

Background

Readmission of patients with heart failure (HF) is associated with increased mortality, morbidity and costs of care[1-3]. Many interventions have been implemented with mixed evidence of decreasing readmissions[4]. Despite suboptimal provider adherence to best practices[5], relatively few have focused on improving provider education and adherence to national practice guidelines [6].

Hypothesis

Resident knowledge of national discharge guidelines and best treatment practices for acute systolic heart failure can be improved through routine exposure to a guidelines-based educational tool routinely placed on the patient's hospital chart - the Heart Failure Admission Navigator (HFAN) tool.

Methods

All patients and internal medicine residents receiving or providing care for HF on four inpatient cardiology services at a large academic hospital were enrolled in the study. Residents and the patients under their care, were randomly assigned to intervention and control arms by cardiology team in 1:1 fashion.

Resident knowledge of national discharge guidelines and best treatment practices for acute systolic HF were assessed at the beginning and end of their month rotation in both groups by a Management And Discharge Evaluation (MADE). The Residents in the intervention arm received brief orientation at the beginning of the month and all patients admitted to their service had a Heart Failure Admission Navigator (HFAN) tool placed in the medical chart.

The HFAN pairs evidence-based national best practices with local practice information in a one-page document to provide a practical discharge readiness checklist (see below).

The MADE score consists of twenty-one points comprised of questions drawn from major society clinical guidelines documents.

Baseline differences in provider characteristics were made by Fisher's Exact test and differences in test scores were assessed by paired and unpaired t-test.

NOT PART OF MEDICAL RECORD—MEDICAL RECORDS, PLEASE CONTACT ADAM CARLISLE IF FOUND— 394-5620

Admitting Service: _____
 Admission Date: _____
 Discharge Date: _____
 Follow-up Appt. Time & Provider: _____
 # Prev. Hosp. last 12 months: _____

Heart Failure Society of America Discharge Criteria	
All heart failure patients	<input type="checkbox"/> Exacerbating factors addressed. <input type="checkbox"/> Near optimal volume status observed. <input type="checkbox"/> Transition from intravenous to oral diuretic successfully completed. <input type="checkbox"/> Patient and family education completed, including clear discharge instructions. <input type="checkbox"/> Left ventricular ejection fraction (LVEF) documented <input type="checkbox"/> Smoking cessation counseling initiated <input type="checkbox"/> Near optimal pharmacologic therapy achieved (see below) <input type="checkbox"/> Follow-up clinic visit scheduled, usually for 7 to 10 days
Patients with advanced HF, or recurrent admissions	<input type="checkbox"/> Oral medication regimen stable for 24 hours <input type="checkbox"/> No intravenous vasodilator or inotropic agent for 24 hours <input type="checkbox"/> Ambulation before discharge to assess functional capacity after therapy <input type="checkbox"/> Plans for postdischarge management (scale present in home, visiting nurse or telephone follow up generally no longer than 3 days after discharge) <input type="checkbox"/> Referral for disease management (see resources on back of sheet)

CHANGES IN CLINICAL STATUS

- 1) What is the change in weight from admission to discharge? _____
- 2) What is the JVP at discharge? < 6 cm H2O 6-12 cm H2O >12 cm H2O
- 3) What is the degree of orthopnea at discharge? None 1 pillow 2 pillows 3+ pillows
- 4) What is the degree of edema at discharge? None Trace 1+ pitting 2+ pitting
- 5) Does your patient meet the above HFSA discharge criteria? Yes No
- 6) Is this patient at above average risk of readmission within 30 days? Yes No

Medication Class	Medication Name	Admit Dose	Disch. Dose	Reason if stop or ↓	Red Flag
Beta-blocker					Not Rx @ discharge
ACE inhibitor					Not Rx @ discharge
ARB					No ACEi or ARB
Aldo. Antag.					
Nitrate					
Hydralazine					
Digoxin					Dose > 0.125 mg/d
Coumadin					New interacting Rx
Diuretic*					Discharge Rx < admit

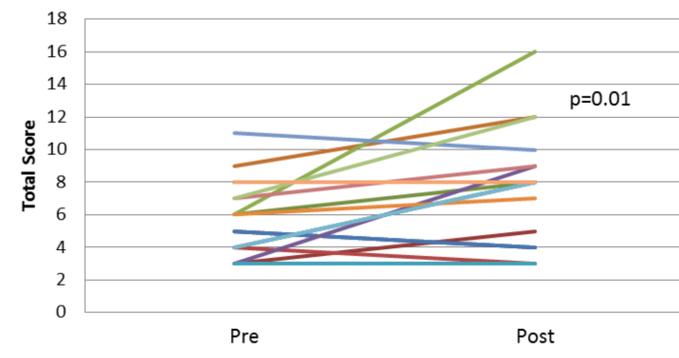
Heart Failure Admission Navigator (HFAN)

Results

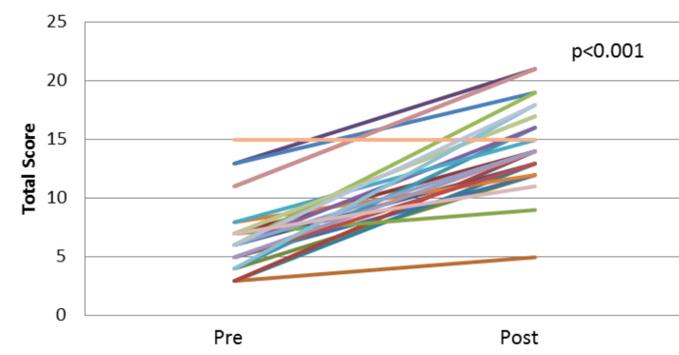
A total of 44 residents (26 intervention, 18 control) had data from pre-test and post-test available for analysis. There was a non-significantly higher proportion of interns in the intervention group compared to the control group (41% vs. 30%). No other provider characteristics were analyzed.

Pre-test scores were similar in residents assigned to control and intervention arms with a mean score of 6.9 (SD 3.2) in the intervention group and 5.9 (SD 2.3) in the control group. Post-test scores in the intervention arm were nearly double the score in the control arm (15 vs. 7.9, $p < 0.001$) and the average increase in score from pre-test to post-test was 8 in the intervention arm vs 2 in the control arm ($p < 0.001$). The smaller increase in scores from pre-test to post-test in the control arm was also statistically significant ($p = 0.01$).

Total Score - Control Arm



Total Score - Intervention Arm



Discussion

A chart-based simple document highlighting guidelines-based practice recommendations resulted in improved housestaff knowledge in caring for patients hospitalized for acute decompensated heart failure.

Further study and longer follow-up is necessary to determine if patient outcomes such as rates of readmission or death or process measures such as adequacy of decongestion, discharge clinical stability, and evidence-based pharmacotherapy before discharge are improved by this educational and systems intervention. Additionally, the long-term benefit of the intervention on provider knowledge of guidelines-based practice in heart failure is not known and needs to be assessed.

However these preliminary data suggest that the use of the HFAN tool can significantly increase provider knowledge of best practices for patients with acute systolic heart failure.

References

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Acknowledgements

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