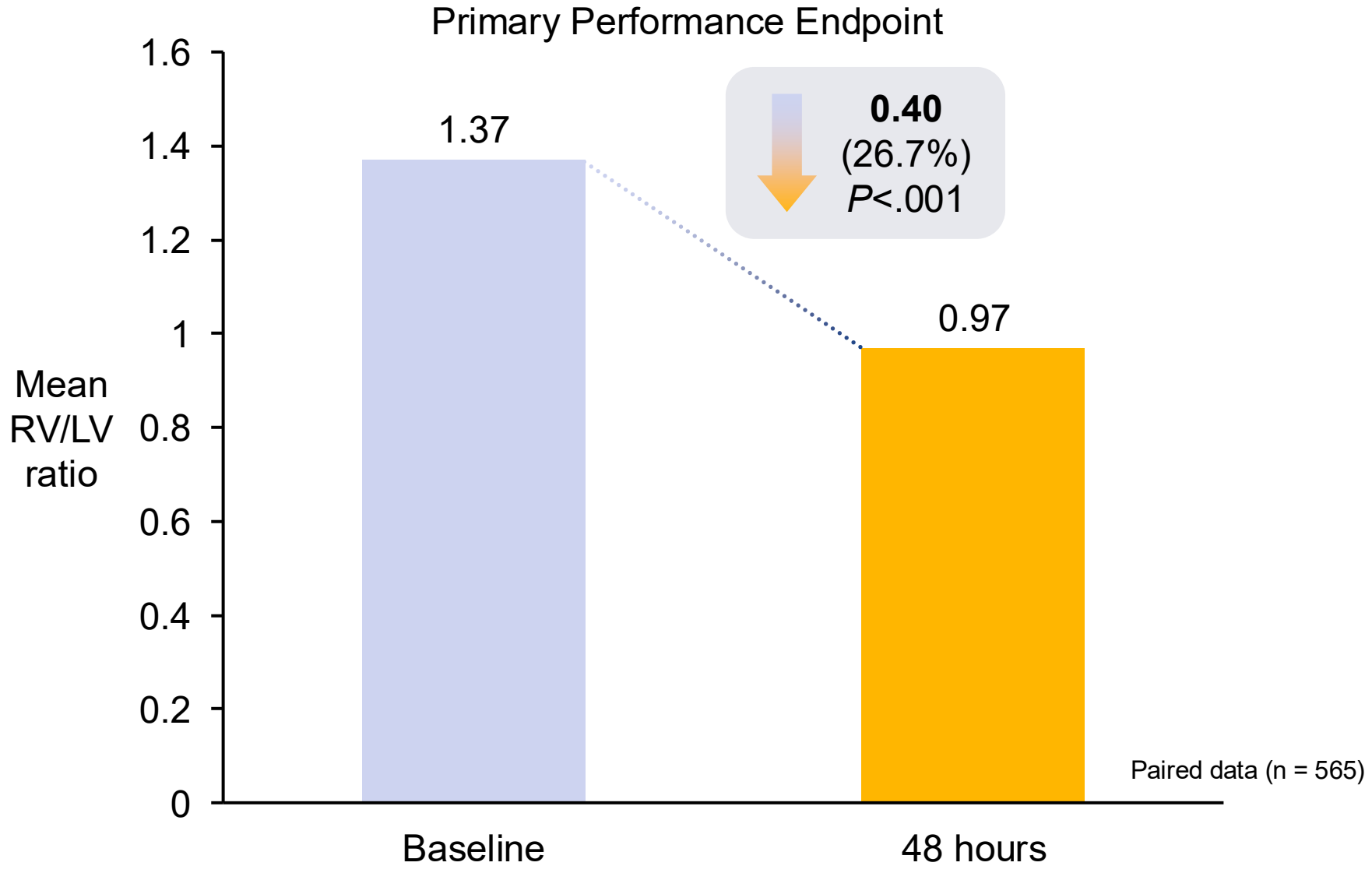
ICU = intensive care unit; PIs = principal investigators.

Moriarty JM, et al. *J Am Heart Assoc*. 2025;14(17):e039975. *Eur Heart J*. 2020;41(4):543-603.

Decrease in On-Table Systolic Pulmonary Artery Pressure (sPAP)



Decrease in RV/LV Ratio*



*Measured by paired images acquired by using the same imaging modality (CT pulmonary angiography or echocardiography) and evaluated by core lab else physician.

Safety Endpoints

Primary safety endpoint (N=595)	
Composite major adverse events (MAEs) within 48 hrs*	**1.8% (11)**
Major bleeding†	1.8% (11)
Device-related clinical deterioration‡	0.3% (2)
Device-related cardiac injury‡	0
Device-related pulmonary vascular injury‡	0.2% (1)
Device-related death‡	0

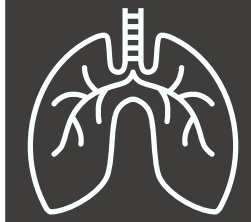
Data presented as % (n).
* Independent medical reviewer–adjudicated.
† Major bleeding is defined as meeting BARC Types 3a, 3b, 3c, and 5, in line with AHA guidelines. Type 3a will not be considered as a major bleeding event if it is related to an expected drop in hemoglobin due to fluid administration and if transfusion is less than 2 units.

Safety details (N=595)	
Secondary safety endpoints*	
Device-related serious adverse events‡	0.3% (2)
All-cause mortality within 30 d	1.5% (9)
Symptomatic PE recurrence within 30 d	0.5% (3)
Transfusion details	
Major bleeding requiring transfusion§	1.3% (8)
Device-related transfusion‖	0.2% (1)

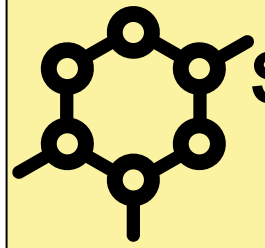
‡ Adverse events that were judged as probably or definitely related to the CAVT devices were considered to be device related.
§ Defined as events that were independent medical reviewer–adjudicated as major bleeding within 48 hours and had action taken of transfusion.
‖ Defined as events that were independent medical reviewer–adjudicated as a probably or definitely device related and had action taken of transfusion.

Periprocedural Parameters: Change from Baseline to 48 hrs after CAVT

Heart rate:
-11.4 beats/min



Respiratory rate:
-2.5 breaths/min



Supplemental O_2 use:
-17.7% points

Supplemental O_2:
-1.3 L/min

ECHO Response to Thrombectomy at 48 hrs

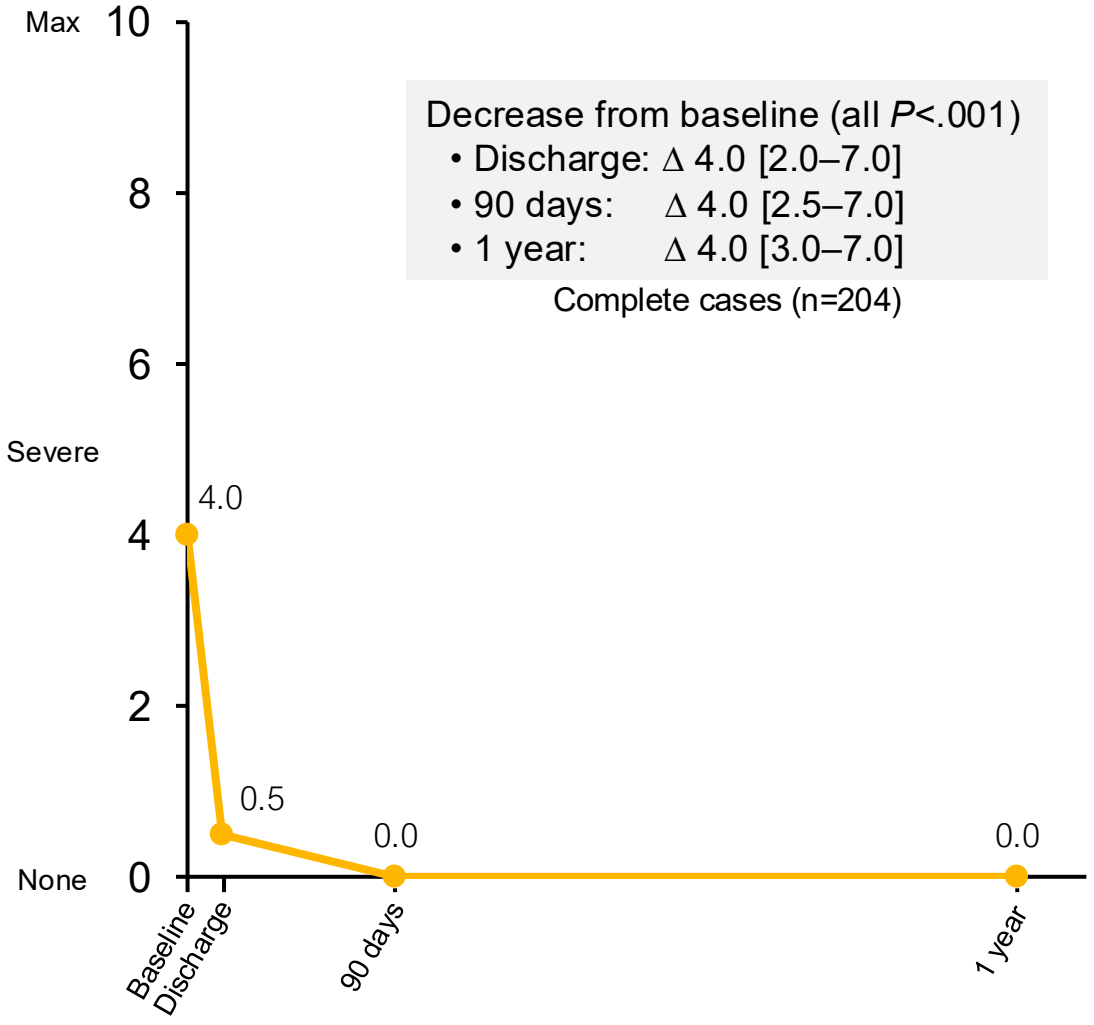
- This subgroup analysis of STRIKE-PE demonstrates that treatment with computer-assisted vacuum thrombectomy (CAVT) is safe and significantly improves right heart function, as demonstrated by CTA and echo
  - RV/LV ratio: ⇩ 0.40
  - TAPSE: ⇧ 4.4 mm
  - TAPSE <16 mm: ⇩ 35.9 percentage points
  - RV diameter: ⇩ 6.3 mm
  - RV diameter >42 mm: ⇩ 31.6 percentage points
- Valuable information can be gained from imaging data beyond RV/LV ratio to provide further insights into the effectiveness of CAVT for patients with PE

- McConnell's sign: ⇩ 31.2 percentage points
- PASP: ⇩ 9.4 mm Hg
- RVOT VTI: ⇧ 3.4 cm

Improved Dyspnea at 1 Year

Median Borg Scale

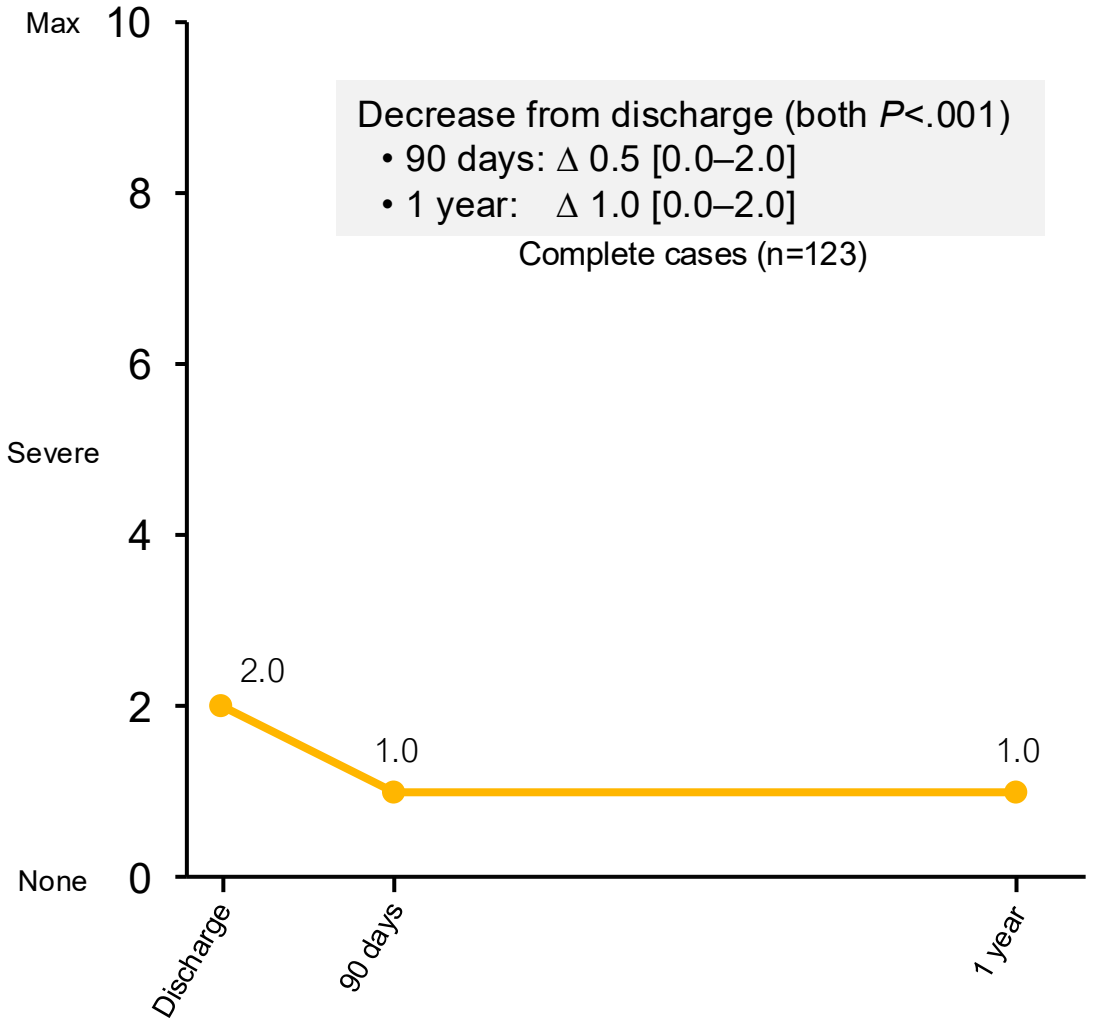
Borg Scale at Rest



Decrease from baseline (all *P*<.001)
- Discharge: Δ 4.0 [2.0–7.0]
- 90 days: Δ 4.0 [2.5–7.0]
- 1 year: Δ 4.0 [3.0–7.0]

Complete cases (n=204)

Borg Scale after 6MWT



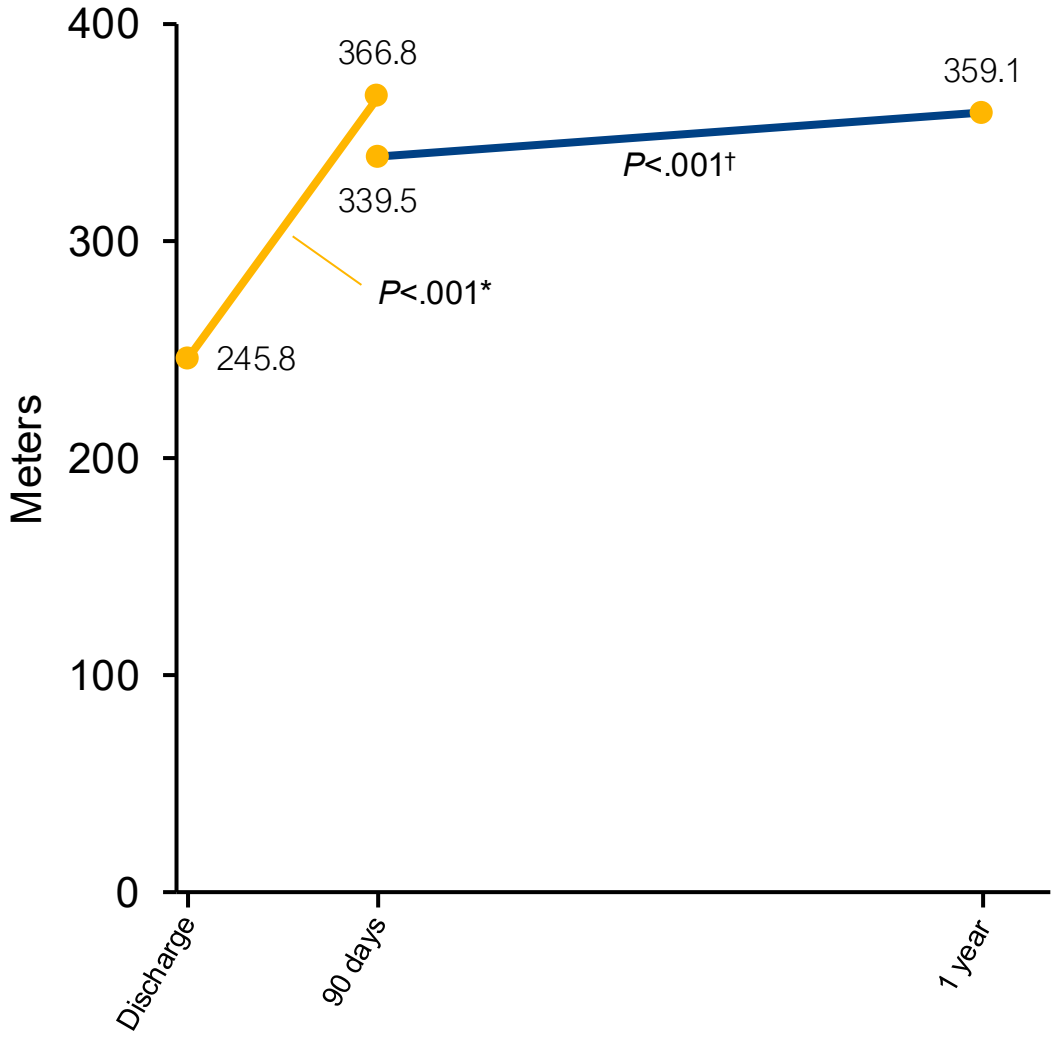
Decrease from discharge (both *P*<.001)
- 90 days: Δ 0.5 [0.0–2.0]
- 1 year: Δ 1.0 [0.0–2.0]

Complete cases (n=123)

Improved Distance Walked and Restored Functional Status at 1 Year

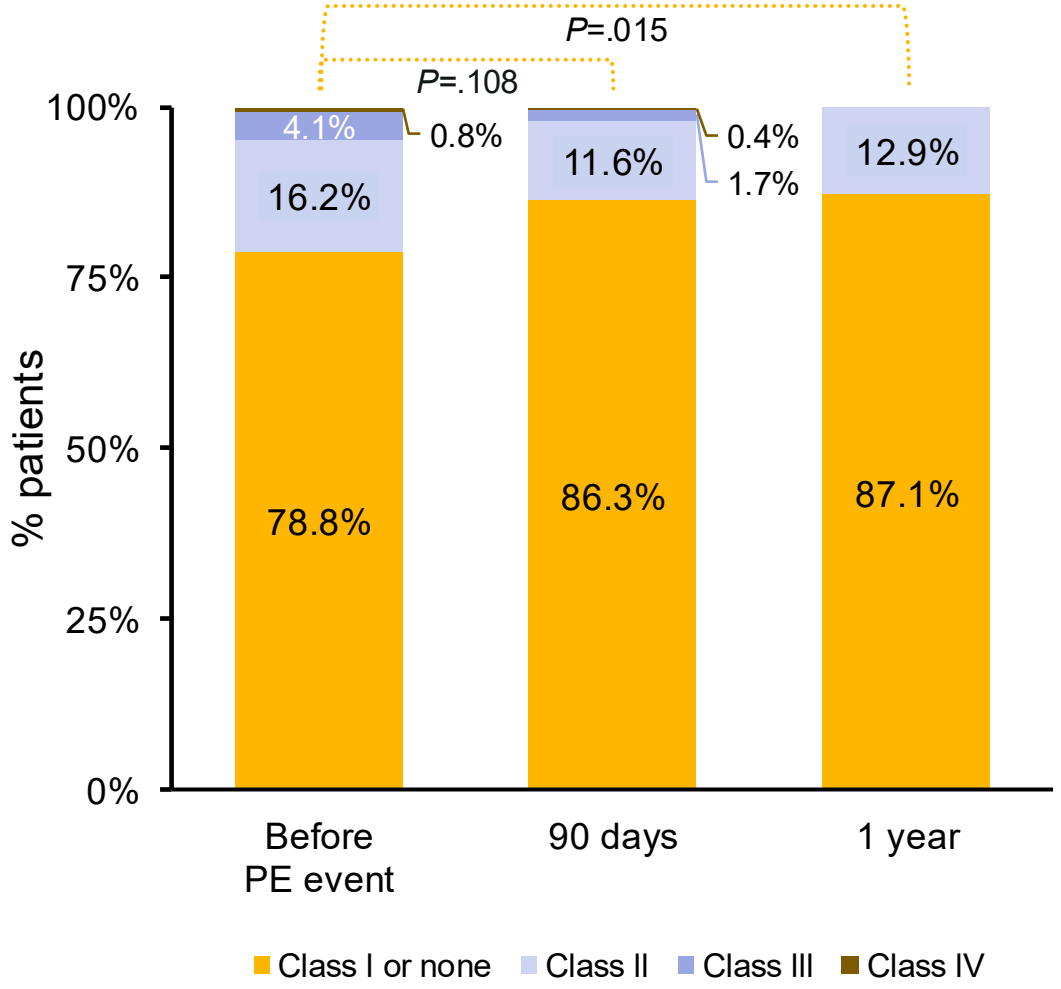
Mean 6MWT Distance and NYHA Class

6MWT Distance



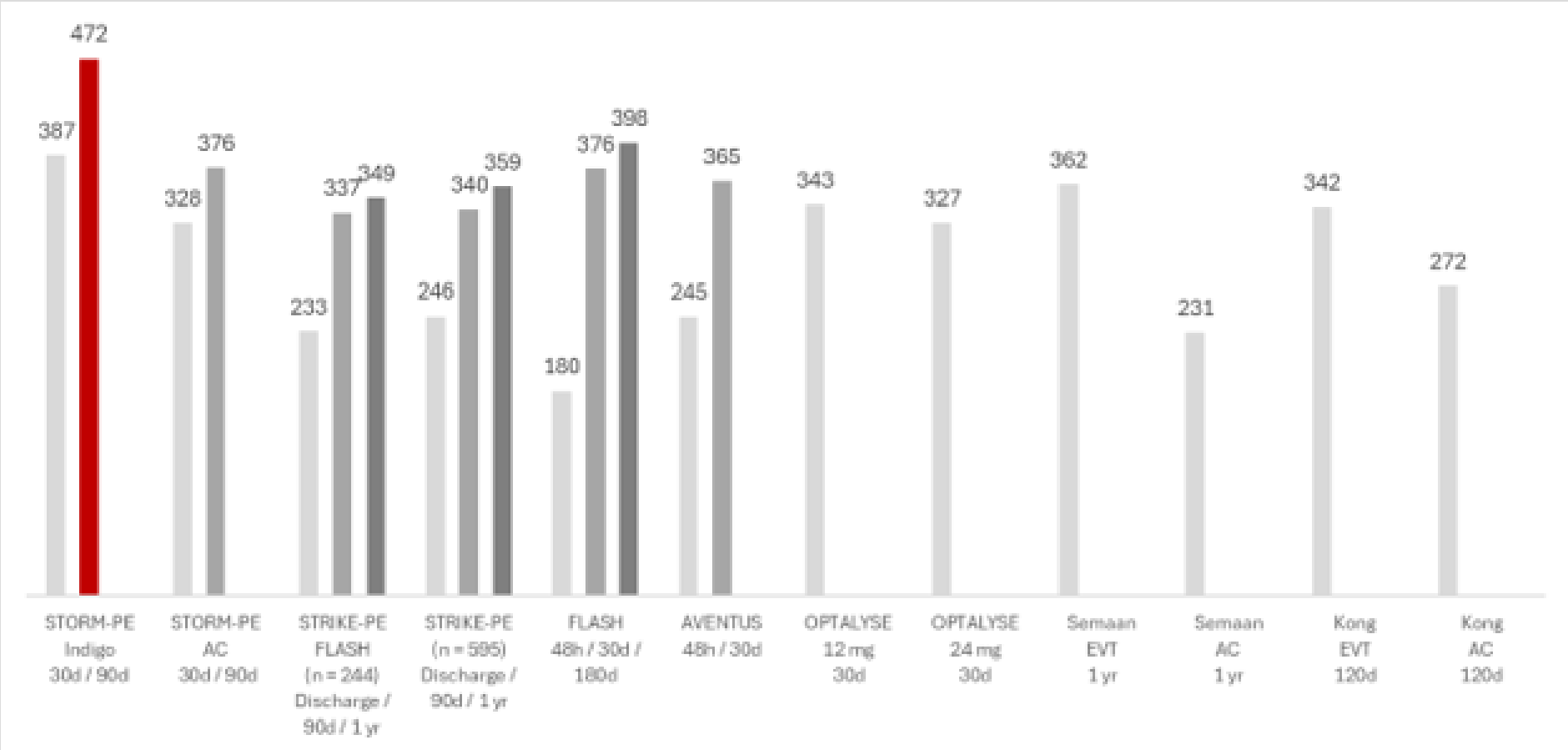
Paired data (*discharge to 90 days, n=308; †90 days to 1 year, n=161)

NYHA Class



Complete cases (n=241)

6 MINUTE WALK TEST DISTANCE (METERS)



OPTALYSE (not shown) recorded 6MWD at 30 days – 327-352 m depending on the arm. Follow-up (FU) was conducted at 90 days and 1 year, but the precise walk distances were not disclosed. Based on the published charts, none of the groups had a walk distance ≥400 m at any FU period.

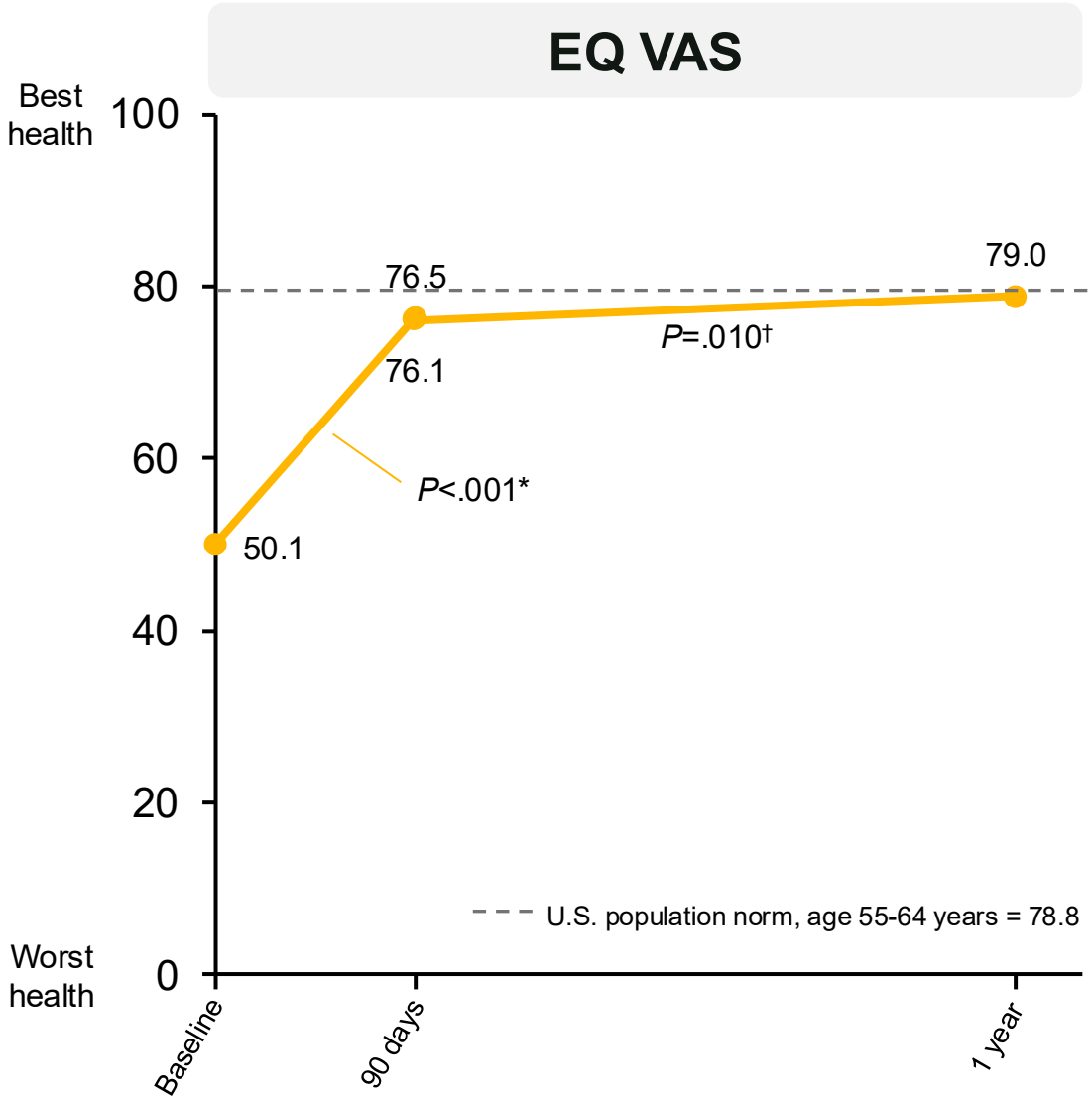
Semaan et al. evaluated PE cases at the University of Pittsburgh healthcare system admitted between 2012-2019. Patients were treated with catheter-directed therapy + AC, and AC alone were propensity matched (n=470 patients analyzed). n=180 and n=155 CDT + AC and AC alone patients, respectively, have a 6MWD recorded at 1 year. No baseline, discharge, or other duration of FU values were given.

Kong et al. Evaluated PE cases at the University of Chicago system admitted between 2017-2020. 33 and 49 patients (intermediate-high and high-risk) were treated with EVT + AC and AC alone, respectively. 6MWD was recorded at a median FU duration of 120 days.

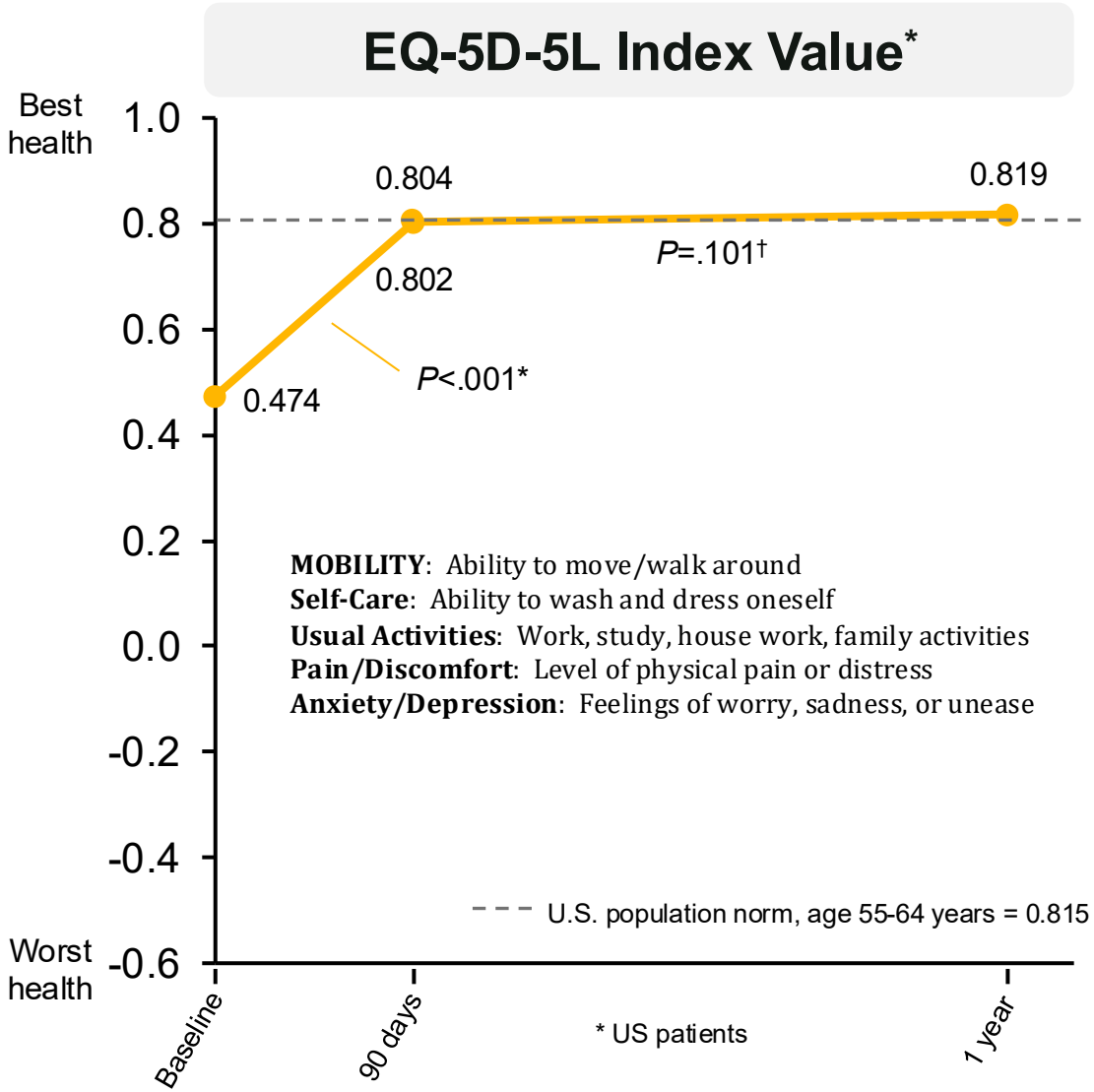
Tapson VF, et al. *JACC Cardiovasc Interv*. 2018;11(14):1401-1410. Semaan DB, et al. *J Vasc Surg Venous Lymphat Disord*. 2023;11(1):70-81. Kong NW, et al. *J Soc Cardiovasc Angiogr Interv*. 2023;2(3):100602.

Improved Quality of Life at 1 Year

Mean EQ VAS and Mean EQ-5D-5L Index Value



Paired data (*baseline to 90 days, n=485; †90 days to 1 year, n=227)



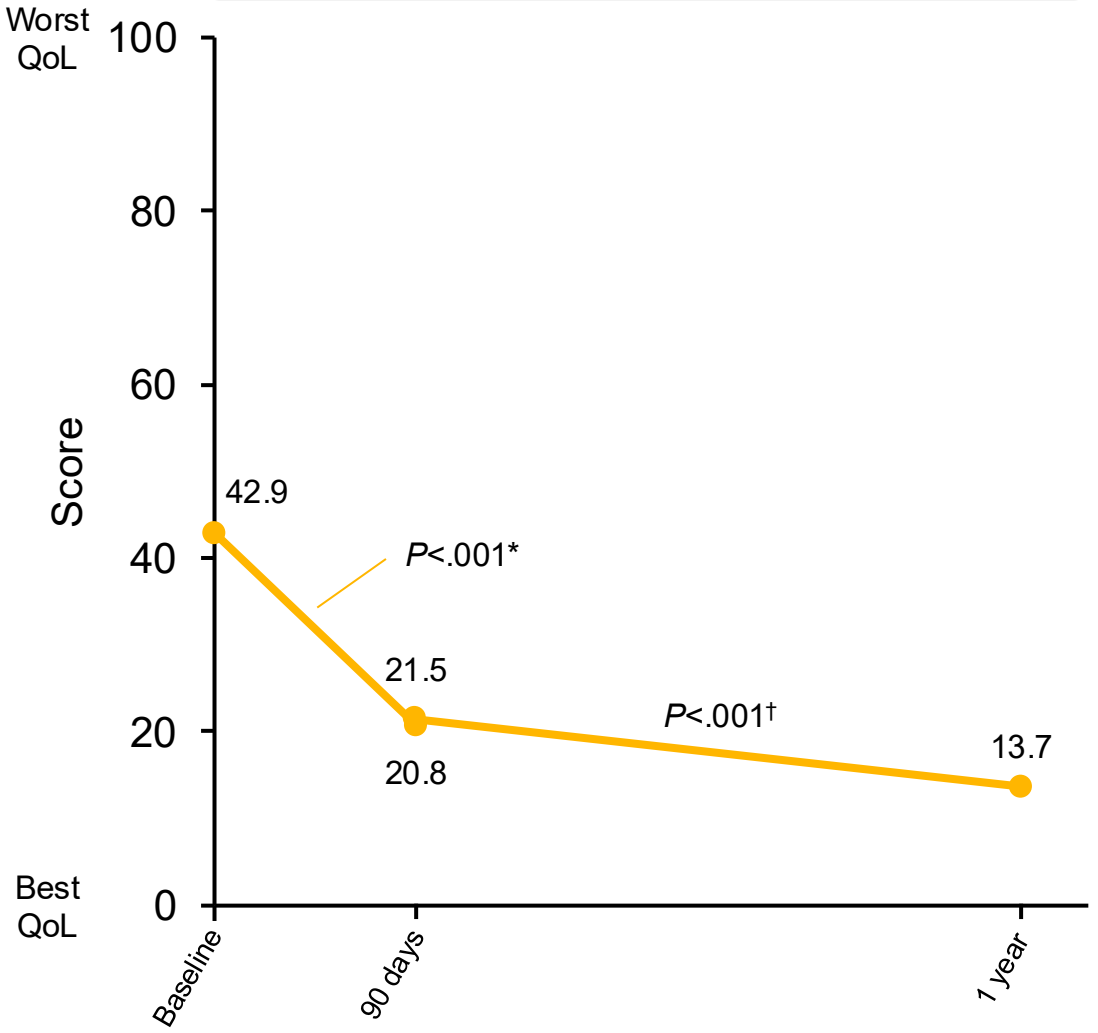
Paired data (*baseline to 90 days, n=340; †90 days to 1 year, n=189)

Jiang et al. *Qual Life Res*. 2021;30(3):803-816.

Improved PE-Specific Quality of Life at 1 Year

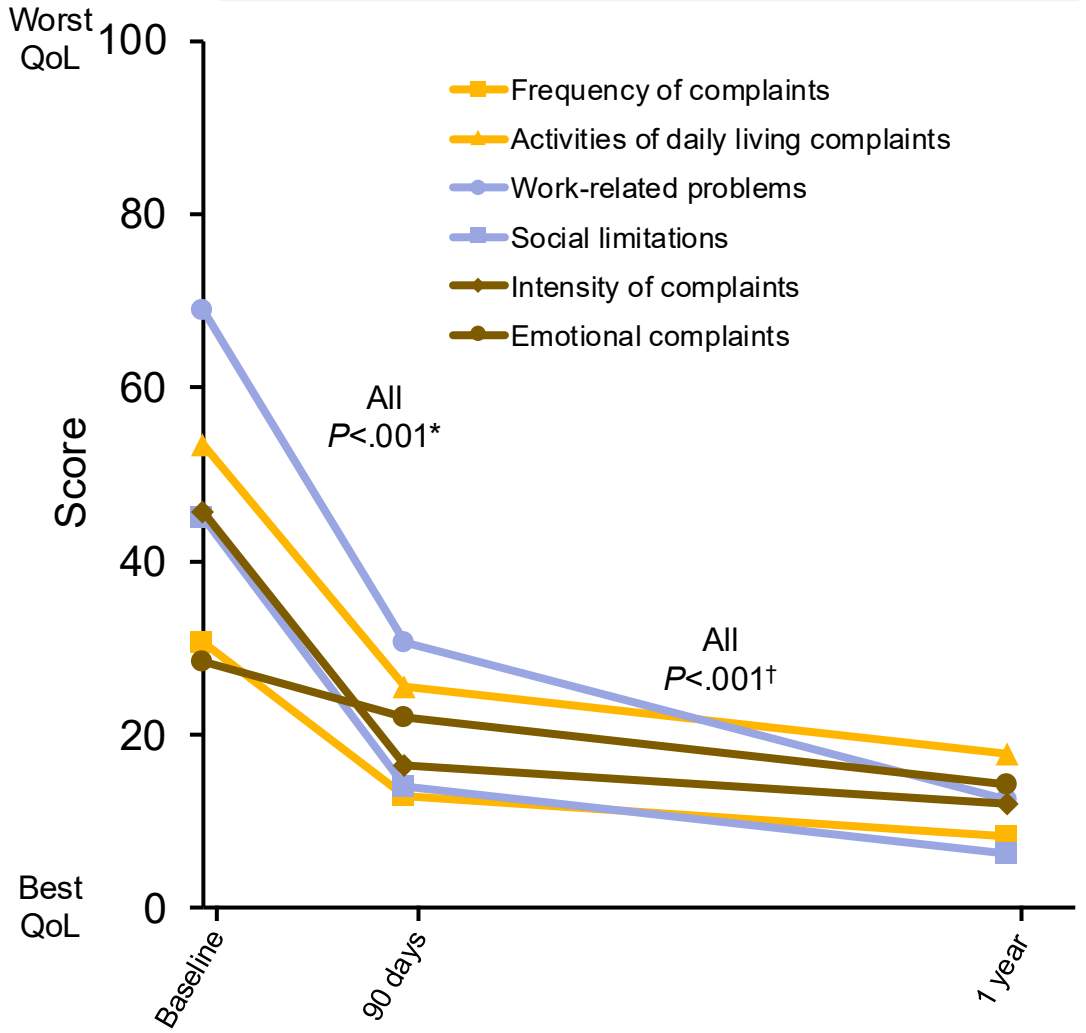
Mean PEmb-QoL – 8 questions in each category

Total PEmb-QoL



Paired data (*baseline to 90 days, n=486; †90 days to 1 year, n=226)

PEmb-QoL Dimensions



Paired data (*baseline to 90 days, n=478-485; †90 days to 1 year, n=224-226)

No Differences in Index Event Presentation

	Male n=239	Female n=211	Difference (95% CI)	*P*-value
Syncope	25.9% (62)	24.2% (51)	1.8% (-6.2%, 9.8%)	.666
Modified Miller Score	14.5 ± 2.7	14.2 ± 3.1	0.3 (-0.3, 0.8)	.362
sPESI ≥ 1	**78.2%**	**82.5%**	-4.2% (-11.5%, 3.1%)	.262
ESC PE Early Mortality Risk				
High	10.5%	9.0%	1.5% (-4.0%, 6.9%)	.604
Intermediate-high	82.4%	85.3%	-2.9% (-9.7%, 3.9%)	.408
Intermediate-low	7.1%	5.7%	1.4% (-3.1%, 5.9%)	.539

Data reported as mean ± standard deviation and % (n/N)

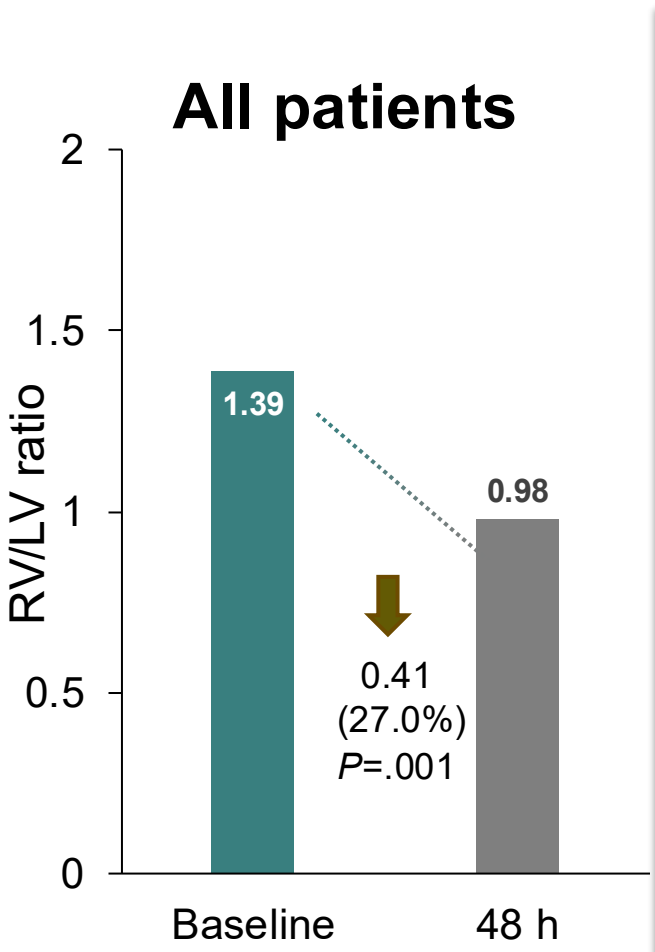
Baseline Lab Values

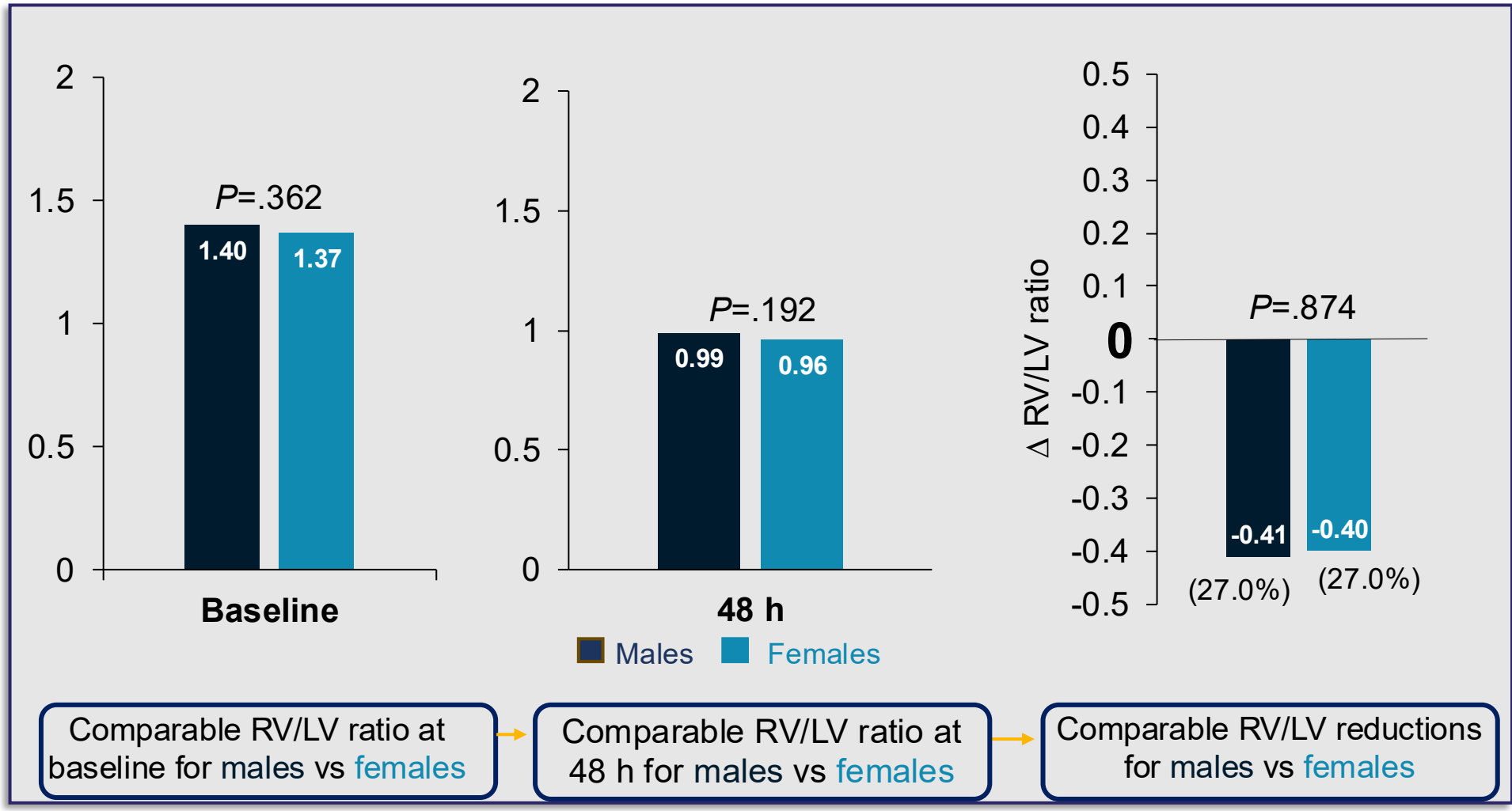
	Male n=239	Female n=211	Difference (95% CI)	*P*-value
Hemoglobin	**14.2 ± 2.0**	**12.6 ± 1.8**	1.5 (1.2, 1.9)	<.001
Hematocrit	42.6 ± 5.7	38.6 ± 5.1	4.0 (3.0, 5.0)	<.001
Platelets	205.0 ± 70.2	**227.8 ± 85.0**	-22.8 (-37.3, -8.2)	.002
Brain Natriuretic Peptide (BNP), pg/mL	441.1 ± 1213.3	420.5 ± 537.9	20.6 (-255.9, 297.1)	.883
NT-pro BNP, pg/mL	3060.0 ± 4146.8	4372.7 ± 5416.9	-1312.7 (-2555.7, -69.8)	.039
Troponin I (ng/mL)	0.178 [0.050, 0.648]	0.171 [0.052, 0.521]	0.005 (-0.050, 0.060)	.917
Troponin I High Sensitivity (ng/mL)	0.157 [0.037, 0.295]	0.215 [0.080, 0.501]	-0.074 (-0.168, 0.020)	.206
Troponin T (ng/mL)	0.065 [0.035, 0.094]	0.083 [0.050, 0.133]	-0.021 (-0.041, 0.000)	.047
Troponin T High Sensitivity (ng/mL)	0.074 [0.039, 0.136]	0.094 [0.053, 0.217]	-0.015 (-0.051, 0.022)	.549
Elevated biomarker[1]	**92.9% (222)**	**94.3% (199)**	-1.4% (-5.9%, 3.1%)	.539

Data reported as mean ± standard deviation, median [IQR], and % (n/N)

[1]Above site lab reference ranges for BNP, NT-proBNP, Troponin I/T, and/or Troponin I/T High Sensitivity, or elevated lab values of 90 pg/mL (BNP) or 500 pg/mL (NT-proBNP) or 0.04 ng/mL (Troponin I) or 0.015 ng/mL (Troponin I HS) or 0.01 ng/mL (Troponin T) or 0.014 ng/mL (Troponin T HS).

Reductions in RV/LV Ratio 48 hours after CAVT





Comparable RV/LV ratio at baseline for males vs females → Comparable RV/LV ratio at 48 h for males vs females → Comparable RV/LV reductions for males vs females

Primary Safety Endpoints at 48 hours

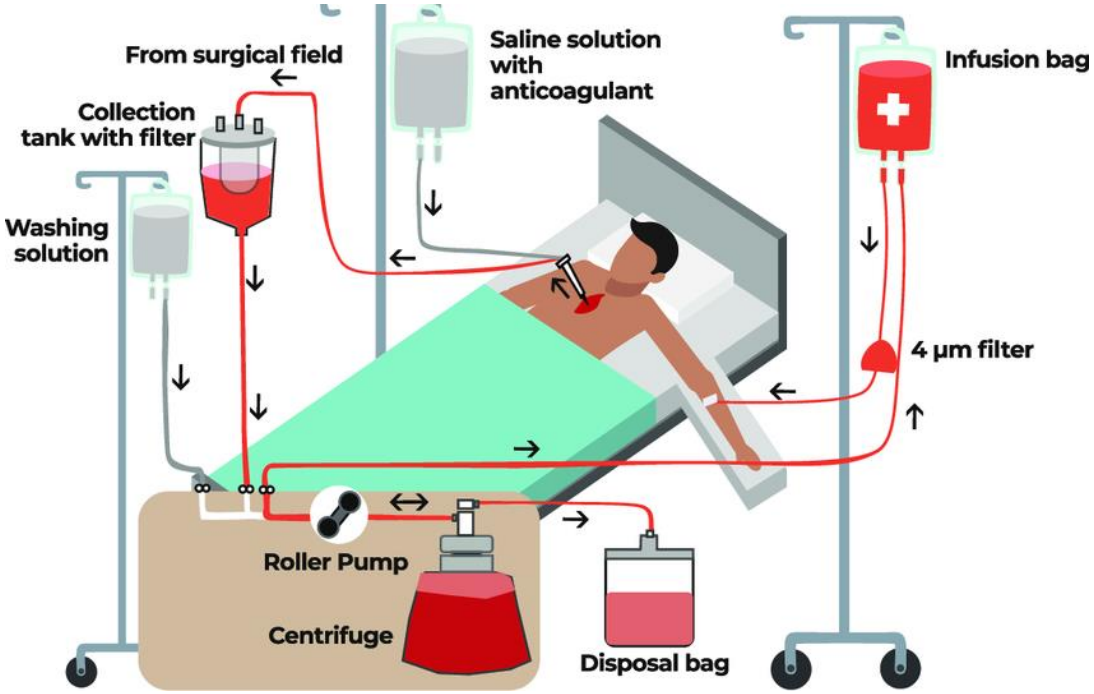
	All patients N=450	Males n=239	Females n=211	Difference (95%)	*P*-value
Major Adverse Events (Composite)*	1.6% (7)	**0.4% (1)**	**2.8% (6)**	-2.4% (-4.8%, -0.0%)	**.038**
Device-related death	0%	**0%**	**0%**	NA	NA
Major Bleeding	1.6% (7)	**0.4% (1)**	**2.8% (6)**	-2.4% (-4.8%, -0.0%)	.038
Device-related Clinical Deterioration	0.4% (2)	**0%**	**0.9% (2)**	-0.9% (-2.3%, 0.4%)	.131
Device-related Cardiac Injury	0%	**0%**	**0%**	NA	NA
Device-related Pulmonary Vascular Injury	0.2% (1)	**0%**	**0.5% (1)**	-0.5% (-1.4%, 0.5%)	.287
Transfusion details					
Pre-discharge transfusion	4.0% (18)**	**2.9% (7)**	**5.2% (11)**	-2.3% (-6.0%, 1.4%)	.217
Major bleeding requiring transfusion†	0.9% (4)	**0.4% (1)**	**1.4% (3)**	-1.0% (-2.8%, 0.8%)	.258
Device-related transfusion	0.2% (1)	**0%**	**0.5% (1)**	-0.5% (-1.4%, 0.5%)	.287

*Events can qualify for more than one component of the composite endpoint; Independent medical reviewer–adjudicated. Adverse events that were judged as probably or definitely related to the CAVT devices were considered to be device-related.; †Major bleeding is defined as meeting BARC Types 3a, 3b, 3c, and 5, in line with AHA guidelines. Type 3a will not be considered as a major bleeding event if it is related to an expected drop in hemoglobin due to fluid administration and if transfusion is less than 2 units; **Two additional patients (0.4%) had a post-discharge transfusion. These patients are females.

Autotransfusion

- Autotransfusion is the process of returning autologous blood, thus minimizing blood loss
- Autologous blood can be reinfused by using washed or unwashed techniques
  - Conventional blood reinfusion systems (eg, cell savers) wash and filter blood before returning it to the patient
  - Blood return systems used during thrombectomy collect and return aspirated blood without washing and extensive filtering

Blood reinfusion system via cell saver



Salhanick MA, et al. *Shock*. 2016;46(2):144-148. Perini FV, et al. *Hematol Transfus Cell Ther*. 2024;46(suppl 1):S48-S52. Terwindt LE, et al. *Transfus Apher Sci*. 2019;58(4):397-407.

Autotransfusion of Unwashed Shed Blood

Reference	Hemoglobin level (g/dL), initial → final*		Postprocedure transfusion rate	
	LBAT without autotransfusion device	LBAT with autotransfusion device	LBAT without autotransfusion device	LBAT with autotransfusion device
Ahmed, et al.	13.3 → 11.7 (n=58)	12.8 → 11.7 (n=47)	5.2% (3/58)	8.5% (4/47)
Bitar, et al.	13.2 → 11.5 (n=87)	12.7 → 11.6 (n=84)	23.0% (20/87)	9.5% (8/84)

- The average hemoglobin levels reported in these analyses did not meet the AABB guideline criteria for transfusion
- Potentially elevated PFH levels and release of contaminants may outweigh any benefit of returning unwashed filtered blood

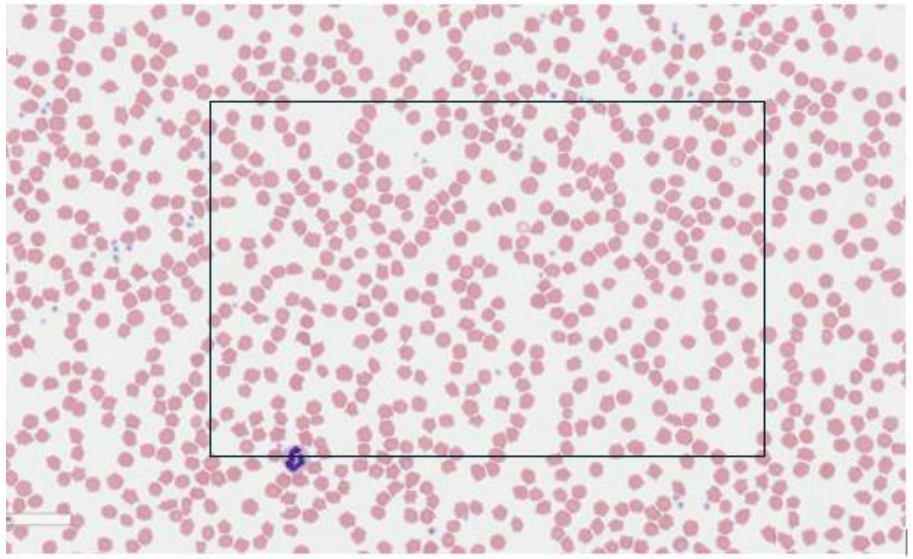
***Final time: Ahmed et al, <24 h postprocedure; Bitar et al, 12-24 h postprocedure.**

AABB = Association for the Advancement of Blood and Biotherapies; PFH = plasma-free hemoglobin.

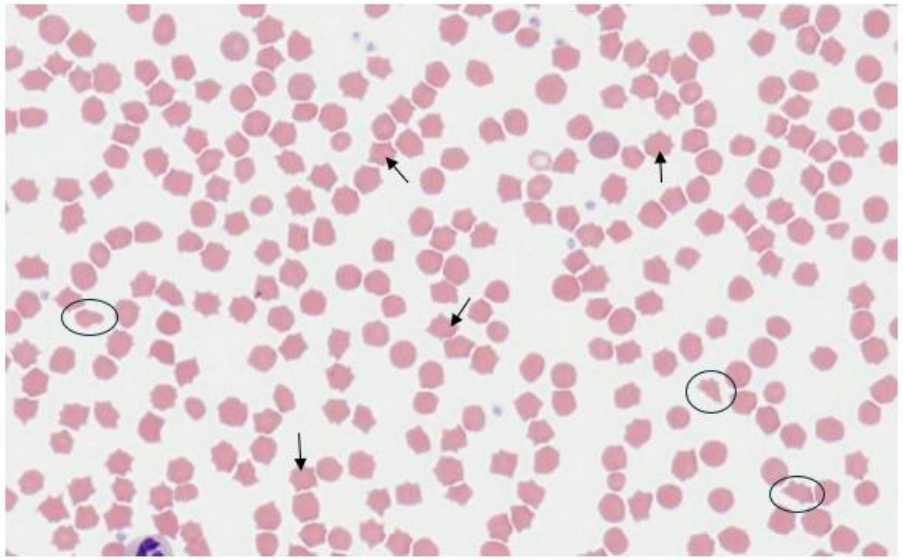
Ahmed J, et al. Presented at: Society of Interventional Radiology Annual Scientific Meeting; March 23-28, 2024; Salt Lake City, Utah. Bitar R, et al. *J Vasc Interv Radiol*. 2024; 5(10):1447-1456. Salhanick MA, et al. *Shock*. 2016;46(2):144-148. Mitchell TA, et al. *Shock*. 2017;47(6):680-687.

PFH in Serum Blood

A. Blood samples showed RBC morphology in a systemic sample (1=baseline systemic, 2=post-aspiration, 3=post-blood return filter)



B. Post-aspiration sample



C. Arrows highlighting lysed cells

Previous work demonstrated porcine RBCs processed through various stages of aspiration and filtration had darkening color through subsequent passes (A. increased coloring indicated increased levels of PFH in each pass).

RBC = red blood cell.

Catheterization and Cardiovascular Interventions

ORIGINAL ARTICLE - BASIC SCIENCE OPEN ACCESS

Hemolysis Detected Following the Preparation and Collection of Blood in a Porcine Model Using a Syringe-Based Aspiration Thrombectomy System for Autotransfusion

Suhail Dohad[1] | Mohammed M. Hoque[2] | Jonathan H. Waters[3] | Marc Salhanick[4]

[1]SMIDT Heart Institute, Cedars-Sinai Medical Center, Interventional Cardiology, Los Angeles, California, USA | [2]Vegas Interventional Radiology, Henderson, Nevada, USA | [3]Department of Anesthesiology and Perioperative Medicine, Medical Director of the UPMC Patient Management Program, University of Pittsburgh Medical Center Magee-Womens Hospital, Pittsburgh, Pennsylvania, USA | [4]Medical City Healthcare, Vascular Surgery, Dallas, Texas, USA

Dohad S, et al. *Catheter Cardiovasc Interv*. 2026;107(3):729-735.

Results

When compared to **PFH** Control

Aspiration

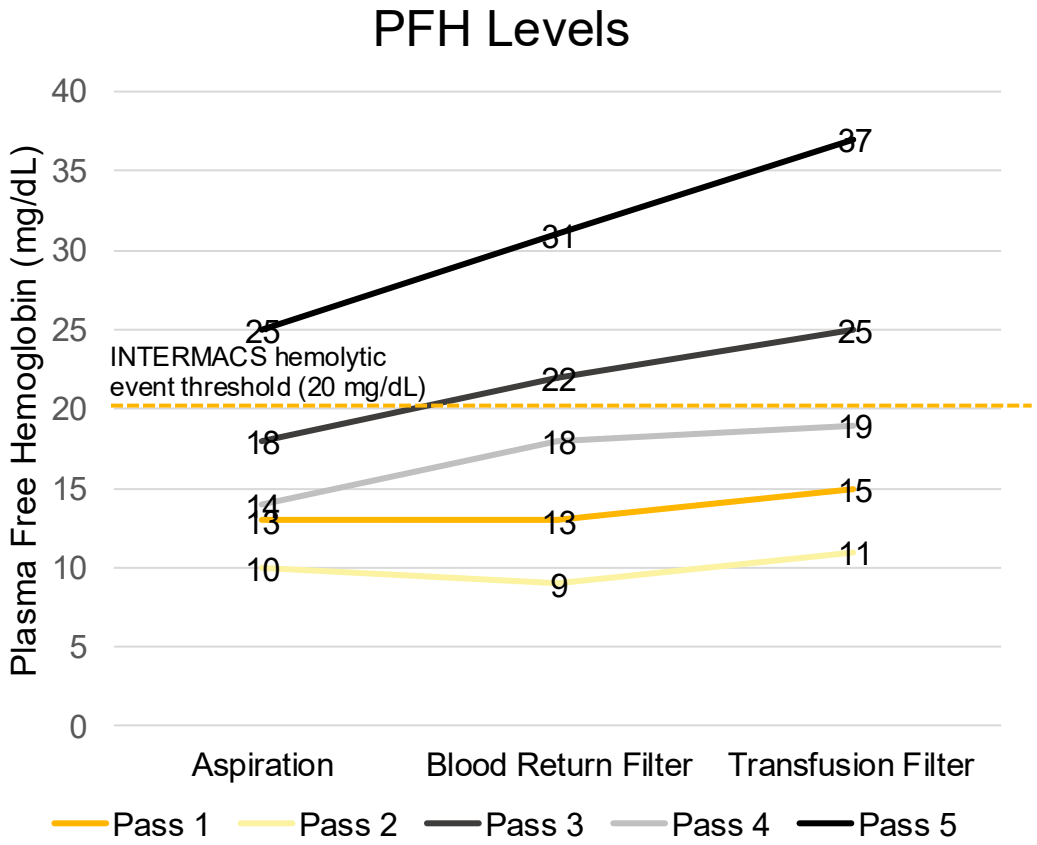
PFH levels **2.7x** higher

Blood Return Filter

PFH levels **3.1x** higher

Transfusion Filter

PFH levels **3.6x** higher



***Interagency Registry for Mechanically Assisted Circulatory Support (INTERMACS) hemolytic event threshold of 20 mg/dL exceeded.**
Dohad S, et al. *Catheter Cardiovasc Interv*. 2026;107(3):729-735.

Conclusion

STRIKE-PE patients treated with CAVT experienced

Improved on-table hemodynamics
Δ sPAP, −10.6 mm Hg

Improved RV strain at 48 h
Δ RV/LV ratio, −26.7%

Low MAE rate
1.8% (11/595)

Short device time
30 min

Improved functional outcomes at 1 yr
Δ Borg scale at rest, −4.0
Δ Borg scale after 6MWT, −1.0
Δ 6MWT distance, +145.6 m

Improved functional status at 1 yr
P=.015

Improved quality of life at 1 yr
Δ EQ VAS, +27.6
Δ EQ-5D-5L index value, +0.400
Δ Total PEmb-QoL, −27.6

STRIKE-PE continues to shape the future of PE management—delivering measurable outcomes that matter to both patients and providers

HMP Global
Cardiovascular CME

PE Case Presentation

Parag Patel, MD, MS

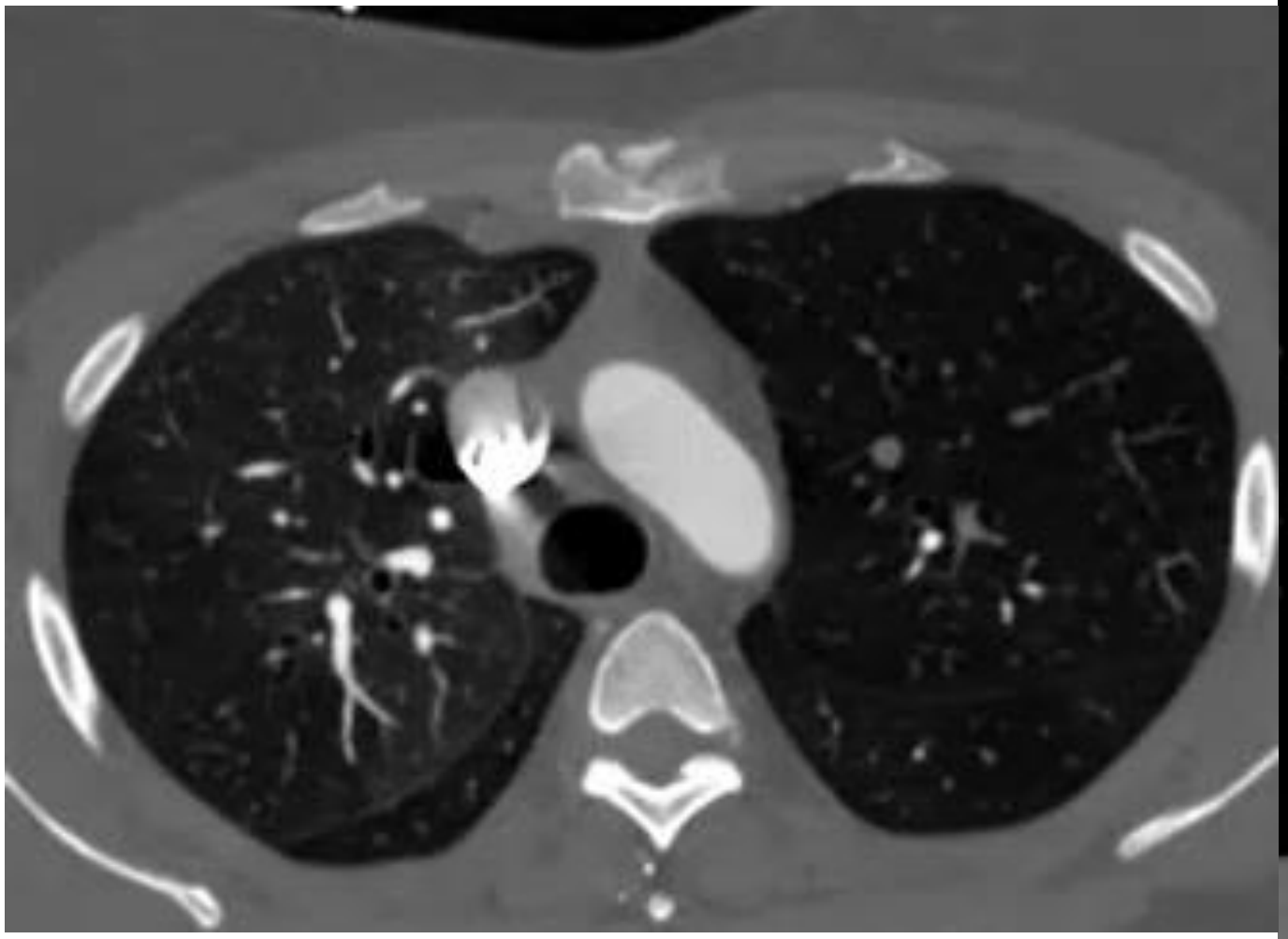
Case

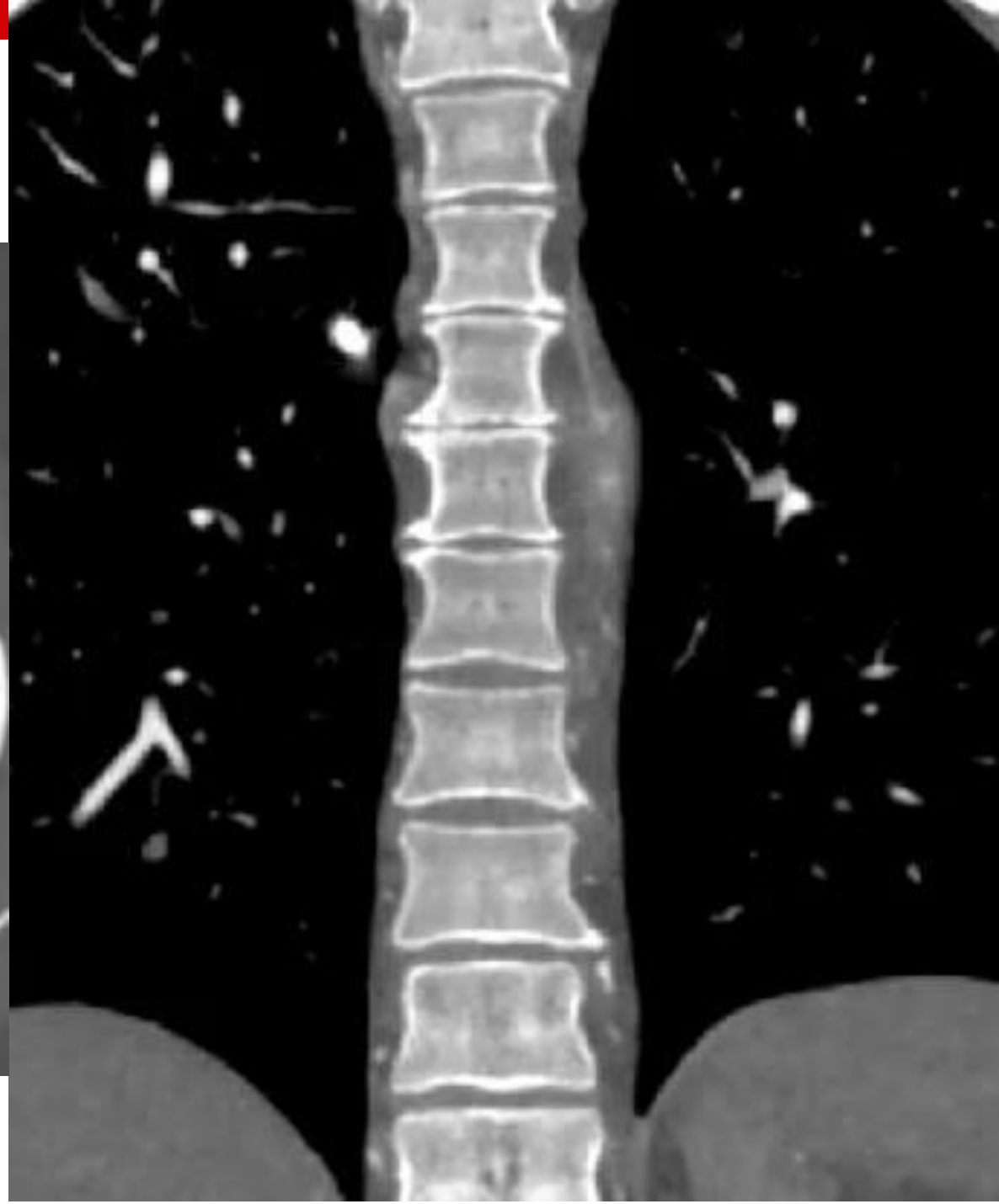
- 50-year-old female patient presents with syncope and shortness of breath
- EMS found the patient tachycardic and hypotensive with systolic blood pressure in 80s

- POCUS: Enlarged right ventricle
- hsTrop: 44
- BNP: 75
- Lactate: 10

EMS = emergency medical services; POCUS = point-of-care ultrasound; hsTrop = high-sensitivity troponin; BNP = B-type natriuretic peptide.

CT PE





Pulmonary Embolism Response Team

[redacted]
Registered Nurse

Progress Notes
Signed

Date of Service: [redacted] 1:51 PM
Creation Time: [redacted] 1:51 PM

PERT ACTIVATION SUMMARY NOTE

Patient: [redacted]
MRN: [redacted]
Date of activation: [redacted]
Time of activation: 1:52 PM

Department that activated PERT: Emergency Department
Previous PERT activation: No
Services on PE call: All members on activation algorithm

Provider (ED or Hospitalist)
MICU Attending/Fellow
IR Attending/Fellow
CT Surgery
Cardiac Anesthesia

Last set of vitals: [redacted]

Vitals	1:07 PM	1:10 PM	1:15 PM	1:30 PM	1:35 PM	1:38 PM	1:46 PM
BP		109/70	80/52 ↓	95/51	106/70	76/40 ↓	93/59
BP Comment			MD Liu bedside				
Pulse		125	127	120	119	113	118
Resp	32 ↑	47 ↑	40 ↑	41 ↑	39 ↑	33 ↑	32 ↑
SpO2		98 %					

Home oxygen requirement: No
Current oxygen requirement: Optiflow 100% 60L
Episode of Syncope: Yes
Vasopressors: None and Norepinephrine
Anticoagulation: Yes: UFH drip + bolus - THERAPEUTIC TARGET 0.3-0.7

MRN = medical record number; ED = Emergency Department; MICU = medical intensive care unit; IR = interventional radiology.

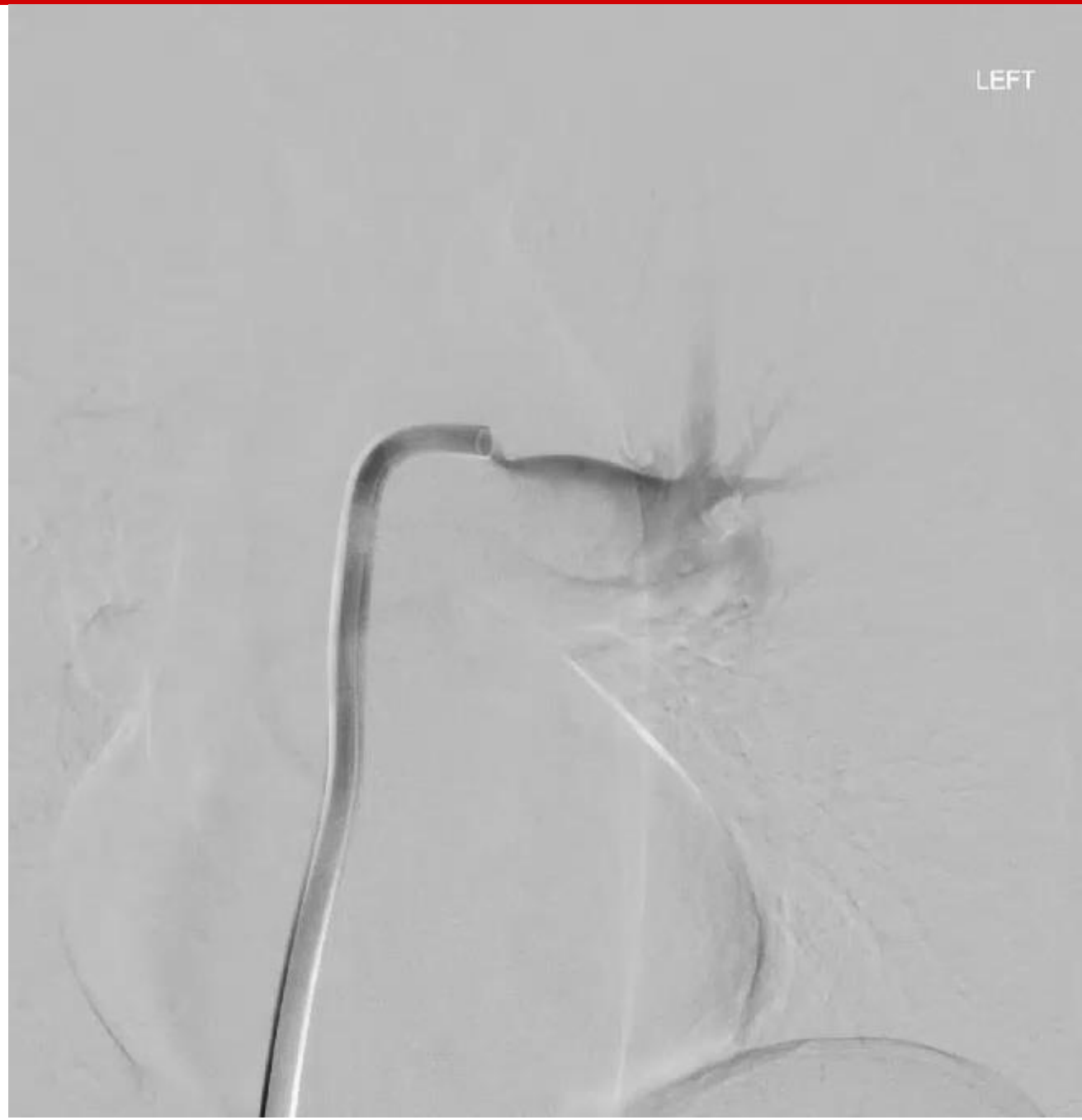
Procedure Details

- R CFV access
- 17 Fr element sheath
- Angled pigtail catheter
- Pre-main PA pressures: 40/14 (24)

R = right; CFV = common femoral vein; PA = pulmonary artery.

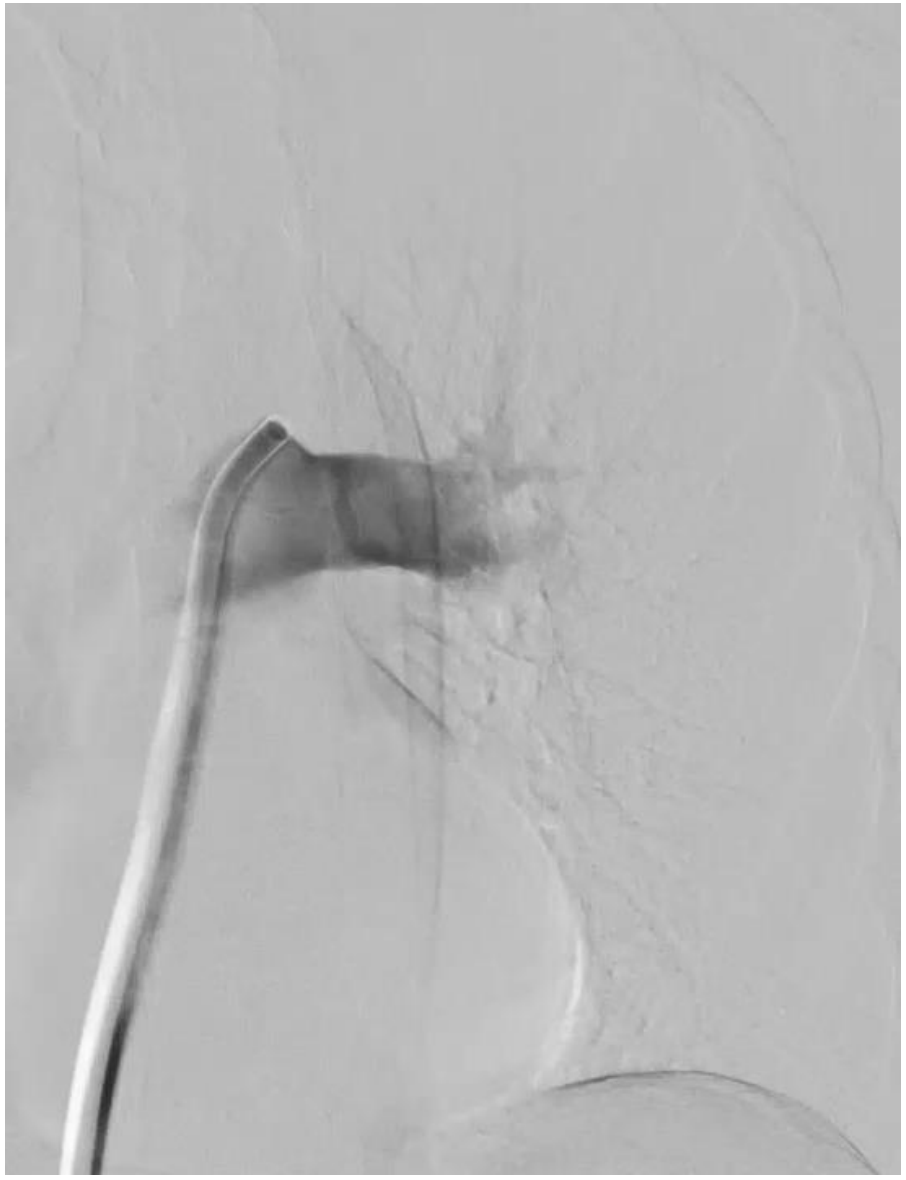
Procedure Details

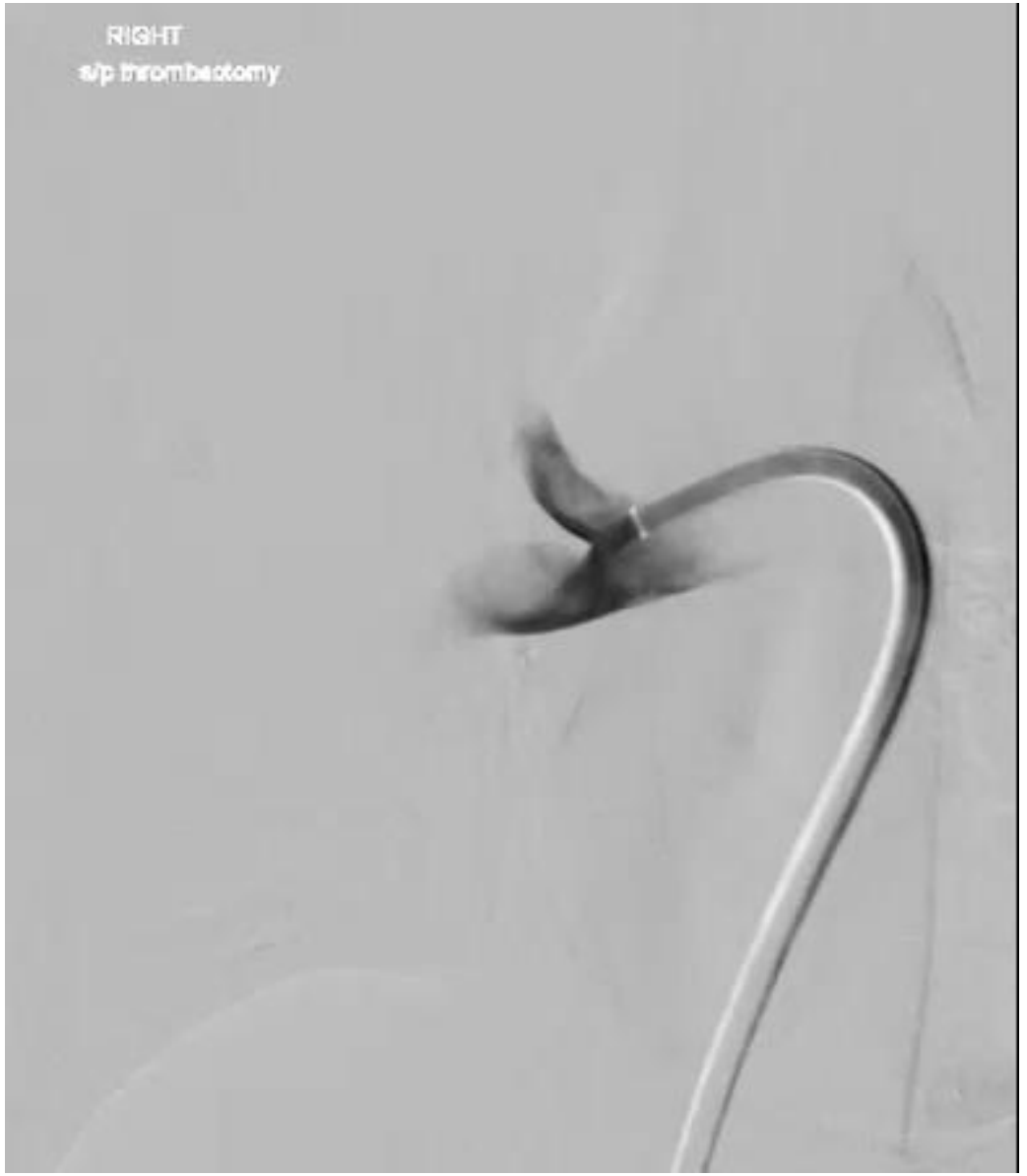
- R CFV access
- 17 Fr element sheath
- Angled pigtail catheter
- **Pre-main PA pressures: 40/14 (24)**
- Thrombectomy: Computer-assisted vacuum thrombectomy



Procedure Details

- **Pre-main PA pressures: 40/14 (24)**
- Thrombectomy: Computer-assisted vacuum thrombectomy
- **Post-main PA pressures: 22/8 (14)**





PERT Summary/Hospital Course

[redacted] Progress Notes Signed — Date of Service: [redacted] 1:51 PM — Creation Time: [redacted] 1:51 PM
Registered Nurse

PERT ACTIVATION SUMMARY NOTE

Patient: [redacted]
MRN: [redacted]
Date of activation: [redacted]
Time of activation: 1:52 PM

Department that activated PERT: Emergency Department
Previous PERT activation: No
Services on PE call: All members on activation algorithm

Last set of vitals: [redacted]

	1:07 PM	1:10 PM	1:15 PM	1:30 PM	1:35 PM	1:38 PM	1:46 PM
Vitals							
BP		109/70	80/52 ↓	95/51	106/70	76/40 ↓	93/59
BP Comment			MD Liu bedside				
Pulse		125	127	120	119	113	118
Resp	32 ↑	47 ↑	40 ↑	41 ↑	39 ↑	33 ↑	32 ↑
SpO2		98 %					

Home oxygen requirement: No
Current oxygen requirement: Optiflow 100% 60L
Episode of Syncope: Yes
Vasopressors: None and Norepinephrine
Anticoagulation: Yes: UFH drip + bolus - THERAPEUTIC TARGET 0.3-0.7

- Arrived at ED via EMS: **12:57 PM**
- CT completed: **1:41 PM**
- Heparin initiated: **1:50 PM**
- PERT call: **1:52 PM**
- PE Thrombectomy: **3:40 PM**
- Transferred to MICU: **5:15 PM**
- Transferred to floor: **Next AM**

- Discharged home: Hospital Day 4
- SpO2: 100% on RA, no home health needed

Thank You