The facts about congestive heart failure

The purpose of this analysis is to quantify the potential financial savings that can be achieved through improved compliance with evidence-based guidelines. The savings estimates are based on results of published research and an analysis of claims data for a commercial population.

Clinical significance

There are approximately 5 million people in the United States with congestive heart failure (CHF), and nearly 500,000 new cases are diagnosed each year. CHF results in 12 to 15 million office visits and 6.5 million hospital days each year. Nearly 300,000 patients die of CHF each year and the number of deaths has increased steadily despite advances in treatment. Once failure develops, studies show a five-year mortality rate approaching 50 percent.

Best research evidence

Use of beta-blockers is a Class I recommendation of the American College of Cardiology and the American Heart Association for all patients with stable heart failure due to left ventricular dysfunction. Like ACE inhibitors, beta-blockers can reduce the risk of death and the combined risk of death or hospitalization. Beta-blocker therapy results in a 30 percent reduction in hospitalizations due to worsening CHF.

Based on the findings of controlled clinical trials:

Impact of treatment

Hospitalizations due to worsening CHF can be reduced by 30 percent among patients taking beta-blocker therapy, from an incidence of 14.7 percent to 10 percent.

Based on a claims analysis of a health plan population:

Rate of non-compliance

In a typical commercial health plan population, 64 percent of patients with heart failure do not take or are not compliant with their beta-blocker medication.

Cost of non-compliance

Nationwide, the cost of inpatient hospital treatment for congestive heart failure was roughly $8,700 per patient in 2004.

Cost of therapy

Annual cost of beta-blocker medication for a fully adherent patient in 2003 was roughly $210 per patient.
Potential savings

Based on the above assumptions, improving compliance with beta-blocker medication could generate the following savings by reducing hospitalization due to worsening congestive heart failure:

**Commercially insured population**
(estimated prevalence = 1.2 per 1,000 health plan members)

- **$0.03** per member per month (PMPM)
- **$30,650** annually per 100,000 plan members
- **$225** annually per non-compliant heart failure patient

**Medicare risk population**
(estimated prevalence = 27.0 per 1,000 Medicare members)

- **$0.57** per member per month (PMPM)
- **$690,000** annually per 100,000 health plan members
- **$225** annually per non-compliant heart failure patient

Results using Symmetry® EBM Connect®

Optum™ Symmetry EBM Connect is a software engine that compares claims and laboratory results data with evidence-based practice guidelines to identify deviations in care. With Symmetry EBM Connect, users can view the rules for a specific condition and identify specific gaps in care. The entire set of rules for congestive heart failure is presented here, with the two rules that support this savings opportunity highlighted.

The following EBM Connect results are based on 3.4 million members with 12 months or greater medical benefit coverage (about 40 percent of these members did not have a pharmacy benefit).*

<table>
<thead>
<tr>
<th>Rule type</th>
<th>Measure description</th>
<th>Report rule ID</th>
<th>Results flagged ‘yes’</th>
<th>Results flagged ‘no’</th>
<th>Rule not applicable</th>
<th>No Rx</th>
<th>Total pts. with condition</th>
<th>EBM flag</th>
<th>Non-compliance rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-1</td>
<td>Patient(s) currently taking an ACE inhibitor or acceptable alternative</td>
<td>9136001</td>
<td>1,612</td>
<td>897</td>
<td>0</td>
<td>1,624</td>
<td>4,133</td>
<td>897</td>
<td>35.8%</td>
</tr>
<tr>
<td>R-1</td>
<td>Patient(s) currently taking a beta-blocker</td>
<td>9136002</td>
<td>1,384</td>
<td>1,125</td>
<td>0</td>
<td>1,624</td>
<td>4,133</td>
<td>1,125</td>
<td>44.8%</td>
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<tr>
<td>A</td>
<td>Patient(s) compliant with prescribed ACE inhibitor or acceptable alternative (minimum compliance 70 percent)</td>
<td>9137004</td>
<td>1,196</td>
<td>259</td>
<td>1,054</td>
<td>1,624</td>
<td>4,133</td>
<td>259</td>
<td>17.8%</td>
</tr>
<tr>
<td>A</td>
<td>Patient(s) compliant with prescribed beta-blocker (minimum compliance 70 percent)</td>
<td>9137005</td>
<td>1,009</td>
<td>231</td>
<td>1,269</td>
<td>1,624</td>
<td>4,133</td>
<td>231</td>
<td>18.6%</td>
</tr>
<tr>
<td>A</td>
<td>Patient(s) compliant with prescribed digoxin (minimum compliance 70 percent)</td>
<td>9137007</td>
<td>532</td>
<td>83</td>
<td>1,894</td>
<td>1,624</td>
<td>4,133</td>
<td>83</td>
<td>13.5%</td>
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<tr>
<td>S-M</td>
<td>Patient(s) taking ACE inhibitors, angiotensin receptor blockers, selective aldosterone receptor antagonists, or digoxin that had serum creatinine test</td>
<td>9138008</td>
<td>1,164</td>
<td>392</td>
<td>953</td>
<td>1,624</td>
<td>4,133</td>
<td>392</td>
<td>25.2%</td>
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<tr>
<td>S-M</td>
<td>Patient(s) taking ACE inhibitors, angiotensin receptor blockers, selective aldosterone receptor antagonists, or digoxin that had serum potassium test</td>
<td>9138009</td>
<td>1,168</td>
<td>388</td>
<td>953</td>
<td>1,624</td>
<td>4,133</td>
<td>388</td>
<td>24.9%</td>
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<tr>
<td>S-DI</td>
<td>Patient(s) taking contraindicated NSAID medication</td>
<td>9138013</td>
<td>351</td>
<td>2,158</td>
<td>0</td>
<td>1,624</td>
<td>4,133</td>
<td>351</td>
<td>14.0%</td>
</tr>
</tbody>
</table>

*Reporting software not included with EBM Connect.
### Rules glossary

<table>
<thead>
<tr>
<th>Rule type</th>
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<th>EBM flag</th>
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</tr>
</thead>
<tbody>
<tr>
<td>S-DI</td>
<td>Patient(s) taking contraindicated Class I anti-arrhythmic medication</td>
<td>9138014</td>
<td>26</td>
<td>2,483</td>
<td>0</td>
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<td>26</td>
<td>1.0%</td>
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<td>CP-C</td>
<td>Patient(s) with more than one echocardiogram in last reported 12 months excluding patients with a diagnosis of unstable angina or patients admitted for an acute MI</td>
<td>9139015</td>
<td>596</td>
<td>2,865</td>
<td>672</td>
<td>N/A</td>
<td>4,133</td>
<td>596</td>
<td>17.2%</td>
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<td>CP-I</td>
<td>Patient(s) having an annual physical assessment</td>
<td>9139016</td>
<td>3,775</td>
<td>358</td>
<td>0</td>
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<td>4,133</td>
<td>358</td>
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<td>CP-I</td>
<td>Patient(s) with indications that had a cardiology consult in last 24 reported months</td>
<td>9139017</td>
<td>597</td>
<td>67</td>
<td>3,469</td>
<td>N/A</td>
<td>4,133</td>
<td>67</td>
<td>10.1%</td>
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</tbody>
</table>

**View the specific rules applied by EBM Connect**

**View patient care measured by EBM Connect**

**View the number of patients included**

**Identify the largest opportunities for improving outcomes and savings**

### About the authors

**Janis Diring-Khan, MPH**  
Director, Quality Measurement  
OptumInsight  
Janis Diring-Khan is an epidemiologist and specialist in physician performance assessment. She has been a leader in the development of physician profiling, integrating complexity adjustment methodologies into utilization and cost profiling, and is responsible for the development of a nationwide clinical quality improvement program.

Diring-Khan received her Master of Public Health Degree in epidemiology from the University of Michigan School of Public Health in Ann Arbor. She completed her graduate internship in epidemiology at Ontario Cancer Institute in Toronto. Diring-Khan holds an Associate of Science Degree in Mathematics from Mott Community College in Flint, Michigan, as well as a Bachelor of Science Degree in Zoology from Michigan State University in East Lansing.

**Dr. Kay Schwebke, MD, MPH**  
Medical Director, Evidence-Based Medicine  
OptumInsight  
Dr. Kay Schwebke is board certified in Internal Medicine and Infectious Diseases. She currently is responsible for the clinical content of Symmetry EBM Connect and supervises the Innovations’ clinical consultant panel. In addition, Schwebke maintains a clinical practice at Hennepin County Medical Center (HCMC), is an assistant professor at the University of Minnesota and acts as the medical director of the HCMC HIV and hepatitis C co-infection clinic. She was medical director of a primary care clinic in southern Minnesota from 1996-1999, a laboratory consultant and medical director of the Allina Medical Clinics from 1992-2004, and the medical director of a long-term care facility from 2000-2010.
Schwebke received B.A. degrees in biology and psychology from the University of Minnesota. She received her M.D. degree at Mount Sinai School of Medicine in New York and completed her internal medicine residency and infectious diseases fellowship programs at the University of Minnesota. She completed a Masters in Public Health (Epidemiology) in 1995 and a Masters in Health Journalism in 2009.

Notes

a. Class I: Conditions for which there is evidence for and/or general agreement that the procedure or treatment is useful and effective.
b. Excludes Medicare.
c. Forty five percent of patients do not take, and an additional 19 percent of patients are not adherent to, their prescribed beta-blocker medication (i.e., less than 70 percent of the prescribed medication was taken). OptumInsight data.

References


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*preventive measures