

Characterization of Rehospitalization rates and Diuresis for Heart Failure exacerbations in Surrey (RAD-HF)



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Background

- Patients with heart failure (HF) have frequent hospitalizations for acute decompensated heart failure (ADHF)
- IV diuresis is the mainstay of therapy for symptomatic relief of volume overload during hospitalization in the ED
- Patients often have difficulty maintaining euvolemia after discharge despite optimization of oral HF therapies
- Published literature suggests outpatient IV diuresis clinics for ADHF has been shown to potentially reduce HF rehospitalization and healthcare costs
- Jim Pattison Outpatient Care and Surgery Centre (JPOCSC) at Surrey, BC has a Heart Function Clinic (HFC) for management of HF pharmacotherapy post hospital discharge; currently outpatient IV diuresis is not offered due to unclear patient needs, no site specific data, and lack of dedicated resources

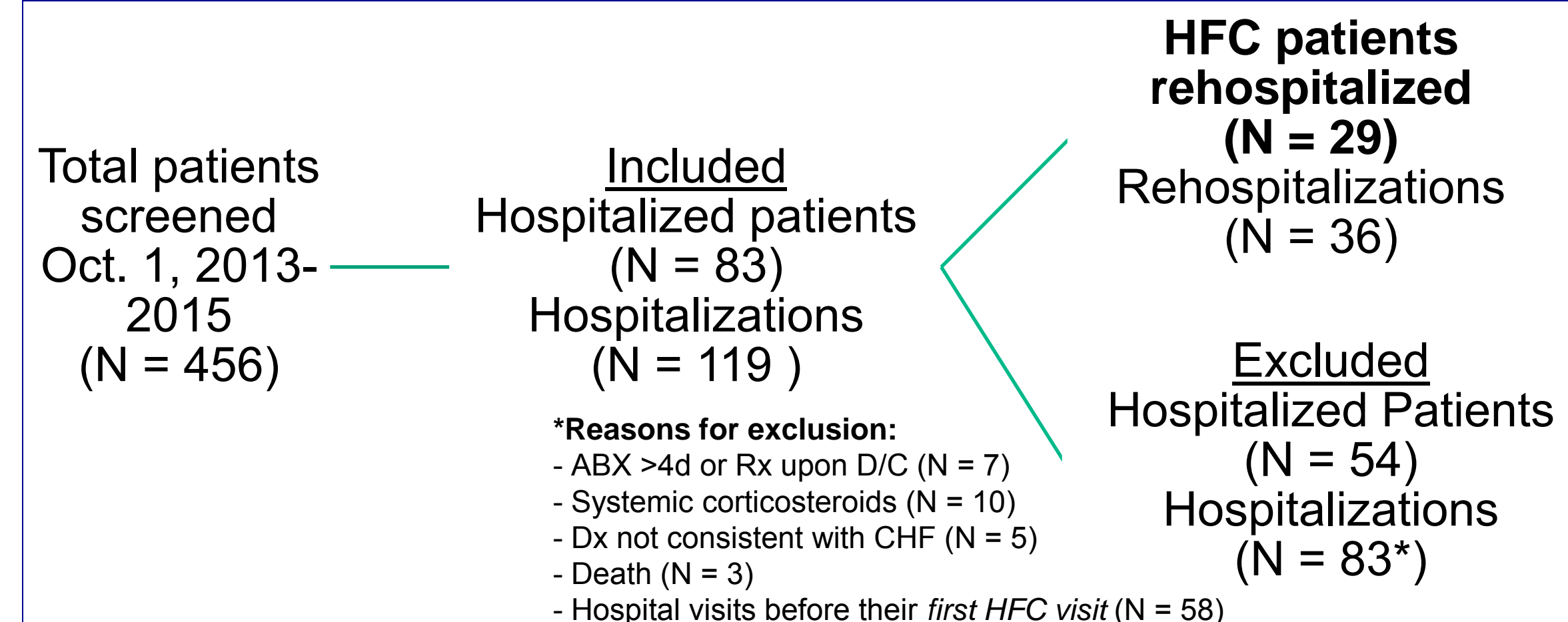
Objectives

- Primary:**
 - To determine the rate of rehospitalization of HFC patients that receive primarily IV diuresis within 30 days, 90 days, and at 1 year following their first HFC visit
- Secondary:**
 - To determine the number and average number of rehospitalizations, duration and average duration of each hospital stay, and dose and duration of IV furosemide received in patients within 1 year of their first HFC visit
 - To determine the percent of HFC that have a follow up appointment or telephone visit within 30 days of hospital discharge

Methods

- Design:** Retrospective Chart Review
- Inclusion Criteria:** HFC patients managed at JPOCSC from Oct. 1, 2013 to 2015, hospitalization* at Surrey Memorial Hospital (SMH) for less than 5 days, and received at least one dose of IV furosemide
 - *Reason for visit terms: "CHF", "HF", "AHF", "ADHF", "congestive heart failure", "heart failure", "pulmonary edema", "pulmonary congestion", "flash pulmonary edema", "pneumonia", "respiratory distress", "shortness of breath", "dyspnea", "COPD", "AECOPD", "MI", or "ACS"
- Exclusion Criteria:** Fever ($\geq 38^{\circ}\text{C}$) plus leukocytosis ($\text{WBC} > 11 \times 10^9/\text{L}$), positive sputum culture, antibiotics for > 4 days or prescribed upon discharge, initiation of systemic corticosteroids, or any diagnosis not consistent with heart failure*
 - *Diagnosis such as COPD exacerbation, interstitial pulmonary fibrosis, acute respiratory distress syndrome, lung metastasis, etc.

Fig 1: Flowchart of included patients



Tab 1: Primary Outcome of Rehospitalization

Rehospitalizations	No. (%) (N = total patients 456)
Within 30 days	6 (1.3)
Within 90 days	12 (2.6)
Within 1 year	25* (5.5)

*Data for Figs 2, 3, 4, Tabs 2 and 3 calculated based on these 25 patients

Fig 2: Rehospitalization visits

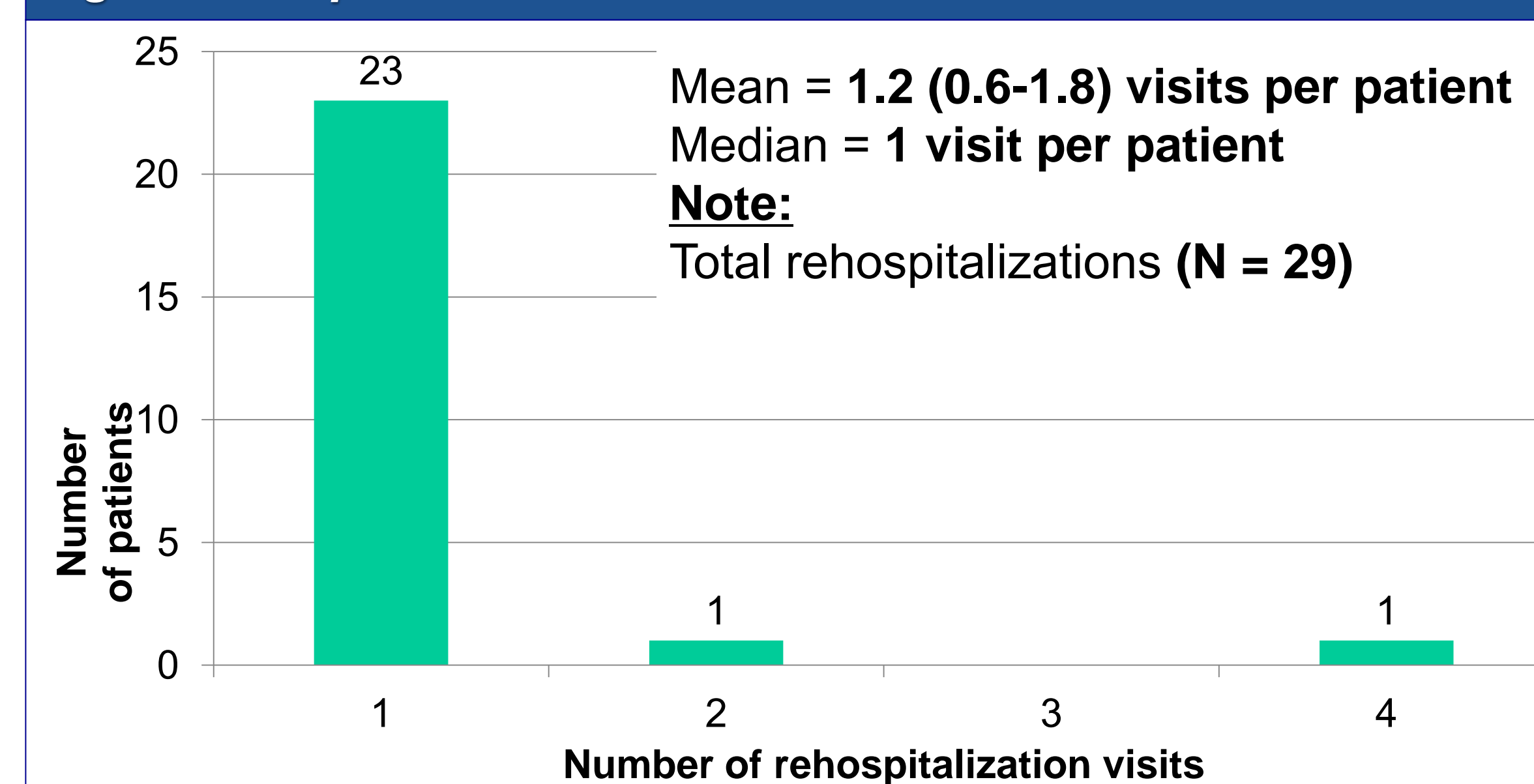


Fig 3: Duration of hospital stay

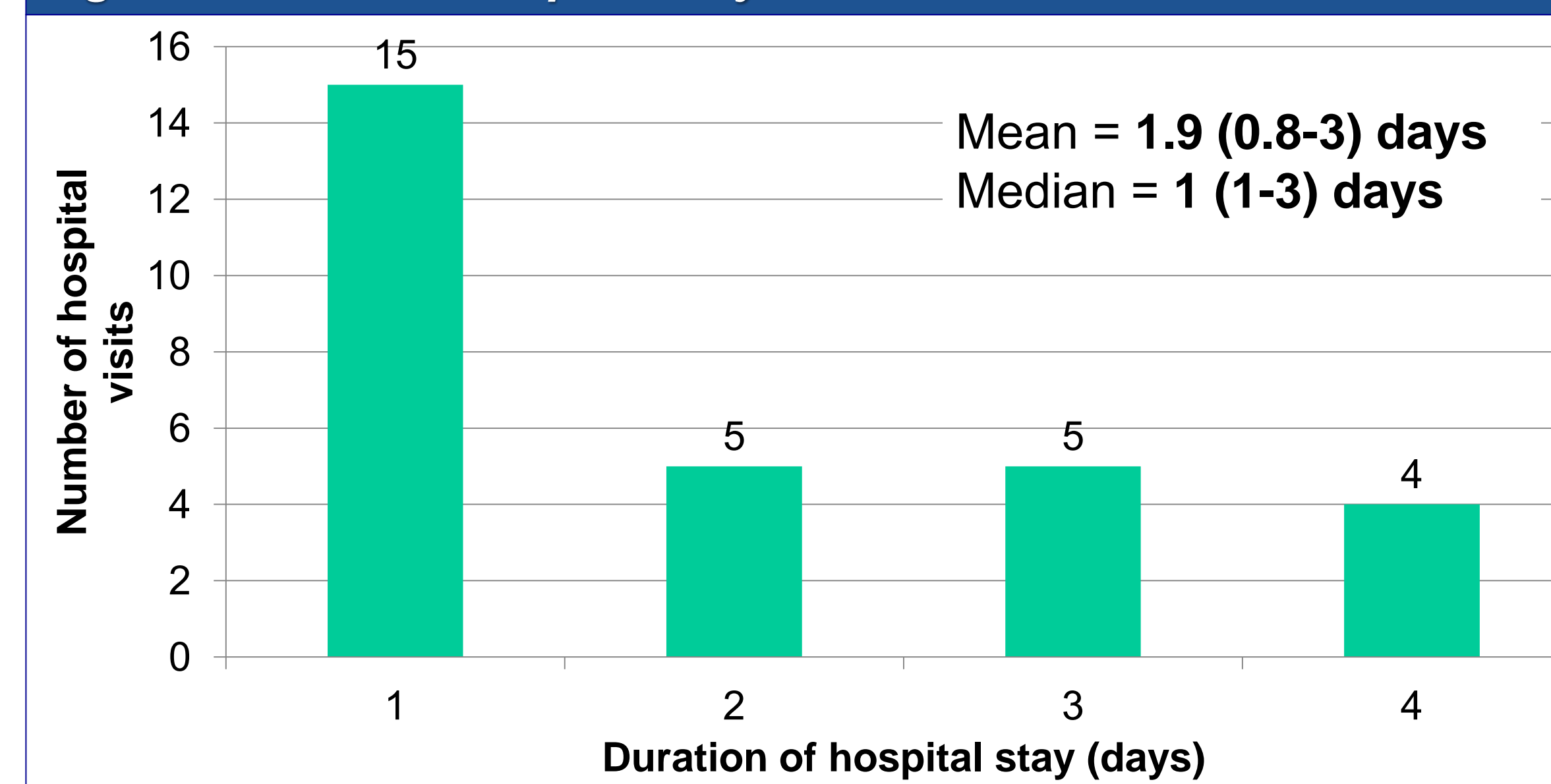
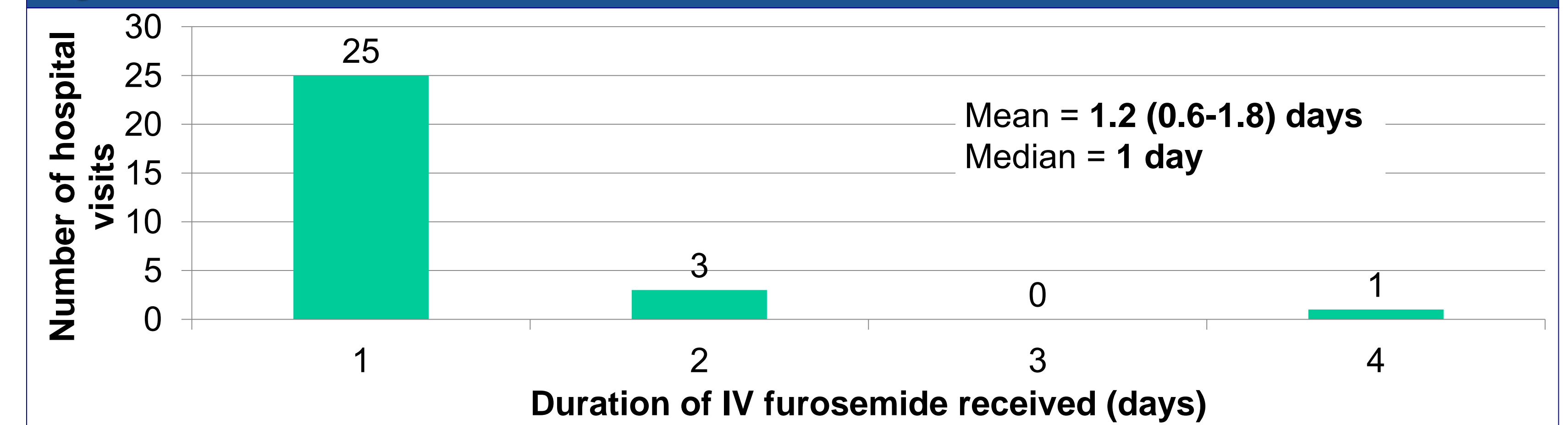


Fig 4: Duration of IV furosemide received



Tab 2: IV furosemide received from days 1-4

Outcomes	Day 1	Day 2	Day 3	Day 4
# of patients (N = total 25 patients) receiving IV furosemide:	23*	5*	1*	1*
% of patients receiving IV furosemide:	92 [†]	20 [†]	4 [†]	4 [†]
Mean (mg)	66.7 (28-106)	68 (29-107)	160	80
Median (mg)	60 (40-80)	80 (40-80)	160	80

*numbers do not add up to N = 25; one patient may receive IV furosemide on multiple days

[†]percents do not add up to 100%; one patient may receive IV furosemide on multiple days

Tab 3: Follow up within 30 days after hospitalization

Follow up within 30 days	No. (%) (N = total rehospitalizations 29)
Yes	12 (41%)
No	
Rehospitalization within 30 days	4 (14%)
Education only*	2 (7%)
No show for follow up appointment	2 (7%)
Follow up after 30 days	1 (3%)
Unknown reason or not documented	8 (28%)

*Attended the HFC for an education session only; follow up not routine

Limitations

- Short term study
 - Full 1 year data not available in all patients; may underestimate rehospitalization rates
- Retrospective study design
 - Outcomes based on documentation in chart and EMR
- Exclusion criteria may be too conservative (ie. ABX < 4 days and no steroids)
 - Outpatient clinics could potentially prescribe antibiotics or oral prednisone
- Data for hospitalizations at SMH only
 - May underestimate rehospitalization rate if admitted to other hospitals
- Many patients treated for co-morbidities (ie. salbutamol for COPD)
 - Unknown whether these patients benefited from diuresis alone
- Multiple non-modifiable reasons for lack of follow up
 - May overestimate patient non-compliance and rates of no follow up

Conclusions

- A small percentage of HFC patients are rehospitalized for only a short course of low dose IV furosemide
- Access to outpatient IV diuresis at JPOCSC may be of use to alleviate ADHF rehospitalizations
- Better characterization of reasons for no follow up may lead to improvement in patient care and outpatient clinic visits