

**Improving the  
Transition of Care Between  
Hospital and  
Ambulatory Care Settings**

**Handoffs An Evolving Dilemma in  
Hospital Medicine**

**June 2, 2009**

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Department of Hospital Medicine  
Denver Health Medical Center**

# Objectives

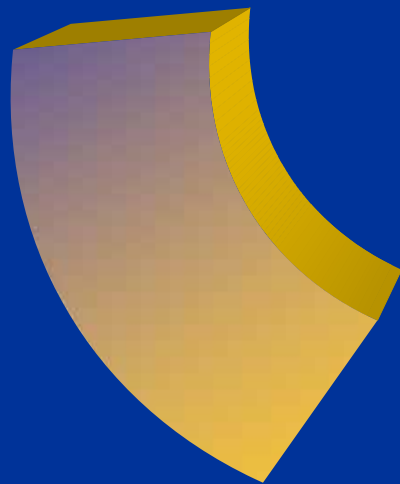
- **Background of the hospital to ambulatory care transition in medicine**
- **Present several constructs outlining this transition of care**
- **Review current literature researching readmissions and transitions of care**

# Handoffs Permeate all Levels of Care

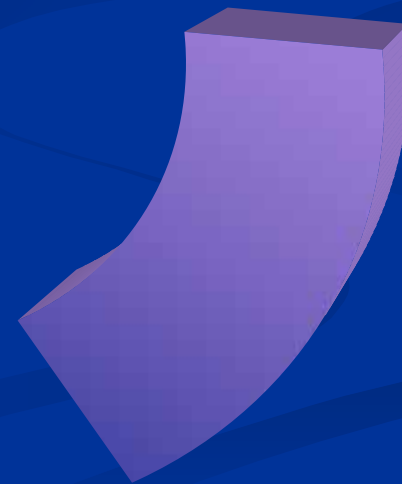


**PROVIDER**

**CENTER**



**SERVICE**



# Handoffs in Hospital Medicine

- **> 6 Million** patients are cared for in US teaching hospitals per year
- **Hospitalists across the United States**
  - GIM physicians identified as hospitalists increased from **5.9%** in 1995 to **19%** 2006
  - Medicare claims for inpt services attributed to hospitalists rose from **9.1%** to **37.1%**
  - Teaching hospitals were on the forefront of this change.

# Handoffs in Hospital Medicine

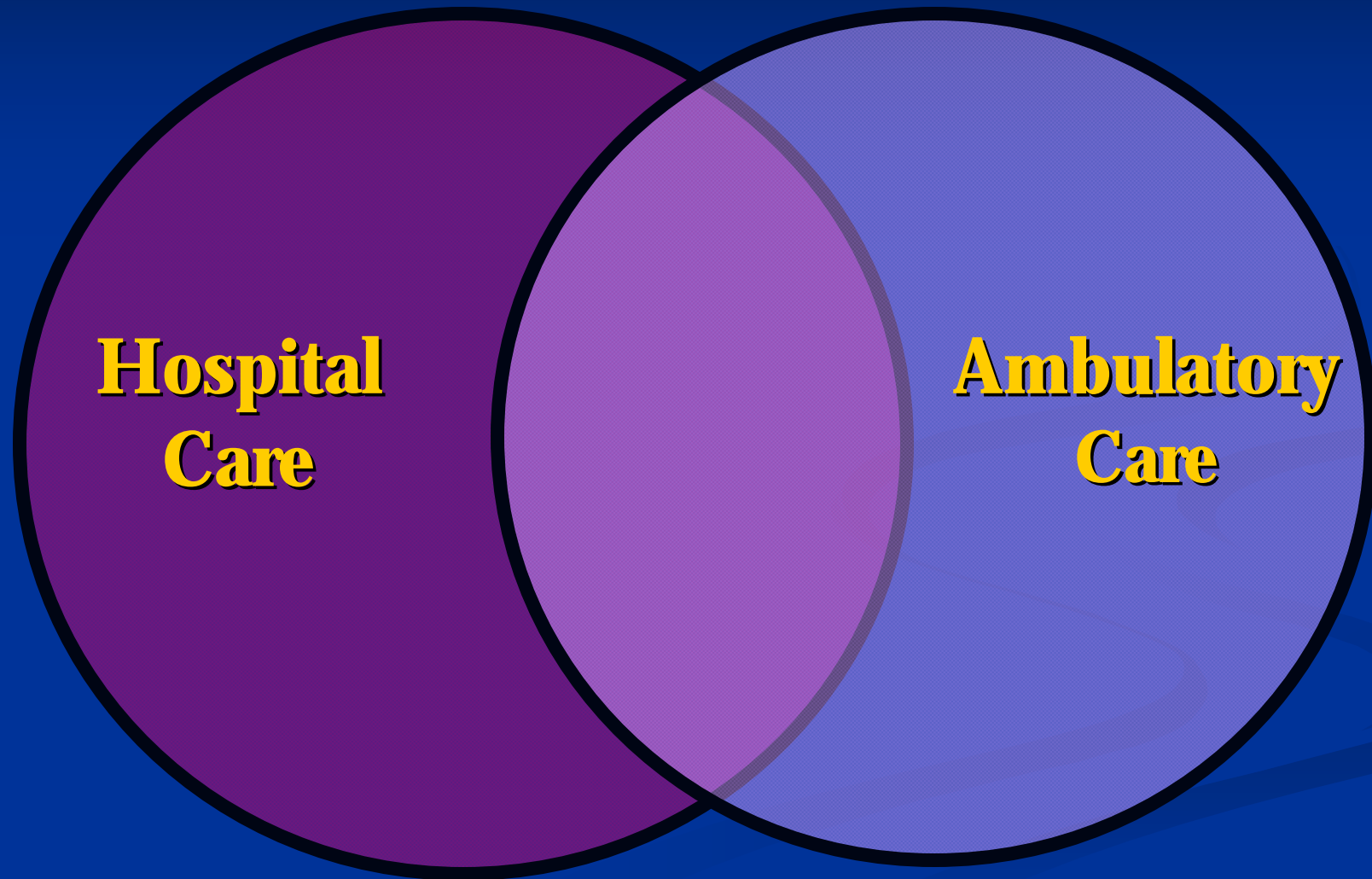
- **Changing continuity of outpatient and inpatient care by primary care physicians**
  - 1996 **50.5%** of hospitalized patients seen by prior outpatient MD – **44.3%** seen by identified PCP.
  - 2006 these reduced to **39.8%** / **31.9%** respectively.
  - This reduction was more prominent in academic centers with **21.2%** pts seen by prior MD in 2006.
  - Increasing hospitalist involvement was associated with **1/3** of this MD discontinuity.

# CONTEXT

**Hospital  
Care**



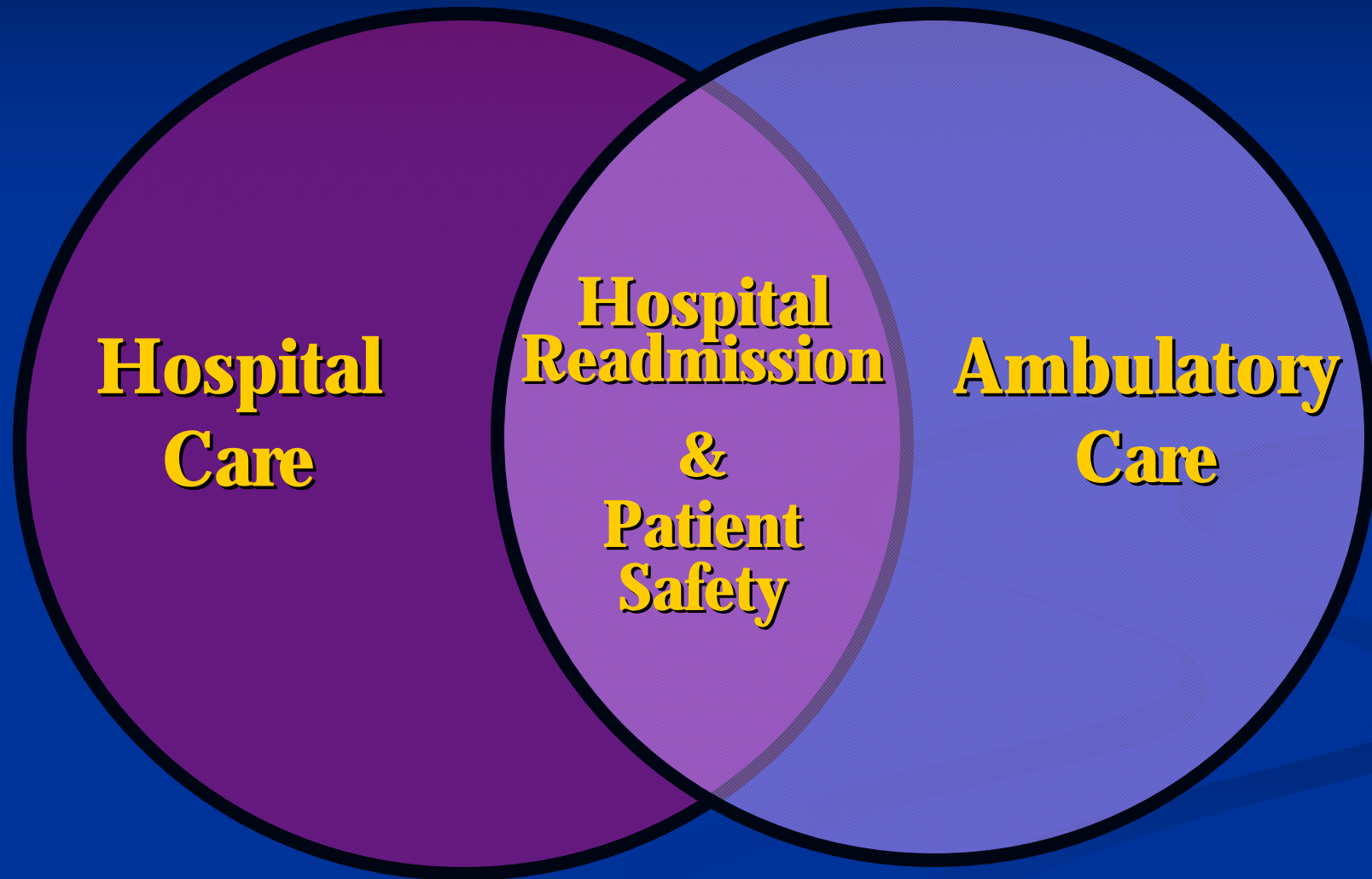
# CONTEXT



**Hospital  
Care**

**Ambulatory  
Care**

# CONTEXT



**Hospital  
Care**

**Hospital  
Readmission  
&  
Patient  
Safety**

**Ambulatory  
Care**

# Why are Patients Rehospitalized?

## ■ **New Problems**

- **New unrelated dx or tx from previous admission**

## ■ **Worsening of Previous Problem**

- **Continuing or escalating treatment of diagnosis from previous admission**
- **Additional diagnostics for the previous diagnosis**

## ■ **Ongoing Care of Chronic Problem**

- **Planned procedure or therapeutics for ongoing management of stable problem**



# Rehospitalizations among Patients in the Medicare Fee-for-Service Program

Jencks et al. N Engl J Med 2009;360:1418-1428.

- **Objective:** To establish the frequency and patterns of rehospitalization in the United States
- **Study Design/Data Source:** Analysis of Medicare Provider Analysis and Review (MEDPAR) file from October 1, 2003 through December 31, 2004. Did not include discharges from 855 critical access hospitals or those enrolled in managed-care plans.



# Rehospitalizations among Patients in the Medicare Fee-for-Service Program

Jencks et al. *N Engl J Med* 2009; 360: 1418-1428

## ■ **Assessment of Rehospitalization:**

- **Rehospitalization =**  
$$\frac{\# \text{ pt discharged and readmitted in 30 days}}{\# \text{ pt discharged alive}}$$
- **Transfers to other hospitals, inpatient rehab, and LTAC were excluded**
- **Rehospitalization for rehabilitation in 30 days excluded.**
- **No more than one rehospitalization per discharge counted.**



# Rehospitalizations among Patients in the Medicare Fee-for-Service Program

Jencks et al. *N Engl J Med* 2009; 360: 1418-1428

## ■ **Assessment of Diagnosis:**

- Identified the 5 medical and 5 surgical diagnosis-related groups (DRGs) that accounted for the largest number of 30 day rehospitalizations
- Tabulated the 10 most frequent reasons for rehospitalization for each DRG.
- Established national rehospitalization rates for the above DRGs



# Rehospitalizations among Patients in the Medicare Fee-for-Service Program

Jencks et al. *N Engl J Med* 2009; 360: 1418-1428.

**Table 1.** Rehospitalizations and Deaths after Discharge from the Hospital among Patients in Medicare Fee-for-Service Programs.

Interval after Discharge	Patients at Risk at Beginning of Period	Cumulative Rehospitalizations by End of Period <i>number (percent)</i>	Cumulative Deaths without Rehospitalization by End of Period
<b>All discharges</b>			
0–30 days	2,961,460 (100.0)	579,903 (19.6)	103,741 (3.5)
31–60 days	2,277,816 (76.9)	834,369 (28.2)	134,697 (4.5)
61–90 days	1,992,394 (67.3)	1,006,762 (34.0)	151,901 (5.1)
91–180 days	1,802,797 (60.9)	1,325,645 (44.8)	177,234 (6.0)
181–365 days	1,458,581 (49.3)	1,661,396 (56.1)	200,852 (6.8)
>365 days	1,099,212 (37.1)		
<b>Discharges after hospitalization for medical condition</b>			
0–30 days	2,154,926 (100.0)	453,993 (21.1)	87,736 (4.1)
31–60 days	1,613,197 (74.9)	653,998 (30.3)	113,188 (5.3)
61–90 days	1,387,740 (64.4)	788,535 (36.6)	127,274 (5.9)
91–180 days	1,239,117 (57.5)	1,032,141 (47.9)	147,851 (6.9)
181–365 days	974,934 (45.2)	1,280,579 (59.4)	166,561 (7.7)
>365 days	707,786 (32.8)		



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# Rehospitalizations among Patients in the Medicare Fee-for-Service Program

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**Table 2.** Highest Rates of Rehospitalization and Most Frequent Reasons for Rehospitalization, According to Condition at Index Discharge.\*

Condition at Index Discharge	30-Day Rehospitalization Rate	Proportion of All Rehospitalizations	Reason for Rehospitalization				
			Most Frequent	2nd Most Frequent	3rd Most Frequent	4th Most Frequent	5th to 10th Most Frequent
	percent		percent of all rehospitalizations within 30 days after index discharge				
<b>Medical</b>							
All	21.0	77.6	<u>Heart failure (8.6)</u>	<u>Pneumonia (7.3)</u>	<u>Psychoses (4.3)</u>	<u>COPD (3.9)</u>	GI problems, nutrition-related or metabolic issues, septicemia, GI bleeding, renal failure, urinary tract infection (17.0)
Heart failure	26.9	7.6	Heart failure (37.0)	Pneumonia (5.1)	Renal failure (3.9)	Nutrition-related or metabolic issues (3.1)	Acute myocardial infarction, COPD, arrhythmias, circulatory disorders, GI bleeding, GI problems (14.0)
Pneumonia	20.1	6.3	Pneumonia (29.1)	Heart failure (7.4)	COPD (6.1)	Septicemia (3.6)	Nutrition-related or metabolic issues, GI problems, respiratory or ventilation problems, pulmonary edema, GI bleeding, urinary tract infection (14.9)
COPD	22.6	4.0	COPD (36.2)	Pneumonia (11.4)	Heart failure (5.7)	Pulmonary edema (3.9)	Respiratory or ventilation problems, GI problems, nutrition-related or metabolic issues, arrhythmias, GI bleeding, acute myocardial infarction (12.5)
Psychoses	24.6	3.5	Psychoses (67.3)	Drug toxicity (1.9)	Drug or alcohol misuse (1.6)	Pneumonia (1.6)	Chest pain, nutrition-related or metabolic issues, depression, GI problems, COPD, organic mental conditions (7.0)
GI problems	19.2	3.1	GI problems (21.1)	Nutrition-related or metabolic issues (4.9)	Pneumonia (4.3)	Heart failure (4.2)	Major bowel surgery, urinary tract infection, septicemia, GI bleeding, COPD, chest pain (13.4)



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**Table 3.** Predictors of Rehospitalization within 30 Days after Discharge.\*

Variable	Hazard Ratio (95% Confidence Interval)
Hospital's ratio of observed to expected hospitalizations†	1.097 (1.096–1.098)
National rehospitalization rate for DRG†	1.268 (1.267–1.270)
No. of rehospitalizations since October 1, 2003	
0	1.00
1	1.378 (1.374–1.383)
2	1.752 (1.746–1.759)
≥3	2.504 (2.495–2.513)
Length of stay	
>2 times that expected for DRG	1.266 (1.261–1.272)
0.5–2 times that expected for DRG	1.00
<0.5 times that expected for DRG	0.875 (0.872–0.877)
Race‡	
Black	1.057 (1.053–1.061)
Other	1.00
Disability	1.130 (1.119–1.141)
End-stage renal disease	1.417 (1.409–1.425)
Receipt of Supplemental Security Income	1.117 (1.113–1.122)
Male sex	1.056 (1.053–1.059)



## Rehospitalizations among Patients in the Medicare Fee-for-Service Program

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### Additional Results:

- Only **50%** of patients readmitted at 30 days had seen an outpatient physician.
- Estimate that **90%** of rehospitalizations at 30 days after discharge are unplanned.
- Medicare payments for unplanned rehospitalizations in 2004 accounted for **\$17.4 billion** of the **\$102.6 billion** in hospital payments.



## Rehospitalizations among Patients in the Medicare Fee-for-Service Program

Jencks et al. *N Engl J Med* 2009; 360: 1418-1428.

### Conclusions:

- Considerable opportunity to improve outpatient follow-up rates
- Rehospitalizations are not primarily driven by profit seeking division of services into multiple hospitalizations
- Variation among states and hospitals suggest improvements on national scale may be important.

# Why are Patients Rehospitalized?

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- **Additional diagnostics for the previous diagnosis**

## ■ **Ongoing care of chronic problem**

- **Planned procedure or therapeutics for ongoing management of stable problem**

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## □ Ongoing care of chronic problem

- Planned procedure or therapeutics for ongoing management of stable problem

# Why are patients rehospitalized for the same problem?

## ■ Spontaneous Complications

- Unpredictable developments in disease process

## ■ Systems Issues

- Insurance/Care accessibility

## ■ Patient Issues

- Health beliefs/Perceptions
- Financial/Scheduling challenges

## ■ Discharge Process Issues

- Transparent discharge care plan

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  - Insurance/Care accessibility
- Patient Issues
  - Health beliefs/Perceptions
  - Financial/Scheduling challenges
- **Discharge Process Issues**
  - **Transparent discharge care plan**

# Where can the discharge process fail?

- **Inpatient to Outpatient MD Communication**
  - Loss of information re: med changes and established POC
  - Redundant treatment/diagnostic plans
  - Dropped follow-up on pending studies
- **Medication Adherence**
  - Failed medication reconciliation
  - Inability to get reconciled meds
- **Understanding Plan of Care Instructions**
  - Low health literacy
- **Follow-up Appointments**
  - Inability to get follow-up appointments

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# Association of Communication Between Hospital-based Physicians and Primary Care Providers with Patient Outcomes

Bell et al. *J Gen Intern Med* 2009;24(3):381-386.

- **Objective:** To determine whether communication between hospital-based physicians and PCPs influences patient outcomes.
- **Methods:** Consecutive sample of patients for six academic centers between July 2001 and June 2003 were enrolled. Random sampling of PCPs were surveyed 2 weeks after discharge. These results were then linked to 30 day patient outcomes.

## Association of Communication Between Hospital-based Physicians and Primary Care Providers with Patient Outcomes

Bell et al. *J Gen Intern Med* 2009;24(3):381-386.

- **77%** PCPs were aware of their patient's admit
- **23%** of those PCPs aware had direct communication with inpatient team
- **42%** PCPs had a d/c summary at 2 weeks
- No significant association between PCP awareness, direct communication, or d/c summary were found with the composite outcome (30 day readmit, ED visits, or death).

# Association of Communication Between Hospital-based Physicians and Primary Care Providers with Patient Outcomes

Bell et al. *J Gen Intern Med* 2009;24(3):381-386.

## ■ **Conclusions:**

- Study was likely underpowered to detect relationship.
- Physicians are more likely to communicate with PCPs regarding patients who are high risk for complications after discharge.
- The quality, not just the presence, of physician communication should be taken into consideration.

# Where can the discharge process fail?

- **Inpatient to Outpatient MD Communication**
  - Loss of information re: med changes and established POC
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# A Reengineered Hospital Discharge Program to Decrease Rehospitalization

Jack et. al. Ann Intern Med 2009;150:178-187

- **Objective:** To test the effects of an intervention designed to minimize hospital utilization after discharge.
- **Study Design:** Randomized controlled trial using block randomization to assign patients to usual care or intervention groups.

# A Reengineered Hospital Discharge Program to Decrease Rehospitalization

Jack et. al. Ann Intern Med 2009;150:178-187

- **Patients:** Patients 18 years or older admitted to Boston Medical Center between June 2003 and July 2004 were randomly ranked each day for potential enrollment into the study.
  - 2 patients were enrolled a day (or 3 if the first 2 were assigned to the usual care group).
  - Excluded if admitted from SNF or OSH, had planned admission, were on hospital or suicide precautions, or were deaf or blind.

# A Reengineered Hospital Discharge Program to Decrease Rehospitalization

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- **Intervention:** Usual care patients received no intervention after enrollment.

Intervention patients were assigned a trained discharge advocate (DA) responsible for:

- Coordinating the discharge plan with hospital team
- Educate and prepare patient for discharge.

# **A Reengineered Hospital Discharge Program to Decrease Rehospitalization**

Jack et. al. Ann Intern Med 2009;150:178-187

## **■ Intervention:**

- **DA prepared the after-hospital care plan (AHCP)**
  - **spiral bound color booklet**
    - **Appointment Calendar**
    - **Color-coded medication schedule**
    - **List of pending results at discharge**
    - **Illustrated description of the discharge diagnosis**
    - **Information on what to do if problems arise**
- **Clinical pharmacist telephoned the participants 2-4 days after index discharge to reinforce the discharge plan**

# **A Reengineered Hospital Discharge Program to Decrease Rehospitalization**

Jack et. al. Ann Intern Med 2009;150:178-187

- **Outcome Measures and Follow-up:** Combination of EMR review and patient reported data
  - **Primary endpoint – hospital utilization at 30 days**
    - Total number of ER visits and hospital readmissions
  - **Secondary endpoints –**
    - Self-reported preparedness for discharge
    - Rate of PCP follow-up visits
    - Knowledge of discharge diagnosis

# A Reengineered Hospital Discharge Program to Decrease Rehospitalization

Jack et. al. Ann Intern Med 2009;150:178-187

- **Results:** In the intervention group of 370 at discharge
  - **94%** PCP appointments (35% usual care)
  - **83%** AHCP
  - **53%** Updated medication reconciliation
  - **93%** AHCP sent to PCP
  - **63%** Telephone contact by pharmacist

# A Reengineered Hospital Discharge Program to Decrease Rehospitalization

Jack et. al. Ann Intern Med 2009;150:178-187

Table 3. Primary and Secondary Outcomes

Variable	Usual Care Group	Intervention Group	P Value
<b>Primary outcomes <math>\leq 30</math> d after index hospitalization</b>			
Patients, <i>n</i>	368	370	
Hospital utilizations, <i>n (visits/patient/mo)*</i>	166 (0.451)	116 (0.314)	0.009
IRR (95% CI)	1.0	0.695 (0.515–0.937)	–
Emergency department visits, <i>n (visits/patient/mo)</i>	90 (0.245)	61 (0.165)	0.014
IRR (95% CI)	1.0	0.674 (0.476–0.955)	–
Readmissions, <i>n (visits/patient/mo)</i>	76 (0.207)	55 (0.149)	0.090
IRR (95% CI)	1.0	0.720 (0.445–1.164)	–
<b>Secondary outcome<sup>†</sup></b>			
Patients, <i>n</i>	308	307	–
Able to identify discharge diagnosis, <i>n (%)</i>	217 (70)	242 (79)	0.017
Able to identify PCP name, <i>n (%)</i>	275 (89)	292 (95)	0.007
Visited PCP, <i>n (%)</i>	135 (44)	190 (62)	<0.001
How well were your questions answered before you left the hospital?‡	108 (62)	129 (77)	0.002
How well did you understand your appointments after you left the hospital?‡	219 (79)	254 (86)	0.025
How well did you understand how to take your medications after leaving the hospital?‡	233 (83)	264 (89)	0.049
How well did you understand your main problem or diagnosis when you left the hospital?‡	167 (57)	198 (66)	0.014
How prepared were you to leave the hospital?‡	163 (55)	197 (65)	0.013

IRR = incidence rate ratio; PCP = primary care provider.

\* Defined as the sum of emergency department visits plus rehospitalizations. An emergency department visit that leads to a rehospitalization is counted only as a rehospitalization.

† Denominators were participants who were reached at the 30-day follow-up phone call and those who answered questions.

‡ Questions were answered on a 5-point Likert scale. The percentage reflects participants who responded with either of the top 2 categories on the scale (“very prepared” or “prepared”).

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\* Defined as the sum of emergency department visits plus rehospitalizations. An emergency department visit that leads to a rehospitalization is counted only as a rehospitalization.

† Denominators were participants who were reached at the 30-day follow-up phone call and those who answered questions.

‡ Questions were answered on a 5-point Likert scale. The percentage reflects participants who responded with either of the top 2 categories on the scale (“very prepared” or “prepared”).

# A Reengineered Hospital Discharge Program to Decrease Rehospitalization

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## ■ Results:

- Total cost savings for the intervention group was **\$149, 995** or **33.9%** lower observed cost.
- **30%** of participants in each study group with any subsequent hospitalization had **> 1** subsequent hospitalization
- Subgroup analyses showed that the intervention was more effective in reducing the primary outcome in participants with greater hospital utilization in the previous 6 months (**p=0.014**)

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- **Results:** Median time spent on intervention
  - DA spent **42.5 min.** w/ pt & **45 min.** preparing AHCP
  - DA spent **20.4 hours** following 14 patients/wk – equivalent to **0.5 FTE**
  - Pharmacist spent **14 min.** w/ pt. & **10 min.** preparing
  - Pharmacist spent **6 hours** following 14 patients/wk- equivalent to **0.15 FTE**

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## **■ Conclusions:**

- **Unable to determine a generalizable cost for the intervention because costs vary so widely across locations and institutions.**
- **Implementation of discharge programs such as this intervention may be important to improve health care organizations' quality ratings.**

# Conclusions

- **The hospital to ambulatory care transition is an exceptionally vulnerable time for patient safety.**
- **Without any limitations in mind – a national, standardized, multifaceted approach to hospital transition would be most effective.**
- **Hospital readmissions will become an important quality measure that may influence future fiscal reimbursements in medicine.**

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