



Reimagining Critical Care for the Modern Cardiac Patient

Staffing models, outcomes, and the case for critical care expertise in the CICU and CVICU

Jonathan Chinae, DO

Emergency & Critical Care Medicine

Medical Director, Mechanical Circulatory Support | Baystate Medical Center – UMass Chan

WNE Cardiac Conference, October 2026

Disclosures



No disclosures

I have no relevant financial relationships with ineligible companies to disclose.

This presentation does not discuss off-label or investigational use of any product.

Agenda

1

The evolving cardiac ICU

2

Staffing models & definitions

3

The evidence

4

International staffing models

5

Why the US is different

6

A path forward

The CICU has outgrown the CCU

Today's CICU patients look like MICU patients: shock, respiratory failure, renal failure, and mechanical circulatory support. US staffing has not kept pace.

74%

of US CICUs use an open
staffing model

8.5%

of US CICUs are led by dual-
boarded cardiologist-
intensivists

81%

of CICU directors report an
unmet need for critical care-
trained cardiologists

Four ways to staff a cardiac ICU



Open unit

Admitting cardiologist or surgeon directs care; intensivist consult optional.



Closed cardiology unit

Dedicated cardiology team owns all CICU patients; intensivist consult available.



Collaborative model

Cardiologist and general intensivist co-manage; intensivist leads ventilation, sedation, organ support.



Cardiac intensivist-led

Dual-trained or critical care—credentialed physician directs all care 24/7.

Who is a "cardiac intensivist"?



Critical care cardiologist

Training: Cardiology fellowship + 1–2 yr critical care fellowship; ABIM boarded in both

Seen in: US academic CICUs; Korea (Na et al.); ~8.5% of US CICU leadership



Acute cardiac care specialist

Training: Cardiology + ESC/ACVC certification (≥21 mo intensive care, then 1-yr subspecialty)

Seen in: European Level II–III ICCUs; Italy (ANMCO)



Anesthesiologist-intensivist

Training: Anesthesiology residency + critical care fellowship, often cardiac anesthesia

Seen in: US CVICUs/CTICUs; UK and European cardiothoracic ICUs



General intensivist

Training: Pulmonary, EM, surgical, or ICM critical care (e.g., CICM in ANZ, FICM in UK)

Seen in: ANZ and UK cardiothoracic ICUs; US collaborative CICU models

Evidence: dedicated cardiac intensivists

Na et al., JACC 2016

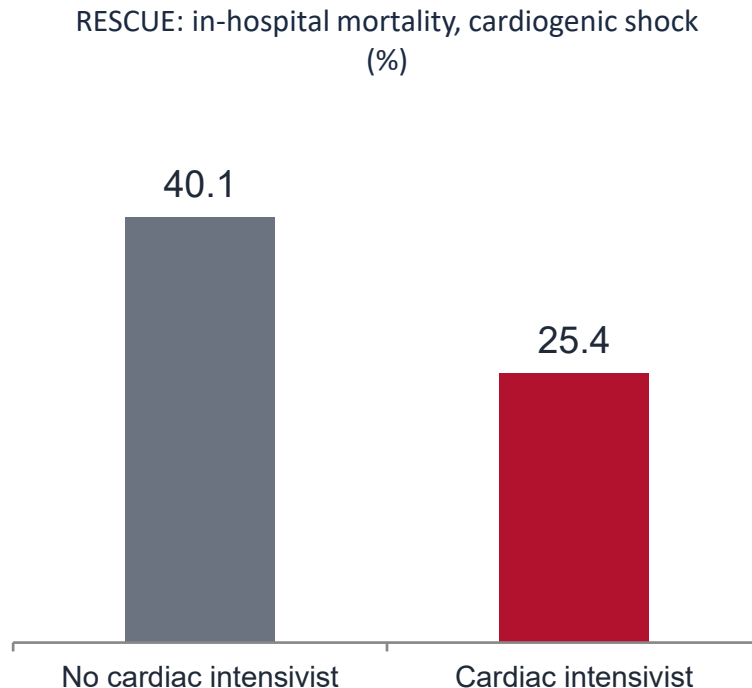
Samsung Medical Center, n = 2,431. Shift from general cardiology to a dual-boarded cardiac intensivist. Lower CICU and in-hospital mortality, including ECMO patients.

Na et al., Int J Cardiol 2017

Cardiogenic shock subgroup from the same transition; mortality benefit maintained.

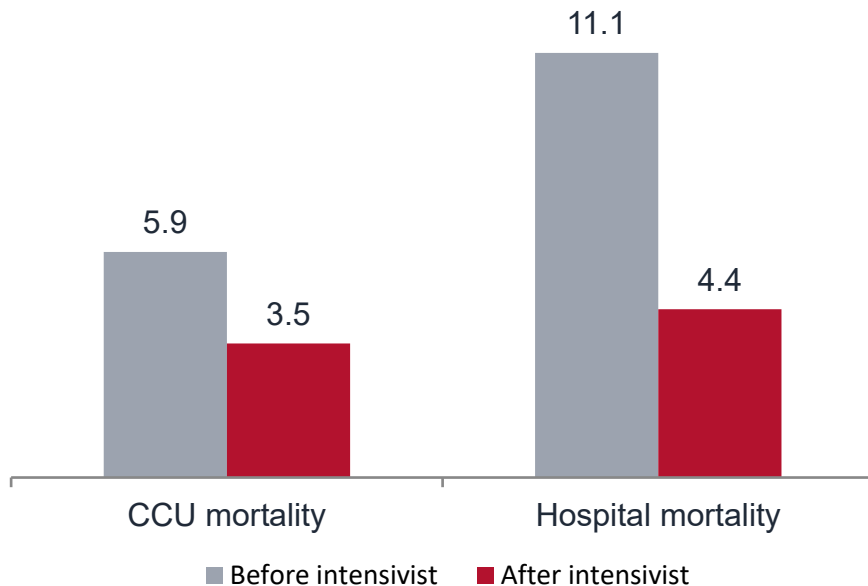
RESCUE registry, 2025

12 Korean centers, n = 1,247 cardiogenic shock patients. Lower in-hospital mortality with cardiac intensivist involvement.



Evidence: adding a general intensivist

Fanari et al. (Christiana Care), adjusted mortality (%)



Kapoor et al., JACC 2017 (University of Maryland, ventilated patients)

9.6 → 7.4 days

CICU length of stay

20.1 → 14.2 days

Hospital length of stay

\$43K → \$30K

Mean CICU charges

Not significant

Mortality reduction

What the evidence does not show

Yale (Miller, JAHA 2021)

Closed unit run by cardiology teams, with intensivist consult available before and after. Mortality fell, mostly in respiratory failure and post-arrest patients.

Katz et al.

Closing the CICU (n = 670) shortened length of stay; no mortality difference, but underpowered.

Partial intensivist model

Daytime-only cardiac intensivist in an open unit, without nights, weekends, or multidisciplinary rounds: no mortality difference.

Takeaway: dedicated 24/7 ownership of the unit matters most. Critical care expertise adds the most in the sickest patients: shock, MCS/ECMO, arrest, and respiratory failure.

From the literature to the bedside

A personal experience: Aurora St. Luke's Medical Center, Milwaukee, WI



Before

High-volume cardiac program

Cardiac surgery and heart transplantation;
Wisconsin's first heart transplant (1968)



~2000s

Intensivist-led CVICU

The CVICU converts to a critical care-trained
intensivist model



Result

STS three stars, all categories

Sustained for 15 consecutive years

One critical care team, the whole patient



Hemodynamics, MCS & ECMO



Ventilation & liberation



Renal support & CRRT



Sedation, delirium & mobility



Infection prevention



Family & goals of care

Presenter's personal experience. STS three-star ratings: STS Public Reporting; Aurora Health Care (2015: 1.17% of US centers earned three stars in all categories).

How other countries staff their units

Region	Who leads the unit	Key feature
Europe (ESC/ACVC)	Cardiologist with acute cardiovascular care accreditation; co-direction with intensivist allowed	Tiered Level I–III national standards
Italy	Cardiac intensivist with ANMCO/ACVC certification	Must manage ventilation, sepsis, CRRT
UK	Cardiothoracic hubs: surgeons, anaesthetists, cardiac intensivists	Cardiology largely consultative
Australia / NZ	CICM-trained intensivists (general and cardiothoracic ICUs)	Closed units are the norm
Korea	Dual-boarded cardiac intensivists at select centers	Source of most outcome data
United States	Mostly admitting cardiologist or surgeon	74% open; 8.5% dual-boarded leadership

Why the US is different



No short credential

Only route is full ABIM critical care boarding (4+ years of fellowship)



No mandate

Leapfrog is voluntary; CMS sets no CICU staffing rule



Payment incentives

Fee-for-service rewards open units and admitting ownership



History and identity

CCUs have been cardiology-owned since the 1960s



Surgical structure

90-day global period and STS reporting keep CVICUs open



Workforce

National intensivist shortage limits 24/7 coverage

Is the Critical Care job market shifting to Cardiac?



What fellows and program directors report

Cardiac and cardiothoracic ICU positions are drawing more critical care graduates than traditional medical ICU jobs.

“The fellows need more time in the HVCC to be competitive in the job market” – PDs for PCCM & CCM Fellowships

What the data supports

47%

of US cardiac surgery ICUs are still open; only 12% closed

46%

of surveyed CICU cardiologists now hold critical care training

81%

of CICU directors report an unmet need for critical care-trained cardiologists

+8%

US critical care physicians, 2020–2022 (13,093 → 14,159)

“Mechanical Circulatory Support is becoming an expectation of the Critical Care physician” – Recent Fellow

A path forward for our institution

Structure

- Closed CICU/CVICU with 24/7 critical care ownership
- Tiered levels matched to acuity
- Shock and MCS team embedded in the unit

Staffing

- Critical care–trained lead physician
- Cardiology and CT surgery co-management for procedures
- Protocolized multidisciplinary rounds

Metrics to track

- ICU and hospital mortality
- Length of stay and ventilator days
- MCS/ECMO outcomes and cost per case

Key takeaways

- 1 Intensivist involvement in the CICU is associated with shorter stays and, in several cohorts, lower mortality
- 2 Benefit is greatest in the sickest patients: shock, MCS/ECMO, arrest, respiratory failure
- 3 Abroad, units are credentialed and closed by national standard; the US has no such standard
- 4 A closed, critical care–led model with measurable outcomes is achievable in the US if so desired

References

1. Na SJ, et al. Association between presence of a cardiac intensivist and mortality in an adult cardiac care unit. *J Am Coll Cardiol*. 2016;68:2637–48.
2. Na SJ, et al. Impact of a cardiac intensivist on mortality in patients with cardiogenic shock. *Int J Cardiol*. 2017;244:220–5.
3. Assessing the clinical impact of cardiac intensivists in CICUs: results from the RESCUE registry. *BMC Cardiovasc Disord*. 2025.
4. Fanari Z, et al. Impact of a multidisciplinary team approach including an intensivist on outcomes in the CCU. *Mayo Clin Proc*. 2016;91:1727–34.
5. Kapoor K, et al. A collaborative cardiologist-intensivist management model improves CICU outcomes. *J Am Coll Cardiol*. 2017;70:1422–3.
6. Miller PE, et al. Transition from an open to closed staffing model in the CICU improves clinical outcomes. *J Am Heart Assoc*. 2021;10:e018182.
7. Katz JN, et al. Length of stay, mortality, cost, and perceptions of care with transition to a closed CICU. *Crit Pathw Cardiol*.
8. van Diepen S, et al. Organizational structure, staffing, resources, and education in US CICUs. *Circ Cardiovasc Qual Outcomes*. 2017;10:e003864.
9. O'Malley RG, et al. Organization and staffing practices in US CICUs. *Eur Heart J Acute Cardiovasc Care*. 2013;2:3–8.
10. Bonnefoy-Cudraz E, et al. ACCA position paper on intensive cardiovascular care units. *Eur Heart J Acute Cardiovasc Care*. 2018;7:80–95.
11. Claeys MJ, et al. Organization of intensive cardiac care units in Europe: a multinational survey. *Eur Heart J Acute Cardiovasc Care*. 2020;9:993–1001.
12. ANMCO position paper: functional reorganization of ICCUs in Italy. *Eur Heart J Suppl*. 2025.
13. Le May M, et al. From coronary care units to cardiac intensive care units. *Can J Cardiol*. 2016;32:1204–13.
14. The intersection between heart failure and critical care cardiology: an international perspective. *J Card Fail*. 2022;28:1703–16.
15. Morrow DA, et al. Evolution of critical care cardiology. *AHA Scientific Statement. Circulation*. 2012;126:1408–28.
16. Staffing models in the cardiac intensive care unit. *Curr Opin Crit Care*. 2022.
17. Vallabhajosyula S, et al. Training paradigms in critical care cardiology: a scoping review. *JACC Adv*. 2024.
18. But we do not have a critical care cardiologist? A pragmatic approach to staffing the CICU. *JACC Adv*. 2025.
19. Survey of contemporary cardiac surgery ICU models in the United States (STS Workforce on Critical Care). *Ann Thorac Surg*. 2019.
20. Papolos A, et al. Modern cardiac ICU care delivery and the role of the CICU cardiologist. *JACC Adv*. 2025.
21. Society of Critical Care Medicine. Critical care workforce update. 2023.



Questions?

Jonathan Chinaea, DO | Baystate Medical Center- UMass Chan