

USE OF MCS IN CONTEMPORARY SHOCK MANAGEMENT

Miguel Alvarez Villela, MD FACC
Director, Interventional Heart Failure
Lenox Hill Hospital, NY

April 16, 2026

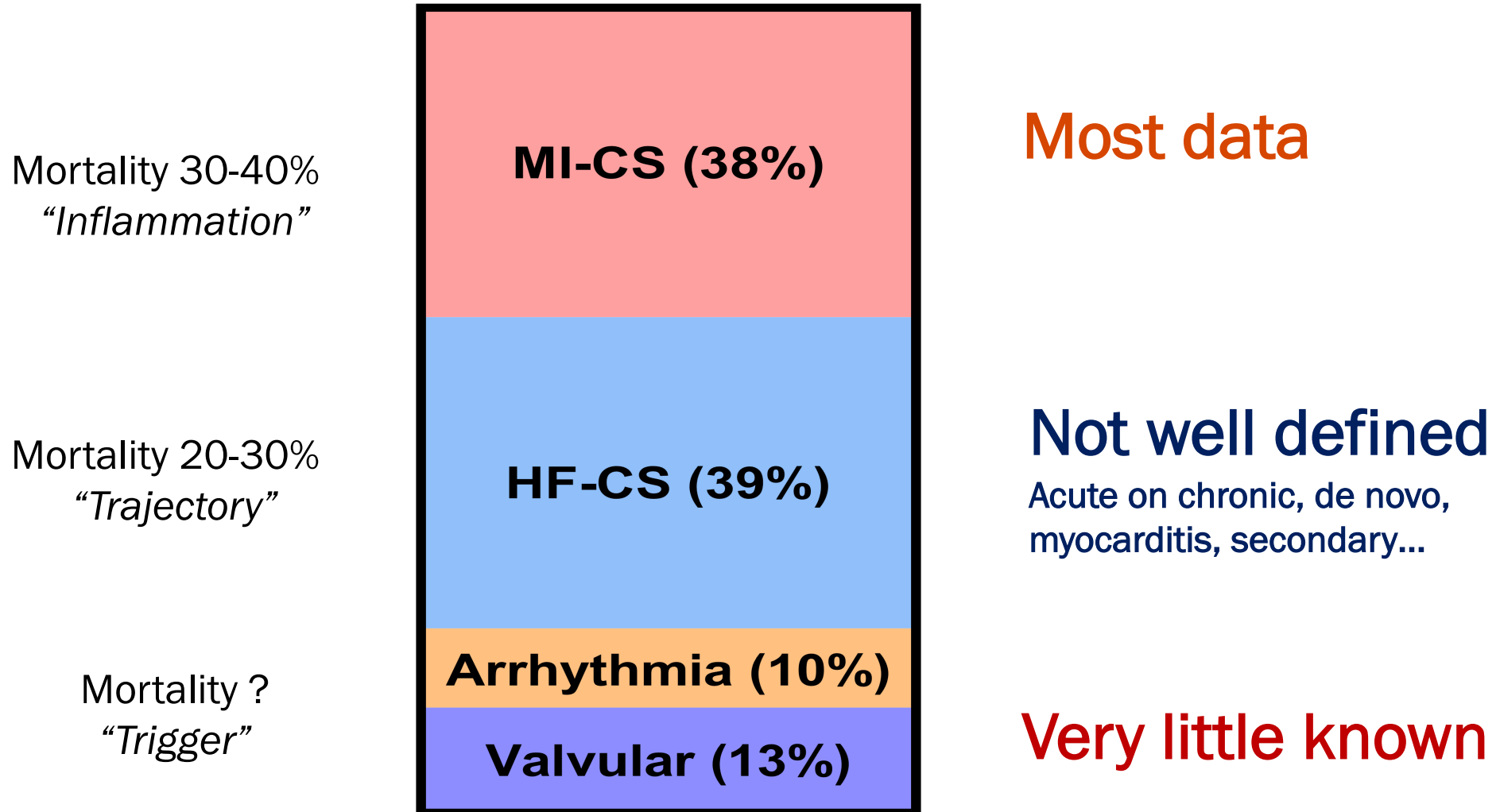


NorthwellSM
Cardiovascular Institute

DISCLOSURES

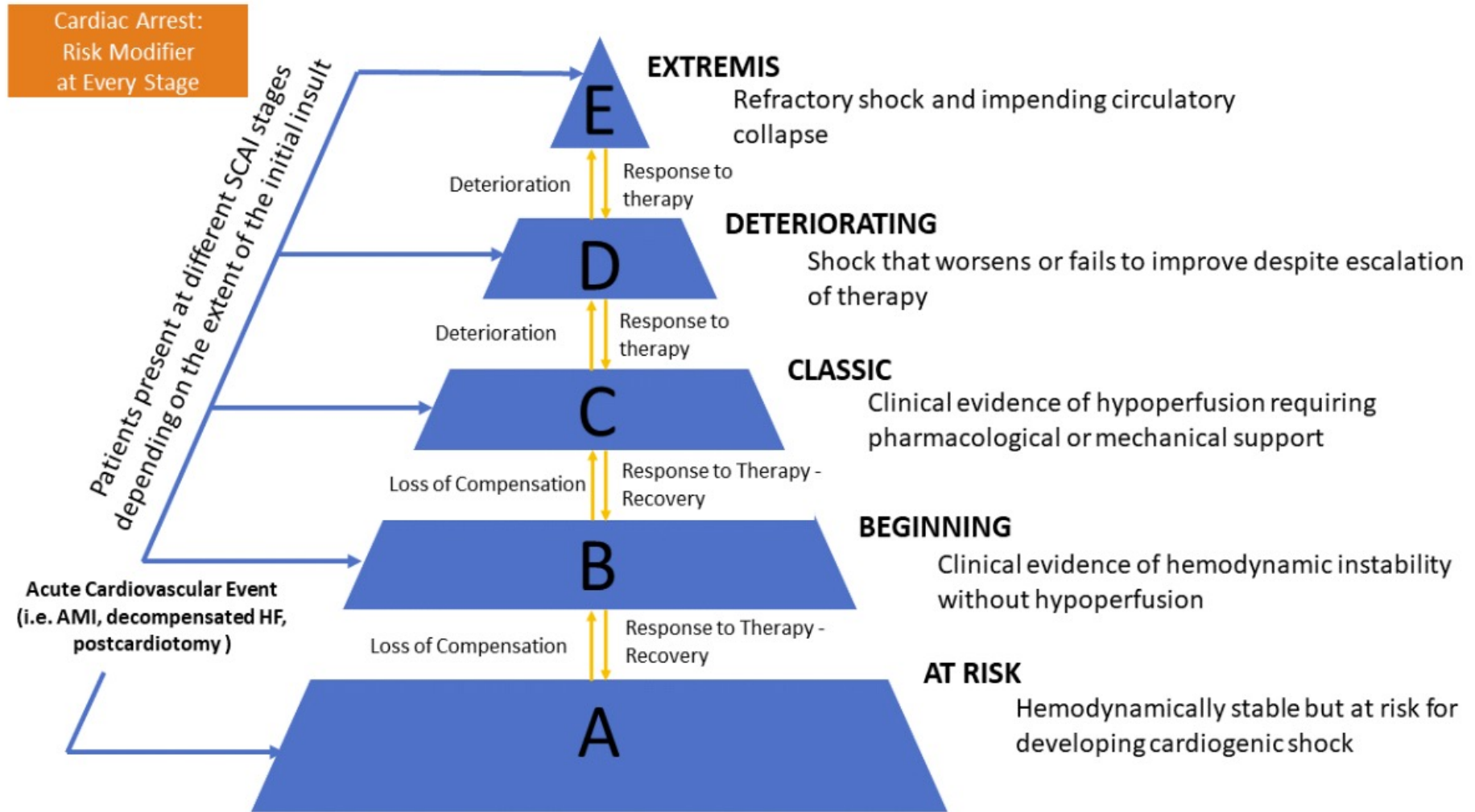
None.

CURRENT LANDSCAPE OF CARIOGENIC SHOCK



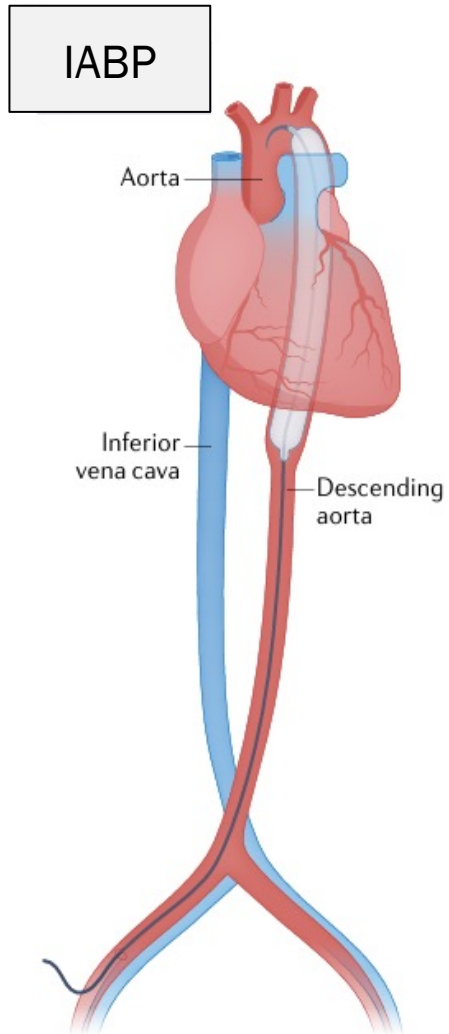
SCAI STAGES IN CS

IMPLICATIONS FOR MCS USE

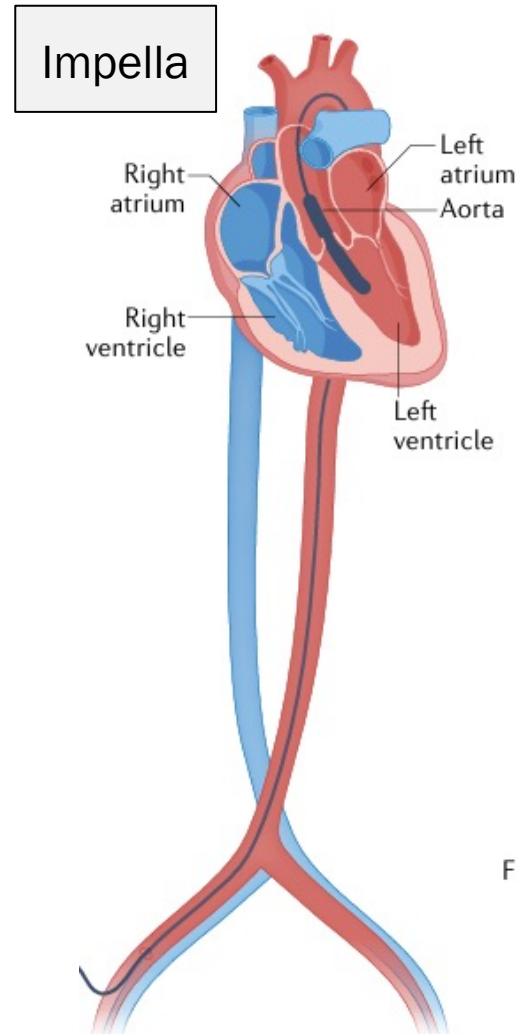


TYPES OF MCS WE CURRENTLY USE

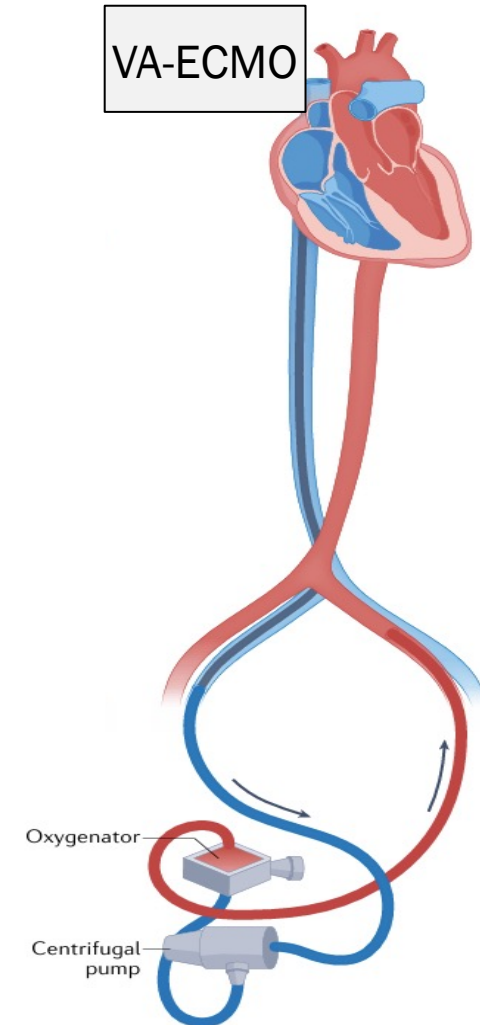
Intracorporeal
Pulsatile Flow



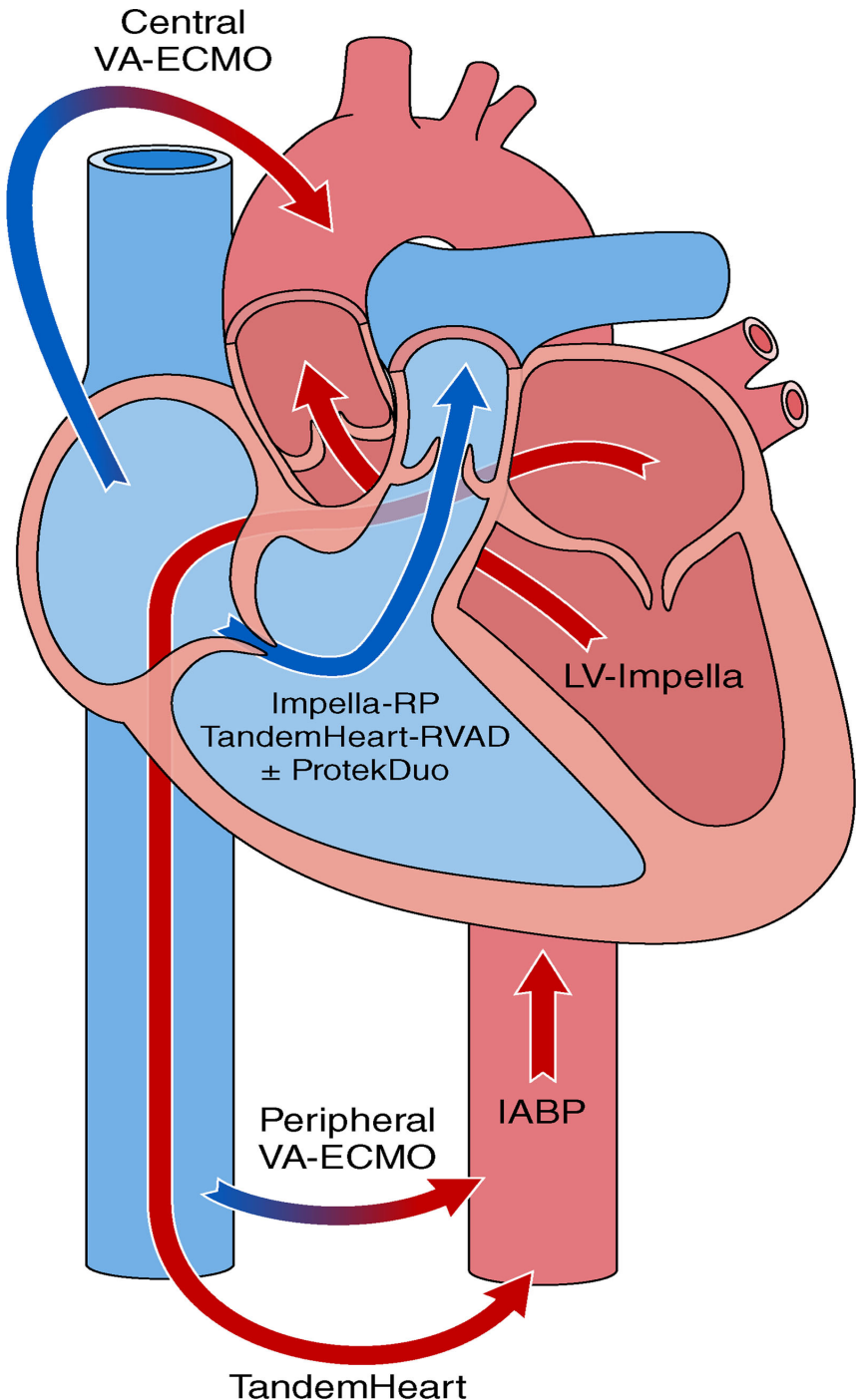
Intracorporeal
Continuous Flow



Extracorporeal
Continuous Flow

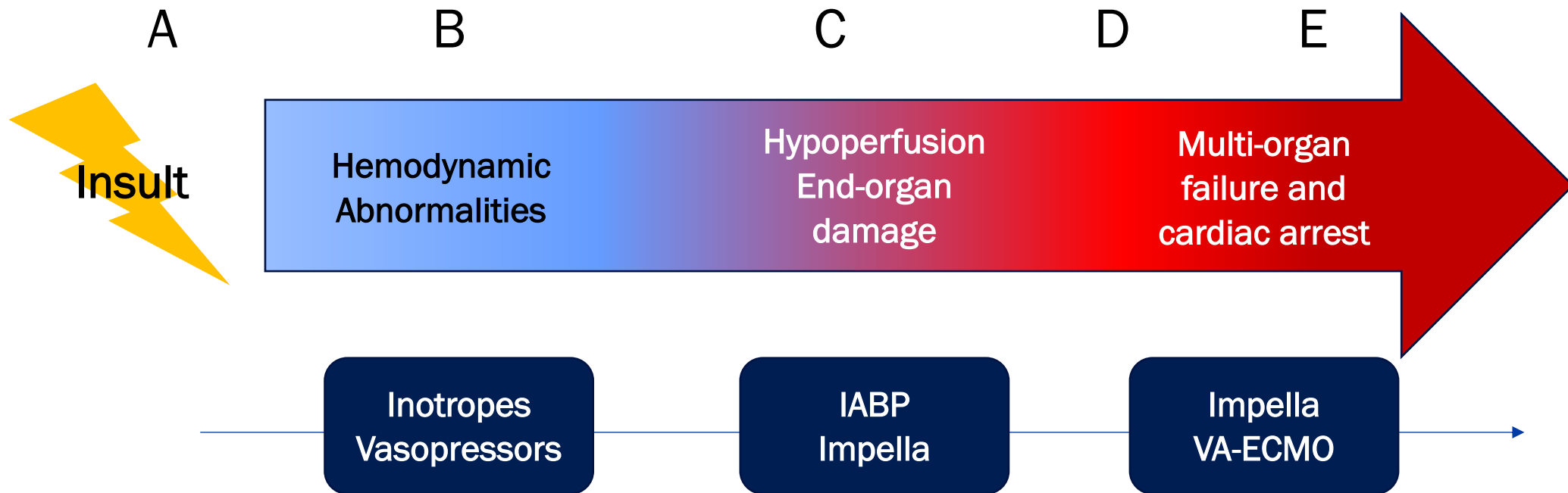


BLOOD FLOW PATTERNS IN DIFFERENT MCS TYPES



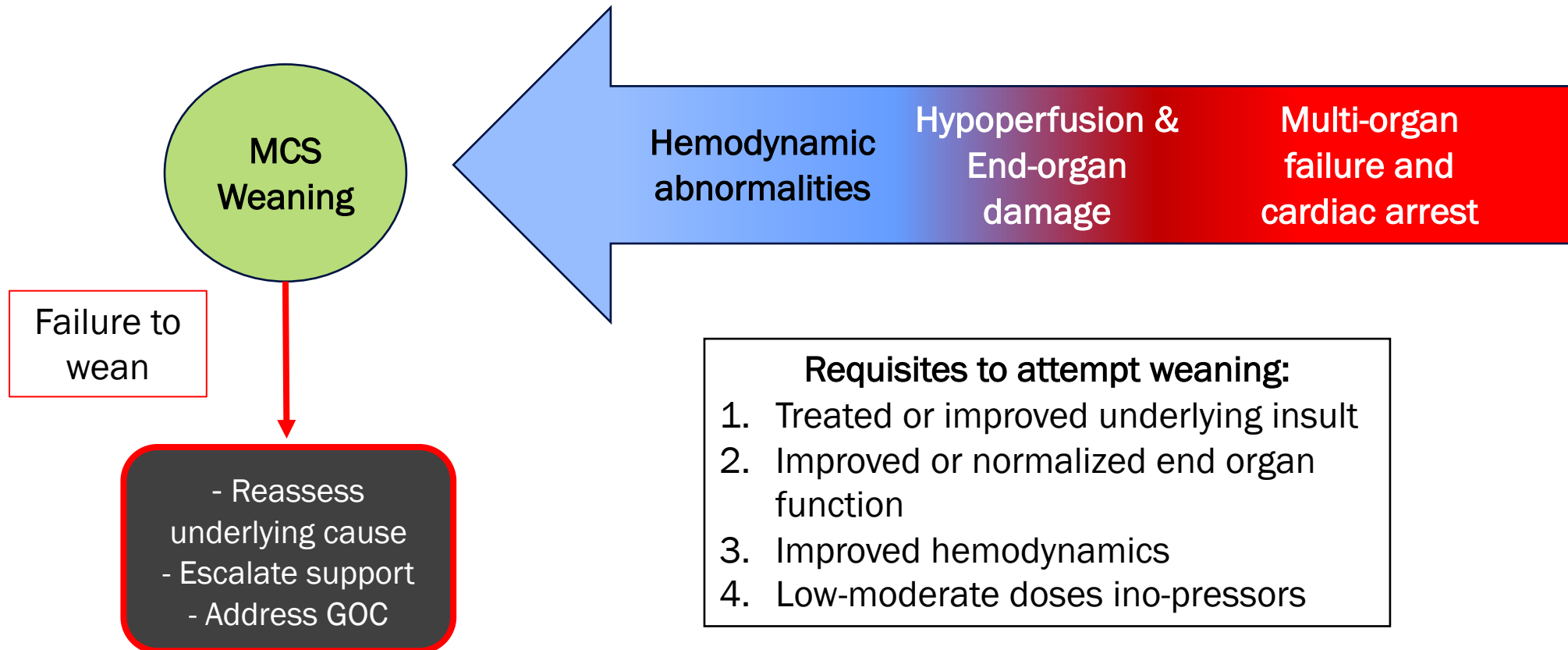
THE MCS PARADIGM IN CS

SHOCK SEVERITY MATCHES LEVEL OF SUPPORT



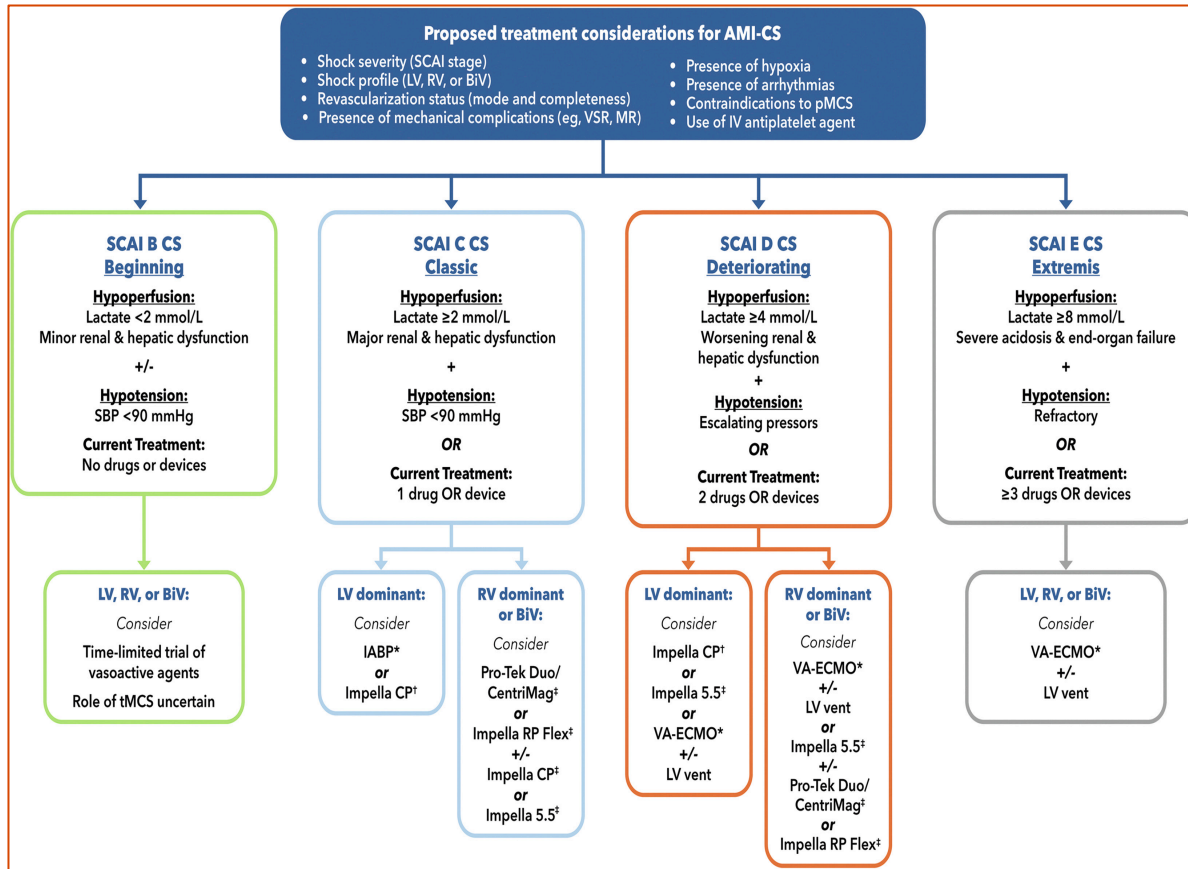
THE IDEAL RESPONSE TO MCS IN CS

ACHIEVING GOALS WITH A BUNDLE OF THERAPIES

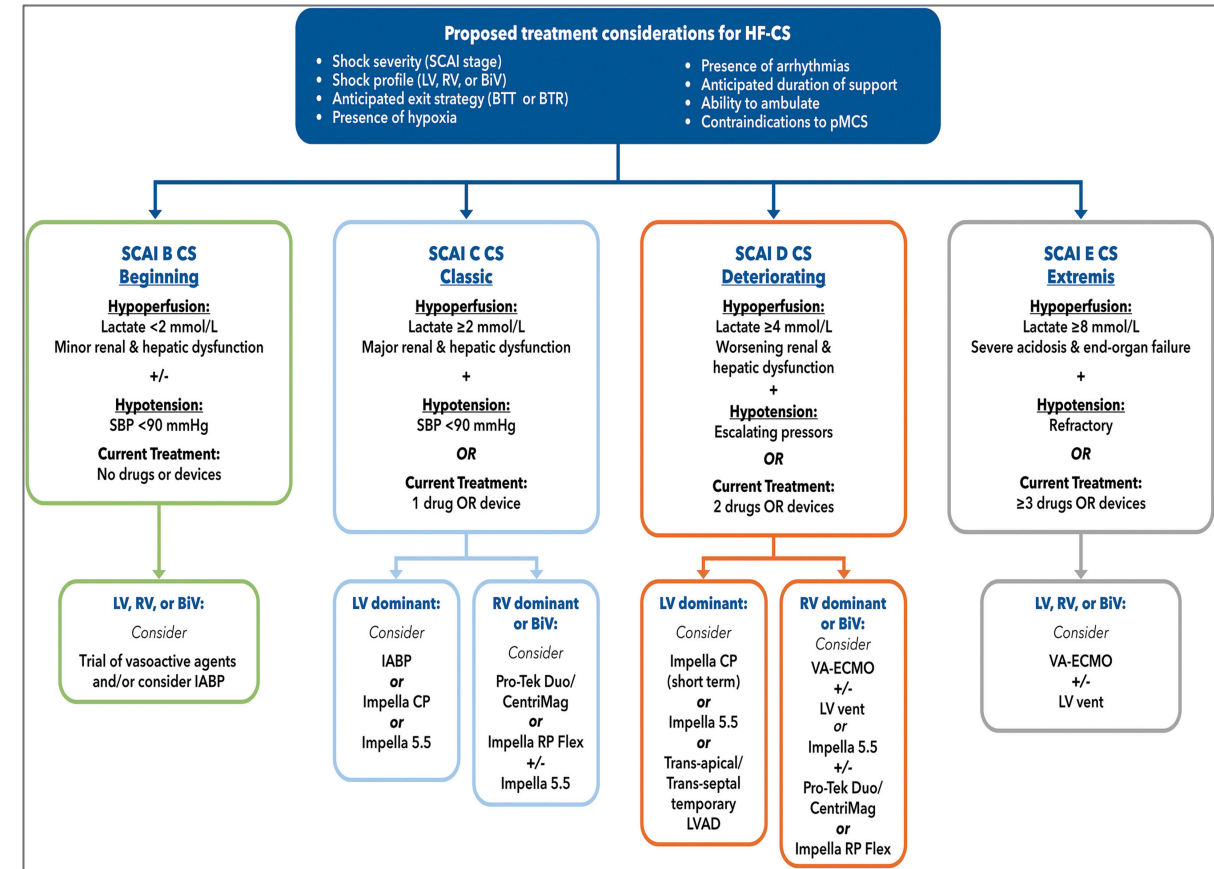


WHO SHOULD GET MCS? GUIDELINES AND CONSENSUS

AMI-CS

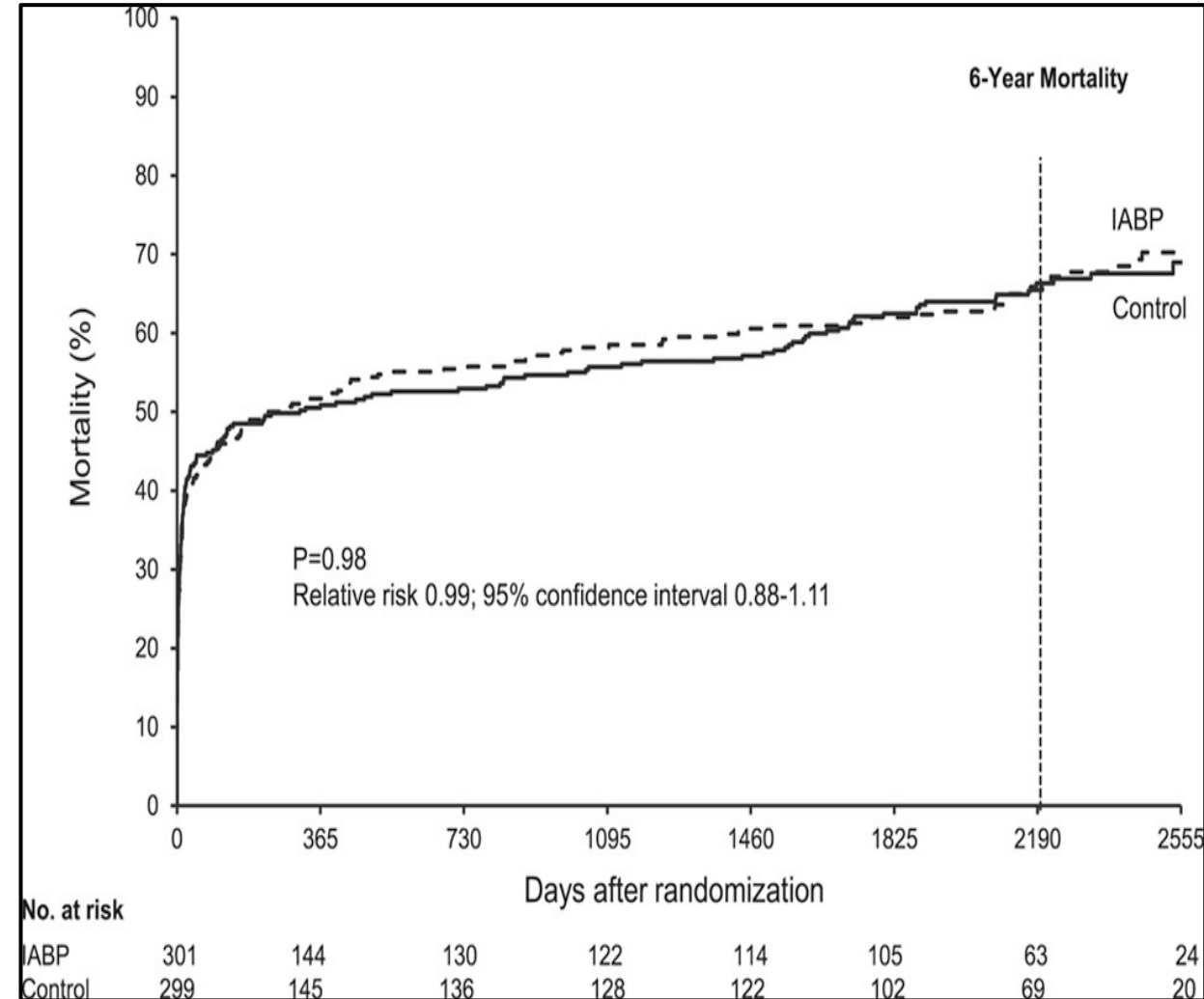
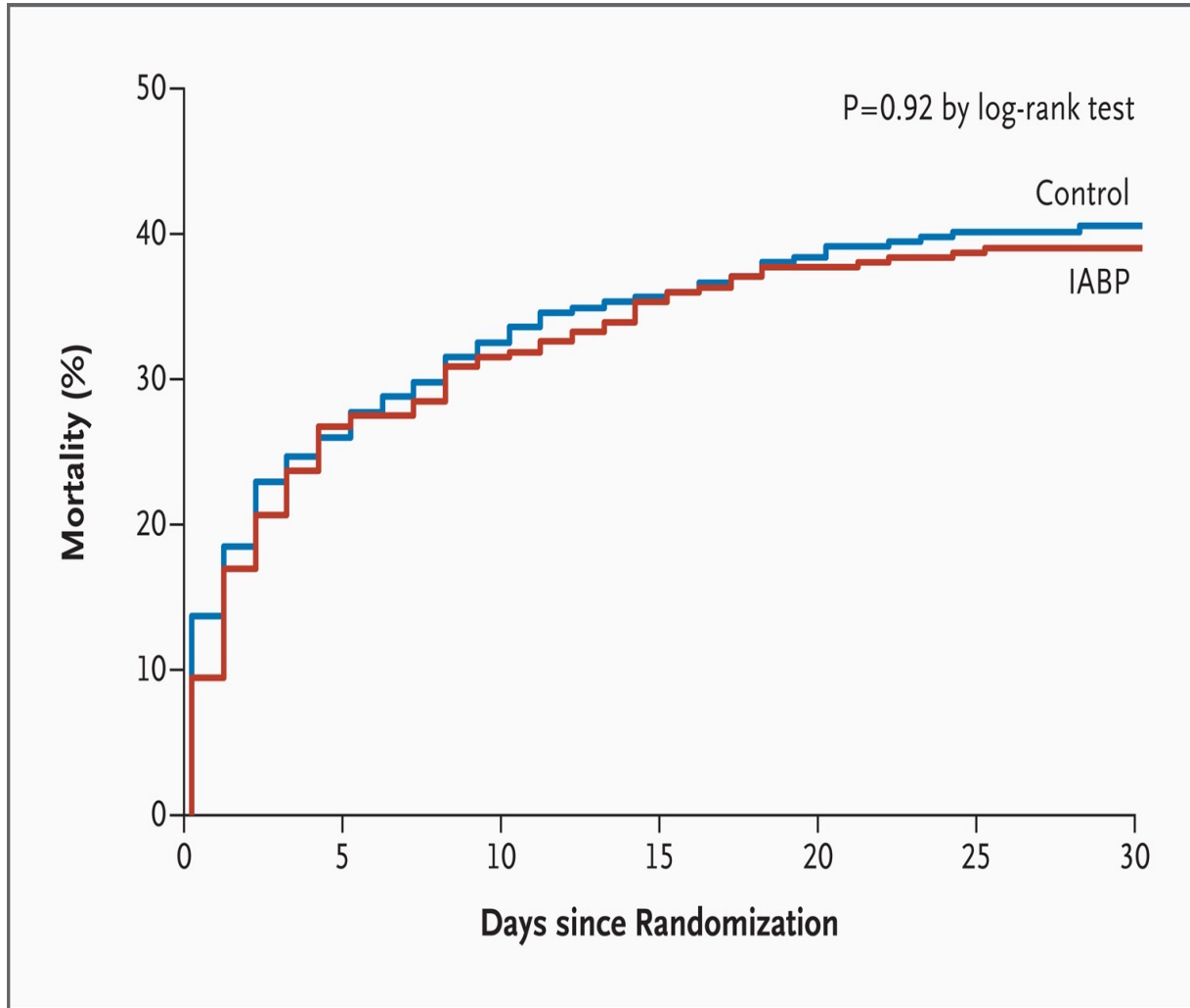


HF-CS



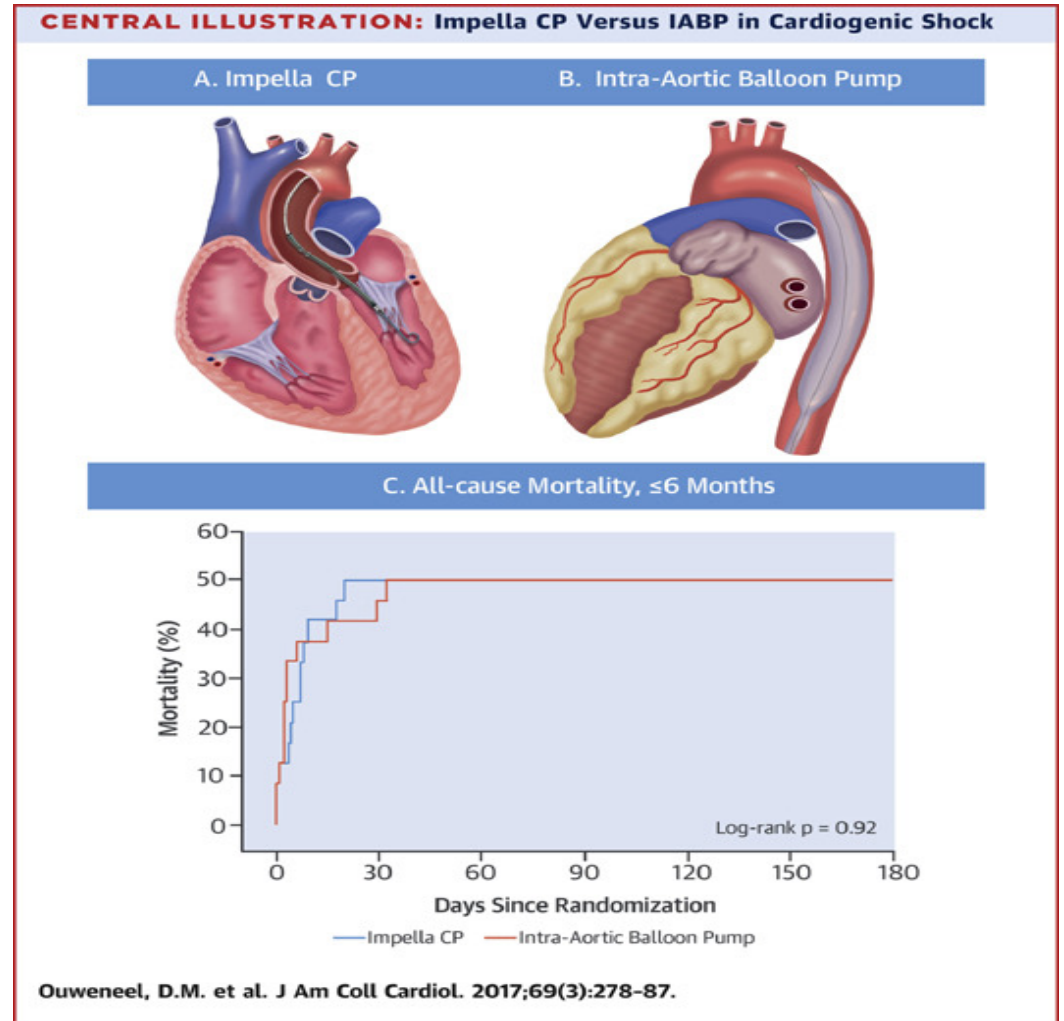
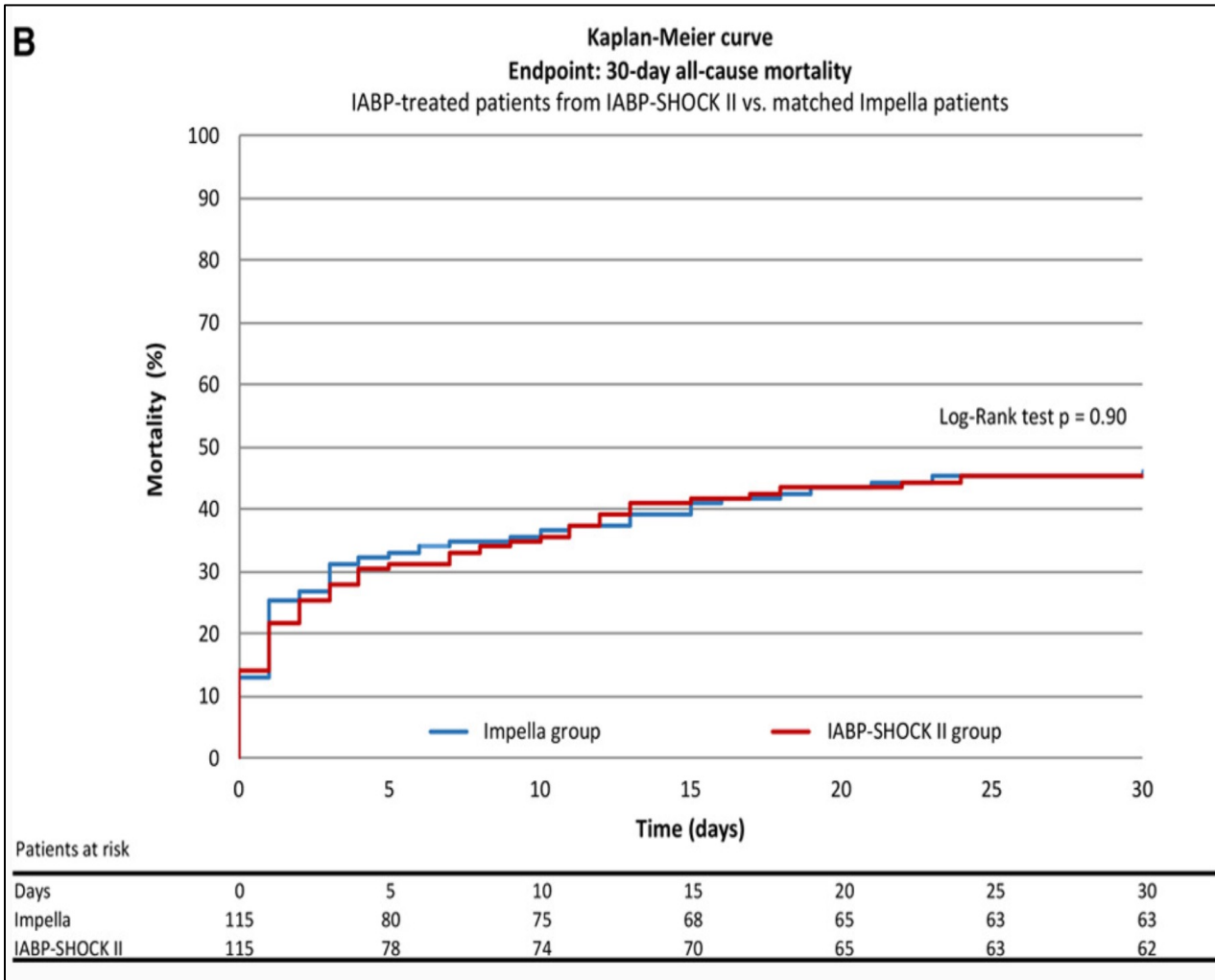
IABP VS. MEDICAL THERAPY IN AMI-CS

NO BENEFIT

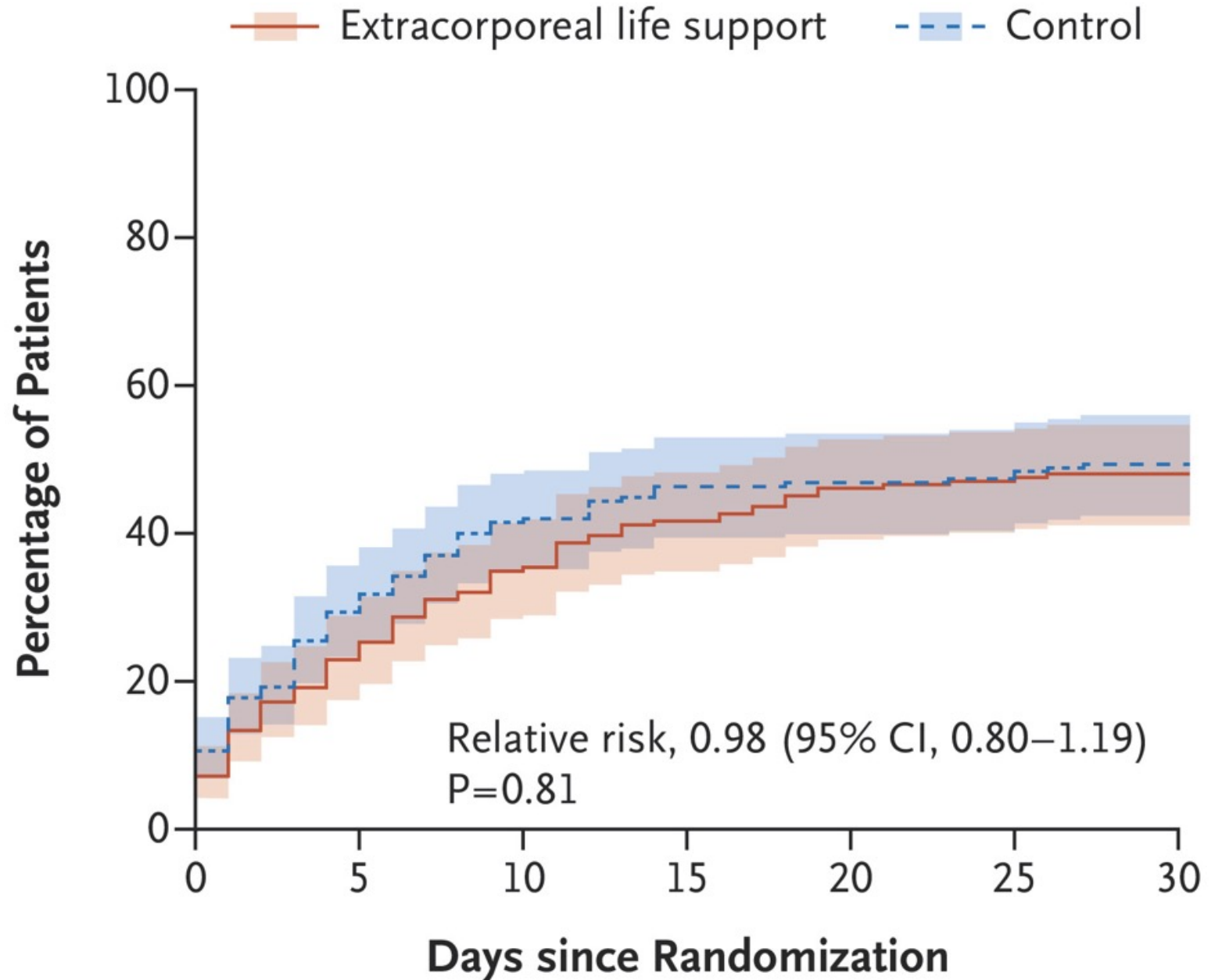


IABP VS IMPELLA IN CS

NO DIFFERENCE

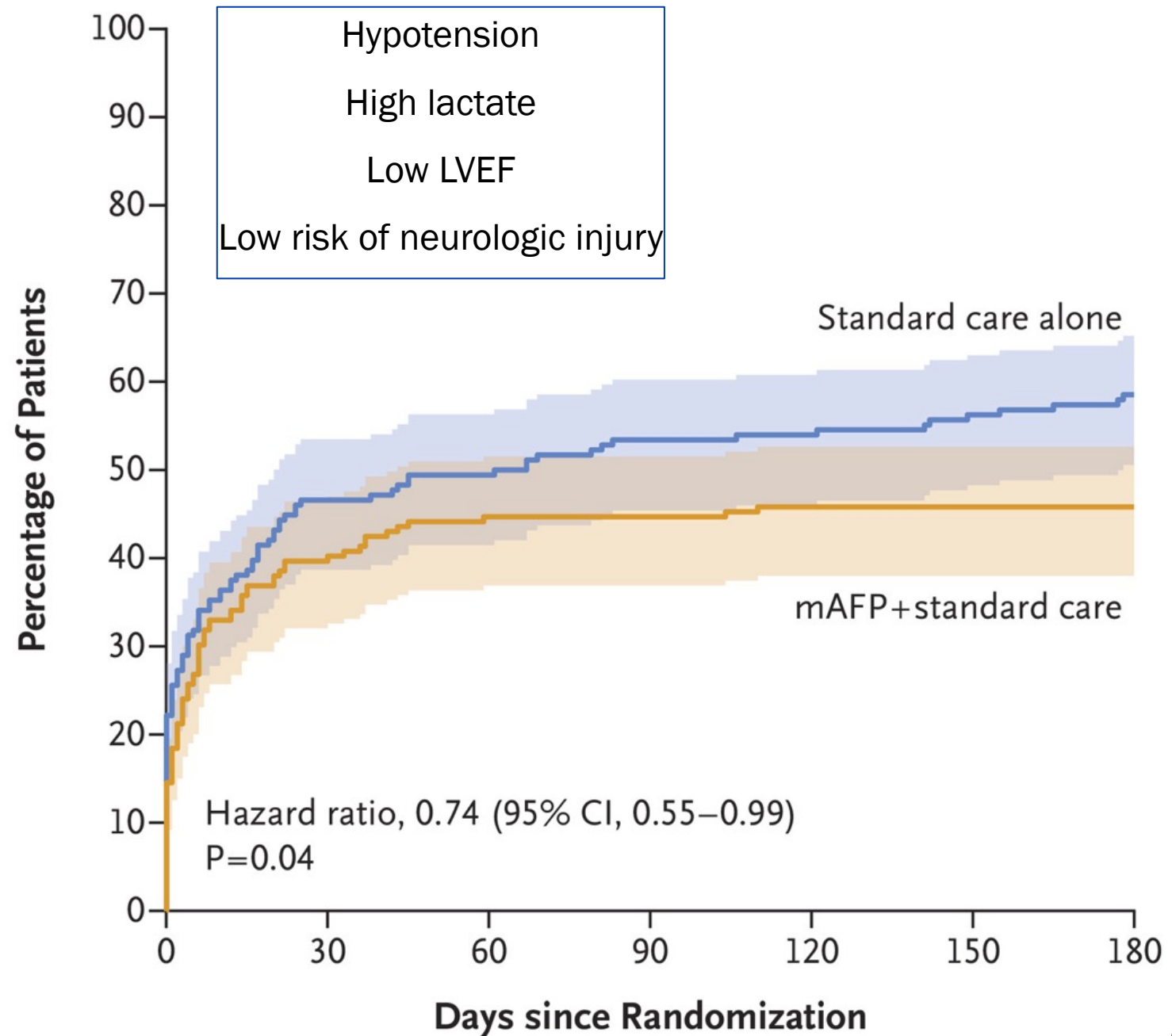


ECMO IN AMI-CS – NO BENEFIT



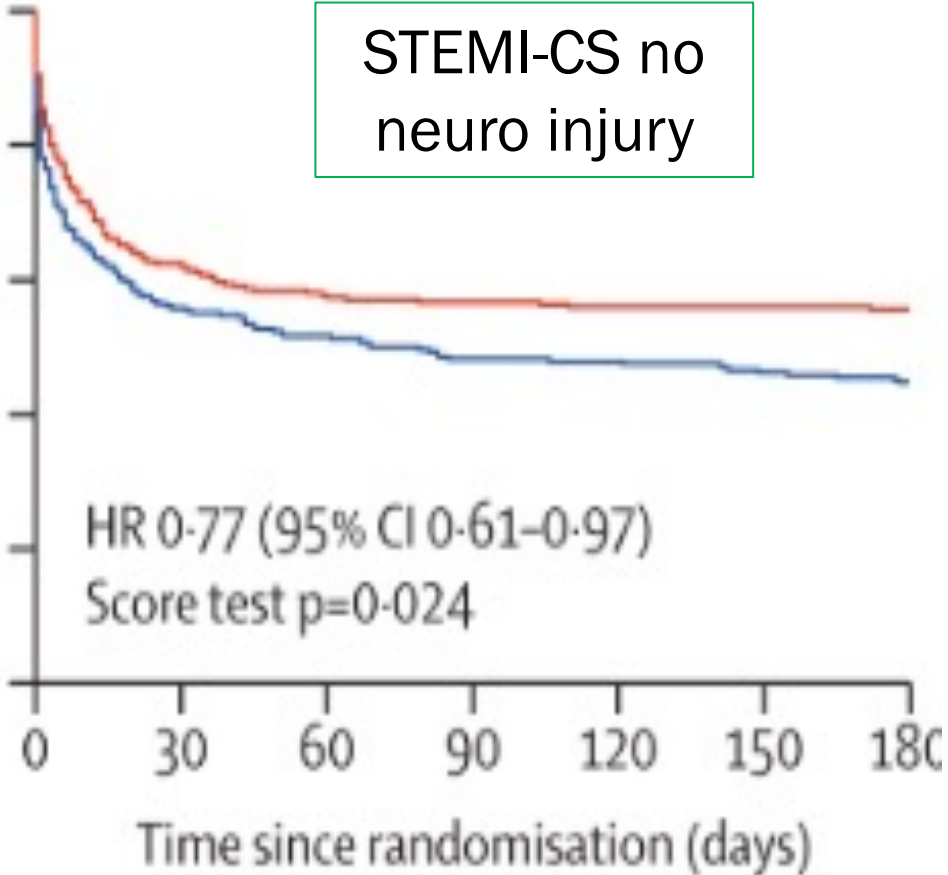
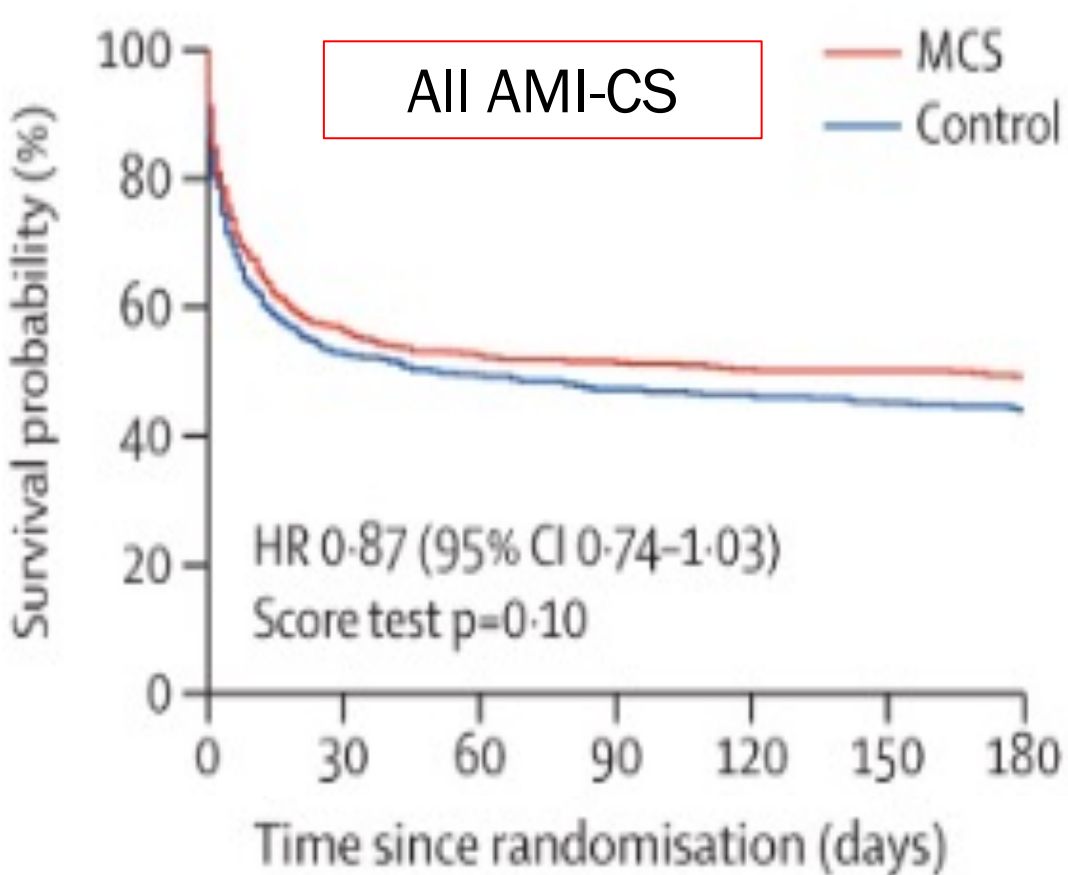
Thiele, Holger, et al. *New England Journal of Medicine* 389.14 (2023): 1286-1297.

**BENEFIT OF IMPELLA
IN STEMI-CS
“DANGER-SHOCK”
HIGHLY SELECTED
PATIENTS**

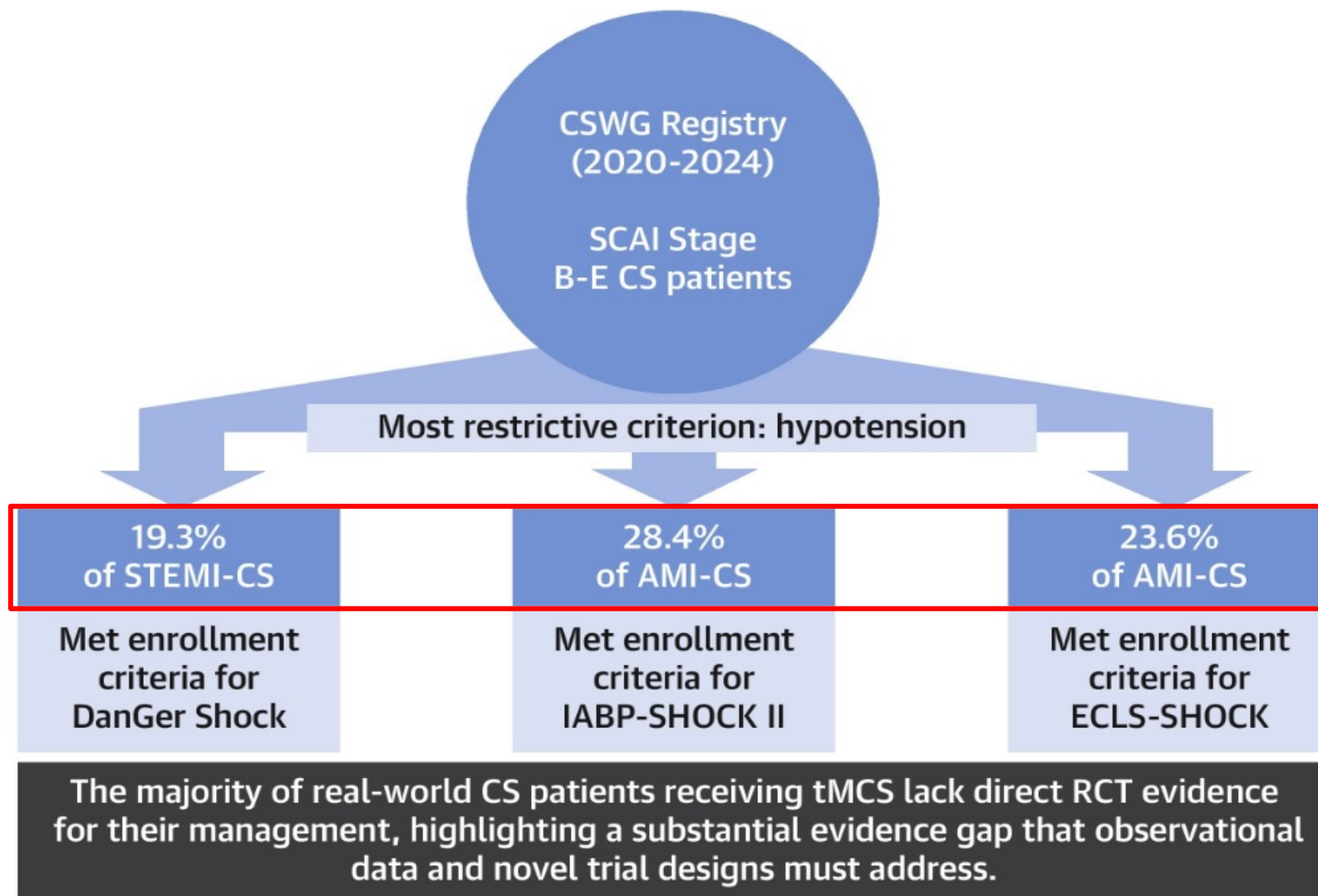


BENEFIT OF ECMO AND IMPELLA IN AMI-CS

PATIENT SELECTION IS KEY BUT FAR FROM REALITY



IT'S HARD TO GO BY EVIDENCE WHEN USING MCS



QUESTIONS TO ASK WHEN THINKING ABOUT MCS

Goals

Hemodynamic/Electrical
stability

Facilitate PCI or surgery

Reduce ino-pressor doses

Strategy

“Native heart” recovery

Bridge-to
Transplant/LVAD/Definitive
therapy

Transfer to higher level of care

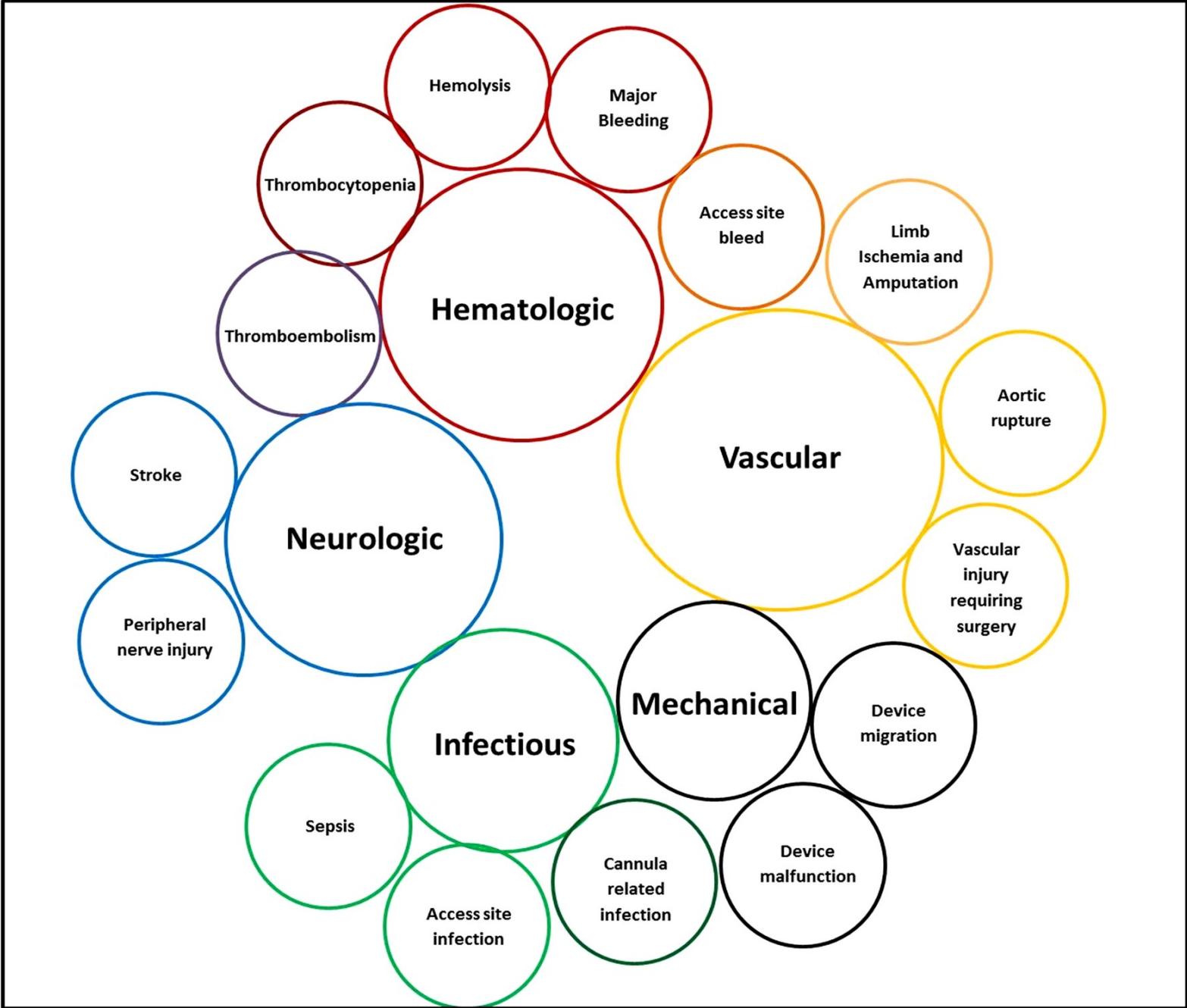
Minimize complications!

COMPLICATIONS OF MCS DEVICES

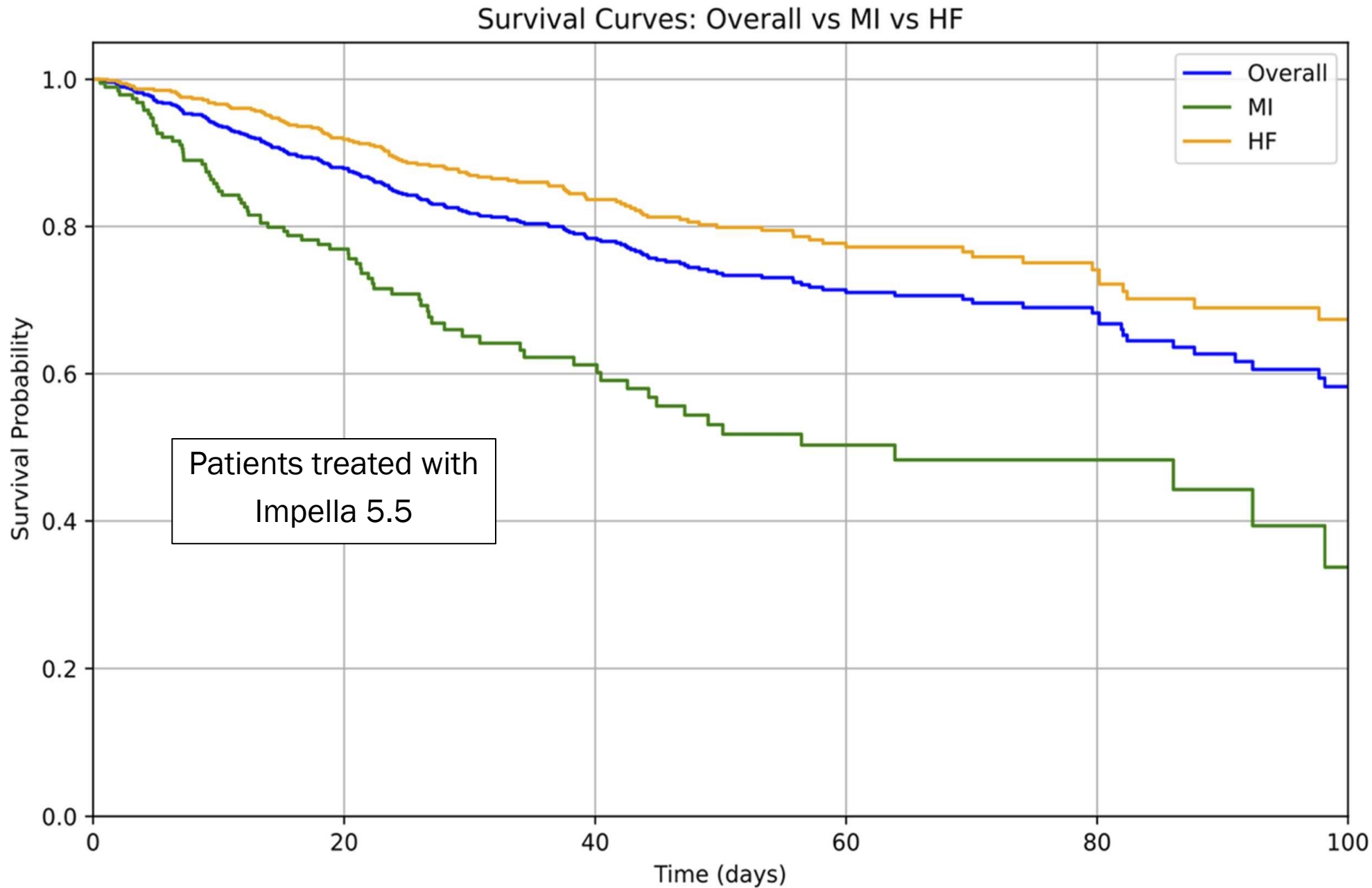
IABP
 Mod-severe bleeding = to medical therapy

Impella:
 Mod-severe bleeding 22%
 RRT 41%

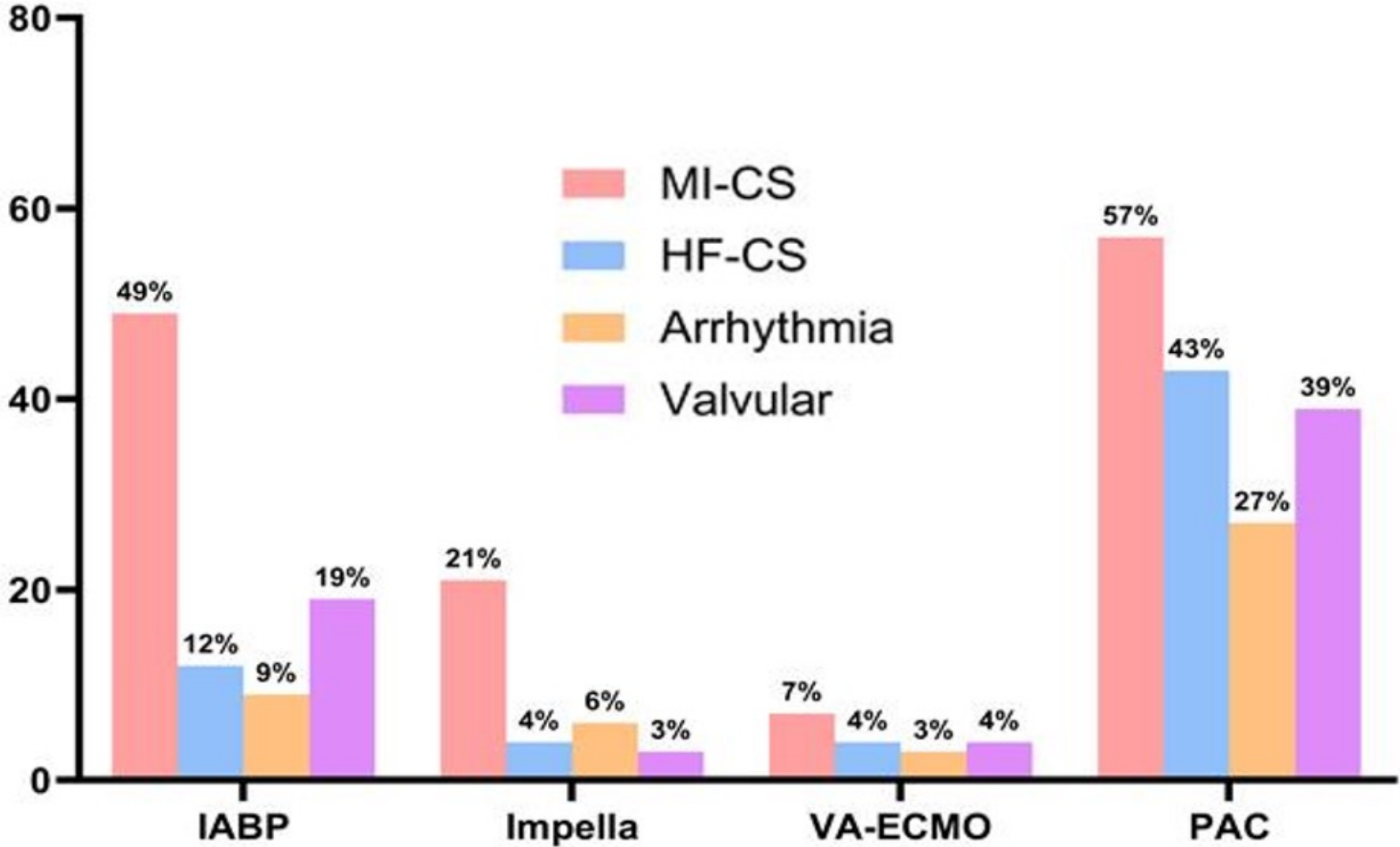
ECMO:
 Mod-severe bleeding 23%
 RRT 8%



**ETIOLOGY
CONDITIONS
OUTCOMES
WHEN USING
MCS IN CS**

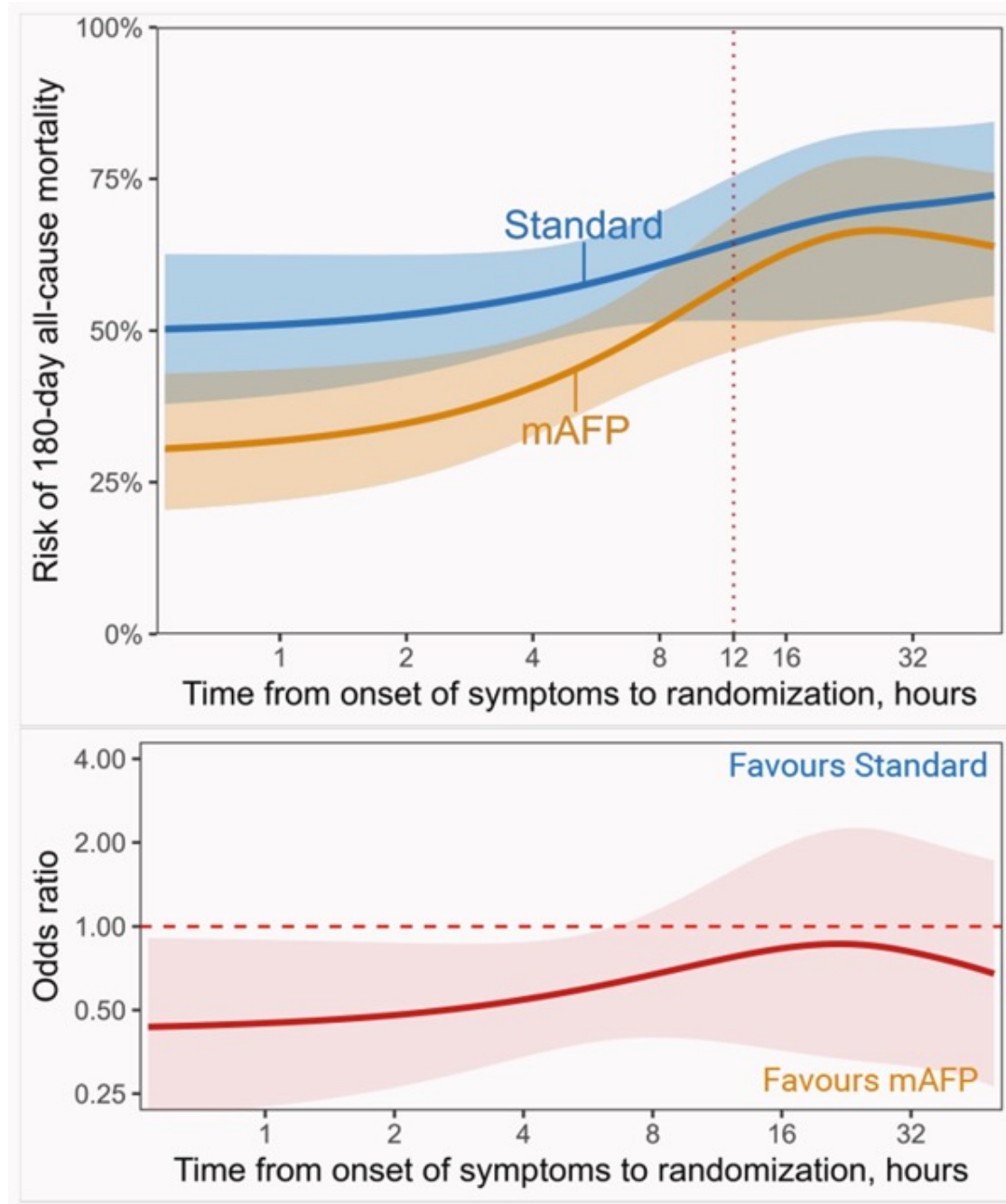


MCS USE AT NORTHWELL 2016-2022



THE TIMING OF IMPELLA MATTERS IN AMI-CS

“EARLIER IS BETTER IF YOU NEED IT”

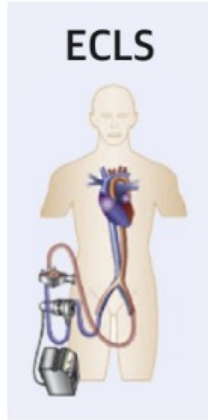


Jensen, Lisette Okkels, et al. *Circulation: Cardiovascular Interventions* (2026): e015718.

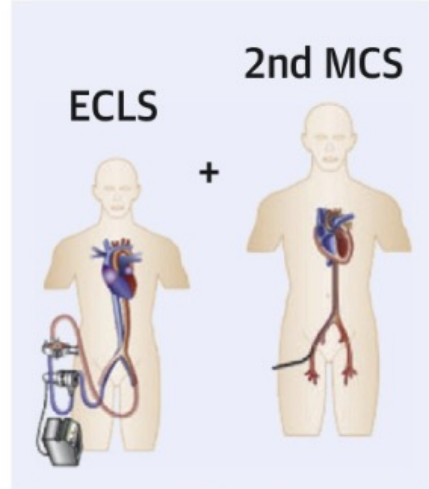
MCS Device Use Within the ECLS-SHOCK Trial

ECMO IS ALSO BETTER *EARLY* IF YOU NEED IT IN AMI-CS

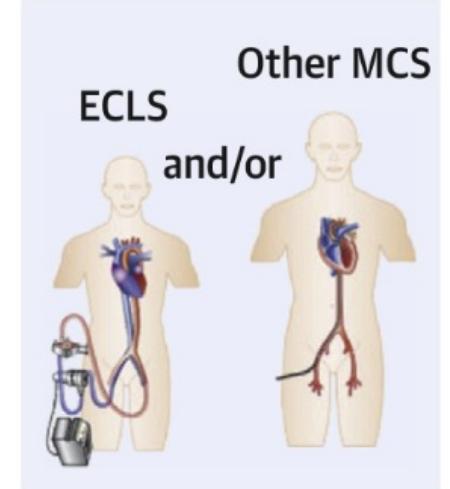
Upfront ECLS Only



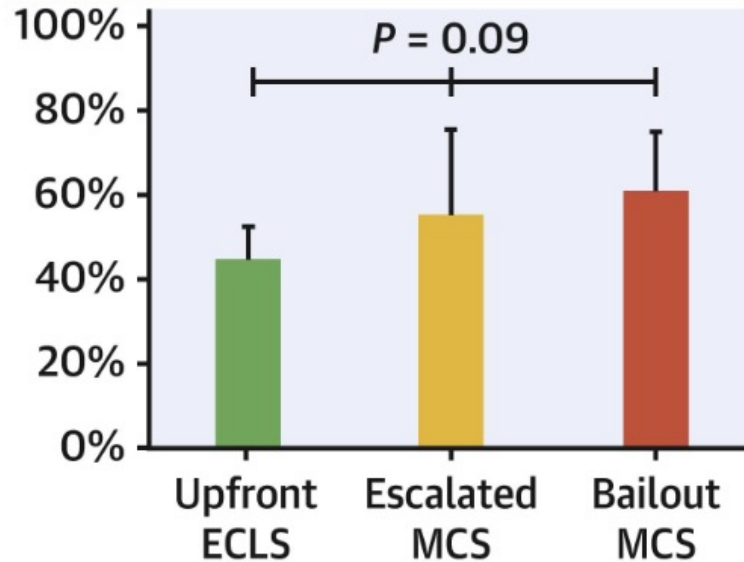
Escalated MCS



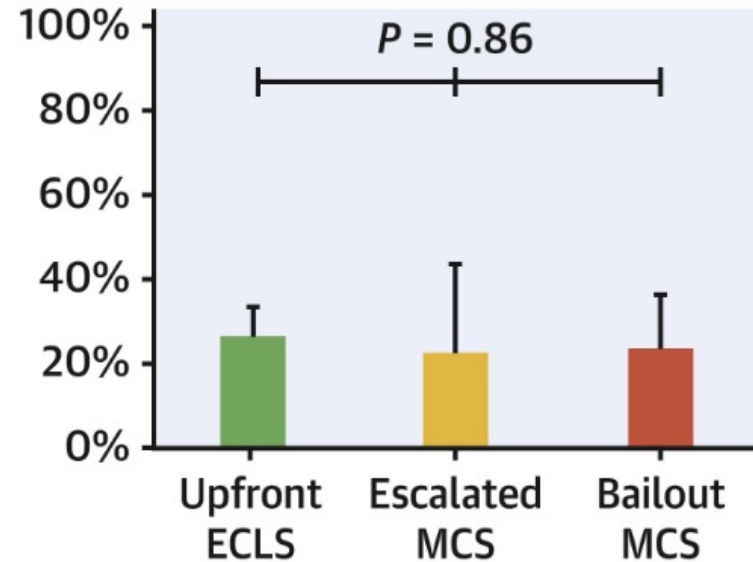
Bailout MCS



30-Day All-Cause Mortality

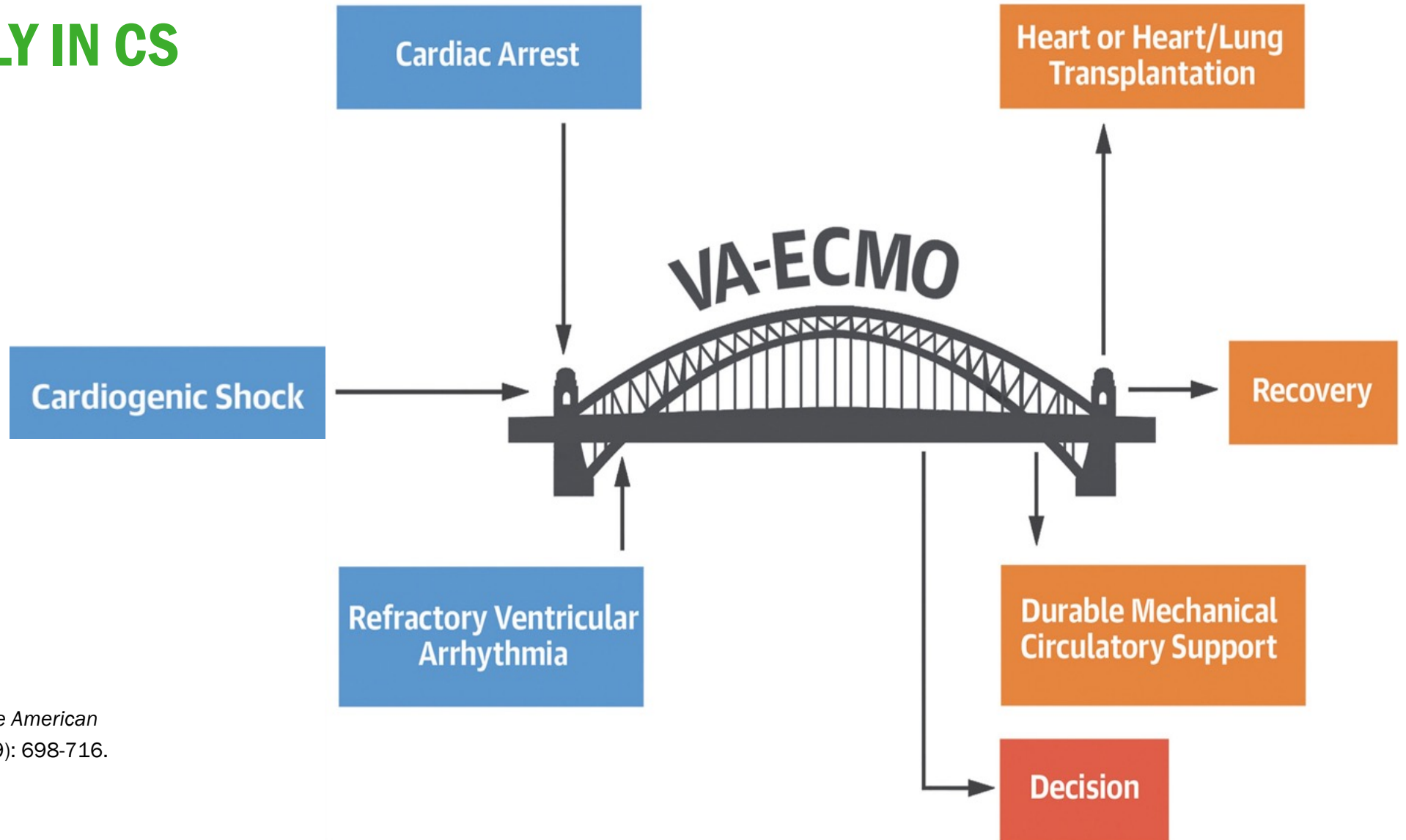


30-Day Moderate or Severe Bleeding



Feistritzer, Hans-Josef, et al. *Cardiovascular Interventions* 18.6 (2025): 691-701.

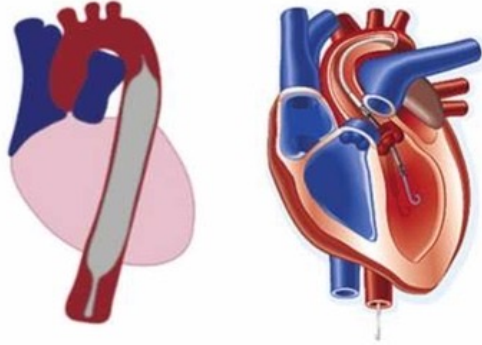
WE USE VA-ECMO VERY STRATEGICALLY IN CS



Guglin, Maya, et al. *Journal of the American College of Cardiology* 73.6 (2019): 698-716.

WE USE IMPELLA 5.5 AS AN EXTENDED BRIDGE

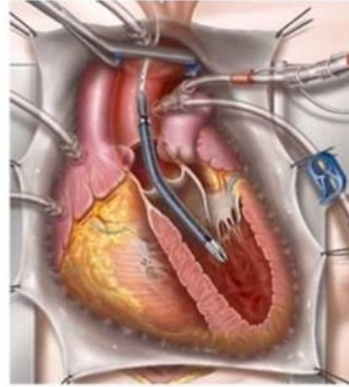
Impella CP and IABP



Temporary MCS

0h – 14 days

Impella 5.5

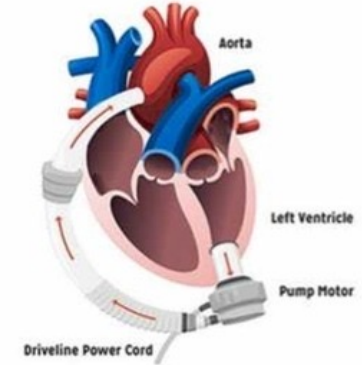


"Prolonged"
Temporary MCS
>14 days

Extended Bridge:

Medical therapy for recovery
Ancillary procedures for recovery
Physical rehabilitation
Support for invasive testing
Psychosocial work-up
End-organ recovery

Surgical LVAD



Durable MCS

Months to Years

CONCLUSIONS

Use of MCS in CS comes at a price

Before you place MCS think about GOALS and STRATEGY – Especially VA-ECMO and Impella

Evidence base for MCS use is weak because the problem is so complex

Shock teams are here to help you make these decisions

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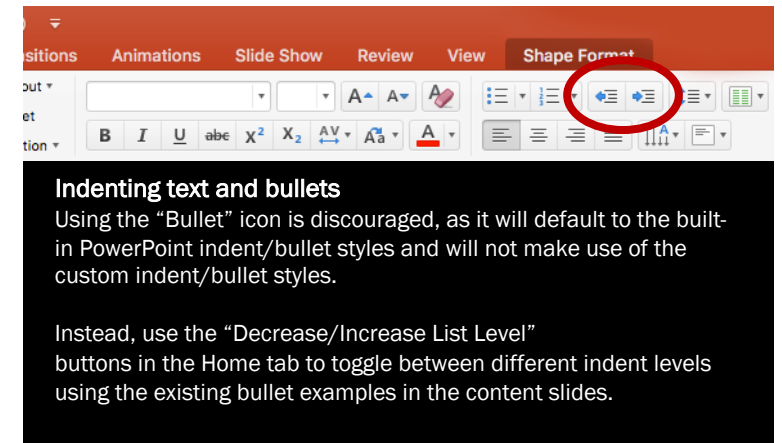


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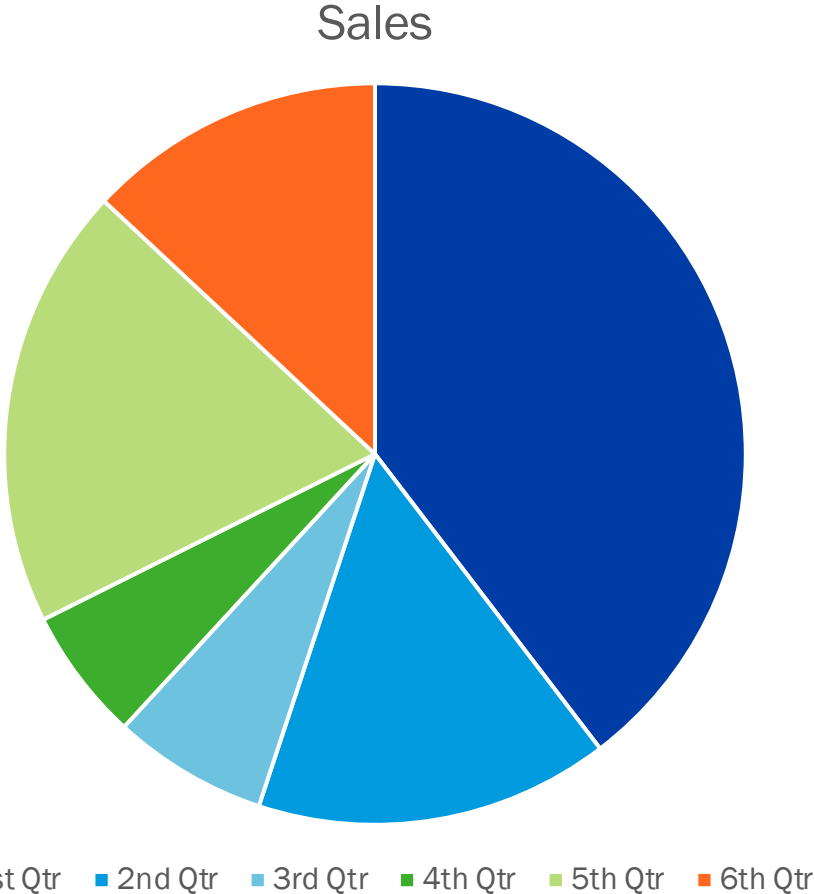
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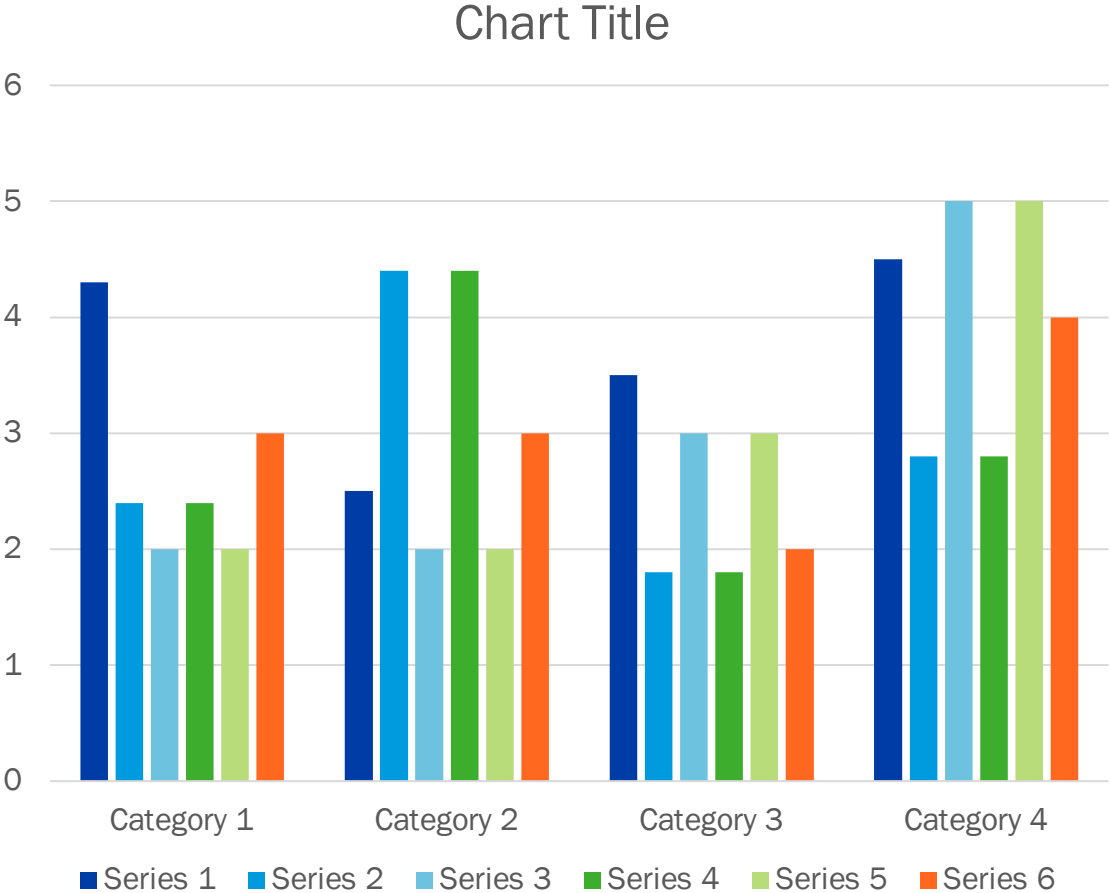


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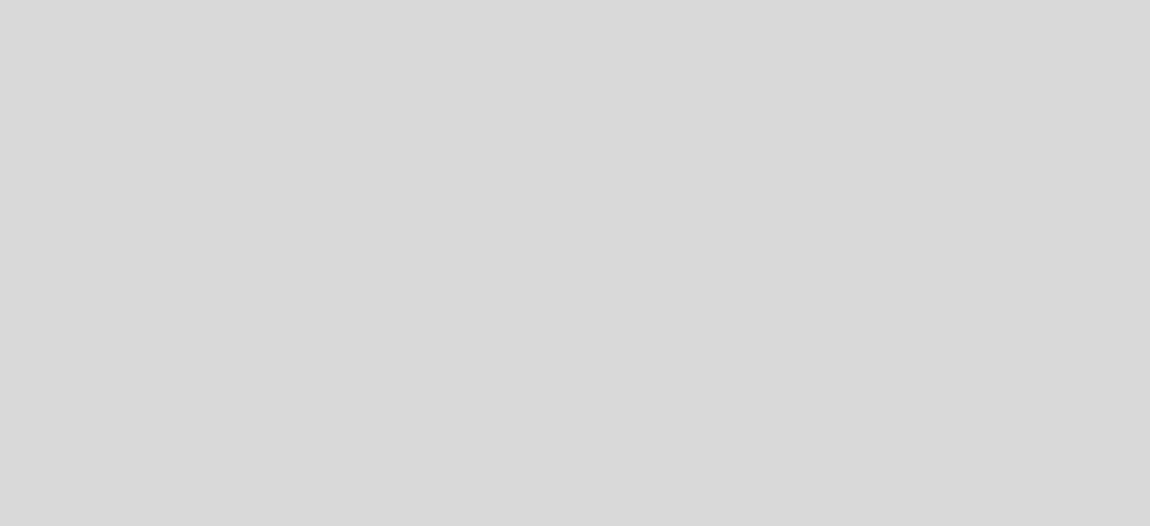


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How to use the Crop Tool

After inserting the panoramic or horizontal image, use the crop tool to fit the image to the allowed image area.

1. Click on the image icon of the content box to insert an image.
2. In the “Picture Format” tab at the top, select the crop tool.
3. If necessary, zoom out to see the edges of your photo. Hold “shift” and drag the corner of your image to desired fit.
4. Delete this instructions box.

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THANK YOU

