Effect of a Hospital and Post-discharge Quality Improvement Intervention on Clinical Outcomes and Quality of Care for Patients With Heart Failure With Reduced Ejection Fraction

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Presenting on behalf of the CONNECT-HF Investigators and Committees
Disclosures

• The presenter reports research funding through his institution from Novartis and has provided consulting services for Novartis.

• CONNECT-HF was funded by Novartis through an investigator-initiated trial program.
Background

- Heart failure with reduced ejection fraction (HFrEF) affects >3 million in US
- Suboptimal outcomes with high rates of rehospitalization and death
- Low use of guideline-directed medical therapy (GDMT) for HFrEF

CHAMP-HF GDMT Use for HFrEF Among Eligible Patients (%)
Background

- Limited data available to inform best practices for hospital and post-discharge quality improvement initiatives

- CONNECT-HF was designed as a pragmatic, prospective, cluster-randomized trial to assess the effect of a hospital and post-discharge quality improvement intervention compared with usual care
Rationale

The CONNECT-HF Intervention:

• Audit and feedback to hospitals on HF processes of care and outcomes

• Education and mentorship to hospitals by the CONNECT-HF Academy

“The strategies of audit and feedback and educational outreach visits were generally effective in improving both process of care and clinical outcomes... multifaceted interventions appeared to be more effective.”
Primary Hypothesis

The intervention would improve clinical outcomes as measured by rates of HF rehospitalization or death and quality-of-care delivery over 12 months of follow-up compared to usual care.
Study Design

US hospitals with capacity to be randomized to a system-based HF quality improvement intervention

1:1 randomization

Intervention

Usual Care

Enroll patients admitted with ADHF and LVEF ≤40% in CONNECT-HF

Co-primary Endpoints:

• Composite of HF rehospitalization or death
• Change in an opportunity-based composite score for HF quality
Study Design

US hospitals with capacity to be randomized to a system-based HF quality improvement intervention

1:1 randomization

Intervention

Usual Care

Enroll patients admitted with ADHF and LVEF ≤40% in CONNECT-HF

Powered for the composite of HF rehospitalization or death to detect a 15% difference between intervention and usual care (n=160 sites, 6240 patients yielded 85% power)
Key Eligibility Criteria

Hospitals

• Treat >50 patients with acute HF annually
• The capacity to perform a system-based QI intervention
Study Design

Hospital Enrollment

n=161 hospitals, 5647 patients

Ongoing HF treatment per local care patterns and clinics

Study follow-up for 12 months through centralized call-center to patients for medication changes and clinical outcomes
## Site Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Intervention (N=82)</th>
<th>Usual Care (N=79)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital size (no of beds)</td>
<td>431 ± 271</td>
<td>454 ± 261</td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northeast</td>
<td>17%</td>
<td>15%</td>
</tr>
<tr>
<td>West</td>
<td>12%</td>
<td>13%</td>
</tr>
<tr>
<td>South</td>
<td>52%</td>
<td>41%</td>
</tr>
<tr>
<td>Midwest</td>
<td>18%</td>
<td>32%</td>
</tr>
<tr>
<td>Teaching hospital</td>
<td>20%</td>
<td>24%</td>
</tr>
<tr>
<td>Interventional cardiology services</td>
<td>97%</td>
<td>97%</td>
</tr>
</tbody>
</table>
## Patient Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Intervention (N=2675)</th>
<th>Usual Care (N=2972)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age, years, mean±SD</strong></td>
<td>62 ± 14</td>
<td>63 ± 13</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>33%</td>
<td>34%</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>56%</td>
<td>56%</td>
</tr>
<tr>
<td>Black</td>
<td>36%</td>
<td>41%</td>
</tr>
<tr>
<td>Asian</td>
<td>3%</td>
<td>1%</td>
</tr>
<tr>
<td><strong>LVEF, %, mean±SD</strong></td>
<td>26 ± 8</td>
<td>25 ± 8</td>
</tr>
<tr>
<td><strong>Recent HF Admissions:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>24%</td>
<td>26%</td>
</tr>
<tr>
<td>≥2</td>
<td>24%</td>
<td>24%</td>
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</tbody>
</table>
Primary Outcome: HF Rehospitalization or Death

Adjusted HR 0.92 (0.81 to 1.05)
P=0.21
Primary Outcome: Composite Quality Score

Change in Composite Quality Score: +2.3% vs -1.0%, between-group difference of +3.3% (95% CI -0.8 to 7.3)
Adjusted Odds Ratio of Higher Score: 1.06 (0.93 to 1.21), P=0.35
Individual Quality Measures

Usual Care: Individual Quality Measures

- > 50% target dose ACE/ARB/ARNi: 28.1 (Baseline) 25.4 (Last follow-up)
- > 50% target dose evidence based Beta Blocker: 36.2 (Baseline) 32.4 (Last follow-up)
- MRA: 39.8 (Baseline) 36.4 (Last follow-up)
- Anticoagulation for Afib: 77.2 (Baseline) 75.2 (Last follow-up)
- Disease Management: 55.3 (Baseline) 56.5 (Last follow-up)
- ICD/CRT: 60.3 (Baseline) 68.0 (Last follow-up)

Intervention: Individual Quality Measures

- > 50% target dose ACE/ARB/ARNi: 27.7 (Baseline) 25.1 (Last follow-up)
- > 50% target dose evidence based Beta Blocker: 33.6 (Baseline) 31.3 (Last follow-up)
- MRA: 34.8 (Baseline) 36.0 (Last follow-up)
- Anticoagulation for Afib: 76.3 (Baseline) 74.9 (Last follow-up)
- Disease Management: 48.9 (Baseline) 58.8 (Last follow-up)
- ICD/CRT: 58.0 (Baseline) 65.6 (Last follow-up)
In this cluster-randomized trial of hospitals treating patients after a hospitalization for HFrEF, a hospital and post-discharge quality improvement intervention that focused on clinician education and audit and feedback of HF quality of care did not meaningfully improve HF outcomes or care above current quality improvement efforts.
Major gaps in guideline-directed care remain
- Low rates of ACEI/ARB/ARNI, evidence-based beta-blocker, and MRA

New approaches are needed to improve care above current quality improvement efforts for patients with HFrEF
- HF rehospitalization or death: 39% over 12 months of follow-up
- Fragmented nature of HF care in the US apparent during the study