HHS Public Access

Author manuscript

J Healthc Qual. Author manuscript; available in PMC 2016 November 09.

Published in final edited form as:

J Healthc Qual. 2016 ; 38(2): 116–126. doi:10.1097/JHQ.0000000000000005.

How Hospitals Reengineer Their Discharge Processes to Reduce Readmissions

Suzanne E. Mitchell, **Jessica Martin**, **Sally Holmes**, **Carol van Deusen Lukas**, **Ramon Cancino**, **Michael Paasche-Orlow**, **Cindy Brach**, and **Brian Jack**

Abstract

Background—The Re-Engineered Discharge (RED) program is a hospital-based initiative shown to decrease hospital reutilization. We implemented the RED in 10 hospitals to study the implementation process.

Design—We recruited 10 hospitals from different regions of the United States to implement the RED and provided training for participating hospital leaders and implementation staff using the RED Toolkit as the basis of the curriculum followed by monthly telephone-based technical assistance for up to 1 year.

Methods—Two team members interviewed key informants from each hospital before RED implementation and then 1 year later. Interview data were analyzed according to common and comparative themes identified across institutions. Readmission outcomes were collected on participating hospitals and compared pre- versus post-RED implementation.

Results—Key findings included (1) wide variability in the fidelity of the RED intervention; (2) engaged leadership and multidisciplinary implementation teams were keys to success; (3) common challenges included obtaining timely follow-up appointments, transmitting discharge summaries to outpatient clinicians, and leveraging information technology. Eight out of 10 hospitals reported improvement in 30-day readmission rates after RED implementation.

Conclusions—A supportive hospital culture is essential for successful RED implementation. A flexible implementation strategy can be used to implement RED and reduce readmissions.

Keywords

readmission; rehospitalization; care transitions

Introduction

Hospital leaders across the United States are striving to identify the best ways to reduce all-cause hospital readmission to improve quality of care, patient safety, and avoid penalties imposed by the Centers for Medicaid and Medicare Services (CMS) (CMS, 2011; Forster et al., 2003; Kripalani et al., 2012). Research has shown that an individualized discharge plan, compared with routine discharge care, can reduce readmissions (risk ratio 0.82; 95%

contact Suzanne E. Mitchell at suzanne.mitchell@bmc.org.

The authors declare no conflict of interest.

confidence interval, 0.73–0.92) (Shepperd et al., 2013). The Re-Engineered Discharge (Project RED) program is a nationally recognized best practice centered on delivering a patient-tailored hospital discharge plan demonstrated to reduce all-cause 30-day readmissions (Jack et al, 2009) and improve safety during care transitions.

Translating research trials into everyday hospital activities, however, is challenging (Clancy and Berwick, 2011). The Agency for Healthcare Research and Quality commissioned the development and testing of a Toolkit to help hospitals implement RED (Jack et al., 2013). We studied the implementation of the RED discharge method (Anthony et al., 2005; Jack et al., 2008), 11 processes that characterize a high-quality discharge (Greenwald et al., 2007) (Table 1) in 10 hospitals across the United States to identify best practices for implementing RED in different organizational settings. This article describes the methods we used to create the RED Toolkit, the implementation challenges faced by hospitals, and how these barriers can be mitigated.

Methods

The RED implementation and dissemination strategy was a three-step approach involving development of an implementation toolkit, selection of 10 hospitals to participate in a RED demonstration study, and evaluation of the implementation process. A Delphi consensus method was used to prepare the RED Toolkit, and qualitative research methods were used to evaluate the hospital implementation experience.

Development of the Re-Engineered Discharge Toolkit

The RED Toolkit comprises six modules that describe components of RED implementation. The modules are listed in Table 2 (Jack et al., 2014). The Toolkit includes strategies for addressing patients' cultural, language, and health literacy needs and preferences. The Toolkit was prepared by the RED research team and is based on the research implementation protocol with additional guidelines based on feedback from implementing hospitals for adapting RED components to meet restricted resources and other identified limitations. The RED Toolkit was revised in an iterative fashion using the Delphi consensus method (Dalkey, 1969; Graham et al., 2003).

Implementation Site Selection

A purposive sample of 10 hospitals from different parts of the country with a mix of safety net, community, for-profit hospitals, and academic and nonacademic institutions were recruited for this demonstration project. Hospitals were identified through the RED Web site by inquiries for implementation support and were screened for inclusion in this study. Hospitals were required to demonstrate a high level of institutional commitment to RED implementation (i.e., a dedicated implementation team with a management-level leader reporting to senior/executive leadership) within the required study time frame and a willingness to cooperate with researchers studying the implementation process including submission of relevant readmission data. Table 3 shows the characteristics of selected hospitals and the population targeted to receive RED.

Training, Technical Assistance, and Learning Community

At each hospital, the RED team conducted an 8-hour training program using the RED Toolkit to officially launch the hospital's implementation program. The training provided policy-level information to engage senior leadership and practical training and information to the implementation team. Hospital implementation teams used the toolkit modules for training staff and phone-based technical assistance to trouble-shoot problems. Hospitals' information technology (IT) departments received substantial technical assistance on installation of the necessary software to import hospital data into the After-Hospital Care Plan (AHCP). Hospitals were offered the opportunity to participate in a monthly telephone group call organized by the RED team, allowing hospitals to network with other participating hospitals.

Assessment of the Implementation Experience

Two researchers with expertise in organizational culture and implementation (C.V.L. and S.H.) and a RED project manager (J.M.) conducted the site visits and key informant interviews with key hospital personnel engaged in RED implementation between April 2011 and June 2012. We used the organizational transformational model (Lukas et al., 2007) as a foundation to develop criteria to analyze sites. We interviewed the senior organizational leaders (e.g., the president, vice president, or CEO), the implementation team leader and team members, staff appointed to be discharge educators, and staff critical to the discharge process, such as physicians, nurses, case managers, pharmacists, and IT staff to gain a comprehensive understanding of the RED implementation experience. A semi-structured interview guide was used, and data were analyzed according to common and comparative themes using the constant comparison method in which essential concepts from interview data are coded and compared over successive interviews to extract recurrent themes. With one exception, site visits were conducted at baseline during the implementation training session and again approximately 1 year after training to assess progress; the exception is a site in which the initial visit followed training by several months.

Fidelity Toward Re-Engineered Discharge Toolkit and Definition of Successful Implementation

We determined implementation to be successful if during the 1-year observation period either (1) all 11 items of the RED were implemented or (2) an adapted version of the RED was implemented, where adaptations were determined in advance and based on availability of resources or site-specific needs during the planning phase of implementation. Fidelity to the RED protocol was defined as implementation according to the RED Toolkit about personnel delivering RED and completion of all 11 RED checklist items as described in the toolkit.

Outcome Assessment

To assess whether implementing RED was associated with a concurrent impact on hospital readmission rates, we compared preimplemenation and postimplementation publicly reported hospital readmission rates. We used the Hospital Compare Web site to document

each participating hospital's readmission rate before the RED implementation period and for the 1-year postimplementation period (http://www.medicare.gov/hospitalcompare).

Results

Four overarching themes characterized hospital implementation experiences: (1) variations in fidelity of RED implementation, (2) factors associated with successful implementation, (3) challenges to implementation, and (4) impact of RED implementation. Overall, seven of the participating hospitals (Hospitals B, C, D, F, G, I, and J) successfully implemented the RED program as planned. These hospitals had the following common features: (1) highly visible commitment from senior leadership, (2) empowered interprofessional implementation team, (3) established methods for sharing results and assessing accountability, (4) buy-in from staff and stakeholders, and (5) flexible in-house IT support. All 7 hospitals reported modest reductions in 30-day readmissions for at least one of the 3 diagnostic areas targeted by CMS for payment penalties (congestive heart failure [CHF], acute myocardial infarction [AMI], and pneumonia [PNA]).

Variation in Fidelity of Re-Engineered Discharge Implementation

Nine of the participating hospitals implemented a site-specific adaptation of the RED protocol during the study period. Hospitals I and J were successful in both maintaining the greatest fidelity to the RED Toolkit. Hospitals B, C, D, F, G, I, and J were successful with RED implementation although they did not adhere to all 11 items of the RED Toolkit per protocol because they developed site-specific adaptations to the RED protocol and successfully implemented the intervention during the 1-year observation period. Hospitals A, E, and H were not successful with RED implementation in the 1-year time period. Hospital A spent extensive time and resources to implement the RED protocol with full fidelity but did not complete implementation within the observation period due largely to challenges with integrating the technology for the AHCP with the hospital's electronic medical record. Hospitals E and H were unable to systematically implement the RED Toolkit at their practice sites.

We observed that hospital teams typically made implementation decisions in the planning phases that were based largely on available resources and adapted the 11-component RED checklist to meet these needs rather than modifying hospital culture or investing in new resources to ensure the fidelity of the RED protocol. Key informants reported that these strategy decisions were meant to overcome implementation barriers, taking into account findings from root cause analyses conducted on cases of readmissions, needs and resource assessments conducted within the organization, and availability of community-based services, which varied considerably across hospital systems. Ultimately, the ability of the hospital's RED implementation team to address needs and barriers with available resources determined how successfully the shift to the RED discharge process from usual care was achieved.

Hospitals varied in the number and extent of RED components implemented and qualifications required for staff to perform certain RED tasks. As one hospital manager expressed, "Resources are limited. It's difficult … The combination [of components] works

well, so if you start taking pieces out, what if you chose the wrong piece to remove and then patient satisfaction and patient outcomes are not as good?" For example, four hospitals did not hire personnel to perform RED responsibilities and instead used unit nurses for discharge education; two teams used nonclinical personnel or third-party vendors to conduct the 2-day post-discharge phone call. All 10 hospitals revised the 2-day postdischarge telephone call script included in the RED Toolkit. For example, one hospital decided to only review high-risk medications or modified scripts to reduce the length of the call. All hospitals generally allocated RED responsibilities in ways that fit their preexisting workflow, resources, and culture rather than to accommodate the RED protocol. Other adaptations included using customized versions of a patient-centered discharge document rather than the RED AHCP. No single staffing model or adaptation emerged as the best.

Likewise, hospitals differed in the scope of patients targeted to receive RED. Eight hospitals chose to initiate RED implementation in 1 or 2 units or wards and/or for patients with a particular diagnosis (i.e., CHF patients only) (Table 3). Reluctance to implement RED hospital wide was partly influenced by financial concerns as related by a senior leader noting the ongoing fee-for-service alignment of payment for hospital services. To our knowledge, there were no attempts to match the selection of RED components implemented to patients' needs.

Factors Associated With Successful Implementation

Active Hospital Leadership—Hospital leaders were keenly aware of the newly promulgated CMS penalties for hospitals with relatively high 30-day all-cause readmission rates. These pressures brought an urgency to improve discharge processes. In virtually all sites, senior leaders were enthusiastic about implementing RED but varied in the effort they personally invested into launching RED, communicating to their organization about the program, acting as project champions, and providing resources. A high level of senior leadership engagement was particularly evident for Hospitals A and I where an empowered senior leadership figure worked as part of the implementation team. This approach sent a powerful message about the importance of RED and expectations for a successful implementation.

An Effective Re-Engineered Discharge Implementation Team—Hospitals that had a well-functioning interdisciplinary team were more successful in working through the complexities of implementation. All 10 RED demonstration hospitals assembled a diverse interprofessional team to develop the changes in organizational work processes to support new discharge processes. A typical team included an implementation leader, nurse managers (usually from the targeted units), staff designated as future discharge educators, physician representatives or leaders, a representative from the pharmacy, and IT staff.

In the eight sites where RED implementation was successful, the RED implementation leader was a highly respected middle manager, usually with a direct reporting relationship to the senior leadership team. Effective leaders used their management structures and processes to align and integrate RED into hospital operations consistent with literature on change management (VanDeusen Lukas et al., 2010; Lukas et al., 2007). They also created

accountability for performance. In one case, a hospital faced staunch resistance to the RED implementation plan from a key project team lead. This situation resulted in a significant delay in implementation of nearly 5 months after recruitment. This hospital was unable to complete implementation in the 1-year time period. In two other hospitals, the RED implementation team leader did not have the status or was not situated appropriately in the organization to marshal the needed resources. These team leaders were unable to leverage organization-wide cooperation. For example,

- At one hospital, the RED team leader lacked a direct link to senior leadership, which created difficulty in resolving conflicts and engaging the necessary cooperation across the organization.
- In another, the RED team leader was a nurse educator who was not positioned to navigate complex organizational issues such as how to involve physician staff or the hospital's IT group.

Implementation teams overall did not anticipate the amount of effort needed to promote the new RED processes to various stakeholders, such as the physician and nursing staff, case managers, social service staff, pharmacy, and IT. Providing initial informational sessions as part of grand rounds or staff meetings introduced the program to key constituents. Implementation teams found it necessary to update stakeholders and obtain their input about strategy and goal setting activities and to provide them with periodic performance and progress reports specific to units. For example,

- One large hospital system had a cohesive interdisciplinary team that met to plan for the anticipated handoffs and RED communication activities.
- In another hospital, a weekly collaborative readmission root cause analysis meeting helped illustrate the need for interdisciplinary accountability for a safe discharge and the value of an interdisciplinary approach to RED implementation.

In at least two hospitals, however, the interdisciplinary approach used in planning RED implementation did not remain intact. Either redesigned work processes were not collaboratively created or the multidisciplinary approach was not sustained throughout the implementation process.

Themes Related to Implementation Challenges and Overcoming Them

Substituting Re-Engineered Discharge Processes for Standard Operations—

Implementing RED with a subset of hospital patients provided an opportunity to test new practices with a limited number of at-risk high-priority patients. It also meant, however, that the RED processes could remain isolated and occur outside the regular workflow. In Hospital I, staff continued their customary way of discharging patients appending RED components in a duplicative manner. As a Vice President said, "Our current [RED] methodology as a stand-alone process is very onerous from a resource-utilization standpoint and it still is somewhat outside of the flow of the normal nursing care that's being done." Hospitals that systematically redesigned and replaced their old work processes did not suffer from these inefficiencies.

Scheduling Timely Postdischarge Follow-up—A key component to delivering RED is making appropriate follow-up appointments for patients before discharge. Hospitals struggled with (1) whom to task with making follow-up appointments, (2) identifying appointment availability among community-based providers, especially for patients with limited or no insurance coverage, and (3) ensuring that follow-up appointments are available in a reasonable time frame generally within a week of discharge. Hospitals tried both communication and persuasion to gain outpatient physicians' cooperation in making time to see recently discharged patients but sometimes did not succeed. For example,

- In one hospital, leadership considered directing follow-up appointments to hospital-owned physician practices. Ultimately, the hospital decided against this approach because they decided that it would be viewed as competitive and adversarial by community practices.
- Another site scheduled in-service presentations in primary care physicians' offices and with community providers such as visiting nurses. This was not particularly successful because physicians viewed implementing RED and the discharge process as a "nursing project."

Hurried Discharges and Discharge Summaries—Although RED implementation should have helped hospital staff address the discharge plan from the beginning of hospitalization and be better prepared for discharge, most sites did not alter the norm for patients to be discharged with little notice. Hospitals had difficulty implementing the RED component requiring discharge summaries be sent to the source of ongoing care within 24 hours. This process requires the discharge summary be written proximate to the time of actual discharge. For the most part, hospitals were unable or unwilling to challenge long-standing habits of attending staff to get discharge summaries completed in an untimely manner. Once completed, some hospitals had difficulty setting up procedures to ensure that the discharge summary was sent to the source of ongoing care in a timely way.

Similarly, it was common for patients to leave without an AHCP, the RED patient-centered document that organizes follow-up care (medications, appointments, pending tests, etc.). In such instances, hospitals mailed the AHCPs to patients, but this precluded the important step of teaching the AHCP to patients and families in the hospital. Staff sometimes resorted to workarounds, such as stapling an existing medication list to the AHCPs, because nurses did not have the time to input that information into the AHCP. In some cases, hospitals underestimated the difficulty of implementing the RED as described by an implementation team member at one hospital, "Some of those on our team saw RED as the panacea that would cure all wounds … it was unrealistic and it certainly did not take into account the complexities of the process."

Leveraging Information Technology Systems—Hospitals chose from four ways to produce the AHCP: (1) program their health information system to generate the AHCP, (2) use a stand-alone RED workstation, (3) integrate the RED workstation into their information system to import data needed to produce the AHCP, or (4) produce the AHCP manually using a word processing template. Only one hospital chose to create its own software to generate the AHCP directly from its electronic information system. All the other hospitals

used a RED workstation to produce the AHCP. Those using a stand-alone AHCP workstation encountered data entry redundancy because information that existed in the electronic medical record had to be reentered into the RED workstation to produce the AHCP. A few hospitals linked the RED workstation into the hospitals' electronic information systems eliminating the need to reenter data and increasing the efficiency of delivering RED. Although several hospitals expressed frustration about the difficulty of integrating software with hospital electronic record systems, most hospitals managed to do so with technical assistance.

Impact of Re-Engineered Discharge Implementation

Employee Engagement and Organizational Culture

Universally, members of the implementation teams believed that the RED processes enhanced patient care, provided tools to help patients better manage their medical conditions, and had an important impact on job satisfaction, staff morale, and engagement. Public recognition of those units meeting established goals for both process (e.g., percent of discharged patients leaving with a follow-up appointment within 7 days) and outcomes (e.g., unit-specific 30-day all-cause readmission rates) is a driver that can build momentum.

Several hospitals reported that implementing RED influenced the culture in their organizations. One hospital attributed the shift to the "integrated team approach to RED." They believe RED has provided the hospital with (1) a guide to building relationships, (2) a mechanism to provide patient education throughout the hospital stay, (3) common goals between the patients and clinical teams, (4) family engagement, (5) patient learning as the closing message, and (6) tools that link patient safety and patient experience. Staff members in one site reported that the new discharge process greatly improved patient experiences and likely explained the hospital-wide improvement in the discharge questions of the Hospital Consumer Assessment of Healthcare Providers and Systems scores in the year after RED implementation.

Readmission Outcomes

Hospitals tracked 30-day readmission rates throughout the implementation process (Table 3; Meister, 2012). All hospitals reported reductions in readmission rates in at least one of the 3 diagnostic areas targeted by CMS for payment penalties (CHF, PNA, and AMI). All but 2 hospitals reported a 0.5% (the national average reduction in readmissions) or greater reduction in 30-day all-cause readmissions after the RED implementation. Although the national average readmission rates for CHF, PNA, and AMI also decreased during the study period, five RED implementation hospitals achieved a greater net decrease in readmission rates than the national average for CHF patients, four hospitals surpassed the national average decrease for AMI readmissions, and five hospitals exceeded the national average decrease for PNA readmissions.

Discussion

To our knowledge, this is the first study of implementation experiences of multiple hospitals and hospital systems implementing a transitional care program. We found similarities and

differences in organizational approaches to RED implementation in terms of senior leadership involvement, staffing commitments and expertise in care transitions, communication and coordination among stakeholder groups, and problem solving to address implementation challenges. Components of the RED protocol were implemented selectively and differently between hospitals, creating uncertainty as to whether there was sufficient fidelity to the RED. It is not clear from this research whether the choices made by hospital leaders regarding which components of the RED to implement affected the results achieved for readmission rates.

The implication of our findings is that implementing a streamlined discharge process to achieve improvements in 30-day readmissions is a complex process requiring significant commitment on behalf of the hospital leadership and implementation team. Consistent with other research, hospitals with a supportive organizational culture and strong engagement from staff members of diverse disciplines and senior leadership that focused attention and resources on the issue of care transitions were more successful (Parrish et al., 2009). Routine root-cause analysis and problem solving, a practice that was common in successful hospitals, may ensure that failures in discharge processes are addressed swiftly and increases the positive perceptions of the RED among key stakeholders.

In the absence of a supportive organizational culture, hospitals face serious challenges when attempting to transform the hospital discharge process and this jeopardizes the opportunity for achieving optimal performance in care transitions and limits the impact on readmission rates. Failure to implement the RED successfully also stemmed from poor communication with stakeholders. This suggests that strong communication and coordination among stakeholders limit false starts in the clinical practice transformation process (Horwitz et al., 2008; Roy et al., 2005; Sutcliffe et al., 2004).

The impact of RED implementation on hospital use after discharge was variable across demonstration sites. Fidelity to the RED intervention did not necessarily correlate with changes in overall or disease-specific 30-day readmission rates. This may be due to the fact that we did not include emergency department visits in our hospital utilization outcome assessment as we did in our Project RED clinical trial. We also believe that this may reflect the influence of patient-level factors and organizational and community context on readmission outcomes. Among our demonstration hospitals, half experienced an overall percent change in 30-day readmission rates from the pre- to post-RED implementation period that was greater than the national average (Table 3). Of these hospitals, three delivered RED with high fidelity to protocol but focused on only one or two of the three CMS target disease categories (CHF, AMI, and PNA). Other hospitals with good fidelity achieved small changes in readmission rates within the 1-year time frame that may reflect the need for a longer observation period after RED implementation for hospitals to realize a detectable change in readmission rates.

Our study has several limitations. First, social desirability response bias (Sudman et al., 1996), in which participants misrepresent their implementation efforts to provide desirable answers, may have occurred during interviews. To minimize this effect, we interviewed several staff members in each hospital and instructed respondents to share both positive and

negative experiences. Second, quantitative methods used to assess the impact of the RED implementation are admittedly imprecise and may be confounded by contextual factors affecting readmissions. This limitation is, however, consistent with the real-world setting of implementation research and the rationale for a primarily qualitative research approach to assessing implementation experiences. Furthermore, these data are commonly used by hospital leaders for assessing the state and impact of ongoing health service change initiatives and therefore relevant in fully representing the RED implementation experience. Third, although we included hospitals in lower socioeconomic settings and other diverse settings, we could not explore the potential role of financial resources or community factors on readmission rates or the successful implementation of RED. Fourth, our study identified conceptual domains that we hypothesized would influence successful implementation; specific measurement of these concepts is needed to test these hypotheses more rigorously in future studies with a larger representative sample of hospitals. Finally, our 1-year observation period was likely insufficient for detecting the full impact of the RED implementation on readmission rates. Future research will be needed to examine this question.

In summary, there is a growing consensus that the essential elements of a successful hospital-based readmission reduction program are now largely identified. The experiences reported here suggest, however, that there are challenges in implementing and sustaining such programs as they transition from research protocols to real-world hospital settings. These challenges are often due to difficulties faced in transforming hospital culture. Changing hospital culture— especially for a process as common and fundamental as hospital discharge—is difficult. Many hospitals have undertaken the task to redesign hospital discharge by implementing programs like RED and other models of care transition programs. Consequently, after remaining steady from 2007 to 2011, the national all-cause 30-day hospital readmission rate among Medicare fee-for-service beneficiaries decreased from 19% to 18.5% in 2012 (Gerhardt et al., 2013; New Data Shows, 2013). Thus, although the transformation in hospital practice is challenging, it is achievable. Continued effort to improve the hospital discharge process supports the public mandate that our healthcare system provide high quality, safe, and less costly healthcare.

Acknowledgments

Jeffrey Ring, PhD, Linda Barnes, PhD, Carol Mostow, LICSW, Ebony Price-Hayward, MD, William Barron, MD, Erica Dobson, PharmD, Fran Bonardi, RN, Luke Hansen, MD, Steve Martin, MD, Victoria Parker, DBA, and Maryam Mohammady. Funding for this project was provided by the Agency for Healthcare Quality and Research.

This research was under contract to the Agency for Healthcare Research and Quality Contract No. HHSA290200600012i, TO #8, Rockville, MD. The authors of this article are responsible for its content. No statement may be construed as the official position of the Agency for Healthcare Research and Quality of the U.S. Department of Health and Human Services.

References

Anthony, D.; Chetty, VK.; Kartha, A., et al. Reengineering the hospital discharge: an example of a multifaceted process evaluation. In: Henriksen, K.; Battles, JB.; Marks, ES.; Lewin, DI., editors. Advances in Patient Safety: From Research to Implementation (Volume 2: Concepts and Methodology). Rockville MD: 2005.

Clancy CM, Berwick DM. The science of safety improvement: learning while doing. Ann Intern Med. 2011; 154:699–701. [PubMed: 21576540]

Centers for Medicare and Medicaid Services (CMS). Hospital inpatient prospective payment systems for acute care hospitals and the long-term care hospital prospective payment system and FY 2012 rates, final rule. Fed Regist. 2011; 76:51607. [Accessed May 14, 2014] Available at: www.gpo.gov/fdsys/pkg/FR-2011-08-18/pdf/2011-19719.pdf.

Dalkey, NC. The Delphi Method: An Experimental Study of Group Opinion RAND Corporation. Santa Monica CA: 1969.

Forster AJ, Murff HJ, Peterson JF, et al. The incidence and severity of adverse events affecting patients after discharge from the hospital. Ann Intern Med. 2003; 138:161–167. [PubMed: 12558354]

Gerhardt G, Yemane A, Hickman P, et al. Medicare readmission rates showed meaningful decline in 2012. Medicare Medicaid Res Rev. 2013; 3(2):E1–E12.

Graham B, Regehr G, Wright JG. Delphi as a method to establish consensus for diagnostic criteria. J Clin Epidemiol. 2003; 56:1150–1156. [PubMed: 14680664]

Greenwald JL, Denham CR, Jack BW. The hospital discharge: a review of a high risk care transition with highlights of a reengineered discharge process. J Patient Saf. 2007; 3:97–106.

Horwitz LI, Moin T, Krumholz HM, et al. Consequences of inadequate sign-out for patient care. Arch Intern Med. 2008; 168:1755–1760. [PubMed: 18779462]

Jack BW, Chetty VK, Anthony D, Greewald J, et al. A reengineered hospital discharge program to decrease rehospitalization. Ann Intern Med. 2009; 150:178–187. [PubMed: 19189907]

Jack, B.; Greenwald, J.; Forsythe, S., et al. Developing the tools to administer a comprehensive hospital discharge program: the ReEngineered discharge (RED)program. In: Henriksen, K.; Battles, JB.; Keyes, MA.; Grady, ML., editors. Advances in Patient Safety: New Directions and Alternative Approaches (Vol. 3: Performance and Tools). Rockville MD: 2008.

Jack, BW.; Paasche-Orlow, MK.; Mitchell, SE., et al. Re-Engineered Discharge (RED) Toolkit. (Prepared by Boston University under Contract No. HHSA290200600012i). Rockville, MD: Agency for Healthcare Research and Quality; 2013. AHRQ Publication Number 12(13)-0084

Jack, BW.; Paasche-Orlow, MK.; Mitchell, SE., et al. Re-Engineered Discharge (RED) Toolkit. Rockville, MD: Agency for Healthcare Research and Quality; 2014. Available at: www.ahrq.gov/professionals/systems/hospital/red/toolkit/index.html

Kripalani S, Roumie CL, Dalal AK, et al. Effect of a pharmacist intervention on clinically important medication errors after hospital discharge: a randomized trial. Ann Intern Med. 2012; 157:1–10. [PubMed: 22751755]

Lukas CV, Holmes SK, Cohen AB, et al. Transformational change in health care systems: an organizational model. Health Care Manage Rev. 2007; 32:309–320. [PubMed: 18075440]

Meister C. Re-engineered discharge: our hospital's story. Readmission News. 2012; 1:1–6. Available at: www.readmissionsnews.com/issues/readmissionsnews0912page1.pdf.

[Accessed May 14, 2014] New data shows affordable care act reforms are leading to lower hospital readmission rates for Medicare beneficiaries. 2013. Available at: http://blog.cms.gov/2013/12/06/new-data

Parrish MM, O'Malley K, Adams RI, et al. Implementation of the care transitions intervention: sustainability and lessons learned. Prof Case Manag. 2009; 14:282–293. [PubMed: 19935345]

Roy CL, Poon EG, Karson AS, et al. Patient safety concerns arising from test results that return after hospital discharge. Ann Intern Med. 2005:121–128.

Shepperd S, Lannin NA, Clemson LM, et al. Discharge planning from hospital to home. Cochrane Database Syst Rev. 2013; 1:CD000313.

Sudman, S.; Bradburn, NM.; Schwarz, N. Thinking About Answers: The Application of Cognitive Processes to Survey Methodology. San Francisco, CA: Jossey-Bass; 1996.

Sutcliffe KM, Lewton E, Rosenthal MM. Communication failures: an insidious contributor to medical mishaps. Acad Med. 2004; 79:186–194. [PubMed: 14744724]

VanDeusenLukas C, Engle RL, Holmes SK, et al. Strengthening organizations to implement evidence-based clinical practices. Health Care Manage Rev. 2010; 35:235–245. [PubMed: 20551771]

Table 1

Components of the RED

1. Make appointments for follow-up care (e.g., medical appointments, postdischarge tests/laboratories)
2. Plan for the follow-up of results from tests or laboratories that are pending at discharge
3. Organize postdischarge outpatient services and medical equipment
4. Identify the correct medicines and a plan for the patient to obtain them
5. Reconcile the discharge plan with national guidelines
6. Teach a written discharge plan the patient can understand
7. Educate the patient about his or her diagnosis and medicines
8. Review with the patient what to do if a problem arises
9. Assess the degree of the patient's understanding of the discharge plan
10. Expedite transmission of the discharge summary to clinicians accepting care of the patient
11. Provide telephone reinforcement of the discharge plan
12. Ascertain need for and obtain language assistance (newly added after RED Toolkit development)

Table 2

RED Toolkit Modules

Tool	Description
An Overview of the RED Toolkit	Explains why hospital would want to reengineer their discharge and provides evidence of RED's impact
The Re-Engineered Discharge: How to Begin Implementation at Your Hospital	Outlines the steps you need to take to begin implementation at your hospital. It will help you consider all aspects of implementation from planning your implementation team to identifying potential barriers
How to Deliver the Re-Engineered Discharge	Describes various tasks the discharge educators undertake to implement the RED components
How to Deliver the RED to Diverse Populations	Assists discharge educators in delivering the RED to patients from diverse backgrounds, including diverse language, culture, race, ethnicity, education, and literacy, and social circumstance
How to Conduct a Postdischarge Follow-up Phone Call	Assists in preparing callers to review appointments, medicines, medical issues, and what to do if a nonemergent problem arises
How to Benchmark Your Hospital Discharge Improvement Process	Describes how to examine your hospital's current rate of readmissions and implement a program to monitor your hospital's progress

RED, Re-Engineered Discharge.

Table 3

Readmission Rates for Participating Hospitals

Hospital	U.S. Region Type/ Number of Beds	Target Population	Mean Pre-RED 30-Day Readmission Rate, %			Mean Post-RED 30-Day Readmission Rate, %			Overall Change Pre- to Post-RED, %
			AMI*	CHF*	PNA*	AMI*	CHF*	PNA*	
National Average			19.8	24.8	18.4	18.3	23.0	17.6	−1.4
A	Western U.S., Veterans Health Administration Medical Center, 808 beds	General medical	NA	NA	15.4%	18.9%	22.6%	19.1%	−3.7, for PNA * only
B	Midwest U.S. Private, suburban, 210 beds	CHF	19.9%	25.2%	19.2%	19.6%	23.2%	19.2%	−0.7%
C	Midwest U.S. Private, urban, 299 beds	CHF	22.0%	24.5%	19.1%	19.5%	22.5%	17.2%	−2.2%
D	Midwest U.S. Private, urban, 184 beds	CHF	20.9%	23.9%	18.7%	18.7%	22.1%	18.6%	−1.4%
E	Midwest U.S. Private, urban, 480 beds	CHF	22.3%	26.9%	21.2%	21.0%	25.8%	19.7%	−1.3%
F	Midwest U.S. Private, urban, 182 beds	CHF	19.0%	28.7%	20.4%	17.2%	25.2%	18.6%	−2.4%
G	Midwest U.S. Private, suburban, 174 beds	CHF	21.2%	26.8%	22.0%	19.2%	27.3%	21.2%	−0.7%
H	Mid-Atlantic U.S. Urban safety net, 213 beds	Medical/ surgical units and renal	NA	25.0%	20.9%	NA	23.3%	18.6%	−2.1%, for CHF and PNA only *
I	Mid-Atlantic U.S. Private, suburban, 245 beds	CHF	20.2%	22.2%	17.8%	18.7%	19.9%	16.7%	−1.7%
J	Northeast U.S. Rural, 101 beds	CHF, PNA	NA	26.7%	20.9%	NA	24.4%	18.0%	−2.6%, for CHF and

Hospital	U.S. Region Type/ Number of Beds	Target Population	Mean Pre-RED 30-Day Readmission Rate, %			Mean Post-RED 30-Day Readmission Rate, %			Overall Change Pre- to Post-RED, %
			AMI*	CHF*	PNA*	AMI*	CHF*	PNA*	
									PNA only*

Data source: www.medicare.gov/hospitalcompare.

*Indicates data only available for CHF and PNA.

AMI, acute myocardial infarction; CHF, congestive heart failure; ESRD, end-stage renal disease; PNA, pneumonia.