Creating Systems of Care to Diagnose and Track Patients with Heart Failure

Keep your eye on the ball...

Larry Allen
Heart Failure Summit
April 12, 2017, Bethesda
Disclosures

- Grant funding: AHA, PCORI, NIH
- Consultant: Novartis, Janssen
- Employer: University of Colorado
Health systems do not consistently delivery high-value care

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Of eligible HFrEF patients:
- only receive spironolactone or eplerenone only 25% of the time
- only receive sacubitril/valsartan only 2.5% of the time

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**Triple Aim**

- Improving the patient experience of care
- Improving the health of populations
- Reducing the per capita cost of healthcare

**Quality Infrastructure**

- Administrative support
- Clinician leaders
- System changes
  - EMR
  - Standing orders
  - Critical pathways
  - Integrated care
- Benchmarking
- Data

**Therapeutic Innovation**

**Payment and Policies**
The course of Stage C HF

Onset of Symptoms → Symptomatic HF → Transition to Stage D (...Death)

MAJORITY of patients with HF and associated burdens and costs
The course of Stage C HF and opportunities along the way
The course of Stage C HF and opportunities along the way

Symptomatic HF

Timely Diagnosis

Case: 67yo F with progressive shortness of breath and cough. After a week, sees PCP, prescribed Z-pack. Persists, after 3 weeks, sees PCP again, prescribed levofloxacin. A week later taken to ED in florid pulmonary edema.
The course of Stage C HF and opportunities along the way

Timely Diagnosis

Symptomatic HF

Case: 67yo F with progressive shortness of breath and cough. After a week, sees PCP, prescribed Z-pack. Persists, after 3 weeks, sees PCP again, prescribed levofloxacin. A week later taken to ED in florid pulmonary edema.

Case: 35yo M with fatigue, RUQ abdominal pain. Gall bladder “sludge” on ultrasound. Taking to the OR for lap chole, when he becomes extremely hypotensive with induction of anesthesia. Stat echo shows LVEF 10%.
The course of Stage C HF and opportunities along the way

Symptomatic HF

Timely Diagnosis

Link Care to LVEF
The almighty ejection fraction

LVEF
How hard can it be?
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LVEF Field Coded

KPNC
PDF NLP

KPCO
Free text Manual

KPNW
Echo auto Nuclear

MGH
Unable

Utah
Solution A

Duke
Solution B

UCH
Solution C
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Interpretation Summary
The left ventricle is moderately dilated. Left ventricular systolic function is severely reduced. There is global severe hypokinesis/akinesis. The right ventricle is normal in size. Right ventricular function is moderately reduced. There is moderate mitral regurgitation. There is mild tricuspid regurgitation. Right ventricular systolic pressure is normal. The inferior vena cava is normal in size with respiratory indicating a right atrial pressure of approximately 3 mmHg. There is no comparison study available.

Procedure A complete transthoracic echocardiogram was obtained (Spectral and Color Flow Doppler imaging). Image (Definity) was administered to improve visualization of the left ventricular myocardium. Left Ventricle The left ventricle is moderately dilated. Left ventricular wall is severely reduced. Calculated biplane EF is 22.2%. There is global severe hypokinesis/akinesis. There is no evidence of a ventricular septal defect by 2D or color Doppler. There is no evidence of a thrombus in the left ventricle.
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The course of Stage C HF and opportunities along the way

Symptomatic HF

Timely Diagnosis

Automatic Identification

Link Care to LVEF
Deployed at all VA cath labs (N=78)

- **Point of care** data collection
- Standardized ACC NCDR *definitions*
- **Real-time** capture and feedback

Intelligent re-design

When a DES is implanted....

... automatic link to pharmacy; If patient does not pick up clopidogrel, patient contacted

IVR during follow-up: adherence & refill reminders, detect problems with meds
Who in your hospital has HF?

- ~$10,000/episode (70% HF $)
- Mean LOS 5 days
- Opportunities
  - Education
  - Rx optimization
- Coding retrospective
  - Admitting Dx nonspecific
  - Requires active approaches
The course of Stage C HF and opportunities along the way

Symptomatic HF

- Timely Diagnosis
- Link Care to LVEF
- Automatic Identification
- Integrated Risk Stratification
## Automated risk score display

### Allen HF Inpt

<table>
<thead>
<tr>
<th>Room/ Patient Name/Age/Sex</th>
<th>MRN</th>
<th>Admis Date</th>
<th>Length of Stay</th>
<th>Attending</th>
<th>Re-admitted Last 30 Days</th>
<th>Score</th>
<th>Score</th>
<th>Creatinine</th>
</tr>
</thead>
<tbody>
<tr>
<td>356/01</td>
<td>404908</td>
<td>11/6/166d 18h</td>
<td>81</td>
<td>Brieke, Andreas, MD</td>
<td>—</td>
<td>67</td>
<td>13</td>
<td>2.2 mg/dL</td>
</tr>
<tr>
<td>360/01</td>
<td>2310520</td>
<td>11/1... 1d 10h</td>
<td>81</td>
<td>Brieke, Andreas, MD</td>
<td>—</td>
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<td>2.2 mg/dL</td>
</tr>
<tr>
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<td>1817591</td>
<td>7/13/16123d</td>
<td>81</td>
<td>Brieke, Andreas, MD</td>
<td>▼</td>
<td>81</td>
<td>11</td>
<td>1.1 mg/dL</td>
</tr>
</tbody>
</table>
## Trigger high-intensity interventions

**Ancillary Consults**

<table>
<thead>
<tr>
<th>Consult Type</th>
<th>Reason for Consult</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient consult to Case Management, Social Work, Home Care</td>
<td>HF patient at high risk for frequent readmissions. Please assess for home care needs (e.g., medication management, home HF program, PT/OT, etc.) and/or placement needs (SNF, LTAC, etc.).</td>
</tr>
<tr>
<td>Inpatient consult to Smoking Cessation Program</td>
<td>Patient reports smoking within previous 12 months</td>
</tr>
<tr>
<td>Inpatient consult to Nutrition</td>
<td>Educate on low sodium diet and fluid intake</td>
</tr>
<tr>
<td>PT eval and treat</td>
<td>Deconditioning / worsening heart failure, assess placement needs</td>
</tr>
<tr>
<td>OT eval and treat</td>
<td>Worsening heart failure, assess placement needs</td>
</tr>
</tbody>
</table>
The course of Stage C HF and opportunities along the way

Symptomatic HF (Stage C)

- Timely Diagnosis
- Early In-hospital Identification
- Link Care to LVEF
- Integrated Risk Stratification
- Follow Patients Home
Integrating home-based data

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**Question #1:** How can we improve the diagnosis of symptomatic heart failure so that it is more timely and maps more specifically to the underlying cause?

**Question #2:** How can we improve the identification and tracking of patients with heart failure in order to target the appropriate interventions?

*Medical Innovation*

*Systems Redesign*

*Payment and Policy Reform*