

BAYLOR Health Care System

The Double Failure of USA's Hospitals to Reduce Readmissions and Mortality: One System's Response

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"Indicators at the Crossroad"
 International Society for Quality in Health Care
 26th International Conference
 11 October 2009

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Objectives

- Provide background on hospital performance measures in the U.S. leading to current Centers for Medicare and Medicaid Services/Joint Commission measures
- Address "double failure" of U.S. hospitals to decrease mortality 30 days from admission and readmissions 30 days from discharge for heart failure patients - despite improved processes of care
- Describe the experience of one large multi-hospital system in the U.S. to improve mortality and readmission rates for heart failure patients
- Describe interim lessons learned

2

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Core Measures

- The Centers for Medicare and Medicaid Services (CMS)/Joint Commission Core Measures are part of a national, standardized performance measurement system
- Core measures assess care in the following areas:
 - Acute myocardial infarction (AMI)
 - Heart failure (HF)
 - Community-acquired pneumonia
 - Surgical care improvement

3

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Core Measures Development

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    graph TD
      A[Joint Commission] --- B[Centers for Medicare and Medicaid Services (CMS) Peer Review Organizations / Quality Improvement Organizations]
      A --- C[2003: Collaboration to align Core Measures]
      B --- C
  
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4

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Joint Commission History

- Joint Commission is the predominant standards-setting and accrediting body in health care in the U.S.
- In 1987, Joint Commission began development of performance measures with the Agenda for Change
- This became the ORYX® initiative
- In 1999, these measures were refined with input from clinical professionals, health care provider organizations, health care consumers

5

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CMS History

- Centers for Medicare and Medicaid Services (CMS) is the U.S. federal agency that administers Medicare, Medicaid, and the Children's Health Insurance Program
- In 1972, CMS began administering professional standards review organizations (PSROs)
- PSROs were the first national quality-assurance system
- In 1984, the PSROs were consolidated into regions for each state and became peer review organization (PROs)
- PROs monitored the quality and appropriateness of medical services provided to Medicare beneficiaries

6

BAYLOR | PROs: Scope of Work

- 1984 – 1986
 - Primary emphasis on reducing inappropriate admissions
 - Reliance on retrospective individual case review
- 1986 – 1989
 - Increasing awareness of regional variations in care outcomes
 - Growing reliance on quality improvement models in health care
- 1989 – 1993
 - Shift in PRO focus toward collaborative relationships with providers to prospectively improve health care
 - Health Care Quality Improvement Program (1992) focused efforts on analyzing patterns of care
 - PROs began working with CMS to develop clinical indicators

7

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BAYLOR | Quality Improvement Organizations

- In 2002, PROs were renamed Quality Improvement Organizations (QIOs)
- QIOs focus on population-based quality improvement
- QIOs facilitate continual improvement of health care services in their communities as well as their original audit/inspection role
- Annual commitment of resources to QIOs is ~ 250 million U.S. dollars

8

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BAYLOR | Core Measures for Heart Failure

- In 1999, CMS identified HF as a focus area for measurement and improvement efforts
- Clinical Area Service (CAS) PROs led the initial contract on HF improvement
- Colorado Foundation for Medical Care was the CAS PRO for further refinement of HF measures
- Initial Core Measures for HF included:
 - Assessment of Left Ventricular Function
 - ACE Inhibitors for Left Ventricular Systolic Dysfunction
- In 2007, 2 more Core Measures for HF were added:
 - Discharge Instructions
 - Adult Smoking Cessation Advice/Counseling

9

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BAYLOR | Temporal Trends in Process Measures for Medicare Patients Hospitalized with Heart Failure in the United States, 2002 - 2007

Process measures

Source: Fonarow GC, Peterson ED. Heart failure performance measures and outcomes. JAMA. 2009;302(7):792-794.

10

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BAYLOR | Temporal Trends in Clinical Outcomes for Medicare Patients Hospitalized with Heart Failure in the United States, 2002 - 2007

Clinical outcomes

First heart failure hospitalizations, No. 603 056 620 095 619 716 499 804 466 474

Source: Fonarow GC, Peterson ED. Heart failure performance measures and outcomes. JAMA. 2009;302(7):792-794.

11

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BAYLOR | Failure to Improve Outcomes for Patients With HF


- Why have process measures for HF improved dramatically over time with no improvement over time in outcome measures for HF?

12

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Baylor Health Care System

- Baylor Health Care System (BHCS) is a not-for-profit integrated healthcare delivery system serving North Texas
 - 15 owned, leased, or affiliated hospitals
 - 6 short-stay hospitals
 - 18,000 employees
 - 485 employed physicians (HealthTexas Provider Network)
 - 3,000 affiliated physicians
 - \$4 billion annual operating revenue



13

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Joint Commission/CMS
Heart Failure Core Measures: 2006

Measure	State TX	Nat'l CMS	BHCS	BAS	SWFW	BHVH	BUMC	GAR	GRP	IRV	WAS	PLN
Assessment of Left Ventricular Function	79%	82%	97%	93%	100%	100%	99%	91%	96%	98%	100%	98%
ACE Inhibitors For LVSD	82%	81%	91%	86%	86%	100%	87%	85%	95%	89%	100%	95%

14

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Joint Commission/CMS
Heart Failure Core Measures: 2007

Measure	State TX	Nat'l CMS	BHCS	BAS	SWFW	BHVH	BUMC	GAR	GRP	IRV	PLN	TIBBP	WAX
Assessment of Left Ventricular Function	83%	84%	98%	98%	96%	100%	98%	97%	96%	99%	96%	100%	98%
ACE Inhibitors or ARB For LVSD	84%	83%	98%	100%	100%	99%	98%	98%	92%	100%	100%	100%	95%
Discharge Instructions	64%	64%	98%	83%	100%	100%	78%	87%	60%	100%	87%	100%	87%
Adult Smoking Cessation Advice/Counseling	85%	85%	98%	95%	100%	100%	100%	100%	100%	97%	87%	100%	84%

15

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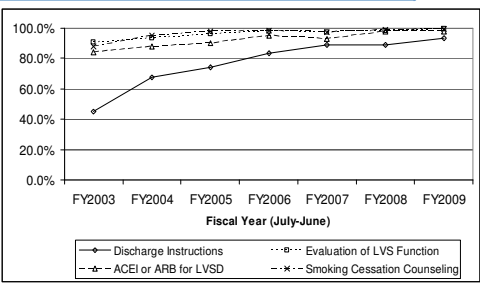
- Similar to the national experience, processes for heart failure at Baylor Health Care System (BHCS) have been improving without improvement in outcomes (mortality and readmission)
- BHCS process of care measures are markedly higher than U.S. national performance while BHCS heart failure mortality and readmissions are similar to national outcome performance

16

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Temporal Trends in Process Measures for Medicare Patients Hospitalized with Heart Failure at BHCS Hospitals

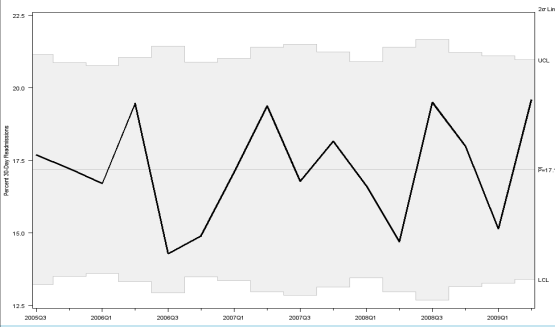


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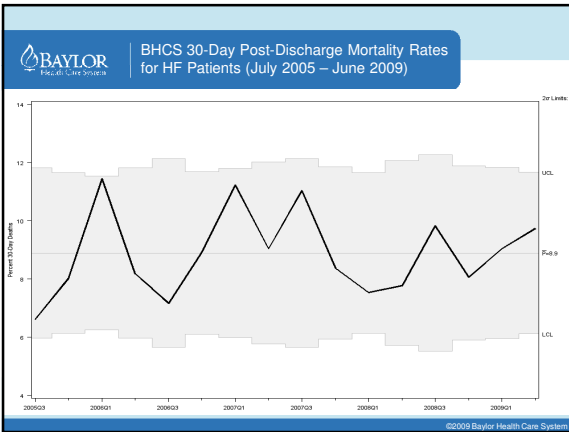
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BHCS 30-Day Post-Discharge Readmission Rates for HF Patients (July 2005 – June 2009)



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30-Day Mortality Across BHCS for HF Patients

Mortality at BHCS Hospitals 30 Days After Admission for Medicare Patients With HF (CMS 2007 Data Release, 7/05 – 6/06 Data)

BASMC	BHVH	BUMC	GAR	GRP	IRV	PLA	THHBP	WAX
14.6% (11.2, 18.1)	10.5% (7.0, 15.3)	9.7% (7.5, 12.4)	11.2% (8.5, 14.5)	9.3% (6.7, 12.4)	10.9% (8.0, 14.7)	9.9% (7.0, 14.1)	N/A	12.7% (8.0, 17.8)
Worse than U.S. Rate	No Different than U.S. Rate	No Different than U.S. Rate	No Different than U.S. Rate	No Different than U.S. Rate	No Different than U.S. Rate	No Different than U.S. Rate	(Only Opened in 02/07)	No Different than U.S. Rate

Risk Standardized Mortality Rate, U.S. = 11.1% (Lower 95% CI, Higher 95% CI)

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Improving Outcomes for Patients With HF

- What is BHCS doing to improve outcomes for patients with HF?

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BHCS HF Task Force

- Heart Failure Task Force was chartered in 2007 following identification by CMS of Baylor All Saints as a high-mortality outlier
- The goal of the BHCS Heart Failure Task Force is to improve the continuum of care for Heart Failure patients, specifically to decrease mortality 30 days from admission and readmissions 30 days from discharge

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BAYLOR | Current HF Action Plan

Recommendations were distilled to four strategies:

- Implement and Use the BHCS HF Order Set
- Medication Reconciliation
- Continuum of Care
- End-of-Life Issues

25

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BAYLOR | Current HF Action Plan

Four Action Plan Strategies	Metrics
Implement and Use the BHCS HF order set	Heart Failure order set use by CMS indicators: <ul style="list-style-type: none"> • In-hospital mortality • Readmission within 30 days • Beta blocker use • PNE vaccination • Anticoagulant for atrial fibrillation at discharge • All or none Bundle core measure compliance • Length of stay
Medication Reconciliation	• Percent of patients with all-or-none bundle for medication reconciliation
Continuum of Care	• % of HF 30-day readmissions and monthly inpatient mortality • Quarterly update of 30-day post-admission mortality
End-of-life issues	• Need to develop hospice and palliative care necessity measures

26

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BAYLOR | Current HF Action Plan

Four HF Improvement Strategies

- **Implement and Use the BHCS HF Order Set**
- Medication Reconciliation
- Continuum of Care
- End-of-Life Issues

27

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BAYLOR | In-Hospital and Follow-Up Outcomes by Process of Care Improvement Tool Use for HF Patients

In-Hospital Mortality

Tool Use	In-Hospital Mortality (%)
PCI Tool Use	2.5
No PCI Tool Use	4.1

60- to 90-Day Mortality and Rehospitalization

Tool Use	60- to 90-Day Mortality and Rehospitalization (%)
PCI Tool Use	34.8
No PCI Tool Use	38.2

Process of Care Improvement tool use (admission order set or discharge checklist) was reported during hospitalization in 45.3% of patients (n=22,017/48,612).

Fonarow GC, et al. Arch Intern Med. 2007;167:1493-1502.

28

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BAYLOR | HF Order Set

Aim Statement for order set use:

By March 2009, all BHCS acute care facilities will increase use of the BHCS Heart Failure order set to 80% by sharing monthly data at physician committee meetings and by individual academic detailing by the facility HF physician champions.

29

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BAYLOR | BHCS HF Order Set Use: July 2008 – August 2009

Month	Percent
Jul-08	50
Aug	50
Sep	52
Oct	52
Nov	58
Dec	58
Jan-09	58
Feb	60
Mar	75
Apr	70
May	75
Jun	70
Jul	62
Aug	85

30

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BAYLOR Medical Care System | Why Use Standard Order Sets?
Effect of HF Order Set Use

- Order set use may achieve the following:
 - Reduce mortality
 - Reduce readmissions
 - Improve care processes
 - Reduce length of stay
 - Reduce costs

31

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BAYLOR Medical Care System | Why Use Standard Order Sets?
Effect of HF Order Set Use

Effect of BHCS order set vs. no order set on mortality, readmission, core measure compliance and length of stay for heart failure patients discharged from BHCS hospitals from December 2007 to January 2009

	All	Order Set		P-value
		BHCS-HF	None	
In-hospital mortality – n(%)	54 (2.3)	18 (1.6)	36 (3.0)	0.02*
30-day mortality – n(%)	315 (13.3)	141 (12.3)	174 (14.3)	0.15*
30-day readmission (excluding patients who died during index hospitalization discharge) – n(%)	315 (13.6)	141 (12.4)	174 (14.7)	0.07†
Core measure compliance – n(%)	1903 (91.4)	928 (92.9)	975 (90.0)	0.02*
Length of stay (days) – mean(SD)	5.2(4.3)	4.9 (3.6)	5.5 (4.9)	0.09†
Direct cost (\$) – mean(SD)	6128 (7414)	5234 (5426)	6973 (8812)	<0.01‡

*based on Chi-square test
† based on a competing risk model
‡ based on Robust ANOVA

32

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BAYLOR Medical Care System | Tactics in Successful Implementation of BHCS Standardized HF Order Set

- Focus on use of the order set by hospitalists
- One-on-one academic detailing to physicians
- Data reports presented at all physician committees
- Transition of care order set in the emergency department
- Concurrent chart review: morning huddles
- Daily census report reviewed for HF diagnosis or chief complaint
- All levels of staff to check charts for appropriate order set use
- One-on-one academic detailing by Health Care Improvement staff to other hospital staff

33

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BAYLOR Medical Care System | Continuum of Care

Four HF Improvement Strategies

- Implement and Use the BHCS HF Order Set
- Medication Reconciliation
- Continuum of Care**
- End-of-Life Issues

34

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BAYLOR Medical Care System | Naylor Advanced Practice Nurse Model

Resource Use Among Elderly Congestive Heart Failure Patients Who Received a Transitional Care Intervention or Usual Care, Six Philadelphia Hospitals, 1997–2001

Metric	Usual care group	Intervention group
Percentage who were rehospitalized or died	61	48
Number of hospital readmissions	162	104
Average cost of care	\$12,481	\$7,636

Data: Medical records and patient interviews (Naylor, M.D., et al., 2004, *J Am Geriatr Soc* 52:675–84.)
Source: McCarthy and Leiberhan, Performance Snapshots, 2006. www.cmwf.org/snapshots

35

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BAYLOR Medical Care System | USA Today Article (July 9, 2009)

News > Health & Behavior > Medical Resources > Health Information > Your Health: Kim Painter

Baylor hospital leads way to lower heart failure readmission rates

Updated 7/9/2009 7:18 PM | Comments: 0(0) | Recommend: 0 (0) | E-mail | Save | Print | Reprints & Permissions | RSS

By Steve Stemberg and Jack Gillum, USA TODAY

It's not that Clyde Yancy and the other heart specialists at Baylor University Medical Center in Dallas have anything against hospitalizing heart failure patients. It's that once they leave, Yancy and his team would rather patients not come back.

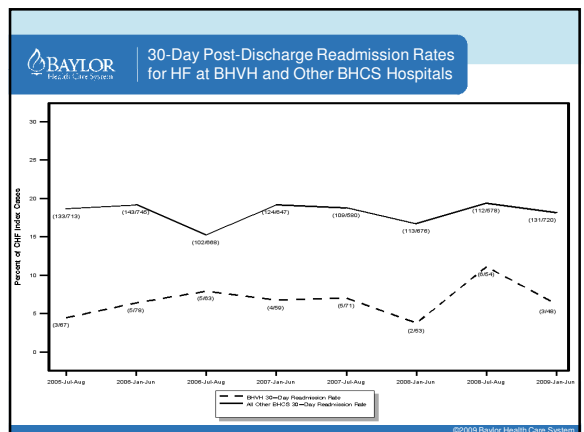
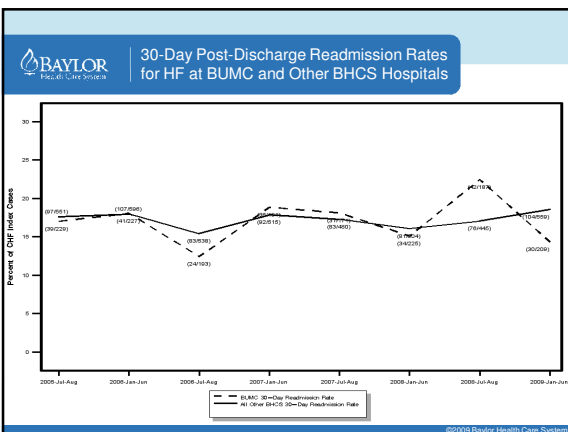
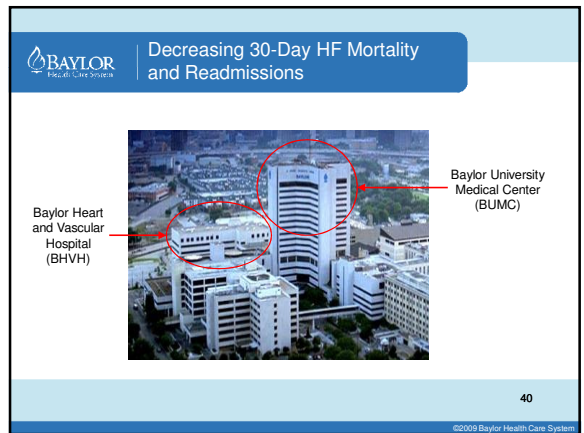
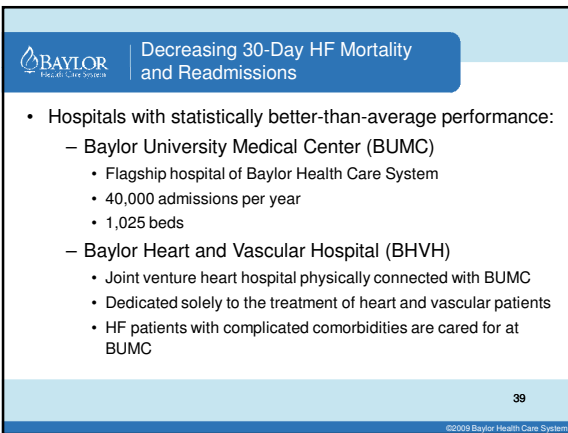
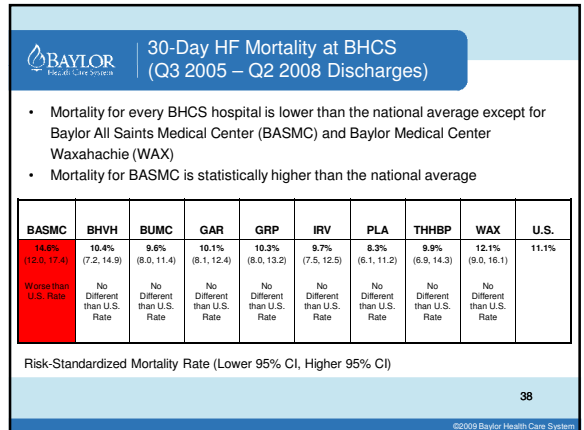
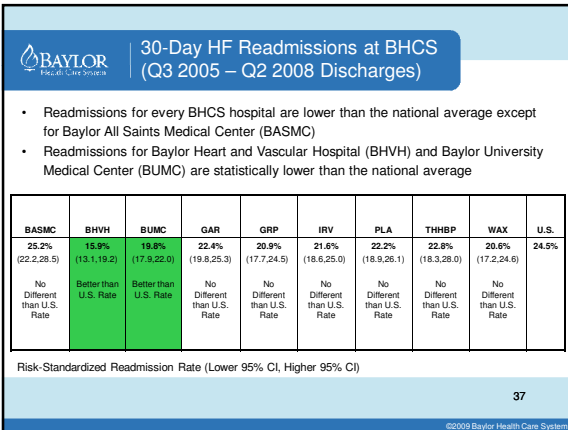
So they have visited every heart failure unit in the hospital and talked with every doctor and nurse. They have scrutinized the care provided to patients at every step of the way, from the moment they arrive until the moment they

Doctor Rainer Khayat, shakes hands with patient.

"They're not only the best in the country, they're the best by 2 percentage points," says Yale cardiologist Harlan Krumholz. "Two points in this analysis, where we were so conservative, is huge. It's like winning the Kentucky Derby by a quarter of a lap."

36

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BAYLOR | 30-Day Mortality Risk Adjustment in HF: Hierarchical Regression Model for HF Based on Administrative Claims Data

Age, years over 65	Not Adjusted for in the Model
Male	
Cardiovascular	
History of Percutaneous Transluminal Coronary Angioplasty (ICD9 V45.82)	Systolic blood pressure on admission
History of Coronary Artery Bypass Graft Surgery (ICD9 V45.81)	Heart rate on admission
History of heart failure (HCC 80)	Respiratory rate on admission
History of Myocardial Infarction (HCC 81)	Body mass index
Unstable angina (HCC 82)	BUN on admission
Chronic atherosclerosis (HCC 83-84)	Creatinine on admission
Cardiopulmonary-respiratory failure and shock (HCC 79)	Sodium on admission
Valvular heart disease (HCC 86)	Hemoglobin on admission
Comorbidity	
Hypertension (HCC 89-91)	Brain natriuretic peptide on admission
Stroke (HCC 95-96)	Left ventricular ejection fraction
Renal failure (HCC 131)	Left ventricular end diastolic diameter
Chronic Obstructive Pulmonary Disease (HCC 108)	Functional status (New York Heart Association Class)
Pneumonia (HCC 111-113)	Socio-economic status
Diabetes (HCC 15-20, 120)	Mechanical ventilation (initial)
Protein-calorie malnutrition (HCC 21)	Inotropic agent treatment
Dementia (HCC 49-50)	
Hemiplegia, paraplegia, paralysis, functional disability (HCC 100-102, 68-69, 177-178)	
Peripheral vascular disease (HCC 104-105)	
Metastatic cancer (HCC 7-8)	
Trauma in last year (HCC 154-156, 158-162)	
Major psychiatric disorders (HCC 54-56)	
Chronic liver disease (HCC 25-27)	

Krumholz HM et al. *Circulation* 2006;113:1688-1701. ©2009 Baylor Health Care System

BAYLOR | Decreasing 30-Day HF Mortality and Readmissions

- Reasons for better-than-average performance of BHVH are not clear, but may be primarily due to patient characteristics
- BUMC's performance may relate to the effect of the Heart Failure Clinic and its home visit program**
- Standardized care via the order set may decrease mortality and readmissions, but we have yet to observe hospital-level improvements in mortality and readmissions associated with order set use
- New strategies for mortality and readmission improvement must be evaluated, including improved transitional care
- "The best way to reduce in-hospital risks is to start by reducing out of hospital risks that result in hospital admission."

* Source: Degos L, Amalberti R, Bacou J, Carlet J, Bruneau C. Breaking the mould in patient safety. *BMJ*. 2009 Jun 29;338:b2585. ©2009 Baylor Health Care System

BAYLOR | BUMC Heart Failure Clinic

- Multi-disciplinary team approach using Physician, Advanced Practice Nurse, Registered Nurse (on call 24/7), Dietitian
- Patient education (empowerment)
- Close patient follow-up
 - Frequent incremental treatment titrations
 - Telephone management
- Triage to identify patients who need advanced therapies (eg, inotropic support, left ventricular assistance device)
- Alliance with other programs
 - Vulnerable Patient Network, including home visits and medication funding

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BAYLOR | Vulnerable Patient Network

- Vulnerable Patient Network (VPN) provides home-based primary care and social support services to uninsured and underserved populations with complex medical conditions
- Socioeconomic status (SES) influences patient outcomes, readmissions, and compliance with treatment
- Heart Failure Clinic and VPN constitute an "expanded transitional care" program that incorporates community-level social institutions to help serve high-risk patients
- "Hospital at Home" concept may be feasible in some countries as a way to improve outcomes for HF patients*

* Mortara A, Pinna GD, Johnson P, et al. Home telemonitoring in heart failure patients: the HHH study (Home or Hospital in Heart Failure). *European Journal of Heart Failure* 2009 11(3):312-318. ©2009 Baylor Health Care System

BAYLOR | Conclusions

- Standardized order sets on admission may decrease mortality 30 days from admission and readmissions 30 days from discharge for heart failure patients.
- Transitional care may decrease mortality and readmissions.
- Continuum of care (end-of-life care planning, transitional care) needs more attention as a way to alter the double failure across the U.S. to decrease mortality 30 days from admission and readmissions 30 days from discharge.
- Reimbursement models must be aligned to support these objectives.

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