

# Real-World Comparison of Mechanical Thrombectomy vs Catheter-Directed Thrombolysis for the Treatment of Pulmonary Embolism: A Single-Center Retrospective Study

Isaac Demaree, BS<sup>1</sup>; Travis Pebror, MD, MS, MBA<sup>1</sup>; Adam Schmitz, MD<sup>1</sup>; Reid Masterson, MD<sup>1</sup>; Sabah Butty, MD<sup>1</sup>

<sup>1</sup>Indiana University School of Medicine, Indianapolis, IN USA.

## Background



The goal of this study is to evaluate outcomes between FlowTrievery mechanical thrombectomy (FTMT) and catheter-directed thrombolysis (CDT) for the treatment of pulmonary embolism (PE) at a single medical center. A recent multi-site randomized controlled trial, PEERLESS, compared periprocedural and clinical outcomes in 550 patients presenting with intermediate-risk PE who were randomized to either FTMT vs CDT. The study demonstrated superiority of FTMT to CDT in a 5-point composite endpoint attributable largely to decreased intensive care unit (ICU) utilization [1]. We seek to compare these two treatment options at a single large-volume hospital without the use of a composite endpoint.

	FTMT (n = 308)	CDT (n = 153)
Age	62.0 ± 16.7	57.4 ± 16.1
Female	145 (47.1%)	74 (48.4%)
BMI	34.9 ± 10.5	35.8 ± 9.0
Tobacco	72 (23.4%)	29 (18.9%)
T2DM	76 (24.7%)	33 (21.6%)
HTN	184 (59.7%)	80 (52.3%)
Obesity	195 (63.3%)	113 (73.9%)
Malignancy	58 (18.8%)	14 (9.1%)
Immobility (30d)	83 (26.9%)	32 (20.9%)
Surgery (3mo)	49 (15.9%)	30 (19.6%)
Pregnancy	3 (1.0%)	4 (2.6%)
OCPs/Estrogen	14 (4.5%)	10 (6.5%)
Hx DVT	36 (11.7%)	28 (18.3%)
Hx PE	35 (11.4%)	29 (18.9%)
Massive	23 (7.5%)	11 (7.2%)
Submassive	285 (92.5%)	142 (92.8%)

Table 1. Demographics of patients in each treatment group.

## Methods

We performed a retrospective, single-center analysis of 461 patients who presented with submassive or massive PE and underwent treatment with either FTMT or CDT based on operator preference. The FTMT group received mechanical thrombectomy without thrombolysis in most cases. The CDT group underwent catheter placement and infusion of local thrombolytics with mean dose of 25.3 ± 11.1 mg and duration of 25.8 ± 9.8 hours. Primary endpoints include mortality at 7 and 30 days; procedure-related decompensation; and non-procedure-related decompensation. Decompensation events were categorized by two independent reviewers with any disagreements resolved by a third party. Secondary endpoints include ICU length-of-stay; total length-of-stay (LOS); and changes before vs after treatment in mean pulmonary artery pressure (mPAP), mean arterial pressure (MAP), and hemoglobin (Hgb). Results were analyzed by calculating the risk ratio and using Fischer’s exact test for ordinal data and Chi-squared test for categorical data.

## Results

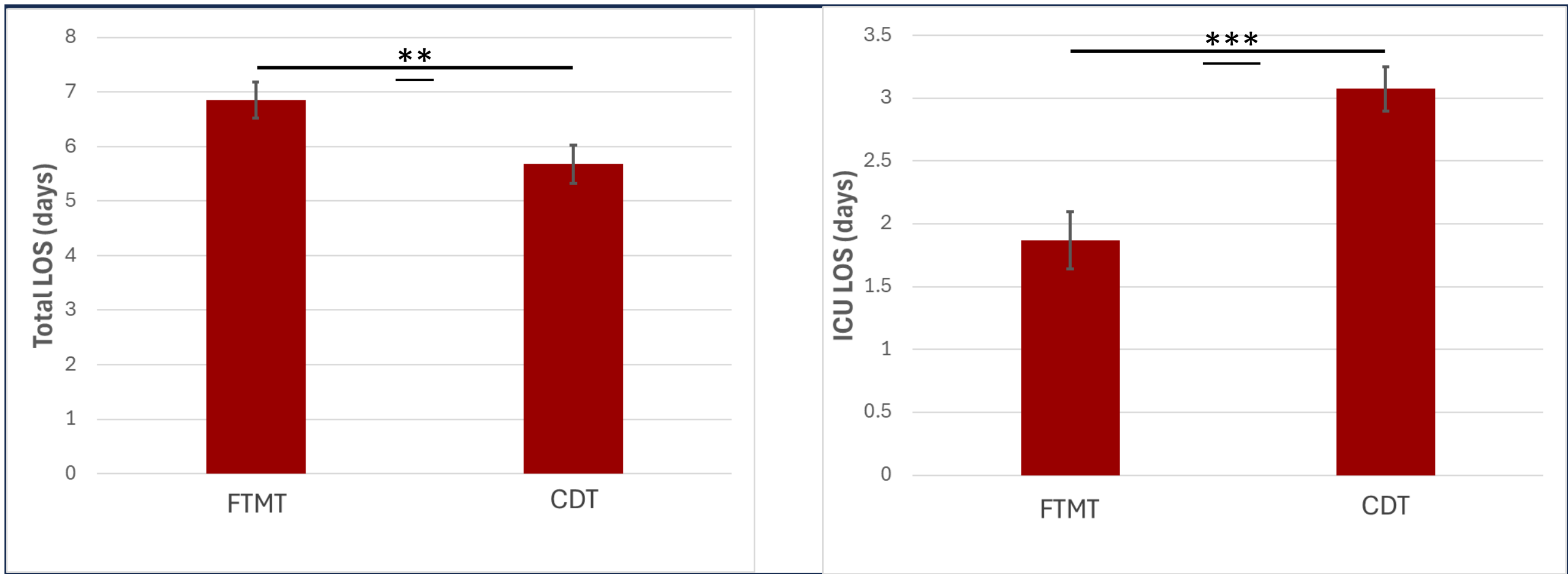


Fig 1. Comparison of ICU and total LOS between FTMT and CDT treatment arms. \*\*\*p < 0.001. \*\*p < 0.01.

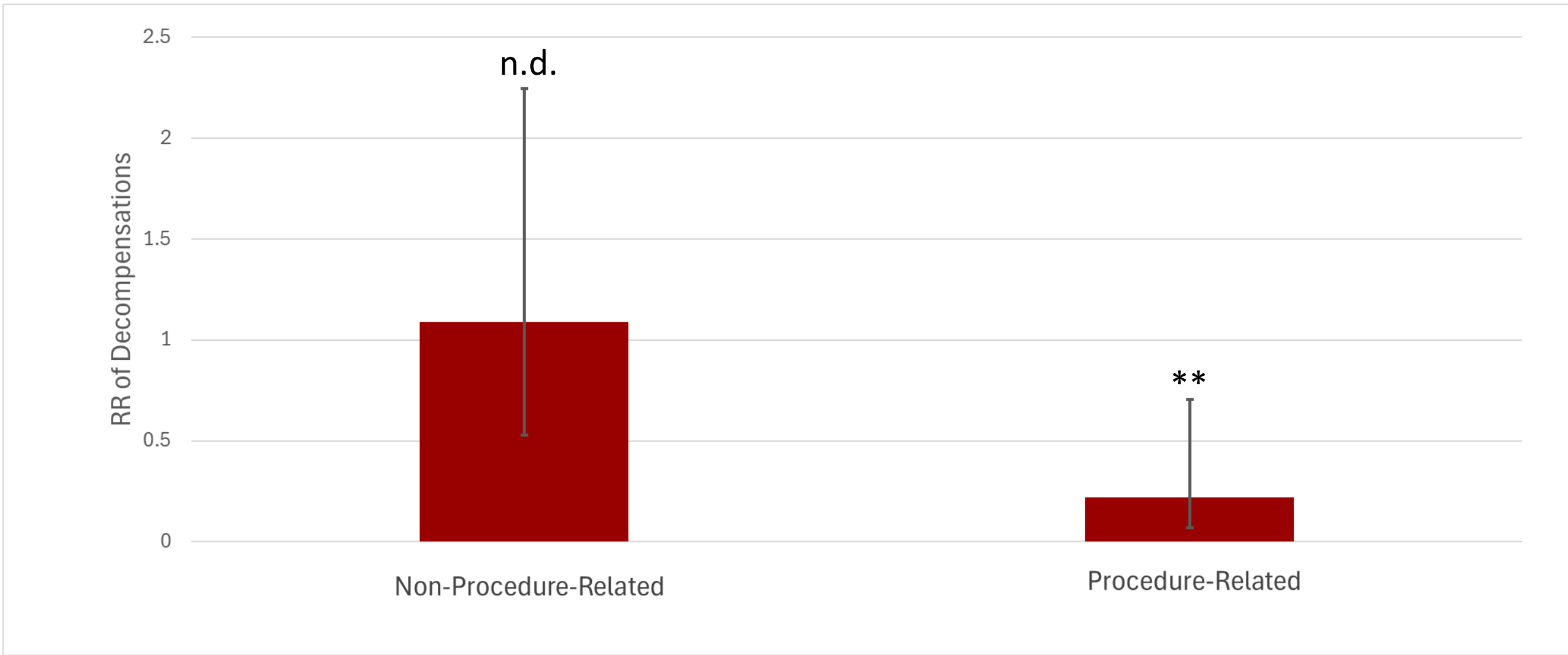


Fig 2. Relative risk of decompensation of FTMT compared with CDT. n.d. = no significant difference. \*\*p < 0.01

## Results (cont.)

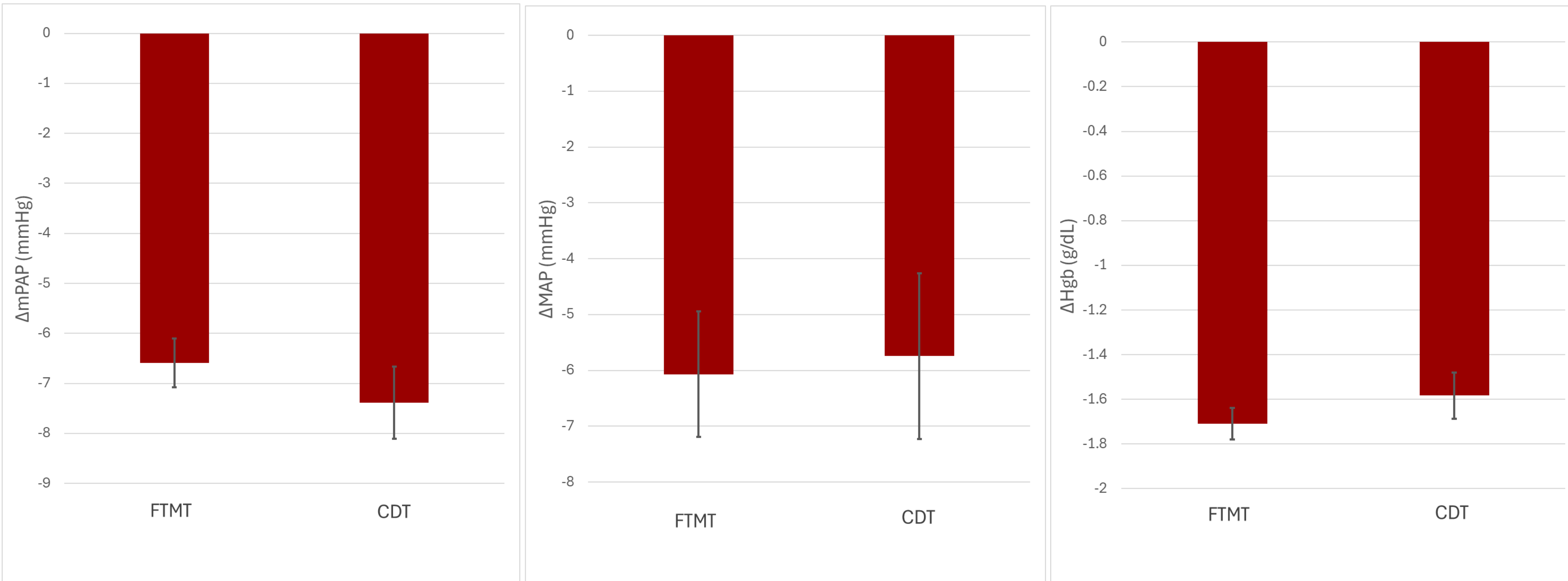


Fig 3. Comparison of change in mPAP, MAP, and Hgb pre- and post-treatment. There was no significant difference for any of the variables.

	FTMT (n = 308)	CDT (n = 153)	Relative Risk	P-Value
Procedure-related Decompensation	4 (1.3%)	9 (5.9%)	0.221 (95% CI: 0.069-0.706)	0.01
Arrythmia	0 (0%)	1 (0.6%)		
Cardiac Arrest	3 (1.0%)	6 (3.9%)		
Major Bleeding	0 (0%)	2 (1.3%)		
Non-procedure-related Decompensation	22 (7.1%)	10 (6.5%)	1.091 (95% CI: 0.530-2.246)	0.51
Pneumonia	5 (1.6%)	0 (0%)		
PE	5 (1.6%)	7 (4.6%)		
Cancer	4 (1.3%)	2 (1.3%)		
Stroke	1 (0.3%)	0 (0%)		
Hemorrhage	1 (0.3%)	0 (0%)		
Other	6 (1.9%)	1 (0.6%)		
7-day Mortality	7 (2.3%)	7 (4.6%)		
30-day Mortality	19 (6.2%)	7 (4.6%)		

Table 2. Procedure-related and non-procedure-related events between FTMT and CDT treatment arms.

## Conclusions

- Similar to the PEERLESS trial, we found that there is decreased utilization of ICU for mechanical thrombectomy because thrombolytics requires ICU admission at our institution.
- Interestingly, total LOS was higher for the thrombolytics group. The reason is unclear. More research would be needed to further elucidate this difference.
- This evidence suggests that the relative risk of procedure-related decompensations was lower in patients treated with FTMT.

## References

[1] Jaber WA, Gonsalves CF, Stortecky S, Horr S, Pappas O, Gandhi RT, Pereira K, Giri J, Khandhar SJ, Ammar KA, Lasorda DM, Stegman B, Busch L, Dexter DJ 2nd, Azene EM, Daga N, Elmasri F, Kunavarapu CR, Rea ME, Rossi JS, Campbell J, Lindquist J, Raskin A, Smith JC, Tamlyn TM, Hernandez GA, Rali P, Schmidt TR, Bruckel JT, Camacho JC, Li J, Selim S, Toma C, Basra SS, Bergmark BA, Khalsa B, Zlotnick DM, Castle J, O'Connor DJ, Gibson CM; PEERLESS Committees and Investigators\*. Large-Bore Mechanical Thrombectomy Versus Catheter-Directed Thrombolysis in the Management of Intermediate-Risk Pulmonary Embolism: Primary Results of the PEERLESS Randomized Controlled Trial. Circulation. 2025 Feb 4;151(5):260-273.