ACTACC
Association for Cardiothoracic Anaesthesia and Critical Care

Perioperative Vasoplegia in Cardiac Surgery National Audit

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ACTACC Link Person Network

Disclosures

ACTACC
Association for Cardiothoracic Anaesthesia and Critical Care

- None relevant
- On behalf of the ACTACC Vasoplegia Audit Group
- ACTACC Linkperson network
- AI (OpenAI, Canvas, Dall-E used for image generation)

Define Vasoplegia in Cardiac Surgery

VANCS (2017) (SCA)

MAP<65mmHg, CI >2.2 l/min/m^2

At least 1000ml fluid challenge

ATHOS II (2017)

CI >2.3 l/min/m^2 or $ScV0^2$ > 70%

And

MAP 55-70mmHg + 25ml/kg preced 24h

On Norad >0.2mcg/kg/min

Snapshot Audit on Perioperative Vasoplegia in Cardiac Surgery

1st October 2024- 31st October 2024

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Patients with suspected vasoplegia in the perioperative period
Patients that received 'rescue' therapies for vasoplegia

Who were the patients investigated ?

Patients suspected of perioperative vasoplegia within the first 48h of undergoing cardiac surgery (from induction of anaesthesia)

What are the objectives?

- **Characteristics of perioperative vasoplegia in UK cardiac surgical patients**
- **What proportion of patients receive rescue therapies for vasoplegia?**
- **What is the association of vasoplegia and clinical outcomes including 30-day mortality, ICU stay and new RRT**

The triggers for case report:

- **Noradrenaline (≥ 0.2 mcg/kg/min) ***

OR

- **>1 Vasopressor (noradrenaline and vasopressin)***

OR

- **Administration of rescue pharmacological agents for vasoplegia such as:**
  - **Methylene blue**
  - **Hydroxocobalamine (Cyanokit)**
  - **Ascorbic acid/Thiamine (Pabrinex)**
  - **Vitamin C**
  - **Cytokine Adsorber (i.e Cytosorb)**

*** > 1 hour administration**

Snapshot Audit on Perioperative Vasoplegia in Cardiac Surgery

Data Collected October 2024

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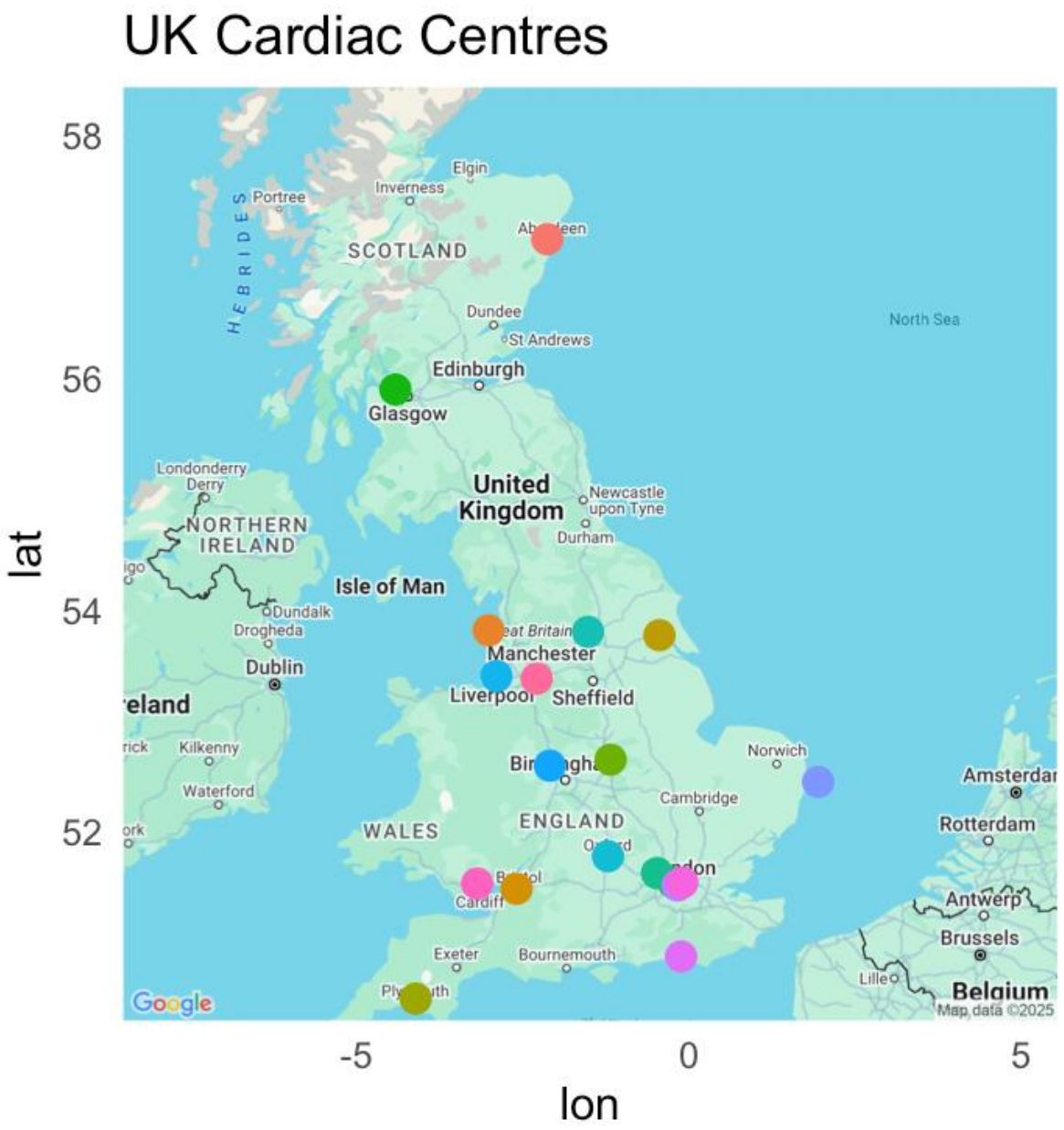
- Section 1
  - Centre information
- Section 2-3
  - Patient Demographics
  - Preop medication
- Section 4
  - Surgical Info
- Section 5-9
  - Clinical Assessment
  - CO monitoring
  - Echo data
- Section 10-11
  - Vasoactive agents (type/dose)
  - Steroids
- Section 12
  - Rescue Therapies
- Section 13-15
  - Sedation
  - Vasodilators
  - Antiarrhythmics
- Section 16
  - Outcomes

Google Form

Response Rate 57%



- Bristol Royal Infirmary: 12/105 (11.4%)
- Aberdeen Royal Infirmary: 7/30 (23.3%)
- Blackpool Teaching Hospital: 8/101 (7.9%)
- Castle Hill Hospital: 2/58 (3.4%)
- Derriford Hospital: 4/111 (3.6%)
- Glenfield Hospital: 4/73 (5.5%)
- Golden Jubilee National Hospital: 7/110 (6.4%)
- Hammersmith Hospital: 2/44 (4.5%)
- Harefield Hospital: 12/114 (10.5%)
- James Cook University Hospital: 3/71 (4.2%)
- John Radcliffe Hospital: 3/60 (5%)
- Liverpool Heart and Chest Hospital: 12/192 (6.2%)
- New Cross Hospital: 2/81 (2.5%)
- Queen Elizabeth Hospital: 2/45 (4.4%)
- Royal Brompton Hospital: 8/98 (8.2%)
- Royal Sussex County Hospital: 5/47 (10.6%)
- St Bartholomew's Hospital: 16/188 (8.5%)
- University Hospital of Wales: 4/38 (10.5%)
- Wythenshawe Hospital (35): 12/109 (11%)

Location at Time of Trigger

Intensive Care

71.8%

Operating Theatre

28,2%

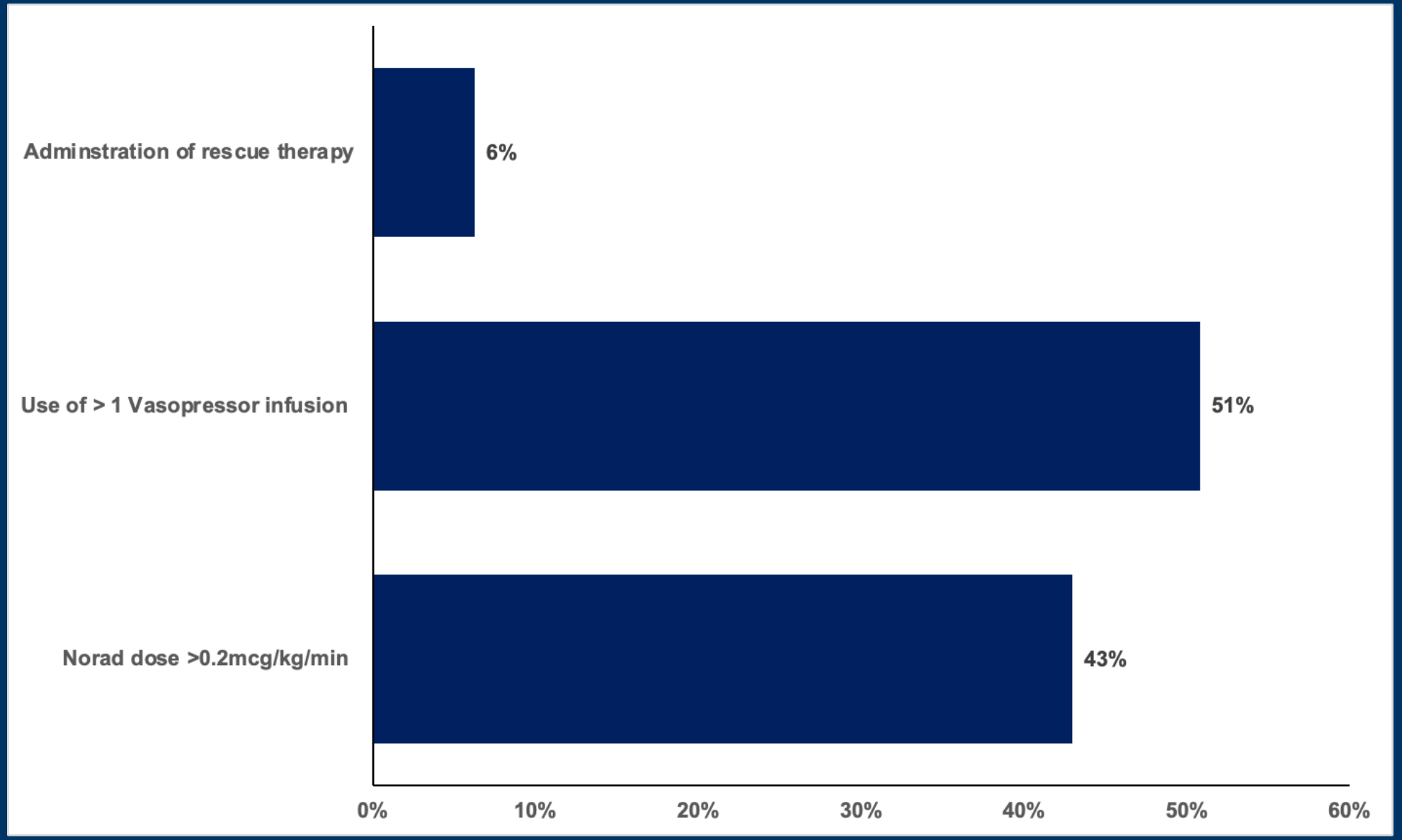
Induction of anaesthesia

Time Lag

Trigger

Count: 118 patients
Median: 9.0 hours
IQR: 6.2 – 13.3 hours

Inclusion Trigger



Incidence analysis

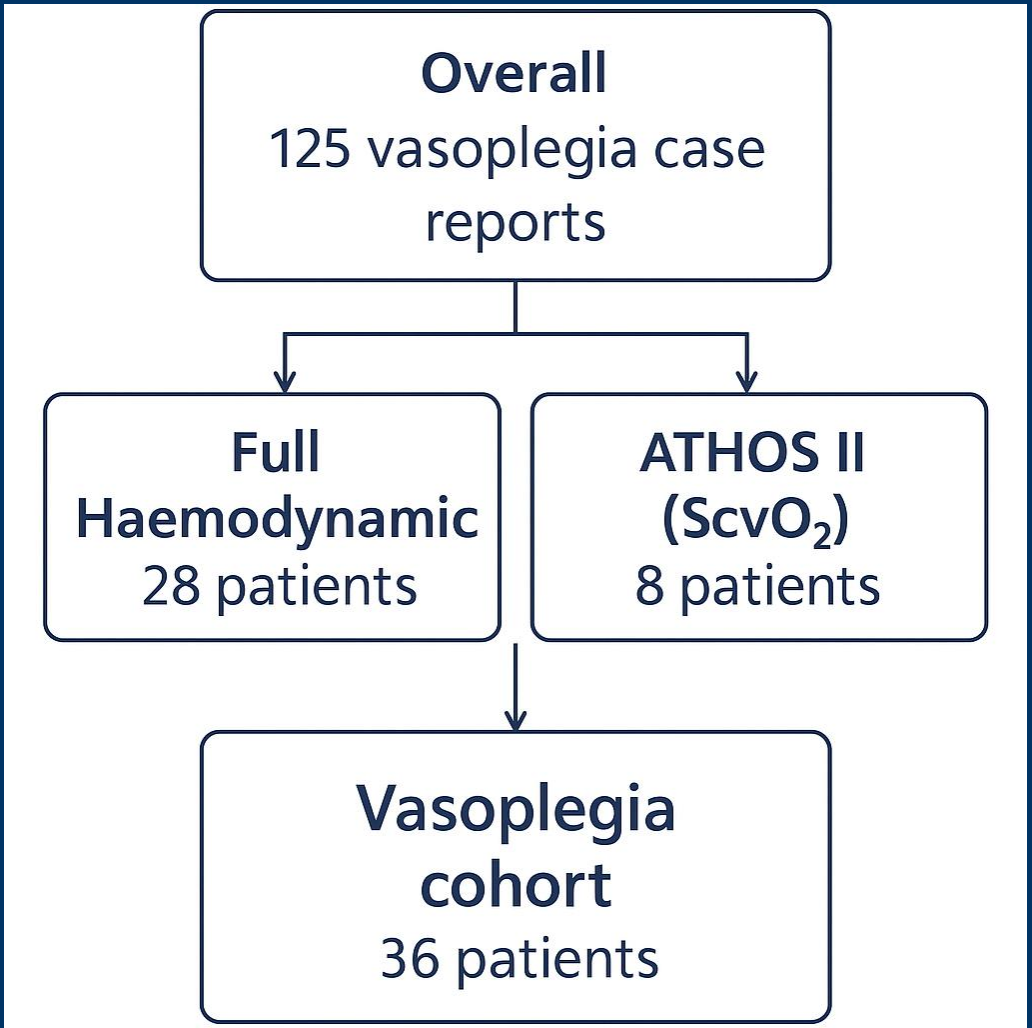
Overall= $\frac{\text{(Vasopressor+ Rescue therapy) 125}}{\text{Total cases October 24 (1675)}}$ 7.5%

NACSA 2023/2024:
Average 2218
operations/month

Subcohort incidence=

Number of patients fulfilling criteria/Number of patients with haemodynamic values or ScV02 available

Incidence Analysis



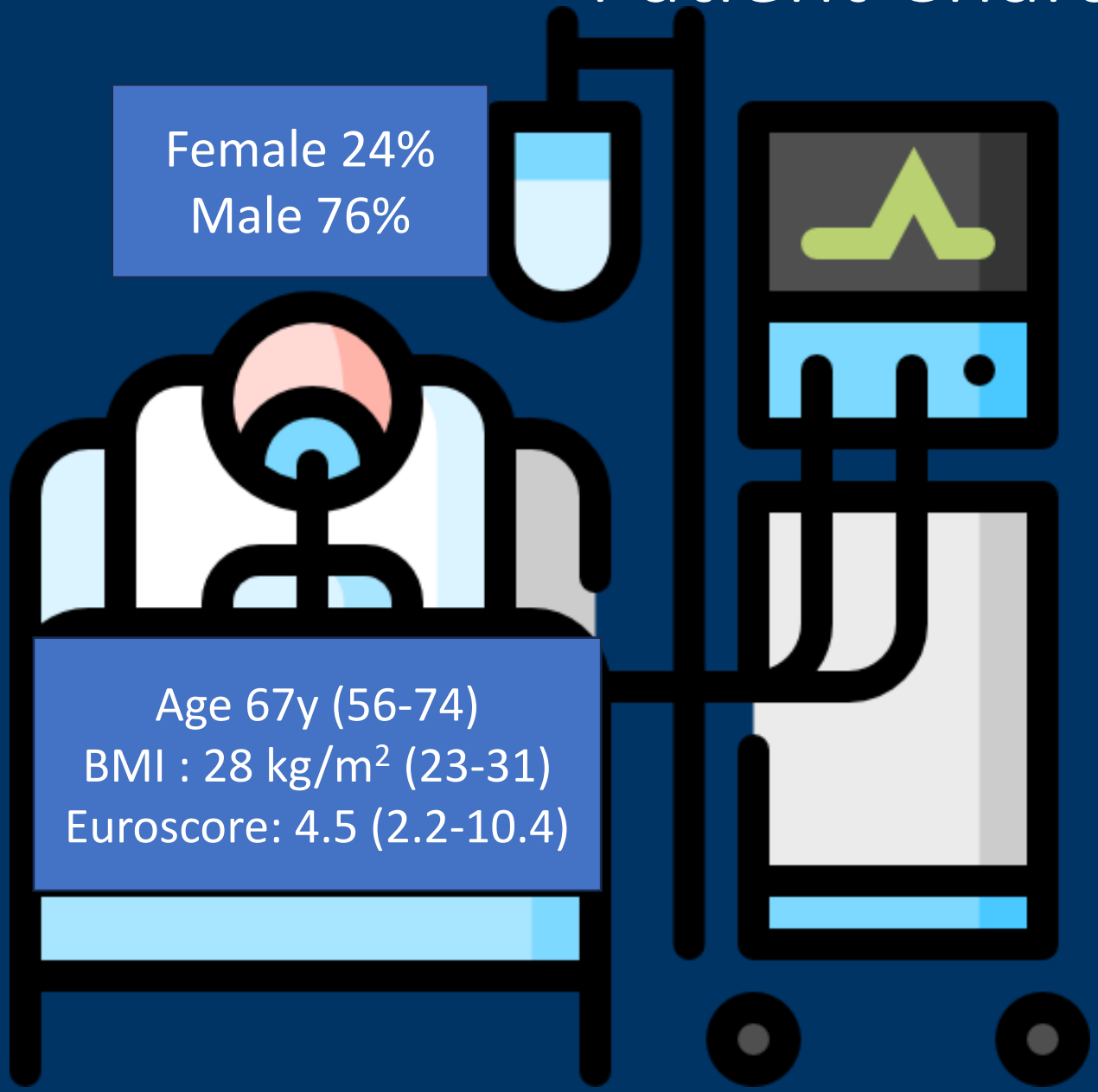
Overall: 7.5%

Sub-cohorts

61 patients (monitoring data)
Full Haemodynamic:58%
ATHOS II(ScVO2):40%

VasoplegiaMerged: 59%
Remaining 89

Patient Characteristics



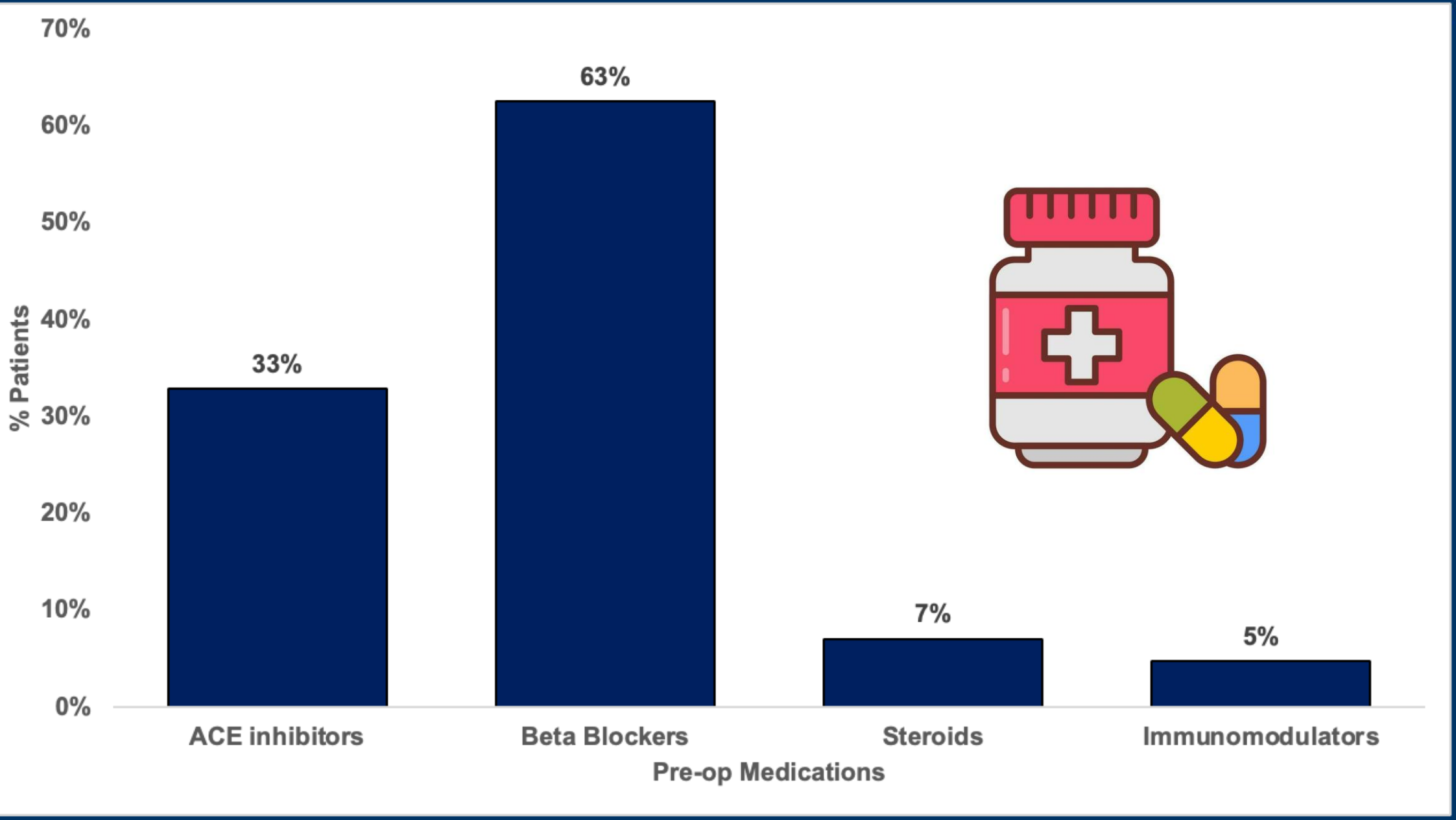
Female 24%
Male 76%

Age 67y (56-74)
BMI : 28 kg/m^2 (23-31)
Euroscore: 4.5 (2.2-10.4)

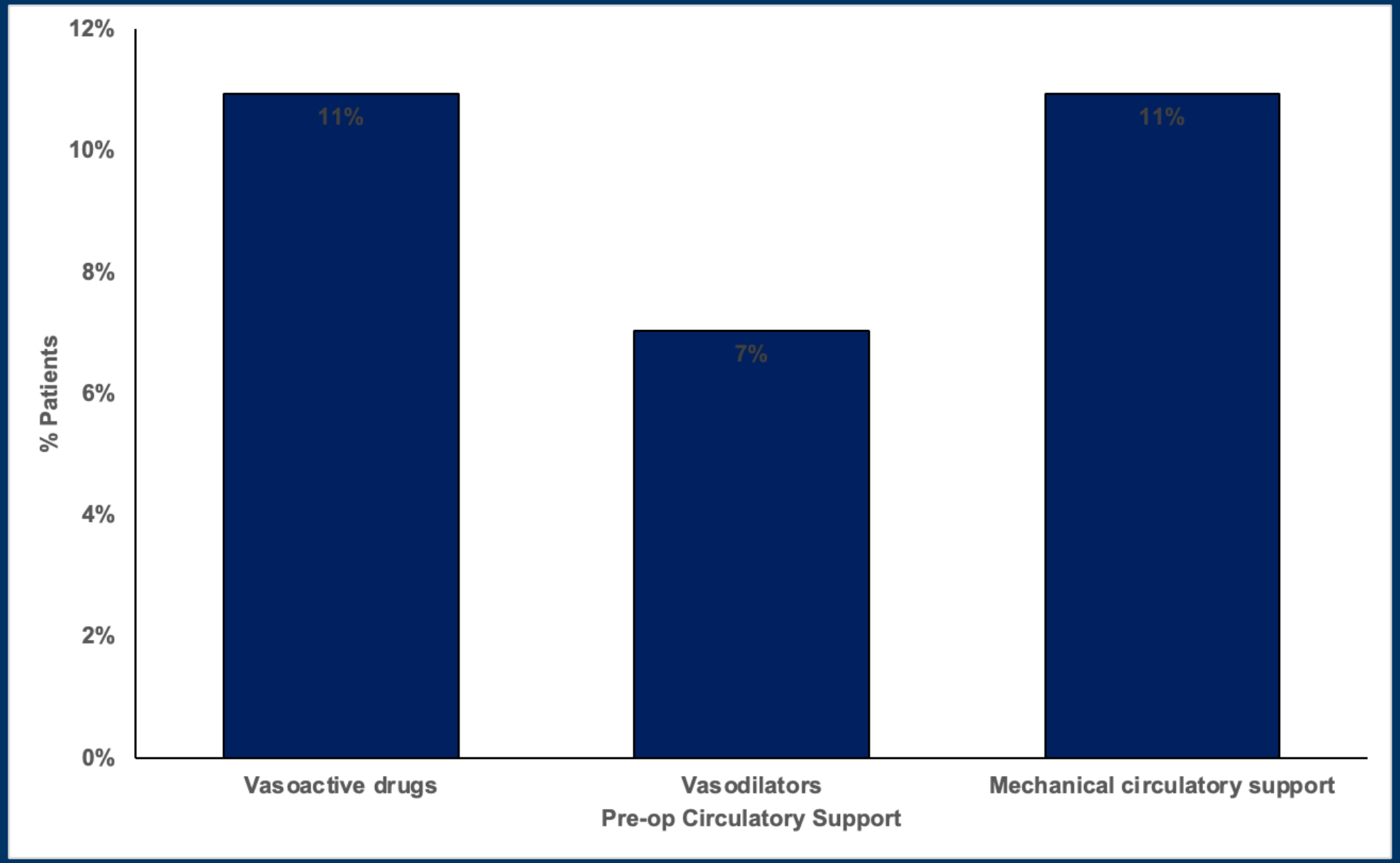
	Median	*25-75th Centile*
Hb (g/dl)	126	106-141
WCC nx 10^9	8	6-10
CRP (mg/l)	8	3-21
Creatinine	93	78-118
HbA1c	43	37-50

- CKD eGFR<60 ml/min/1.73m^2 33% (42 patients)
- Type 2 DM 47% (60 Patients)
- Endocarditis 15.2%(19 patients)

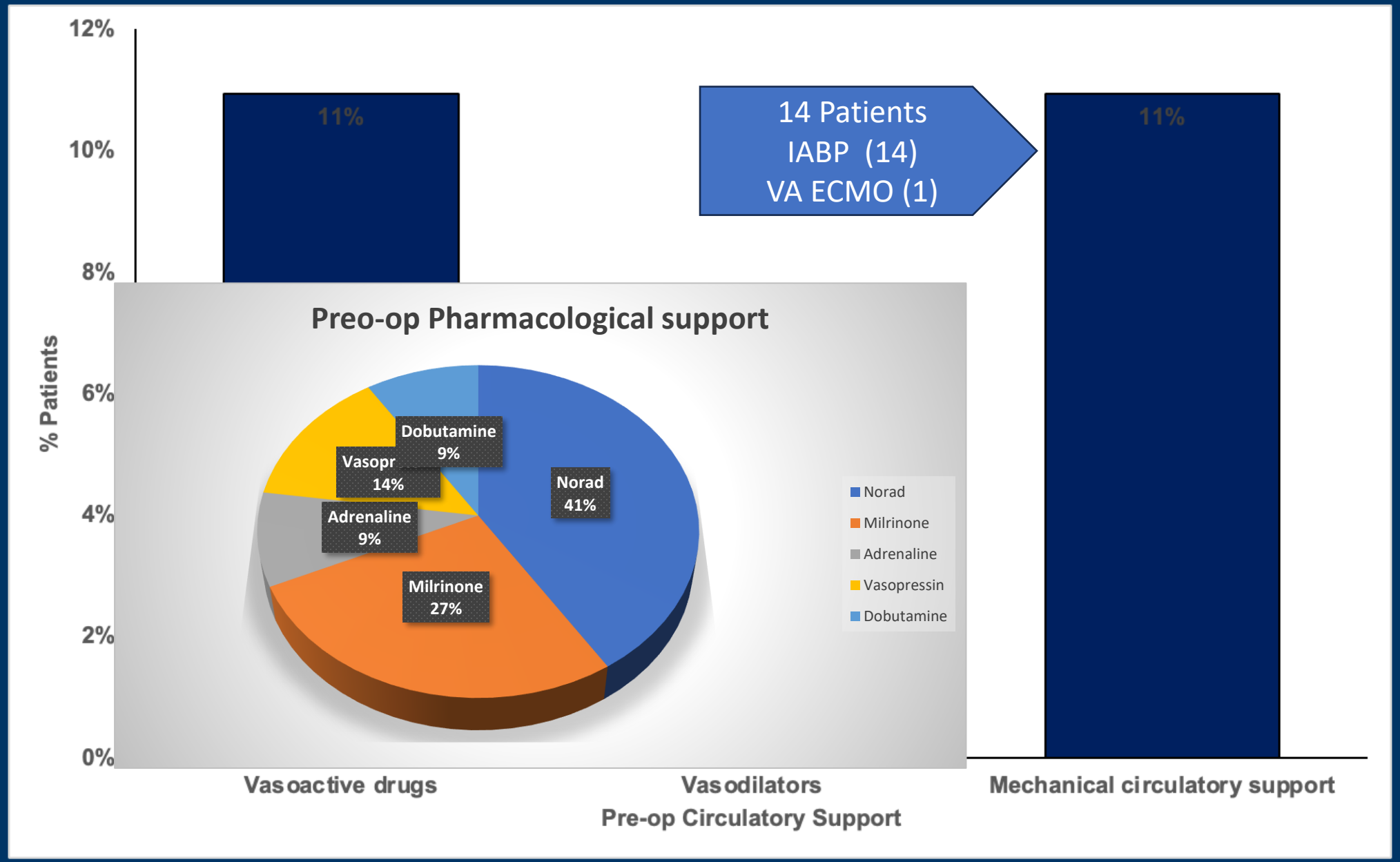
Preoperative Medications (Whitin 48h of Sx)



Preoperative support



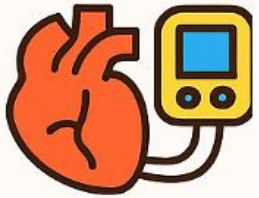
Preoperative support



Single valve surgery

31 24.8%

CABG on pump



26 20.8%

Major aortic surgery

16 12.8 %

Double valve surgery

15 12.0%

CABG + valve

14 11.2%

Other
(HOCM surgery, ASD pepair, VSD)

13 10.4%

CABG off pump

4 3,2%

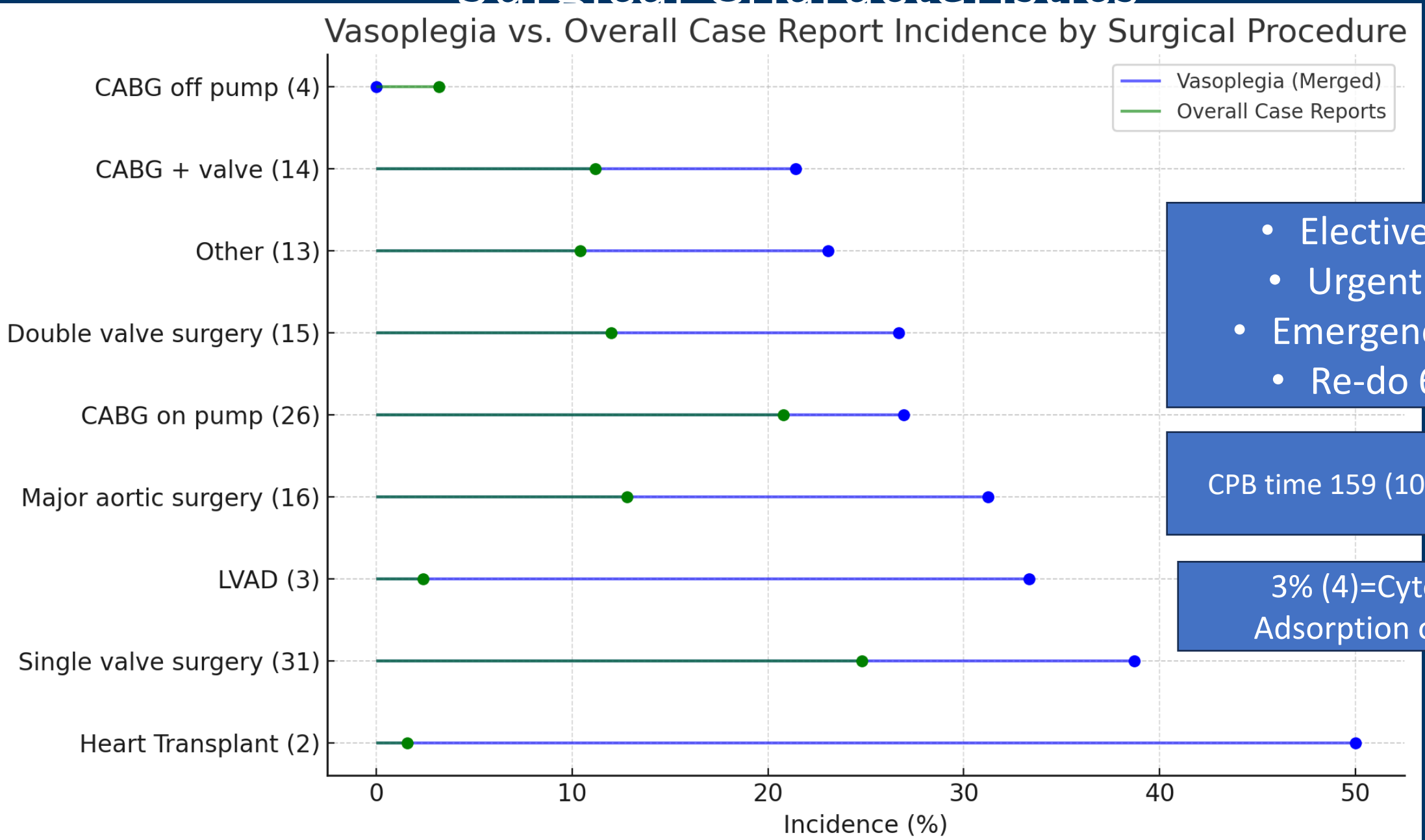
LVAD implantation

3 2,4%

Heart transplant

2 1,6%

Surgical Characteristics

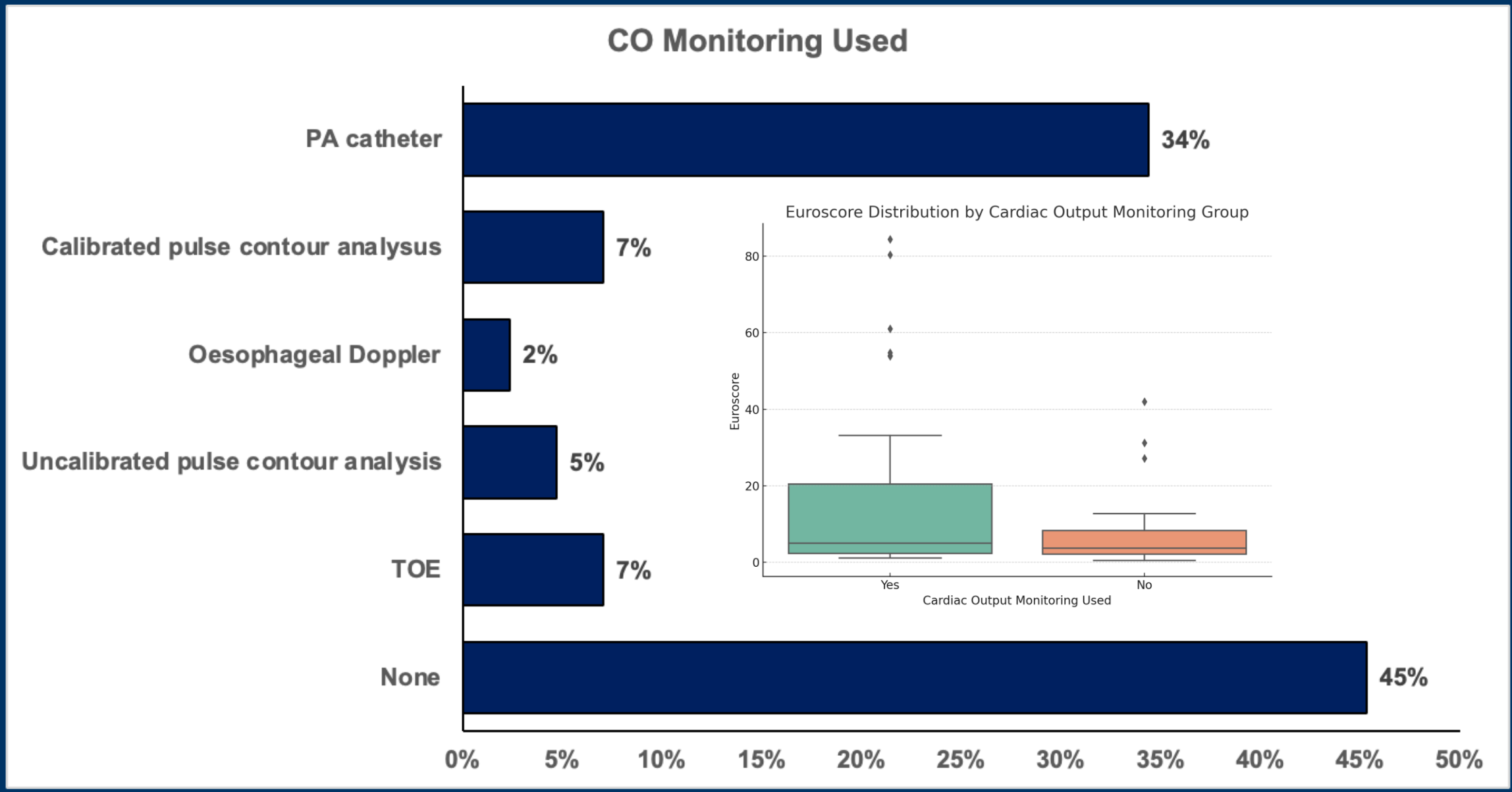


- Elective 41%
- Urgent 47%
- Emergency 11%
- Re-do 6.4%

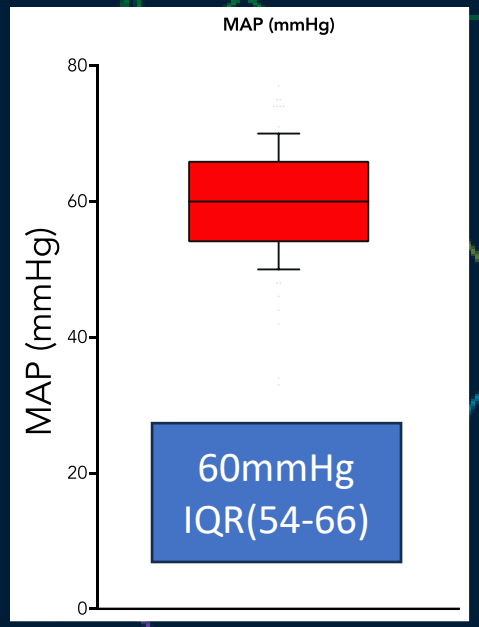
CPB time 159 (108-230) min

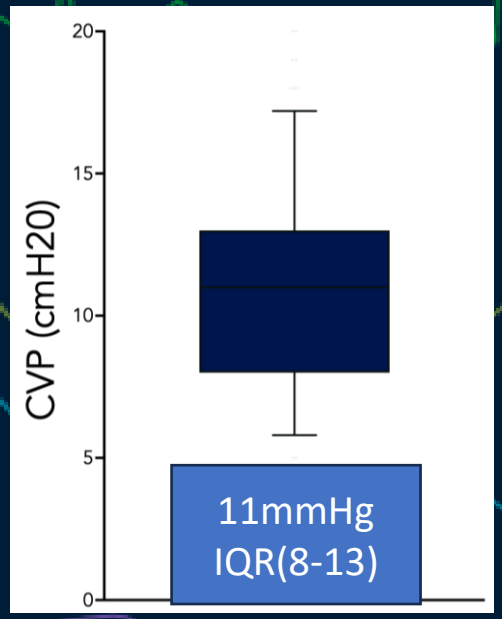
3% (4)=Cytokine Adsorption on CPB

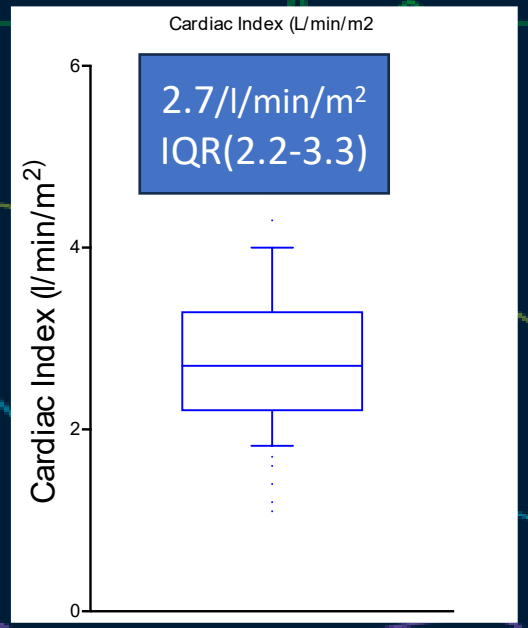
CO monitor used in 56%

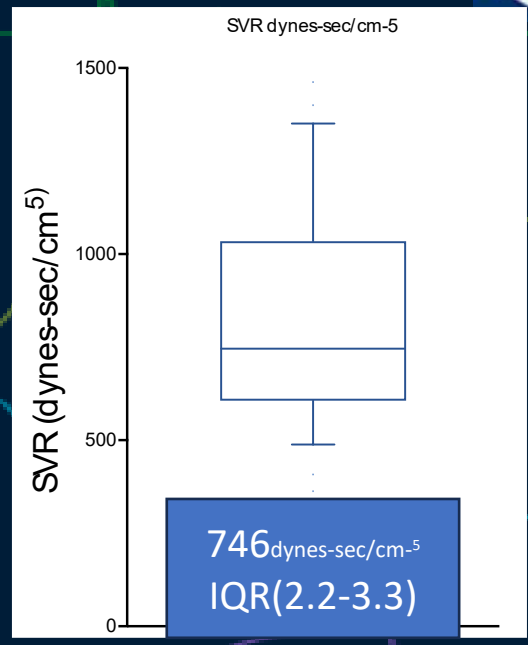


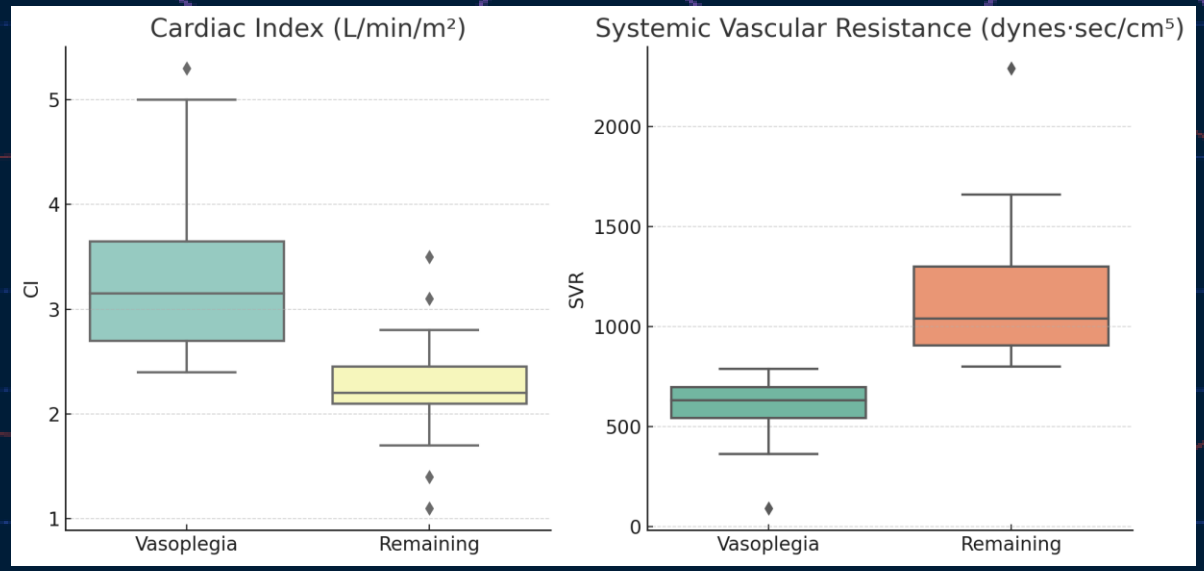
Physiological Parameters





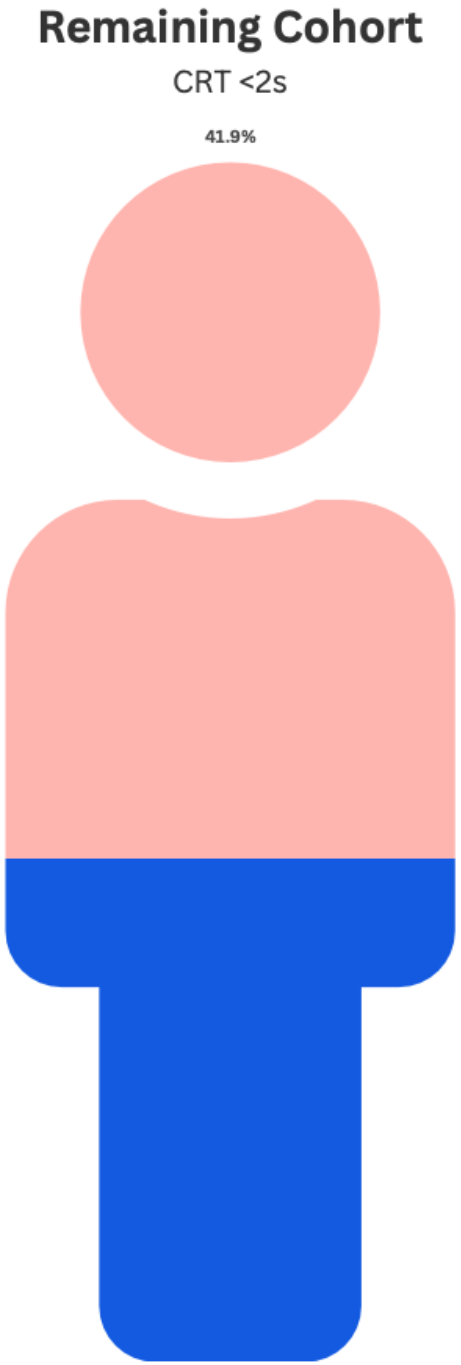


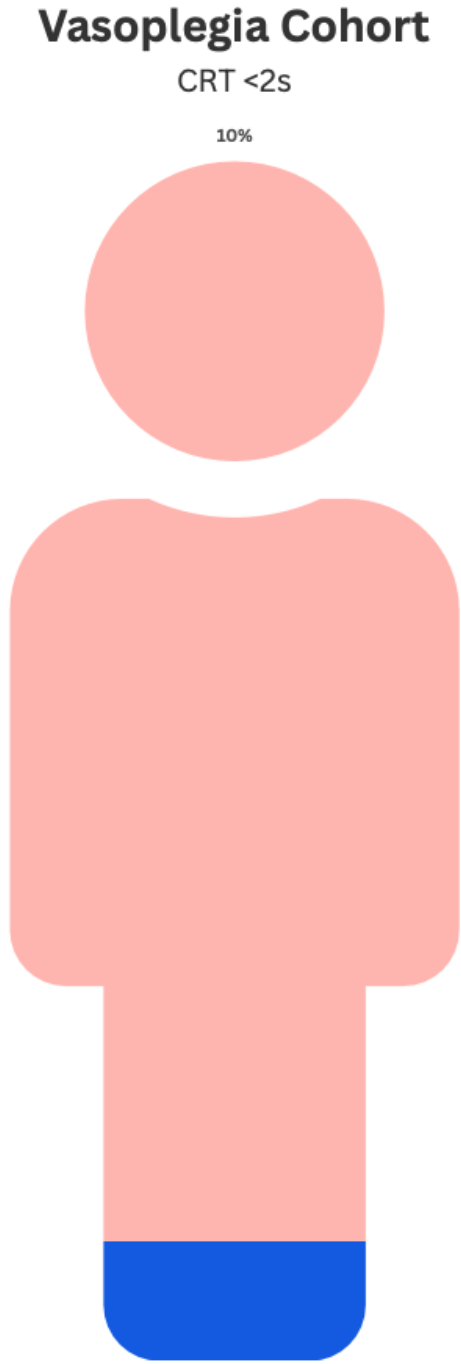




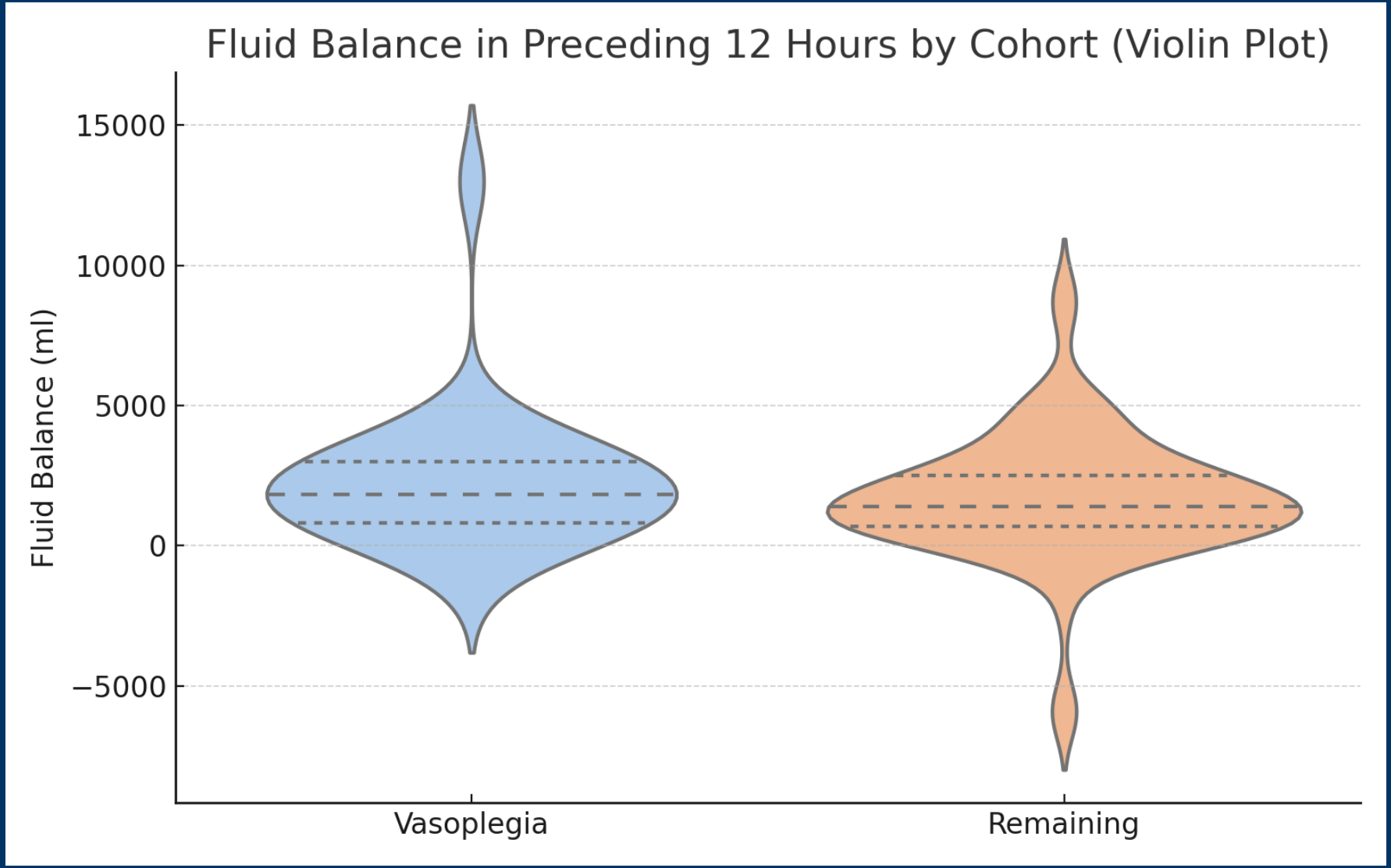
Vasodilated to touch

- Vasoplegia Cohort: 90%
Remaining: 58%





Fluid Balance on trigger

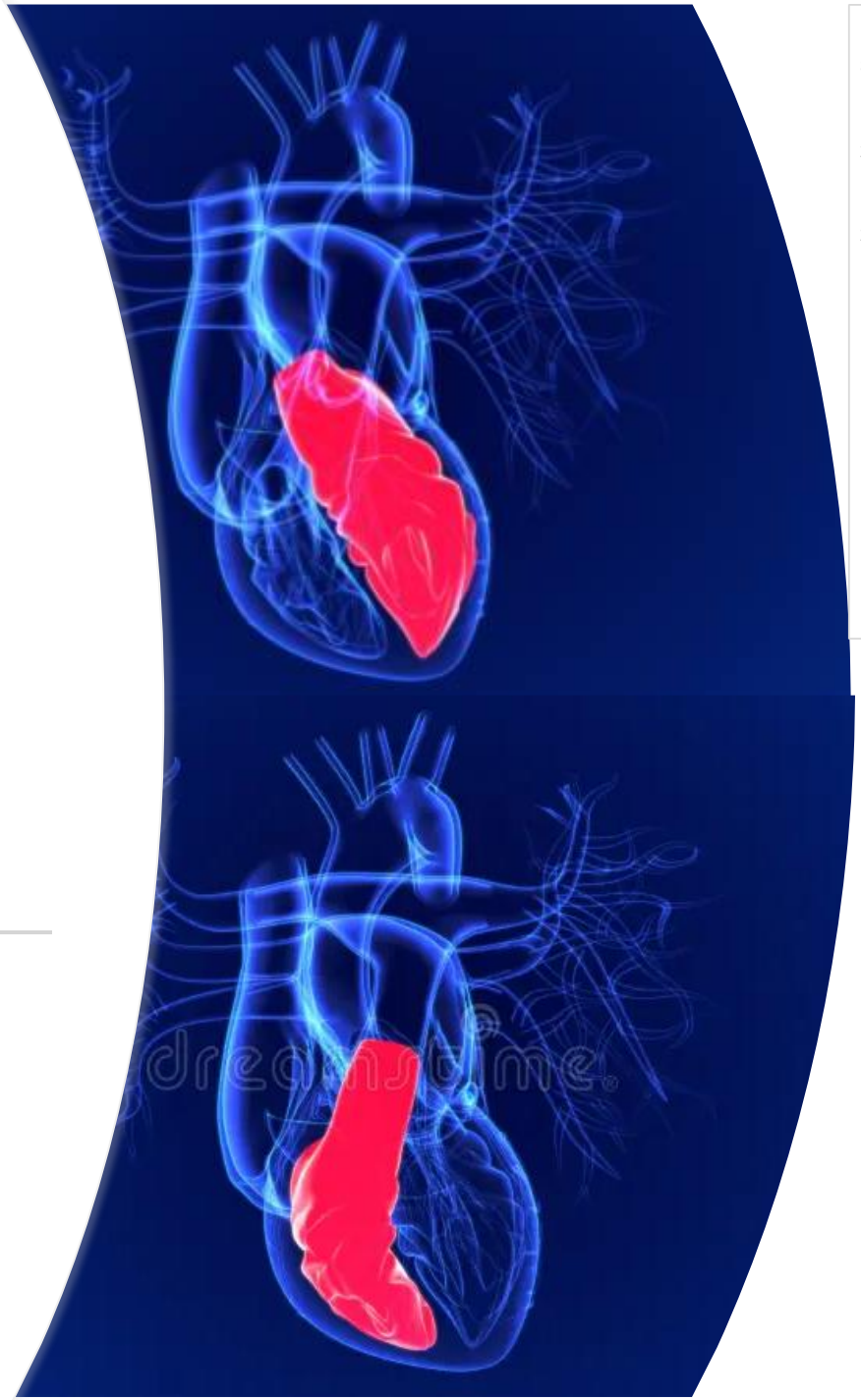


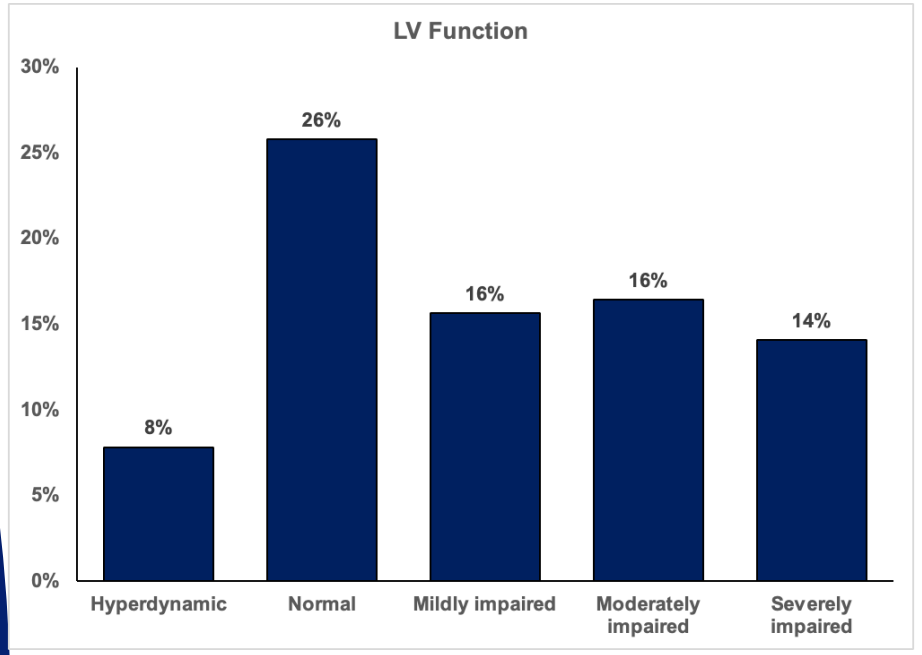
Median Volumes

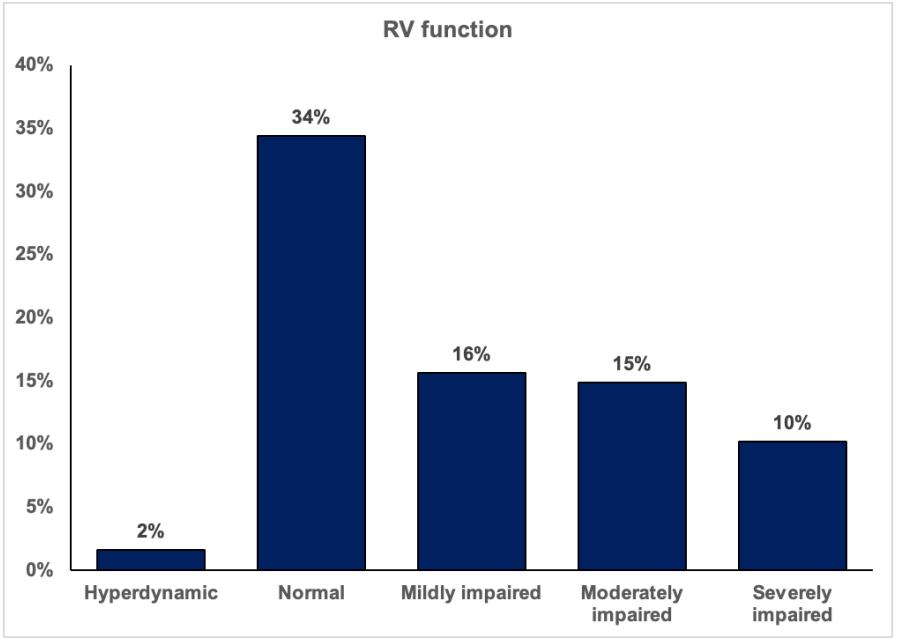
Overall
1430ml (720-2978)
Vasoplegia: 1836(800-3000)

Remaining:
1402 (681-2500)

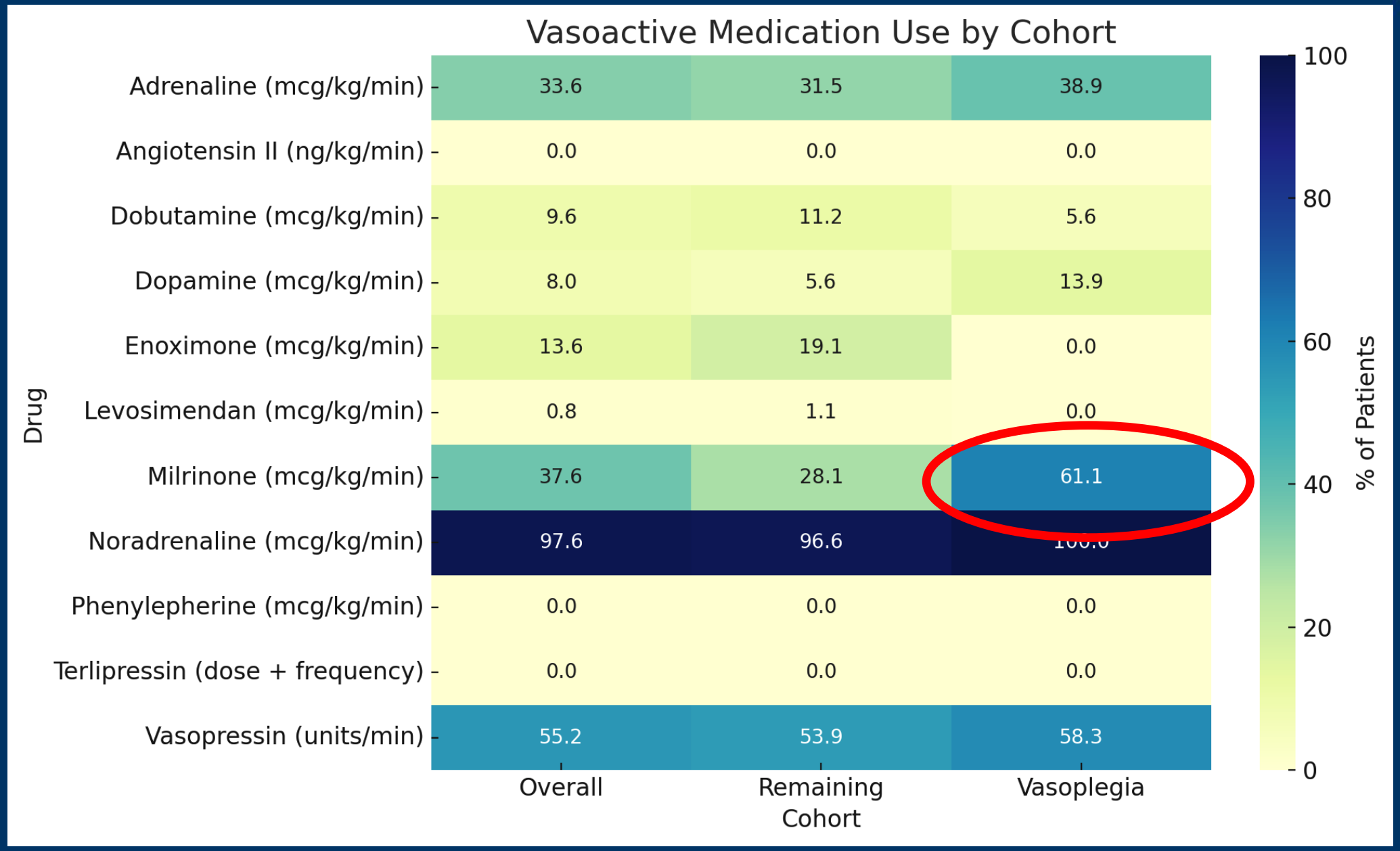
TOE examination

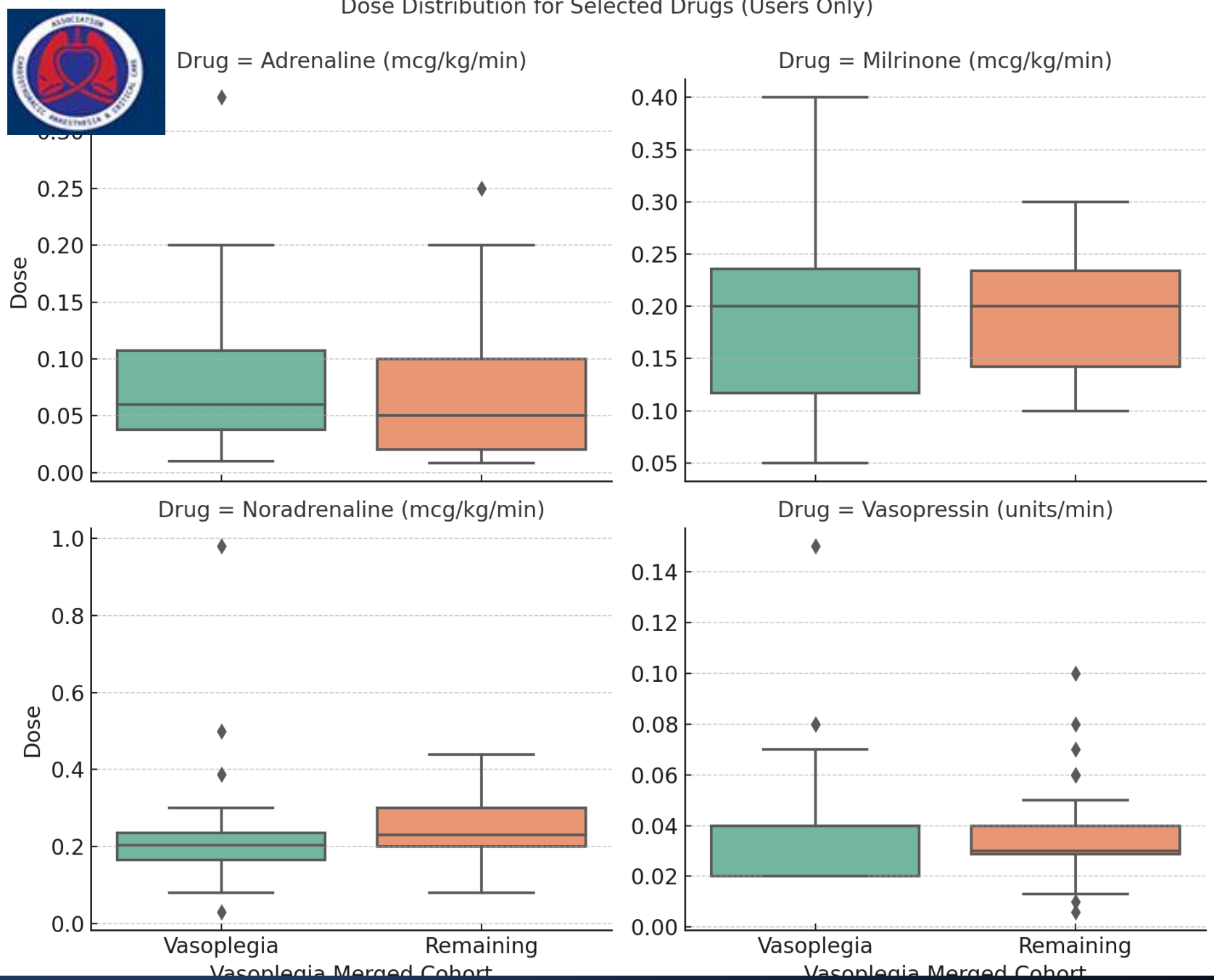






Pharmacological Support

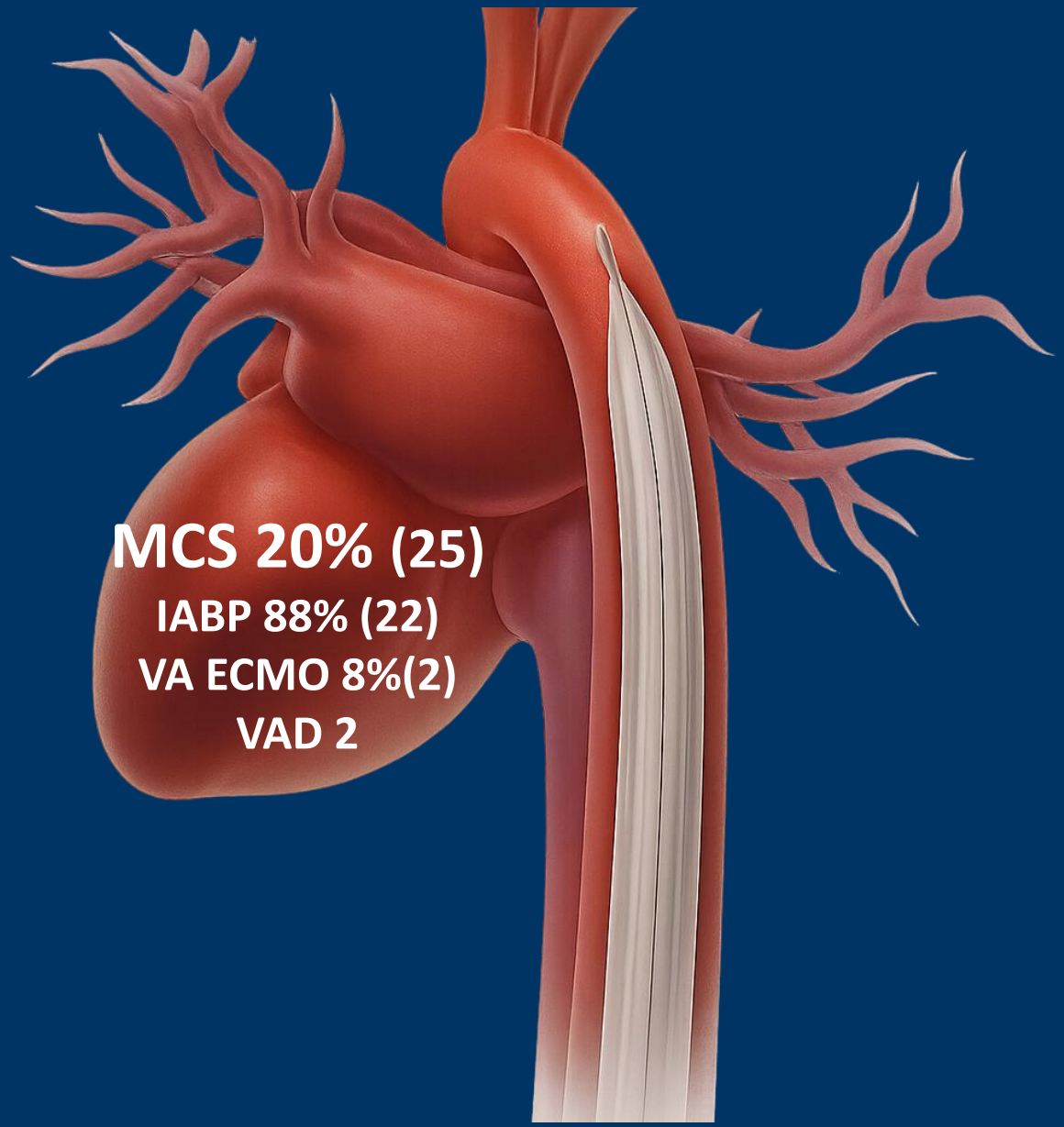




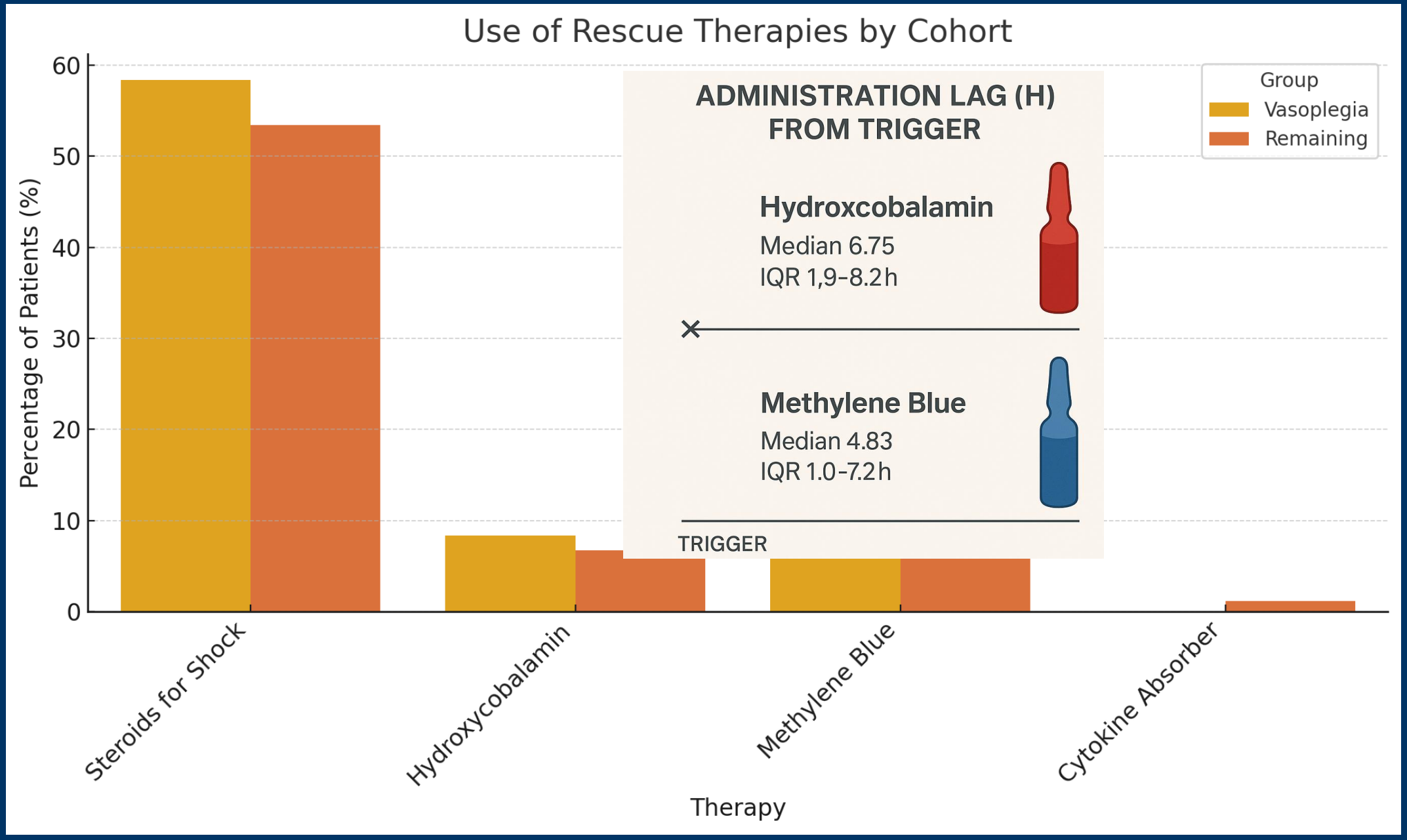
Pharmacological Support

- Noradrenaline mcg/kg/min: 0.22 (0.19-0.29)
- Adrenaline mcg/kg/min: 0.05 (0.02-0.1
- Vasopressin units/min: 0.03 (0.025-0.04)
- Milrinone mcg/kg/min: 0.2 (0.1-0.23)

Other support @ Trigger



Steroid and Rescue Therapies

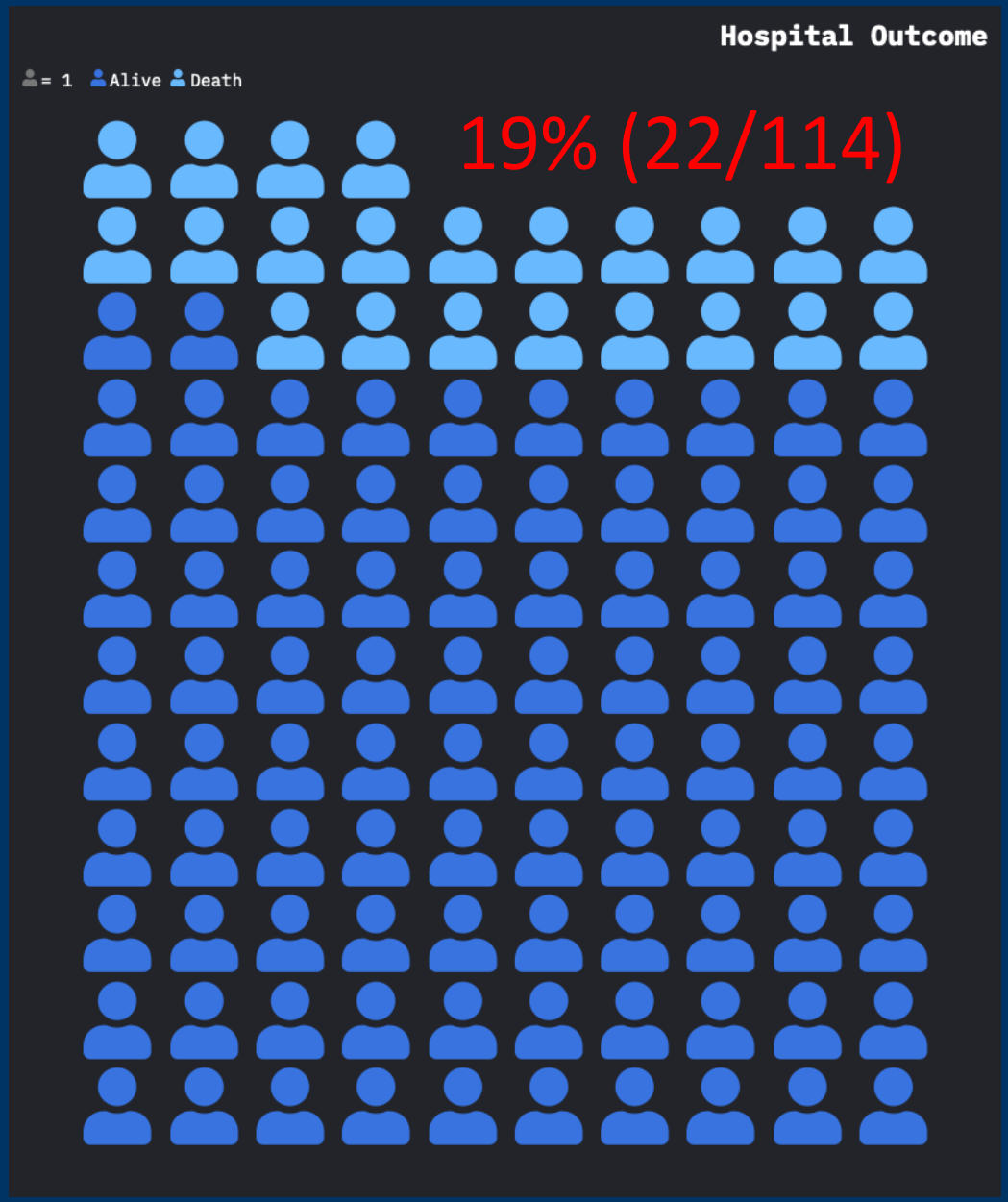


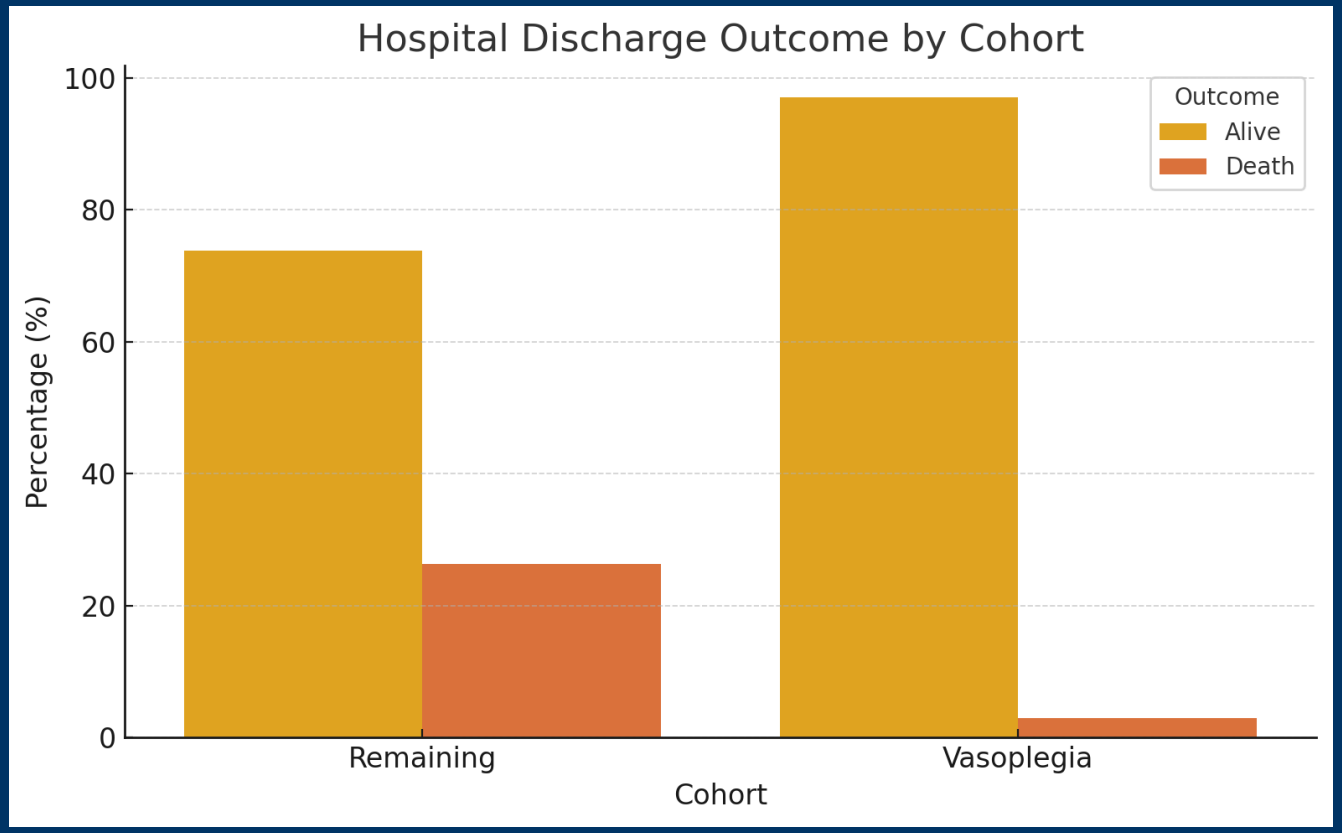
Potential Vasodilators

NO 9.6% (12)
Prostacyclin 0.8% (1)

Amiodarone 8% (11)

Patient Outcomes





ICU Mortality 17.6% (22/125)

ICU LOS Median 6 (4-16)
Hospital LOS 13 (8-27)

Limitations

Selection bias

- inclusion based on vasopressor thresholds and rescue therapy
- No control group by design (Audit)

Definitions of Vasoplegia highly dependent on monitoring

Designed as snapshot audit (short window)

No adjustment for confounding (no multivariate)

May be missing mixed shock states

Conclusions

- Vasoplegia rates compatible with wider literature 5%-20% or Higher Risk groups (30-50%)
- Diagnosis linked to monitoring but clinical signs may help
- Most cases triggered by vasopressor criteria/ Rescue therapy is rare
- Inclusion criteria identified a high risk cohort (17-19% Mortality)

CAPTIVE
Cardiogenic Shock(MCS) +
Vasoplegia

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Thank you

Special thank you to all contributors to the audit and the ACTACC linkperson network