

# Fluid resuscitation strategies and clinical outcomes in septic shock patients with heart failure

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## BACKGROUND

- Sepsis is a medical emergency affecting more than 30 million individuals annually worldwide.
- Treatment includes initial resuscitation with at least 30 mL per kg of IV crystalloid fluid within the first 3 hours.
- Hypervolemia is especially a concern in patients with heart failure (HF).
- This study will compare fluid resuscitation strategies and clinical outcomes in patients in septic shock with and without preexisting HF.

## OUTCOMES

### Primary Outcome

- ICU fluid intake

### Secondary Outcomes

- Vasopressor requirement
- Steroid use
- MV-free days
- Hospital mortality

## STUDY DESIGN

- Design: IRB-approved, retrospective, observational
- Time Frame: May 2016 through October 2017
- Setting: Community teaching hospital
- Inclusion Criteria:
  - Admitted to ICU
  - Septic shock
  - Vasopressors for longer than 3 hours
  - Echocardiogram within one year of hospitalization
- Heart failure defined as an ejection fraction less than 40%

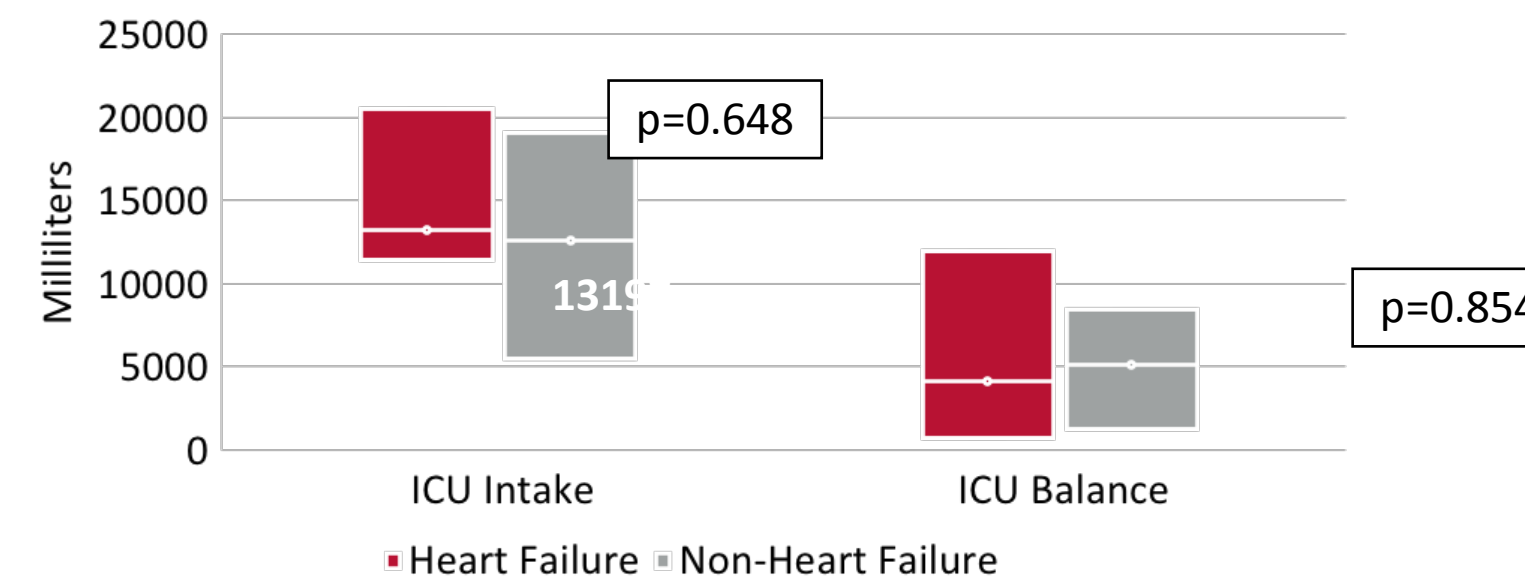
## RESULTS

**Table 1. Baseline Characteristics**

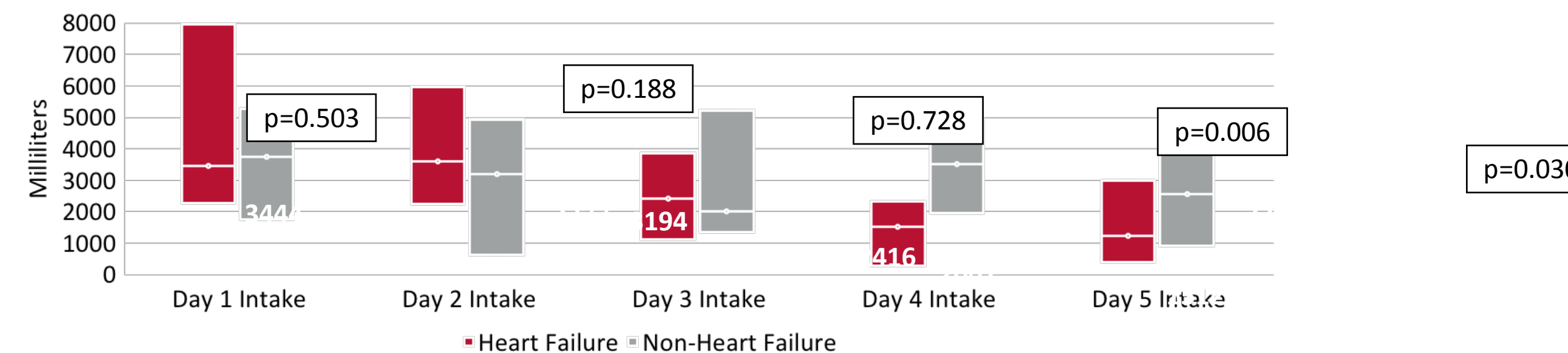
	Heart failure (n=25)	Non-heart failure (n=25)
<b>Male</b>	18 (72%)	14 (56%)
<b>Age, years</b>	72 (56 – 80)	61 (52 – 68)
<b>Admission weight, kg</b>	82 (68 – 106)	87 (72 – 108)
<b>Ejection fraction, %</b>	30 (23 – 36)	60 (55 – 65)

All values presented as Number (%) or Median (Q<sub>1</sub> – Q<sub>3</sub>)

**Figure 1. Cumulative ICU Intake & Balance**



**Figure 2. Daily ICU Intake**



## RESULTS CONTINUED

**Table 2. Secondary Outcomes**

	Heart failure (n=25)	Non-heart failure (n=25)	p-value
<b>2<sup>nd</sup> Vasopressor required</b>	19 (76%)	16 (64%)	0.355
<b>Steroid use</b>	10 (40%)	10 (40%)	1.000
Cumulative dose, mg	212 (100 – 949)	720 (413 – 2885)	0.075
<b>Time to 2<sup>nd</sup> agent</b>			
Vasopressor, hours	160 (105 – 508)	270 (145 – 758)	0.151
Steroid, hours	2 (23 – 15)	32 (1 – 234)	0.052
<b>Mechanical ventilation</b>	20 (80%)	13 (52%)	0.037
<b>MV-free days</b>	22 (0 – 26)	25 (0 – 28)	0.296
<b>Hospital mortality</b>	9 (36%)	7 (28%)	0.544

All values presented as Number (%) or Median (Q<sub>1</sub> – Q<sub>3</sub>)

## CONCLUSIONS

- Decreased fluid intake on ICU days 4 and 5 suggests a more conservative fluid approach after initial resuscitation.
- The higher rate of MV in HF patients may have been a result of hypervolemia.
- HF patients were treated more aggressively with earlier initiation of second-line agents.
- The study was limited by small sample size and lack of severity of illness scores, which may have differed between groups.
- Future research will examine these differences in treatment strategies and outcomes in HF patients in a larger, multicenter cohort.

## REFERENCES

Fleischmann C, Scherag A, Adhikari NK, et al. Assessment of Global Incidence and Mortality of Hospital-treated Sepsis. Current Estimates and Limitations. *Am J Respir Crit Care Med* 2016; 193(3): 259-72.