

Iron Sucrose Utilization in Heart Failure: A Quality Improvement Initiative

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Introduction

- 2022 AHA/ACC Heart Failure Guidelines recommend the use of intravenous (IV) iron in patients with heart failure with reduced ejection fraction and iron deficiency with or without anemia to improve functional status, quality of life, and decrease heart failure hospitalizations¹.
- The IRONOUT HF trial showed oral iron supplementation in this population does not provide an adequate result due to poor absorption and inadequacy to replete iron stores^{2,1}.
- Administering IV iron while inpatient also comes at a cost to the healthcare system, it is not a medication that the healthcare system gets reimbursed for if administered inpatient, but the healthcare system does get a reimbursement and an administration fee if given outpatient.
- The purpose of this study is to assess appropriateness of inpatient IV iron use in heart failure patients.

Methods

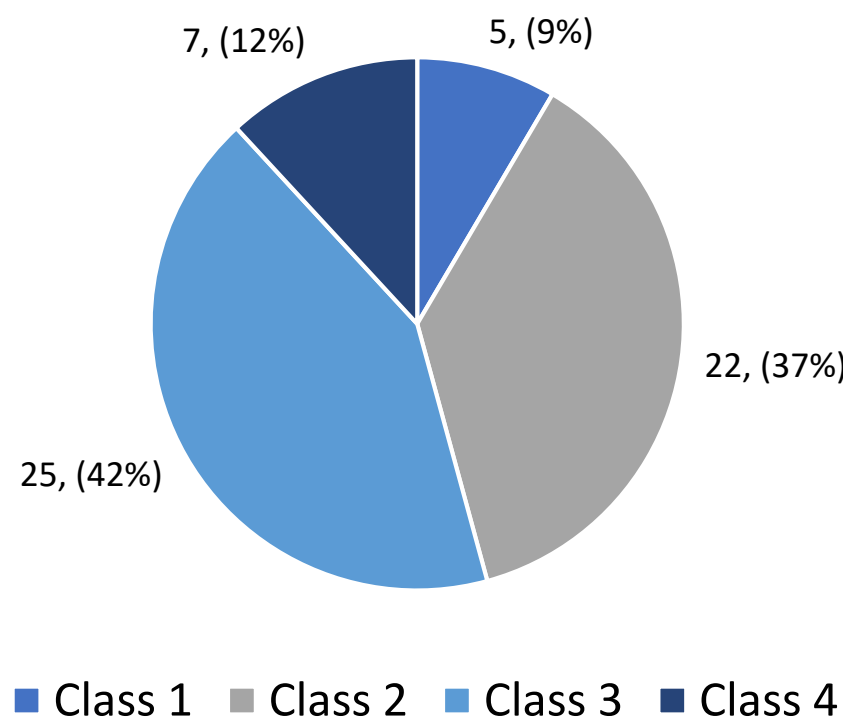
- Single-center, retrospective analysis of patients who received IV iron sucrose while inpatient between May 1 and August 25, 2024, at Rochester General Hospital.
- Inclusion Criteria:** 18 years of age or older, new or previously diagnosed heart failure.
- Exclusion Criteria:** Clinical evidence of active malignancy, end stage renal disease, chronic kidney disease, and pregnancy.
- Primary Objective:** To determine the appropriateness of inpatient IV iron therapy administration, as recommended in the 2022 AHA/ACC Heart Failure Guidelines.
 - Appropriate use defined as: Patients with HFrEF with a transferrin saturation (TSAT) < 20% and Ferritin 100-299 µg/L or Ferritin < 100 µg/L
- Secondary Objectives:** The 30-day readmission rate within the Rochester Regional Health System after receiving IV iron sucrose and cost evaluation of inpatient IV iron administration compared to outpatient administration.

Results

Table 1. Baseline Demographics (n=59)	
Age in years, Mean ±SD	71.9 ± 13.2
Male, n (%)	30 (51)
Serum Creatinine in mg/dL , Mean ±SD	1.2 ±0.5
GFR > 60, n (%) ^a	32 (54)
Comorbid Conditions, n (%)	
Atrial Fibrillation/ Atrial Flutter	26 (44)
COPD/ History of COPD	18 (31)
Heart Failure Specific Characteristics	
New Diagnosis of Heart Failure, n (%)	9 (15.1)
Left Ventricular Ejection Fraction, Mean ±SD	44.4 ±18.9
Iron Studies, Mean ± SD	
Hemoglobin at the time IV iron was ordered	10.3 ± 2.3
Ferritin	65.1 ± 76
TSAT	8.7 ± 5.9

^a Unable to conduct a full analysis on patients GFR's because of limitations with reporting in epic, GFRs >60 are reported as so and don't report a specific number.

NYHA Classification Among the Study Population, n (%)



64.4% of the patients that received IV iron in this analysis did not meet the guideline criteria for the use of IV iron in heart failure.

There was a statistically significant difference in if in the patient received a heart failure consult or not in the patients who IV iron was not appropriate for. Those who did not receive a HF consult had a 57.8% higher rate of inappropriate usage.

There is a significant cost burden to the health system when administering IV iron inpatient, this can be reduced by eliminating inappropriate administrations and administering at an outpatient clinic when possible.

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Discussion

- The guidelines define HFrEF as ejection fraction < 40%, therefore for appropriate use in this analysis the patient must have an EF < 40%. The AFFIRM HF trial used an EF cutoff of less than 50%, other studies use a cutoff of less than 45%. There is limited data supporting the usage in patients with an EF > 50%.
- The mean of the total cumulative dose of IV iron given to patients was 713mg, this was calculated with a 95% confidence interval of (629, 797). The number of doses also varied with the minimum seen being 1 dose to the max recorded being 8 doses.
- Cost Evaluation:**
 - On the inpatient side, each vial of 100mg of IV iron is purchased at \$58.94, this makes the cost of that average total cumulative dose of IV iron while inpatient \$420.24.
 - When a patient receives IV iron sucrose while inpatient the hospital does not receive reimbursement for that medication.
 - On the outpatient side, each vial of 100mg of IV iron can be purchased at 340B pricing so, each 100mg vial is \$25.49. This makes the overall cost of a cumulative 713mgs to be \$181.74.
 - IV iron sucrose given outpatient is reimbursed at a bundled rate with an administration fee in it. Each dose the patient receives the reimbursement is \$200 dollars to the health system.
- 14 of the patients included in the study received blood transfusions during their hospitalizations, these patients may not have needed the IV iron supplementation but there is little data that looks at the effects of blood transfusions and IV iron.

Results

Figure 1. Appropriateness of IV Iron Administration

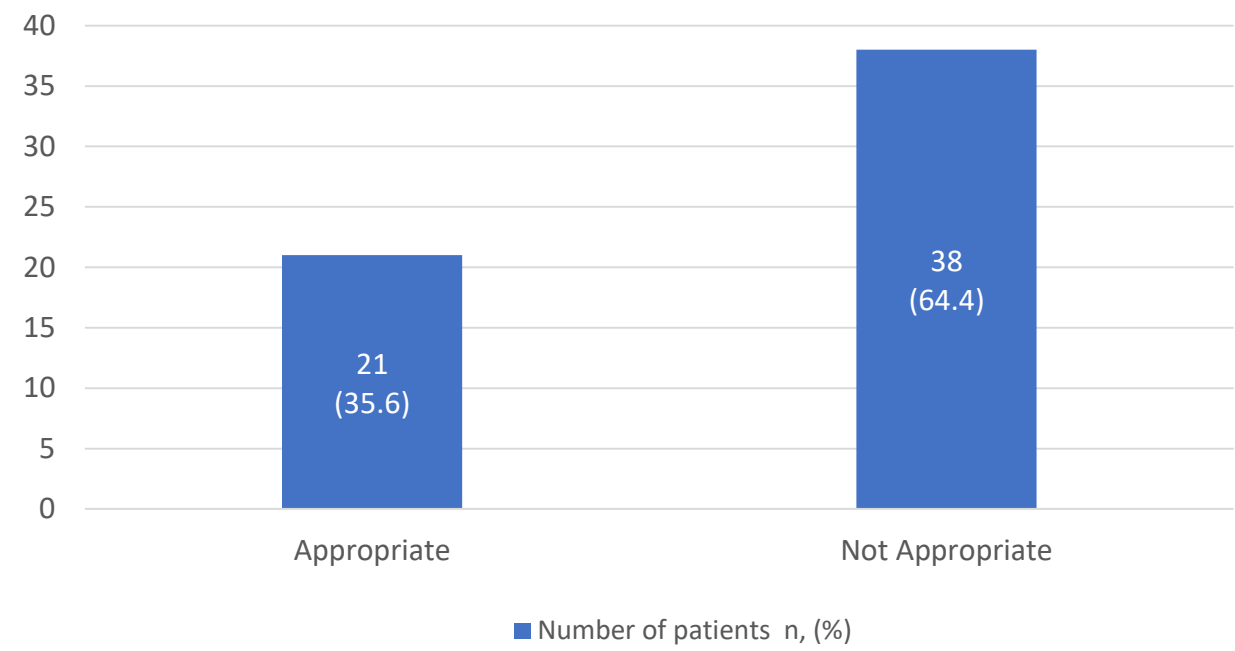
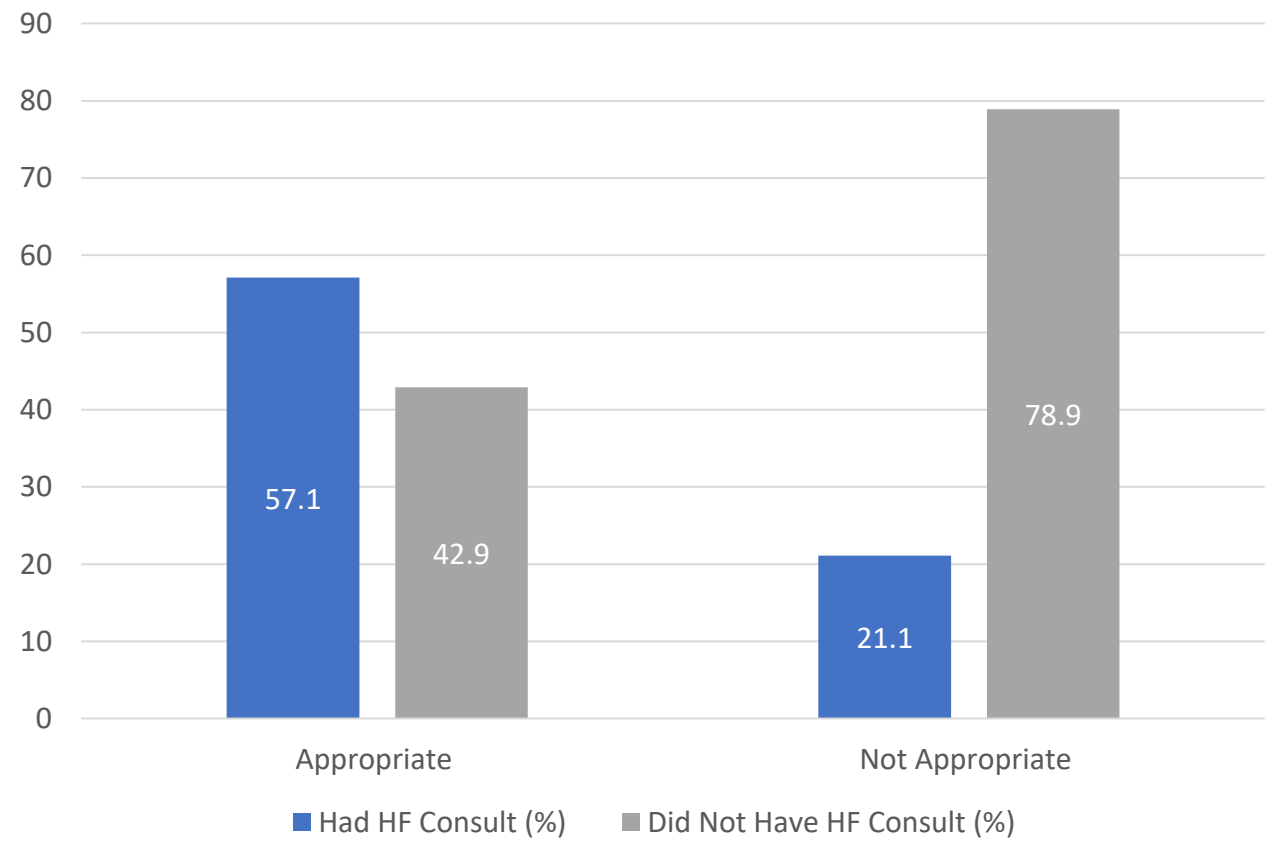
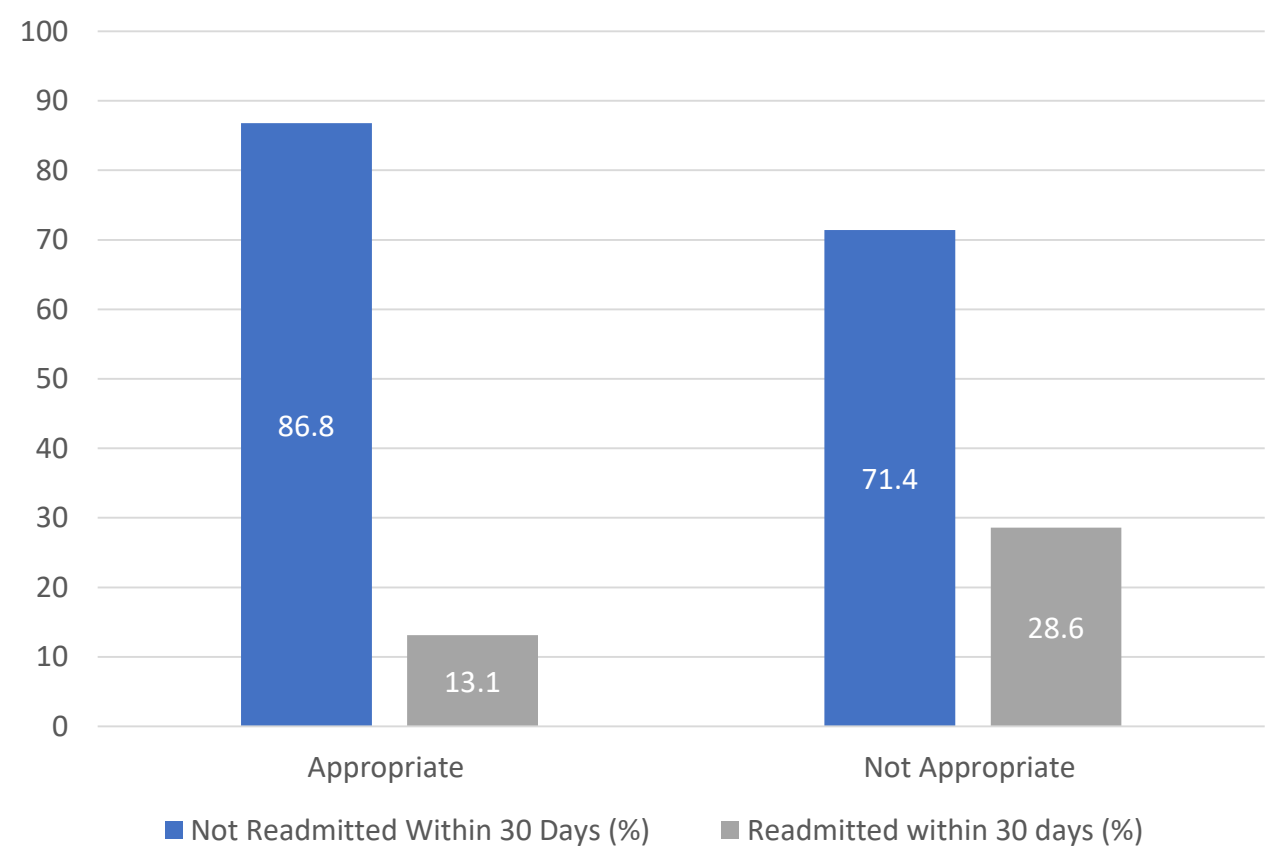


Figure 2. Percent of Patients Who Received HF Consults



The inappropriate use of iron was 57.8% higher in the patient's that did not have a HF consult (p=0.005)

Figure 3. 30-day Readmission Rate After Receiving IV Iron



Readmission was 42.8% lower in patients in whom iron use was appropriate (p=0.146)

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ASHP Midyear Clinical Meeting 2024

The authors have nothing to disclose.

References
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