Developing the Tools to Administer a Comprehensive Hospital Discharge Program: The ReEngineered Discharge (RED) Program

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Abstract

Introduction: The hospital discharge is nonstandardized and marked with poor quality. One in five hospital discharges is complicated by an adverse event (AE) within 30 days, many of which lead to emergency department visits and rehospitalizations. **Methods:** Using an iterative group process, we developed the principles and components of the ReEngineered Discharge (RED), a set of 11 distinct components designed to prepare patients for discharge. Three tools were created: a training manual used to train discharge nurses to provide the RED; an individualized, patient-friendly "After Hospital Care Plan" (AHCP), a booklet used to prepare patients for discharge; and a workstation to integrate all pertinent discharge information used to electronically create the AHCP. **Outcomes:** The RED was adopted by the National Quality Forum (NQF) as one of their "Safe Practices." Among the intervention subjects, 89 percent were provided with an AHCP at discharge; it required approximately 1 hour for the discharge advocate to provide the RED intervention. **Implications:** Use of the AHCP tool can effectively prepare patients for discharge, as recommended by NQF 2006 Safe Practice number 11. These results have important implications for quality of care at discharge and for lowering costs.

Introduction

The transition process from the hospital to the outpatient setting is nonstandardized and frequently poor in quality.[1] One in five hospital discharges is complicated by an adverse event (AE) within 30 days, often leading to an emergency department visit and/or rehospitalization.[2, 3, 4]

Many readmissions stem from errors that can be directly attributed to the discontinuity and fragmentation of care at discharge.[5, 6] High rates of low health literacy; lack of coordination in the "hand-off" from the hospital to community care, gaps in social supports, and other limitations also contribute to the risk of rehospitalization, particularly for low-income urban patients.[7, 8, 9] Increasingly, as hospitalists provide more inpatient care,[10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20] it is difficult for primary care physicians (PCPs) to be aware of all the complexities of a hospitalization.[21, 22]

Compounding the problem, the typical brief post-hospital followup visit does not allow the PCP adequate time to become familiar with the details of the hospitalization. Furthermore, the discharge summary, the main tool utilized by primary-care providers to ensure the continued care of the patient, is often not available to them or is missing key information.[23, 24] Thus, the transition from the hospital to the ambulatory setting is a "hand-off" that opens the door for many potential medical errors.

There were over 38 million discharges in the United States in 2003, at a total cost of over $753 billion.[25] Patients requiring recurrent hospitalization accounted for only 13 percent of hospitalized patients, but they used up to 60 percent of resources.[26] Any successful effort to reduce AEs will likely make care safer and reduce unnecessary rehospitalizations, thereby decreasing costs. A reduction in the rehospitalization rate, even by a few percentage points, would produce profound effects on health care financing.[27, 28] Eliminating 4.7 percent of hospitalizations, a conservative estimate of the rate of unnecessary rehospitalizations, would save $5.1 billion annually.[29]

In its report, *To Err is Human: Building a Safer Health System,*[30] the Institute of Medicine (IOM) argued that most medical errors are a result of systemic problems rather than of poor performance by individual providers. The transition from the hospital to the ambulatory setting holds the potential for systemic problems, with numerous inherent possibilities for mistakes, lapses, and AEs. While adequate knowledge, skills, and adherence to established protocols by hospital and ambulatory care physicians can prevent many of these problems, others are the result of flaws in the design and organization of the health care system. These flaws are magnified in safety net hospitals, like Boston Medical Center, where the connection between hospital care and community-based care can be tenuous, and the patient population faces many barriers to care.

This report summarizes the rationale for and development of the principles and components of a comprehensive hospital discharge that we call the ReEngineered Discharge (RED), tools that can be used to administer this discharge, and preliminary results of a randomized controlled trial funded by the Agency for Health Research and Quality (AHRQ), designed to test the effectiveness of the RED.

Medical Errors and Adverse Events at Hospital Discharge

Errors and Adverse Events Are Common on Both Sides of the Transition

A study of a medical service at an urban teaching hospital demonstrated that 49 percent of discharged patients, who followed up with their PCPs, experienced an error in care due to a discontinuity between the inpatient and outpatient setting. Furthermore, patients who experienced "work-up" errors were 6.2 times as likely as those not experiencing these errors to be rehospitalized within 3 months.[31]

In addition, over one-third of recommended outpatient workups scheduled after hospital discharge are not completed. Noncompletion is partially attributed to poor documentation on

discharge summaries.[24] From a review of medical charts and structured telephone interviews conducted with patients 3 weeks after discharge, Forster, et al.[2] concluded that between 15 and 23 percent of patients experienced an AE during the transition from the hospital to the ambulatory care setting. One-third of the AEs were preventable; one-third resulted in disability; and half were associated with use of additional health services. Overall, close to two-thirds of post-discharge AEs were preventable or ameliorable.[2, 3] As Forster noted,[32] "There is good reason to hope that the safety of the discharge process can be substantially improved."

The five error types most often observed and reported by U.S. family physicians are: [33, 34]

- Errors in prescribing medications.
- Errors in getting the right laboratory test done for the right patient at the right time.
- Filing system errors.
- Errors in dispensing medications.
- Errors in responding to abnormal laboratory test results.

Patients see multiple providers before, during, and after a hospital encounter, and communication among these providers tends to be inconsistent. The majority of PCPs do not receive patients' discharge summaries in time for hospital followup visits,[23, 35] and when they do, it may take as many as 7 days for a PCP to receive it by mail.[36] This glaring lack in communication results in difficulty in adequate monitoring of the recently discharged patient's condition and/or test results.[37, 38]

During this period of vulnerability, patients often have trouble getting in contact with a physician from the hospital, which they may need to do to discuss new symptoms, the side effects of medications, or deviations from the discharge plan. With the PCP unaware of the patient's medical condition and hospital physicians unavailable, patients are left in clinical limbo during the precarious days immediately following a hospitalization.

Urgency for Interventions Related to Medication Errors

Nearly one in every five medication doses in American hospitals may be administered in error. The error rate is also high in long-term care centers and small hospitals.[39, 40] Research suggests that 1.7 to 3.9 percent of patients' emergency department (ED) visits result from problems with medications, 66 percent of which might have been prevented.[41, 42]

Estimates of the number of deaths from medication use range from 7,000 to 140,000 yearly. Medication error rates depend on how these rates are measured. Lower rates are found when reporting is passive (e.g., based on incident reports) rather than active (e.g., based on observations).[43, 44] Many more patients suffer from drug-related morbidity than mortality; the worst outcomes include permanent disability and life-threatening experiences.[45, 46]

Medication errors also add to costs. The cost of treating an adverse drug event in a hospital averages $3,244 to $5,857 per case.[47, 48, 49, 50]

Adverse Drug Events: Common, Serious, and Costly

Adverse drug events (ADEs) are the most common AEs that occur following hospital discharge.[2, 3] Annual estimates of the proportion of outpatients experiencing ADEs range from 5 to 35 percent.[51, 52] A survey of 661 patients found that 162 patients had a total of 181 ADEs. Of these, 13 percent were serious; 28 percent were ameliorable; and 11 percent were preventable. Nearly two-thirds of ameliorable events (63 percent) were attributable to the physician's failure to respond to medication-related symptoms; 37 percent were due to the patient's failure to inform the physician of the symptoms.[53]

In another study, possible drug-related incidents occurring in the ambulatory clinical setting were assessed using multiple methods.[54] Of 1,523 ADEs identified in this study, 27.6 percent were considered preventable. Of these, 38 percent were categorized as serious, life-threatening, or fatal; 42.2 percent of these events were preventable. Human error associated with ADEs occurred most often (58.4 percent) at the stage of prescribing. Human error came into play in monitoring, which accounted for 60.8 percent of ADEs. Errors involving patient adherence were also common, accounting for 21 percent of ADEs.

Finally, ambulatory ADEs are costly. One study estimated the annual cost of ambulatory ADEs at over $76.6 billion.[46]

Developing the RED Toolbox

Re-Engineering the Hospital Discharge

With funds and encouragement from AHRQ's Safe Practices Implementation Challenge Grant Program (AHRQ grant HS-014289), we undertook an in-depth analysis and redesign of the current hospital-discharge process. After reviewing the literature, we used an iterative group process to produce a process map of the discharge.[55] We reviewed the map with senior administrators, physicians, residents, nurses, pharmacists, and ancillary staff, and revised it based on their feedback. The map was reality-tested by "sharp-end" providers (those closest to the patient directly involved with the discharge process) at weekly meetings of the working group and at nursing, social services, and case management staff meetings. It was modified based on feedback from Boston Medical Center (BMC) administration, BMC senior management, and Boston HealthNet medical and executive leadership (an integrated health service delivery network serving Boston area residents with limited ability to pay for medical care).

We began to investigate what worked, what did not, and how we could improve the discharge process. We identified and categorized potential failures, the likelihood of making a mistake, and potential consequences of the error. We then identified any processes that could help detect errors before they occurred and suggested an action plan for each potential failure that could cause significant consequences. We (representing most key stakeholders within the hospital) then gathered to redesign our discharge process.

Working in small groups, members were instructed to use the information from the research literature, knowledge from the above analyses, and their own creativity to develop a new

discharge process. Each of the groups then described their new map and the themes or principles thought to be important to the discharge process leading to the construction of the principal themes of the ReEngineered Discharge (Table 1). A full description of this process was published in the AHRQ publication, *Advances in Patient Safety: From Research to Implementation.*[1]

Table 1. Principal themes of the ReEngineered Discharge (RED) process

1. Delineation of roles and responsibilities must be explicit.

2. Waiting until the discharge decision is made before beginning the discharge process can increase the risk of errors.

3. Patient education must occur throughout the hospitalization, not just at the time of discharge.

4. Information must flow reliably from the primary-care physician (PCP), to the hospital team, among hospital team members, and back to the PCP.

5. Information to be included in the discharge résumé (summary) should be available when it is prepared. The discharge résumé must be completed before discharge and updated at the time of discharge. Waiting days or weeks leads to errors.

6. Every discharge must have a written discharge plan that is comprehensive in scope and that addresses medications and other therapies, dietary and other lifestyle modifications, followup care, patient education and health literacy improvements, and instructions about what to do if the patient's condition changes.

7. A comprehensive discharge plan must be completed for every patient before discharge, and a copy of the plan should be provided to the patient at discharge.

8. All patients should have access to their discharge information written in their language and at their literacy level.

9. Patients at risk for rehospitalization should have their discharge plan reinforced after discharge.

10. All information about the patient's admission must be organized and promptly delivered to the PCP.

11. Efficient and safe hospital discharges are significantly more challenging if case management staff members are available only during limited daytime hours.

12. Discharge processes must be benchmarked, measured, and subjected to continuous quality improvement.

To learn more about the patients being rehospitalized in our community, we analyzed characteristics of patients admitted to the BMC HealthNet inpatient clinical service, which served as the source of study patients for Project RED. In this analysis, we learned that 22 percent of the admissions were followed by a rehospitalization within 90 days. These rehospitalizations were slightly concentrated toward the days immediately following discharge. Thirty-four percent of the rehospitalizations occurred within the first 2 weeks following discharge.

Looking at the day of the week of discharge, we found that discharge over a weekend was a powerful predictor for rehospitalization. Patients discharged on Friday, Saturday, or Sunday were 30 percent more likely to be rehospitalized or seen in the emergency department within 90 days than those discharged other days.

Qualitative Research of the Transition from the Hospital to the Ambulatory Setting

Another study examined the phenomenon of AEs from the perspective of discharged patients.[56] Twenty-one rehospitalized patients were assessed using semistructured, open-ended interviews during their hospital stay at BMC. The results showed that difficult life circumstances posed a greater barrier to recuperation than lack of medical knowledge. All participants were able to describe their medical condition, the reasons they were admitted to the hospital, and the discharge instructions they received. All patients knew the types of medications they were taking and the conditions for which the medications were prescribed.

The patients' recuperation was compromised by factors that undermined their ability to follow their doctors' recommendations, including support for medical and basic needs, substance use, and limitations in the availability of transportation to medical appointments. Distress, particularly depression, further contributed to poor health and undermined their ability to follow doctors' recommendations and the discharge plan.

Taken together, these results suggest that life circumstances outside the hospital are as critical to recovery as institutional coordination of medical care. Thus, interventions targeting low-income patients are more likely to succeed if they include social and medical support during the transition from hospital to home and if they ease the patient's burden of daily responsibilities.

Depression as a Risk Factor for Rehospitalization

We also conducted a study[57] that evaluated the utility of adding psychosocial information to more traditional measures to improve the ability to predict rehospitalization among high-risk patients with prior admissions. A logistic regression model that included prior admissions in the last year, comorbidity, physical functional status, and depression showed that depression tripled the odds of rehospitalization (OR 3.3; 95 percent CI 1.2 - 9.3). We concluded from this study that hospitalized patients with a recent hospitalization and a positive screen for depression are three times as likely to be rehospitalized within 90 days as those without depression.

National Quality Forum Endorsement of the RED

In 2006, the National Quality Forum (NQF) Consensus Standards Maintenance Committee was charged with the task of updating the *Safe Practices for Better Healthcare* developed in 2003.[58] The committee recognized the critical importance of the discharge as a significant patient transition and decided to expand the pre-existing focus on promoting accurate communication about treatment and procedures at discharge to a broader, more comprehensive approach to hospital discharge that would be evidence-based and patient-centered and would target existing systems failures.[59] The committee undertook a thorough evidence-based review of the domain, followed by consultation with a number of subject matter experts, including primary input from the "Re-Engineered Discharge" project at the Boston University School of Medicine. This Safe Practice largely parallels the components of the ReEngineered Discharge (Table 2). The complete NQF Safe Practice can be accessed at www.qualityforum.org.

Table 2.   Operationalized components of the Re-Engineered Hospital Discharge

1. **Educate the patient about his/her diagnoses throughout the hospital stay.**

2. **Make appointments for clinician followup and post-discharge testing.**

    - Make appointments with input from the patient regarding the best time and date of the appointment.
    - Coordinate appointments with physicians, testing, and other services.
    - Discuss reason for and importance of physician appointments.
    - Confirm that the patient knows where to go and has a plan about how to get to the appointment; review transportation options and other barriers to keeping these appointments.

3. **Discuss with the patient any tests or studies that have been completed in the hospital and discuss who will be responsible for following up the results.**

4. **Organize post-discharge services.**

    - Be the sure patient understands the importance of such services.
    - Make appointments that the patient can keep.
    - Discuss the details about how to receive each service.

5. **Confirm the medication plan.**

    - Reconcile the discharge medication regimen with those taken before the hospitalization.
    - Explain what medications to take, emphasizing any changes in the regimen.
    - Review each medication's purpose, how to take each medication correctly, and important side effects to watch out for.
    - Be sure patient has a realistic plan about how to get the medications.

6. **Reconcile the discharge plan with national guidelines and critical pathways.**

7. **Review the appropriate steps for what to do if a problem arises.**

    - Instruct on a specific plan of how to contact the PCP (or coverage) by providing contact numbers for evenings and weekends.
    - Instruct on what constitutes an emergency and what to do in cases of emergency.

8. **Expedited transmission of the Discharge Resume (summary) to the physicians (and other services, such as the visiting nurses) accepting responsibility for the patient's care after discharge that includes:**

    - Reason for hospitalization with specific principal diagnosis.
    - Significant findings. When creating this document, the original source documents (e.g., laboratory, radiology, operative reports, and medication administration records) should be in the transcriber's immediate possession and be visible when it is necessary to transcribe information from one document to another.
    - Procedures performed and care, treatment, and services provided to the patient.
    - The patient's condition at discharge.
    - A comprehensive and reconciled medication list (including allergies).
    - A list of acute medical issues, tests, and studies for which confirmed results are pending at the time of discharge and require followup.
    - Information regarding input from consultative services, including rehabilitation therapy.

Table 2. Operationalized components of the Re-Engineered Hospital Discharge

9. **Assess the patients' degree of understanding by asking them to explain the details of the plan in their own words.**

   - May require removal of language and literacy barriers by utilizing professional interpreters.
   - May require contacting family members, who may share in caregiving responsibilities.

10. **Give the patient a written discharge plan at the time of discharge that contains the following:**

    - Reason for hospitalization.
    - Discharge medications, including which medications to take, how to take them, and how to obtain them.
    - Instructions on what to do if their condition changes.
    - Coordination and planning for followup appointments that the patient can keep.
    - Coordination and planning for followup tests and studies, for which confirmed results are not available at the time of discharge.

11. **Telephone re-enforcement of the discharge plan and problem solving 2 to 3 days after discharge.**

The committee undertook a harmonization approach in order to synchronize the practices across the pertinent requirements or initiatives of the Joint Commission, the Centers for Medicare & Medicaid Services, the Agency for Healthcare Research and Quality, the Leapfrog Group, and the Institute for Healthcare Improvement. This harmonization effort was termed "the 4Cs" across each of these organizations, including:

- A cross-walk of requirements.
- Cross-language or synchronized descriptions where possible.
- Cross-credit opportunities.
- Cross-communication of common performance targets.

This set of processes was intended to establish the new discharge practice as a clear roadmap for hospitals to satisfy a common set of requirements of major purchasing, accrediting, and quality organizations. In the summer of 2006, the RED project was presented to the national health care community for review and input for revisions. Substantial input from providers and purchasers was received, and a round of revisions ensued.

In October 2006, the national members of the NQF voted to endorse the new practice as a national standard.[58] The stated objective of the practice is "to ensure that effective transfer of clinical information to the patient and ambulatory clinical providers occurs at the time of discharge from the health care organization." Our current proposal is designed to meet this objective. A manuscript describing the development of the RED and the NQF Safe practice was published in conjunction with the publication of the NQF's new Safe Practices.[60]

The RED Toolbox

Using resources funded by AHRQ, the research team at BMC operationalized the RED-based NQF Safe Practice and created tools to allow for a safer discharge. Three tools were created: a training manual for discharge nurses to provide a regulated "checklist" for each component of the RED; an individualized, patient-friendly "After-Hospital Care Plan" (AHCP) written at the patient's appropriate literacy level; and a workstation to integrate all pertinent discharge information and to generate the AHCP.

Training Manual

We have prepared a 30-page training manual and workbook for health care professionals that describes in detail how to deliver a safe and effective hospital discharge, including the following points:

- Instructions and information pertaining to the best ways in which to contact the team providing care for the patient.
- The various components of the RED. For each of the components, the manual contains a detailed script describing how to collect the necessary information.
- Prompts for providers to reconcile the discharge plan with any existing national guidelines for the patient's diagnosis and general scripts for discussing the diagnosis with the patient.
- Instructions for determining the best time to schedule an appointment through consultation with the patient.
- Prompts to ascertain that the patient has transportation to all appointments, as well as instructions on telling the patient what to do if an appointment needs to be changed.
- Encouragement to the provider to include a photograph of the primary care physician and a map describing locations of appointments in the AHCP, in order to further facilitate the patient's likelihood of attendance at appointments.
- Encouragement to providers to obtain a list of the patient's medications that has been reconciled by the hospital team and updated in the patient's electronic medical record. The reconciled medication list is then included in the AHCP.
- Scripts for discussing the medications with the patient, ensuring that he/she understands how to take them and has a plan to obtain them from the pharmacy.
- Detailed dialogues for each step of the discharge process.

After Hospital Care Plan

One principle of the RED and of the NQF Safe Practice is that all patients should leave the hospital with a discharge plan. We call our discharge plan the "After Hospital Care Plan" because, in the course of our work, we realized that some patients are confused by the word "discharge."

The AHCP is a spiral-bound, color booklet designed to clearly present the information needed by patients to prepare them for the days between discharge and their first visit with their ambulatory care physician. We worked with consultants from the Rhode Island School of Design to help us with the graphic design. The AHCP is presented in an easily understood chart format. It lists upcoming appointments and tests; provides a color-coded calendar of upcoming appointments,

and includes prompts and questions to help the patient prepare for his/her upcoming appointment (patient activation).

Each AHCP is individualized, including the patient's name, contact information for his/her primary care physician, a color-coded medication schedule tailored to the patient's medication regimen, and an illustrated informational page describing the discharge diagnosis. The information included in the booklet is presented and organized in a manner designed to be accessible to individuals of all literacy levels.

Computerized Workstation to Print the AHCP

Creation of the AHCP is now automated by means of a Discharge Planning Workstation, a dedicated computer workstation. The workstation is the nexus of all information regarding patient discharge and discharge followup. It is a stand-alone tool where the nurse responsible for the discharge (the "discharge advocate") enters the key data into a database. Once this information is entered, the workstation automatically creates a draft AHCP. The discharge nurse then reviews and refines this plan, if necessary. Following this, the discharge nurse prints out the draft discharge plan and takes it to the physician for review and sign-off.

Once the discharge plan has been finalized, it is "published" and a spiral binding is added at the workstation. The discharge advocate then teaches the information it contains to the patient at his/her bedside. One objective over the next year is to integrate the workstation into the hospital's electronic health record (EHR) system (Centricity-Logician™ at Boston Medical Center), exporting the information to the patient's ambulatory EHR and emailing it to the patient's PCP.

Testing the RED

The RED is currently being tested in a two-arm, randomized, controlled trial (ClinicalTrials.gov Identifier: NCT00252057) among hospitalized patients admitted to the general medical service of BMC. This study is taking place on a portion of the inpatient general medicine service at BMC. This service is composed of four teams of residents each plus a teaching-attending physician.

After obtaining informed consent, subjects are randomized to those receiving standard discharge (control group) and an experimental group that receives the components of the RED by a trained discharge advocate. As part of the RED, the discharge is reinforced via a telephone call from a pharmacist with access to the AHCP 2 to 5 days post-discharge. In this report, we provide preliminary information about the first 571 subjects enrolled in this trial (289 intervention subjects and 282 controls).

Participants and Randomization

The study population is 52 percent female, mean (±SD) age of 49 (±14); 52 percent African American; 15 percent private insurance; 64 percent high school graduate or less; and 56 percent limited in health literacy (as measured by the REALM score). The distribution of baseline variables (i.e., sex, age, race, education, income, insurance, employment, having a primary care

provider, homeless at any time in the past 3 months, hospital admission in the previous 6 months, Short Form-12 Health Survey, REALM score) is equally divided between the two study arms, suggesting successful randomization. Of the subjects enrolled, 87 percent have been reached for the data collection telephone call at 30 days post-discharge.

The Time It Takes to Administer the RED

An important barrier to providing the RED intervention (at least in our teaching hospital, where residents care for inpatients and are responsible for discharges) is that our discharge advocate needs to coordinate the discharge plan with the resident team. In our experience, residents consider hospital discharge a lower priority than other activities. On average, it requires 3.9 attempts by our Discharge Advocate to contact the resident team on the day of discharge to discuss the discharge plan, reconcile medications, etc. Most patients require three attempts. Excluding the time spent in contacting the resident team and producing the "AHCP," the Discharge Advocate spends an average of 51.9 minutes in face-to-face time with each patient (median, 45 minutes; range, 15-185 minutes).

Effectiveness of the Delivery of the RED

The AHCP has been given to 89 percent (N = 257) of intervention subjects. Subjects not given an AHCP either left the hospital against medical advice, left at a time that no discharge advocate was available, or were transferred to another hospital service.

Of the subjects receiving the AHCP booklet, 58 percent received a RED medication schedule, 88 percent received a physician appointment schedule, 91 percent received an appointment calendar, and 82 percent received a diagnosis education sheet. Pending hospital tests at discharge and tests to be completed post-discharge are also listed in the AHCP.

Completion of RED Intervention Components

The RED intervention has been successful in completing the specified components of the RED (Table 3) and identifying barriers to completion of these components. Among the 289 intervention subjects, 96 percent (N = 276) were discharged from the hospital with a primary-care appointment, most within 3 weeks after discharge. For 97 percent of the PCP appointments made, the subject's discharge plan was sent to the PCP prior to their followup appointment. This discharge plan included both the hospital discharge summary and the RED AHCP, if available. Of the intervention subjects, 90 percent (N = 261) were discharged with at least one medication; RED discharge advocates were able to reconcile medication lists with the hospital team for 57 percent (N = 148) of these subjects. For those patients whose medications could not be reconciled by the discharge advocate, the hospital team was asked to complete the medication list prior to discharge and print a copy for the subject.

Table 3.   Successful completion of RED intervention components

RED component	Intervention Group [N (%)]
Appointments and tests scheduled	
PCP appointment scheduled (N = 289)	276 (96)
Discharge plan sent to PCP (N = 276)	268 (97)
Medication plan	
Patient has medications at discharge (N = 289)	261 (90)
Medications reconciled with hospital team (N = 261)	148 (57)
After Hospital Care Plan (AHCP)	
AHCP given to patient (N = 289)	257 (89)
Patients with AHCP items included	
Appointment schedule (N = 257)	226 (88)
Appointment calendar (N = 257)	233 (91)
Diagnosis Education Sheet (N = 257)	211 (82)
Patients with AHCP and medications	
RED medication schedule (N = 237)	138 (58)
Electronic medical record med schedule (N = 237)	120 (51)

Barriers to Implementing the RED

Our experience to date has helped identify key barriers to implementing comprehensive discharge programs for hospitalized patients. These barriers include:

- It is not clear who is responsible for all elements of the discharge transition, such as completing the patient preparation and education and communicating with the source of ongoing outpatient care.
- The discharge process receives low priority in the work schedule of inpatient clinicians, leaving little time to create a coordinated, patient-centered, and comprehensive discharge plan.
- The medication plan is regularly changed late in the hospitalization, if not right at discharge. This leaves patients underprepared to address any learning, access, or support issues that the changes may engender (e.g., self-administration of insulin or low molecular-weight heparins, or post-hospitalization monitoring-associated logistics of patients initiated on warfarin).
- The financial pressure to fill beds as soon as they are empty works as a disincentive to give nurses and doctors the time needed to create and teach a complete discharge plan.

- Medication reconciliation with the ambulatory electronic health record is often not done, even when it is required of residents and when our discharge research staff "hound" residents to do it.
- Discharge is relegated to the least experienced members of the team, who are most likely to make medical errors and/or not appreciate the most important elements to include in discharge communications, with plans often not reviewed by attending physicians for days or weeks after discharge.
- Discharges occur around the clock but especially in the late afternoon and evening, when optimal staffing often is not available.

Conclusion

A comprehensive discharge, as endorsed by the National Quality Forum Safe Practice Number 11, can be successfully implemented using the RED AHCP tool. However, about 1 hour of nursing time is needed to create and teach the discharge plan. There is consensus that the RED provides a "checklist" of key processes that should be completed on every patient at the time of discharge. However, in implementing this under a research protocol, it is clear that there are many barriers to a comprehensive discharge inherent in the procedures, processes, and priorities of hospital systems. We are now completing a randomized, controlled trial of the RED compared with usual care. Finally, we are now working on new health information technology systems designed to provide the RED and minimize nursing time.

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