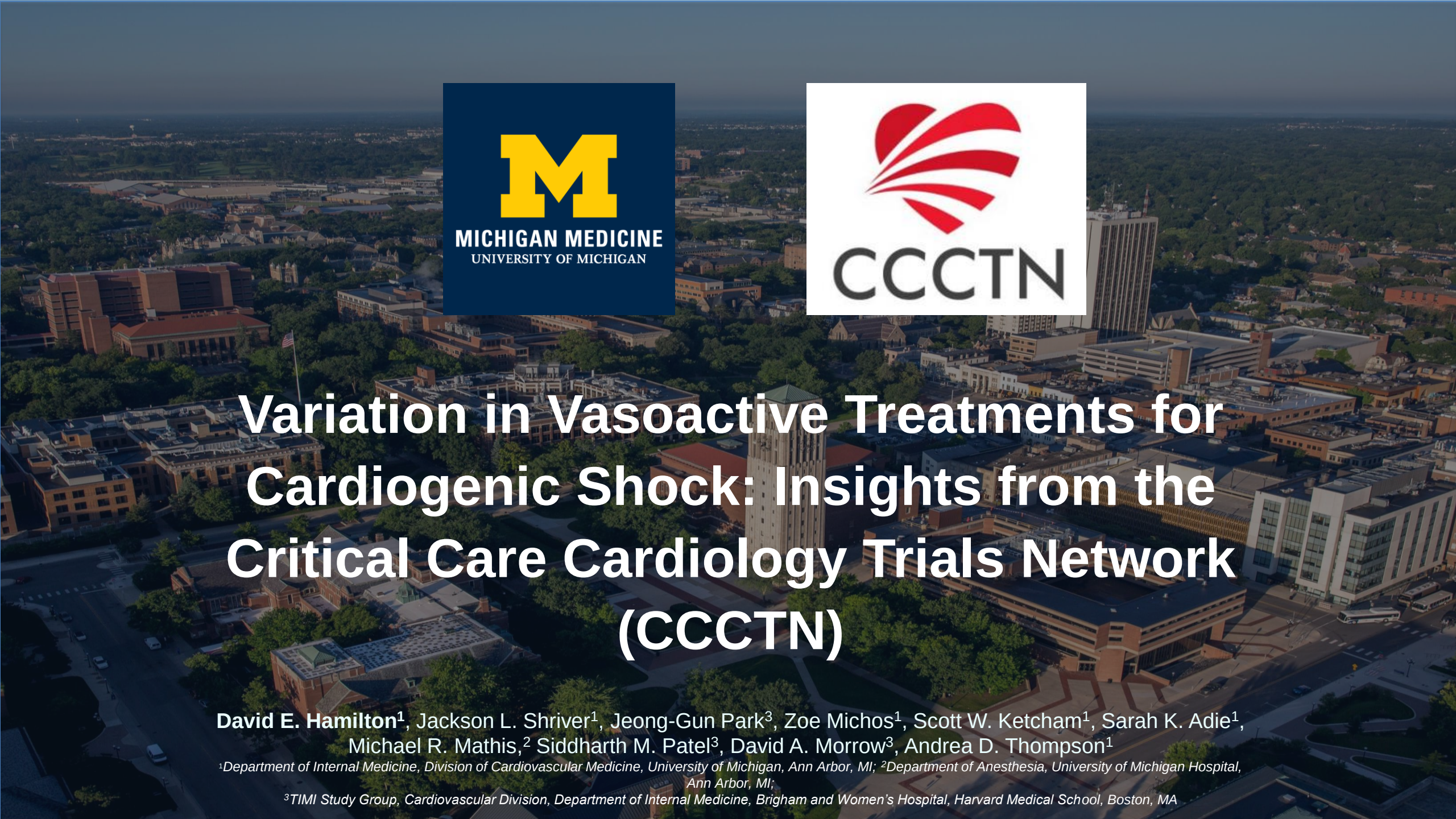


Variation in Vasoactive Treatments for Cardiogenic Shock: Insights from the Critical Care Cardiology Trials Network (CCCTN)

David E. Hamilton[1], Jackson L. Shriver[1], Jeong-Gun Park[3], Zoe Michos[1], Scott W. Ketcham[1], Sarah K. Adie[1], Michael R. Mathis,[2] Siddharth M. Patel[3], David A. Morrow[3], Andrea D. Thompson[1]

[1]*Department of Internal Medicine, Division of Cardiovascular Medicine, University of Michigan, Ann Arbor, MI;* [2]*Department of Anesthesia, University of Michigan Hospital, Ann Arbor, MI;*

[3]*TIMI Study Group, Cardiovascular Division, Department of Internal Medicine, Brigham and Women's Hospital, Harvard Medical School, Boston, MA*

Disclosure

- None

Introduction/Methods

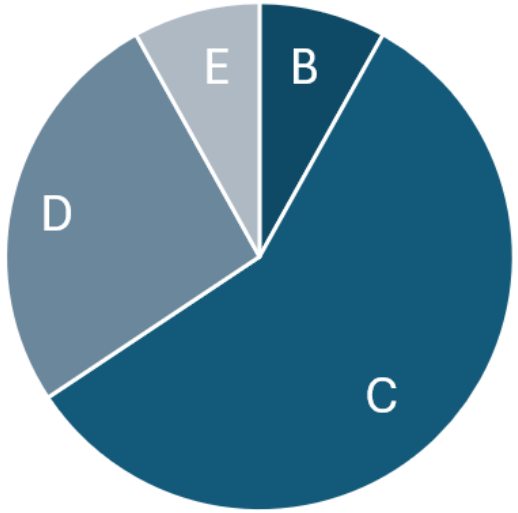
- “There is a lack of robust evidence to suggest the clear benefit of one inotropic agent over another in cardiogenic shock (CS).”
- We hypothesized that variation in the utilization of inodilators to treat CS is associated with both institution- and patient-level factors.
- CCCTN: investigator-initiated multicenter network of CICUs in North America and Europe.
- Analysis cohort: 3,282 patients with CS from 2018-2023 across 37 CICUs
- Quantify variability of inodilator treatment associated w/ patient- and institution-factors using linear mixed-effect modeling

(Heidenreich, JACC 2022; DeBacker, NEJM 2010; Mathew, NEJM 2021; Levy, JACC 2018)

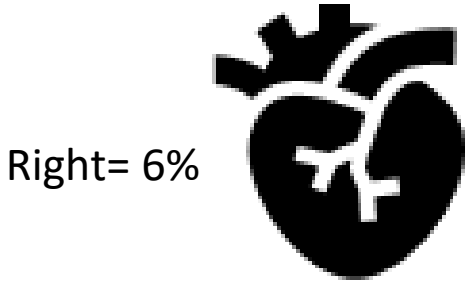
Study Population

		Overall (n=3,282)
Demographics	Age, yrs, med. (IQR)	66 (56-74)
	Sex, %, Female	32%
	Race, %, White	57%
	Black	20%
	Other/Unknown	23%
History, %	HTN	57%
	CAD	36%
	Severe Valvular Disease	15%
	pHTN	7%
	Heart Failure	56%
Admission, %	Cardiac Arrest	24%
	AMI-CS	25%
	HF-CS	63%
	MCS	31%
Center	Cases/Month, med. (IQR)	11 (9-17)
	Location, n (%), Urban	83%
	Suburban	15%
	Rural	3%
	ICU Beds, med. (IQR)	14 (10-23)

SCAI Shock Stage



Shock Ventricular Predominance

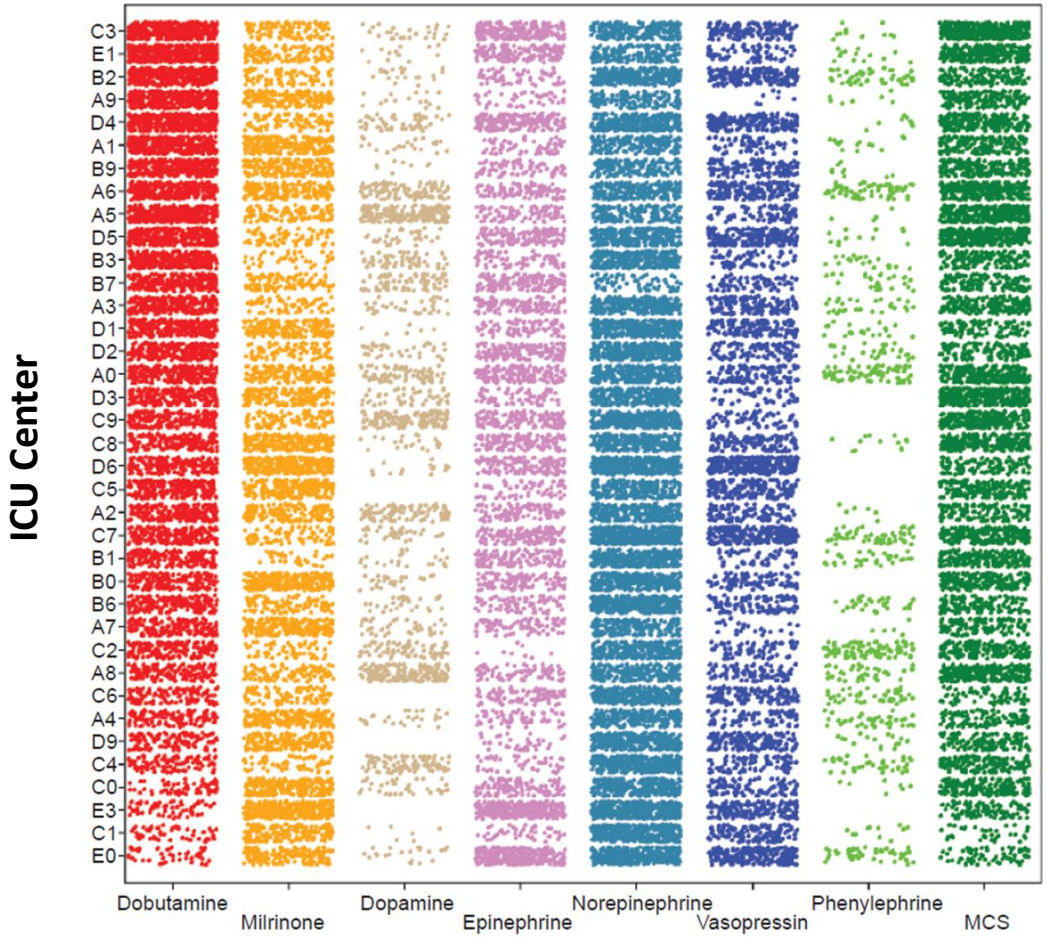


Right= 6%

Left= 57%

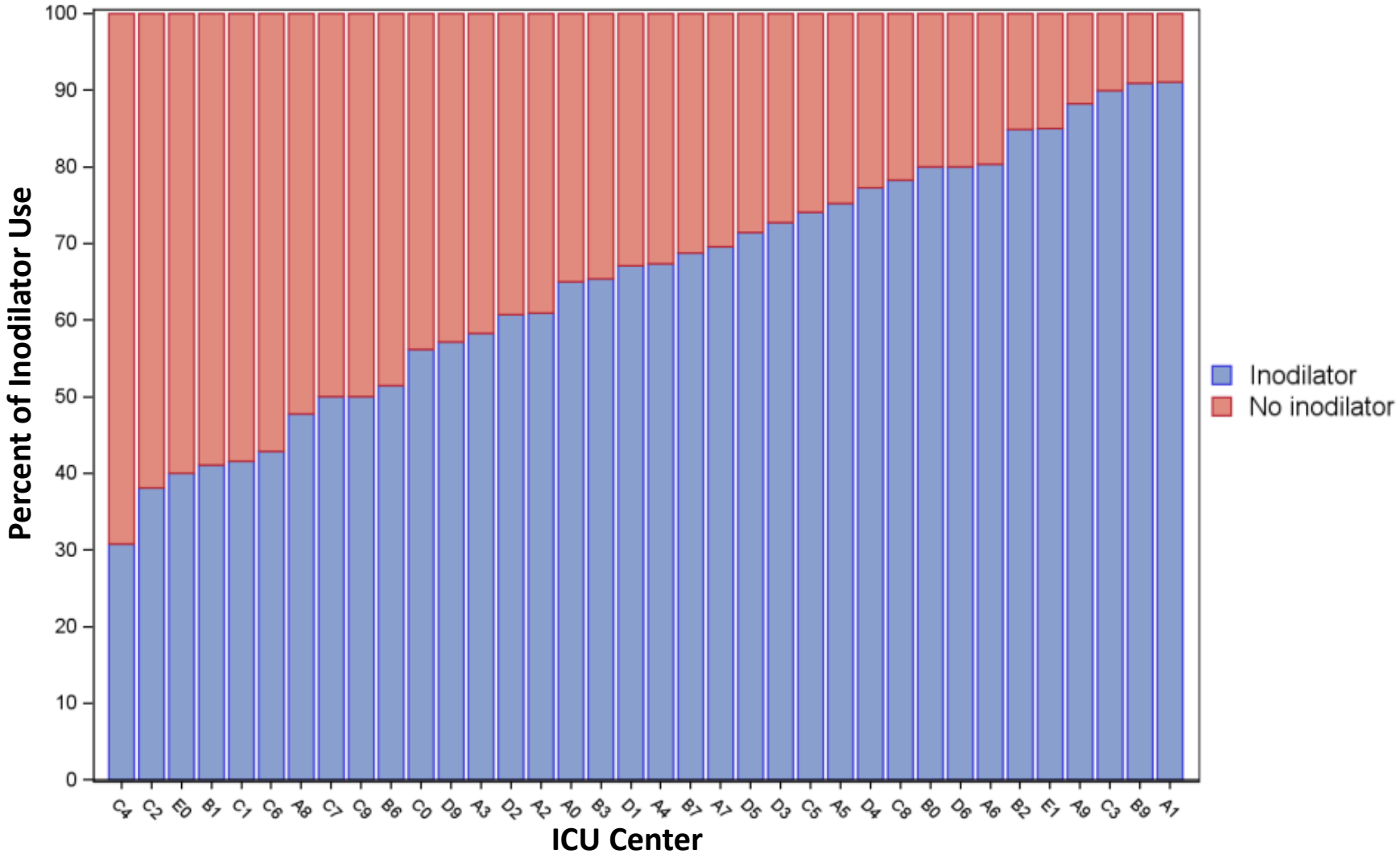
Bi Ventricular= 29%

Variability in Vasoactive Agent by Institution



Median	38%	29%	6%	20%	61%	20%	3%	33%
IQR	30-62%	18-36%	3-12%	14-27%	45-70%	14-29%	1-7%	25-46%
Range	10-81%	6-82%	1-37%	2-64%	14-90%	2-53%	0-15%	10-81%

Variability in Inodilator Use by Institution



Factors Associated with Inodilator Use

Higher Probability of Inodilator Use

	OR (95% CI)	p-value
Sex (male)	1.23 (1.02-1.49)	0.03
HF history	1.99 (1.62-2.45)	<0.0001
Sev. Valve Disease	1.34 (1.03-1.73)	0.03
SCAI Stage D	1.34 (1.07-1.68)	0.01
BiV failure	1.59 (1.27-2.00)	<0.0001

Lower Probability of Inodilator Use

	OR (95% CI)	p-value
Age (yrs)	0.97 (0.97-0.98)	<0.0001
PAD history	0.73 (0.54-0.99)	0.04
Cardiac Arrest	0.33 (0.27-0.42)	<0.0001
AMI-CS	0.71 (0.56-0.90)	0.005
SCAI Stage E	0.58 (0.41-0.81)	0.002
RV failure	0.49 (0.33-0.72)	0.0003
eGFR at baseline	0.99 (0.99-0.99)	0.01

No Association

Patient-Level	OR (95% CI)
pHTN	0.92 (0.64-1.34)
MCS (w/i 36 hrs.)	1.19 (0.95-1.49)
Institution-Level	**OR (95% CI)**
CS cases/month	1.00 (0.97-1.04)
Location: US	Ref
Canada	1.19 (0.47-3.04)
UK	2.05 (0.24-17.64)
Location: Urban	Ref
Suburban	0.63 (0.29-1.37)
Rural	0.83 (0.13-5.20)
Number of Beds	1.00 (0.99-1.00)
Transplant Center	0.79 (0.36-1.72)

% Variability in Use of Inodilators Explained by Patient- and Instituation-Level Factors	46%
% Variability in Use of Inodilators Explained by ICU Center Alone	23%

Conclusion

- There is substantial variation in vasoactive treatment and inodilator use related to patient-level factors and ICU center.

- Such variability underscores the need for additional high-quality evidence to guide vasoactive treatment strategies in CS.