Effective Interventions to Reduce Rehospitalizations:

A Survey of the Published Evidence

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Introduction

Rehospitalization—patient admission to a hospital soon after discharge—is both common and costly. In the majority of situations, hospitalization is necessary and appropriate. However, nearly one in every five elderly patients who are discharged from the hospital is rehospitalized within 30 days.[1] Many of these rehospitalizations are avoidable, and thus suggest a failure in the systems of establishing patients stably and safely in a new setting of care. Avoiding preventable rehospitalizations represents a win-win opportunity for patients and families, payers, health care purchasers, and providers.

Investigators working in a range of clinical settings have identified effective methods for reducing avoidable rehospitalizations. The Institute for Healthcare Improvement (IHI) has produced this two-part series of background materials to highlight promising approaches to reduce avoidable rehospitalizations. This document is a survey of the published literature regarding the effective interventions to reduce avoidable rehospitalizations. The companion document in this series, *Effective Interventions to Reduce Rehospitalizations: A Compendium of Promising Interventions*, provides information regarding current best programs and practices to reduce rehospitalizations.

Our survey of the published evidence revealed that the current body of published interventions to reduce rehospitalizations fall into four broad categories: 1) enhanced care and support during transitions; 2) improved patient education and self-management support; 3) multidisciplinary team management; and 4) patient-centered care planning at the end of life.

Purpose and Methods

The intent of our survey of the published literature was to review the evidence for effective interventions to reduce rehospitalizations across patient populations and settings of care. We conducted a PubMed search of the published literature to find evidence of the effectiveness of interventions to improve transitions of care and reduce rehospitalizations. As this is a very broad topic, we narrowed the search strategy by limiting our consideration of articles by publication date (to those articles published fewer than 10 years from September 2008), English, and US-based studies. Search terms included: "transitions of care," "re-hospitalizations," "readmissions," unnecessary hospitalization," "avoidable hospitalization," reducing hospitalization," "reduce re-hospitalization," "reduce readmissions," "readmissions mental illness," "readmissions dementia," "readmissions end of life," "interventions reduce rehospitalization," "case management," "community reduce readmission," "discharge planning readmission," and "home care readmission." Each search returned well over 1,000 results. For each search result, a practicing physician reviewed up to 500 results based on these limits and selected roughly 100 articles for consideration by the research team for further review. The research team selected approximately 25 articles from each group to review in detail. In total, the number of articles reviewed for this survey of evidence was 158.

We encountered a heterogeneous collection of studies and findings. Foci of studies were variably on: 1) the epidemiology of avoidable hospitalizations and rehospitalizations from specific settings of care (such as from nursing homes, or from home health care); 2) specific service interventions (such as enhanced patient and family education, or use of home telemonitoring); or 3) interventions for patients with specific diseases (such as heart failure, chronic obstructive pulmonary disease, or hip fracture).

When the review team encountered complex interventions that crossed numerous categories of intervention, we attempted to describe the intervention in only one category, according to our assessment of the primary focus on the intervention.

Results

IHI's analysis of the findings of this broad literature survey revealed the following four categories of interventions to reduce rehospitalizations: 1) enhanced care and support at transitions; 2) improved patient education and self-management support; 3) multidisciplinary team management; and 4) patient-centered care planning at the end of life.

1. Enhanced Care and Support at Transitions

Studies in this category included those which provided: a) improved discharge processes; b) early post-discharge follow-up; c) front-loaded home care visits; d) remote monitoring; or e) nurse-led transition care services.

a. Improved discharge processes

The strongest evidence supporting the effectiveness of improving hospital-based discharge processes is provided by the Project RED (Re-Engineered Discharge) intervention.[2] The Project RED intervention centers around the assignment of a nurse discharge advocate, who works with patients during the hospitalization to conduct patient education, arrange post-acute follow-up, confirm medication reconciliation, and prepare an individualized discharge instruction booklet for the patient that is also sent to the primary care provider. The Project RED intervention also includes a follow up phone call from a pharmacist to the patient 2 to 4 days post-discharge to confirm the follow-up plan and to review medications. Project RED reduced the incidence of subsequent hospital utilization (either ED or inpatient visit) within 30 days by 30% (RR= 0.695; 95% CI 0.515 to 0.937; p=0.009). The intervention was most effective among participants with hospital utilization in the 6 months before index admission (p=0.014).

A second intervention designed to improve the existing discharge process was conducted by Balaban and colleagues.[3] This intervention focused on enhancing communication

between the inpatient and outpatient providers by designing a user-friendly discharge form, which was reviewed with the patient prior to discharge, and electronically sent from the inpatient nurse to the nurse in the outpatient primary care practice. The outpatient nurse followed up with a telephone call to review the post-discharge plan, and the patient's primary care physician reviewed and modified this plan of care as needed. Four undesirable outcomes were measured after hospital discharge: 1) no outpatient follow-up within 21 days; 2) readmission within 31 days; 3) emergency department visit within 31 days; and 4) failure by the primary care provider to complete an outpatient workup recommended by the hospital doctors. Outcomes of the intervention group were compared to concurrent and historical controls. Only 25.5% of intervention patients had 1 or more undesirable outcomes compared to 55.1% of the concurrent and 55.0% of the historical controls. Only 14.9% of the intervention patients failed to follow-up within 21 days compared to 40.8% of the concurrent and 35.0% of the historical controls. Only 11.5% of recommended outpatient workups in the intervention group were incomplete versus 31.3% in the concurrent and 31.0% in the historical controls. Of note, when the impact on 30-day readmission rates was analyzed in isolation from the other three undesirable outcomes, there was no significant effect (8.5% readmission in the intervention group, 8.2% readmission in concurrent control and 14% readmission in historical control).

In a study of patients with psychiatric disorders, Reynolds and colleagues found that when inpatient staff continued to work with discharged patients until a working relationship with an outpatient provider was established, fewer patients were rehospitalized than in the control group.[4]

b. Early post-discharge follow-up

A high percentage of rehospitalizations occur in the days to weeks following discharge.[1] A review of unplanned readmissions from home care found the crucial time period for rehospitalization is the first 2 to 3 weeks following hospital discharge;[5] another review of home care readmissions found that 35% of patients had experienced at least one rehospitalization within 2 to 14 weeks following hospital discharge.[6] A national Medicare analysis found 50% of patients who were rehospitalized within 30 days had no intervening physician visit between discharge and rehospitalization.[1] Therefore, we included in our survey of the literature a scan for interventions that focused on the effect of early post-hospital follow-up on rehospitalization rates.

The most extensive review of the impact of comprehensive discharge planning and post-discharge support was conducted by Phillips.[7] Philips reviewed 18 studies, which included over 3,000 patients (n=3,304). The mean age range of participants was 56 to 79 years and the average follow-up period was 9.8 months (range 3 to 12). All studies included what the authors referred to as "comprehensive discharge planning"—usually with medication review and anticipatory guidance on discharge from the hospital. Post-

discharge elements were variable and these authors attempted to sort studies into the following groups:

- Single home visit—three studies. Patients in this group received from 1 to 3.5 hours of intervention.
- Increased clinic follow-up and/or frequent telephone contact—four studies, one of which also included a home visit. Patients in this group received 2 weeks to 6 months of total intervention.
- Home visit and/or frequent telephone contact—six studies, three of which had both home visits and telephone contact. Patients in this group received 3 to 6 months of total intervention.
- Studies with "components intended to provide continuous multidisciplinary home care"—four studies. These were essentially studies with more than two disciplines represented and characterized by long-term implementation (2 to 12 weeks), with at-home care being a central part of the intervention. One of these studies had an intervention lasting up to 1 year.

The Phillips meta-analysis found that comprehensive discharge planning and post-discharge support reduced rehospitalizations by 25% overall (relative risk 0.75; CI 0.64 to 0.88; NNT 12).

Other studies supporting early post-discharge follow-up include the following:

- An intervention that enhanced nurse education about heart failure and focused specifically on mitigating the majority of rehospitalizations that occur in the first 2 weeks post-discharge reported a reduction in all-cause 30-day readmission rates (18% vs. 6%) when follow-up appointments were made 7 to 10 days post-discharge. Additionally, heart failure-specific readmission rates decreased from 7.3% to 1.7%.[8]

- Jerant and colleagues found that follow-up phone calls by nurses to patients with heart failure resulted in significantly fewer emergency room visits (p=0.03), and a non-significant trend toward fewer rehospitalizations. Mean costs for heart failure-related rehospitalizations were $5,850 for the intervention cohort and $44,479 for the usual care cohort (p=0.2).[9]

- Stewart and colleagues showed that a home visit one week after discharge by a nurse and a pharmacist to optimize medication management reduced unplanned readmissions for patients with congestive heart failure by about 50%.[10]

- Patients with severe heart failure who received more intense care—consisting of examination by internists and a trained paramedical team at least once a week at

home—had a lower hospitalization rate than during the year prior to the intervention.[11]

Other studies utilizing similar strategies for early post-discharge follow-up care did not show evidence of effectiveness. Campbell and colleagues tested a clinical practice guideline of conducting a telephone follow-up call 48 to 72 hours after a patient was discharged from the ED with community-acquired pneumonia; they found no effect on patient outcomes, including rehospitalization rates.[12] Carroll and colleagues used similar strategies of early follow-up care, including home visits within 72 hours and telephone calls from an advanced practice nurse at 2, 6, and 12 weeks post-discharge. A peer advisor also made 12 weekly phone calls to the patients. At 3 weeks and 6 months, there was no change in rehospitalization rates.[13]

c. Front-loaded home care visits

Front-loading home care services to increase the number of visits in the immediate post-hospitalization period proved to be effective in decreasing rehospitalization rates for patients with heart failure (39.4% vs. 15.8%, $p<0.001$), but not for patients with insulin dependent diabetes.[14] A similar program implemented front-loaded home visits, combined with intensified focus on care coordination between providers; this program reduced unplanned readmissions by only 2.6% over a 6-month period.[15]

d. Remote monitoring

A large body of evidence exploring the effect of various remote monitoring strategies exists with a large proportion of the studies focusing on patients with heart failure. Remote monitoring interventions vary by inclusion of other elements of enhanced team management and/or closer follow-up, nature and intensity of patient education or self-management training, and number and duration of telephone contacts.[9,16,17,18, 19,20,21,22] We included 8 articles in this discussion.

Due to this variation, it is difficult to assess the isolated effect of remote monitoring on rehospitalization rates. The range of effect on reducing rehospitalizations (variably measured at 30 days to 1 year) ranged from a low of 14% to a high of 80%.[16,17,18,19,20] Overall, interventions which added some element of closer follow-up, patient education and contact over time were effective in reducing the frequency of hospitalizations (largely in patients with heart failure).[16,17,18,19,20] However, it is notable that an intervention which provided intensive telephone-based case management and patient education to a Hispanic population failed to show any beneficial effect on hospitalization rates.[22]

The variety of remote monitoring strategies is demonstrated by a systematic review of 9 studies by Chaudhry and colleagues.[17] The studies explored telephone-based symptom

monitoring, automated monitoring of signs and symptoms, and automated physiologic monitoring. Among the 9 studies, 6 suggested a reduction in all-cause hospitalizations (ranging from 14% to 55%) and heart failure hospitalizations (ranging from 29% to 43%).

Other studies demonstrating the effectiveness of remote monitoring include the following:

- Slater and colleagues incorporated multidisciplinary team management, inpatient education, as well as an outpatient telephonic program to reinforce education after discharge. This 3-month long program reduced heart failure rehospitalizations from 854 to 200. [18]

- Nurse telemanagement as a remote monitoring alternative to weekly home nurse visits was studied by Benatar and colleagues.[16] In the nurse telemanagement program, home monitoring devices were utilized by patients to measure weight, blood pressure, heart rate, and oxygen saturation. Patients transmitted their data to a secure Internet site, and caregivers then monitored patients through this site. In addition, any abnormal physiological data sent an alarm and the patient's home telephone number to alphanumeric pagers to allow for prompt response by nurses. After 3 months, this intervention was associated with 13 rehospitalizations due to heart failure, compared to 24 rehospitalizations for the home nurse visit group ($p \leq 0.001$).

- A call center that provided 24/7 hotline support as well as a registered nurse who contacted patients on a regular basis was associated with an approximately 80% reduction in congestive heart failure (CHF) readmissions. The 6-week long telemanagement program reduced the CHF readmission rate from 12% to 2%.[19]

- At the Fuqua Heart Center of Atlanta at Piedmont Hospital, patients self-managed their condition and provided nursing staff with information using a user-friendly touch screen monitor. Nurses contacted patients that did not report for an extended period of time. Thirty-day readmission rates for heart failure patients were reduced from 5.85% to 1.45%, a 75% decrease.[20]

Other studies with similar interventions showed a trend towards reducing rehospitalizations but did not reach statistical significance. In a study by Donald and colleagues,[21] asthma patients were given a peak expiratory flow meter and asked to monitor themselves for at least a week, after which they met with a nurse for face-to-face asthma education. In the ensuing 6 follow-up calls, patients were asked about their asthma symptoms and management and offered advice and encouragement. While the 12-month readmission total was reduced from 20 in the control group to 1 in the intervention

group, it did not reach statistical significance. When comparing the effectiveness of 3 interventions—home telecare delivered via a 2-way video-conference device with an integrated electronic stethoscope, nurse telephone calls, and usual outpatient care—Jerant and colleagues found no statistically significant difference in rehospitalization rates for heart failure patients.[9]

e. Nurse-led transition care services

In addition to interventions which aim to improve the existing discharge process, many investigators have developed programs that enhance the care provided to patients during the period of transition out of the hospital. Overall, these programs generally include the use of nurses in varying capacities as coaches, clinical specialists, patient educators, and clinical coordinators of care.[4,23,24,25,26,27,28,29,30]

The Care Transitions intervention, developed by Coleman and colleagues, centers on providing community-dwelling patients at high risk of rehospitalization with a transition coach in the post-acute hospital period. Coaching focuses on engaging patients as active participants in their own care, as well as encourages patients to clarify and/or follow up on recommended discharge instructions. The results of a randomized controlled trial of the Care Transitions intervention found a statistically significant decrease in both 30- and 90-day rehospitalization rates (30-day = 8.3% vs. 11.9 %, p=0.048; 90-day= 16.7% vs. 22.5%, p=0.04).[23,31]

Naylor and colleagues developed a transitional care model for frail adults that provides 3 months of clinical care and coordination in the post-acute period by an advance practice nurse (APN). The APN provides comprehensive discharge planning and home visit follow up, facilitates patient and caregiver identification of goals of care, and coordinates care. At 52 weeks (1 year) post-discharge, the intervention group had a statistically significant reduction in total rehospitalizations (reduced from 162 in the control group [n=121] to 104 in the intervention group [n=118], p=0.47).[24]

A similar intervention that provided home visits using advanced practice nurses to direct and supervise a pulmonary disease management program for patients with COPD, 24-hour nurse contact, complex care coordination services, and assistance with patient and family needs demonstrated a reduction in rehospitalizations for COPD patients from 28.2% (control group) to 9.8% (intervention group), p>0.05.[26] An intervention testing the effect of frequent contact with a geriatric nurse before and after discharge for elderly patients hospitalized with hip fracture resulted in fewer rehospitalizations than among controls.[32]

Chiu conducted a review of 15 nurse-led post-hospital transition interventions and found that 8 studies showed an effect in reducing rehospitalizations by at least 33%.[25] Chiu and colleagues concluded that effective interventions included the following: communication

tools, patient activation, nurse-led coaching, one-hour education sessions, telephone outreach, comprehensive discharge planning, and home follow-up visits.[25] However, the results of several other studies that included many of these elements of success failed to demonstrate a reduction in rehospitalization rates.[4,28,29,33]

2. Improved Patient Education and Self-Management Support

We found that the majority of case management or disease management interventions relied heavily on either improved patient education or increasing competency in self-management support. These interventions are described below.

Patient education and self-management support

Patient education, while not the sole focus of intervention studies, were a major focus of nine articles we reviewed.[18,34,35,36,37,38,39,40,41] Educational interventions included a variety of modalities and services, and were provided across a variety of settings. Educational interventions ranged from encouraging active self-management to symptom education. Interventions reviewed primarily consisted of additional time spent on education and self-management instruction in the inpatient setting.

Among individuals with schizophrenia, symptom education was associated with a reduction in 90-day rehospitalization rates for schizophrenia from 36.0% to 21.6% (p= 0.03).[36] Among patients with chronic heart failure, a 1-hour one-on-one patient education session with a trained nurse educator reduced the risk of rehospitalization or death (RR 0.65; 95% CI 0.45-0.93; p=0.018) over a 6-month time frame of post-discharge follow-up.[37] A similar intervention which emphasized patient education to increase adherence to medication and diet regimens and recognize early symptoms of exacerbation reduced readmissions by 35% over 9 months.[39]

A meta-analysis of randomized controlled trials (RCTs) that evaluated the effect of heart failure-specific patient education coupled with post-discharge follow-up assessment found a 21% reduction in the relative risk of rehospitalization (pooled RR 0.79; 95% CI 0.68-0.91; p<0.001) over 3 to 12 months of follow up.[34] A systematic review of RCTs examining self-management interventions in which patients retain the primary role of self-monitoring and determining when medical attention is needed was associated with a reduced risk of rehospitalization for heart failure by 56% (OR 0.44; 95% CI 0.27-0.71), reduced all-cause rehospitalization by 41% (OR 0.59; 95% CI 0.44-0.8; p=0.001), and lower per patient costs.[35]

Not all studies reviewed found a positive effect of patient education or self-management support interventions. A randomized controlled trial of a formal education and support intervention among heart failure patients reported a non-significant 39% decrease in total number of rehospitalizations after 1 year of follow-up (p=0.6).[40]

Disease management or case management

We reviewed 19 studies examining the effect of a variety of case management or disease management interventions. The majority of studies were conducted with a focus on patients with heart failure, although some studies focused on patients with COPD or a general medical population. The largest and most robust study, a meta-analysis of the results of 15 randomized controlled trials,[42] examined the effect of case management on Medicare patients with a range of chronic conditions.

A systematic review of 36 RCTs on the effect of disease management programs for heart failure found that while only 6 out of 32 studies reported statistically significant reductions in rehospitalizations, the pooled statistics were significant for reducing the first rehospitalization by 8% and subsequent all-cause rehospitalizations by 19%.[43]

Kimmelstiel and colleagues conducted a randomized controlled trial of the short-term and long-term effects of disease management across a diverse provider network. The intervention consisted of a home visit from an experienced nurse, meeting with the patient and family/caregivers, that focused on education and self-management support principles with instruction and phone numbers given to call the nurse at any time with a change in clinical status. The intervention resulted in statistically significant fewer heart failure-related hospitalizations at 90 days (RR 0.48; p=0.027), however there was a loss of long-term effect after 90 days.[44]

A notably successful case management intervention is reported by Kane and colleagues' evaluation of the Evercare intervention.[45] In brief, Evercare segments patients who enroll in their Medicare + Choice managed care product into four risk strata and employs different levels of intensity of nurse practitioner (NP) follow up, depending on the risk category. Each NP has a caseload of approximately 100 residents who are usually located in one or two nursing homes. A 2004 analysis of the effect of the Evercare program found a significantly lower average number of hospital admissions per 100 enrollees (0.35 intervention vs. 0.89 control).

We reviewed publications supporting enhanced or intensive case management services when compared to "usual care" case management. Kuno showed intensive case management was associated with statistically significant reductions in the number of hospitalizations for patients with serious mental illness over a 1-year follow up,[46] and Casas and colleagues found that an integrated care intervention that included access to a specialized case manager resulted in significantly fewer rehospitalizations among patients with COPD.[47]

Other studies demonstrating the effectiveness of disease management or case management on reducing rehospitalizations include the following:

- Gorski and colleagues found that an aggressive patient education program combined with telehealth with targeted nurse-initiated phone call outreach

decreased hospitalizations for patients with heart failure from 22.6 to 14.6 per 1,000 enrollees; a 35% decrease.[39]

- An enhanced heart failure program which included and increased provision of both patient education (which was actually a 3-month education program for nurses) as well as integrated care management services was successful in documenting a decrease in 30-day all-cause readmission rates from 18% to 6% and heart failure-specific readmissions from 7% to 1.7%.[8]
- Patients treated in a short-term, specialized heart failure clinic had a trend toward lower risk of rehospitalization at 30 days (relative risk reduction 77%, 3% vs. 13%; p=0.08) and a statistically significant lower rehospitalization rate at 90 days and 1 year (5% vs. 23%, p<0.02 for 90 days; 16% vs. 31%, p<0.03 for 1 year) than patients who received usual care.[48]

We reviewed several studies which failed to find that enhanced case management services decreased hospitalizations. A study of 15 Medicare demonstration programs employing case management for Medicare patients in a variety of settings failed to find that the case management services decreased hospitalizations, potential preventable hospitalizations, or overall Medicare costs.[42] Additionally, there was no documented improvement in any of the adherence measures resulting from the self-management support training.

A meta-analysis conducted by Harris and colleagues on 12 RCTs studying hospital-based case management showed no difference between the hospital-based case management intervention and usual care (OR 0.87; 95% CI 0.69-1.04).[49] A systematic review of 9 studies for disease management for COPD patients failed to detect a difference between disease management interventions and usual care.[50]

Six additional studies failed to demonstrate statistically significant decreases in hospitalizations as a result of disease management interventions. A comprehensive disease management intervention for general medical outpatients included early post-discharge case manager follow up within 7 days of discharge, subsequent home visits, and proactive telephone contact over 6 months. This intervention did not find a statistically significant difference in unscheduled rehospitalizations, quality of life, or psychological functioning.[51] An in-hospital discharge planning and case management protocol for geriatric patients incorporated many principles of patient-centeredness and self–care, but failed to demonstrate a difference in 15- and 90-day rehospitalization rates.[52]

Similarly, a phone-based disease management program for “low risk” patients with heart failure consisting of telephone-based education and self-management instruction, combined with an average of 9 hours per patient of care coordination over 1 year, failed to show positive results. After 1 year, there was a 50% rehospitalization rate in both

groups, 32% to 37% of which was attributed to heart failure.[53] A similar intervention consisting of high-frequency proactive telephone contact with a decreasing level of intensity, length, and frequency over a 6-month follow-up period also failed to demonstrate a significant reduction in all-cause rehospitalization rates at either 3 months or 6 months.[22]

3. Multidisciplinary Team Management

There is an extensive body of research describing the effects of multidisciplinary team management on outcomes relating to rehospitalizations. Our scan included 3 systematic reviews, each of which reviewed 29, 30 and 11 articles, and 8 additional studies.

Multidisciplinary team management is a heterogeneous term encompassing a wide range of specific services over a variable amount of time. On the whole, the core elements of multidisciplinary team management include utilization of a wide range of clinical expertise in a variety of settings across the continuum of care. Multidisciplinary interventions include nurse-led programs; specialty-based follow-up; medication review; medication adherence interventions; patient education; enhanced monitoring; nutrition, exercise, physical, occupational, and speech therapy; and/or social work. The majority of studies focused exclusively on patients with heart failure, although we also reviewed studies of patients with other cardiac disease, atrial fibrillation, dementia, and hip fracture.

Overall the evidence for multidisciplinary team management is mixed. Even the nature of the term "multidisciplinary team management" is a broad category, and individual studies investigated the impact of approaches that varied in team composition, intensity, coordination, and diversity of clinical disciplines. When effective, these interventions reduced hospitalization rates by approximately 20% to 25%.[48,54,55,56,57,58] However we reviewed numerous studies which found no change in hospitalization rates.[30,59,60]

Three recent systematic reviews found that multidisciplinary team management for patients with heart failure resulted in reduced hospitalizations. Holland and colleagues found multidisciplinary team management was associated with reduced all-cause rehospitalizations (RR 0.87; 95% CI 0.79-0.95; p=0.002) and reduced heart failure-specific rehospitalization (RR 0.7; 95% CI 0.61-0.81; p<0.001).[54] McAlister and colleagues found that multidisciplinary team management reduced heart failure rehospitalizations (RR 0.74; 95% CI 0.63-0.87) as well as all-cause rehospitalizations (RR 0.81; 95% CI 0.71-0.92).[55] Specifically, among the programs that focused on enhancing patient self-care, heart failure hospitalizations decreased (RR 0.66; 95% CI 0.52-0.83) along with all-cause hospitalizations (RR 0.73; 95% CI 0.57-0.93). Additionally, strategies that employed telephone contact with advice to see their physician if exacerbation occurred reduced heart failure hospitalizations (RR 0.75; 95% CI 0.57-0.99) but not all-cause hospitalizations. A third systematic review of multidisciplinary team management for patients with heart failure found programs that included patient education and specialty follow-up were effective in reducing the risk of hospitalization (RR=0.77; 95% CI 0.68 to 0.86).[61]

Other studies demonstrating the effectiveness of multidisciplinary team management on reducing avoidable rehospitalizations include the following:

- Multidisciplinary disease management plus home telehealth and a proactive review of care needs by disease management nurses for patients with cardiac disease or diabetes successfully reduced hospitalizations and ED utilization over 2 years of follow up. For patients with diabetes, hospitalizations and ED visits decreased by 51% and 17.5%, respectively, and for patients with cardiac disease, hospitalizations and ED use decreased by 5% and 50%, respectively.[62]
- A multidisciplinary hip fracture service involving co-management by both the orthopedic and geriatric services, early discharge planning, and the transmission of detailed discharge instructions to the receiving care facility documented lower readmission rates than a national benchmark.[57]
- A multidisciplinary, long-term, home-based intervention lowered rehospitalizations and costs when compared to usual care for patients with stroke, heart failure, acute coronary syndrome, and surgery.[63]

Although multidisciplinary team management was shown to be effective in reducing hospitalizations in a number of studies, other studies reported similar multidisciplinary team management strategies with a trend toward reduced hospitalizations, but without reaching statistical significance.[58,64]

4. Patient-Centered Care Planning at the End of Life

Numerous studies have documented the high utilization of health care resources in the last 6 months of life.[65,66] Other studies have examined the low rates of referral and utilization for hospice and palliative care services during the last phase of life.[67,68,69]

Recent studies investigated the impact of improved screening and referral for hospice care, when appropriate and desired. When patients desire and are referred for hospice services, hospitalization rates in the subsequent 30 to 180 days are decreased by 40% to 50%, as demonstrated by Casarett and Gonzalo.[70,71] Casarett and colleagues trialed an intervention to improve screening of nursing home residents for appropriateness to hospice coupled with communicating this assessment to the patient's personal physician. The intervention group had significantly fewer acute care admissions over a 6-month period than usual care (0.28 vs. 0.49; p=0.04).[70] Similarly, Gonzalo and Miller found a significant effect of hospice enrollment on hospitalization use in the last 30 days of life (OR 0.47; 95% CI 0.45-0.50).[71]

Conclusions

Our survey of the published evidence revealed that the current body of published interventions to reduce rehospitalizations fall into four broad categories: 1) enhanced care and support during transitions; 2) improved patient education and self-management

support; 3) multidisciplinary team management; and 4) patient-centered care planning at the end of life.

This survey of the published literature highlights the following:

1. There is a vibrant community of researchers and institutions endeavoring to identify successful strategies to reduce avoidable rehospitalizations.
2. Many of the interventions in the literature to date have focused on heart failure populations.
3. A variety of approaches seem to be promising, including close coordination of care in the post-acute period, early post-discharge follow-up, enhanced patient education and self-management training, proactive end-of-life counseling, and extending the resources and clinical expertise available to patients over time via multidisciplinary team management.
4. Improvement in reducing rehospitalizations is possible, although discerning the relative effect of any single intervention discussed in this document is not possible at this time.

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Effective Interventions to Reduce Rehospitalizations:

A Compendium of 15 Promising Interventions

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Introduction

Hospitalizations account for nearly one-third of the total $2 trillion spent on health care in the United States. In the majority of cases, hospitalization is necessary and appropriate; however, a substantial fraction of all hospitalizations occur when patients return to the hospital soon after their previous stay. These rehospitalizations are costly, potentially harmful, and often avoidable.

Evidence suggests that the rate of avoidable rehospitalization can be reduced by improving core discharge planning and transition processes out of the hospital; improving transitions and care coordination at the interfaces between care settings; and enhancing coaching, education, and support for patient self-management. However, a notable challenge to improving patient care at transitions is effectively applying evidence from individual pilot studies to clinical services in a variety of settings.

This document is intended to provide a sampling of the range of effective programs underway to reduce avoidable rehospitalizations across the US. The programs listed in this document are all very promising approaches to improve patient care; the reader will note that we have distinguished for purposes of clarity the programs that have documented, peer-reviewed evidence of success in reducing rehospitalizations, and other programs with less rigorous levels of evidence available to date.

In total, 15 programs are highlighted in this document: four with very strong trial or evaluation evidence of effectiveness, seven with very good evidence of reduction in rehospitalization rates, and four that are promising interventions but require further data. Our hope is that this overview will serve as a primer for understanding the range of interventions currently being applied or under study for reducing avoidable rehospitalizations.

Interventions with Very Strong Trial or Evaluation Data

Evidence from randomized controlled trials or program evaluations demonstrates the effectiveness of the following interventions: Project RED, Transitional Care Model, Care Transitions Program, and Evercare.

1. RED: Re-Engineered Discharge[1]

Brian Jack, MD, and colleagues at Boston University Medical Center developed a process for improved discharge coordination called Project Re-Engineered Discharge (RED). The project is located at an urban hospital that serves a low-income, ethnically diverse population.

The intervention includes a number of components, which are facilitated by a specially trained nurse called a Discharge Advocate who does the following:

- Educates the patient about his or her diagnosis throughout the hospital stay;
- Makes appointments for clinician follow-up, test result follow up, and post-discharge testing;
- Organizes post-discharge services;
- Confirms the medication plan;
- Reconciles the discharge plan with national guidelines and clinical pathways;
- Gives the patient a written discharge plan, assesses the patient's understanding of the plan;
- Reviews what to do if a problem arises;
- Expedites transmission of the Discharge Résumé (summary) to outpatient providers; and
- Calls to reinforce of the discharge plan and offer problem-solving 2-3 days after discharge.

Results:

- Intervention significantly reduced hospital utilization, incidence rate ratio 0.695, p=0.009.
- 80 patients in intervention group had 116 episodes of hospital utilization (61 ED and 55 readmissions) during 30-day follow-up period; 99 patients in the usual care group had 166 episodes of hospital utilization (90 ED and 76 readmissions) during the 30-day follow-up period.
- Subgroup analyses revealed that the intervention was most effective for patients with higher rates of hospital utilization in the preceding 6 months.

2. Transitional Care Model[2,3]

Mary Naylor, PhD, RN, and colleagues at the University of Pennsylvania School of Nursing created and tested the Transitional Care Model (TCM), which provides pre- and post-discharge coordination of care for high-risk, elderly patients with chronic illness by advanced practice nurses. The core components of TCM include:

- Consistency of provider across the entire episode of care, with the Transitional Care Nurse (TCN) as the primary coordinator of care;
- In-hospital assessment and development of an evidenced-based plan of care;
- Regular home visits with available, ongoing telephone support (24 hours per day, seven days per week) for an average follow-up of two months post-discharge;
- Comprehensive, holistic focus on each patient's needs, including the reason for the primary hospitalization as well as other complicating or coexisting events;
- Emphasis on early identification and response to health care risks and symptoms and avoidance of adverse and untoward events that lead to readmissions;
- Active engagement of patients and their family and informal caregivers, including education and support; and
- Communication to, between, and among the patient, family, and informal caregivers, and health care providers and professionals.

Results:

Two randomized controlled trials have documented that the use of the TCM results in fewer rehospitalizations, lower overall health care costs, and improved patient satisfaction with care:

- Patients in the TCM group were significantly less likely than control patients to be rehospitalized at least once within six months (37.1% vs. 20.3%; $P < 0.001$); a 2004 trial found significantly fewer rehospitalizations at one year among patients who received the intervention than usual care patients (104 vs. 162; $P = 0.047$).
- Patients in the TCM group incurred half the average total health care costs at six months than control patients ($3,630 vs. $6,661; $P < 0.001$); a 2004 trial found total health care costs averaged $5,000 less per patient for patients who received TCM-based care than for control patients ($7,636 vs. $12,481; $P = 0.002$).

3. Care Transitions Program[4,5,6]

Eric Coleman, MD, MPH, developed the Care Transitions Program,[SM] a four-week intervention that focuses on improving care transitions by fostering improved self-management skills.

The four main components of the Care Transitions Program are:

- Medication self-management;
- Patient-centered record (PHR);
- Follow-up with physician; and
- Knowledge of "red flags" or warning signs/symptoms and how to respond.

The Care Transitions Program is designed for community-dwelling patients age 65 and older, and centers on the use of a Transition Coach. The Transition Coach, who is a nurse or nurse practitioner, conducts a home visit within 72 hours of discharge and speaks with the patient by phone on post-discharge days 2, 7, and 14. During these communications, the Transition Coach prepares the patient for upcoming encounters with health care providers. For example, during the home visit, the Transition Coach uses role-playing to prepare the patient for follow-up visits with providers and helps the patient complete a personal health record. The Transition Coach also coaches the patient to reconcile or identify discrepancies in medications, encourages follow up, and serves as a single point of contact.

Results:

One study evaluated 158 elderly patients admitted with one of ten conditions (HF, COPD, CAD, diabetes, stroke, hip fracture, peripheral vascular disease, spinal stenosis, arrhythmias, and DVT/PE):

- Patients who participated in the Care Transitions Program were significantly less likely to be rehospitalized than controls from an administrative database (n = 1,235) at 30, 90, and 180 days after discharge (adjusted odds ratio at 30 days = 0.52; 95% confidence interval = 0.28-0.96)
- The time to rehospitalization was significantly longer for the Care Transitions Program group than the controls (225.5 days vs. 217.0 days; adjusted P = 0.003).

A formal cost analysis was not conducted by the investigators, but they have estimated that the cost savings associated with the intervention for 350 patients would be $296,000 over 12 months.

4. Evercare™ Care Model [7,8]

Evercare is one of the nation's largest health care coordination programs for people who have long-term or advanced illness, are older, or have disabilities. Evercare serves more than 300,000 dual-eligible people nationwide who either reside in a long-term care facility or have severe chronic conditions and live in the community.

The core elements of the intervention are:

- Enhanced primary care and care coordination by nurse practitioners or care managers;
- NP care in the nursing home setting; and
- Development and coordination of personalized care plans with all health care providers.

Evercare services are triaged according to the following four levels of care intensity:

Levels 1 and 2: Individuals are primarily healthy and living independently, or have >2 conditions

- CM provides phone-based services and mail (includes preventive health reminders).
- CM provides phone-based consultation, facilitates care and coordinates community services.

Level 3: Individuals have numerous chronic conditions and/or significant functional disabilities

- For community-based individuals, CMs coordinate care and community services.
- For individuals living in a facility, NPs coordinate and provide care.
- CMs and NPs meet frequently with families in order to discuss the patient's care needs and to address end-of-life issues and jointly prepare the treatment plans.

Level 4: Individuals with advanced illnesses in the last year of life

- Nurses provide hospice and palliative care services; focus of care is to adapt and respond to the needs of the individual and their families, minimize symptom burden, and support the individual's values.

Results:

- Reduced hospitalizations by 45%; the incidence of hospitalizations was reduced from 4.63 to 2.43 per 100 patients in 15 months, P<.001).
- Reduced ED visits by 50%.
- Cost savings estimated at approximately $103,000 a year in hospital costs per NP.

Interventions with Strong Evidence of Reduction in Rehospitalization Rates

The following programs have had success in reducing rehospitalizations. In some cases, these programs have published program evaluation data; in many, however, the results reported are at this time self-reported successes. The programs are Community Care-North Carolina, Commonwealth Care Alliance-Brightwood Clinic, The Heart Failure Resource Center, Home Health Telemedicine, Novant Physician Group Practice Demonstration, Kaiser Permanente Care Coordination, and IHI Transitions Home.

1. Community Care North Carolina[9,10]

Community Care North Carolina (CCNC) is a community-based care management program for Medicaid recipients, operating by developing local networks of primary care providers to coordinate prevention, treatment, referral, and institutional services. There are currently 14 networks of more than 3,000 physicians across North Carolina, managing the care of 970,544 individuals.

CCNC operates in the following manner:

- Works directly with providers experienced in caring for North Carolina's low-income residents;
- Creates private/public partnerships to cooperatively meet patient needs and allocate resources;
- Makes care deliverers responsible for performance and improvement;
- Ensures all funds are kept local and used for providing care; and
- Establishes local networks for managing Medicaid patients and other community health issues.

CCNC currently has six initiatives, including disease management for asthma, heart failure, and diabetes, ED, and pharmacy initiatives, and case management for high-risk/high-cost patients.

Results:

- In 2002, pediatric asthma admissions decreased 21%; adult asthma admissions decreased 25%.
- In 2002, diabetes admissions decreased 9%.
- In 2007, CCNC achieved savings of $27 per member per month (PMPM) for asthma patients
- For diabetes patients, CCNC saved $21 PMPM, resulting in $306,432 annual savings.

2. Commonwealth Care Alliance Brightwood Clinic[11]

Located in Springfield, MA, the Brightwood Clinic developed a capitated care management model for low-income Latinos with disabilities and chronic illnesses. The Brightwood intervention sought to identify all Medicaid members with special health care needs and provide enhanced primary care, on-site mental health and addiction advocacy services, care coordination, and support services. Nurses, nurse practitioners, mental health and addiction counselors, and support service staff worked collaboratively with the health center's primary care providers.

The key components of the intervention included:

- Enhanced primary care and behavioral health and care coordination;
- Reminder calls for preventive care;
- Multidisciplinary clinical team model, with all care authorization done by team;
- PCP as a core team member;
- Behavioral health and physical health integration;
- Physician identification of an adverse selection group;
- Follow up on emergency room, hospital, and detox admissions;
- Support groups;
- Health education and promotion;
- Nonclinician team members, nonclinician home visits and
- Bilingual staff and clinicians.

Results:

- Cost savings of $204 PMPM when compared to fee-for-service expenditures; all the reductions in cost were due to decreased utilization of hospital-based services.
- Among a subgroup of enrollees with costs greater than $2,000 PMPM, costs decreased from $9,400 to $2,500, due to decreased utilization of hospital-based services.
- Among a subgroup with lower PMPM costs in FFS (<$500), costs increased from $162 to $775, reflecting improved access to needed outpatient services.
- ER utilization decreased from 0.109 visits PMPM to 0.097 visits PMPM.

3. Heart Failure Resource Center[12,13]

Located at Piedmont Hospital, a 481-bed, not-for-profit, acute care hospital in Atlanta, the Heart Failure Resource Center (HFRC) uses three key elements to improve outpatient care for chronically ill patients with heart failure:

- Use of nurse practitioners as care managers;
- Evidence-based clinical care protocols; and
- Remote patient telemonitoring.

Advanced practice nurses (APNs) function as outpatient clinical case managers. They monitor and respond to test results, adjust and optimize medications, and institute intravenous diuretic therapy when necessary to avoid ER visits or hospitalizations. Physicians are available for consultation if needed.

The APNs participate in weekly multidisciplinary team rounds, consisting of a clinical nurse specialist, staff nurses, a clinical pharmacist, a cardiac rehab specialist, a clinical case manager, the program manager, and medical directors discusses each new patient's case and care plan. The APNs implement care via evidence-based protocols that are approved by the medical directors.

For complex cases, the HFRC uses telemonitoring. Patients are provided with a touch-screen computer, scale, and blood-pressure cuff that plug into their home phone line. Daily readings of heart failure symptoms, weight, blood pressure, and heart rate are transmitted to the HFRC staff.

The considers the HFRC a cost-neutral benefit for patients. The program uses a cost avoidance model, taking into consideration the cost reductions due to fewer heart failure hospitalizations to help cover the cost of the program.

Results:

- The 30-day rehospitalization rate decreased from 4.6% to 1.6% for patients who were treated at the HFRC for fiscal year 2007—a reduction of 75%.
- The 90-day rehospitalization rate decreased from 10.4% to 2.9% for patients in the program, compared patients who did not receive the intervention.

4. Home Healthcare Telemedicine[14]

The Home Healthcare Telemedicine model originated at Presbyterian Home Healthcare, a home care agency in New Mexico. The program serves patients recently discharged with congestive heart failure or COPD. The intervention relies on two key elements:

- Nurses specializing in providing telehealth care; and
- Telemonitoring technologies.

At program initiation, a home health nurse conducts two in-home visits during the patient's first week at home. A technician installs the necessary hardware for the telehealth system. Subsequently, a telemedicine nurse provides an introductory video encounter during first week after discharge and visits the patient remotely via video feed one to three times per week. The traditional home health nurse visits the telehealth patient once a week.

As part of the intervention, a computer terminal and a high resolution video unit are placed in the patient's home. The device also includes a high-resolution stethoscope, blood pressure monitor, scale, and pulse oximeter. Measurements are transmitted to the telehealth nurse. In addition, units without video capability are used to monitor patients after discharge from home care. Data are fed directly into Presbyterian's IT system; abnormal parameters trigger an alert to the nurse, who can reinitiate home care in an effort to prevent hospitalization.

Results:

- The rehospitalization rate for patients with congestive heart failure decreased from 6% before the program to about 1% after program initiation.
- The organization has calculated that the productivity of the telehealth nurses is almost double that of the traditional home health nurses (8 visits vs. 5 visits per 8 hours).
- In addition, nurse travel time was reduced with implementation of the telemedicine program.
- The cost of the telemedicine units (approximately $5,500) is less than one hospital admission, demonstrating the return on investment for the organization.

5. Novant Physician Group Practice Demonstration Project[15]

As one of 10 participants in the three-year CMS Physician Group Practice Demonstration Project, which began in 2005, staff at Forsyth Medical Group focused on improving care transitions as one component of the project. The demonstration project provides physician group practices with performance-based payments for improving the quality and cost efficiency of health care delivered to Medicare fee-for-service beneficiaries.

Staff and administrators at Forsyth Medical Group implemented a chronic care model called Comprehensive Organized Medicine Provided Across a Seamless System (COMPASS) to improve management of care and patient adherence. The core components of the intervention are the following:

For providers:

- Evidence-based practice standards protocols/practice tools;
- Education; and
- Inpatient to outpatient systems.

For patients:

- Chronic and preventive care guidelines;
- Education; and
- Population and disease management services.

Results:

- Data from the first year of the demonstration project showed that use of the model resulted in lower costs per beneficiary and improved quality metrics for patients with diabetes treated in the group practice.
- Preliminary claims data suggest that the intervention improves transitions for chronically ill patients. The group documented 20% fewer ED visits and 44% fewer hospital admissions for patients with CHF and COPD. Rehospitalization data were not provided.

6. Kaiser Permanente Chronic Care Coordination[16]

The Kaiser Permanente health system has piloted a program called Chronic Care Coordination. There are three main components to the intervention:

- Multidisciplinary chronic care team;
- Needs-based care plans; and
- Seamless communication with patients.

A multidisciplinary team, consisting of 17 specially trained nurses with experience in chronic disease management or geriatrics and two licensed clinical social workers, facilitates smooth transitions from acute care and long-term care settings for patients with chronic conditions. The team uses phone contact to communicate with patients on a regular basis and provides a number of services to facilitate care coordination, including medication reconciliation, review of discharge plans and recommendations, education and support, and coordination of services.

Eligible patients have at least one of the following characteristics:

- Four or more chronic illnesses;
- Recent hospitalization;
- High utilization of the emergency department; and
- Recently discharged from a skilled nursing facility (SNF).

Results:

- Of 100 patients transitioning from SNF to home, 2.4% in the intervention were rehospitalized, compared to 14% who received usual care.
- The intervention patients also had fewer ED visits than usual care patients (7% vs. 16%) and a lower rate of readmission to a SNF within 60 days (0 vs. 13%).
- The costs of services and care for patients who received the intervention were $1,900 less per patient per year, due to fewer hospitalizations, SNF admissions, and ED visits.

7. IHI Transitions Home for Patients with Heart Failure: St. Luke's Hospital[17]

Launched in 2003, Transforming Care at the Bedside (TCAB) is a national program of the Robert Wood Johnson Foundation (RWJF) and IHI. One of the most promising changes developed within TCAB is "creating an ideal transition home" for patients discharged from medical and surgical units within hospitals. The initial focus of the intervention was improving transitions home for patients with congestive heart failure.

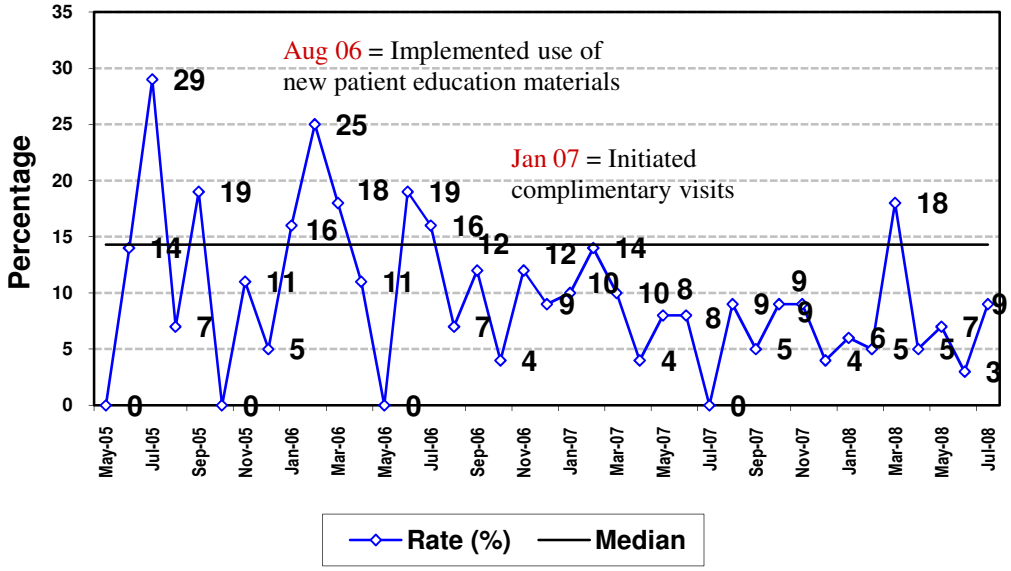
The four core elements of the intervention are:

- Enhanced admission assessment for post-discharge needs;
- Enhanced teaching and learning;
- Patient and family-centered handoff communication; and
- Early post-acute care follow-up.

Results:

- Staff at St. Luke's Hospital in Cedar Rapids, Iowa, documented a 50% reduction in rehospitalizations, from an average of 14% to a current average of 7%. (Figure 1)
- Process measures, such as successful teach-back and patient satisfaction with discharge processes, are 90-100%.

Figure 1: Readmissions of Patients with HF within 30 Days as a Percentage of Patients Discharged



Promising Interventions Requiring Additional Data

The following four interventions are very promising approaches to improving transitions of care and/or reducing avoidable hospitalizations; however, convincing data regarding their effect on reducing rehospitalizations are not currently available. The programs include INTERACT, Project BOOST, Guided Care, and Hospital at Home.

1. INTERACT[18]

Joseph Ouslander, MD, Director of Boca Institute for Quality Aging at Boca Raton Community Hospital in Florida, and colleagues have created a program aimed at reducing the number of hospital admissions from nursing homes. The intervention, referred to as INTERACT (Interventions to Reduce Acute Care Transfers), includes three key tools for providers:

- Care paths;
- Communication tools; and
- Advance Care Planning tools.

Results:

- The group evaluated the number of potentially avoidable hospitalizations from three nursing homes, as determined by the ratings of an expert panel.
- The results suggest that the proportion of avoidable hospitalizations dropped due to the intervention from 23 of 30 (77%) avoidable admissions to 32 of 65 (49%) avoidable admissions after the 6-month intervention.

2. Project BOOST[19]

The Society of Hospital Medicine created Project BOOST (Better Outcomes for Older adults through Safe Transitions) to optimize care transitions from the hospital to home. Supported by a grant from the John A. Hartford Foundation, the Society of Hospital Medicine provided training and coaching support to an initial group of 6 hospitals and recently announced a second wave of 24 hospitals across the US.

By improving discharge processes, Project BOOST aims to:

- Reduce 30-day readmission rates for general medicine patients;
- Improve facility patient satisfaction scores and H-CAHPS scores related to discharge;
- Improve flow of information between hospital and outpatient physicians;
- Identify high risk patients and offers specific interventions to mitigate their risk; and
- Improve patient and family education practices to encourage use of teach-back .

BOOST recommends the following as elements of a universal discharge checklist:

- General Assessment of Preparedness (GAP) assessment, completed with issues addressed;
- Medications reconciled with preadmission list;
- Medication use/side effects reviewed using teach-back with patients/caregivers;
- Teach-back used to confirm patient/caregiver understanding of diagnosis, prognosis, self-care requirements, and symptoms of complications requiring immediate medical attention;
- Action plan for management of symptoms/side effects/complications requiring medical attention established and shared with patient/caregiver using Teach-back;
- Discharge education plan completed, taught, provided to patient/caregiver at discharge;
- Discharge communication provided to post-hospitalization care providers;
- Documented receipt of discharge information from principal care providers;
- Direct communication with principal outpatient provider at discharge; and
- Telephone contact arranged within 72 hours of discharge in order to assess the patient's condition and adherence and to reinforce follow-up.

Results:

- No publicly available results are reported at this time.

3. Guided Care[20,21]

Chad Boult, MD, MPH, MBA, and other researchers at the Johns Hopkins Bloomberg School of Public Health have created a program referred to as Guided Care. The core elements of the intervention are:

- Nurse-physician teams;
- Patient self-management; and
- Coordination of care services.

Patients are eligible if age 65 or older and deemed to be at high risk for requiring hospitalization or other cost-intensive care (i.e., patients with the 25% highest costs, based on previous year's claims data).

The intervention involves the placement of specially trained nurses within primary care offices. Working with the physician, they do the following:

- Assess needs and preferences;
- Create an evidence-based "care guide" and an "action plan";
- Monitor patients proactively;
- Support chronic disease self-management;
- Communicate with providers in EDs, hospitals, specialty clinics, rehab facilities, home care agencies, hospice programs, and social service agencies in the community;
- Smooth transitions between care sites;
- Educate and support caregivers; and
- Facilitate access to community services.

Results:

- A randomized trial is underway. Early analysis demonstrates a higher rating of care among intervention participants than controls, and higher ratings for satisfaction with interactions with patients and family members among participating physicians.
- Preliminary analysis also demonstrates a trend toward reduced frequency of early readmissions with Guided Care compared to usual care.
- Financial analysis from the first year found decreased costs, by $1,300 per patient and $75,000 per nurse.

4. Hospital at Home[22,23]

The Hospital at Home model was developed by Johns Hopkins School of Medicine investigators at Bayview Medical Center, a 700-bed, not-for-profit hospital located in Baltimore, Maryland. The central premise of the program is the provision of acute care services by a multidisciplinary team as an alternative to inpatient hospital care. The core components of the intervention include:

- Daily physician visits; and
- Care and patient education coordinated by a registered nurse.

Eligible patients are over age 65 and require acute hospital admission for exacerbation of COPD, CHF, cellulitis, or community-acquired pneumonia.

Results:

- Patients who received the intervention had a significantly shorter length of stay (3.2 vs. 4.9 days; $P = 0.004$).
- Mean cost was lower for the patients treated in the Hospital at Home program than for controls ($5,081 vs. $7,480; $P < 0.001$).
- At 8 weeks after admission, there were no differences in utilization of health services (e.g., ED visits, inpatient hospital readmissions, mean number of admissions to SNFs, and mean number of home health visits).

Discussion

The programs briefly summarized in this document include many promising ideas: improved execution of discharge processes, enhanced care at times of transitions, coaching for self-efficacy, support for patient self-management, coordination of care services after discharge, remote monitoring, and others.

This collection of programs is an early compilation of promising efforts to reduce avoidable rehospitalizations. There are many other efforts underway across the US to improve care at times of transitions and reduce avoidable hospitalizations and rehospitalizations for a variety of patient populations across a range of settings. The inclusion of programs in this compendium was based on available outcome data (i.e., rehospitalization rates) in peer-reviewed literature, presentations or written reports in the public domain, or well-detailed program descriptions. Publicly available reporting on the outcomes of programs (i.e., with respect to rehospitalizations) is lacking for many of the numerous effective programs currently underway across the country. To that end, IHI encourages publically sharing local successes to facilitate the adoption and adaptation of successful initiatives.

Based on the evidence highlighted in this document and IHI's experience with partnering organizations, IHI recommends that clinical leaders interested in reducing avoidable rehospitalizations consider the following high-leverage opportunities:

1. Improve existing processes of transition out of the hospital.
2. Improve the "reception" of the patient into the new setting of care.
3. Enhance services at times of transition for patients at high risk of recurrent rehospitalizations.
4. Engage patients/families as active participants in their care and facilitating patient self-management and/or remote monitoring.

The following pages contain a case study of a successful discharge process improvement initiative at Cedars Sinai Medical Center, Los Angeles, California, and a quick-reference table of the 15 programs discussed previously.

Case Study: Cedars Sinai Medical Center, Los Angeles, California

The following is a brief case study of a successful intervention in a medical unit to reduce avoidable rehospitalizations.

Aim

Short-term: Reduce readmission rate by 50%.

Long-term: Target readmission rate at 5%.

Methods

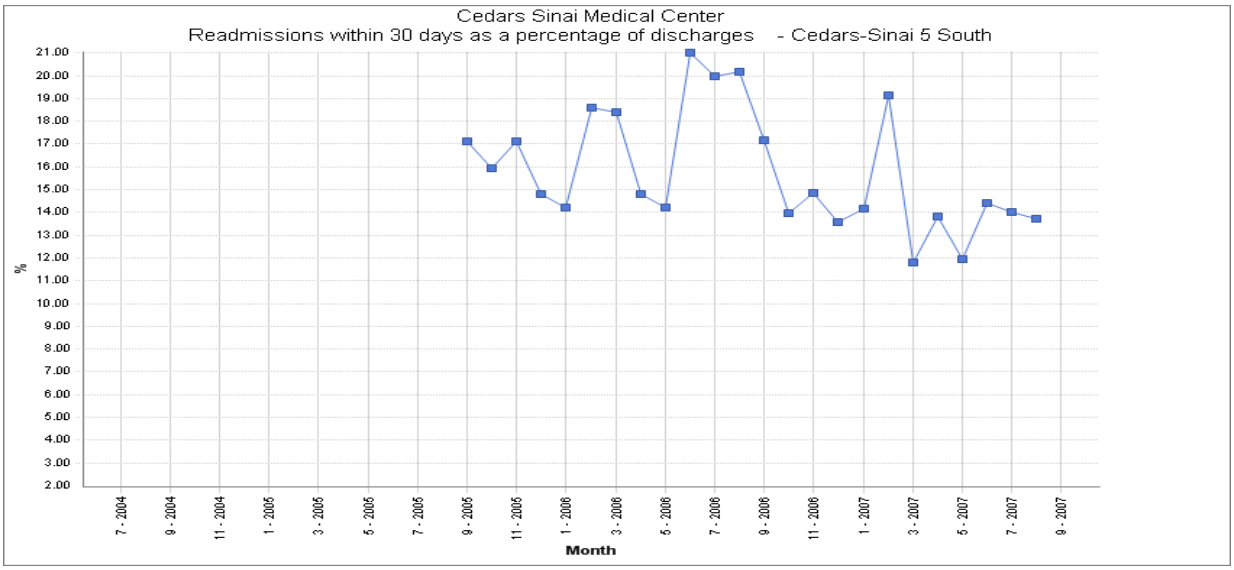
1) Improve patient understanding of medical and self care issues;

2) Increase referrals to palliative care for patients with advanced stage HF;

3) Improve reliability of completion and accuracy to medication reconciliation; and

4) Partner with patients and families in the redesign of care.

Results



Changes Tested and Implemented

1. Partnered with patients and family members to understand patient needs when leaving the hospital:
    - Designed a letter given to patients on admission which suggests how to make going home easier, including bringing keys to the house and clothing for the trip;

- Developed a Journey Home communication board; and
- Began testing use of Teach Back around patient self-care.

2. Collaboration with physicians on how to improve the discharge process resulted in outlining suggestions for physicians on how to make the process smoother. Recommendations include:
    - The physician should speak with the nurse during each round regarding care and discharge plans.
    - Identify specific direct communication between physicians and nurses on rounds or by phone regarding orders for discharge.

3. Roles and responsibilities of nurses and clinical partners are explicitly described in discharge guidelines.
    - The discharge action plan is completed within 24 hours of patient admission; in March 2007 the completion rate was 93%.

4. Creatively adapted the "agenda-setting cards" to improve discharge communication.
    - Each card in the deck has a question frequently asked by patients with HF. Questions were gathered from patients by HF nurses. The agenda-setting cards reduce patients' hesitation to ask questions and assist them with driving the learning agenda.
    - Patients are given the card deck to keep and are encouraged to choose 2-3 cards for discussion at each learning opportunity across care settings. To date the cards have been very successful in the hospital settings and the team has plans to move them into the ambulatory setting next.[24]

5. Nurses identify the patient's family caregivers during multidisciplinary rounds and ask who will be helping with care in the home.

6. Improved medication reconciliation upon discharge.
    - Integrated into the larger hospital-wide medication reconciliation initiative. On discharge, the staff members print the most recent medication list from the electronic health record and then indicate next to each medication whether it is to be stopped or continued. Instructions for

how medications should be taken must be clearly stated. Concurrently, intravenous medications are converted to oral medications.

- Small tests of change were used to improve admission and discharge reconciliation. Intake reconciliation form accuracy and completeness was initially improved to 85% and was subsequently improved to 95% for the last three quarters. The electronic discharge reconciliation form accuracy and completeness was initially improved to 90% and subsequently improved to 100% for the last three quarters.

7. Revamped the interdisciplinary team rounds (where patients are typically discussed on hospital Day Two). For each patient, the team must answer four questions:
    - Where will the patient likely go after discharge?
    - Who will be providing the care—is this likely to be adequate or does the patient require a higher intensity of care?
    - What are the patient's needs after discharge?
    - What are the potential discharge barriers?

8. Began giving patients a business card with the contact name and phone number of the discharging unit, and encourage patients and families to call the unit should questions arise after returning home.
    - Nurses recognized that collecting and tracking these questions would provide insight on how their discharge efforts might be improved. Over half of the calls have been related to medications and, as a result, the discharge team is now enhancing education in this area. Data gathered from calls received from patients and families:

Call-Backs from Unit Business Cards (N=13)	
Seeking medication clarification	83%
Directed to call the physician	8%
Directed to seek ER care	9%

9. Partnered with a skilled nursing facility (SNF) that receives the largest proportion of the hospital's discharges to develop a standard transfer form. Developed a discharge algorithm for discharge to the SNF or home.

10. Increased palliative care referrals from seven to ten per month between December 2006 and February 2007.

11. Reinforced the use of the SBAR critical communication tool in the discharge planning process.

SBAR Rollout (Scale of 1-5, 5 being very satisfied)	
Has the SBAR rollout been successful?	4.73
Has SBAR improved communication?	4.40
I always use SBAR in patient handoffs.	4.53

Summary Table of Interventions to Reduce Rehospitalizations

INTERVENTION	Rehospitalization Results	Complexity	Cost Benefit	Other Comments
A: STRONG EVIDENCE OF REDUCTION IN REHOSPITALIZATIONS				
A1. RED: Re-Engineered Discharge (Jack)	• 30% decrease in hospital utilization (ED or hospitalization) in 30-day follow up • Intervention most effective in patients with history of high utilization	• Minimal – Discharge Advocate coordination role and follow-up phone calls	• $386,759 lower cost in RED group due to 32% lower use of hospital	• Decreased combined endpoints of ED and hospitalization
A2. Transition Coach (Coleman)	• Decreased rehospitalization overall: 30 days = 8% (vs. 12% control) 90 days = 17% (vs. 23%) 180 days = 26% (vs. 31%) • Decreased rehospitalization for same diagnosis 30 days = 3% (vs. 5%) 90 days = 5% (vs. 10%) 180 days = 9% (vs. 14%)	• Medium – RN or NP as transition coach	• Anticipated cost savings: $296k for 350 chronically ill adults	• Longer time to next rehospitalization (225 days vs. 217 days, p<0.001)
A3. Transitional Care Model (Naylor)	• 17% fewer 180-day rehospitalizations in intervention group (37% vs. 20%) • Significantly fewer rehospitalizations in intervention group at 1 year (p<0.05)	• Medium – Advanced Practice Nurses provide transition support for high-risk elderly patients	• 50% reduction in total health care costs ($3k vs. $6k) at 6 months • $5k cost savings per patient at 1 year ($7,600 vs. $12,400)	
A4. Evercare™ Care Model	• Reduced hospitalizations by 45% with no change in mortality (2.4 per 100 vs. 4.6) • Reduced ED visits by 50%	• High - NPs and social workers, phone & visits in LTC or home to coordinate services, facilitate communication, integrate personal care plans. 4 levels of care acuity.	• Hospital cost savings per nurse practitioner per year of $103,000	

INTERVENTION	Rehospitalization Results	Complexity	Cost Benefit	Other Comments
B: VERY GOOD DATA SHOWING DECREASED (RE)HOSPITALIZATIONS				
B1: Community Care North Carolina	• Pediatric asthma hospitalizations decreased by 21-23% • Adult asthma hospitalizations decreased by 25% • Diabetes hospitalizations decreased by 9%	• High – highly coordinated network of providers and community-based supports	• Asthma cohort costs decreased $27 PMPM, accrued $1.5M in annual savings to Medicaid • Diabetes cohort costs decreased $21 PMPM	
B2: Commonwealth Care Alliance-Brightwood Clinic	• Unspecified (re)hospitalization rates; savings accrued via reduced hospital utilization	• High – highly coordinated outpatient multidisciplinary teams with close individual outreach and follow up	• Cost savings $204 PMPM compared to FFS • Among subgroup with >$2000 PMPM in FFS, savings greatest ($9,400 monthly average to $2,500 monthly average) • Among lower-cost patients (<$500 PMPM), costs increased ($162 to $775)	• Very high resource-intensive patient population • ED utilization decreased from 0.109 visits PMPM to 0.097 visits PMPM
B3. Heart Failure Resource Center	• 2007 30-day rehospitalization rates decreased from 4.6% to 1.6% • 75% lower than HF patients not in program • 2007 90-day rehospitalization rates decreased from 10.4% to 2.9%	• Medium – APNs managing outpatients		• Used a cost-avoidance financial model to assess return on investment
B4: Home Healthcare Telemedicine	• Low baseline CHF rehospitalization rate (6%) decreased to approximately 1%	• High – RN monitoring using in-home phone, video & computer equipment	• Cost of 1 telemedicine unit ($5,500) less than 1 hospitalization	• RN productivity higher for telemedicine (8 visits vs. 5 visits daily)
B5: Novant Physician Group Practice Demonstration Project	• 44% fewer hospital admissions for patients with CHF and COPD • No rehospitalization data available	• Low – Chronic Care Model, population management, link outpatient and inpatient communication	• Lower costs in participating practices (no specifics)	• 20% fewer ED visits for patients with CHF and COPD

INTERVENTION	Rehospitalization Results	Complexity	Cost Benefit	Other Comments
B6: Kaiser Permanente Chronic Care Coordination	• Hospitalization rates for patients transitioning from SNF to home decreased from 14% to 2.4%	• Medium – RNs & LCSWs, various levels of care	• $1,900 savings per patient per year due to decreased hospitalizations, SNF admissions, and ED visits • $3M in annual savings for patients transitioning from SNF to home due to reduced utilization	• ED visits decreased from 16% to 7% • SNF 60-day readmissions decreased from 13% to 0
B7: Creating an Ideal Transition Home for Patients with Heart Failure (IHI)	• All-cause 30-day rehospitalizations decreased from 14% to 7% at St. Luke's Hospital in Iowa	• Low to medium – depends on changes implemented		• 100% patient satisfaction with discharge process • >90% successful "Teach Back"
C: PROMISING INTERVENTIONS REQUIRING ADDITIONAL DATA				
C1: INTERACT (Ouslander)	• Preliminary data suggests reduced avoidable hospitalizations from 77% to 49% after 6-month intervention	• Minimal – toolkit for nursing homes to prevent avoidable transfers		• Expanding to sites in 3 states in June 2009
C2: Project BOOST (SHM)	• None available at this time	• Low to medium- depends on changes implemented		• Expanding to 24 additional hospitals in spring 2009
C3: Guided Care (Boult)	• Preliminary 6-month data suggests 15- and 45-day rehospitalization may be 3% lower than control group • No difference at 30 days	• Minimal – use of RNs integrated with primary care	• Net savings: $130k per year per 55 beneficiaries	• RCT underway for patients at high risk
C4: Hospital at Home (Leff)	• At 8 weeks, no difference in utilization of ED, rehospitalizations, admissions to SNFs, home health visits	• High – RNs and acute care services in home setting	• Mean cost for hospital-at-home episode = $5,000 vs. hospital stay of $7,500	

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REDUCING READMISSIONS
A Comprehensive Approach to Reducing Costs and Improving Quality

Harold D. Miller
President and CEO
Network for Regional Healthcare Improvement
and
Executive Director
Center for Healthcare Quality and Payment Reform

Why All the Interest in Hospital Readmissions?

- We started measuring them
  - You don't manage what you don't measure
  - You don't care about problems you don't know about
- It's a way to reduce costs without rationing
- High rates of readmissions mean there are significant savings opportunities if they can be reduced
- Readmissions affect most types of patients, so all payers are interested
- Some projects have shown significant reductions in readmissions can be achieved at low cost
- Savings can be achieved quickly

A Good Formula for Healthcare Reform

- We started measuring them
  - You don't manage what you don't measure
  - You don't care about problems you don't know about
- It's a way to reduce costs without rationing
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- Readmissions affect most types of patients, so all payers are interested
- Some projects have shown significant reductions in readmissions can be achieved at low cost
- Savings can be achieved quickly

However…

- Not all readmissions are preventable and we don't have good measures for which are and aren't
- A wide range of factors cause readmissions, so no single intervention can address them all
- Since multiple providers are involved, it's not clear who should be held accountable
- Current healthcare payment systems don't support or reward providers' efforts to reduce readmissions

What is Currently Being Done to Reduce Readmissions?

- Primary focus is on improving care transitions
  - Evidence that there are weaknesses in hospital discharge
  - Evidence that there is lack of coordination during transition
  - Evidence that patients aren't ready for discharge instructions while they're in the hospital
  - Easy to identify the patients
  - Several projects have reduced readmissions through relatively simple interventions focused on improving transitions from hospital to community

Examples of Projects With Published Evidence of Success

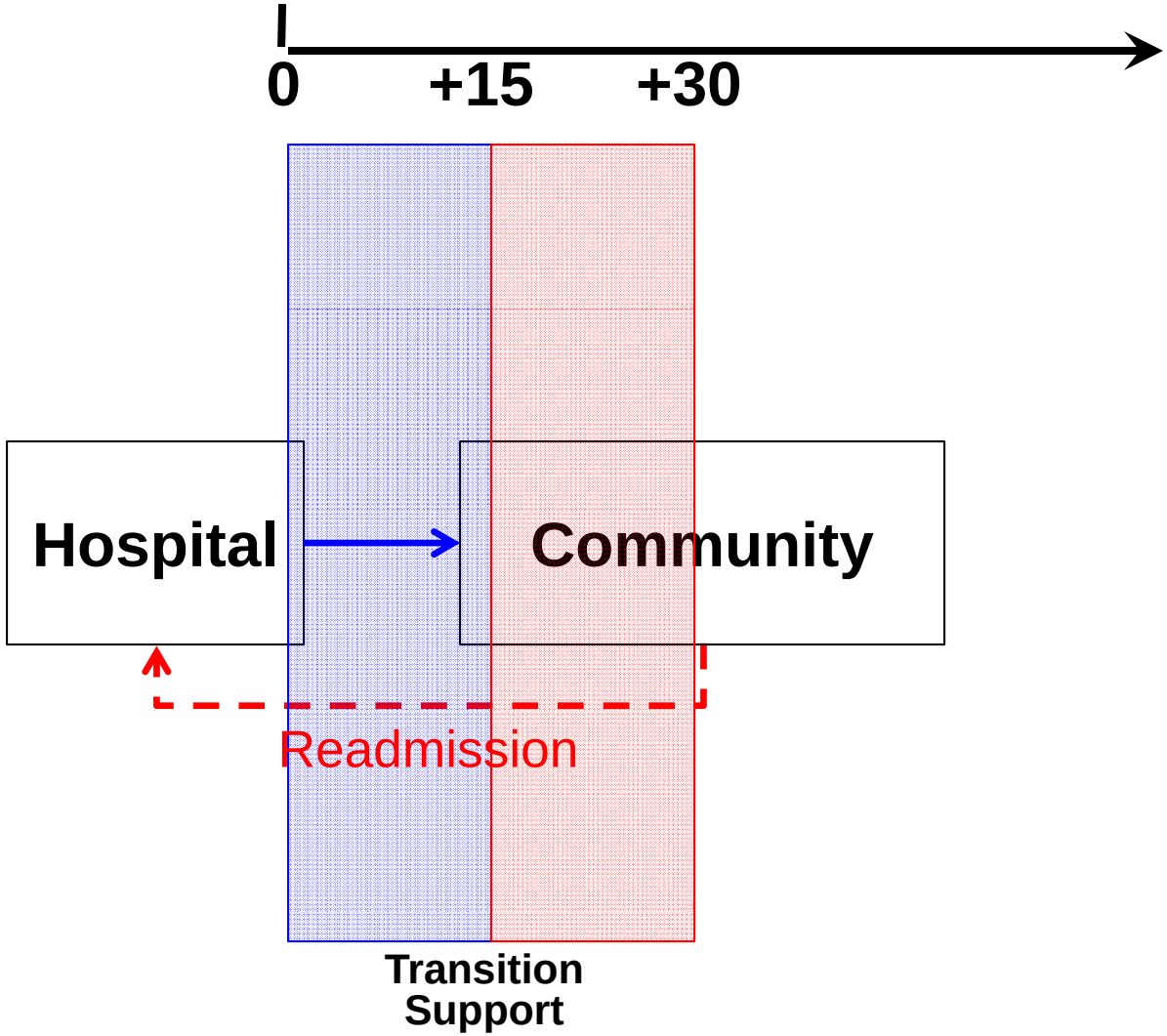
PROJECT	WHEN	WHAT	HOW	WHO	WHICH
Transitional Care (Naylor)	During stay + Post-Discharge (up to 12mo.)	Patient Education & Self-Mgt Support	Hospital visits + Home visits + Phone calls	Advanced Practice Nurse	65+ 65+ with CHF
Care Transitions (Coleman)	Pre-Discharge + 1 Mo. Post-Discharge	Self-Mgt Support	Hospital visit + Home visit + 3 phone calls	Nurses or Lay Coaches	All
Project RED (Jack)	Discharge + Immediate Post-Discharge	Patient Education + Medication Assistance	Hospital visit + Phone call	Nurse (or simulation) + Pharmacist	All

Extensive Efforts at Replication Nationally

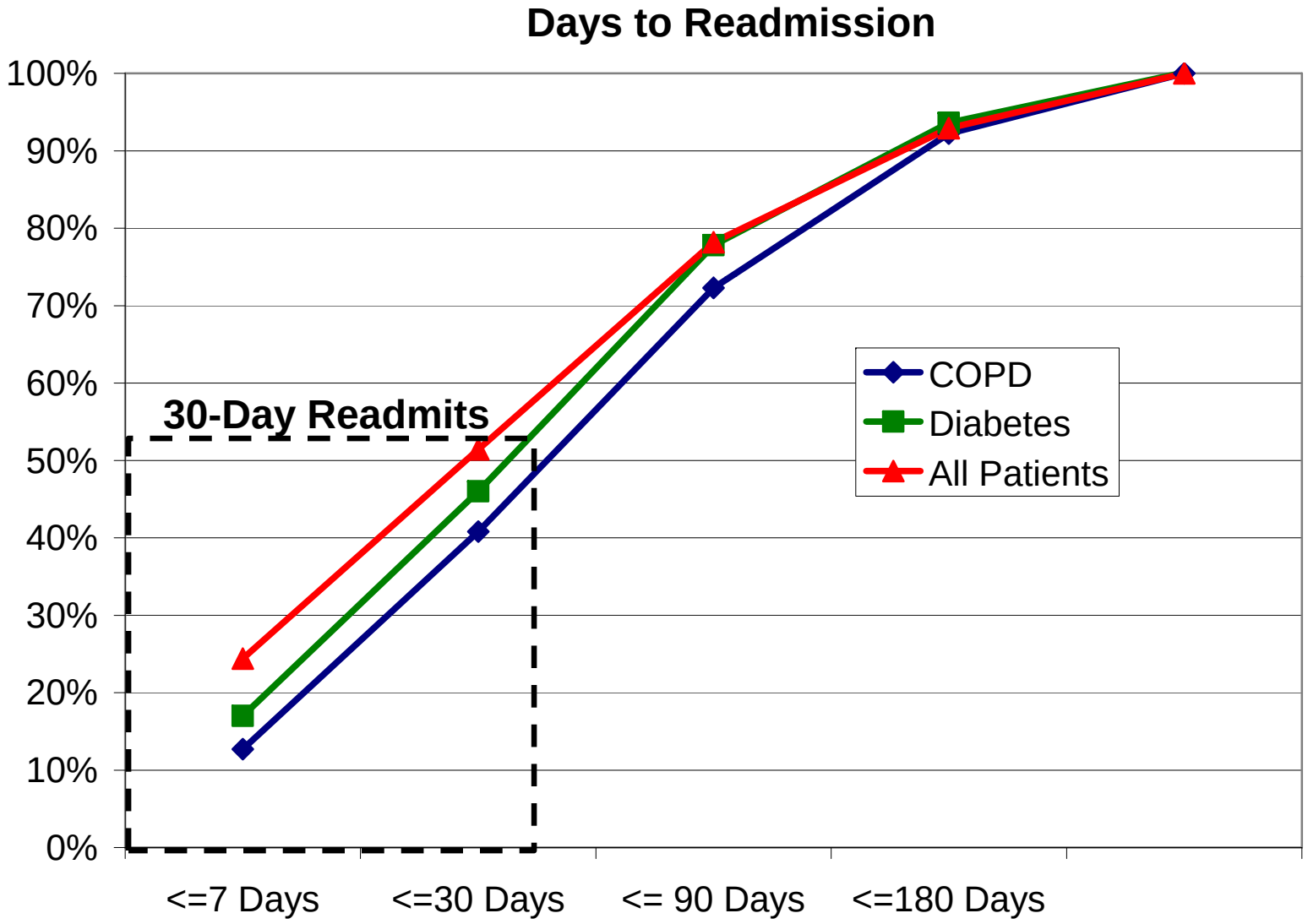
- Project BOOST (Better Outcomes for Older Adults through Safe Transitions)
  - Toolkit, training, and mentoring for improved discharge planning
  - http://www.hospitalmedicine.org/ResourceRoomRedesign/RR_CareTransitions/html_CC/project_boost_background.cfm
- QIO Care Transitions Initiative for Medicare Beneficiaries
  - CMS project to improve transitions in 14 communities led by QIOs
- CMS Community-Based Care Transitions Program for High-Risk Medicare Beneficiaries
  - $500 million, 5 year program
  - Partnerships of hospitals with high readmission rates and community based organizations delivering care transition services

Most efforts are primarily focused on seniors/Medicare beneficiaries, even though high rates of readmissions occur at all ages

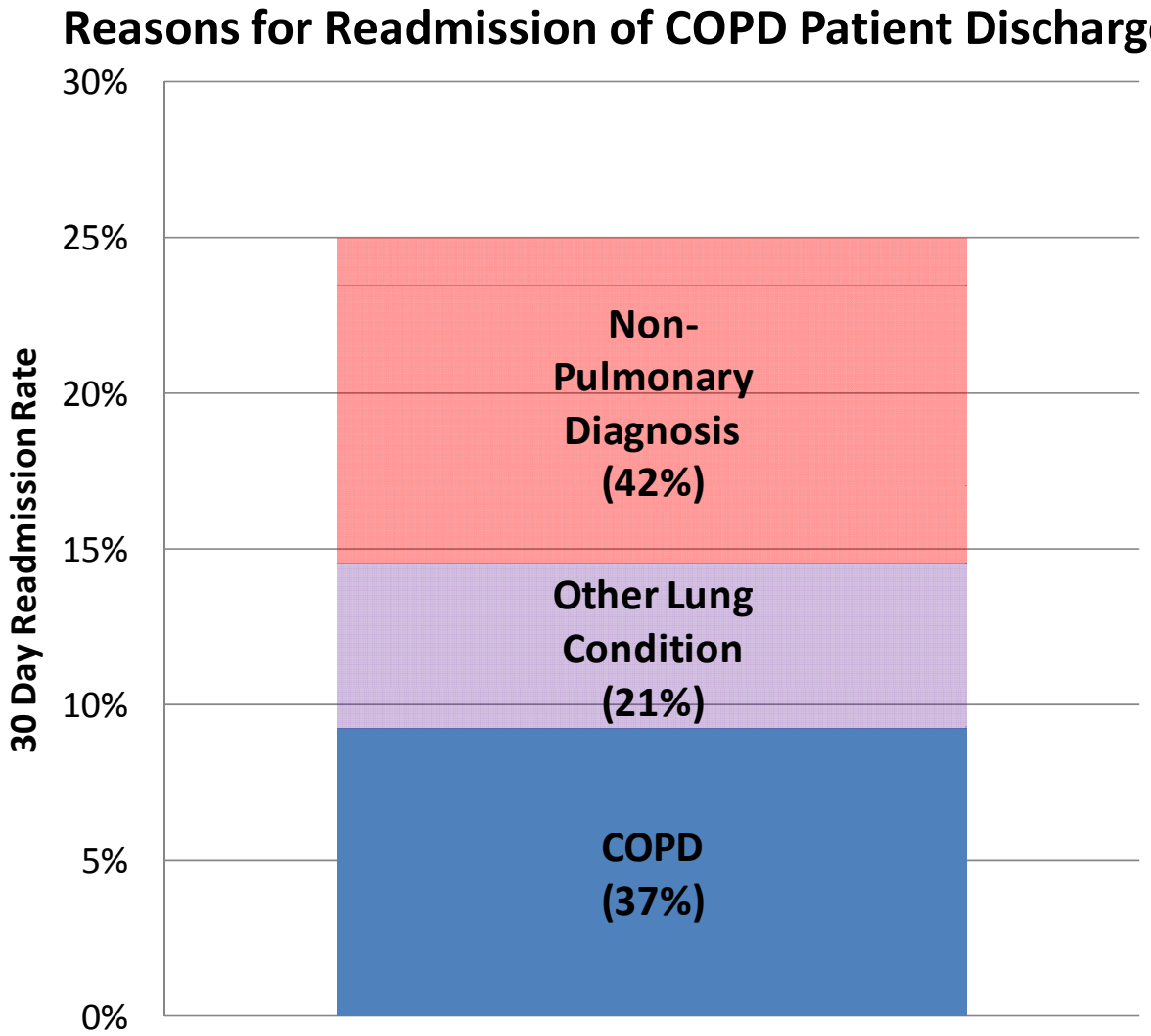
Improving Transitions Seems Like It's Addressing The Problem…



Except That Many Readmissions Occur Well After 30 Days…



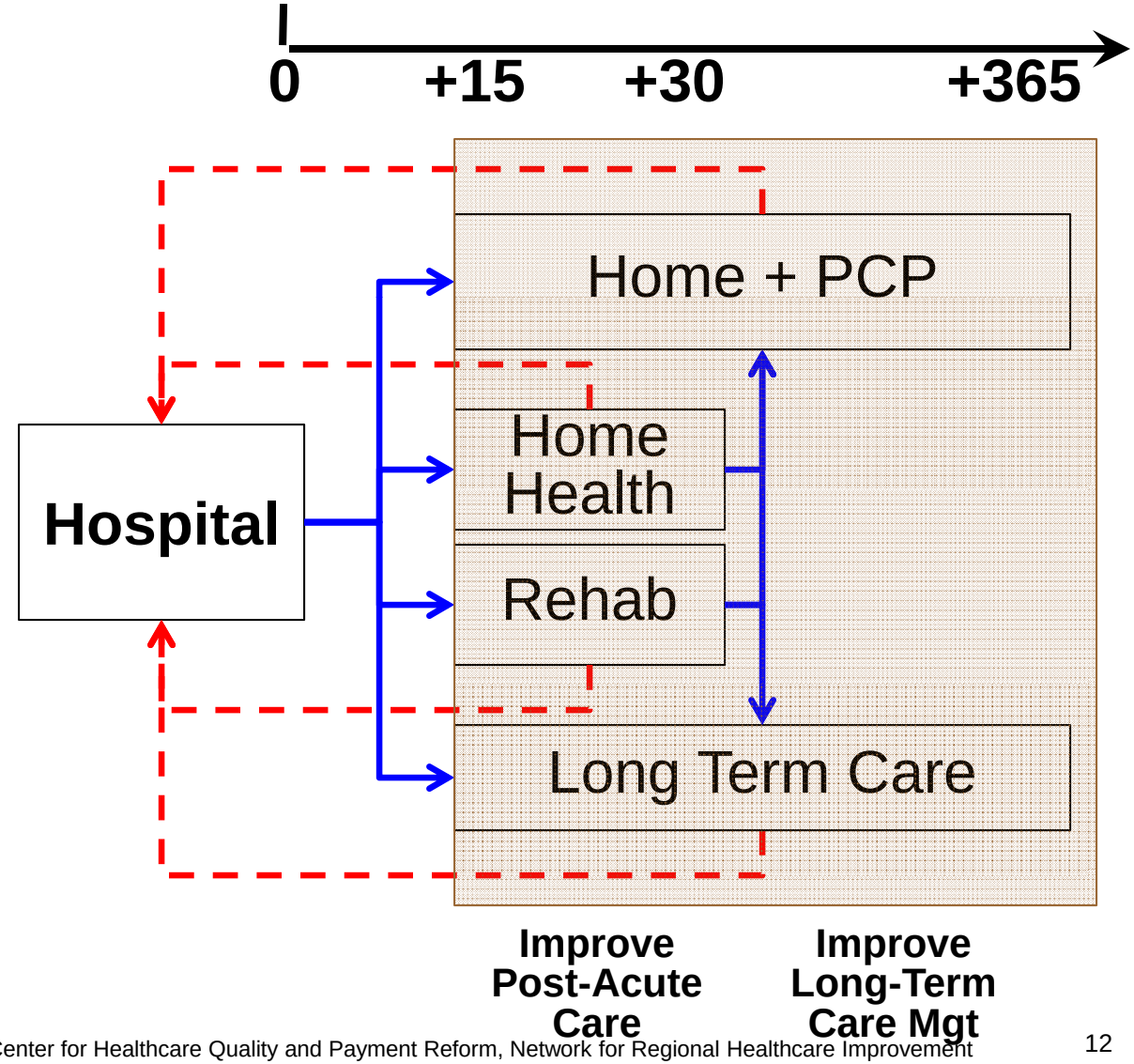
…Many Readmissions Are for Different Issues…



…And Many Readmissions Aren't Caused by Problems in Transitions

- 88 Year Old Woman Admitted to Hospital for UTI/Sepsis (7/2)
  - IV antibiotics and fluids administered, rapid improvement
  - Kept in hospital 4 days, deconditioned, admitted to rehab facility (7/6)
  - Discharged and returned to assisted living facility (7/17)
- Rehospitalized in 14 days with another UTI (7/20)
  - Administered antibiotics and fluids, good improvement
  - Kept in hospital for 3 days, returned to rehab facility (7/23)
  - Developed UTI in rehab facility; nurse practitioner said policy was not to treat "asymptomatic UTIs"
  - Developed sepsis and taken to ER (8/11)
- Rehospitalized in 19 days with UTI/Sepsis (8/11)
  - Administered IV antibiotics; slow improvement
  - Family demanded that hospital develop plan for preventing UTIs
  - Physician prescribed ongoing prophylactic antibiotic regime
  - Kept in hospital for 6 days; discharged to new rehab facility (8/17)
  - No longer able to walk independently; returned home in wheelchair (9/9)
- No Further Readmissions for 14 months

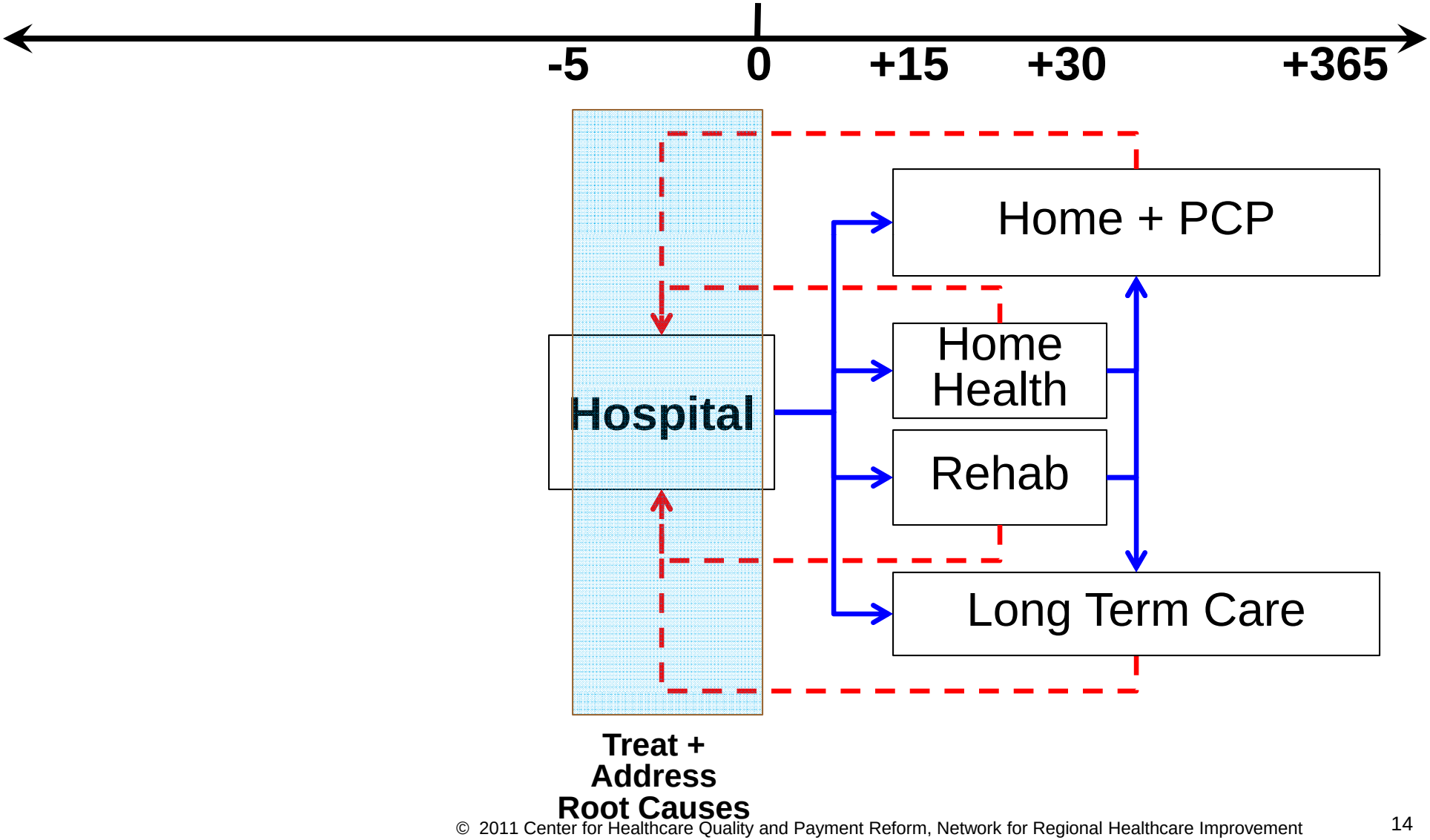
Improvements in Post-Discharge Care Also Needed



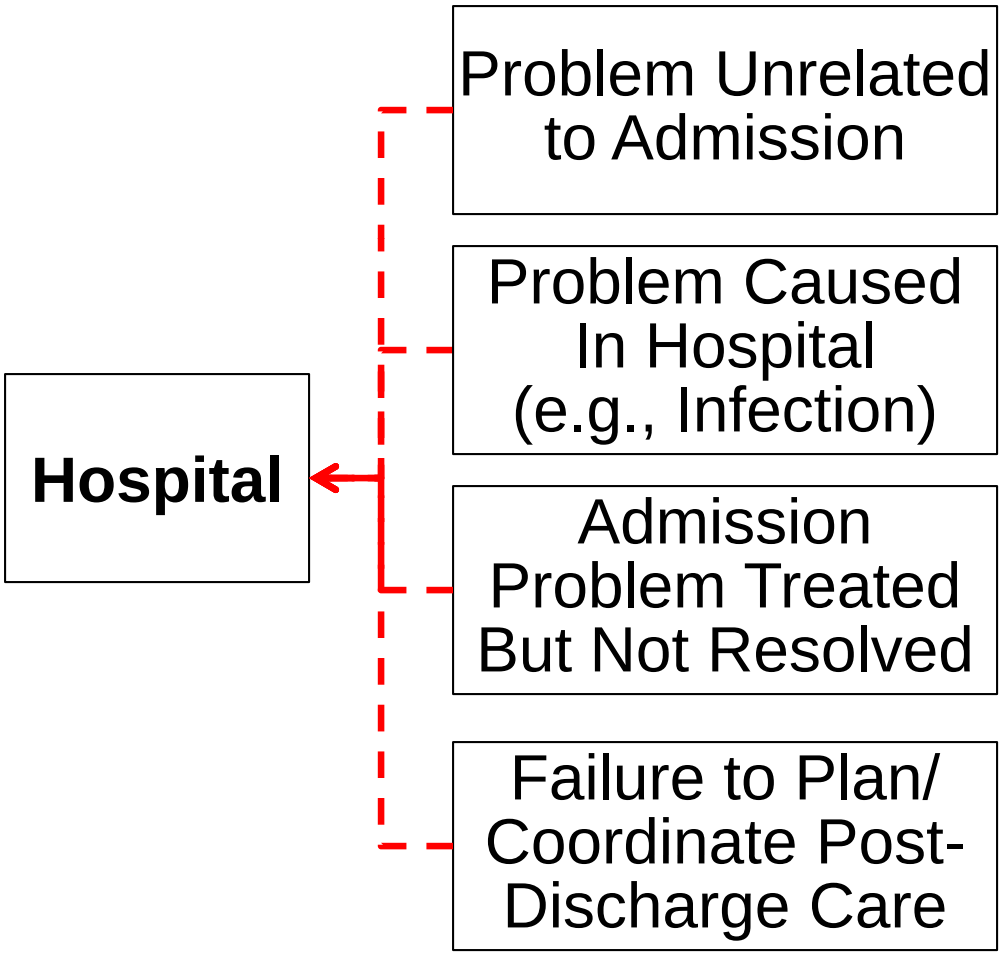
Some Initiatives Focusing on Changing Post-Acute Care

- INTERACT (Interventions to Reduce Acute Care Transfers)
  - Developed by Georgia Medical Care Foundation (QIO)
  - Provides tools for nursing homes/long term care facilities to use to monitor and redesign care to reduce readmissions
  - http://interact2.net/

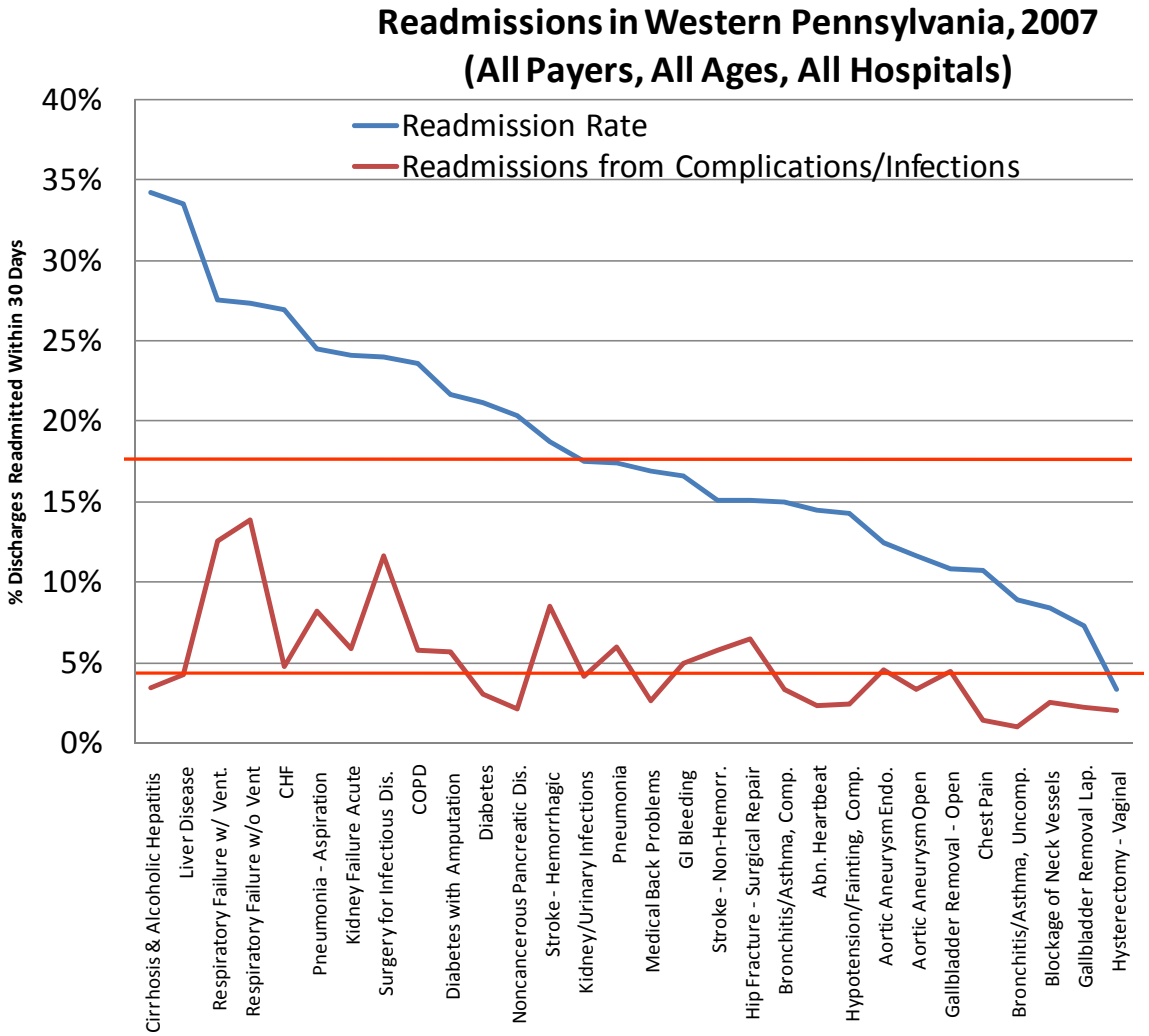
Hospitals Need to Address Root Causes of Readmits If Possible



Different Causes for Readmission



Most Readmissions Are Not A Hospital-Caused "Problem"



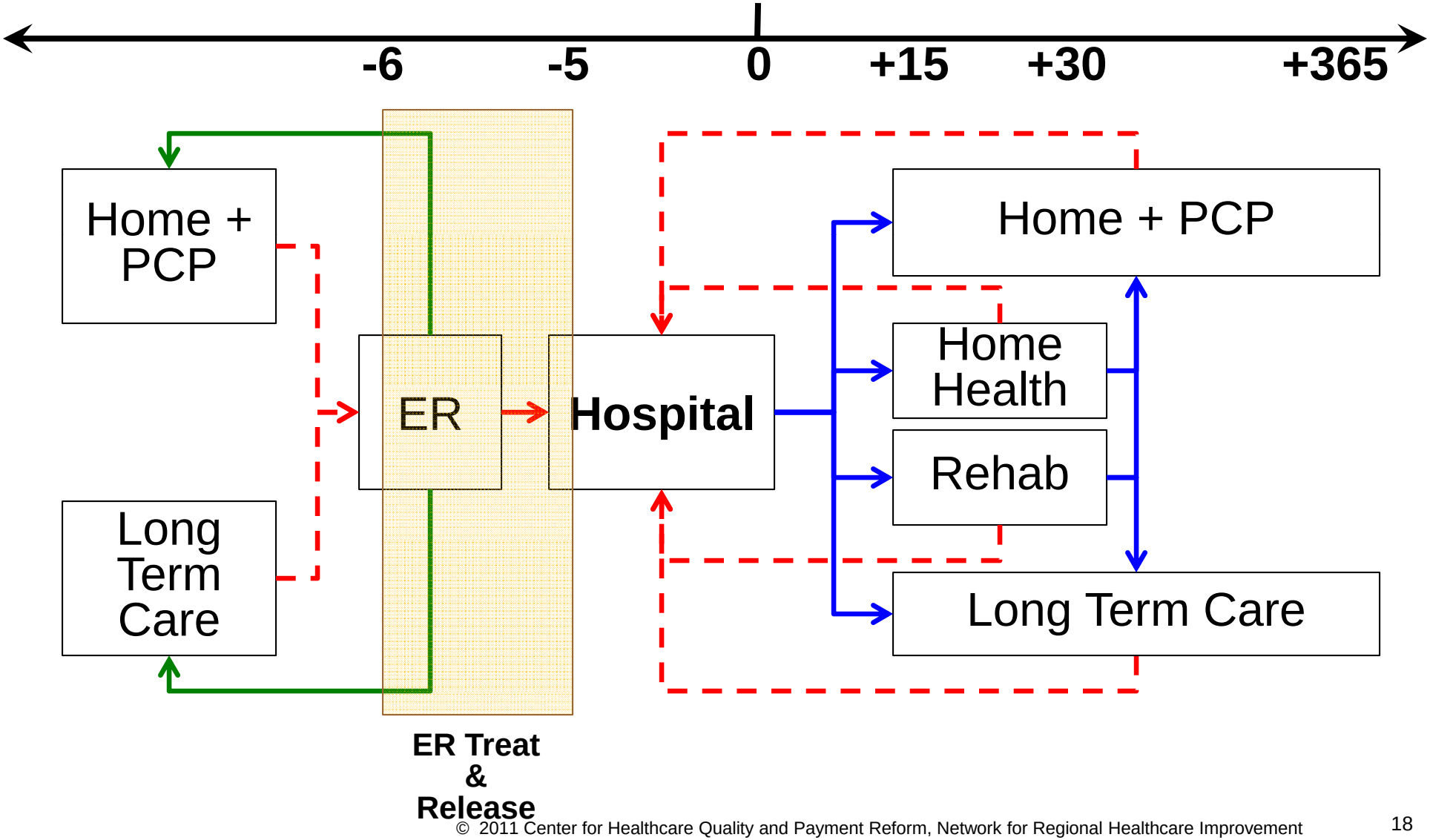
Average Readmission Rate: 18%

24% of Readmissions Due to Complications or Infections

But The Hospital Could Also Address Other Root Causes

- Earlier transition to post-discharge medications
- Better patient education about post-discharge medications
- Testing alternative medications to address problematic side effects or affordability
- Better education, physical therapy, occupational therapy, etc. to support better self-care and condition management after discharge

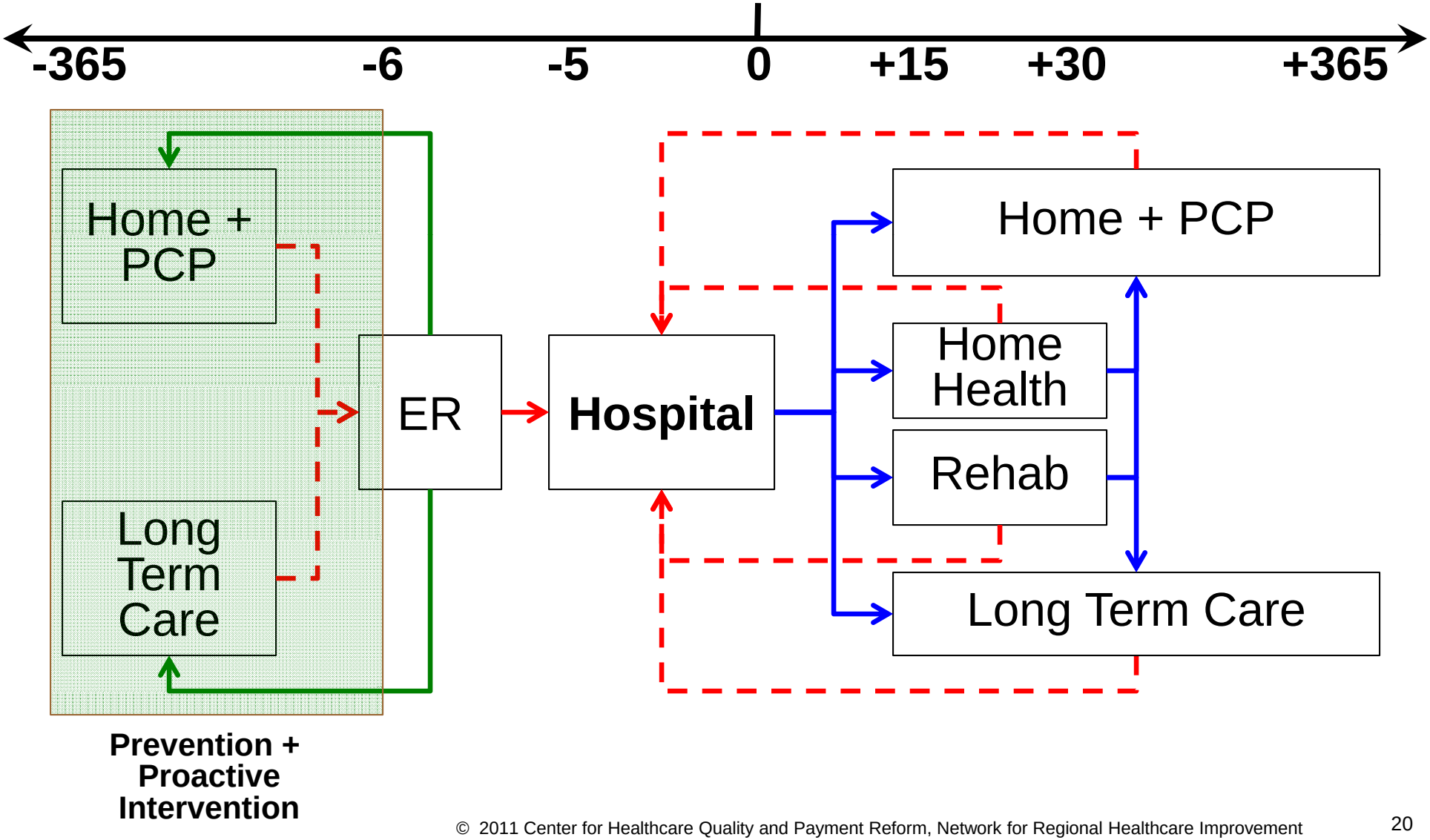
Improving Ability of ERs to Treat and Release, Not Admit



“Asthma Lounge”

- Highland Hospital in Alameda California created an "asthma lounge" within its emergency department.
- Nurses in the ER immediately move patients experiencing asthma exacerbations to the asthma lounge, which is staffed 24 hours a day by nurses and respiratory therapists who follow treatment protocols to expedite care, stabilize patients, and provide education on their condition.
- Nurses phone patients within 48 hours of ER discharge to check on them and reinforce the educational information.
- Since the lounge opened, waiting times and the frequency of return visits decreased significantly among asthma patients, while patient satisfaction levels have increased.

Don't Wait for Hospitalization: PCMH To Prevent Initial Admission



Significant Reduction in Rate of Hospitalizations Possible

Examples:

- 40% reduction in hospital admissions, 41% reduction in ER visits for exacerbations of COPD using in-home & phone patient education by nurses or respiratory therapists

  J. Bourbeau, M. Julien, et al, "Reduction of Hospital Utilization in Patients with Chronic Obstructive Pulmonary Disease: A Disease-Specific Self-Management Intervention," *Archives of Internal Medicine* 163(5), 2003

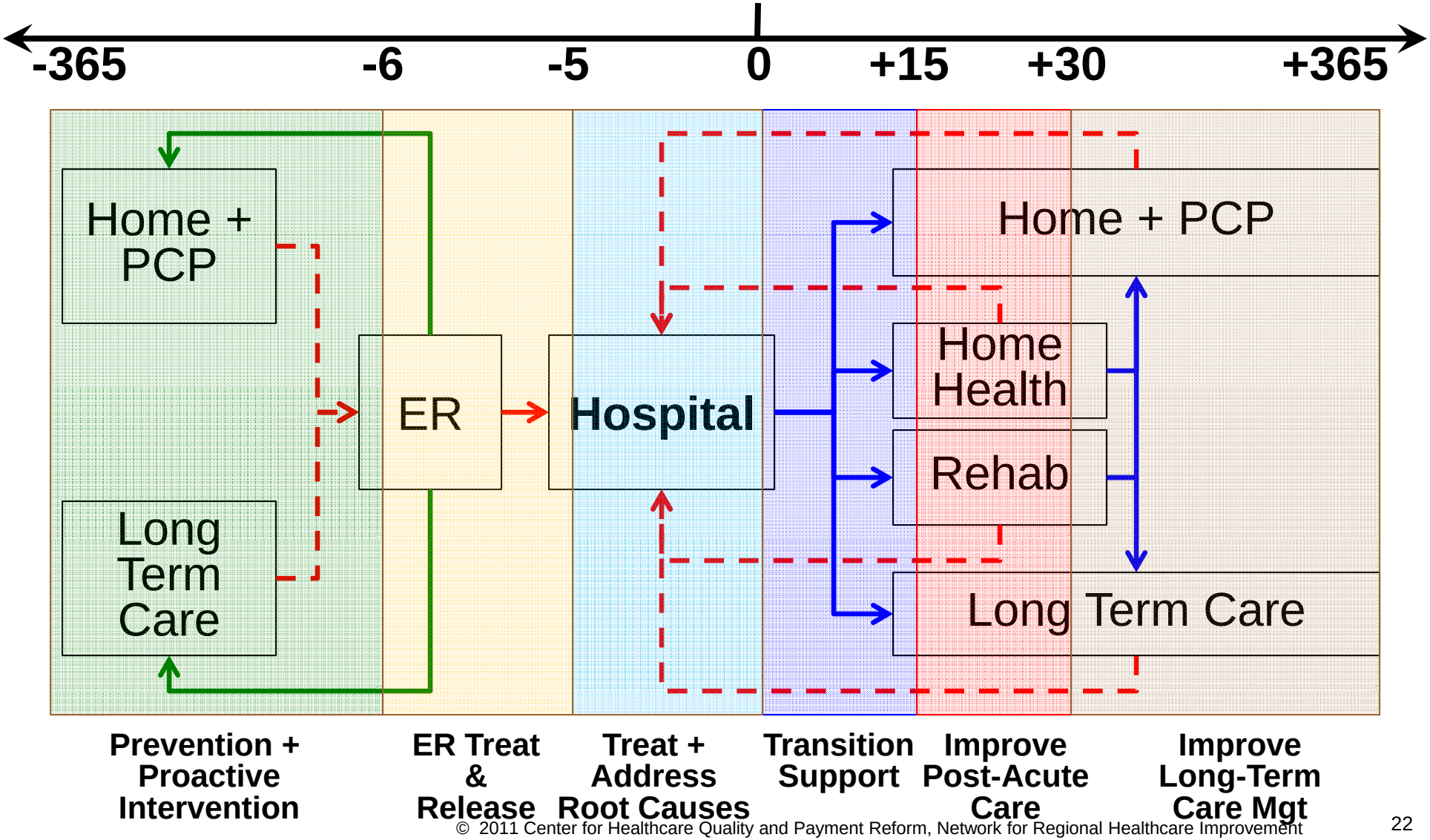
- 66% reduction in hospitalizations for CHF patients using home-based telemonitoring

  M.E. Cordisco, A. Benjaminovitz, et al, "Use of Telemonitoring to Decrease the Rate of Hospitalization in Patients With Severe Congestive Heart Failure," *American Journal of Cardiology* 84(7), 1999

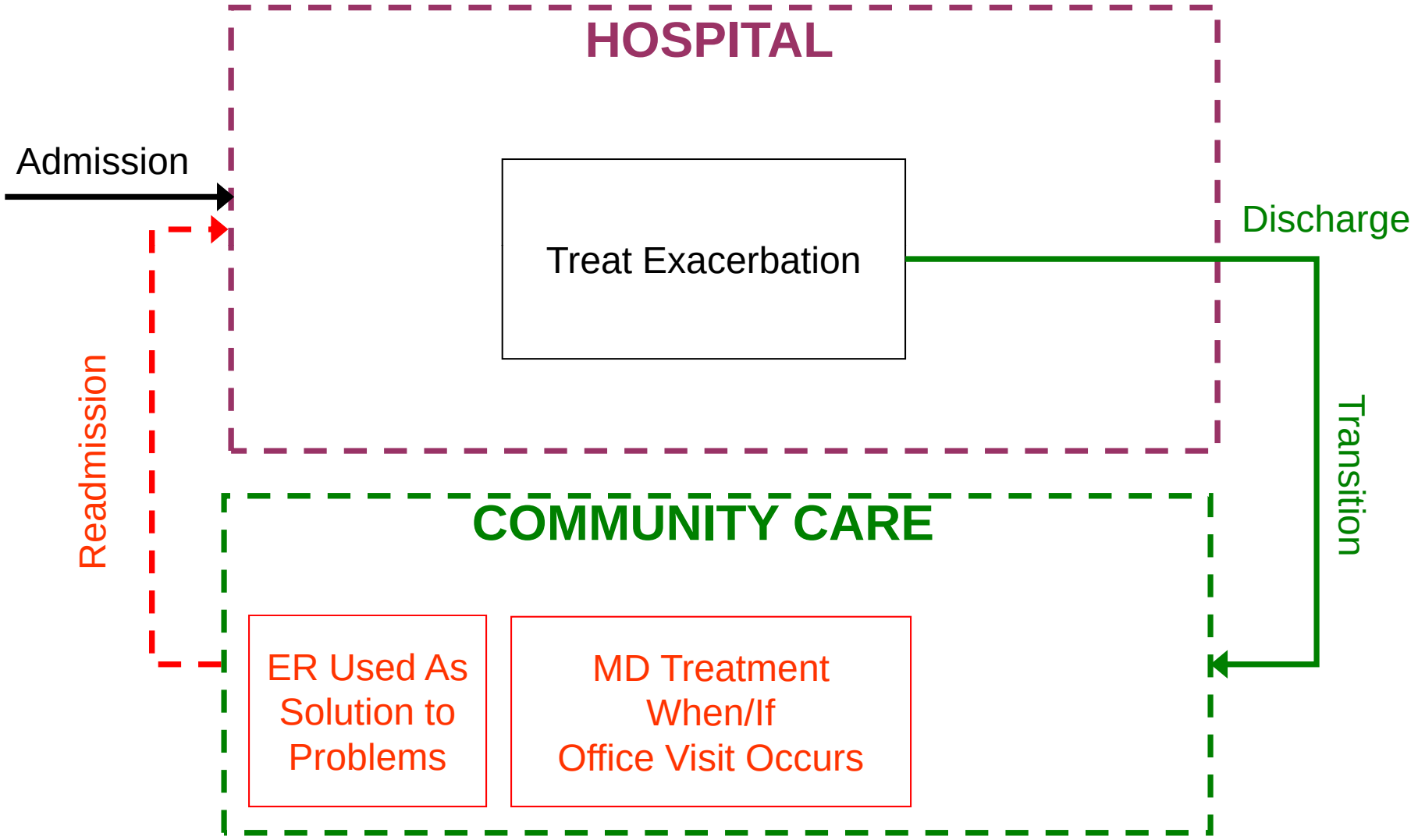
- 27% reduction in hospital admissions, 21% reduction in ER visits for COPD through self-management education

  M.A. Gadoury, K. Schwartzman, et al, "Self-Management Reduces Both Short- and Long-Term Hospitalisation in COPD," *European Respiratory Journal* 26(5), 2005

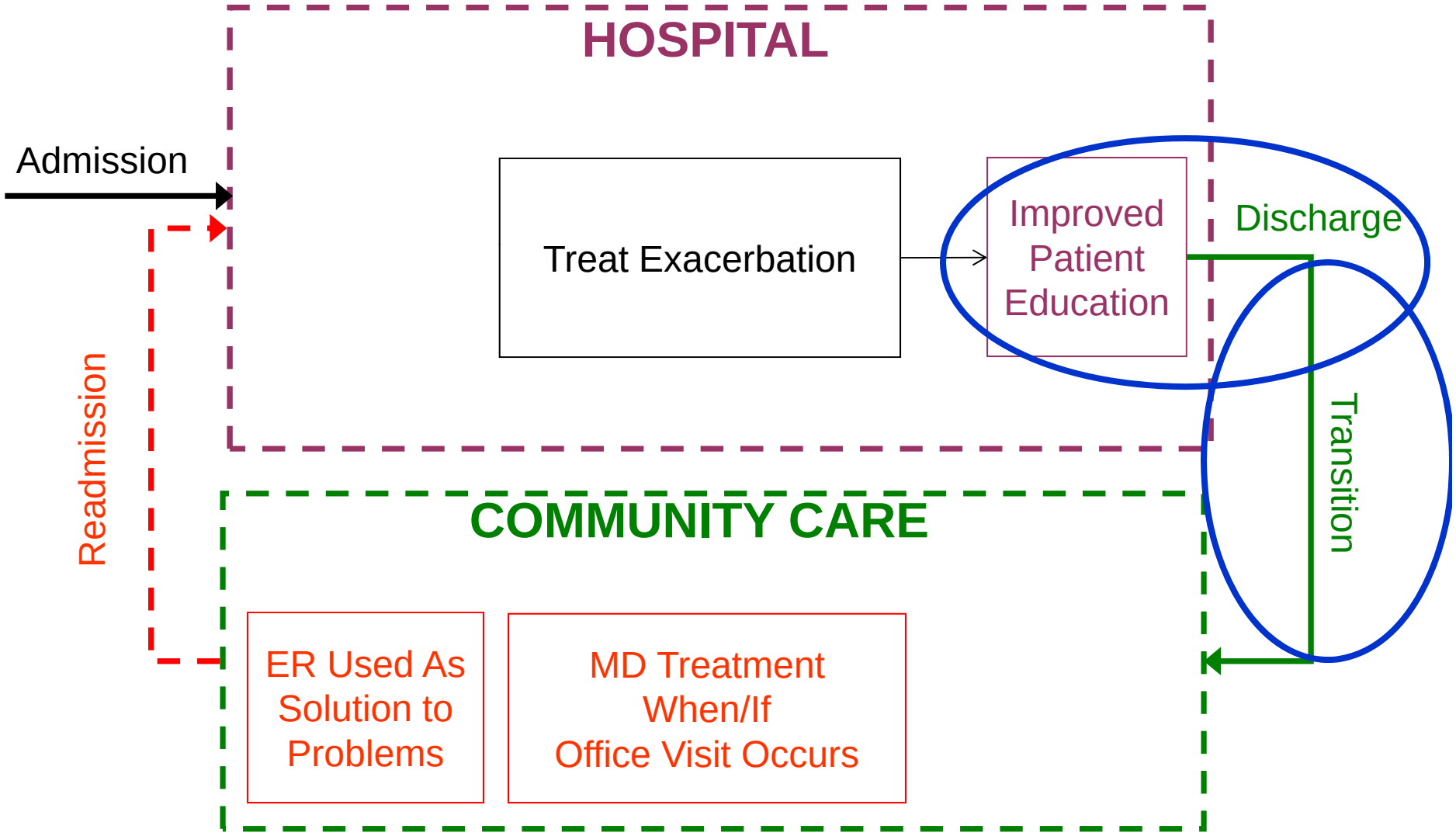
A Truly Comprehensive Solution



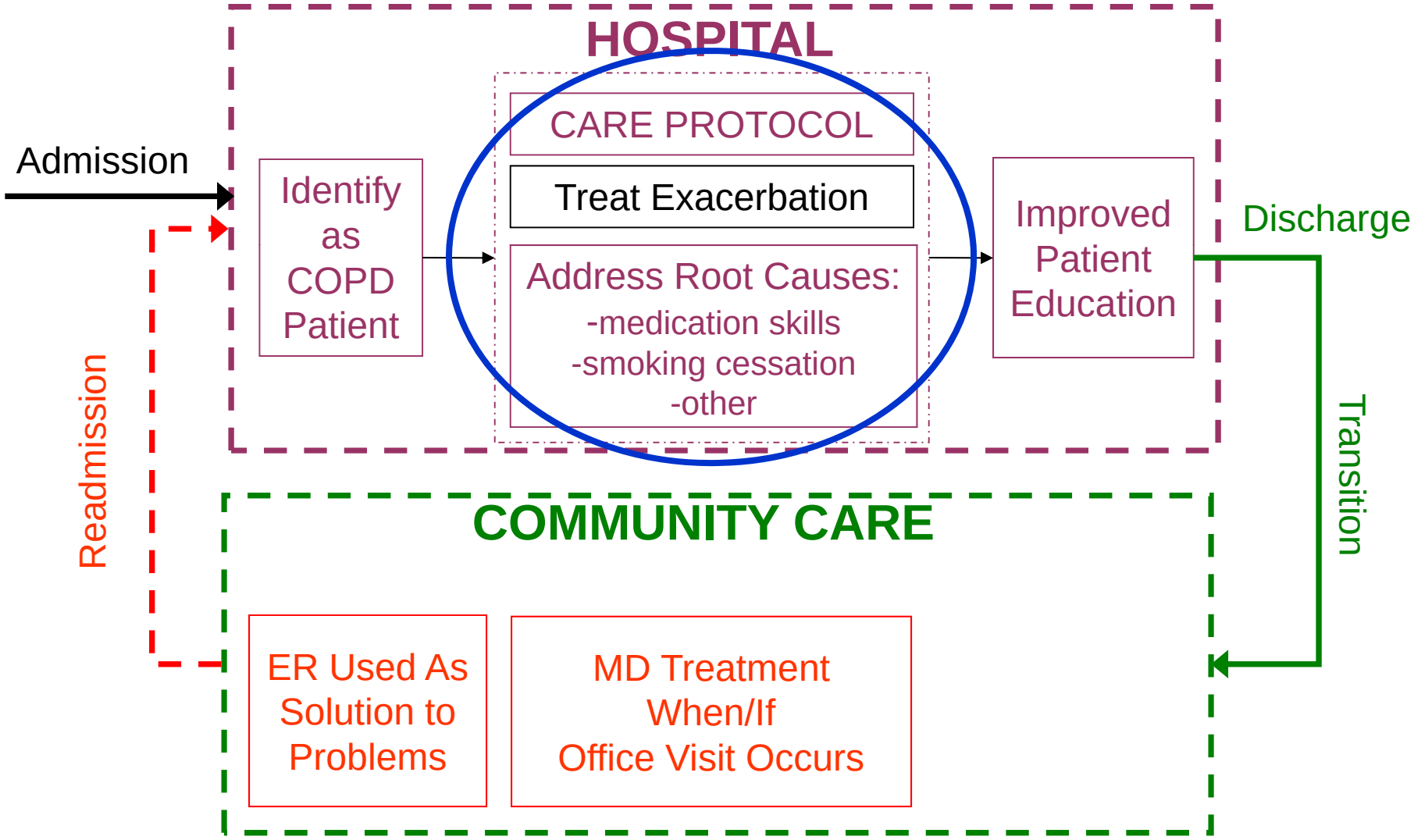
A COPD Example from the Pittsburgh Regional Health Initiative



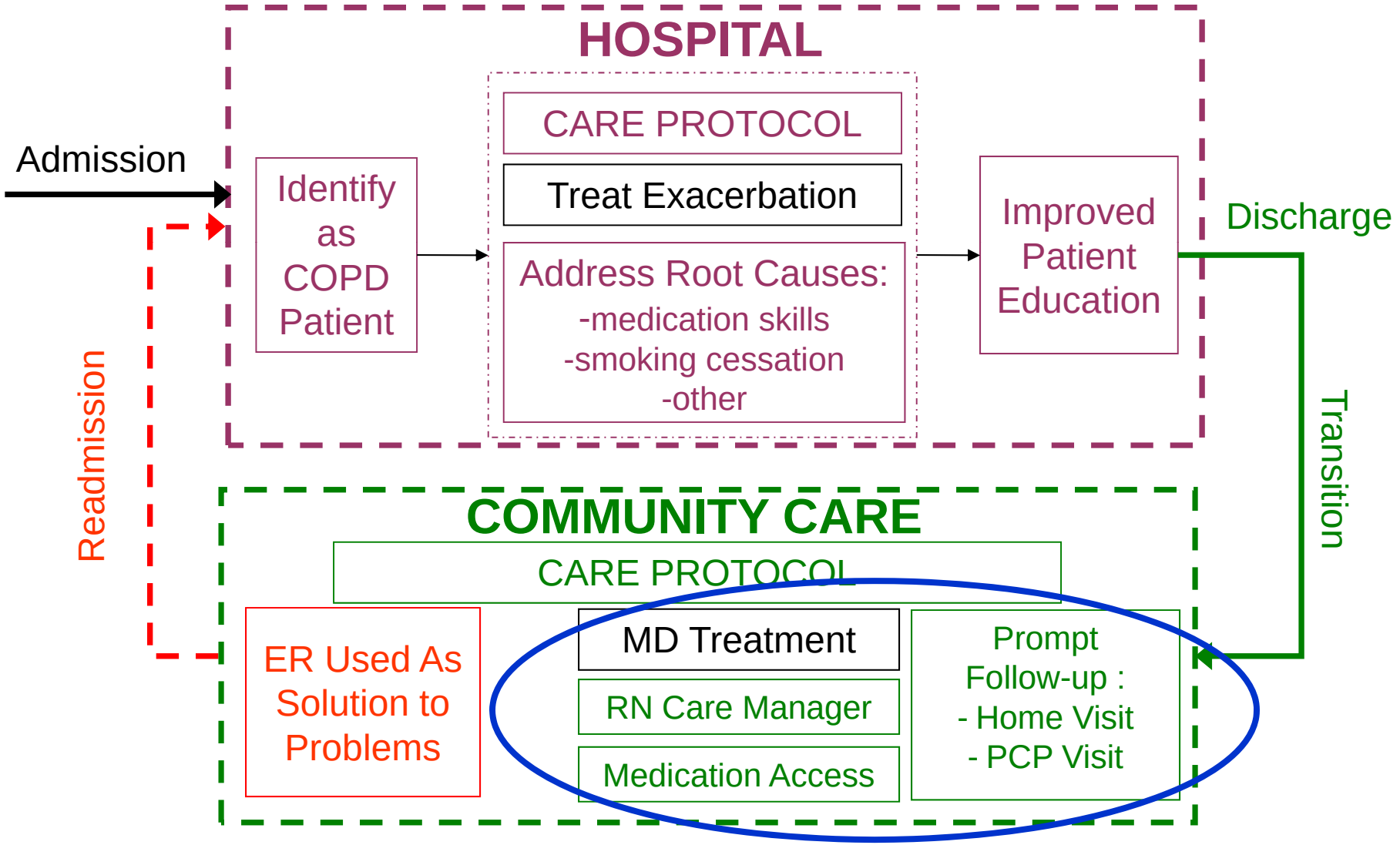
What We Tried to Fix: Better Discharge/Transition PLUS..



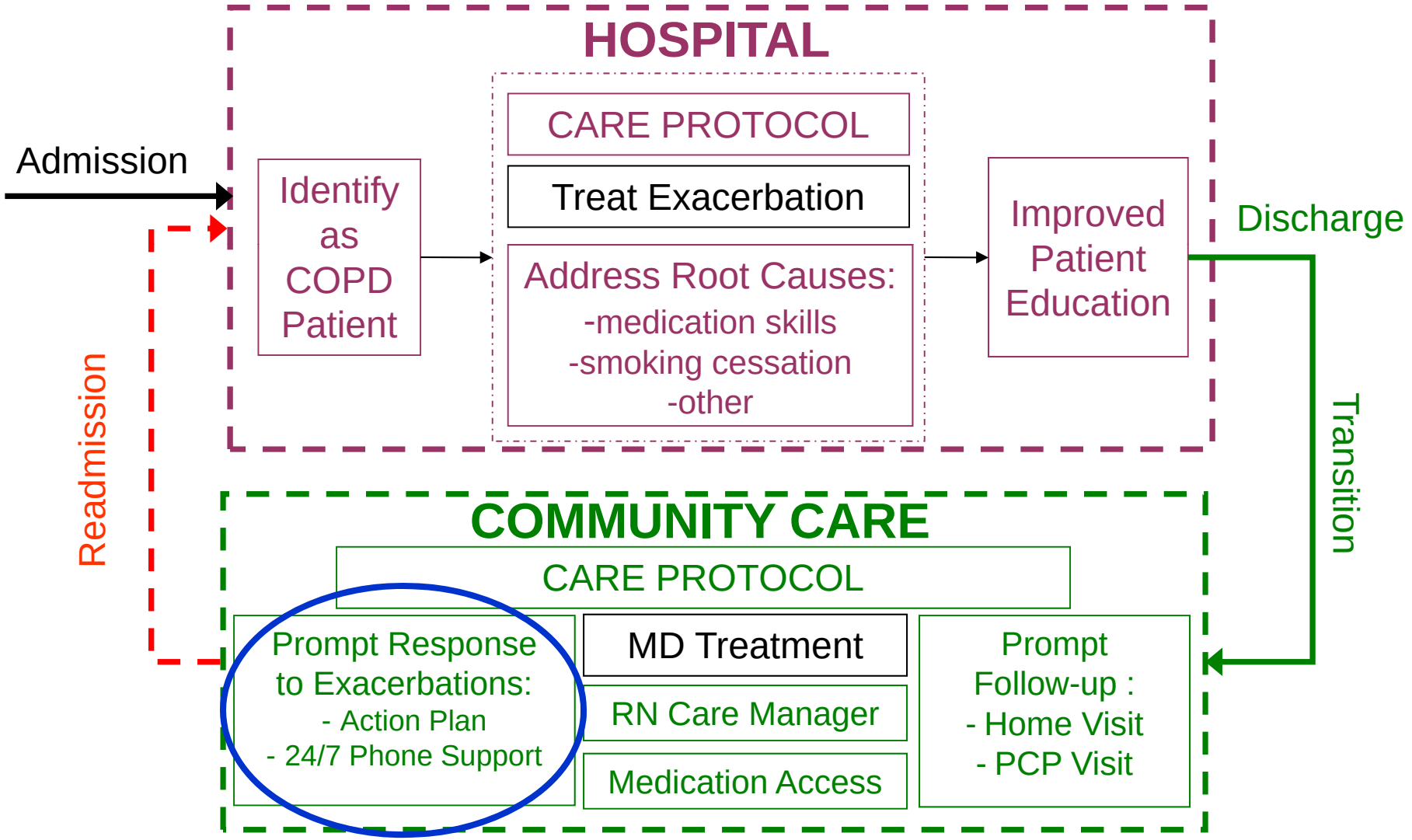
What We Tried to Fix:
Improved Care in Hospital



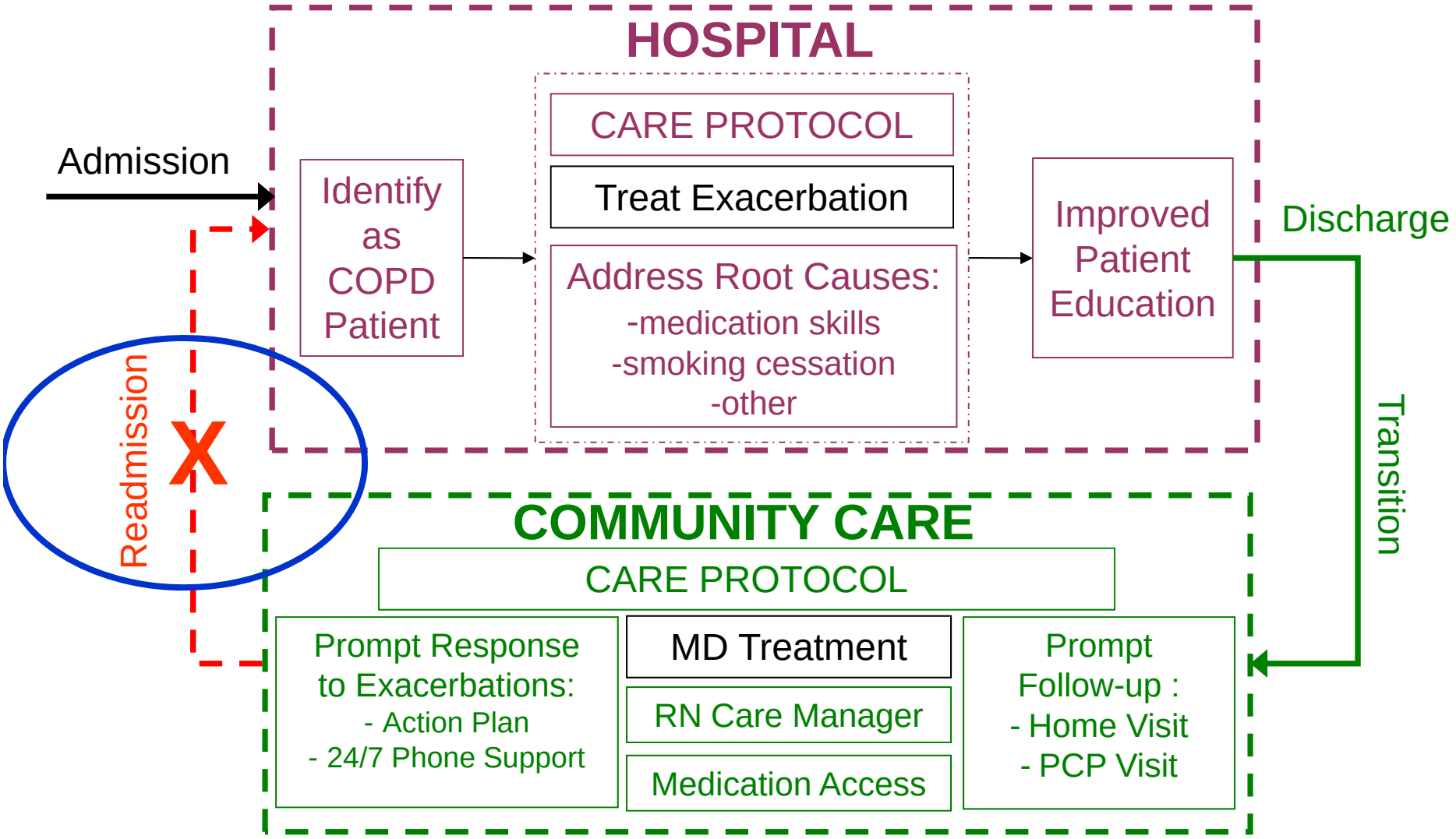
What We Tried to Fix:
Expanded PCP/Care Mgr Support



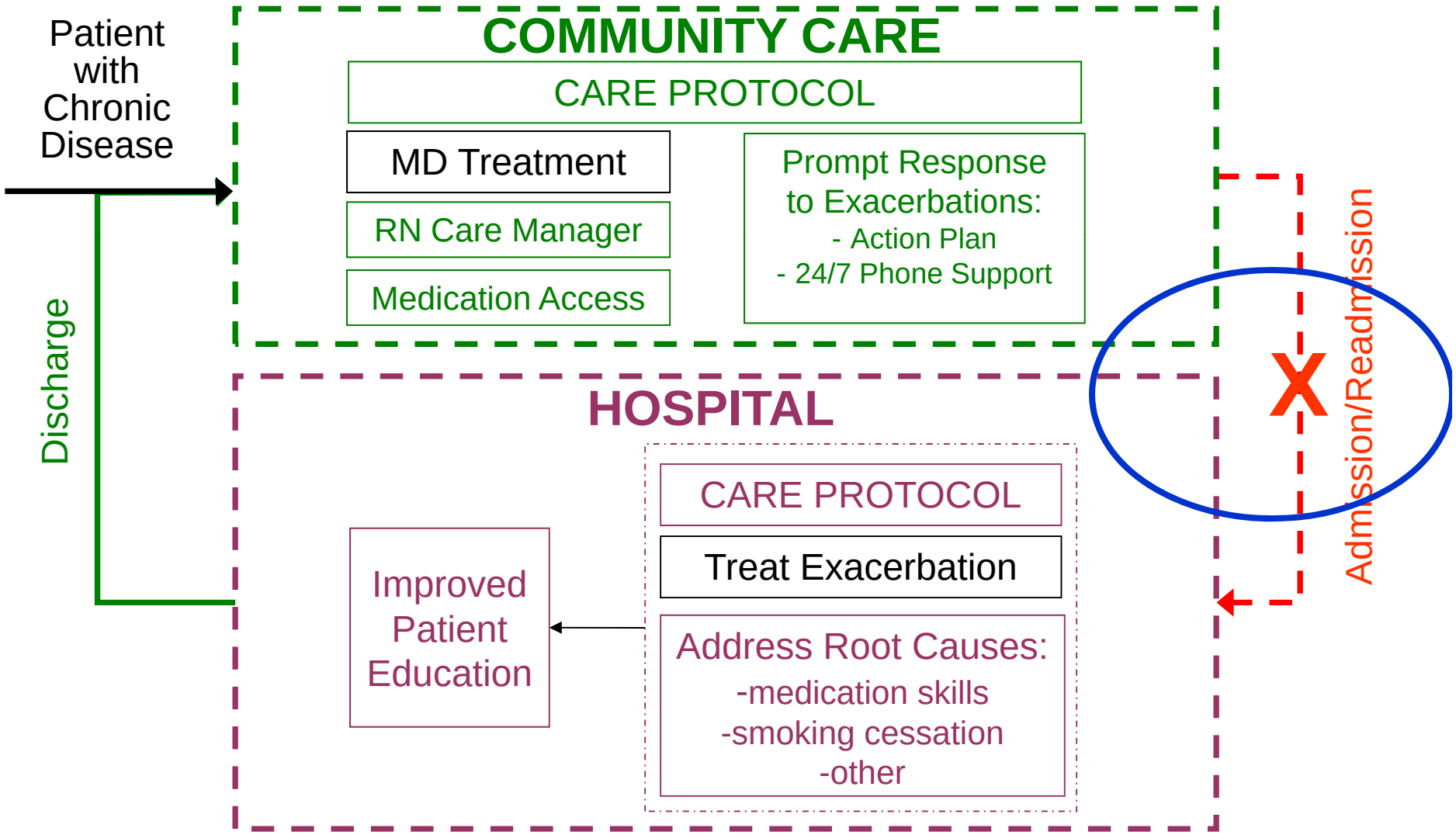
What We Tried to Fix:
Non-Hospital Solution to Problems



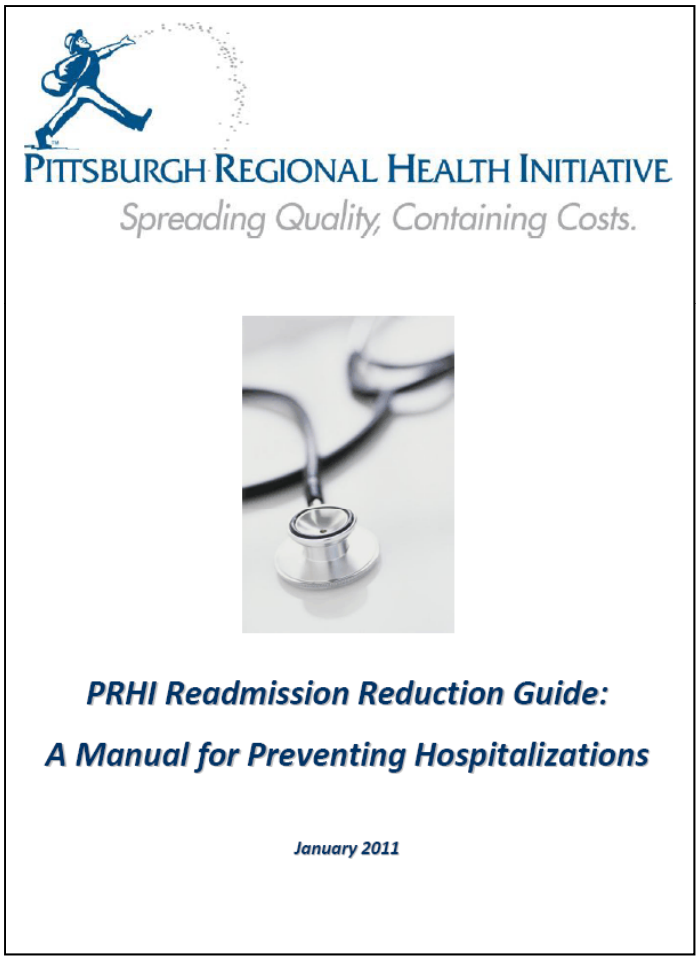
Goal: To Prevent Readmissions, But Also...



... Ultimately to Prevent *Initial* Admissions



More on the Pittsburgh Readmission Reduction Project

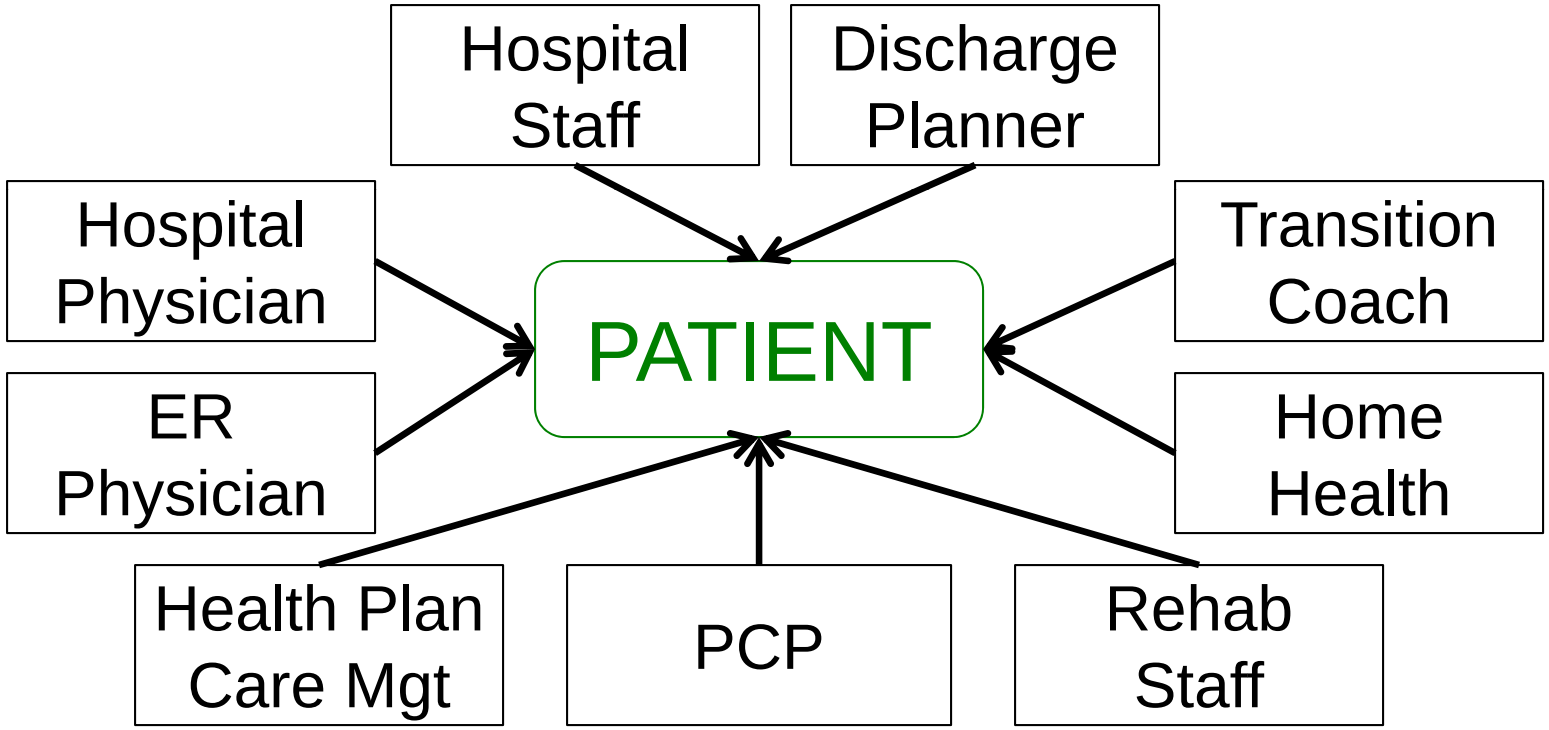


www.PaymentReform.org **www.PRHI.org**

Common Elements of Most Readmission Reduction Initiatives

- **Provider Coordination**
  - e.g., medication reconciliation, fax or EHR connection
- **Patient Education**
  - e.g., why/how to take medications, proper wound care
- **Self-Management Support**
  - e.g., coaching, smoking cessation, R_x financial assistance
- **Reactive Intervention**
  - e.g., support hotline, same-day appointment scheduling, on-site non-hospital care (e.g., in home or nursing home)
- **Proactive Intervention**
  - e.g., home visits, phone calls, remote monitoring

Will This Be Patient-Centered, Coordinated Care?



How Do We Coordinate Multiple Efforts?

- Option 1: Everybody Works for the Same Corporation

How Do We Coordinate Multiple Efforts?

- Option 1: Everybody Works for the Same Corporation
  - Yeah, right, like that ensures coordination…

How Do We Coordinate Multiple Efforts?

- Option 1: Everybody Works for the Same Corporation
- Option 2: Everybody Coordinates With Each Other

How Do We Coordinate Multiple Efforts?

- Option 1: Everybody Works for the Same Corporation
- Option 2: Everybody Coordinates With Each Other
  - Data analysis to identify where problems exist
  - Mechanisms to coordinate multiple programs
  - Information exchange about individual patients
  - Real-time feedback on performance

How Do We Coordinate All Of This?

- Option 1: Everybody Works for the Same Corporation
- Option 2: Everybody Coordinates With Each Other
  - Data analysis to identify where problems exist
    - A common database covering all patients and providers
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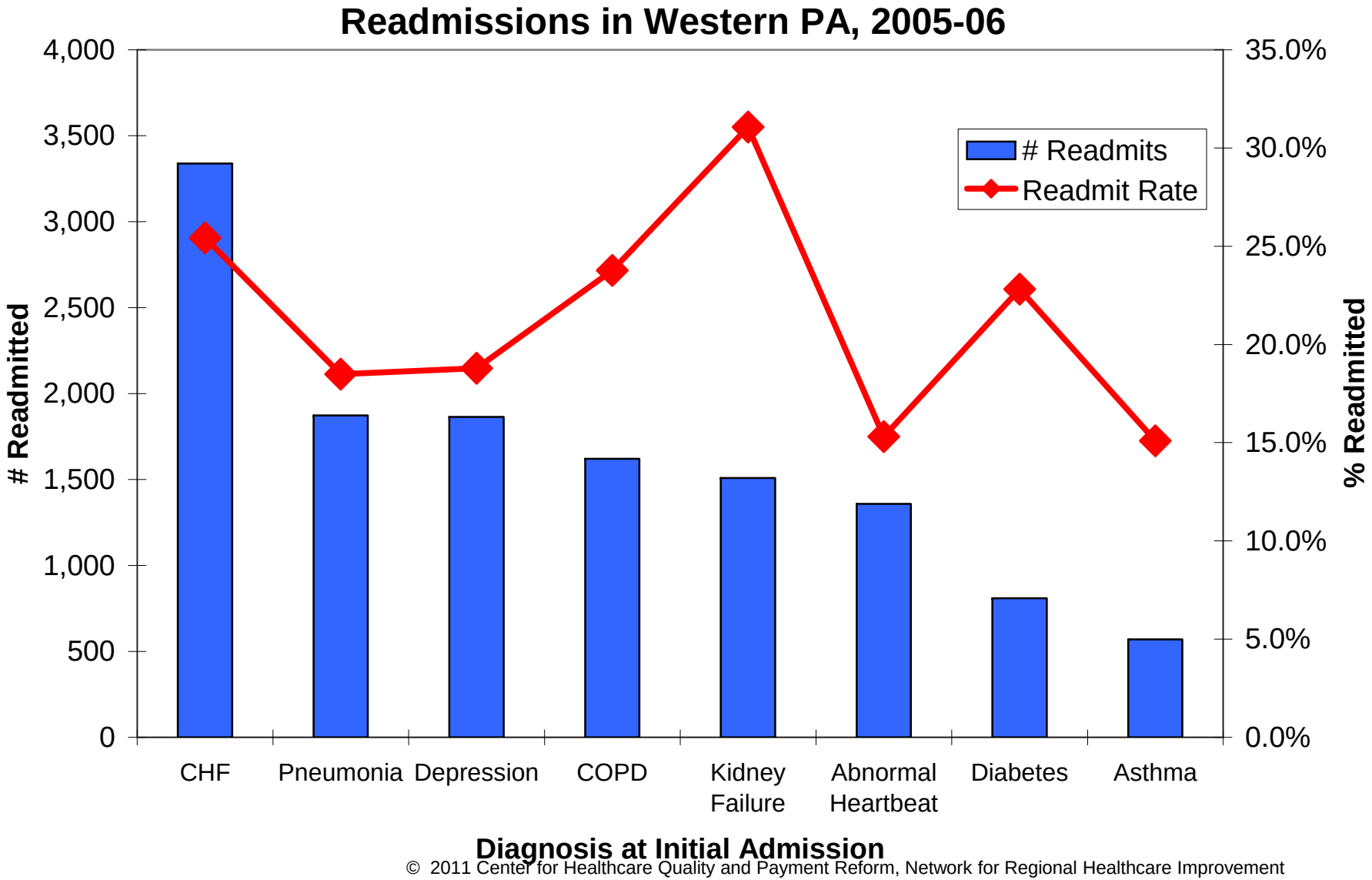
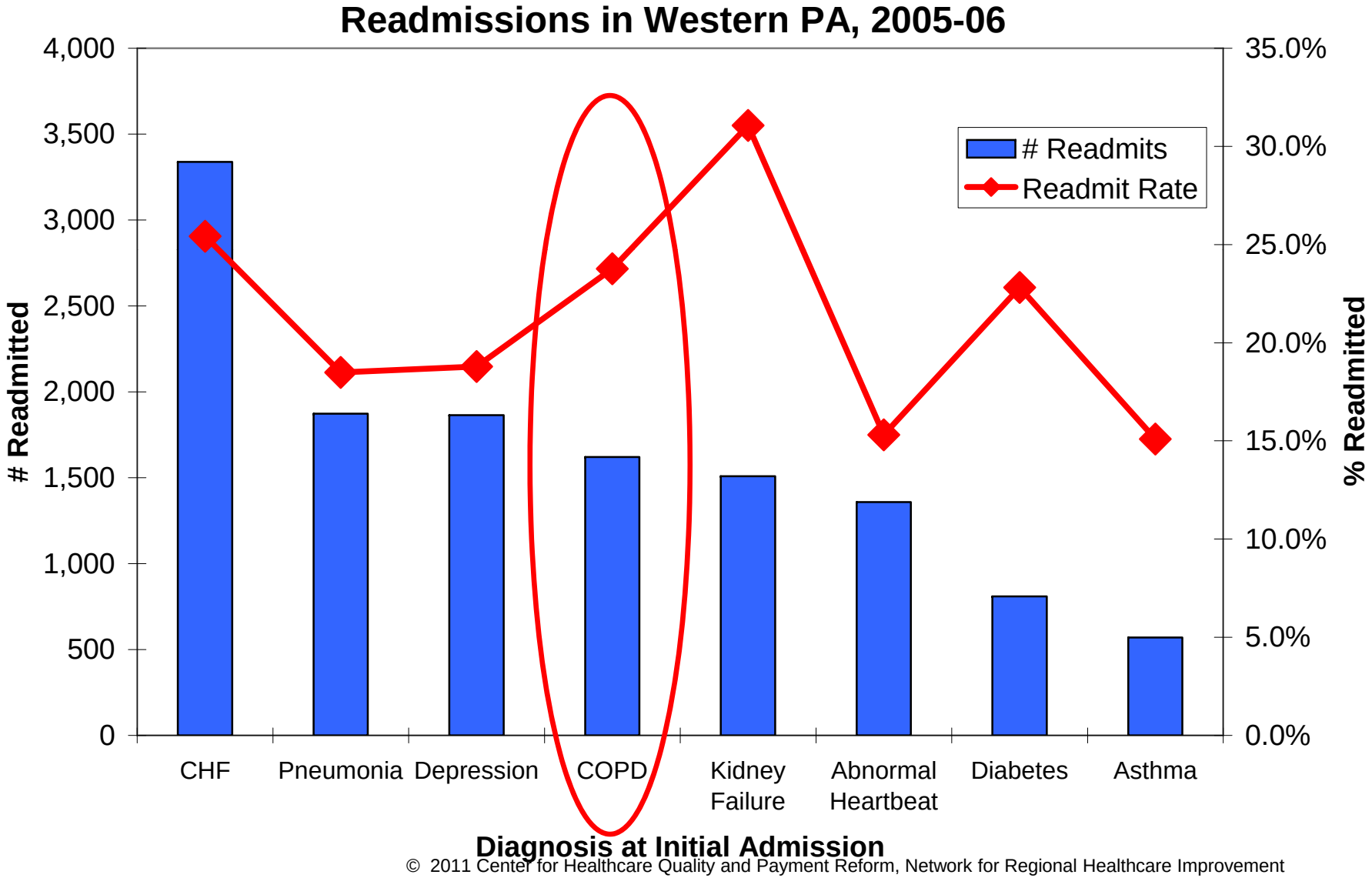
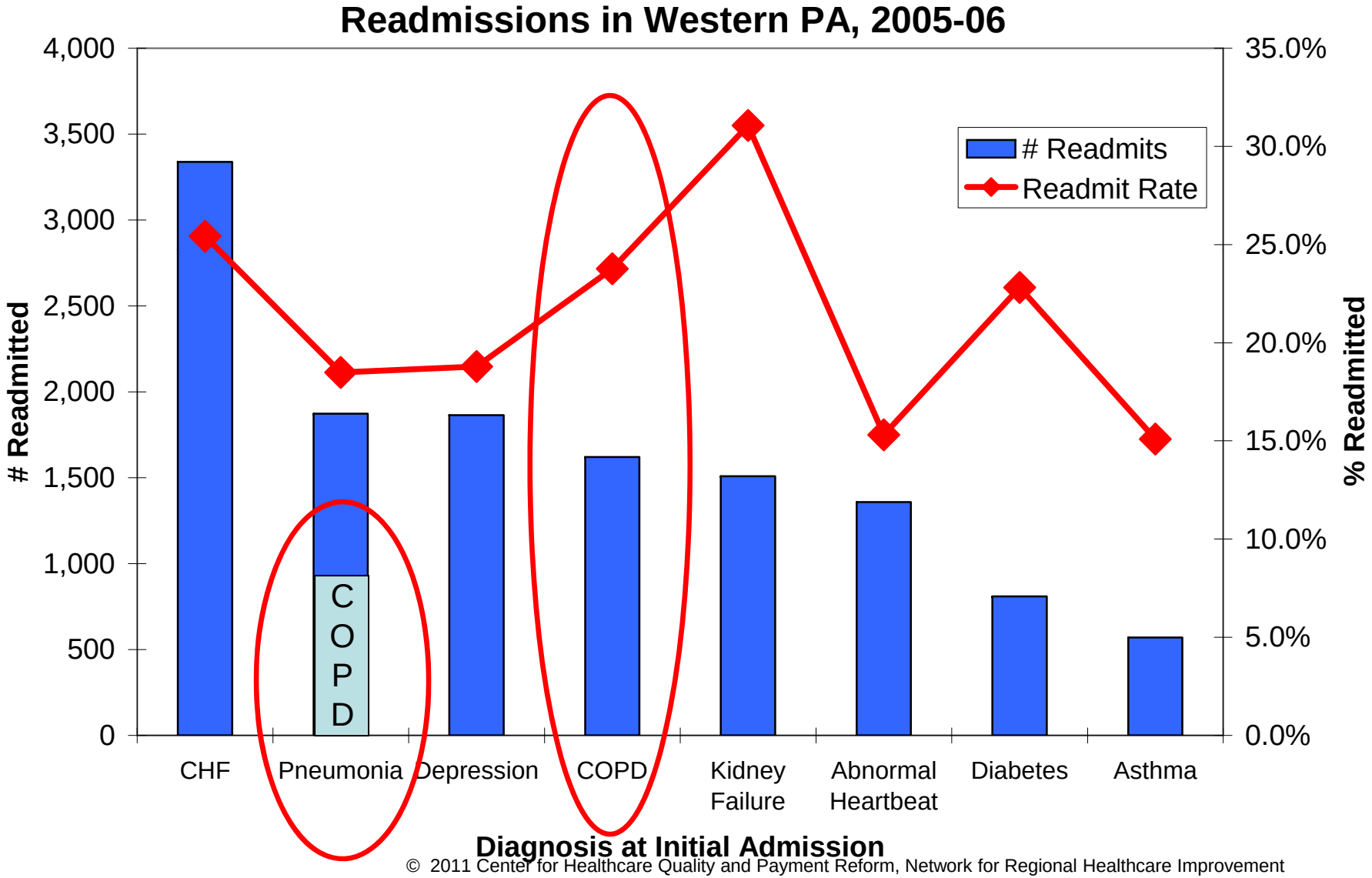
Chronic Diseases Are Largest Categories of Readmissions



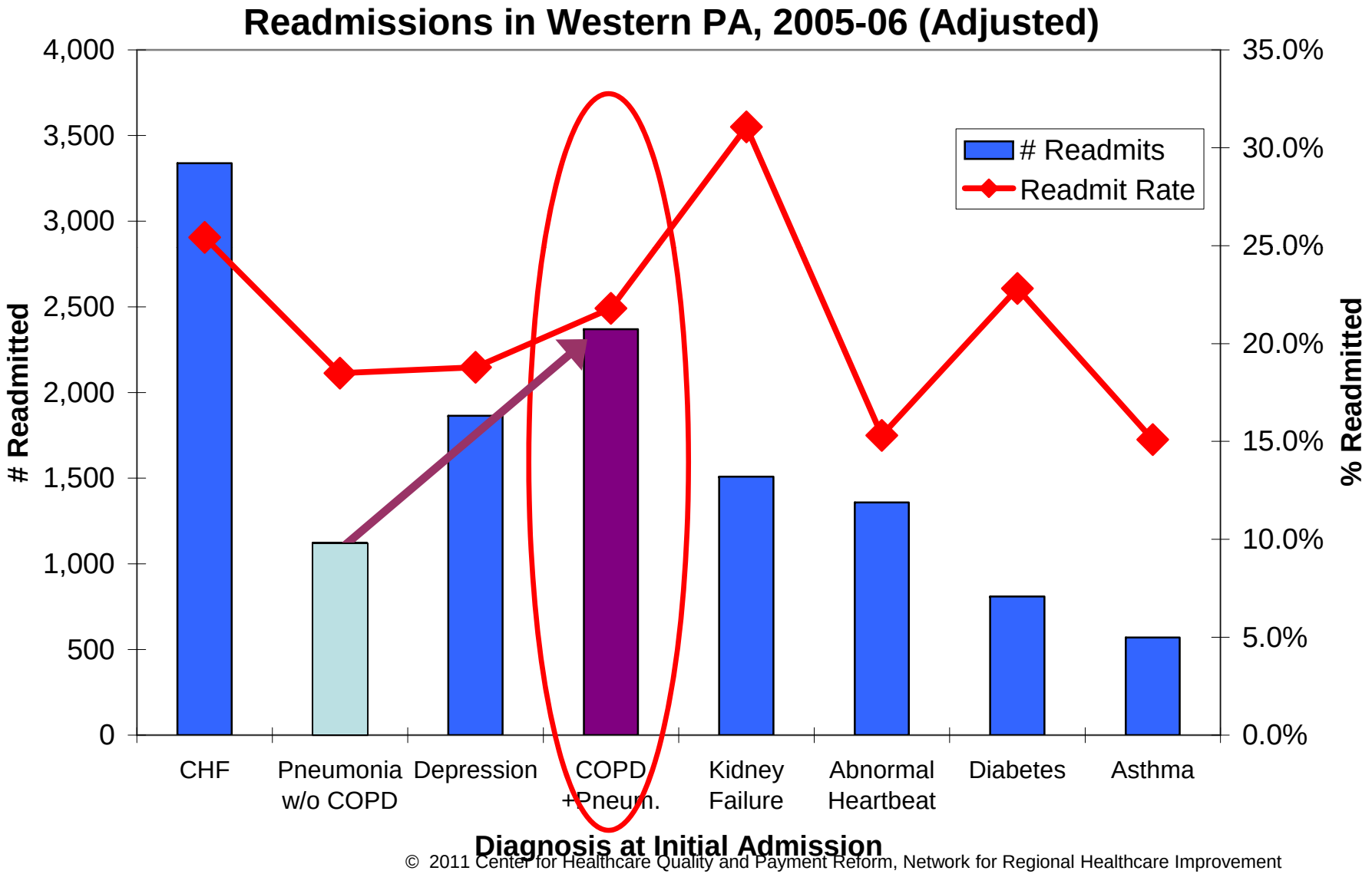
Initial Focus: COPD is 4th Highest Volume & 25% Readmission Rate



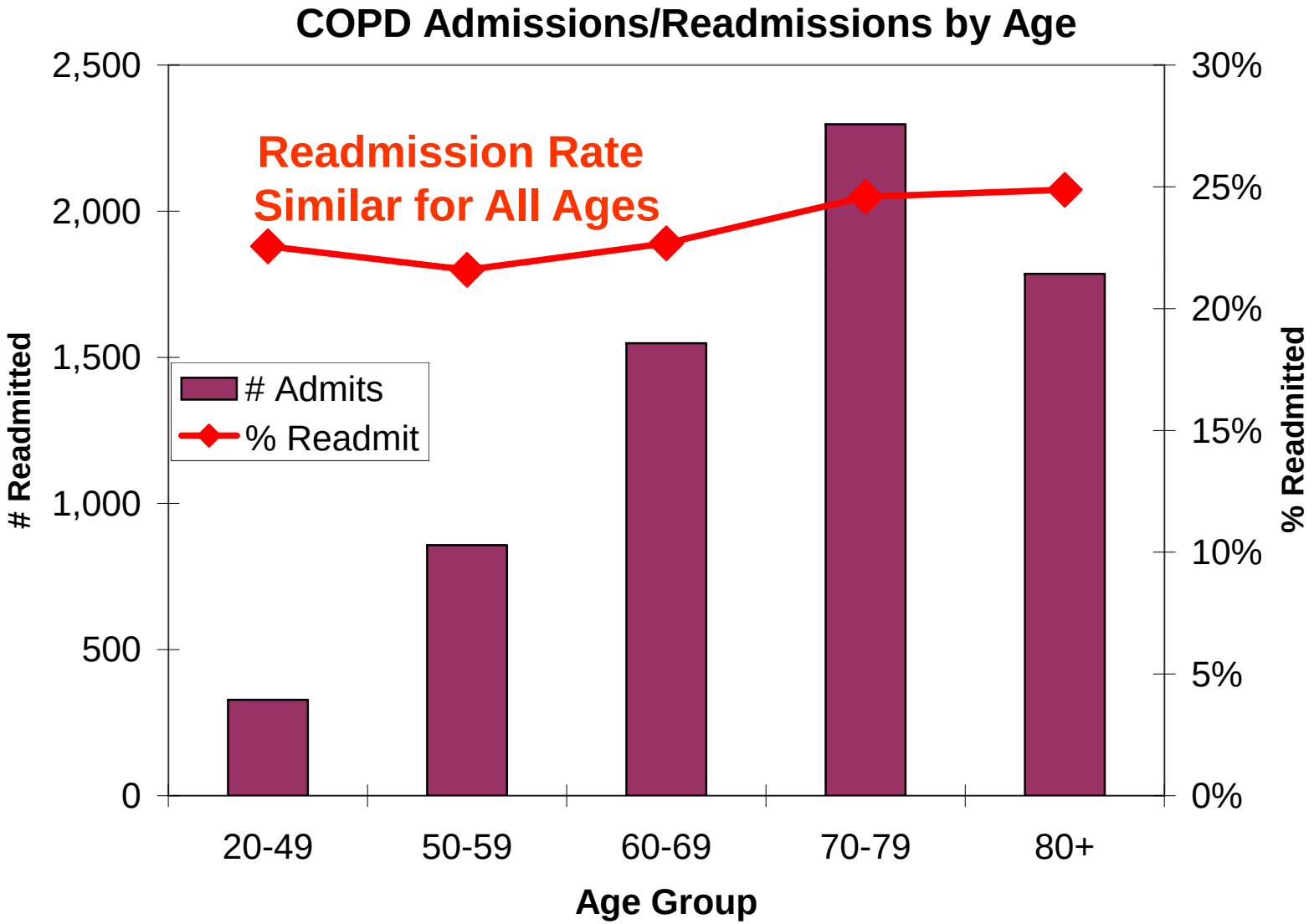
Analysis Showed 40% of Pneumonia Readmits Had COPD



So COPD Patients are 2nd Highest Volume of Readmits



COPD Readmissions Affected Commercial/Medicaid, Too



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  - Data analysis to identify where problems exist
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  - Mechanisms to coordinate multiple programs
    - A neutral convener, e.g., Q-Corp
  - Information exchange about individual patients
  - Real-time feedback on performance

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    - A neutral convener, e.g., Q-Corp
  - Information exchange about individual patients
    - Protocols to transfer information or an HIE
  - Real-time feedback on performance
    - “Real time” reports on readmissions and root cause analysis (claims data is too slow)

Examples of Techniques Used in Pittsburgh's Project

- **Outcome Measurement:**
  - Monthly hospital-generated reports on readmission rates
    - All-payer claims data indicated that for these hospitals, 80-90% of readmissions return to the same hospital
  - Tracking of individual patients in registry by Care Manager
- **Causal Analysis:**
  - Special questionnaire in hospital to all readmitted patients
  - Care manager recorded reasons for hospitalization and identified any weaknesses in community support
- **Chart Review:**
  - Assessment of whether all recommended elements of care were actually delivered

Are Readmission Reduction Projects Sustainable?

- We don't pay for things that we know will reduce readmissions
  - E.g., care transitions coaches to assist patients returning home after a hospitalization
  - E.g., having a nurse care manager visit chronic disease patients to provide education and self-management support
  - E.g., using telemonitoring to identify patient problems before admissions are necessary
  - E.g., having a physician answer a phone call with a patient who is confused about their treatment plan or experiencing a potential problem

Will Hospitals Provide Ongoing Financial Support?

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  - E.g., care transitions coaches to assist patients returning home after a hospitalization
  - E.g., having a nurse care manager visit chronic disease patients to provide education and self-management support
  - E.g., using telemonitoring to identify patient problems before admissions are necessary
  - E.g., having a physician answer a phone call with a patient who is confused about their treatment plan or experiencing a potential problem
- Hospitals and doctors lose money if they reduce readmissions
  - Hospitals are paid based on the number of times they admit patients
  - Physicians are paid based on the number of times they see patients and they see patients more often when patients are in the hospital

Five Basic Approaches to Payment Reform

1. Don't pay providers (hospitals and/or docs) for readmissions
2. Pay a provider more to implement programs believed to reduce readmissions
3. Pay providers bonuses/penalties based on readmission rates
4. Pay for care with a limited warranty from the provider (i.e., provider does not charge for readmissions meeting specific criteria)
5. Make a comprehensive care (global) payment to a provider for all care a patient needs (regardless of how many hospitalizations or readmissions are needed)

A Blunt Approach: Don't Pay for Readmissions at All

1. Don't pay providers (hospitals and/or docs) for readmissions
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Refusing to Pay for Readmissions Has Undesirable Consequences

- The hospital and/or physicians could legitimately refuse to treat the patient needing readmission, if the payer won't pay for their services
- The patient may be readmitted to a hospital other than the one where the initial care was given, or the patient may be treated by physicians other than the ones which provided the care on the initial admission
- Hospitals/physicians may refuse to admit patients in the first place if they feel the patients are at high risk for readmission after discharge
- Not all readmissions may be preventable

A More Positive Approach: Paying for What Works

1. Don't pay providers (hospitals and/or docs) for readmissions
2. Pay a provider more to implement programs believed to reduce readmissions
3. Pay providers bonuses/penalties based on readmission rates
4. Pay for care with a limited warranty from the provider (i.e., provider does not charge for readmissions meeting specific criteria)
5. Make a comprehensive care (global) payment to a provider or group of providers for all care a patient needs (regardless of how many hospitalizations or readmissions are needed)

Two Dilemmas

- **Dilemma #1: Who to Pay?**
  - Hospitals, PCPs, Nursing Homes, Home Health Agencies, Area Agencies on Aging, etc., could all implement programs that could reduce readmissions
  - Funding them all will reduce the return on investment
- **Dilemma #2: No Guarantee of Results**
  - Although it's been demonstrated that many different types of programs have been able to reduce readmissions, none of them are *guaranteed* to work, and those who want to replicate them aren't guaranteeing results
  - So how does the payer (Medicare, Medicaid, or a commercial health plan) know that providing additional funding for a program will reduce readmissions by more than the cost of the program, or even reduce readmissions at all?
  - Result: payers are reluctant to fund such programs on a broad scale

Creating Incentives for Performance

1. Don't pay providers (hospitals and/or docs) for readmissions
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P4P Programs Don’t Offset the Underlying FFS Incentives

P4P Programs Don't Offset the Underlying FFS Incentives

- **Example:** A pay-for-performance (P4P) program that reduces a hospital's payment rate by 5% if its readmission rate is higher than average
- **Scenario:** Hospital has 25% readmission rate for a particular condition; the average for all hospitals is 18%

Initial Admits	Readmit Rate	Total Admits	Payment Per Admit	Revenues
500	25%	625	$5,000	$3,125,000

P4P Hurts the Hospital If It Doesn't Reduce Readmissions

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Initial Admits	Readmit Rate	Total Admits	Payment Per Admit	Revenues	Change
500	25%	625	$5,000	$3,125,000	
500	25%	625	$4,750 (-5%)	$2,968,750	($156,250)

But the Hospital May Be Hurt More If It Does Reduce Readmits

- **Example:** A pay-for-performance (P4P) program that reduces a hospital's payment rate by 5% if its readmission rate is higher than average
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500	25%	625	$4,750 (-5%)	$2,968,750	($156,250)
500	**18%**	590	$5,000	$2,950,000	($175,000)

The P4P penalty actually costs the hospital less than reducing readmissions, particularly if additional costs must be incurred for readmission reduction programs

The Problems With P4P Bonuses/Penalties Alone

- The P4P penalty has to be very large to overcome the very large underlying disincentive in the DRG/FFS payment system against reducing readmissions
- The P4P penalty has to be even larger if reducing readmissions means the hospital will need to incur extra costs for readmission reduction programs *in addition* to reducing its revenues
- The larger the P4P penalty, the closer it comes to looking like non-payment for readmissions, i.e., the hospital or physician may be deterred from admitting the patient in the first place if the patient is viewed as a high risk for readmission after discharge
- There is no incentive to do *better* than the performance standard which is set in the P4P program

Medicare's Complex Workaround

- Hospital Readmissions Reduction Program (§3025 of PPACA)
  - All DRG payments reduced up to 1% in 2013, 2% in 2014, 3% in 2015+
  - Actual reduction based on number of "excess" risk-adjusted readmissions for heart attack, heart failure, and pneumonia
  - Additional conditions to be added in 2015

It Will Provide Stronger Incentives Than Some P4P Programs…

- Hospital Readmissions Reduction Program (§3025 of PPACA)
  - All DRG payments reduced up to 1% in 2013, 2% in 2014, 3% in 2015+
  - Actual reduction based on number of "excess" risk-adjusted readmissions for heart attack, heart failure, and pneumonia
  - Additional conditions to be added in 2015
- Why this *theoretically* works "better" than other P4P programs:
  - Magnifies the penalty for high readmission rates for targeted conditions
  - Continues to pay (almost) the same for readmissions when they occur

…But That Doesn't Mean It's a Good Idea

- Hospital Readmissions Reduction Program (§3025 of PPACA)
  - All DRG payments reduced up to 1% in 2013, 2% in 2014, 3% in 2015+
  - Actual reduction based on number of "excess" risk-adjusted readmissions for heart attack, heart failure, and pneumonia
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- Why this *theoretically* works "better" than other P4P programs:
  - Magnifies the penalty for high readmission rates for targeted conditions
  - Continues to pay (almost) the same for readmissions when they occur
- Why it's not good policy in *reality*:
  - Reduces the hospital's payment for *all* admissions to the hospital, regardless of whether there is any problem with other admissions
  - Creates the largest penalties for hospitals that have relatively few patients with the target conditions (since the penalty is a percentage of revenues for *all* patients, not just the patients with those conditions)
  - Creates no incentive to reduce readmissions for any other conditions or to reduce rates below average
  - Only affects the hospital, not physicians & not community programs

A Better Idea: Paying for Care With a Warranty

1. Don't pay providers (hospitals and/or docs) for readmissions
2. Pay a provider more to implement programs believed to reduce readmissions
3. Pay hospitals bonuses/penalties based on readmission rates
4. Pay for care with a limited warranty from the provider (i.e., provider does not charge for readmissions meeting specific criteria)
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Yes, a Health Care Provider Can Offer a *Warranty*

Geisinger Health System ProvenCare℠

- A single payment for an ENTIRE 90 day period including:
  - ALL related pre-admission care
  - ALL inpatient physician and hospital services
  - ALL related post-acute care
  - ALL care for any related complications or readmissions
- Types of conditions/treatments currently offered:
  - Cardiac Bypass Surgery
  - Cardiac Stents
  - Cataract Surgery
  - Total Hip Replacement
  - Bariatric Surgery
  - Perinatal Care
  - Low Back Pain
  - Treatment of Chronic Kidney Disease

Readmission Reduction: 44%

ProvenCare® CABG Quality Clinical Outcomes - (18. mos)

	Before ProvenCare (n=132)	*With ProvenCare* (n=181)	% Improvement/ (Reduction)
In hospital mortality	1.5 %	0 %	
Patients with any complication (STS)	38 %	30 %	**21 %**
Patients with >1 complication	7.6 %	5.5 %	**28 %**
Atrial fibrillation	23 %	19 %	**17 %**
Neurologic complication	1.5 %	0.6 %	**60 %**
Any pulmonary complication	7 %	4 %	**43 %**
Blood products used	23 %	18 %	**22 %**
Re-operation for bleeding	3.8 %	1.7 %	**55 %**
Deep sternal wound infection	0.8 %	0.6 %	**25 %**
Readmission within 30 days	6.9 %	3.8 %	**44 %**

Readmission within 30 days	6.9 %	3.8 %	**44 %**

What a Single Physician and Hospital Can Do

- In 1987, an orthopedic surgeon in Lansing, MI and the local hospital, Ingham Medical Center, offered:
  - a fixed total price for surgical services for shoulder and knee problems
  - a warranty for any subsequent services needed for a two-year period, including repeat visits, imaging, rehospitalization and additional surgery
- Results:
  - Surgeon received over 80% more in payment than otherwise
  - Hospital received 13% more than otherwise, despite fewer rehospitalizations
  - Health insurer paid 40% less than otherwise
- Method:
  - Reducing unnecessary auxiliary services such as radiography and physical therapy
  - Reducing the length of stay in the hospital
  - Reducing complications and readmissions

A Warranty is Not an Outcome Guarantee

- Offering a warranty on care does not imply that you are guaranteeing a cure or a good outcome
- It merely means that you are agreeing to correct avoidable problems at no (additional) charge
- Most warranties are “limited warranties,” in the sense that they agree to pay to correct some problems, but not all

Example: $5,000 Procedure, 20% Readmission Rate

Cost of Success	Added Cost of Readmit	Rate of Readmits
$5,000	$5,000	20%

Average Payment for Procedure is Higher than the Official "Price"

Cost of Success	Added Cost of Readmit	Rate of Readmits	Average Total Cost
$5,000	$5,000	20%	$6,000

Starting Point for Warranty Price: Actual Current Average Payment

Cost of Success	Added Cost of Readmit	Rate of Readmits	Average Total Cost	Price Charged	Net Margin
$5,000	$5,000	20%	$6,000	**$6,000**	$ 0

Limited Warranty Gives Financial Incentive to Improve Quality

Cost of Success	Added Cost of Readmit	Rate of Readmits	Average Total Cost	Price Charged	Net Margin
$5,000	$5,000	20%	$6,000	$6,000	$ 0
$5,000	$5,000	**15%**	**$5,750**	$6,000	$250

Reducing Adverse Events…

...Reduces Costs...

…Improves The Bottom Line

Higher-Quality Provider Can Charge Less, Attract Patients

Cost of Success	Added Cost of Readmit	Rate of Readmits	Average Total Cost	Price Charged	Net Margin
$5,000	$5,000	20%	$6,000	$6,000	$ 0
$5,000	$5,000	15%	$5,750	$6,000	$250
$5,000	$5,000	15%	$5,750	$5,900	$ 150

Enables Lower Prices

Still With Better Margin

A Virtuous Cycle of Quality Improvement & Cost Reduction

Cost of Success	Added Cost of Readmit	Rate of Readmits	Average Total Cost	Price Charged	Net Margin
$5,000	$5,000	20%	$6,000	$6,000	$ 0
$5,000	$5,000	15%	$5,750	$6,000	$250
$5,000	$5,000	15%	$5,750	$5,900	$150
$5,000	$5,000	10%	$5,500	$5,900	$400

Reducing Adverse Events…

...Reduces Costs...

…Improves The Bottom Line

Win-Win-Win Through Appropriate Payment & Pricing

Cost of Success	Added Cost of Readmit	Rate of Readmits	Average Total Cost	Price Charged	Net Margin
$5,000	$5,000	20%	$6,000	$6,000	$ 0
$5,000	$5,000	15%	$5,750	$6,000	$250
$5,000	$5,000	15%	$5,750	$5,900	$150
$5,000	$5,000	10%	$5,500	$5,900	$400
$5,000	$5,000	10%	$5,500	$5,700	$200
$5,000	$5,000	5%	$5,250	$5,700	$450

Quality is Better...

...Cost is Lower...

...Providers More Profitable

In Contrast, Non-Payment Alone Creates Financial Losses

Cost of Success	Added Cost of Readmit	Rate of Readmits	Average Total Cost	Payment	Net Margin
$5,000	$5,000	20%	$6,000	$6,000	$ 0
$5,000	$5,000	20%	$6,000	$5,000	-$1,000
$5,000	$5,000	10%	$5,500	$5,000	-$ 500
$5,000	$5,000	0%	$5,000	$5,000	$0

Non-Payment for Readmits

Causes Losses While Improving

Warranty Pricing Should Capture Costs of New Programs

Warranty Pricing Should Capture Costs of New Programs

Cost of Success	Added Cost of Readmit	Rate of Readmits	Average Total Cost	Warranty Price	Net Margin
$5,000	$5,000	20%	$6,000	$6,000	$0

Provider Offering Warranty Must Focus on Cost & Performance

Cost of Success	Added Cost of Readmit	Rate of Readmits	Average Total Cost	Warranty Price	Net Margin
$5,000	$5,000	20%	$6,000	$6,000	$0
$5,200	$5,200	16%	$6,032	$6,000	-$32

Higher Cost to Reduce Readmits

Even If Somewhat Successful

Means Losses

Option 1: Improve Performance Enough to Justify Higher Costs

Cost of Success	Added Cost of Readmit	Rate of Readmits	Average Total Cost	Warranty Price	Net Margin
$5,000	$5,000	20%	$6,000	$6,000	$0
$5,200	$5,200	16%	$6,032	$6,000	-$32
$5,200	$5,200	10%	$5,720	$6,000	+$280

Better Results

Means Better Margins

Option 2: Reduce Costs of Interventions

Cost of Success	Added Cost of Readmit	Rate of Readmits	Average Total Cost	Warranty Price	Net Margin
$5,000	$5,000	20%	$6,000	$6,000	$0
$5,200	$5,200	16%	$6,032	$6,000	-$32
$5,200	$5,200	10%	$5,720	$6,000	+$280
$5,050	$5,050	16%	$5,858	$6,000	+$ 142

Lower Program Costs

Means Better Margins

Then Offer the Payer Some Savings

Cost of Success	Added Cost of Readmit	Rate of Readmits	Average Total Cost	Warranty Price	Net Margin
$5,000	$5,000	20%	$6,000	$6,000	$0
$5,200	$5,200	16%	$6,032	$6,000	-$32
$5,200	$5,200	10%	$5,720	$5,900	+$180
$5,050	$5,050	16%	$5,858	$5,900	+$ 42

Lower Price to Payer

Warranty Enables the Right Balance of Cost & Performance

- Providers have an incentive to reduce readmissions as much as possible
- Providers have an incentive to find the lowest cost way to do that

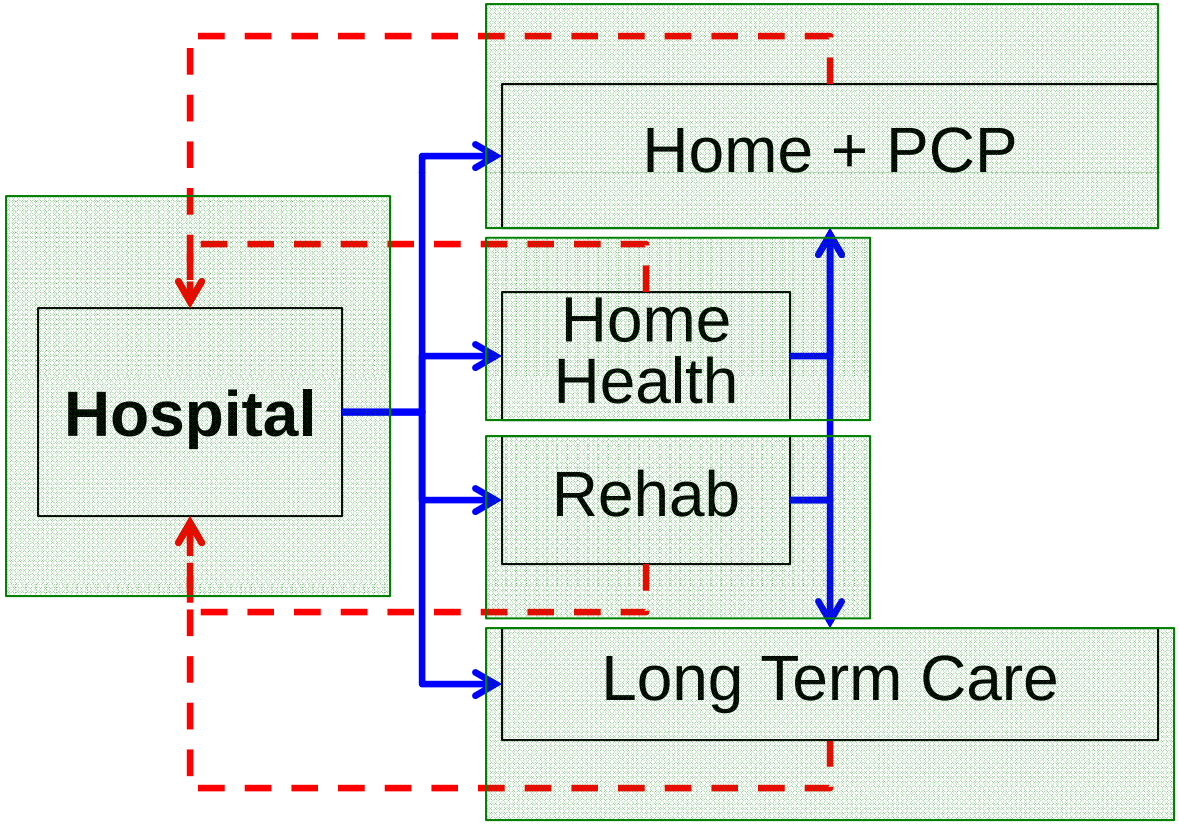
To Make It Work: Shared, Trusted Data for Pricing

- **Hospital/Health System** needs to know what its current readmission rates (or other complications) are and how many are preventable to know whether the warranty price will cover its costs of delivering care
- **Medicare/Health Plan** needs to know what its current readmission rates, preventable complication rates, etc. are to know whether the warranty price is a better deal than they have today
- **Both** sets of data have to match in order for both providers and payers to agree!

Who Gives the Warranty?

- The Hospital?
- The PCP?
- The LTC Facility?

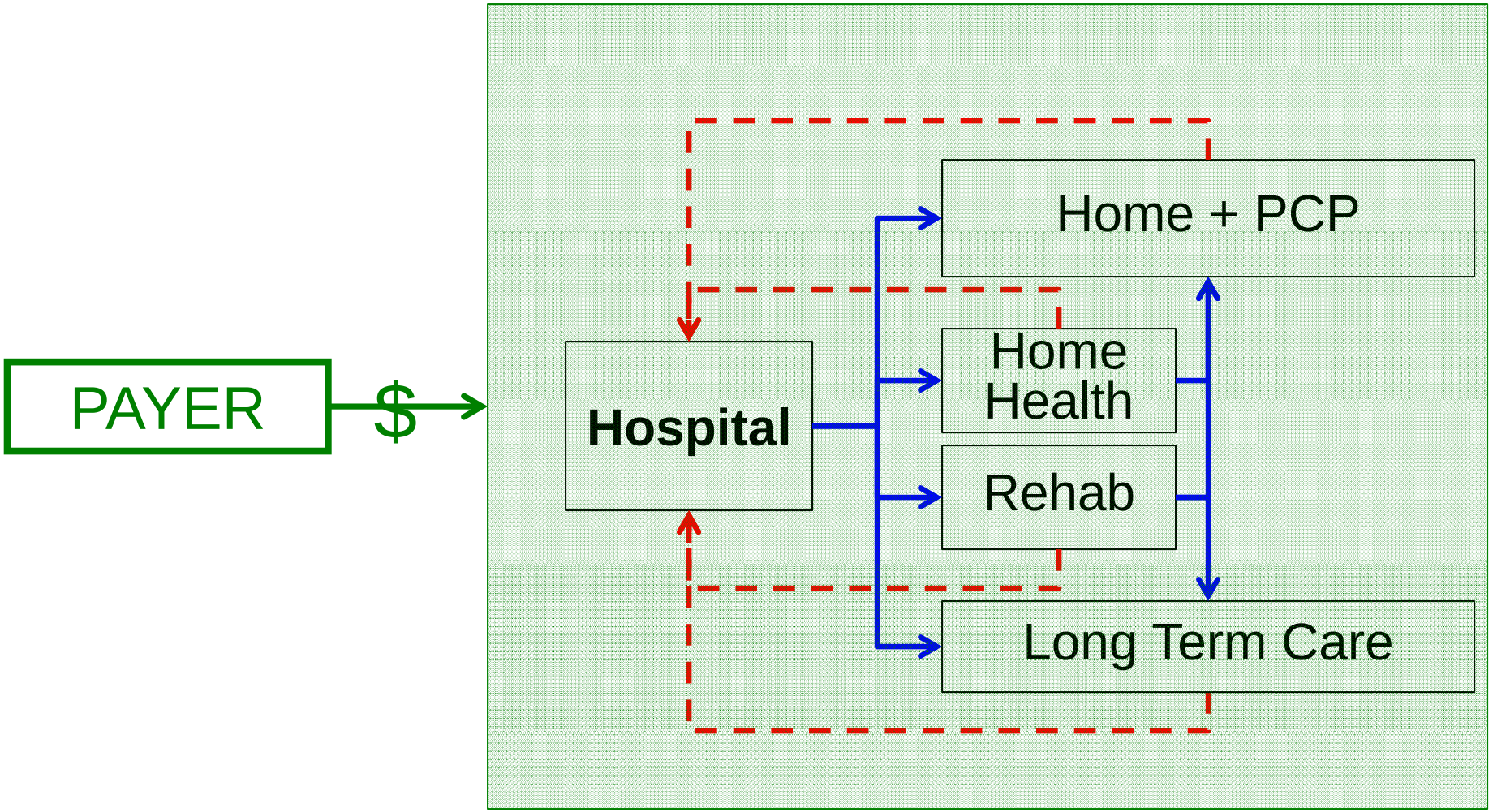
Which readmissions are they each taking accountability for?



Comprehensive Payment for Comprehensive Services

1. Don’t pay providers (hospitals and/or docs) for readmissions
2. Pay a provider more to implement programs believed to reduce readmissions
3. Pay providers bonuses/penalties based on readmission rates
4. Pay for care with a limited warranty from the provider (i.e., provider does not charge for readmissions meeting specific criteria)
5. Make a comprehensive care (global) payment to a provider or group of providers for all care a patient needs (regardless of how many hospitalizations or readmissions are needed)

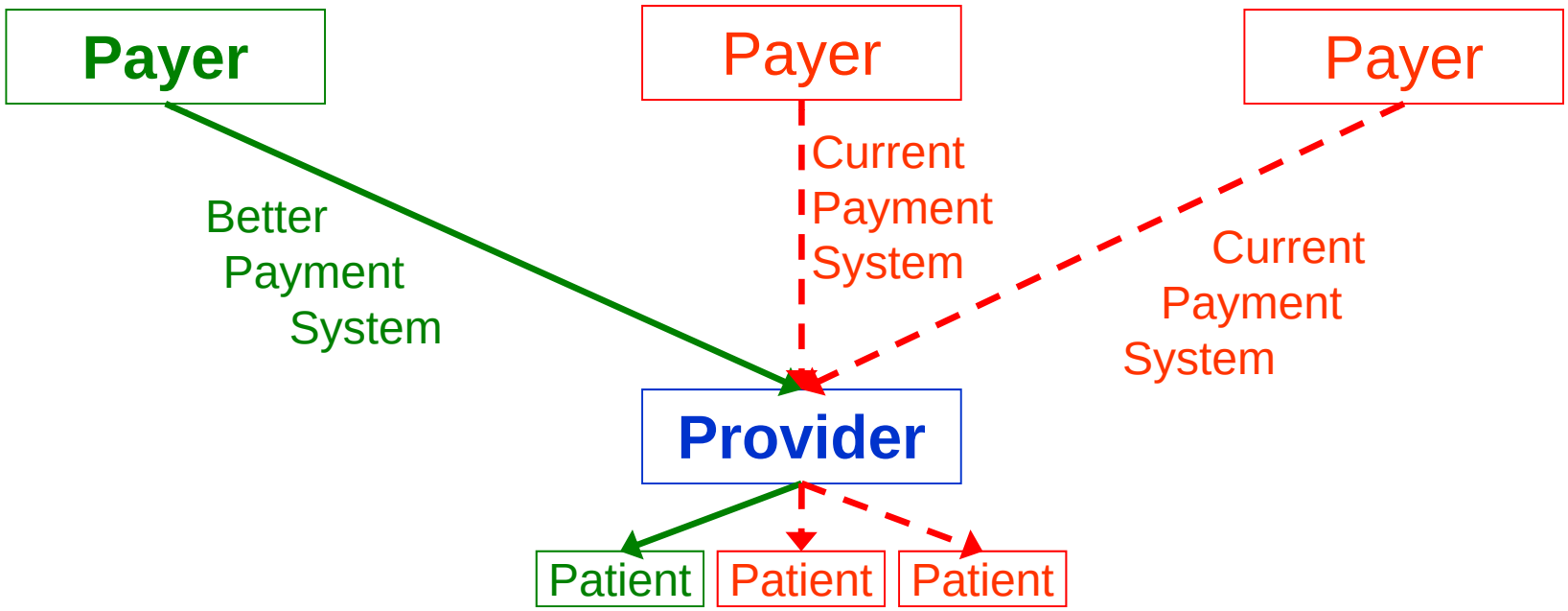
A Comprehensive or "Global" Payment



New "Bundling" Initiatives From CMS Innovation Center

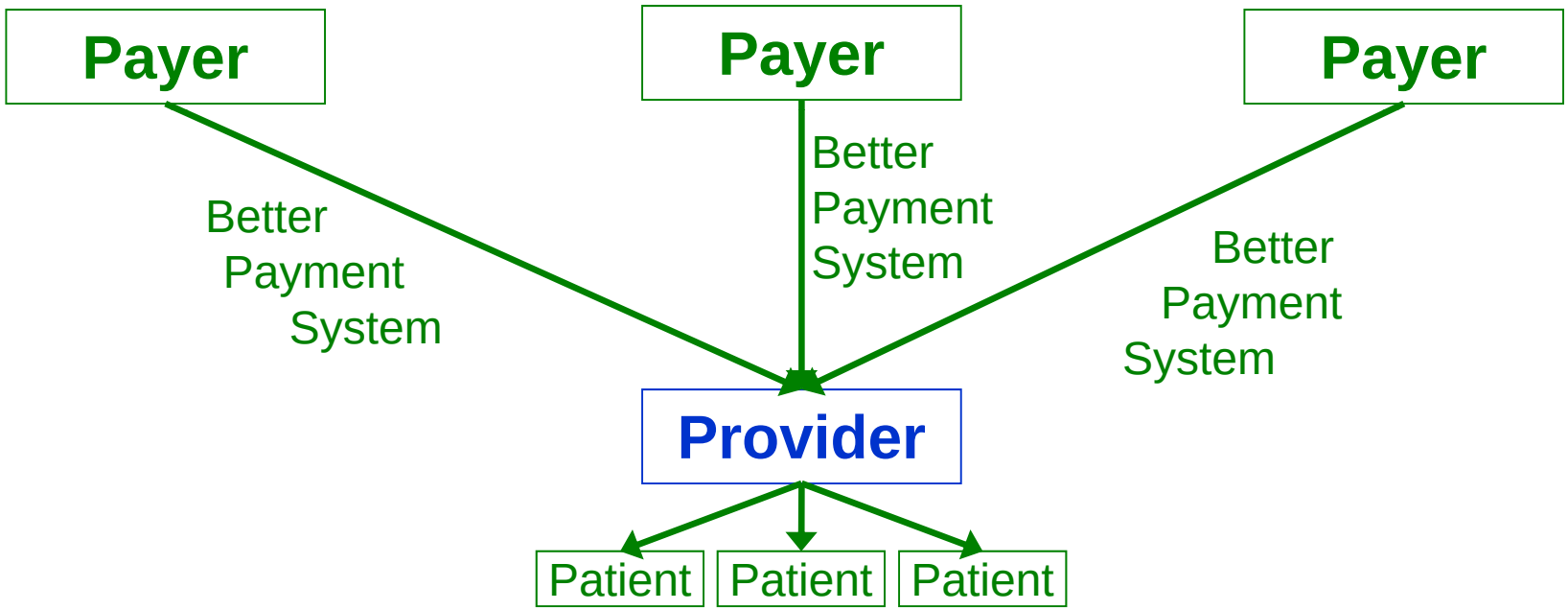
- **Model 1 (Inpatient Gainsharing)**
  - Hospitals can share savings with physicians
  - No actual change in the way Medicare payments are made
- **Model 2 (Virtual Episode Bundle + Warranty)**
  - Budget for Hospital+Physician+Post-Acute+Readmissions
  - Medicare pays bonus if actual cost < budget
  - Providers repay Medicare if actual cost > budget
- **Model 3 (Virtual Post-Acute Bundle + Warranty)**
  - Budget for Post-Acute Care+Physicians+Readmissions
  - Bonuses/penalties paid based on actual cost vs. budget
- **Model 4 (Inpatient Bundle, No Warranty)**
  - Single Hospital + Physician payment for inpatient care

One Payer Changing Isn't Enough



Provider is only compensated for changed practices for the subset of patients covered by participating payers

Payers Need to Align to Enable Providers to Transform



A Simple Starting Point: Coordinate Payment Reform Silos

SILO #1

Implementing Medical Home/ Chronic Care Model

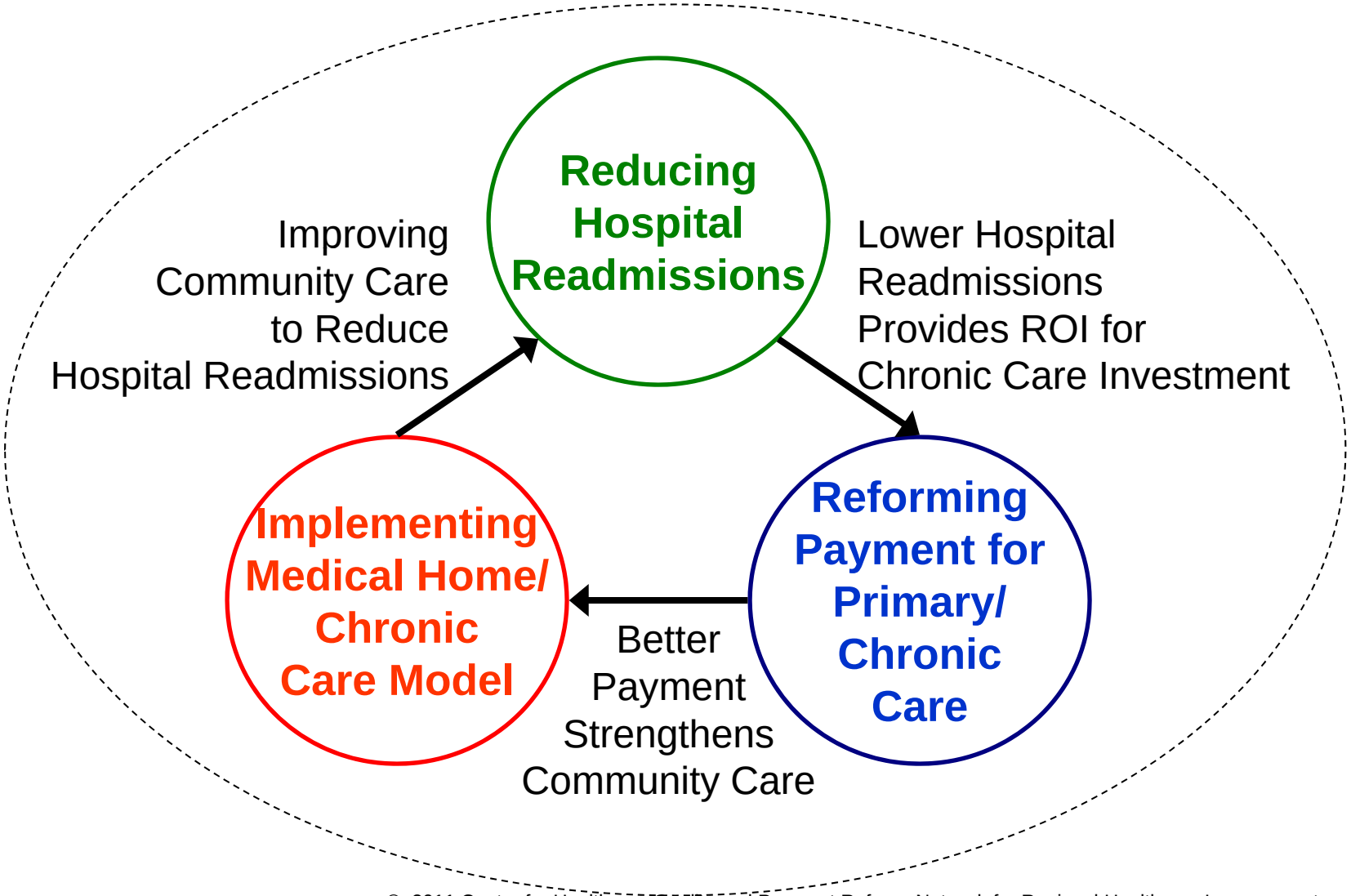
Pay More to Physicians For Being Certified As a Medical Home With No Focus on Readmissions

SILO #2

Reducing Hospital Readmissions

Penalize Hospitals for Readmissions Even If the Cause is Inadequate Primary Care

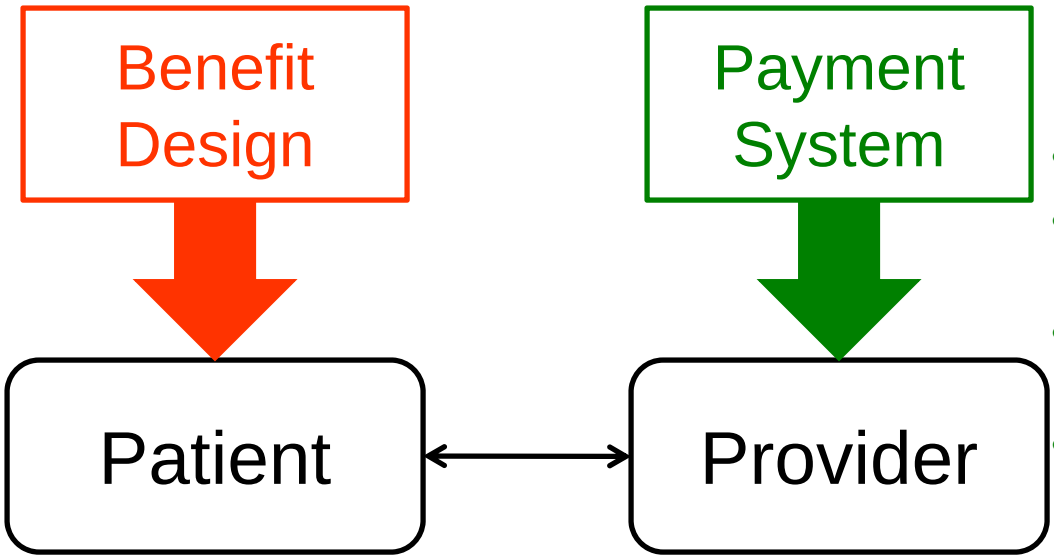
Marrying the Medical Home and Hospital Readmissions



Benefit Design Changes Are Also Critical to Success

Ability and Incentives to:

- Improve health
- Take prescribed medications
- Allow a provider to coordinate care
- Choose the highest-value providers and services



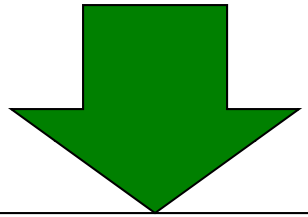
Ability and Incentives to:

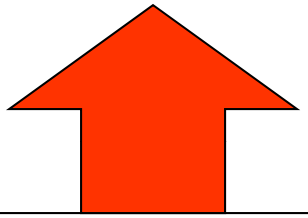
- Keep patients well
- Avoid unneeded services
- Deliver services efficiently
- Coordinate services with other providers

Example: Coordinating Pharmacy & Medical Benefits

High copays & deductibles to reduce pharmacy spending…

…Are likely contributing to high rates of readmission





Pharmacy Benefits

Drug Costs

- High copays for brand-names when no generic exists
- Doughnut holes & deductibles

Medical Benefits

Hospital Admissions

Hospital Readmissions

ER Visits

Principal treatment for most chronic diseases involves regular use of maintenance medication

A Comprehensive, Data-Driven Approach to Reducing Readmits

- **Analyze data to determine where your biggest opportunities for reducing readmissions exist**
  - Which conditions (e.g., CHF and COPD), which patients (age, geography, etc.), which settings (home, rehab, LTC)
- **Identify the (many) root causes of readmissions and redesign care in the settings where those root causes occur and/or can be most effectively addressed**
  - Transitional interventions should address the problems with transitions, not try to fix problems that should have been addressed earlier
  - Patients should not have to be hospitalized to get better ambulatory care; design/coordinate your efforts around a strong PCMH base
- **Create a business case to support sustainable funding**
  - Savings have to exceed costs – increase impact or reduce costs
  - Coordinate efforts to avoid duplication and gaps
- **Monitor performance and continuously adjust**
  - Just because it's "proven" in the literature doesn't mean it will automatically work well in your setting with your patients
  - Ask patients and family how well it's working, not yourselves!

For More Information:

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