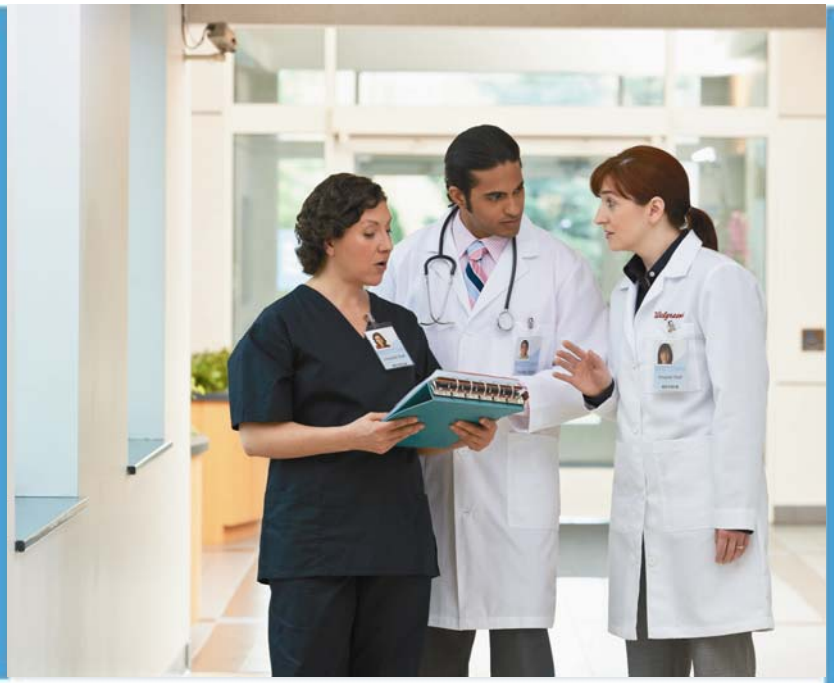
Managing Admissions and Re-admissions



December 2013

Introductions

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Board member, Massachusetts Health Insurance Connector Authority (Exchange).

Author of several books and peer-reviewed studies in healthcare management and predictive modeling. 2011 publication has chapter on Massachusetts Reform.

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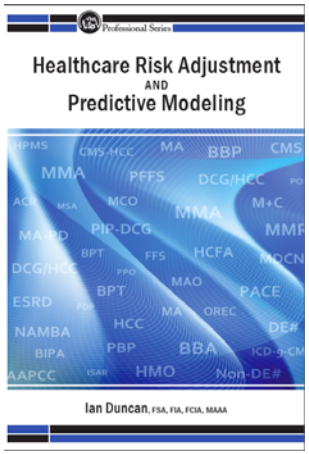

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Today's Agenda

1. The changing healthcare industry.
2. Hospital re-admissions: an emerging area of focus.
3. The WellTransitions^{SM} program.
4. Re-admission programs: lessons from the literature.
5. Lessons from the DeKalb Hospital program.
6. Walgreens Outpatient Pharmacy.
7. Discussion.

Walgreens

Walgreens mission and vision

MISSION

To be the most trusted, convenient multichannel provider/advisor of innovative pharmacy, health and wellness solutions, and consumer goods and services in communities across America…

A destination where health and happiness come together to help people get well, stay well, and live well.

VISION

To be “My Walgreens” for everyone in America, the first choice for health and daily living

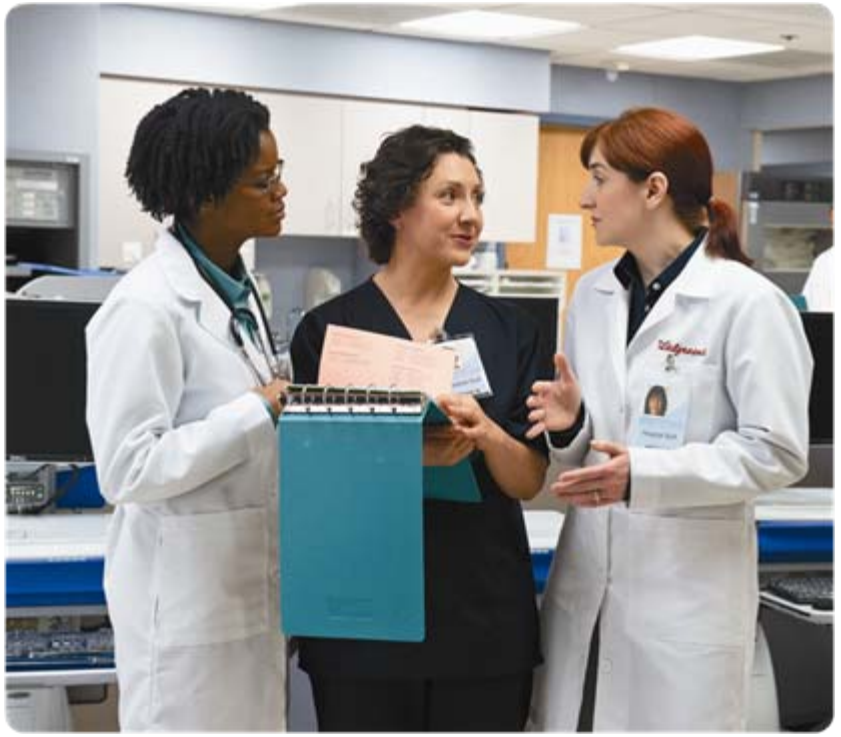
My Walgreens

Transforming community pharmacy into an integrated healthcare delivery system

A premier provider of healthcare and wellness services

75,000 healthcare providers deliver high-quality healthcare services

- Retail and specialty pharmacists
- RNs, LPNs, NPs, PAs
- Physicians and dentists
- Medical, dental, and radiology technicians and assistants
- Dietitians
- Health and wellness coaches
- Health and fitness trainers
- Case managers and referral coordinators



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Moving into the future: Walgreens Well Experience

Walgreens Well Experience brings primary healthcare services front and center.

Walgreens provides the most comprehensive portfolio of health systems management solutions

Walgreens integrates outpatient pharmacy into the healthcare continuum

- Improves access to specialty and limited-distribution therapies
- Improves MPR and patient adherence
- Reduce penalty for avoidable readmission
- Access to 340B solutions
- Coordinates post-discharge care through the nation's largest network of retail pharmacies

On-site outpatient pharmacies

Employee access to 30d/90d Rx

WellTransitionsSM

Specialty Pharmacy

Home Infusion Services

340B solutions

Community-based Take Care Clinics®

Walgreens

Walgreens Health System Solutions are a growing presence reflecting growing access and service needs

100+ locations

- Planned expansion to 196 locations in 2012
- Premier locations include:
  - Teaching hospitals
  - Hospital networks
  - Children's hospitals
  - Community hospitals
- Staffed by PharmDs and pharmacists
- Locations include HIV/AIDS Centers of Excellence

Transforming community pharmacy into an integrated healthcare delivery system

1901:
Charles R. Walgreen opened his first pharmacy in Chicago

First to offer Rx labeling in multiple languages

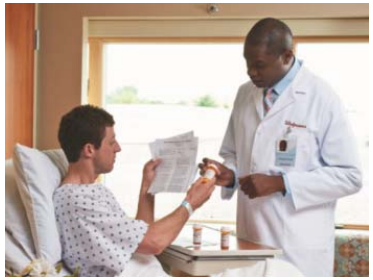
Introduction of 340B pharmacy program

1901 | 1992 | 1995 | 2002 | 2006 | 2012

First drive-through pharmacy

First health system pharmacy

Today:
- More than 8,500 points of care nationwide, on track to fill 1 billion prescriptions in 2012
- 100+ health systems pharmacies



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A changing healthcare industry:
Key indicators and issues

Key indicators and issues driving change in healthcare

Industry challenges

- Reimbursement under pressure from payers
- Increasingly complex regulatory environment
- Affordable Care Act is in legal and political turmoil
- Cost of unfunded mandates

Cost drivers

- Government will cover 70% of the population
  - ~32 million new consumers entering the healthcare system
  - Aging population with multiple chronic conditions (high cost, high risk)
  - 88 million in Medicare by 2040 vs. 47 million in 2010
- Manage Early Readmissions
- Growing shortage of primary care physicians

Health System trends

- Patient-centric focus, with emphasis on improved outcomes
  - Aggressive cost management, with increased scrutiny of provider performance
  - Accountable care is no longer a theoretical problem
  - Bundled payments/service initiatives
  - Develop approaches for the medical home
- Pay for performance mandatory programs and pilots in place starting 2012

Walgreens on-site outpatient pharmacies drive value by lowering cost, improving outcomes & patient satisfaction

Understanding your challenges…

1. "Do more with less"
2. Reduce Penalties for avoidable readmissions
3. Maintain Competitive Advantage

Delivering high-value solutions

Improved pharmacy access and management

- Home infusion – single point of contact
- Specialty pharmacy (LDD, REMS)
- Tailored inventory for in-stock availability
- 90-day retail
- Compounding
- Medication waste reduction

Adherence WellTransitions℠

- Patient Enrollment
- Generate Med List
- Fill discharge meds
- Bedside delivery
- Patient education
- Smooth hospital to community transition
- Post-discharge follow- up and reporting

Partnership with Walgreens Outpatient Pharmacy

- Support HCAHPS objectives

HCAHPS, Hospital Consumer Assessment of Healthcare Providers and Systems.
HEDIS is a registered trademark of the National Committee for Quality Assurance.

Walgreens Health Systems Solutions drive value to lower cost, improve outcomes & satisfaction

Understanding your challenges…

1. "Do more with less"
2. Reduce Penalties for avoidable readmissions
3. Maintain Competitive Advantage
4. Optimize 340B services

Delivering high-value solutions

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Partnership with Walgreens Outpatient Pharmacy

- Support HCAHPS objectives

340B Complete®

- Complete program
- Comprehensive technology
- Dedicated team
- Audit Process

HCAHPS, Hospital Consumer Assessment of Healthcare Providers and Systems.
HEDIS is a registered trademark of the National Committee for Quality Assurance.

1 *Do More with Less:* Improved pharmacy access and management

Walgreens outpatient pharmacies offer immediate, economical, on-site access to prescribed treatment

Better access to improve first fill and adherence rates through:

- 90-day prescriptions at retail
  - 83% generic dispensing[1]
- Compounding service—especially useful for pediatric and HIV patients
- 340B access and ensures compliance for eligible clients
- Discharge solutions including bedside delivery of prescribed medications

Walgreens helps you cost-effectively meet your inventory, access, and management goals.

1. Data on file, Walgreen Co.

Walgreens outpatient pharmacies have the expertise to support complex disease states

Clinical expertise and resources to support even the most complex treatments

- 100 clinical liaisons (RNs) perform infusion and specialty pharmacy training, in-services, and streamline community connections
- Facilitate prior authorizations, co-pay and patient assistance programs
- Walgreens offers access to 80+ medications with high REMS requirements streamlining your access to Limited Distribution Drugs (LDD)

Walgreens supports your inpatient clinical staff and discharge personnel with one-to-one patient education and counseling.

2 *Hospital Re-admissions*
An emerging area of focus

The Issues

1. Burden of Readmissions
2. Lessons from the Health Literature
3. Multidisciplinary Collaborative Care
4. Methods & Results
5. Discussion & Implications

How big is the problem?

What has worked previously?

What did we do?

How well did we do?

So, what does this mean?

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The Burden of 30-day Readmissions

- Readmissions were estimated to cost Medicare $17.4 billion in 2004.[1]
- Between 2007 and 2011, the all-cause FFS Medicare readmission rate remained stable at 19 percent, with some early indications of reductions in 2012.[2]
- According to Dartmouth Atlas data, 2010 readmission rates continue to vary greatly by geographic area – ranging from 11.4% to 18.1%.[3]

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1.Jencks, SF, Williams MV, and Coleman EA. “Rehospitalizations among Patients in the Medicare Fee-for-Service Program.” New England Journal of Medicine 2009; 360:1418-28. http://www.nejm.org/doi/full/10.1056/NEJMsa0803563

2.Gerhardt G, Yemane A, Hickman P, Oelschlaeger A, Erollins E, Brennan N. Medicare Readmission Rates Showed Meaningful Decline in 2012. Medicare & Medicaid Research Review 2013; 3 (2) E1-12. Available at: http://www.cms.gov/mmrr/Downloads/MMRR2013_003_02_b01.pdf

3.Goodman DC, Fisher ES, Chang, CH, Raymond SR, Bronner KK. After Hospitalization: A Dartmouth Atlas Report on Readmissions Among Medicare Beneficiaries. Robert Wood Johnson Foundation/Dartmouth Atlas Project. February 2013. http://www.rwjf.org/content/dam/farm/reports/reports/2013/rwjf404178

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Medicare Readmission Rates*

	% Population	Mean Age	% Male	% MH	PMPM
0 admissions	83.4	70	46	21	$315
0 readmissions	14.1	72	43	54	$2,636
1 readmission	1.8	72	45	65	$4,948
2+ readmissions	0.7	68	47	75	$8,078

* Walgreens analysis of data from 5% Medicare sample in 2010. %MH = proportion with mental health diagnosis

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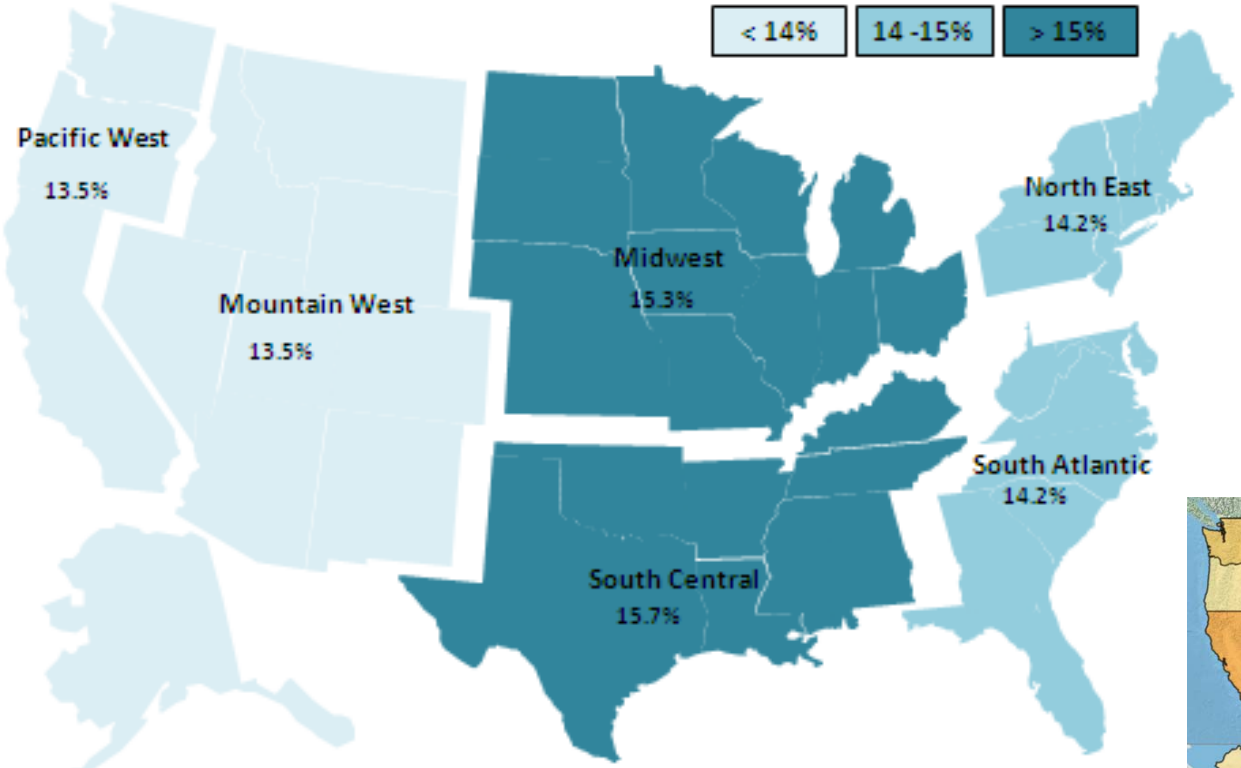
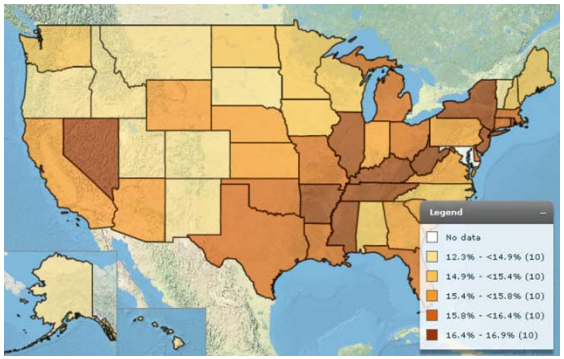
Regional Readmission Rates

% of Medicare beneficiaries with at least one 30-day readmission in 2010, by region





Note: Data from 5% Medicare sample in 2010. Inlaid state-level map from 2010 Dartmouth Atlas data.

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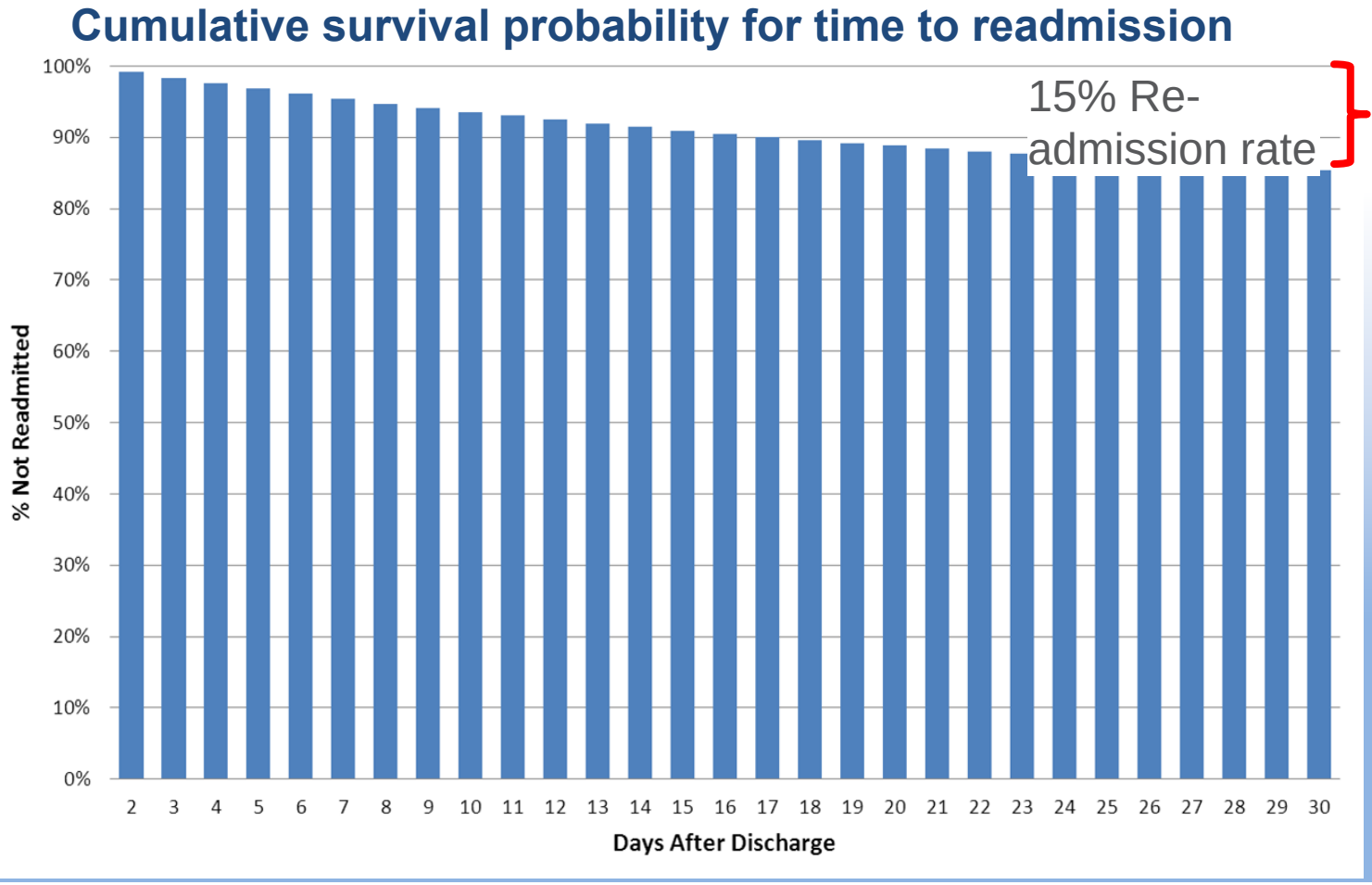
Readmission Decay Curve



Note: Data from 5% Medicare sample in 2010.

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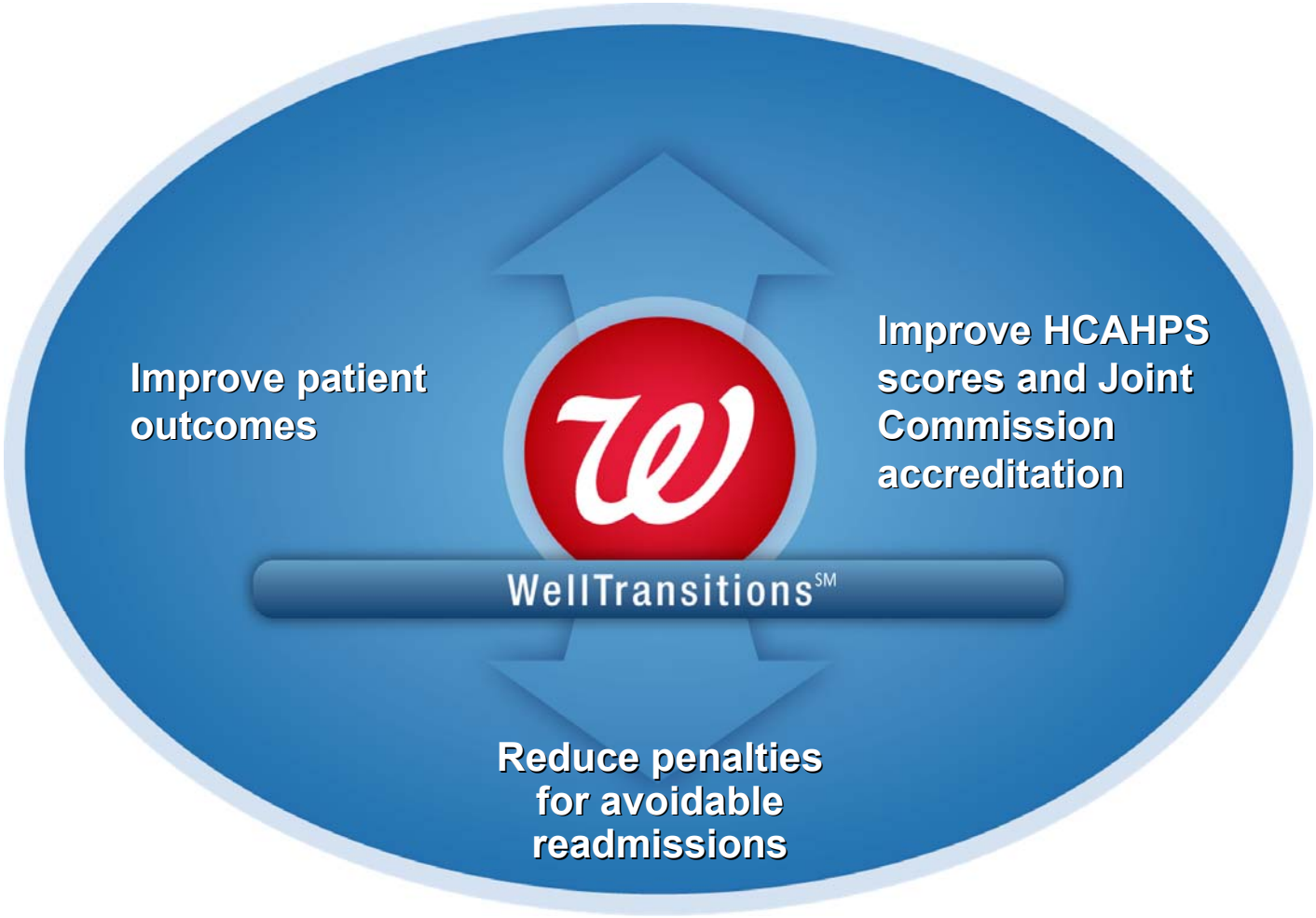
3 *Reduce penalties for avoidable readmissions:* WellTransitions℠

WellTransitions℠: Address 3 key hospital system needs with a single, integrated program



HCAHPS, Hospital Consumer Assessment of Healthcare Providers and Systems.

WellTransitions℠ takes patients from health system to home

Collection and Validation of medication history at admission, to facilitate:

- Medication alignment and prescription therapy planning
- Bedside medication delivery and consultation

Post-discharge patient follow-up

- 48- and 72-hour call-backs

Community pharmacy transition

- Day 9 and day 25 call-backs

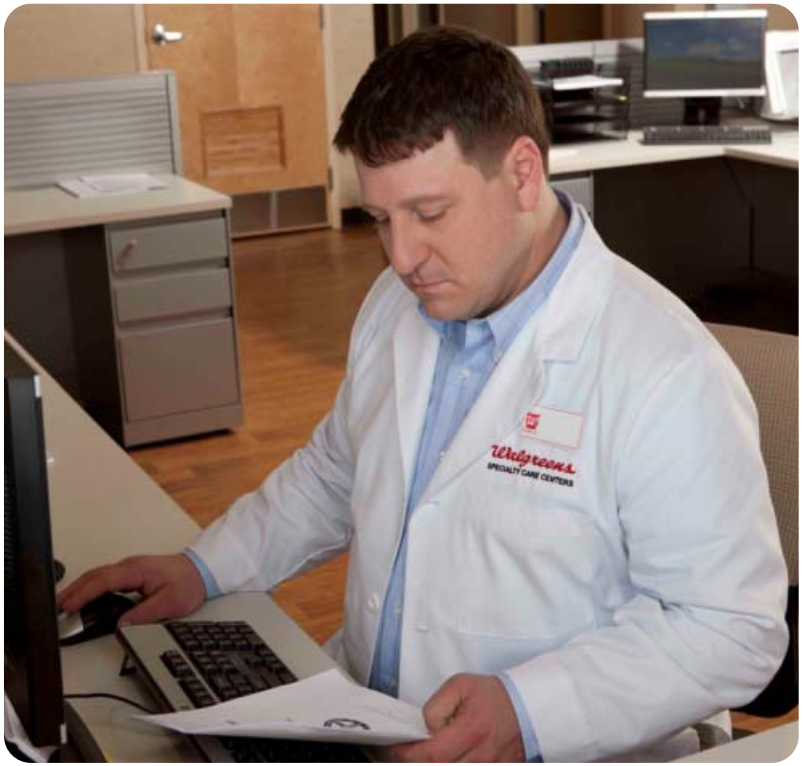
Joint outcomes reporting

Walgreens and Surescripts®: To improve the coordination of care

Joint outcomes reporting quantifies the value of Walgreens WellTransitions℠

Monthly joint outcome reports enable health system to assess program metrics

- Reduction in cost to verify medication reconciliation
- Reduction in cost of the discharge medication consultation
- Reduction in avoidable readmissions due to medication misadventures and lifestyle factors
- Improve HCAHPS scores
- Reduction in risk of poor outcomes due to lack of timely or coordinated information



HCAHPS, Hospital Consumer Assessment of Healthcare Providers and Systems.

Walgreens Health System Solutions address the factors contributing to readmission

Medicare readmissions can be avoided with a combination of efforts[1]

- Seamless transitions between providers and care settings
- Enhanced information or resources
- Patient comprehension of discharge instructions
- Reduction in medical error or adverse event that occurs during the initial hospitalization
- Enhanced social support
- Scheduled follow-up from dedicated resources

1. Minott J. Academy Health. http://www.academyhealth.org/files/publications/Reducing_Hospital_Readmissions.pdf. Accessed June 25, 2012.

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4 *What do we know about Re-admission programs?* Lessons from the literature

Identifying Risk of Re-admission

Patient-specific factors

- Age, sex, socioeconomic deprivation, prior health care use, and specific conditions such as malignancy, progressive heart failure, and a range of comorbidities

Quality of in-hospital care

- General quality of hospital care experienced by the patient and patient climate

Quality of discharge planning/follow-up care

- Presence and adequacy of discharge planning, level of appropriate outpatient and community care, the degree of patient and family education, and how frequently the patient meets with their physician after discharge

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Providers are not good at predicting re-admission risk

Assessed the predictions made by

- Physicians
- Case managers
- Nurses

"...none of the AUC values were statistically different from chance"

Inability of Providers to Predict Unplanned Readmissions

Nasima Allaudeen, MD[1,2], Jeffrey L. Schnipper, MD, MPH[3], E. John Orav, PhD[4], Robert M. Wachter, MD[2], and Arpana R. Vidyarthi, MD[2]

[1]Department of Medicine, VA Palo Alto Healthcare System, Palo Alto, CA, USA; [2]Division of Hospital Medicine, Department of Medicine, University of California, San Francisco, CA, USA; [3]BWH Academic Hospitalist Service and Division of General Medicine, Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA; [4]Department of Biostatistics, Harvard School of Public Health, Boston, MA, USA.

BACKGROUND: Readmissions cause significant distress to patients and considerable financial costs. Identifying hospitalized patients at high risk for readmission is an important strategy in reducing readmissions. We aimed to evaluate how well physicians, case managers, and nurses can predict whether their older patients will be readmitted and to compare their predictions to a standardized risk tool (Probability of Repeat Admission, or P_{ra}).

METHODS: Patients aged ≥65 discharged from the general medical service at University of California, San Francisco Medical Center, a 550-bed tertiary care academic medical center, were eligible for enrollment over a 5-week period. At the time of discharge, the inpatient team members caring for each patient estimated the chance of unscheduled readmission within 30 days and predicted the reason for potential readmission. We also calculated the P_{ra} for each patient. We identified readmissions through electronic medical record (EMR) review and phone calls with patients/caregivers. Discrimination was determined by creating ROC curves for each provider group and the P_{ra}.

RESULTS: One hundred sixty-four patients were eligible for enrollment. Of these patients, five died during the 30-day period post-discharge. Of the remaining 159 patients, 52 patients (32.7%) were readmitted. Mean readmission predictions for the physician providers were closest to the actual readmission rate, while case managers, nurses, and the P_{ra} all overestimated readmissions. The ability to discriminate between readmissions and non-readmissions was poor for all provider groups and the P_{ra} (AUC from 0.50 for case managers to 0.59 for interns, 0.56 for P_{ra}). None of the provider groups predicted the reason for readmission with accuracy.

CONCLUSIONS: This study found (1) overall readmission rates were higher than previously reported, possibly because we employed a more thorough follow-up methodology, and (2) neither providers nor a published algorithm were able to accurately predict which patients were at highest risk of readmission. Amid increasing pressure to reduce readmission rates, hospitals do not have accurate predictive tools to guide their efforts.

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Published online March 12, 2011

KEY WORDS: readmission; unplanned; prediction.
J Gen Intern Med (2011)771-6
DOI: 10.1007/s11606-011-1663-3

BACKGROUND

Against the background of rising concerns about both the cost and quality of American medical care, hospital readmissions have come under increasing scrutiny from both outside and within the government.[1–3] Hospital readmissions may be a marker for poor quality care, are dissatisfying for patients and families, and increase health care costs. Medicare estimates that $15 billion is spent on the 17.6% of patients who are readmitted within 30 days[4].

Although it would be ideal to develop interventions that improve the hospital-to-home transition for all patients, given limited resources, some have argued for targeting intense efforts—such as comprehensive discharge planning, post-discharge phone calls or home visits, and early clinic visits—towards high risk patients. However, such strategies require that we have accurate methods to identify patients at highest risk.

Anecdotal evidence suggests that inpatient providers (physicians, nurses, discharge planners) currently make informal predictions of readmission that affect discharge planning. Such predictions are not new: providers have tried to predict other outcomes, such as mortality and length of stay, in several settings (e.g., intensive care unit, emergency department), with varying success.[5–10] However, the accuracy of informal predictions of hospital readmission is unknown. Several algorithms have also been developed in recent years to predict hospital readmissions, but their use has been limited, because they require information not typically gathered during clinical care, their models are complex and difficult to use, and/or because they are not accurate. A few studies have compared providers with algorithm-based tools to predict readmission and mortality in other settings,[9] but it remains unknown how well providers' predictions of readmission for general medicine patients compare with published algorithms or how the predictions of multiple disciplines compare with one another.

To reach the ultimate goal of preventing readmissions, identifying the high-est risk patients is the first of a multistep process. Providers would next need to speculate on the reason for readmission before then targeting an effective

Allaudeen N, Schnipper JL, Orav EJ, Wachter RM, Vidyarthi AR. Inability of providers to predict unplanned readmissions. J Gen Intern Med. 2011;26(7):771-6

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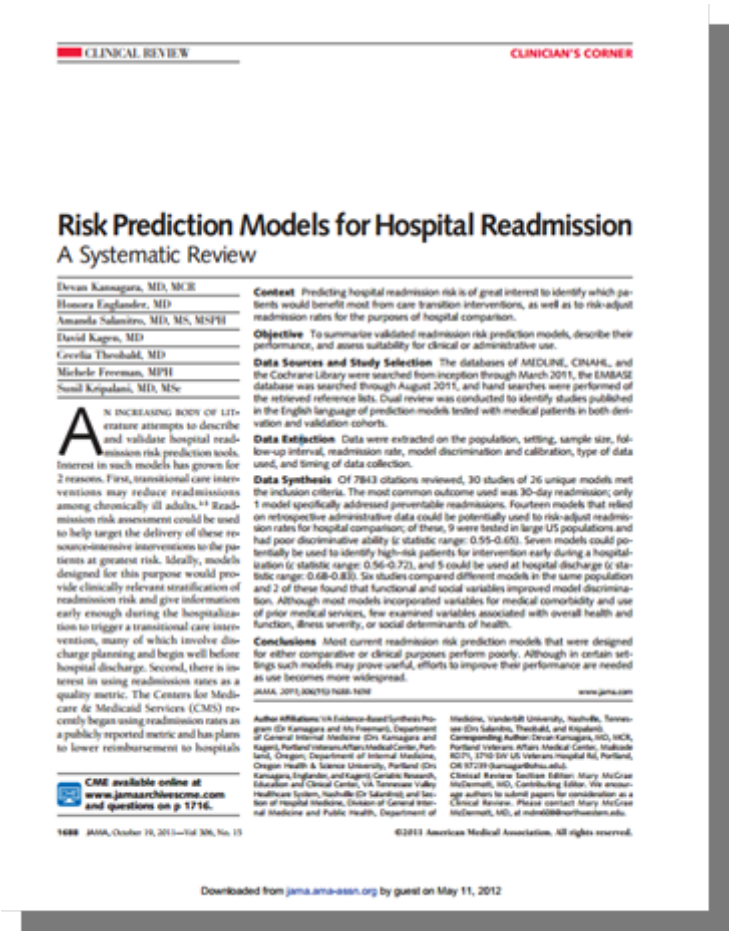
Current Predictive Models aren't much better

"Most current readmission risk prediction models perform poorly…Efforts to improve their performance are needed."

Implications

A single, nationwide model is unfeasible

Additional data points may improve predictive accuracy – possibly including pharmacy data



CLINICAL REVIEW

CLINICIAN'S CORNER

Risk Prediction Models for Hospital Readmission

A Systematic Review

Dewan Kansagara, MD, MCR
Honora Englander, MD
Amanda Salanitro, MD, MS, MSPH
David Kagen, MD
Cecelia Theobald, MD
Michele Freeman, MPH
Sunil Kripalani, MD, MSc

Context Predicting hospital readmission risk is of great interest to identify which patients would benefit most from care transition interventions, as well as to risk-adjust readmission rates for the purposes of hospital comparison.

Objective To summarize validated readmission risk prediction models, describe their performance, and assess suitability for clinical or administrative use.

Data Sources and Study Selection The databases of MEDLINE, CINAHL, and the Cochrane Library were searched from inception through March 2011, the EMBASE database was searched through August 2011, and hand searches were performed of the retrieved reference lists. Dual review was conducted to identify studies published in the English language of prediction models tested with medical patients in both derivation and validation cohorts.

Data Extraction Data were extracted on the population, setting, sample size, follow-up interval, readmission rate, model discrimination and calibration, type of data used, and timing of data collection.

Data Synthesis Of 7843 citations reviewed, 30 studies of 26 unique models met the inclusion criteria. The most common outcome used was 30-day readmission; only 1 model specifically addressed preventable readmissions. Fourteen models that relied on retrospective administrative data could be potentially used to risk-adjust readmission rates for hospital comparison; of these, 9 were tested in large US populations and had poor discriminative ability (c statistic range: 0.55-0.65). Seven models could potentially be used to identify high-risk patients for intervention early during a hospitalization (c statistic range: 0.56-0.72), and 5 could be used at hospital discharge (c statistic range: 0.68-0.83). Six studies compared different models in the same population and 2 of these found that functional and social variables improved model discrimination. Although most models incorporated variables for medical comorbidity and use of prior medical services, few examined variables associated with overall health and function, illness severity, or social determinants of health.

Conclusions Most current readmission risk prediction models that were designed for either comparative or clinical purposes perform poorly. Although in certain settings such models may prove useful, efforts to improve their performance are needed as use becomes more widespread.

JAMA. 2011;306(15):1688-1698

Author Affiliations: VA Evidence-based Synthesis Program (Dr Kansagara and Ms Freeman), Department of General Internal Medicine (Drs Kansagara and Kagen), Portland Veterans Affairs Medical Center, Portland, Oregon; Department of Internal Medicine, Oregon Health & Science University, Portland (Drs Kansagara, Englander, and Kagen); Geriatric Research, Education and Clinical Center, VA Tennessee Valley Healthcare System, Nashville (Dr Salanitro); and Section of Hospital Medicine, Division of General Internal Medicine and Public Health, Department of Medicine, Vanderbilt University, Nashville, Tennessee (Drs Salanitro, Theobald, and Kripalani).
Corresponding Author: Devan Kansagara, MD, MCR, Portland Veterans Affairs Medical Center, Mailcode RD77, 3710 SW US Veterans Hospital Rd, Portland, OR 97239 (kansagar@ohsu.edu).

Clinical Review Section Editor: Mary McGrae McDermott, MD. Contributing Editor. We encourage authors to submit papers for consideration as a Clinical Review. Please contact Mary McGrae McDermott, MD, at mdm608@northwestern.edu.

CME available online at www.jamaarchivescme.com and questions on p 1716.

Kansagara D, Englander H, Salanitro A, Kagen D, Theobald C, Freeman M, Kripalani S. Risk prediction models for hospital readmission: a systematic review. JAMA. 2011 Oct 19;306(15):1688-98.

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LACE Model

Length of stay
Acuity
Comorbidity
ER visits in the last six months

C statistic = 0.684

1-point increase in the LACE score increases the odds of unplanned readmission by 18% (odds ratio 1.18, 95% CI 1.14–1.21)

CMAJ RESEARCH

Derivation and validation of an index to predict early death or unplanned readmission after discharge from hospital to the community

Carl van Walraven MD, Irfan A. Dhalla MD, Chaim Bell MD, Edward Etchells MD, Ian G. Stiell MD, Kelly Zarnke MD, Peter C. Austin PhD, Alan J. Forster MD

Previously published at www.cmaj.ca

See related commentary by Goldfield, page 538

ABSTRACT

Background: Readmissions to hospital are common, costly and often preventable. An easy-to-use index to quantify the risk of readmission or death after discharge from hospital would help clinicians identify patients who might benefit from more intensive post-discharge care. We sought to derive and validate an index to predict the risk of death or unplanned readmission within 30 days after discharge from hospital to the community.

Methods: In a prospective cohort study, 48 patient-level and admission-level variables were collected for 4812 medical and surgical patients who were discharged to the community from 11 hospitals in Ontario. We used a split-sample design to derive and validate an index to predict the risk of death or nonelective readmission within 30 days after discharge. This index was externally validated using administrative data in a random selection of 1 000 000 Ontarians discharged from hospital between 2004 and 2008.

Results: Of the 4812 participating patients, 385 (8.0%) died or were readmitted on an unplanned basis within 30 days after discharge. Variables independently associated with this outcome (from which we derived the mnemonic "LACE") included length of stay ("L"); acuity of the admission ("A"); comorbidity of the patient (measured with the Charlson comorbidity index score) ("C"); and emergency department use (measured as the number of visits in the six months before admission) ("E"). Scores using the LACE index ranged from 0 (2.0% expected risk of death or urgent readmission within 30 days) to 19 (43.7% expected risk). The LACE index was discriminative (C statistic 0.684) and very accurate (Hosmer–Lemeshow goodness-of-fit statistic 14.1, $p = 0.59$) at predicting outcome risk.

Interpretation: The LACE index can be used to quantify risk of death or unplanned readmission within 30 days after discharge from hospital. This index can be used with both primary and administrative data. Further research is required to determine whether such quantification changes patient care or outcomes.

Readmission to hospital and death are adverse patient outcomes that are serious, common and costly.[1,2] Several studies suggest that focused care after discharge can improve post-discharge outcomes.[3,4] Being able to accurately predict the risk of poor outcomes after hospital discharge would allow health care workers to focus post-discharge interventions on patients who are at highest risk of poor post-discharge outcomes. Further, policy-makers have expressed interest in either penalizing hospitals with relatively high rates of readmission or rewarding hospitals with relatively low expected rates.[5] To implement this approach, a validated method of standardizing readmission rates is needed.[6]

Two validated models for predicting risk of readmission after hospital discharge have been published.[6,7] However, these models are impractical to clinicians. Both require area-level information (e.g., neighbourhood socio-economic status and community-specific rates of admission) that is not readily available. Getting this information requires access to detailed tables, thereby making the model impractical. Second, both models are so complex that risk estimates cannot be attained from them without the aid of special software. Although these models have been used by health-system planners in the United Kingdom, we are unaware of any clinicians who use them when preparing patients for hospital discharge.

Our primary objective was to derive and validate a clinically useful index to quantify the risk of early death or unplanned readmission among patients discharged from hospital to the community.

Methods

Study design

We performed a secondary analysis of a multicentre prospective cohort study conducted between October 2002 and July

From the Ottawa Hospital Research Institute (van Walraven, Forster), Ottawa, Ont., the Institute for Clinical Evaluative Sciences (Austin), Toronto, Ont., the Department of Medicine (Dhalla, Bell, Etchells), University of Toronto, Toronto, Ont., the Department of Emergency Medicine (Stiell), University of Ottawa, Ottawa, Ont., and the University of Calgary (Zarnke), Calgary, Alta.

CMAJ 2010. DOI:10.1503/cmaj.091117

van Walraven C, Dhalla IA, Bell C, Etchells E, Stiell IG, Zarnke K, Austin PC, Forster AJ. Derivation and validation of an index to predict early death or unplanned readmission after discharge from hospital to the community. CMAJ. 2010 Apr 6;182(6):551-7

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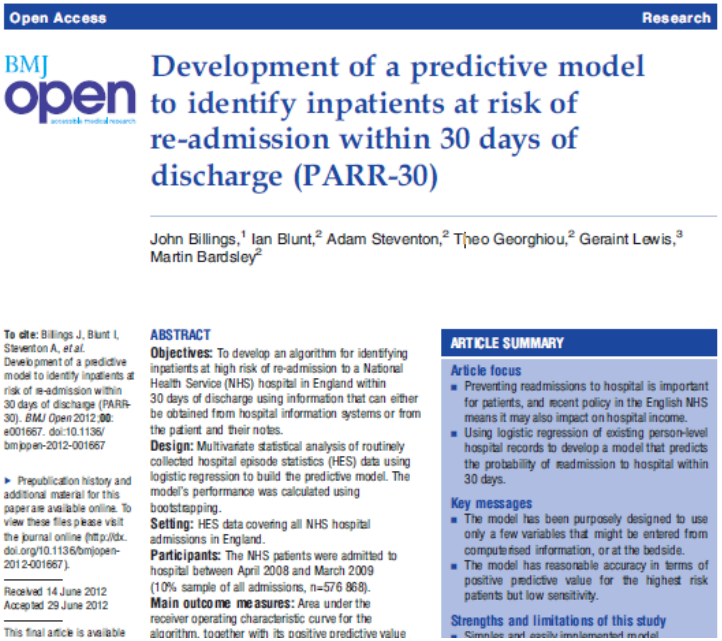
PARR-30 Model

Patients at Risk of Readmission within 30 days

C statistic = 0.700

Variables include:

- Patient age
- Number of emergency admissions in last 12 months
- Whether there has been an emergency admission in the last 30 days
- Socioeconomic deprivation score
- 11 chronic conditions



Open Access Research

BMJ open

Development of a predictive model to identify inpatients at risk of re-admission within 30 days of discharge (PARR-30)

John Billings,[1] Ian Blunt,[2] Adam Steventon,[2] Theo Georghiou,[2] Geraint Lewis,[3] Martin Bardsley[2]

To cite: Billings J, Blunt I, Steventon A, *et al*. Development of a predictive model to identify inpatients at risk of re-admission within 30 days of discharge (PARR-30). *BMJ Open* 2012;**00**: e001667. doi:10.1136/bmjopen-2012-001667

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ABSTRACT

Objectives: To develop an algorithm for identifying inpatients at high risk of re-admission to a National Health Service (NHS) hospital in England within 30 days of discharge using information that can either be obtained from hospital information systems or from the patient and their notes.

Design: Multivariate statistical analysis of routinely collected hospital episode statistics (HES) data using logistic regression to build the predictive model. The model's performance was calculated using bootstrapping.

Setting: HES data covering all NHS hospital admissions in England.

Participants: The NHS patients were admitted to hospital between April 2008 and March 2009 (10% sample of all admissions, n=576 868).

Main outcome measures: Area under the receiver operating characteristic curve for the algorithm, together with its positive predictive value

ARTICLE SUMMARY

Article focus

- Preventing readmissions to hospital is important for patients, and recent policy in the English NHS means it may also impact on hospital income.
- Using logistic regression of existing person-level hospital records to develop a model that predicts the probability of readmission to hospital within 30 days.

Key messages

- The model has been purposely designed to use only a few variables that might be entered from computerised information, or at the bedside.
- The model has reasonable accuracy in terms of positive predictive value for the highest risk patients but low sensitivity.

Strengths and limitations of this study

- Simples and easily implemented model

Billings J, Blunt I, Steventon A, Georghiou T, Lewis G, Bardsley M. Development of a predictive model to identify inpatients at risk of re-admission within 30 days of discharge (PARR-30). BMJ Open. 2012 ;2(4)

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Interventions to reduce readmissions

Systematic review of 43 studies identified three types of interventions:

- Pre-discharge
- Post-discharge
- Bridging

Conclusion: “no single intervention implemented alone was associated with reduced risk for 30-day re-hospitalization”

REVIEW | IMPROVING PATIENT CARE

Interventions to Reduce 30-Day Rehospitalization: A Systematic Review

Luke O. Hansen, MD, MHS; Robert S. Young, MD, MS; Kelki Hinami, MD, MS; Alicia Leung, MD; and Mark V. Williams, MD

Background: About 1 in 5 Medicare fee-for-service patients discharged from the hospital is rehospitalized within 30 days. Beginning in 2013, hospitals with high risk-standardized readmission rates will be subject to a Medicare reimbursement penalty.

Purpose: To describe interventions evaluated in studies aimed at reducing rehospitalization within 30 days of discharge.

Data Sources: MEDLINE, EMBASE, Web of Science, and the Cochrane Library were searched for reports published between January 1975 and January 2011.

Study Selection: English-language randomized, controlled trials; cohort studies; or noncontrolled before–after studies of interventions to reduce rehospitalization that reported rehospitalization rates within 30 days.

Data Extraction: 2 reviewers independently identified candidate articles from the results of the initial search on the basis of title and abstract. Two 2-physician reviewer teams reviewed the full text of candidate articles to identify interventions and assess study quality.

Data Synthesis: 43 articles were identified, and a taxonomy was developed to categorize interventions into 3 domains that encompassed 12 distinct activities. Predischarge interventions included patient education, medication reconciliation, discharge planning, and scheduling of a follow-up appointment before discharge. Postdischarge interventions included follow-up telephone calls, patient-activated hotlines, timely communication with ambulatory providers, timely ambulatory provider follow-up, and postdischarge home visits. Bridging interventions included transition coaches, physician continuity across the inpatient and outpatient setting, and patient-centered discharge instruction.

Limitations: Inadequate description of individual studies' interventions precluded meta-analysis of effects. Many studies identified in the review were single-institution assessments of quality improvement activities rather than those with experimental designs. Several common interventions have not been studied outside of multicomponent "discharge bundles."

Conclusion: No single intervention implemented alone was regularly associated with reduced risk for 30-day rehospitalization.

Primary Funding Source: None.

Ann Intern Med. 2011;155:520-528. www.annals.org
For author affiliations, see end of text.

Among Medicare fee-for-service patients discharged from the hospital, 19.6% are rehospitalized within 30 days (1). The Medicare Payment Advisory Commission has estimated that three quarters of such rehospitalizations may be avoidable and annually account for $12 billion in excess health care costs (2). Others have estimated total hospital costs at $44 billion per year for rehospitalizations within 30 days of hospital discharge (3). The Patient Protection and Affordable Care Act designates reduction of avoidable rehospitalization as a target for health care cost savings and authorizes lower payments to hospitals with high risk-standardized rates of readmission. Reducing readmission rates may be facilitated by a provision of the legislation (section 3026 of HR 3590) that provides $500 million for the Centers for Medicare & Medicaid Services to fund the Community-based Care Transitions Program (4). This initiative aims to help organizations implement evidence-based interventions that reduce hospital readmission among high-risk Medicare beneficiaries.

Parker and colleagues (5) have classified interventions to reduce readmission into 4 categories: discharge planning protocols, comprehensive geriatric assessments, discharge support arrangements, and educational interventions. Although each of these general categories may have unique benefits, efforts to enhance care delivery processes would benefit from a comprehensive inventory of evidence-based components to reduce readmissions within the 30-day window that has become the standard for evaluation of hospital quality. A previous review of hospital utilization did not focus on 30-day readmission and did not provide a taxonomy of interventions to reduce rehospitalization (6).

We identified studies that 1) tested peridischarge process interventions applicable to a general medical adult population by using experimental or observational designs and 2) reported relative readmission outcomes for an intervention and a noninvention cohort. We developed a taxonomy of interventions used to reduce rehospitalization within 30 days. This review provides an inventory of interventions studied to reduce rehospitalization within 30 days and describes the best published evidence for effectiveness of these interventions.

See also:

Web-Only
Appendix Table
Conversion of graphics into slides

METHODS

Data Sources

In collaboration with a research librarian, we conducted a systematic search of MEDLINE, EMBASE,

Hansen LO, Young RS, Hinami K, Leung A, Williams MV. Interventions to Reduce 30-Day Rehospitalization: A Systematic Review. Annals of Internal Medicine. Oct 18 2011;155(8):520-528.

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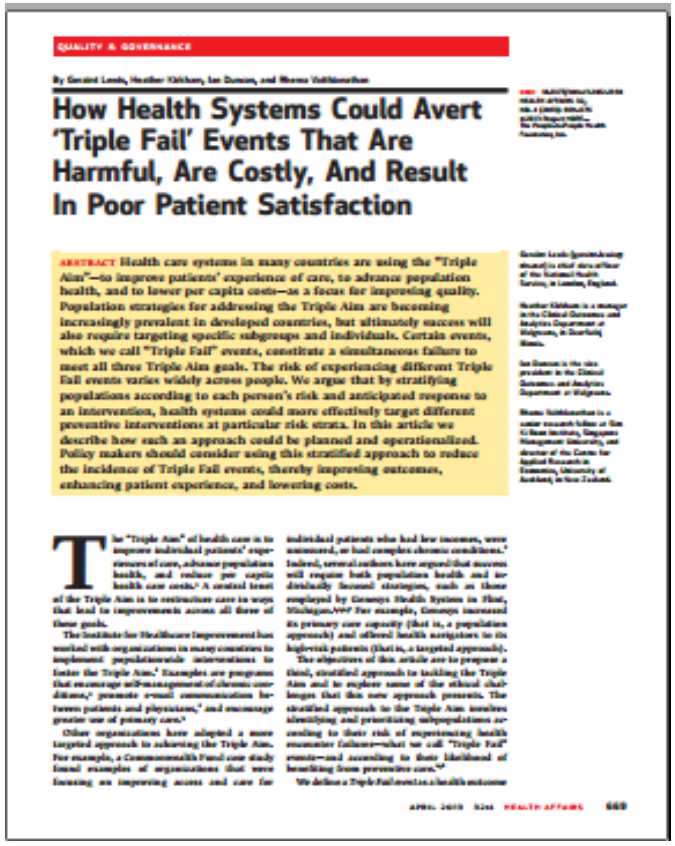
Walgreens research: the “Triple Fail”

Discussion of successful programs and opportunities for Health Systems:

- Hospital Re-admits
- Nursing Home Admits
- Invasive treatment of preference-sensitive conditions



QUALITY & GOVERNANCE

By Geraint Lewis, Heather Kirkham, Ian Duncan, and Rhema Vaithianathan

How Health Systems Could Avert ‘Triple Fail’ Events That Are Harmful, Are Costly, And Result In Poor Patient Satisfaction

ABSTRACT Health care systems in many countries are using the “Triple Aim”—to improve patients’ experience of care, to advance population health, and to lower per capita costs—as a focus for improving quality. Population strategies for addressing the Triple Aim are becoming increasingly prevalent in developed countries, but ultimately success will also require targeting specific subgroups and individuals. Certain events, which we call “Triple Fail” events, constitute a simultaneous failure to meet all three Triple Aim goals. The risk of experiencing different Triple Fail events varies widely across people. We argue that by stratifying populations according to each person’s risk and anticipated response to an intervention, health systems could more effectively target different preventive interventions at particular risk strata. In this article we describe how such an approach could be planned and operationalized. Policy makers should consider using this stratified approach to reduce the incidence of Triple Fail events, thereby improving outcomes, enhancing patient experience, and lowering costs.

How Health Systems Could Avert 'Triple Fail' Events That Are Harmful, Are Costly, and Result in Poor Patient Satisfaction Geraint Lewis, Heather Kirkham, Ian Duncan and Rhema Vaithianathan. *Health Affairs*, 32, no.4 (2013):669-676

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5 *Experience of WellTransitions*
The DeKalb hospital experience

HCAHPS outcomes study: DeKalb Medical Center

591 beds, serving >500,000 patients annually

- 3 campuses in Georgia
- 3800 associates, 300 practicing physicians
- On-site Walgreens Health & Wellness Store

Situation:

- "Communication about medicines" domain was the lowest-scoring HCAHPS domain in prior 2 years

"Communication About Medicines" is the 2nd Lowest-scoring Domain *nationally*.*
Average National Top Box Score: 63% (3,912 hospitals reporting).
Average Top Box Score for GA hospitals: 63% (113 hospitals reporting).

Only "Quietness of Hospital Environment" has a lower national score (60%). Highest score: Discharge Information (84%).

DeKalb Medical

* Average "Top Box" Score ("Always"/"Yes"/"Definitely".)
Summary of HCAHPS Survey Results.
HCAHPSonlyine.org/HCAHPS_Executive_Insight.
10/2011 to 9/2012 Discharges.
CMS Baltimore MD Accessed 9/2013.

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HCAHPS outcomes study: DeKalb Medical Center results

26% relative increase
in HCAHPS domain score

Feedback:

"Nursing staff love the constant interaction (pharmacist/technician explaining the medications, involvement in throughput huddles, discharge calls, etc.)."

Walgreens is now seen as an integral provider within the hospital system—NOT a vendor.

Dramatic improvement in HCAHPS "Communication about medicines" domain scores[1]

From the first percentile to the 65th percentile.

Currently 2ND Highest Volume Bedside Delivery Program in U.S., serving about 300 inpatients and more than 100 outpatients monthly.

1 Stemphiak M., Bedside Delivery-an Easier Pill to Swallow. HHN (p2-3), August 2012

About DeKalb Medical

- 3 hospital system in Metro Atlanta Region
  - 407 beds, 22,000 discharges, 65,000 ED visits, 4.6 ALOS
  - 100 bed, 5,800 discharges, 58,000 ED visits, 4.18 ALOS
  - 40 bed LTACH
- DPHO, mostly non-employed physicians
- Hospitalists – employed
- Major factors impacting hospital utilization trends
  - Growing Uninsured populations
  - Health Care Reform PPACA Impact
  - Misalignment of financial incentives among healthcare providers
  - Fragmentation of health care delivery system

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Readmission management imperatives

Recidivism Trends: Patients with 3 or more admissions in a 6 month period represent a high proportion of the overall admission volume.

	Jan-Jun 2012	Jan-Jun 2011	%CHG Frequent Admitters	%CHG Overall Volume
NORTH DECATUR				
% Admissions by Frequent Admitters	14.1%	13.9%	1.7%	-1.3%
%Frequently Admitted Patients	4.56%	4.53%	0.7%	-1.6%
HILLANDALE				
% Admissions by Frequent Admitters	12.4%	8.6%	44.2%	78.5%
% Frequently Admitted Patients	3.85%	2.56%	50.2%	69.0%

Readmission management imperatives

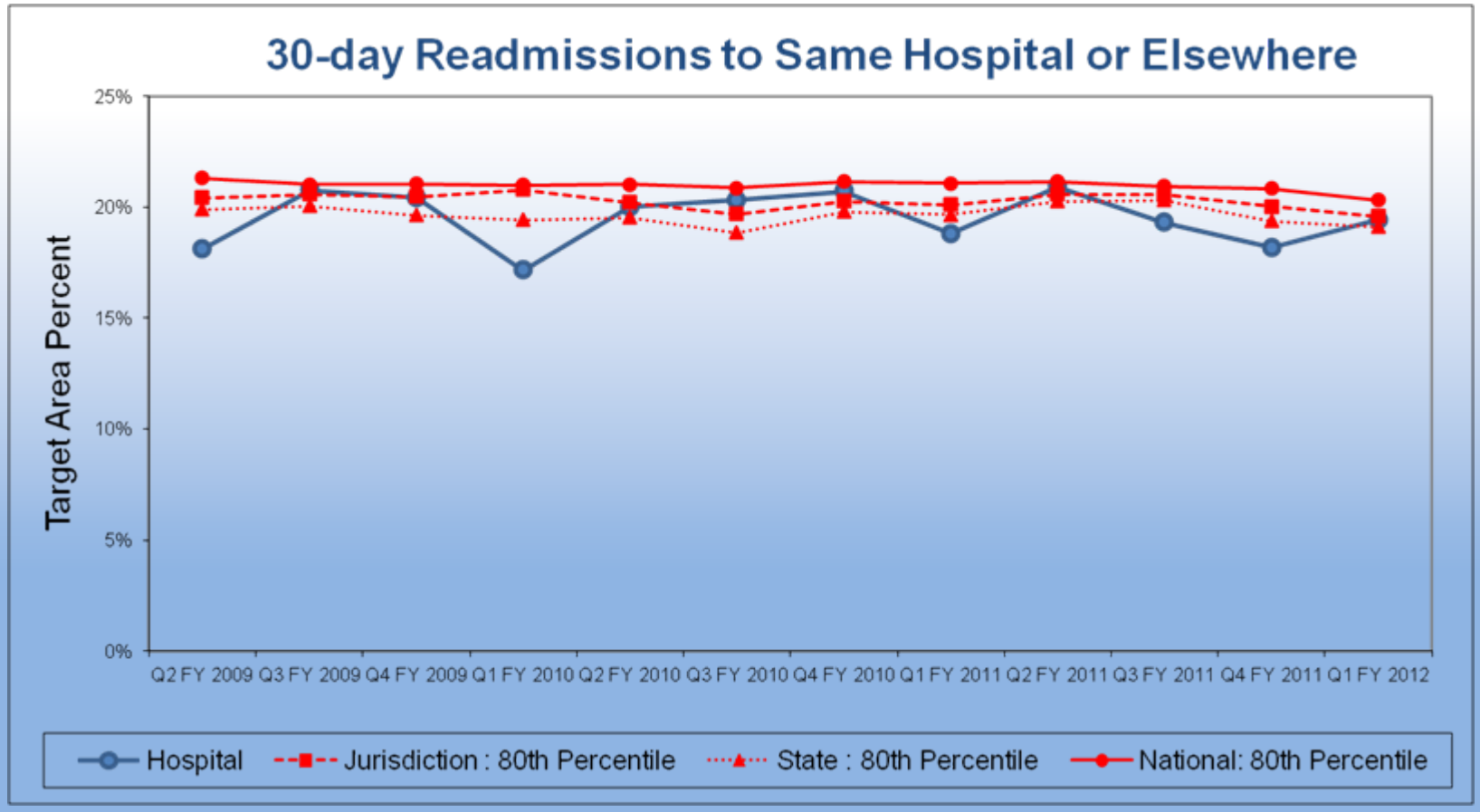
The Top 15 DRG drivers of readmissions at Dekalb Medical represent a high proportion of the overall readmission volume.

- North Decatur (33%)
- Hillandale (48%)

The Top 15 DRG average readmission rate is 15.5%.

- Heart Failure
- Renal Failure
- Psychosis
- Sepsis
- COPD
- Pneumonia
- Respiratory Failure
- Red Blood Cell Disorders
- GI Bleed
- UTI
- Diabetes

Medicare All Cause All Hospital Readmission Trend
FFY12 Q1 PEPPER Report – North Decatur



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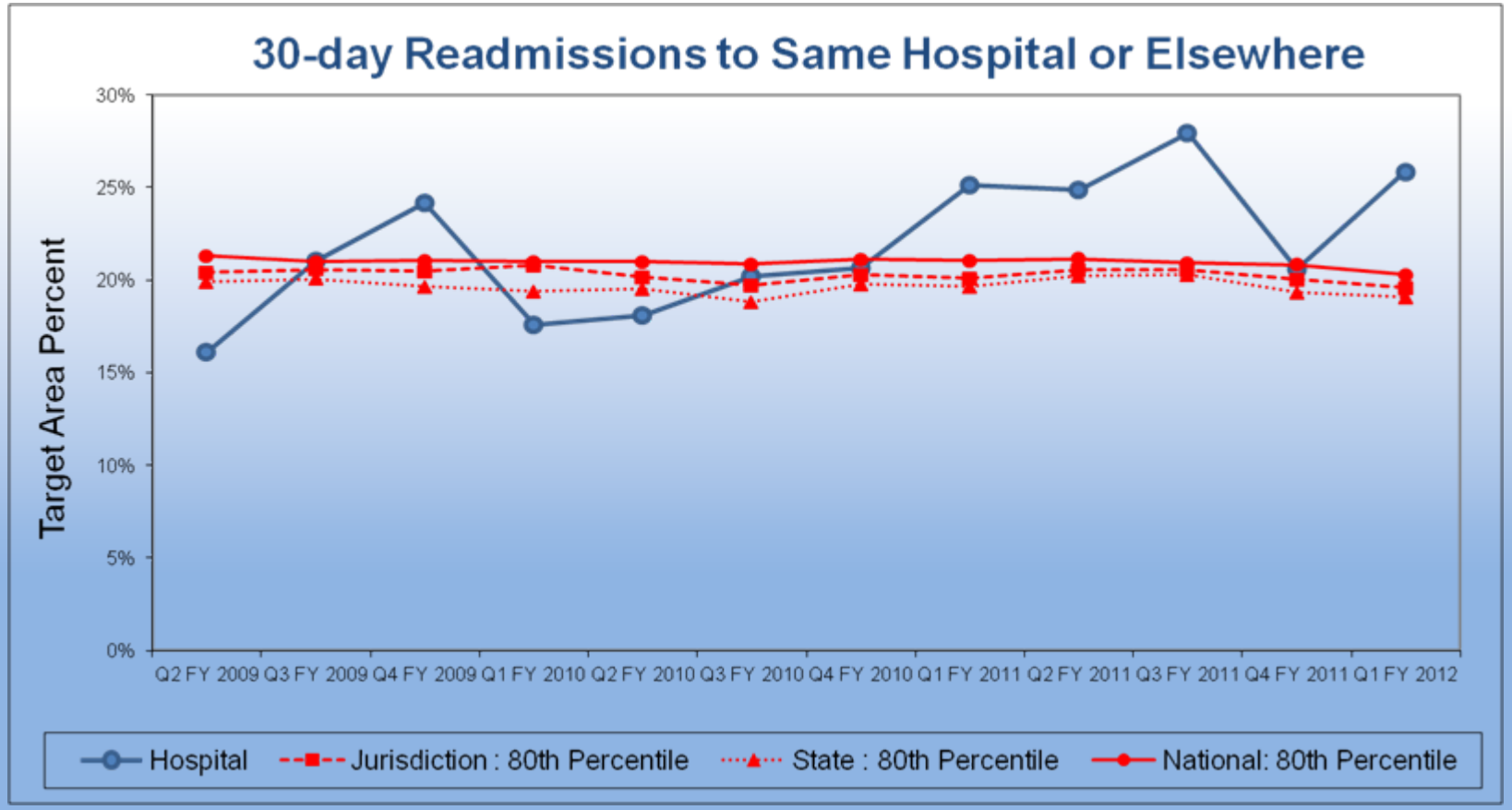
Medicare all cause same hospital readmission trend
FFY12 Q1 PEPPER Report - Hillandale



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5 Care transition pillars readmission management

Collaborate with patient/family, physicians, and community based providers to coordinate safe and appropriate post hospital care designed to reduce readmission

ASSESSMENT -Timely assessment/reassessment risk factors, care process, and outcome goals

EDUCATION - Effective patient/family/caregiver education

HANDOVER COMMUNICATION - Effective communication between care providers

DISCHARGE PLAN - Timely discharge planning assessment, referral, and ready for discharge communication

COMMUNITY CONNECTION - Effective post-hospital follow-up care

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Care transition focus discharge process

Implemented Walgreens Bedside Rx Delivery

North Decatur Campus (May 2011)

Hillandale Campus (January 2012)

Key Functions

- Ensures patient receives the medication upon discharge
- Supports patient satisfaction with discharge experience
- Pharmacy consultation provided, if needed
- Caregiver included in consult
- Reaffirms understanding of medication while patient still in healthcare system
- Immediate start of therapy on discharge
- 15-30 minute turn-around time
- Provides 30-day supply of medications
- Ability to refill at any pharmacy of patients choice
- Follow-up phone call from clinical pharmacist within 72 hours of discharge

Currently 2ND Highest Volume Bedside Delivery Program in U.S., serving about 300 inpatients and more than 100 outpatients monthly.

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Care transition focus discharge process

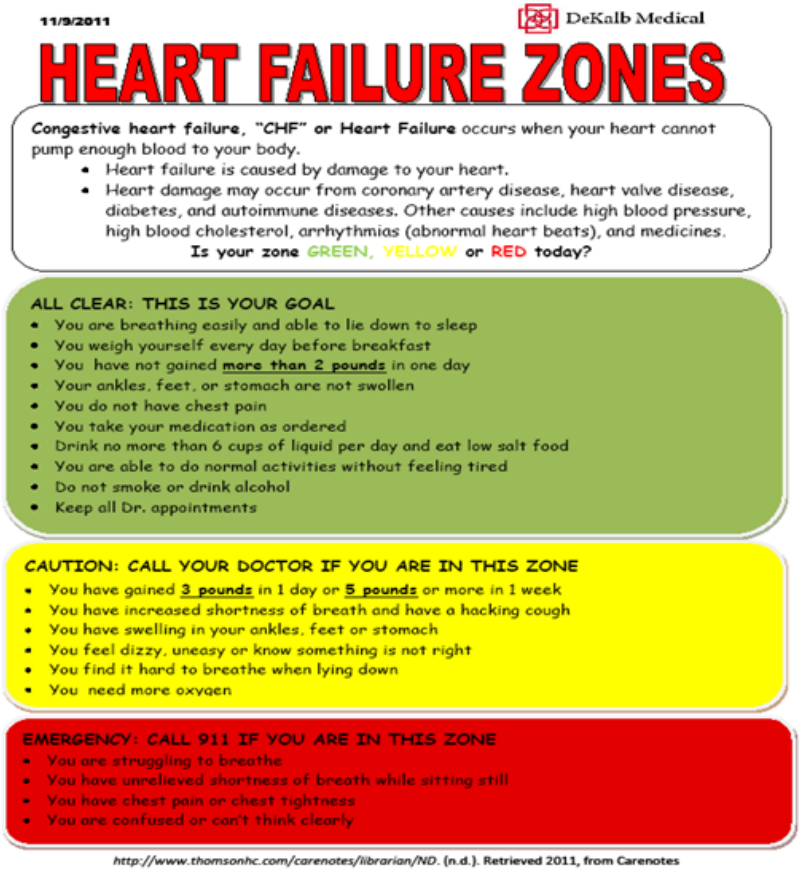
Implemented ZONE Patient Education Model

Key Program Elements

Patient Education Process – Teach Back Method

Implemented – 1st Quarter of 2010

Provided by hospital nursing staff and Preferred Home Health Provider (VNHS)



11/9/2011

DeKalb Medical

HEART FAILURE ZONES

Congestive heart failure, "CHF" or Heart Failure occurs when your heart cannot pump enough blood to your body.

- Heart failure is caused by damage to your heart.
- Heart damage may occur from coronary artery disease, heart valve disease, diabetes, and autoimmune diseases. Other causes include high blood pressure, high blood cholesterol, arrhythmias (abnormal heart beats), and medicines.

Is your zone GREEN, YELLOW or RED today?

ALL CLEAR: THIS IS YOUR GOAL

- You are breathing easily and able to lie down to sleep
- You weigh yourself every day before breakfast
- You have not gained more than 2 pounds in one day
- Your ankles, feet, or stomach are not swollen
- You do not have chest pain
- You take your medication as ordered
- Drink no more than 6 cups of liquid per day and eat low salt food
- You are able to do normal activities without feeling tired
- Do not smoke or drink alcohol
- Keep all Dr. appointments

CAUTION: CALL YOUR DOCTOR IF YOU ARE IN THIS ZONE

- You have gained 3 pounds in 1 day or 5 pounds or more in 1 week
- You have increased shortness of breath and have a hacking cough
- You have swelling in your ankles, feet or stomach
- You feel dizzy, uneasy or know something is not right
- You find it hard to breathe when lying down
- You need more oxygen

EMERGENCY: CALL 911 IF YOU ARE IN THIS ZONE

- You are struggling to breathe
- You have unrelieved shortness of breath while sitting still
- You have chest pain or chest tightness
- You are confused or can't think clearly

http://www.thomsonhc.com/carenotes/librarian/ND. (n.d.). Retrieved 2011, from Carenotes

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Care transition enhancement opportunities

- Expand recidivist management plan via ED Case Management, High Risk Case Manager, and Call Center follow-up
- Facilitate PCP identification/referrals/appointments
- Accurate medical history and medication reconciliation
- Provide structured patient/family education and reinforcement via Rx Bedside Delivery and 72hr follow-up and Home Health
- Establish coach programs for recidivists and P4P discharges
- Provide transitional care clinic for P4P readmission discharges
- Coordinate systematic handover communication between care providers

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Readmission outcomes study for Dekalb Medical Center

Methods

Study Design

- Retrospective cohort of census of all discharges
- Controls from
  - Hospital's historic data (a type of retrospective cohort study)
  - Contemporaneous matches from non-participating facility (i.e., Hillandale campus compared to North Decatur campus

Statistical Analysis

- 30-day readmission calculation based on CMS SAS code, though
  - Only 2-hospital system
  - Not limited to Medicare population
- Multiple logistic regression, controlling for demographic and clinical variables

Lewis G, Paynter J. Pharmacy-Hospital Collaboration to Reduce Readmissions. Care Continuum Alliance Forum 12. Atlanta, GA: October 2012. Research approved by Dekalb Medical's institutional review board (IRB) on April 25, 2012 (DM Protocol #040512).

Descriptive Statistics

Variable	Historic Hillandale		Contemporaneous Hillandale		Historic North Decatur		Bedside Delivery North Decatur	
n (count of qualifying admits)								1,516
30-day readmit (%, n)							5.6%	85
LOS (mean ± SD)							4.0	4.2
age > 65 (%, n)							29.3%	444
age (mean ± SD)							55.7	15.3
HF_case (%, n)							0.3%	5
AMI_case (%, n)							1.6%	24
PN_case (%, n)							1.72	26
Medicaid (%, n)							9.3%	141
Race: Other (%, n)							4.2%	64
Race: Black (%, n)							59.8%	907
Race: White (%, n)							36.0%	545

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Descriptive Statistics

Variable	Historic Hillandale		Contemporaneous Hillandale		Historic North Decatur		Bedside Delivery North Decatur	
n (count of qualifying admits)		4,232		7,024		13,283		1,516
30-day readmit (%, n)	9.5%	400	10.8%	757	10.6%	1,408	5.6%	85
LOS (mean ± SD)	4.3	5.1	4.3	9.6	5.5	6.4	4.0	4.2
age > 65 (%, n)	30.8%	1,305	31.3%	2,197	41.1%	5,459	29.3%	444
age (mean ± SD)	54.9	18.0	55.0	18.4	59.5	17.7	55.7	15.3
HF_case (%, n)	3.5%	148	2.1%	146	1.7%	227	0.3%	5
AMI_case (%, n)	1.3%	56	1.1%	74	1.0%	130	1.6%	24
PN_case (%, n)	4.87	206	4.2	295	3.52	468	1.72	26
Medicaid (%, n)	12.0%	509	12.8%	902	9.9%	1,312	9.3%	141
Race: Other (%, n)	2.1%	90	1.3%	93	5.0%	669	4.2%	64
Race: Black (%, n)	92.3%	3,908	92.8%	6,521	62.1%	8,242	59.8%	907
Race: White (%, n)	5.5%	234	5.8%	410	32.9%	4,372	36.0%	545

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Readmission rates by age and intervention group

	Age < 65	Age ≥ 65	Total
Historic Hillandale	9.1%	10.2%	9.5%
Contemporaneous Hillandale	10.4%	11.6%	10.8%
Historic North Decatur	9.9%	11.6%	10.6%
Bedside Delivery	5.8%	5.2%	5.6%
Total	9.9%	12.0%	10.7%

Unadjusted risk of readmission

Independent variables and covariates	OR	95%	CI	Pr > ChiSq
Male	0.948	0.891	1.007	0.0849
Age 65 +	1.231	1.159	1.307	<.0001
Medicaid	1.346	1.232	1.47	<.0001
Race (Reference Group: White)	0			
Black	1.184	1.103	1.271	<.0001
Other	0.938	0.795	1.107	0.4499
Month	1.014	1.005	1.023	0.0018
LOS	1.028	1.024	1.033	<.0001
CMS Conditions (principal diagnosis HF, AMI, or PN)				
Any of three	0.969	0.858	1.094	0.6085
HF	1.546	1.263	1.892	<.0001
AMI	0.439	0.3	0.643	<.0001
PN	0.922	0.784	1.084	0.3233
Intervention - BSD vs. no BSD)	0.486	0.389	0.606	<.0001
Interventional group (Reference Group: Bedside Delivery)	0			
Historic Hillandale	1.757	1.38	2.238	<.0001
Contemporaneous Hillandale	2.033	1.613	2.563	<.0001
Historic North Decatur	1.995	1.592	2.5	<.0001
Contemporaneous North Decatur	2.184	1.747	2.73	<.0001

Adjusted risk of readmission

Independent variables and covariates	OR	95%	CI	Pr > ChiSq
Male	0.954	0.896	1.014	0.1316
Age 65 +	1.302	1.221	1.389	<.0001
Medicaid	1.437	1.31	1.577	<.0001
Race (Reference Group: White)	0			
Black	1.243	1.153	1.339	<.0001
Other	0.896	0.757	1.061	0.2019
Month	1.019	1.01	1.029	<.0001
LOS	1.026	1.022	1.031	<.0001
CMS Conditions (Reference: without condition)				
HF	1.554	1.267	1.905	<.0001
AMI	0.428	0.292	0.627	<.0001
Interventional group comparison (Reference Group: Bedside Delivery)	0			
Historic Hillandale	1.572	1.232	2.005	0.0003
Contemporaneous Hillandale	1.879	1.488	2.373	<.0001
Historic North Decatur	1.828	1.458	2.293	<.0001
Contemporaneous North Decatur	2.071	1.655	2.591	<.0001

Risk of readmission: Adjusted vs. Unadjusted

Interventional group comparison (Reference Group: Bedside Delivery)	Adjusted	Unadjusted
Historic Hillandale *	1.572	1.757
Contemporaneous Hillandale *	1.879	2.033
Historic North Decatur *	1.828	1.995
Bedside Delivery program	1.000	1.000

* $p<.01$

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Key findings

- At both hospitals, the readmission rates are trending higher, comparing the historic period (2010) to the current period (2011 – June 2012) among patients not provided bedside delivery.
- Adjusting for gender, age, race, length of stay, month of discharge, and CMS condition, **all three control groups had greater likelihood of readmission (*adjusted OR* = 1.6 – 1.9**) compared to the cohort of patients who received bedside delivery.

Interpretation of findings

Results of current analysis suggests that bedside delivery of medications may decrease risk of 30-day readmission.

- O'Dell and Kuckukarisan[1] noted significantly lower readmissions for cardiac patient seen by a clinical pharmacist upon discharge compared to usual care (1.3% vs 9.1%; *p* = 0.04), but only for patients with severe angina.
- In a randomized control trial[2], a pharmacist intervention noted reduced 30-days readmissions compared to the control group (10.0% vs. 38.1%, *p*= 0.04), but the difference was not significant by 60-days (30.0% vs. 42.9%, *p* = 0.52).
- The "RED" intervention[3] noted significantly lower 30-day rates of combined of ER and hospitalization (*IRR*=0.695 [0.515, 0.937]) but not 30-day readmission alone (0.720 [0.445. 1.164])

1. O'Dell KM, Kucukarslan SN. Impact of the clinical pharmacist on readmission in patients with acute coronary syndrome [abstract]. The Annals of pharmacotherapy. Sep 2005;39(9):1423-1427.
2. Koehler BE, Richter KM, Youngblood L, et al. Reduction of 30-day postdischarge hospital readmission or emergency department (ED) visit rates in high-risk elderly medical patients through delivery of a targeted care bundle. Journal of Hospital Medicine. 2009;4(4):211-218.
3. Jack BW, Chetty VK, Anthony D, et al. A reengineered hospital discharge program to decrease rehospitalization. *Annals of internal medicine.* Feb 3 2009;150(3):178-187.

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Study limitations

- These preliminary results are not adjusted for comorbid conditions (secondary diagnosis and procedure codes).
- Not all criteria in the CMS code could be applied (e.g., prior Medicare eligibility), and current analysis is not restricted to CMS conditions, so direct comparison to rates provided by CMS is cautioned.
- We are performing further analysis using HCC risk adjustment to ensure that patient risk is matched.

Implications for clinical care and policy change

- Increased understanding of risk of readmission risk can assist clinical staff **identify highest risk patients**.
- Ongoing assessment will help **refine interventional components** of bedside delivery program.
- Ability to show positive impact of bedside delivery program will **support expansion of program** to Hillandale site.

Care transition enhancement opportunities

- Expand recidivist management plan via ED Case Management, High Risk Case Manager, and Call Center follow-up
- Facilitate PCP identification/referrals/appointments
- Accurate medical history and medication reconciliation
- Provide structured patient/family education and reinforcement via Rx Bedside Delivery and 72hr follow-up and Home Health
- Establish coach programs for recidivists and P4P discharges
- Provide transitional care clinic for P4P readmission discharges
- Coordinate systematic handover communication between care providers

Future research: next steps

- Add variables to adjust for comorbidities in current model
- Analyze impact of bedside delivery vs. 48-hour follow-up call
- Consider assessing impact on readmission over longer periods (e.g., 90-day readmission)
- Develop a hospital-specific, claims-based predictive risk model (PRM)
- Evaluate the use of the risk stratification tool for the DeKalb's inpatient population
- Refine the risk stratification tool
- Evaluate the impact of risk stratification of the intervention
- Future impact evaluation via regression discontinuity

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