Mass General Brigham
Healthcare at Home

Point-of-Care Testing vs. Core Laboratory Testing in Home Hospital Patients with Acute Decompensated Heart Failure: A Retrospective Cohort Study

Minjia Yu, MD PHD[1,2]; Henry Ssemaganda, MD MS[1] ; Saheba Shaikh, MPH[1]; Nancy Anoruo, MD MPH[1,2]; David M Levine, MD MPH MA[1,2]
Mass General Brigham[1], Harvard Medical School[2]

Background

- Home Hospital (HH) increasingly manages complex acute illness, including acute decompensated heart failure (ADHF).
- Timely electrolyte and renal monitoring is important during IV diuresis.
- Point-of-care testing (POCT) can provide rapid results in the home, but its association with clinical outcomes in HH patients with ADHF is not well established.

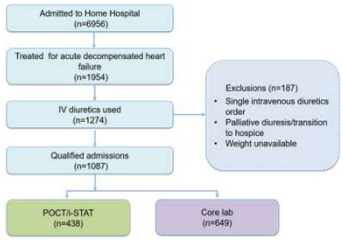


objective

➢ To compare clinical outcomes between POCT/Istat and core laboratory testing in HH patients with ADHF.

Methods

- **Study design:** Retrospective cohort study; Quality improvement study
- **Study period:** 11/12/2022-7/31/2025
- **Population:** HH patients with ADHF receiving IV diuresis



Key variables

- **Primary outcome:** weight loss per hour of IV diuresis
- **Secondary outcomes:** HH LOS, AKI, hypo/hyperkalemia, escalation to hospital/ED, 30d readmission/ED visit
- **Covariates:** demographics, comorbidities, vitals/labs, home medications, first diuretic dose, GWTG-HF score

Cohort

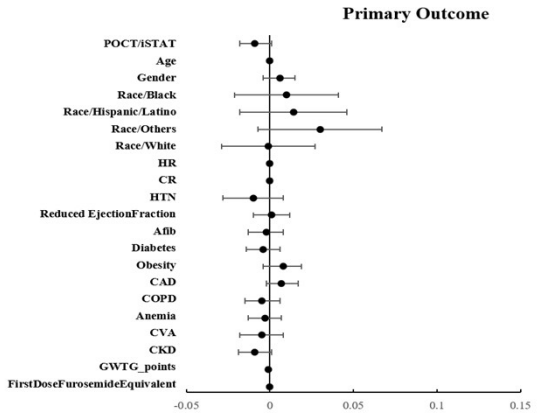
POCT	CORE LAB
438	649
40.3%	59.7%

Mean age 79.5 years • 51.8% women
68.8% atrial fibrillation • 58.4% CAD • 60.3% obesity

CKD: 65.1% POCT vs 57.2% core (P = 0.007)
Anemia: 66.9% POCT vs 59.2% core (P = 0.010)

Primary Outcome

Adjusted Associations With Weight Loss per Hour of IV Diuresis

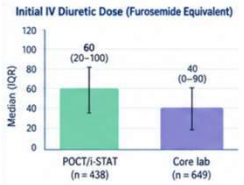


≈ −0.01
adjusted estimate

P = 0.051
95% CI ≈ −0.019 to 0

No statistically significant difference in weight loss per hour of IV diuresis after adjustment.

Secondary Outcomes



Initial IV furosemide-equivalent dose: 60 vs 40 mg; P < 0.001

Outcome	POCT vs Core Lab (estimate/OR, 95% CI)	P value
HH LOS(days)	↑	<0.01
AKI(KDIGO)	↑	0.03
Hypokalemia (<3.5)	↑	0.04
Hyperkalemia(>5)	No difference	0.28
Escalation to hospital/ED	↑	0.01
30D readmission/ED visits	No difference	0.43

Discussion

- POCT was not associated with greater weight loss per hour after adjustment.
- Patients receiving POCT had greater baseline clinical complexity, including higher rates of CKD and anemia, and received higher initial IV diuretic doses.
- POCT was associated with longer HH length of stay and higher rates of diuresis-related complications/escalation.
- There associations may reflect clinical complexity and clinician selection for POCT, rather than a direct effect of POCT itself.
- No significant difference in 30-day ED visit/readmission was observed.

Conclusions

In this retrospective cohort of HH patients with ADHF, POCT/iSTAT was not associated with improved weight loss per hour after adjustment. POCT use was associated with longer LOS and more diuresis-related complications/escalation, potentially reflecting greater clinical complexity and clinician selection.

Limitations

- Retrospective, observational design
- Potential residual confounding by illness severity and clinician selection
- Potential variability in weight measurement timing/completeness
- Single health-system setting

Future Directions

- Prospective studies to validate findings
- Identify patient subgroups who may benefit from POCT
- Standardize diuresis protocols and POCT use in HH
- Evaluate cost-effectiveness and patient-centered outcomes

References:
1. Aditya A, et al. Home Hospital Outcomes for Acute Decompensated Heart Failure and Factors Associated With Escalation of Care. *Circulation: Cardiovascular Quality and Outcomes. 2024*
2. Fonarow GC. Risk stratification for in-hospital mortality in acutely decompensated heart failure: classification and regression tree analysis. *JAMA. 2005*
3. Hasselblad V. Relation Between Dose of Loop Diuretics and Outcomes in a Heart Failure Population: Results of the ESCAPE Trial. *Eur J Heart Fail. 2007*
4. Pidetcha P. Accuracy and precision of the i-STAT portable clinical analyzer: an analytical point of view. *J Med Assoc 2000*
5. Steinfelder-Visscher J. Evaluation of the i-STAT Point-of-Care Analyzer in Critically Ill Adult Patients. *J Extra Corpor Technol. 2008*
6. Parvin CA. Impact of point-of-care testing on patients' length of stay in a large emergency department. *Clin Chem. 1996*