



PITTSBURGH REGIONAL HEALTH INITIATIVE
Spreading Quality, Containing Costs.



***PRHI Readmission Reduction Guide:
A Manual for Preventing Hospitalizations***

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SECTION I: The PRHI Readmission Reduction Guide: Overview

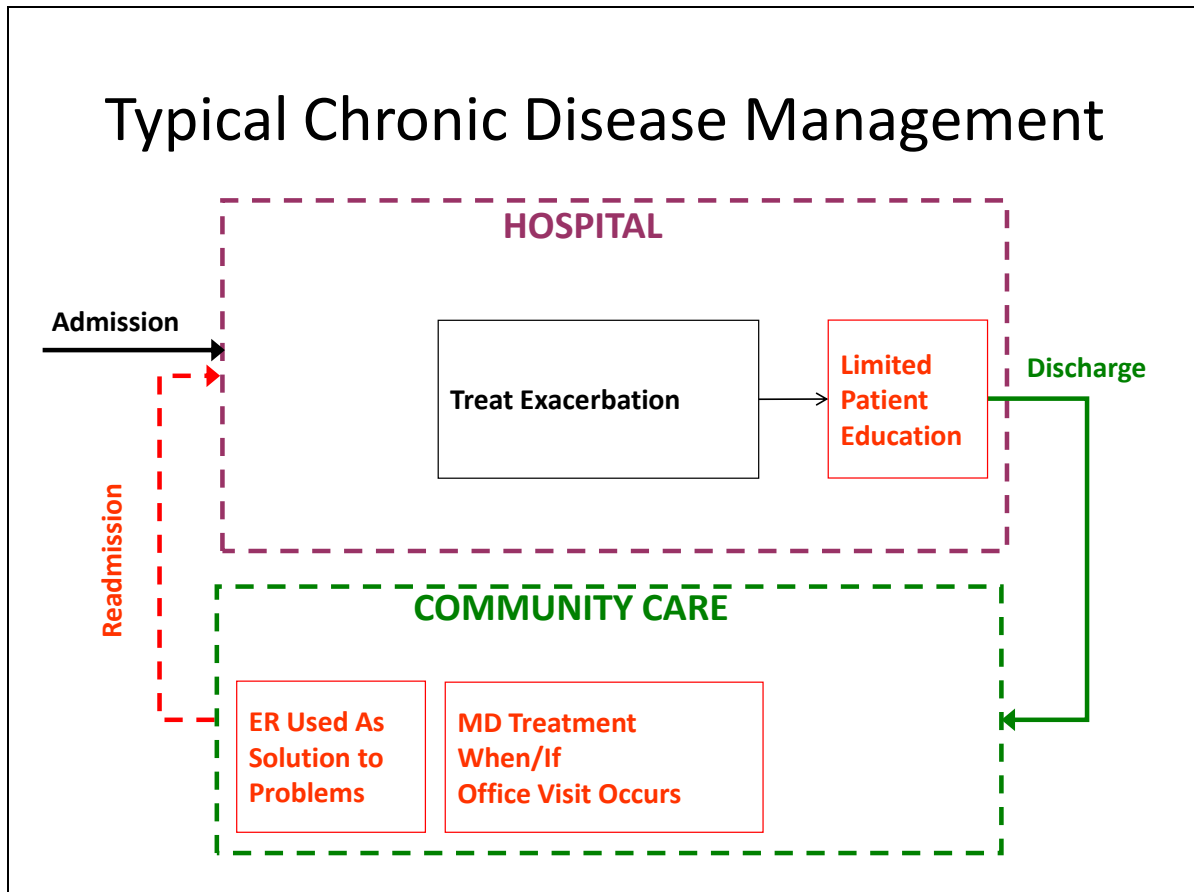
Background

Across the United States, hospital readmission within 30 days occurs in 20% of cases. Many of these readmissions may be preventable.¹ Although Medicare readmissions are higher, the problem is not limited to the Medicare population. PRHI analyses of hospital discharge data in Southwestern Pennsylvania (2007-2009) for prevalent chronic diseases found 30-day readmission rates for patients with commercial insurance that range from 17% for Chronic Obstructive Pulmonary Disease (COPD) and depression to 24% for heart failure. The estimated annual financial impact of 30-day readmissions for Medicare alone is \$17 billion. Not only are hospitalizations among the most expensive forms of health care, but inpatient stays increase the risk of acquiring healthcare-associated infections. Further, there is evidence that the hospitalization itself can contribute to a further deterioration in patient health status, particularly for older patients. The negative impact on patient quality of life and the huge burden on the healthcare system have made reducing hospital readmissions a central goal of healthcare delivery and payment reform efforts.

Abundant evidence indicates that improving the processes of care – particularly for patients with chronic diseases – can reduce avoidable hospitalizations. The typical management of a patient’s chronic disease, along with the ensuing cycle of admissions and readmissions, is sketched out below in Figure 1. This figure describes the process for individuals who are admitted to the hospital and treated for a serious exacerbation of a chronic condition. At the hospital, the patient’s condition is treated and medications adjusted with the primary goal of getting the patient well enough for discharge, rather than addressing the factors that caused the admission in the first place; the patient receives limited education during his/her hospital stay about self care after discharge that could prevent further exacerbations and hospitalizations; the patient is discharged with prescriptions for medications that may differ from the medications they were given during the hospital stay and which may not match the medications they used prior to the hospital admission; there is often no formal hand-off to his/her community care providers or coordination to determine whether or not compliance with the hospital’s recommended treatment regimen is even possible; finally, the patient may or may not visit their primary care physician for a post-discharge appointment, and there is typically no follow-up by the hospital itself. When subsequent exacerbations arise, the Emergency Room is the typical solution.

¹ For example, Jencks SF et al. estimate that half of Medicare hospitalizations are preventable (New England Journal of Medicine 2009;360:1418-1428).

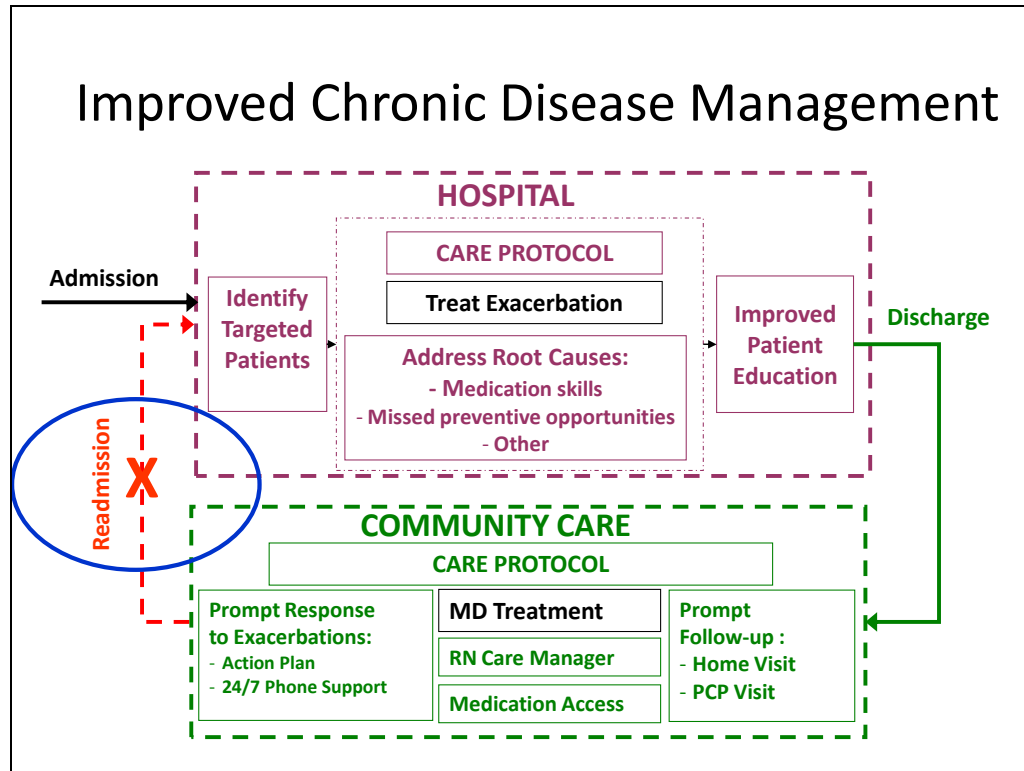
Figure 1



Most current readmission reduction initiatives focus on improving the transition of patients from hospital to community. While improving the transition is extremely important, it is insufficient given that the factors causing readmission may occur long after the initial post-discharge period. For example, PRHI analyses of readmission data show that for chronic disease patients, only 46% of readmissions occur within 30 days,² and 64% of the 30-day readmissions occur after the immediate 7-day post-discharge period. **The unique aspect of hospital readmissions is that their causes can potentially span multiple providers along the whole continuum of patient care.** A readmission may be due to something which does or does not occur in the hospital, or it may have little to do with factors the hospital can control, such as inadequate care in the community after discharge. With these issues in mind, an improved chronic disease management process is depicted below in Figure 2. Note that there are multiple opportunities to improve care along the entire continuum.

² Kanel, K., Elster, S. and Vrbin, C., PRHI Readmission Briefs, Brief I: Overview of Six Target Chronic Diseases, June 2010, <http://www.prhi.org/docs/PRHI%20Readmission%20Brief%20Overview%20REVISED%2006-08-10.pdf>.

Figure 2



In an effort to improve the processes of care that result in an avoidable readmission, the Pittsburgh Regional Health Initiative (PRHI)³ launched two pilot readmission reduction projects in 2007. With support from the Richard King Mellon Foundation, PRHI Strategic Initiatives Consultant Harold Miller recruited a community hospital and two large primary care physician practices willing to transform the way they delivered care in order to achieve significant reductions in readmissions for patients with Chronic Obstructive Pulmonary Disease (COPD). The first pilot focused on patients admitted to UPMC St. Margaret Hospital (a 250-bed community hospital that is part of the larger University of Pittsburgh Medical Center) along with Renaissance Family Practice (a practice of 26 physicians, the largest that admits patients to UPMC St. Margaret). The second focused on the patients of Premier Medical Associates – a suburban primary care practice of 50 physicians caring for more than 3,000 patients with COPD and the largest source of admissions to the Forbes Regional Hospital (a community hospital that is part of the West Penn Allegheny Health System). A methodical, 3-year process ensued that resulted in a 44% reduction in readmissions in the first year of the project, maintained consistently low rates of readmissions in two different sites, and also identified steps that could be taken by most hospitals and primary care practices in order to achieve significant readmission reductions for a broad range of chronic disease patients.

³ See Appendix A for more information about PRHI.

The *PRHI Readmission Reduction Guide (Guide)* describes the key steps needed to transform care and break the admission-readmission cycle. In addition, the *Guide* includes an overview of PRHI's Perfecting Patient CareSM (PPC) process improvement methodology.⁴ Throughout the *Guide*, individual steps in the improvement process are illustrated with chronic disease readmissions examples taken from PRHI's COPD pilot projects. This information is intended to be helpful not only to those looking for specific examples to illustrate the general steps, but also those interested in conducting a readmissions reduction project geared specifically to patients with COPD.

Role of Continuous Quality Improvement in Readmissions Reduction

Most changes that are necessary to reduce avoidable chronic disease readmissions result from improving the *processes* for delivering that care. As such, methodical process improvement approaches can be invaluable in guiding the needed changes. However, it is essential that process changes be driven explicitly by goals for improving outcomes, rather than simply implementing processes that have worked in other settings. The process improvement methodology that guided PRHI's readmission reduction project is called Perfecting Patient CareSM (PPC). Based on Lean and Toyota principles, PPC is a team-based problem-solving approach designed to address the challenges that healthcare organizations face in ensuring patient safety and satisfaction, and delivering efficient, high quality health outcomes.

PPC helps healthcare organizations to design work processes that reveal and correct problems rather than hide them. The method uses teamwork to build mechanisms that promptly tackle problems through root cause analysis and rapid-cycle experiments that yield sustainable incremental improvements in quality of care, reduction in waste and errors, and lower costs. PPC brings problem solving out of the conference room and on to the front lines under the premise that the true experts in how to *improve* work are the people *doing* the work. Improvements are implemented where the work is done, by those doing the work and at the time the problem occurs.

Five core principles form the foundation of PPC:

1. Care systems must be organized to meet patient needs: safely, efficiently and completely
2. Leadership must support continuous improvement
3. Targets for eliminating error, waste and obstacles to the best care must be ambitious.
4. Teamwork is necessary to achieve 100% compliance with proven clinical and safety practices
5. Rapid problem solving and work redesign experiments must be performed during daily work

Critical to realizing each of these principles are solid, reliable data that reveal to *all* members of an organization whether there *is* a problem, why the problem is occurring, and whether improvement efforts are making a difference.

Plan-Do-Check-Act

The *Guide* is organized around the Plan-Do-Check-Act (PDCA) cycle. Based on the scientific method, the PDCA cycle is a key component of the PPC methodology. While the improvement generated in an organization will be specific to the resources and characteristics of that organization, these tasks are

⁴ See Appendix B for more information about Perfecting Patient CareSM.

generic to all process improvement work and serve as the foundation from which to customize improvements to individual processes. Each step of the PDCA cycle is briefly described below.

PLAN → In the first step, objective data are collected to identify a readmission reduction opportunity. Institutional partners are then identified and a multi-disciplinary Readmission Reduction Team convened to deeply understand the problem and its *Root Causes*, through systematic *Observations* that paint a clear picture of the *Current Condition*. Baseline data are collected to measure whether subsequent improvements actually make a difference. During this phase, it is imperative to develop a *business case* that describes to all stakeholders (management, staff and patients) why they should care. Once the *Current Condition* is examined and understood, the Team articulates what the *Target (or ideal) Condition* would be and hypothesizes what will happen when *Countermeasures* (specific improvements) aimed at achieving that *Target Condition* are implemented.

DO → In the second step, the team takes their understanding of the problem and their vision of the Target Condition and creates an *Implementation Plan* for carrying out the Countermeasures they believe will achieve the Target Condition. Frontline staff then carries out the *Plan* and the results are captured.

CHECK → In the third step, the Readmission Reduction Team reviews and analyzes the outcomes of the experiment. Data collected throughout the experiment are compared to the baseline data and to determine if the desired results were achieved. Once the analysis of the data is completed, a report of the outcomes is shared with all stakeholders.

ACT → In the fourth step, **if the goal was achieved**, the team begins the next PDCA cycle by standardizing and cascading the improvement throughout the organization, putting in place systems to sustain the change(s) that include methods to track and assess the measures used during the experiment phase over the long-term. **If the goal was not achieved**, the team assesses the extent to which the *Countermeasures* were successful and, therefore, which to maintain and which to abandon or modify. A goal may not be achieved, yet a countermeasure still led to a partial improvement; this might warrant either adapting the *Countermeasure* or maintaining it and implementing additional change. The Readmission Reduction Team then moves to begin the next round of improvements, considering the new *Current Condition*, taking a fresh look at the *Root Cause* of the problem, and developing alternative ways of achieving the goal, including experiments with different types of *Countermeasures* that perhaps were thought of, but not implemented, in previous improvement cycles.

By continuously improving in rapid cycles, the organization moves toward its goal much more rapidly than through traditional research studies that implement a single change and wait years to evaluate the results. Ideally, the process is refined and experimentation is repeated until goals are achieved, and then the process is standardized and spread throughout the organization. No one should expect that significant goals can be achieved with just one or two rounds of improvement. Improvement will require *patience* to allow for the proper time to Plan, Study, Check and Act. Rushing through or neglecting any of these steps can severely impede and ultimately add time to achieving the goal of improving and sustaining positive change.



Patient education prior to discharge at
UPMC St. Margaret.

SECTION II: Improving Readmissions

Step One: PLAN

"PLANNING" TASKS
1. Develop a Plan for Accessing Needed Data.
2. Identify a High-Impact Readmission Reduction Opportunity.
3. Recruit Partners & Convene Interdisciplinary Readmissions Reduction Team.
4. Select an Initial Improvement Target.
5. Understand the Current Condition.
6. Articulate the Target Condition.

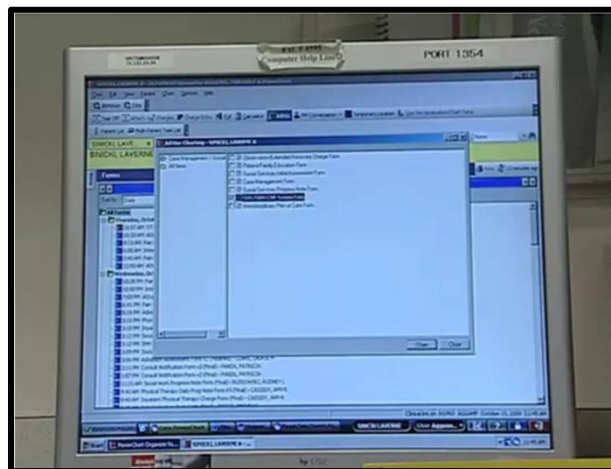
The goal of this first step is to identify and attempt to fully and completely understand a readmission problem. Because planning forms the foundation for truly understanding a problem, and therefore the appropriate improvements to undertake, this phase is the longest of the PDCA cycle.

Task 1: Develop a Plan for Accessing Needed Data

Before initiating any improvement activities, it is crucial to try to identify and organize the collection of data that will not only identify readmission reduction opportunities (e.g., patients for whom current readmission rates are very high), but will later determine whether an experimental improvement has succeeded. Typically, there are four different sources for the needed data, each with pros and cons in terms of informing a Readmission Reduction Initiative.

1. Multi-payer databases. Information about hospitalizations of patients insured by all payers (commercial and public) is advantageous for identifying readmission problems. Such data can reveal patterns of admissions and readmissions of patients with specific medical conditions and characteristics across all payer groups and often within specific hospitals. PRHI used hospital discharge data made available via the Pennsylvania Health Care Cost Containment Council to look at a cross section of admissions as well as the admission and readmission experiences of (de-identified) patients. While such data can be very useful for establishing readmission benchmarks, because they are typically available with 6-12 month time lags, they will not be helpful in providing the kind of real-time feedback necessary to determine whether an improvement experiment has succeeded. A further limitation for guiding improvement is that they contain no detailed clinical data.
2. Health plan data. Data provided by insurers can be useful, depending on the kinds of detailed clinical information needed to evaluate specific care processes. Data will typically include limited clinical data (e.g., lab results). Usefulness, however, depends on how many health plans cover the targeted geographic area, and whether all or most are willing to make data available.

3. Hospital data. If a Readmission Reduction Initiative is limited to a single hospital, patient admission and readmission data can be both timely and complete. However, it will miss readmissions to other hospitals, which may pose a problem when addressing some conditions (e.g., depression, myocardial infarction) for which patients are oftentimes readmitted to different hospitals. This is particularly an issue if there are multiple hospitals in the community, increasing the likelihood that a patient will end up in a different hospital for a readmission than for the initial admission, based on where s/he lives or the location of the nearest emergency room.
4. Primary Care Practice data. The value of this data source will depend on whether there are mechanisms for accessing and tracking patients' admissions and readmissions. For example, one of the PRHI Readmission Reduction Initiative partners (Premier Medical Associates) had access to the admissions census at its admitting hospital, enabling the practice to track daily admissions and discharges of its patients. It is worth noting, however, that this method can be labor intensive for the PCP, requiring daily review of the admissions census.



PRHI Readmission Reduction Initiative: LESSONS LEARNED:

Use Data to Improve Quality!

Having access to timely and relevant data is absolutely critical to success. Focusing on data-driven outcomes is more motivating for healthcare professionals than simply focusing on processes. For this reason, work to identify methods to capture data on admissions and readmissions of targeted patients in order to document clearly the impact on reduced hospitalization. Whenever possible, try to satisfy data requirements without collecting new data.

Key Data Needs: Data needs may vary depending on the targeted chronic condition, but the following data are typically required:

- Number of admissions
- 30-day readmission rates
- Reason(s) for readmission(s) (data source may be patient surveys)
- Costs of admissions and readmissions (to help determine cost effectiveness of the Readmission Reduction strategies)

Designing a Data Collection Strategy: Aim to create a process that makes data collection and reporting as easy and as timely as possible. Asking the following questions may provide some guidance:

1. Can data be accessed directly from the data provider?
If the information is available electronically, work with an Information Technologist/Data Specialist to arrange for reports to be compiled and delivered.
2. Is there anything else that might be important to track down the road?
Be sure to get a broad view of the situation from the start so that no backtracking is necessary.
3. How frequently will data be assembled?
Set up a clear reporting schedule that reasonably suits the needs of those collecting the data and those to whom the data is reported.
4. How can the Readmission Reduction Team receive data in real time?
Work to ensure data is reported in a timely fashion, reflecting the most recent trends.
5. In what format and how frequently should the data be reported?
Consider the final reporting format that will be used, and work to align the final needs with the format for ongoing reporting.
6. Who is responsible?
Be sure that expectations are clear regarding who will be pulling reports, working with data, sharing results, etc.

Task 2. Identify a High-Impact Readmission Reduction Opportunity

The key first step in undertaking a readmission reduction initiative is to identify the patient group and/or disease on which to focus improvement efforts. In making this selection, answer the following questions:

- **CURRENT COSTS:** Where would readmission reductions affect the most patients and/or most reduce costs?
 - For which patients and/or what diseases are readmissions especially costly?
 - For which patients and/or what diseases are readmission rates high?
- **FUTURE COSTS:** For what patients and/or diseases are cost and readmissions likely to increase in the future?
 - Consider the changing landscape of healthcare legislation and policies on the horizon.

- Consider the probable impact of changing demographics over time (i.e., whether an aging population will increase the burden of a particular chronic disease).
- **EVIDENCE BASE:** Is there evidence that specific interventions and/or care processes reduce readmissions?
- **POTENTIAL FIT FOR YOUR ORGANIZATION:** Is a Readmission Reduction Initiative that targets a specific patient and/or disease likely to contribute new insights into improved care processes within your organization?
 - Are there already other ongoing Readmission Reduction Initiatives that would make a new initiative redundant?
 - Do past and/or current Readmission Reduction Initiatives make sense for your organization, patient population, region, etc.?

The PRHI Readmission Reduction Initiative: *To identify a specific target, the questions above were answered as follows:*

Current Costs: PRHI began its project by analyzing data from more than 436,000 Western Pennsylvania hospital discharges between July 1, 2005 and September 30, 2006. These data, available from the Pennsylvania Health Care Cost Containment Council (PHC4),⁵ were analyzed in order to identify those patient groups with the highest number and rate of hospital readmissions, i.e., those groups which potentially have the highest preventable costs in the health care system.

The data revealed that readmissions are concentrated among patients with congestive heart failure (CHF), coronary artery disease (CAD), pneumonia, chronic obstructive pulmonary disease (COPD) and depression. The data also showed that each year in Western Pennsylvania, 25% of patients with CHF are readmitted to the hospital within 30 days after discharge, representing nearly 3,500 patients a year. The readmission rate for patients with COPD was similarly high at 23%. Depression rose to the top of reasons for readmission when examining the under-65 population. CHF, pneumonia, depression and COPD are also frequent comorbidities for the high admission/readmission patient populations.

Further analyses revealed that at least 40% of the readmissions for pneumonia occurred among patients with COPD, which is not surprising, since COPD patients are likely to develop complications from upper respiratory tract infections. After recognizing that patients with COPD could be admitted and readmitted to the hospital for two different kinds of diagnoses, it was determined that COPD patients actually represented the second-highest volume of hospital readmissions in the region after patients with CHF.

Future Costs: In addition to the data showing that COPD was a major current source of readmissions, national and international data showed that: (a) COPD is the 4th leading cause of death (behind heart disease, cancer, and stroke)⁶ and admissions increased by 8% between 1997 and 2007;⁷ (b) the impact

⁵ PHC4 was created by the Pennsylvania Legislature in 1986. For more information about PHC4, please see <http://www.phc4.org/>. See also Burton, Thomas M., "Hospitals Find Way to Make Care Cheaper – Make it Better," Wall Street Journal, October 6, 2009, Page A1, <http://online.wsj.com/article/SB125478721514066137.html>, Accessed 4 January 2011.

⁶ U.S. Department of Health & Human Services, "Take the First Step to Breathing Better. Learn More about COPD," <http://www.nhlbi.nih.gov/health/public/lung/copd/index.htm>, Accessed 4 January 2011.

of COPD on lost productivity and health care costs is expected to increase in the future; and (c) COPD is currently under-diagnosed and under-treated nationally (e.g., 40% of primary care doctors don't have spirometers – the most important diagnostic device for measuring lung capacity necessary for identifying COPD – and another 33% have them and don't use them). If diagnosis improves as the result of national campaigns, like DRIVE-4-COPD for example, there may be increases in the COPD patient population.

Evidence Base: Several well-designed studies have pointed to relatively simple interventions that can dramatically reduce hospital admissions and readmissions for patients with COPD. For example, patient education home visits and telephone follow-up have been shown to reduce hospital readmissions for exacerbations of COPD by nearly 40%;⁸ moreover, ensuring that COPD patients receive the influenza vaccine can reduce hospital admissions by 30-50%.⁹ There is also evidence that hospital readmissions are significantly reduced through smoking cessation and the use of statins, ACE inhibitors and angiotensin receptor blockers.

Potential for Advancing Knowledge: In discussions with hospitals, physicians and insurers in the Western Pennsylvania region and across the country, we discovered that there were a number of initiatives already underway to reduce hospital admissions and readmissions for patients with CHF. However, despite the significant number of readmissions for COPD, there were no systematic interventions underway in Western Pennsylvania to improve outcomes for patients with COPD.

For all of these reasons, COPD was identified as a high-priority target for PRHI's Readmission Reduction Initiative.

Task 3. Recruit Partners & Convene an Interdisciplinary Readmission Reduction Team

To select partners for a readmission reduction initiative, begin by answering these key questions:

1. What organizations and providers are involved in the current care processes that may need to change to reduce readmissions for the targeted patients?
2. Will the effort involve a single organization (e.g., a hospital), or will several organizations work together?

Because the causes of hospital readmissions, particularly for patients with chronic disease, are significantly affected by the care that occurs outside of the hospital, partners will ideally include both hospital staff and community physicians. If multiple organizations are involved, it will be important for the organizations to communicate with one another and to collaborate in the development and implementation of improvements in the care of their mutual patients. Considerations in designing the project and selecting partners, therefore, include:

- The existing relationship between the organizations
- The number of patients served by them

⁷ U.S. Department of Health & Human Services, AHRQ, HCUP Facts and Figures: Statistics on Hospital-based Care in the United States, 2007, http://www.hcup-us.ahrq.gov/reports/factsandfigures/2007/pdfs/FF_report_2007.pdf, Accessed 4 January 2011.

⁸ J. Bourbeau et al., "Reduction of Hospital Utilization in Patients with Chronic Obstructive Pulmonary Disease: A Disease-Specific Self-Management Intervention," *Arch Intern Med* 163, no. 5 (2003).

⁹ P. Wongsurakiat et al., "Acute Respiratory Illness in Patients with COPD and the Effectiveness of Influenza Vaccination: A Randomized Controlled Study," *Chest* 125, no. 6 (2004).

- The support of leadership in the organizations
- The overall commitment to continuous improvement

Once the partners have been selected, an interdisciplinary Readmission Reduction Team can be convened. While the exact composition of the team will depend on the needs of the targeted patients, members should include all those whose work potentially affects the outcomes of interest, those who will be involved in any new improvement processes and those who may assist in the collection and tracking of data. The responsibility for reducing readmissions is shared by community and hospital care providers. Therefore, the ideal team will include community physicians and staff, as well as hospital-based personnel with representatives from all departments involved in care of targeted patients. This may include:

- Nursing representatives (from both hospital and primary care practice)
- Nurse Educator
- Primary Care Practice Supervisor or Administrator
- Primary care physician
- Social Worker
- Physical Therapist
- Occupational Therapist
- Information Systems representative
- Home Care representative (if applicable)
- Disease specific specialists such as Cardiologist, Pulmonologist, Respiratory Therapist, Nutritionist
- RN care manager (position described in detail, below)

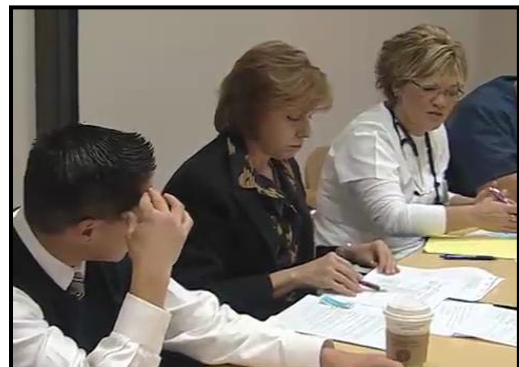


The First Team Meeting

Once the Readmission Reduction Team has been convened, it can – ideally with the guidance of a coach – begin the process of selecting an improvement opportunity and designing an implementation plan (or, more likely, a series of implementation plans) for improving the selected care process.

The following should be accomplished at the initial Readmission Reduction Team meetings:

1. Agree on project components and goals.
2. Design mechanism(s) for implementing, monitoring, and evaluating desired changes.
Questions to discuss and resolve include:
 - Will the project require a staff coordinator? If so, can the function be performed by existing, reassigned or new staff?
 - Will the project require a specific information technology liaison?
3. Agree on a monthly meeting schedule to review current data, resolve problems, and remove barriers.



PRHI Readmission Reduction Initiative: LESSONS LEARNED:

Healthcare providers often need conveners/facilitators/coaches to help them develop innovative, comprehensive, coordinated solutions to problems, particularly across department/organizational boundaries. PRHI's training and coaching options include [PPC University](#), as well as [Tomorrow's HealthCare™](#), a web-based learning community.

At later meetings, the Team can determine how patients will be identified. Consider which option is best for your project. It may be best to involve a narrow group of patients, and expand later to include an increased number of patients. Patients may be identified: on admission to hospital; through physician or clinician referral; and/or through self selection.

The PRHI Readmission Reduction Initiative: Identifying Patients

In the PRHI Readmission Reduction Initiative, all patients admitted to the hospital with a primary or secondary diagnosis of COPD were invited to participate and were given a survey on admission (see Appendix F). Patients had the option of refusing to participate in the survey and/or refusing to be visited by a care manager in their homes. Reasons for exclusion from the COPD project included patients undergoing chemotherapy, patients who were at the end of life and patients who had been enrolled multiple times but failed to take action to improve their health.

Task 4. Select an Initial Improvement Target

Knowing where to start when attempting to improve the complex inpatient and outpatient processes involved in readmissions can be overwhelming. Despite the myriad improvement opportunities, the Readmission Reduction Team must stay focused and work on one problem at a time. In selecting a place to begin, the Readmission Reduction Team can be guided by prior research identifying the factors underlying avoidable readmissions. Before undertaking specific improvement efforts, consult with experts (including those who may be key partners in the Readmission Reduction work), and review the research literature on the causes of readmissions and the types of interventions which have been successful in reducing hospital readmissions, admissions, ER visits, etc., for the targeted condition or patient group. It is important to keep in mind, however, that improvements are not “one size fits all.” Therefore, don’t expect to find a simple “plug and play” model that simply can be inserted into your unique organization and patient mix.

In selecting or developing an intervention, consider the following:

1. What factors have been hypothesized and/or proven to be causes of readmissions?
2. Which interventions have strong research support for their effectiveness in reducing readmissions but have not been widely replicated?
3. Which interventions have mixed results regarding their effectiveness and what are some of the potential factors that may differentiate between effectiveness and ineffectiveness?
4. Which interventions have been demonstrated to be ineffective and are likely not worth pursuing further?
5. What interventions have been developed but not yet fully tested?

Although solutions must be customized to meet the needs of specific patients in specific institutional settings, improvement opportunities can focus on process changes that are widely applicable across the patient care continuum. In addition to the literature and interviews with experts, questions about care quality and how to get the biggest bang for your improvement buck may help guide the selection of an initial improvement target. Below are fruitful areas to examine in selecting an improvement target.

Inpatient Care

1. Are there methods for identifying when new admissions are readmissions and determining how care should change during the current stay to prevent future readmissions?
2. Are there best practice guidelines for inpatient and outpatient care, and, if so, are they followed?
 - Are there mechanisms for monitoring deviations from these guidelines?
 - Does ongoing training of physicians and staff on guidelines and processes exist?
3. Are processes in place to intervene in the Emergency Department to avoid hospital admission where possible (e.g., stabilization, contact with PCP, etc.)?

Hospital Discharge

1. Are there processes in place for determining early on in a hospital stay the medications, lifestyle changes, etc. the patient will need after discharge?
2. Are high quality materials, resources and processes (e.g., patient education materials, skilled staff) available to provide effective patient education on the medications, lifestyle changes, etc. needed to successfully manage chronic conditions?
 - Are these educational materials used early in the hospital stay and used consistently by all departments?
 - Are the educational materials also used during the post-discharge period?
3. Are pre-discharge processes in place to ensure that patients have the necessary skills and resources for a successful return to home (e.g., access to medications, appropriate support in the home or long-term care facility, etc.)?
 - Are there processes and staff for assessing a patient's home environment?
 - Do patients know what is expected of them after leaving the hospital?
 - Do patients know what to do if they begin to experience symptoms of an exacerbation of their chronic condition?
4. Are resources and processes in place to arrange for the continuation in the community of treatments that took place in the hospital (e.g., smoking cessation program or pulmonary rehabilitation)?
5. Are there processes for ensuring that a patient schedules a follow-up PCP and/or specialist visit within 7 days of discharge from the hospital?
6. Are processes in place for transmitting hospital evaluations and recommendations for follow-up care to the patient's primary care physician, care manager and community pharmacist?

Outpatient Care

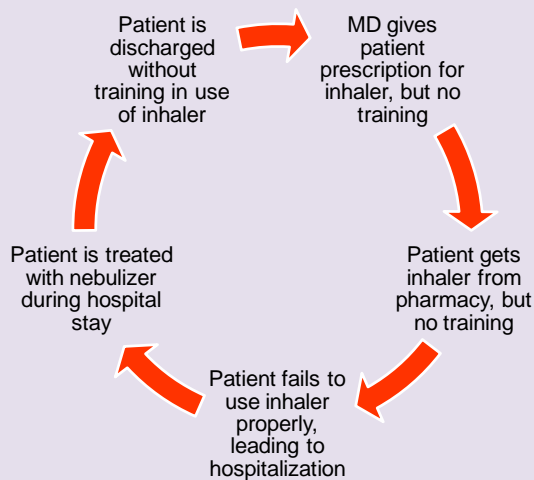
1. Are high quality materials, resources and processes (e.g., patient education materials, skilled staff) available for doing patient education on the medications, lifestyle changes, etc. needed to manage chronic conditions successfully?
2. Are there processes to screen for and address any comorbidities (e.g., depression) that may heighten readmission risk?
3. Are there processes for monitoring whether patients have had necessary checkups, immunizations, etc.?
4. Do patients know exactly how they should respond to symptoms of exacerbations of their chronic conditions, e.g., to contact their PCP office?
5. Are processes in place at the PCP office to respond in a timely fashion when a patient contacts the office with early warning signs of an exacerbation?
6. Are processes in place for ensuring that PCPs are notified of patient admissions and discharges in a timely manner?

The PRHI Readmission Reduction Initiative: *Using Best Practices to Reduce Readmissions*

A review of the COPD readmissions literature and discussions with physicians and staff who routinely dealt with COPD patients, particularly those who had been readmitted to the hospital, identified inhaler training and smoking cessation as two principal factors that likely contribute significantly to readmissions. Both can be addressed effectively through redesigning care processes and, as described below, became a major focus for the PRHI Readmission Reduction Initiative.

Inhalers: The primary treatment for COPD is the use of one or more inhalers that deliver medications directly to the lungs to make breathing easier. Although inhalers may appear simple to use, the reality is that patients must carefully follow a series of precise steps in order to ensure that the appropriate medication dose reaches the lungs. This issue is compounded for patients with more advanced stages of COPD who generally require the use of multiple different types of inhaled medication, each of which comes in its own unique inhaler device and with its own unique procedures for use. In some cases, the method for properly using one inhaler is exactly the opposite of the proper method for using another inhaler. Unsurprisingly, patients using multiple inhalers are those at highest risk of hospitalization. Therefore, a lower probability of correct inhaler usage among this population likely translates into a higher probability of emergency room visits, hospitalizations and readmissions.

Despite this, and despite the fact that inhaler medications are the primary mechanism for avoiding exacerbations that can lead to hospitalization, most patients receive little or no training in the correct use of the inhalers. Indeed, studies have shown that as many as 80% of patients do not use inhalers properly, contributing to a vicious cycle (see diagram, below) in which no part of the healthcare system takes responsibility for ensuring that patients knew how to use their medications correctly.



COPD patients at UPMC St. Margaret receive information prior to discharge that educates them on effectively managing their disease.

Task 5. Understand the Current Condition

Once the Readmission Reduction Team selects a single problem within the care process to address, it is time to understand the problem in great depth by conducting Observations that will inform the team about the Current Condition (a PPC term that describes the way in which a process currently works) of the process. The final step in the Planning phase is to perform a Root Cause Analysis that helps the team to dig deep below the surface (i.e., the symptoms) of the problem to discover the true, root cause of the issue being addressed. These three tools are described below.

Observation

Observation is literally the act of going and seeing a process and recording exactly what is seen, either on paper or on an electronic device. The goal of *Observation* is to identify where improvements can and should be made within a process. It is not intended to come up with the solution to a problem, but to deeply understand the problem. **It is important to note that *Observation* is not for altering, judging or solving a problem being observed.** Although this concept sounds simple, it is important that observers provide an objective view of a process without judgments about what is right or wrong.



When using this tool, observers *should*:

- Write down only what they see
- Focus on the process and not people

Observers should *not*:

- Interfere in any way with the process being observed
- Write down what wasn't done or what should have been done
- Attempt to solve any problems while observing

When planning an observation, one aspect of care is selected (e.g., how patient education is delivered) and an observation team is assembled. The ideal team of observers may include just 1 or 2 people, but should not exceed 10 people. Roughly half of the observers should be members of the department whose care process is being observed and half from the Readmission Reduction Team and other departments likely to be impacted by changes in the processes targeted for improvement. If possible, observe a total of 20 cycles of a process before beginning to design improvements (e.g., observe the patient education process 20 times) – even if it is a process with which you think you are familiar. Although this number may seem high, it is necessary to observe an adequate number of cycles in order to build an accurate picture of what the “average” process cycle looks like. Importantly, observations nearly always yield new insights.

During an observation, observers can be stationed at various points along a care process or they can quietly follow staff as they do their work. Again, it is critical to pay attention to the process, *not the people*. For instance, the entry “Paul failed to wash his hands before entering patient room” is focusing on the person and what was not done. Instead, the entry could read, “Nurse 1 entered the patient

room.” The observers write down what they see, minute-by-minute, often using a stopwatch to record the time certain entries occur. A sample observation form is included in Appendix E.

Once the observations are complete, they are assessed and assembled into a summary that describes the average process cycle while also calling out positive features (good things that occurred during the process), waste (such as searching, waiting, etc.) and improvement opportunities. The team then uses this summary to depict the *Current Condition* of the process being observed.

The PRHI Readmission Reduction Initiative: *Observation*

One of the hypotheses in PRHI’s COPD readmission reduction project was that patients were not receiving adequate education about their disease or sufficient training in using their inhalers. To determine the Current Condition at UPMC St. Margaret, PRHI and St. Margaret staff observed nurses administering inhalers to patients and saw that the nurses were confused about the steps themselves. Observations were also made of the work done by the Respiratory Therapists, which revealed that most patients were treated with nebulizers during their hospital stay, rather than handheld inhalers. Additionally, the observers found that the Respiratory Therapists provided little in the way of education to the patients about their condition.

Current Condition

As mentioned above, the *Current Condition* is the way in which work is currently done within a process. The *Current Condition* should not depict what *should* happen, what is stated in the Policy and Procedure manual, or what the *ideal* process would be. Instead, this is an opportunity to understand the starting point for the current round of process improvement. To convey such a message in a way that is concise and easy to understand, the *Current Condition* is typically represented using a visual diagram. For example, a simple drawing may be a floor plan that shows the movement of staff, supplies, or information along a care process. Showing graphically where problems occur can be a powerful tool for achieving shared understanding among all stakeholders of the problems that the Readmission Reduction Team will attempt to solve.

Root Cause Analysis

After clearly outlining the *Current Condition*, the Readmission Reduction Team convenes and focuses on any problems uncovered in the process. The team selects one problem to focus on during the current cycle of improvement and performs a *Root Cause Analysis* to discover the true cause of the problem. Understanding the root cause of a problem can prevent the Readmission Reduction Team from working on the wrong problem or a symptom of the problem. A *Root Cause Analysis* involves asking a series of “Why” questions, each building off the previous “why” to determine the cause of an identified problem. It is common to ask “why” up to five times before a root cause is identified; however, this is not a fixed number and it may take fewer or more rounds of asking “why” to uncover the root cause.

Here is an example:

Problem: Readmitted COPD patients are not taking their inhaler medications.

Q: Why aren't these patients taking their inhaler medications?

A: They don't feel relief from their symptoms so they don't think the medications work.

Q: Why aren't the patients getting relief from their symptoms when they take their inhalers?

A: The patients don't fully understand the purpose of their inhalers, particularly when they have two or more, or know how to operate the inhalers properly.

Q: Why don't the patients understand the purpose and proper use of their inhalers?

A: They didn't receive a clear explanation of the benefits of the different inhalers or training on how to use the inhalers when they received them or during subsequent visits.

Q: Why didn't they receive training?

A: There isn't a standardized system in place to ensure that all patients with inhalers receive training before they are discharged.

In this case, the root cause of the problem is that there is not a process to ensure that patients are receiving the education they need to fully understand how to properly use their inhalers. It would be easy to stop at the very first statement of the problem and blame the patient for being non-compliant. Looking deeper into the issue, however, uncovers the need for an education program that teaches patients the proper way to operate their inhalers so that they receive the correct medication dose and ultimately experience relief from their symptoms. The PRHI Readmission Reduction Team working at UPMC St. Margaret had a similar experience to the one outlined above.¹⁰

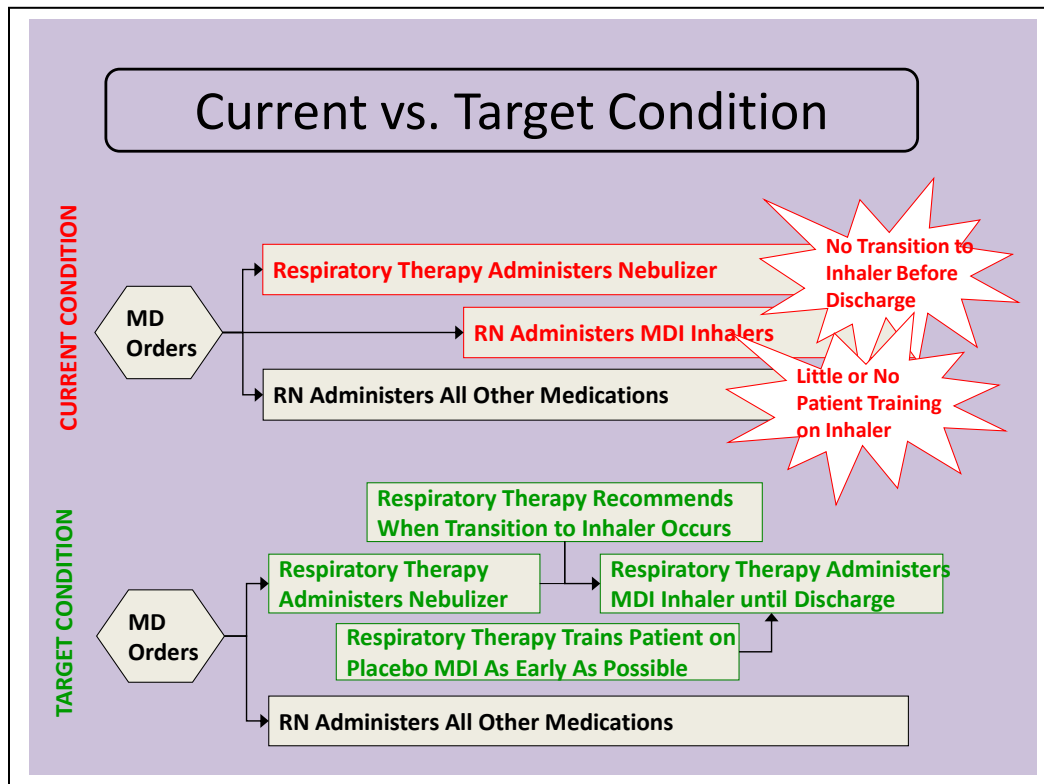
When the planning phase has been successfully completed and the root cause of the problem is understood, the Readmission Reduction Team can now develop *Hypotheses* about the likely impact of specific *Countermeasures* on readmissions, with the goal of reaching a *Target Condition*.

¹⁰ You can learn more about their story by accessing a [PRHI Teachable Moment](#), a 3-minute video.

Task 6. Articulate the Target Condition

The *Target Condition* is the ideal of how the process you are trying to improve should work once specific *Countermeasures* have been implemented. Similar to the *Current Condition*, the *Target Condition* should clearly convey to all stakeholders what the ideal process should look like. The *Target Condition* can often be best represented by developing a graphical depiction of the improved process. Ideally, as shown in Figure 3 below, comparing the *Current Condition* with the *Target Condition* can identify improvement opportunities to the Readmission Reduction Team.

Figure 3.



Countermeasures

Countermeasures are specific improvements that are designed to make small changes within the current process in order to reach the *Target Condition*. In selecting the appropriate *Countermeasures* for the current cycle of improvement, consider what corrective process changes are:

- Able to be implemented rapidly
- Simple and effective
- Low cost or no cost

While not every *Countermeasure* will meet all of these criteria, these simple thinking points can help a Readmission Reduction Team to identify improvement opportunities. It is important to try to implement one change at a time. If too many changes are made at once, the Readmission Reduction Team will never be able to keep track of which changes had a positive effect versus those that lead to no improvement or had a negative impact.

Hypotheses

Developing a solid hypothesis is a key element to ensuring that all stakeholders involved in the improvement understand exactly what is expected to result from implementing specific countermeasures. When developing an improvement, a good hypothesis should take the form of: when *X Countermeasures* are implemented, *Y* will be the result. For example, building from the example used for the *Root Cause Analysis* description, the team might hypothesize that when a system is put into place that ensures all COPD patients receive education on how to properly operate their inhalers, fewer of these patients will be readmitted due to not taking or incorrectly taking their inhaled medications.

PRHI Readmission Reduction Initiative: LESSONS LEARNED:

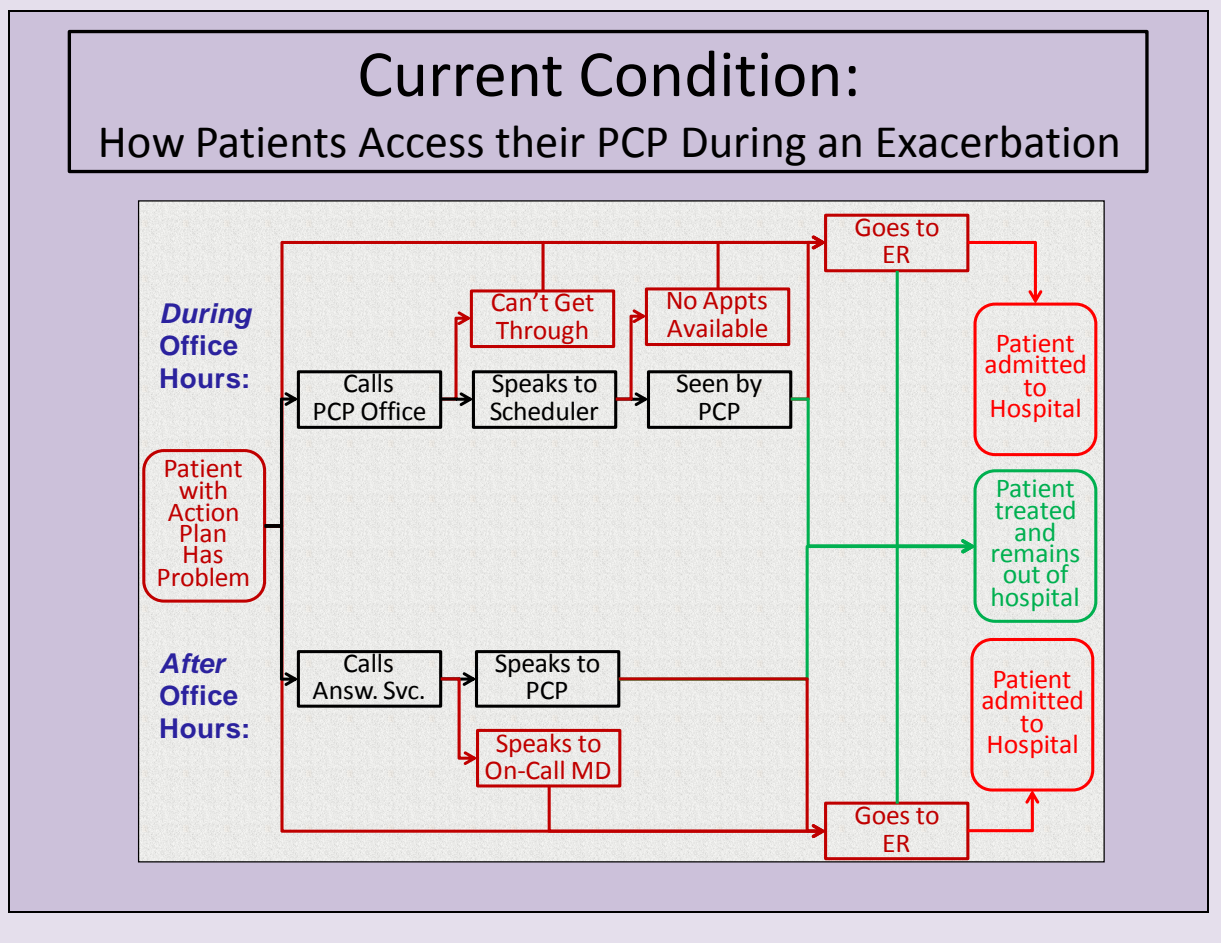
Chances for success increase if the Readmission Reduction Team has (a) sufficient time and coaching to work through all of the details of implementation, and (b) has the necessary support and resources from the organization's management to make all of the needed changes.



A COPD patient receives personalized instruction in inhaler use from staff at UPMC St. Margaret.

The PRHI Readmission Reduction Initiative: Graphical Depiction of Outpatient Current Condition: 24/7 PCP Access

One of the interventions commonly used to reduce hospitalizations for patients with chronic disease is a “Patient Action Plan” that describes both what the patient should do to avoid exacerbations of their disease and what they should do when an exacerbation occurs. A goal of the Patient Action Plan is to have the patient contact his/her physician early, when an exacerbation is beginning and non-hospital treatment can be used, rather than waiting until the condition is so severe that an ER visit is necessary. However, in addition to ensuring that a patient contacts the physician early, it is also necessary to ensure that the physician can respond quickly when the patient makes that contact, including outside of normal working hours. Only one-third of patients readmitted to one of the PRHI Readmission Reduction Initiative hospital sites (UPMC St. Margaret) arrived at the hospital during the hours of a regular work week; the rest arrived during evenings or weekends. Based on interviews with readmitted COPD patients, 55% went (or were sent) directly to the ER while 30% said they had attempted to call their PCP early on but did not receive a response. During the PRHI Readmission Reduction Initiative, careful *Observations* were performed and a map of the *Current Condition* was developed.



To plan an improvement, the Readmission Reduction Team then mapped what a process more closely approximating the ideal *Target Condition* would look like. In this scenario, when patients attempt to report their symptoms early on, the Primary Care Provider (PCP) would be prepared to ensure patient access to advice, day or night, and not simply by referring the patient to the ER. In developing the *Target Condition*, some questions the Readmission Reduction Team asked were: (1) Can the patient schedule a same day office visit (if contact is made during office hours)? and (2) Can the patient arrange a phone consult with the PCP, if after office hours?

During Office Hours:

- Process for Office Phone Screening, Assessment, and Scheduling:**
 - Call from Patient with COPD Action Plan → Receptionist
 - Receptionist → COPD? (Decision)
 - COPD? (No) → Nurse Phone Assessment
 - Nurse Phone Assessment → Send to ER If Necessary (Red box)
 - Nurse Phone Assessment → Schedule Visit Today If Possible (Green box)
 - Schedule Visit Today If Possible → Patient Can't Come Today (Red box)
 - Patient Can't Come Today → Needs Home Visit or Call Now (Red box)
 - Needs Home Visit or Call Now → Physician Sees Patient
 - Physician Sees Patient → Treatment Changed If Needed (Green box)
 - Treatment Changed If Needed → Nurse Notifies Care Mgr (Green box)
- Communication Between Office & Care Manager:**
 - Nurse Notifies Care Mgr → Care Manager

After Office Hours:

- Protocol for On-Call Physicians to Use:**
 - Call from Patient with COPD Action Plan → Answering Service
 - Answering Service → MD Calls & Assesses
 - MD Calls & Assesses → Patient Stable, Can Wait (Green box)
 - MD Calls & Assesses → Needs Home Visit or Call Now (Red box)
 - MD Calls & Assesses → ER Visit Needed (Red box)
 - Needs Home Visit or Call Now → Call Care Mgr or Home Care (Purple box)
 - ER Visit Needed → Short-Term Treatment in ER (Purple box)
 - Call Care Mgr or Home Care → Home Visit to Patient (Purple box)
 - Home Visit to Patient → Contact RN/MD w/ Findings (Purple box)
 - Short-Term Treatment in ER → Requires Home Visit to Not Admit (Red box)
 - Short-Term Treatment in ER → Patient Can Return Home (Green box)
 - Requires Home Visit to Not Admit → Care Mgr Notified (Green box)
 - Patient Can Return Home → Care Mgr Notified (Green box)
 - Requires Admission (Red box) → Care Mgr Notified (Green box)
- Home Visits for At-Risk Patients:**
 - Home Visit to Patient → Contact RN/MD w/ Findings
- Protocol for ER/Admits:**
 - Requires Admission → Care Mgr Notified

Step Two: DO

"DOING" TASKS
1. Develop an Implementation Plan
2. Prepare Staff and Conduct the Experimental Improvement
3. Capture Results

In this step, the Readmissions Reduction Team moves from understanding the full dimensions of the problem to developing and implementing experimental approaches to solving it.

Task 1. Develop an Implementation Plan

With the *Countermeasures* chosen and the *Target Condition* understood by all team members, the Readmission Reduction Team can now outline and implement the tasks necessary for testing the identified changes. This will involve creating an *Implementation Plan* for implementing the *Countermeasures* and conducting experiments aimed at improving the process that was observed.

The *Implementation Plan* guides the actual "doing" by answering the following questions for all tasks necessary to pilot the improvement experiment:

1. What is the task?
2. How will the task be performed?
3. Who will carry out the task?
4. When will the task be completed?

Clearly answering each of these questions in a brief outline helps to create a plan that is easy to follow and ensures accountability for achieving specific tasks by target deadlines.

When designing the *Implementation Plan*, be very specific about the changes being made. Asking some of the following questions may help:

1. What are all of the steps, however small, that must be done in order for the implementation to work? Is education needed?
2. How will staff know or remember new procedures?
3. Can visual cues help?
4. Will an alert be posted on a bulletin board?
5. Who is responsible for informing the physicians, the nurses, the registration clerks, etc.?

Assign each implementation task – whether direct or supporting – to a specific person, and give each task a specific deadline and expected outcome. Remember: something that is everyone's job is no one's job. If tasks are not completed by the set deadline, check with the responsible party to determine whether s/he needs help in completing the work.

Task 2. Prepare Staff and Conduct the Experimental Improvement

The next step is to prepare staff for actually carrying out the planned improvement. Changing even one aspect of the basic care plan for patients often requires modifying departmental procedures, work flow or staff responsibilities. A number of tools are available to help Readmission Reduction Teams figure out how to do this.

Some important suggestions for preparing staff include:

1. An introductory communication targeted at *all* staff who will be affected by the changes being made. This should describe the project, why it's being done (the *Business Case*), who is involved in the project team, what the expected outcomes will be and the timeframe for the changes to be put into place. Also consider providing a primary contact for staff to communicate with if they have any concerns or thoughts about the project.
2. Develop a method to share progress or to update staff on the results of the changes. This provides a means of engagement and communication to be sure all staff is "in the loop."
3. Make all responsibilities and deadlines clear before the improvement process begins. Having these on record will set clear expectations and create a sense of urgency around the changes.

The PRHI Readmission Reduction Initiative: Training

The approaches used throughout the PRHI Readmission Reduction Initiative to help staff identify and solve process improvement problems are described below:

WORKSHOPS: In this approach, a 3-day workshop was convened with an interdisciplinary group of staff from Nursing, Respiratory Therapy, Quality/Care Management, Nursing Education, Home Care and Pharmacy. During the workshop, goals for COPD patient care were developed based on the draft protocol, current work processes were reviewed and critiqued, and revised work processes were designed to better achieve goals consistent with the protocol. The workshop team was able to agree that responsibility for inhaler training and administration should be transferred from the Nursing Department to the Respiratory Therapy Department in order to maximize quality and consistency of care. Since it was not felt to be practical to have physicians participate through the entire workshop, the staff participants met with physician leaders at the end of the second day to discuss their findings and recommendations for changes in physician roles in work processes, get feedback from the physicians, and then incorporate that feedback into their final recommendations. On the third day, a report-out was presented by the Workshop team to top hospital administration and physicians, and recommendations were endorsed by all key leaders. A detailed implementation plan was then developed in the final session of the Workshop, with roles clearly defined for all departments.

KAIZEN EVENTS: Emerging from the initial Workshop was the recommendation to transfer responsibility for inhaler training and administration from Nursing to Respiratory Therapy. However, because this would increase the workload of the Respiratory Therapy Department, a four-day "Kaizen Event" (a focused, rapid problem solving event involving multidisciplinary teams over several days) was held in order to redesign the work in Respiratory Therapy and thereby reduce wasted time with existing processes (that could be used to carry out the new tasks instead). The result was a lower-cost approach to care, requiring only one additional Respiratory Therapist rather than the two additional staff that had originally been estimated. In addition, however, the redesigned workflow enabled Respiratory Therapists to spend more continuous time with patients, which increased satisfaction for both patients and staff.

Example of an Implementation Plan

The following is an example of an implementation plan designed to achieve the following *Target Condition*: COPD patients know how to properly use inhaler medications as a result of creating an education program provided by Respiratory Therapy.

Implementation Plan:

Task	Assigned To	Target Completion Date	Status
Work with team to identify standards for patient education on inhaler use	Susan R.	January 18	Completed
Work with team to create standardized education for COPD patients	Susan R.	January 30	In Progress
Create standard for providing education within Respiratory Therapists' existing schedules/routines	Frank L.	January 30	In Progress
Educate Respiratory Therapists on new work procedures	Frank L.	February 5	Not Started
Educate Nurses on new work procedures	Janice M.	February 5	Not Started
Begin Experiment	Frank L.	February 6	Not Started

Task 3: Capture Results

Reducing readmissions requires numerous steps and multiple rounds of process improvement, but a solid data collection mechanism will help to support ongoing updates and progress reports. As will be discussed below, knowing whether each step has made a difference, *one-by-one*, is crucial feedback that directs the team to institutionalize an improved process or to try something new in a rapid-cycle format. Six-month old readmission rates do not provide helpful feedback and can prolong the time it takes to redirect improvements if those data demonstrate the current countermeasures are not working.

In the example of redesigning patient education on inhaler use, a crucial piece of information would be the readmission rate of patients who have received the new education. The team should create a process for monitoring patient readmissions within this group in real-time. The team might also consider: implementing a brief survey to capture patient understanding of inhaler use, engaging the care manager in submitting feedback on patient inhaler use upon completion of a home visit, and creating a simple tool for capturing the time spent by respiratory therapy on the new patient education process. All of these elements will provide a detailed data trail that will allow the team to assess what is working well and what is not in regards to their implemented countermeasures.

The PRHI Readmission Reduction Initiative: Monitoring

The Readmission Reduction Team met monthly and measured progress in a number of ways throughout the Initiative. Readmissions from the hospital data systems were monitored monthly. Individual patient cases were tracked through a registry. Interviews were conducted with readmitted patients to try and determine what caused the readmission. Finally, chart reviews were conducted to verify that various care changes were being implemented.

Step Three: CHECK

During the Checking phase of the PDCA cycle, it is finally time to review the implemented *Countermeasures* and to collect the agreed upon measures that will allow for a comparison to the baseline data collected during the planning phase. Once the experimental period has been completed, the Readmission Reduction Team is able to evaluate the impact of the experiment and to ask:

1. Was the target impact achieved?
2. Did results support the hypothesized change?
3. Did results reflect the changes and outcomes intended in the *Implementation Plan*?
4. Did results move the process closer to the ideal?

Some of these data will be monitored during the Doing step as the experiment itself progresses. It is important to review and tweak the experiment as it is being rolled out in order to avoid staff frustration. During the Checking phase, the team will complete a more thorough review of the data to determine if the *Target Condition* was achieved. The results of this analysis will inform the Team's next step in the PDSA process.

Step Four: ACT

If the experiment succeeded in improving a process, the Readmission Reduction Team moves to standardize the successful process and ensure that the change is sustained. It is essential that each step of the new process be clearly defined and replicable, noting:

Who is responsible for each task?

- What work must be done, by whom and when?
- Is ongoing staff training required?

In addition, it is critical that the success, including estimated cost savings, be communicated to those who will be responsible for supporting the changes in the long run. In many cases, particularly in the case of readmission reduction, success may improve outcomes for patients but reduce revenues for healthcare providers. Without appropriate reforms in payment systems, the carefully designed and successful care changes may not be sustainable. All of these elements should become part of the recommendations made to administration, physicians and key leaders. Moreover, it is important to celebrate success by showing visually and quantitatively what the problem was and exactly how the solution improved the situation. ***Finally, even as efforts are being made to institutionalize and sustain successful improvements, the Readmission Reduction Team can begin planning how to address additional opportunities to reduce readmissions as further improvement can always be made.***

If the goals to be achieved by the process changes were not achieved, the Readmission Reduction Team acts by assessing what did and what did not work. It may be that the process changes were not actually implemented as planned, or it may be that the process changes were implemented but did not have the expected impacts, or that they had the desired impact but other changes in the environment offset those impacts. Based on that analysis, the team then begins the next PDCA cycle for improvement by returning to the Planning Step to reassess the problem using what was learned from the previous cycle. After another careful round of planning, the team should then consider alternative hypotheses and develop a new *Implementation Plan* for implementing a new countermeasure. Cycles of planning and experimentation continue until the target is reached for that process. Engaging the team doing the work is essential throughout this process as those closest to the work are likely to have the most important insights into what can be improved. Ensure that staff receives regular reports about the impact of their work and that progress is shared widely.

The PRHI Readmission Reduction Initiative: *Care Processes in Ongoing Improvement Cycles*

Following efforts to improve inhaler training over a 2-year period, the PRHI Readmission Reduction Team evaluated the following processes in order to achieve significant reductions in readmissions for patients with COPD:

1. Methods for identifying readmissions and determining how care should change during the inpatient stay
2. Guidelines for appropriate care of patients during the inpatient stay and post-discharge as well as mechanisms for monitoring deviations from the guidelines
 - Treatment guidelines for physicians and an in-hospital care protocol were developed laying out methods for identification of COPD, treatment plan and care delivery.
 - Once a patient was identified at admission as having a primary or secondary diagnosis of COPD and was enrolled in the project, all of the involved departments were notified. This triggered processes associated with the Readmission Reduction Initiative including:
 - Patient education about COPD and inhaler use from respiratory therapy
 - Smoking cessation education by respiratory therapy and nursing staff
 - Assessment and training in various self-management skills by physical therapy and occupational therapy
 - A phone call to schedule a follow-up appointment with the PCP
 - Medication review with pharmacy
 - Dietary review by Nutrition staff
 - An initial meeting with the community care manager
3. Methods for training physicians and staff on guidelines and processes
4. Processes for determining early in the hospital stay what medications, lifestyle changes, etc., the patient needed after discharge. For example, the respiratory therapy department assessed the patient's ability to use a handheld inhaler vs. a nebulizer and advised the physician on what type of medication would likely work best for him/her.

SECTION III. Critical Elements of Reducing Readmissions

While the Readmission Reduction Team will focus on problems and solutions that are not only identified in the literature, but also specific to the needs of the partner organization(s), there are two aspects of successful readmission reduction that are critical and should be part of any readmission reduction effort: care management and patient engagement. Because both are so important that they are described here in a stand-alone section.

Nurse Care Manager Home Visits

A major finding from research on reducing hospital admission and readmission rates for people with chronic diseases is that it is critical to provide focused patient education and an assessment of the patient in their home setting (typically by a nurse care manager) in the days following hospital discharge. For example, care management using in-home and patient education by nurses or respiratory therapists over the phone has been shown to reduce hospital admissions by 40% and ER visits for exacerbations of COPD by 41%.¹¹ Because care managers (CMs) can be so critical to preventing avoidable hospital readmissions, guidance in this section is more prescriptive.

The CM is a health professional, preferably a nurse, who makes initial contact with patient while they are in the hospital and continues that contact post discharge. The CM should become an integral member of the primary care team with responsibility for:

- Identifying patients appropriate for visits after discharge (typically through a chart review and an initial visit while the patient is still in the hospital);
- Educating patients (and families or caregivers as necessary) after discharge;
- Working with hospital staff to understand what the patient will need after discharge;
- Visiting patients at home within 48-72 hours of discharge (the home visit is described in detail, below);
- Encouraging patients to arrange for and keep physician appointments within a week following discharge;
- Assisting patients in finding resources to help them afford prescriptions, equipment or other supplies needed to successfully manage their disease;
- Connecting patients with other resources such as education, group therapy or psychiatric help;
- Maintaining staff contacts at each provider site and monitoring patient progress

Options for Care Manager Location

Because care management is not yet typically reimbursed by most insurers, hospitals and physician practices intent on reducing readmissions will need to consider options how the CM should be paid and where they should be located. The CM needs to see enough patients at high risk of hospitalization to justify the expense of the Care Manager position. Further, tracking the savings associated with reduced

¹¹ 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. Similarly, care managers supporting COPD patients through self-management education resulted in 27% reduction in hospital admissions and 21% reduction in ER visits (M.A. Gadoury, K. Schwartzman, et al, "Self-Management Reduces Both Short- and Long-Term Hospitalisation in COPD," *European Respiratory Journal* 26(5), 2005.

readmissions will be necessary to document the business case for creating the new position. Among the options to explore for locating the CM are the following:

- Employee in large physician practice
- Shared employee among several physician practices
- Hospital-based employee (supporting multiple small primary care practices)
- Contract for services with home health agency

The PRHI Readmission Reduction Initiative: *Business Case for Care Manager*

Although there were collectively enough COPD patients to justify a full-time care manager, and the potential savings from reduced hospital readmissions would be more than sufficient to offset the cost of a full-time care manager, none of the physician practices admitting to UPMC St. Margaret Hospital was large enough to justify having a full-time care manager for its patients alone. After examining the options and using grant funding, the Readmission Reduction Team hired a CM onto the hospital's payroll but agreed that her time would gradually be shared among most or all of the individual physician practices that manage patients discharged from St. Margaret, beginning with the PCP participating on the Readmission Reduction Team.

The Care Manager's Initial Patient Contact

Meeting patients while they are hospitalized initiates a relationship that will bridge care settings. When a patient has been admitted to the hospital who meets the previously agreed upon patient selection criteria, processes must be in place to ensure not only that new inpatient care protocols are activated, but that the CM is alerted to the fact that a new patient has arrived.



Patient Engagement

Once a suitable patient for the Readmission Reduction project is identified, it is important to take advantage of the unique opportunity for teaching that a hospital stay can represent. Staff involved with care can initiate conversations about the patient's condition using relevant education material.

Patient Education Material

The quality of the education material is very important. Consider the following in the selection or creation of patient education literature to be shared with patients:

- Is the language used to explain the disease and its treatments simple?
- Are there visual depictions of any important instructions?
- Is information included on common treatments and medications?
- Is there space for patients to record important information, such as daily weight, blood pressure or prescription dosage and instructions?
- Are there instructions on the day-to-day management of the disease?

- Does the education material include a *Patient Action Plan* that patients can customize to include information such as physician contact information?

Patient Action Plan

This final question is perhaps the most important. The *Patient Action Plan* is a tool for helping the patient to understand and better manage their condition (See Appendix C). Ideally, it is created by the patient with the assistance of a Care Manager during the hospital stay, although it may be developed at home with the patient immediately after discharge. The plan includes:

- What the patient agrees to do to prevent exacerbations
- Warning signs of an exacerbation
- Clear instructions on when to call for help, whom to call and what to expect in response
- Physician contact information

PRHI Readmission Reduction Initiative LESSONS LEARNED:

For most patients, home visits by a nurse care manager are much more effective in identifying and addressing problems with patient adherence than mere phone calls. Phone calls are more effective *after* an initial home visit. Some patients may require multiple home visits to adequately address patient education needs, and the Nurse Care Manager needs the flexibility to determine how many visits and phone calls are appropriate to meet each patient's needs.

Post-Discharge Home Visits

Scheduled two to three days post discharge, the home visit provides an opportunity for the CM to assess the patient's ability to cope in the home environment and to reinforce the instructions that were discussed with the patient while in the hospital. For example, the CM will reassess patient understanding and use of treatments and equipment, and determine whether any additional care is needed. Together with the patient, the CM can review the actions the patient has agreed to take to help prevent exacerbations, emphasize the early signs of an exacerbation and reinforce the importance of taking immediate steps as spelled out in the *Patient Action Plan* (see Appendix C).

The PRHI Readmission Reduction Initiative: *Home Assessment*

The CM used a Home Assessment tool (Appendix D) that enabled her to assess the patient's:

- Ability to cope in the home environment
- Reassessment of inhaler technique (CM observes the patient taking medications and using inhalers/nebulizers)
- Understanding of recommended treatment regimen

Need for long-term oxygen therapy and/or home nebulizer

SECTION IV. Reflections

This *PRHI Readmission Reduction Guide* gleans insights from a multi-year chronic disease readmission reduction project that demonstrated myriad opportunities for care improvement along the entire care continuum – from community-based care to hospital care, and from hospital discharge to outpatient care, and in all of the linkages between them. Most of the new processes the PRHI Readmission Reduction Team implemented involved different ways of organizing care. In some cases, the changes required additional staff (e.g., the integration of a care manager as a permanent part of the primary care team) – the costs for which were more than offset by the savings that result from reduced readmissions. But the savings go to health insurers, Medicare, Medicaid, and other payers, rather than the providers. It is, therefore, impossible for the providers to offset additional costs of care without cooperation from payers (e.g., shared savings). Lessons learned over the course of the Initiative have been inserted throughout this *Guide*; they are worth reiterating here:

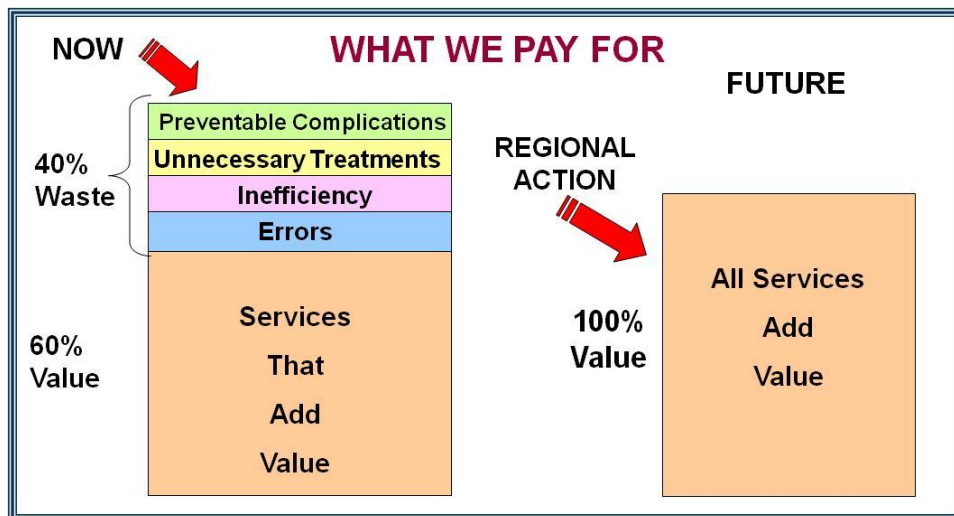
- Focusing on outcomes is more motivating for MDs, RNs, etc. than simply focusing on processes; evidence-based guidelines can unintentionally deter outcome-driven experimentation.
- Getting accurate data rapidly enough to allow continuous improvement is difficult; just identifying specific categories of patients for which guidelines are applicable can be hard.
- Healthcare providers need conveners/facilitators/coaches to help them develop innovative, comprehensive, coordinated solutions to problems, particularly across departments and/or organizational boundaries.
- Patients need personalized education and encouragement to use treatment properly and act on symptoms early.
- Home visits are an essential piece of the solution, but finding nurses willing to make home visits is often difficult.
- Pharmaceutical benefit design needs to be more closely linked to patient care management.
- Payment reform is critical: healthcare providers don't need financial *incentives* to reduce readmissions, but they can't implement effective services if they aren't paid for them.

APPENDICES

APPENDIX A: What is the Pittsburgh Regional Health Initiative (PRHI)?

PRHI is one of the first regional multi-stakeholder health improvement collaboratives formed in the U.S. with the goal of reducing costs by improving the quality, safety, and efficiency of health care. Founded in 1997 as a nonprofit, supporting organization of the Jewish Healthcare Foundation, PRHI (led by business and civic leaders, healthcare providers, insurers, purchasers, and consumers) operates on the premise that dramatic quality improvement is the best cost-containment strategy for health care.

Figure A: Waste and Value in the Healthcare System



PRHI's vision is that, by eliminating waste, patients can expect better care at a lower cost (see Figure A). Waste, as current research has shown, is pervasive in the U.S. healthcare system. One study estimated that waste may add up to as much as \$850 billion per year, including \$100-150 billion due to inefficient administrative systems, \$75-100 billion due to provider inefficiency and errors, \$25-50 billion due to lack of care coordination, \$250-325 billion for unwarranted use, \$125-\$175 billion due to fraud and abuse and \$25-50 billion for avoidable care and preventable conditions.¹²

PRHI strives to accelerate improvement and set the pace for the nation. To achieve this aim, PRHI has turned its own Southwestern Pennsylvania community of healthcare partners into a demonstration lab. The experiments performed reflect three principles:

1. Health care is local. Federal policy changes alone cannot achieve needed reform.
2. Those who work at the point of care develop quality and safety improvements that work and last.
3. Continuous improvement in quality and safety requires the highest possible standard, namely perfection. To settle for less limits achievement.

PRHI offers healthcare leaders the necessary tools, expertise, education, models and networks to

¹² Kelley, 2009

perfect patient care and safety in their organizations. Using the Toyota Production System as a model, PRHI developed a quality improvement method for clinical settings known as Perfecting Patient CareSM (PPC). PRHI teaches this method through a four-day curriculum called PPC University and through advanced, customized courses and on-site coaching. Thousands across the nation have already learned how PPC can transform health care.

APPENDIX B: Perfecting Patient CareSM

To achieve its vision, PRHI developed its own quality improvement method called *Perfecting Patient CareSM* (PPC), derived from Lean methodology. PPC University (a four-day learning experience) and on-site PPC coaches with expertise in problem-solving provide healthcare professionals with the training, tools, and support they need to achieve the highest value patient care.

Together with its healthcare partners, PRHI has successfully demonstrated the power of PPC to deliver safer, more efficient, and proven care, simultaneously. Nearly 2,000 people, including doctors, nurses, pharmacists, administrators, and technicians, have received PPC training. While the majority of the participants have come from facilities in the Pittsburgh region, trainees increasingly come from outside the region and have included representatives from 26 states, 267 organizations, 137 hospitals and practices, and 9 insurers.

Most of the early applications of PPC training took place within hospitals – focusing on reducing healthcare-acquired infections, reducing pathology lab error rates, and increasing employee retention. For example, a unit at the Veterans Administration Pittsburgh Healthcare System (VAPHS) hospital was an early adopter of PPC and targeted MRSA infections. Led by a PRHI staffer who was an engineer, and by a respected VAPHS nurse, the unit began to solve problems methodically, one by one, making it easier for workers to observe known guidelines, such as hand hygiene, gloving, and gowning. Over a three-year period, the unit posted an 85% decline in MRSA rates, according to an outside evaluation by the U.S. Centers for Disease Control and Prevention. This work led to revised policies in the VA system throughout the United States.¹³

Similarly, using PPC training, in 2005 a local pathologist, Stephen Raab, MD, PhD, and his colleagues began applying its basic principles in a hospital pathology lab. The results were widely published, describing how Raab and his team achieved faster specimen processing and, in the case of Pap smears and thyroid biopsies, improved communication with surgeons and physicians, yielding better results for patients.¹⁴

Finally, in addition to improving patient outcomes by minimizing errors, improving efficiency, and lowering cost, PPC methods have increased employee satisfaction. By eliminating wasted time and resources, staff finds the time needed to meet patient needs. Importantly, staff retention correlates with the quality, safety, and efficiency of the work environment. Take, for example, one of PRHI's demonstration projects: Simply leveling the work load among nurses in an organ transplant unit helped to reduce staff turnover from 12 percent to zero and to generate savings of nearly \$900,000 in the first year.¹⁵

¹³ Pittsburgh Regional Health Initiative, ROOTS: The Healthcare Quality Revolution, 2008 (p. 12) <http://www.prhi.org/docs/ROOTS%20Celebrating%2010%20Years%20of%20the%20Pittsburgh%20Regional%20Health%20Initiative.pdf>.

¹⁴ Condel JL, Sharbaugh DT, Raab SS. [Error-free pathology: applying lean production methods to anatomic pathology](#). Clin Lab Med. 2004 Dec;24(4):865-99. Review; Raab SS, Andrew-Jaja C, Condel JL, Dabbs DJ. [Improving Papanicolaou test quality and reducing medical errors by using Toyota production system methods](#). Am J Obstet Gynecol. 2006 Jan;194(1):57-64; Raab SS, et al. Effectiveness of Toyota process redesign in reducing thyroid gland fine-needle aspiration error; Am J Clin Pathol. 2006 Oct;126(4):585-92; [Dissemination of Lean methods to improve Pap testing quality and patient safety](#). Raab SS, et al. J Low Genit Tract Dis. 2008 Apr;12(2):103-10.

¹⁵ Op cit., p. 31.

Over time, PRHI expanded the application of these quality improvement methods outside of the hospital to include skilled nursing facilities and community primary care providers, garnering similar results. It was clear that the method was effective in nearly every healthcare setting in which it was applied.

The PPC method has helped improve work flow, reduce hospital-acquired infections, improve care for diabetic patients, reduce pathology errors, lower the number of patient falls in hospitals and nursing homes, aid employee retention and improve cardiac care, among other things. A summary of specific clinical accomplishments follows:

- A 68 percent reduction in central-line associated bloodstream infections among nearly 40 hospitals that participated in a region-wide demonstration. Using PRHI's Toyota-based process improvement methods, one of the participating hospitals virtually eliminated CLABs from its cardiac and medical intensive care units and, in 2007, marked an entire year and a half without a single CLAB in one of the units.
- An 85 percent reduction in Methicillin-resistant *Staphylococcus aureus* (MRSA) infections in the post-surgical unit of a Pittsburgh VA hospital. The MRSA project led to a host of other quality and efficiency gains at the Pittsburgh VA, as clinicians back-chained to identify problems elsewhere in their institution that contributed to the spread of infections. Among the gains was a 10 percent improvement in on-time delivery of medications, which raised the rate to 99 percent. (Delayed antibiotic administration had been a factor in the incidence of MRSA.) Lessons from the VA MRSA project also have since been rolled out nationwide, throughout the VA Healthcare System.
- Reductions ranging from 23 percent to 82 percent in three different hospital-acquired infections (HAIs) targeted variously by five hospitals across the state as part of a demonstration supported jointly by the PRHI, the Jewish Healthcare Foundation and the Pennsylvania Health Care Cost Containment Council.
- Significant efficiency gains and improved care processes at the VA Pittsburgh Healthcare System's diabetes clinic, including a 20 percent increase in the number of patients the clinic can schedule; a 68 percent reduction in waiting times for patients; a doubling of the time patients spend with clinicians; and an increase in the comprehensiveness of care because of a newly implemented team approach involving a diabetes educator, a pharmacist and a nutrition counselor as well as an endocrinologist. Findings (withheld pending academic publication) suggest that patient outcomes (as measured by key indicators of disease control) have improved as well.
- A 17 percent reduction in patient waiting times at an outpatient psychiatric clinic that enabled a comparable increase in the time patients spend with clinicians.
- A 50 percent reduction in tissue sampling errors associated with Pap tests in a large gynecology practice
- A 61 percent reduction in the need for repeat testing among patients undergoing thyroid biopsies at a major teaching hospital
- Improvements in stability of the region's healthcare workforce; an organ transplant unit in a major academic hospital, for example, reduced nursing staff turnover to zero, from 12 percent, during a PPC implementation that also generated an annual savings of \$880,000 because of the improved retention. Informal surveys and anecdotal observations among clinicians in other PPC

demonstrations suggest that, in addition to being a powerful tool for clinical and operational improvement, PPC may prove equally valuable in healthcare workforce recruitment and retention.

- A Improvement in care processes—and outcomes—for diabetic patients at a Federally Qualified Health Center implementing the Wagner Model for Chronic Care; patients at the clinic receive recommended care more frequently and saw some key indicators of health improve. For example, average hemoglobin A1C levels fell to 7.6 from 9, for example, and the percentage of patients whose blood pressures were at or below 130/80 increased to 34.7 percent from 27.8 percent.
- Move to “open access” scheduling at a Federally Qualified Health Center that decreased no-shows from 40 percent to 15 percent and improved productivity (measured by the number of patients seen per hour) by 30 percent.
- A streamlining of procedures in a community hospital ER that reduced the time for beginning IVs in patients from an average of 20 minutes to 10 minutes and reduced average supply costs per patient by 6 percent, for an annual savings of nearly \$18,500.
- Standardization of ICU nursing protocols that enabled nurses at one hospital to start common procedures immediately and reduced length of stay by more than 2.2 days per patient—totaling a \$1.5 million savings in bed days alone. The measures also reduced ventilator usage by 12 to 26 hours.
- Reduced the time needed for information exchange at change of nursing shifts from an hour to less than 15 minutes at the VA Pittsburgh Healthcare System by adopting Toyota-based quick-change procedures. The quality of information also improved.
- Improved on-time rate among patients transferred to surgery from 50 percent to 98.6 percent in one week at a major teaching hospital.
- Improved timeliness of first appointments for children being evaluated for autistic spectrum disorder from 11 weeks to 6 weeks, despite increased demand.
- Reduced the number of defective steps in pathology processing from 27.9% to 12.5% within one year of introducing PPC systemization, despite a 6% increase in work load at Henry Ford Hospital in Detroit.

APPENDIX C: Patient Action Plan used in the PRHI COPD Readmission Reduction Initiative

COPD PATIENT ACTION PLAN: Page 1 of 4

PATIENT NAME: _____ COPD CARE MANAGER _____ PHONE # _____

ACTION PLAN GOAL: The patient/caregiver will use the tools/instructions that the COPD Care Manager has supplied, and to know when to call the physician's office/Care Manager when problems occur.

TRIGGERS THAT EXACERBATE MY COPD: (WHAT MAKES MY BREATHING WORSE)

1. _____
2. _____
3. _____
4. _____
5. _____

WHAT I AGREE TO DO TO TRY AND AVOID THE ABOVE TRIGGERS:

1. _____
2. _____
3. _____
4. _____
5. _____

I AM HAVING THESE ISSUES WITH MY RESPIRATORY MEDICATIONS:

1. _____
2. _____
3. _____

I WILL RESOLVE THE ISSUES WITH MY RESPIRATORY MEDICATIONS BY DOING:

1. _____
2. _____
3. _____

I, _____ agree to try and avoid the triggers that exacerbate my COPD, and resolve the issues I have with my respiratory medications.

RESPIRATORY MEDICATIONS

Long-acting Bronchodilators – are medications used to provide control – not quick relief – of your COPD symptoms by opening the airways to the lungs. These medications are given either once a day or twice a day, every day. These are considered maintenance treatment of COPD to reduce disability, reduce exacerbation and improve quality of life. You may not feel any immediate effect, but if you don't use it every day, you'll be more likely to get an exacerbation.

Medication	Dose/Route/Freq.	Reminders on how to use inhaler	Normal Side Effects	Call Physicians office if:

REMINDERS ON INHALER USE – REFER TO "HOW TO LIVE WITH COPD" BOOKLET

Short-acting Bronchodilators – are medications that relieve COPD symptoms very quickly by opening the airways to the lungs. They are sometimes referred to as 'rescue' inhalers or 'puffers' and are used regularly up to four times a day or just as needed.

Medication	Dose/Route/Freq.	Reminders on how to use inhaler	Normal Side Effects	Call Physicians office if:

Bronchodilators act as stimulants and have side effects such as nervousness and agitation. Some patients may experience these symptoms during the inhalation or immediately after the inhalation. Sometimes, these symptoms will resolve on their own within a short period of time, however, if this does not resolve within 30 minutes you or your caregiver will need to call the physicians office. The medication may need to be adjusted or possibly changed to a different type of respiratory medication. Your physician may prescribe oral anti-inflammatory such as Prednisone when your symptoms get worse (exacerbation). These are rarely prescribed on a permanent basis. This medication helps to relieve symptoms such as shortness of breath, cough and secretions. These are usually ordered as a taper dose and you must follow the directions by decreasing the dosing as ordered. Sometimes antibiotics may be prescribed for treating respiratory infections, take these as directed.

IF YOU NEED TO CALL THE PHYSICIAN'S OFFICE:

- Tell the office staff you are a COPD patient and your action plan says you need to call and make an appointment as soon as possible.
- Tell the staff member exactly what is the problem.

YOU CALL AFTER OFFICE HOURS OR ON THE WEEKEND:

- Tell the answering service that you are a COPD patient and you were instructed by the Physician's office and your care manager to contact them immediately if you are having any problems.
- If you do not receive a return call from the Physician within _____ minutes, call again.
- If you still have not received a return call within 2 hours, call the care manager.

MANAGING MY COPD AT HOME

GREEN ZONE: ALL CLEAR

- My respiratory goal of no increased shortness of breath over my baseline is met
- My breathing does not interfere with activity, movement or ability to enjoy life
- I am comfortable and proficient with administration of my respiratory medications
- I have no difficulties in obtaining my respiratory medications.

GREEN ZONE MEANS:

- Continue to use your respiratory medications as directed by the physician.

YELLOW ZONE: CAUTION

- Any increase in shortness of breath over my baseline of breathing
- Any increase in coughing or sputum production over my baseline (what normally happens on a daily basis)
- If my sputum changes color from clear white to dark yellow, brown or green
- If I develop a fever
- If I am unable to obtain my respiratory medication either financially or unable to get to the pharmacy to pick up the medications

YELLOW ZONE MEANS:

- Your respiratory status may be changing and you may need to take action
- With any increase in shortness of breath, use your rescue inhaler (if ordered) and try the pursed lip breathing. If ordered, administer a nebulizer treatment
- If symptoms persist and your breathing does not improve within 24 hours, call the physician's office, **DO NOT WAIT** and think the problem is going to resolve on its own.

Physicians Phone # _____

COPD Care Manager Phone # _____

RED ZONE:

- I feel as though I cannot breathe or have chest pain
- If my caregiver notices that I am confused and/or drowsy along with severe shortness of breath

RED ZONE MEANS:

*****CALL 911 IMMEDIATELY*****

YOU NEED TO BE ASSESSED BY MEDICAL STAFF

IF YOU ARE CURRENTLY SMOKING IT IS EXTREMELY IMPORTANT THAT YOU QUIT. Cigarette smoke is the primary pollutant that can damage your lungs and is the leading cause of COPD. If you stop smoking, the decline in your lung function can be slowed or stopped and further disability may be avoided. There are several products on the market that do not require a prescription from the physician for smoking cessation. There are prescription medications that your physician can order for you. I encourage you to speak with your physician to see which product may be appropriate for you. If you have access to a computer, the American Lung Association as well as the American Heart Association have information on their websites.

BE AWARE OF FACTORS THAT CAN MAKE YOUR SYMPTOMS WORSE (COPD EXACERBATION) AND TRY TO AVOID THEM IF THEY AFFECT YOU.

- **INDOOR POLLUTANTS** – cigarette smoke, household cleaning products, strong odors, animal dander/fur, burning fireplace and dust – **QUIT SMOKING AND AVOID SECOND-HAND SMOKE, AVOID STRONG ODORS BY STAYING IN WELL VENTILATED AREAS, AVOID SLEEPING WITH YOUR CAT OR DOG IF YOU HAVE ALLERGIES**
- **OUTDOOR POLLUTANTS** – exhaust fumes, gas fumes, smog, pollen and cut grass – **AVOID SMOG BY STAYING INDOORS IF THE AIR QUALITY IS NOT GOOD**
- **EMOTIONS** – anger, anxiety and stress – **IF YOU ARE STRESSED AND ANXIOUS, TALK TO YOUR FRIENDS AND FAMILY ABOUT YOUR FEELINGS, PRACTICE BREATHING AND RELAXATION TECHNIQUES PROVIDED IN THE COPD BOOKLET**
- **CHANGES IN TEMPERATURE** – extreme heat or cold, wind or humidity – **WHEN IT IS COLD, DRESS WARMLY AND COVER YOUR NOSE WITH A SCARF, WHEN IT IS HOT, STAY IN AN AIR-CONDITIONED ENVIRONMENT IF POSSIBLE, DRINK PLENTY OF WATER UNLESS THERE ARE MEDICAL RESTRICTIONS, AVOID STRENUOUS ACTIVITIES AND WEAR LIGHT CLOTHING IN LIGHT COLORS AND A HAT**
- **RESPIRATORY INFECTIONS** – cold, flu, bronchitis or pneumonia – **AVOID PEOPLE WHO HAVE A RESPIRATORY INFECTION SUCH AS A COLD OR FLU. WASH YOUR HANDS IF YOU ARE IN CONTACT WITH THEM. YOU AND THE PEOPLE YOU ARE LIVING WITH SHOULD GET A FLU SHOT EVERY FALL. ASK YOUR DOCTOR ABOUT THE PNEUMONIA VACCINE.**

REMEMBER TO PACE YOUR ACTIVITIES. THIS DOES NOT MEAN YOU DON'T NEED TO EXERCISE. EVEN PASSIVE EXERCISE WILL HELP BOTH YOUR LUNGS AND YOUR HEART. LISTEN TO YOUR BODY WHEN IT'S TELLING YOU TO SIT DOWN AND REST. IF YOU BEGIN TO FEEL OUT OF BREATH REMEMBER TO USE THE PURSED-LIP BREATHING TECHNIQUE – inhale slowly through your nose until you feel that your lungs are filled with air. Purse your lips as you would if you were whistling or about to kiss someone. Exhale slowly while keeping your lips pursed. Make sure to take longer to breathe out then you would to breathe in. remember to keep your lips pursed.

APPENDIX D: COPD Home Assessment Tool

Home Assessment Tool for COPD: Page 1 of 5

Patient: _____ Date: _____ In: _____ Out: _____ Miles: _____

Patient Date of Birth: _____

Patient Physician: _____ Phone: _____

Medication Allergies: _____ Environmental Allergies: _____

Vital Signs: Pulse: _____ Respirations: _____ B/P: _____

Respiratory Assessment:

	Yes	No
1. Is the size of the chest appropriate for the size and age of the patient?	<input type="checkbox"/>	<input type="checkbox"/>
2. Is the chest symmetrical:	<input type="checkbox"/>	<input type="checkbox"/>
3. Can you hear audible noises?	<input type="checkbox"/>	<input type="checkbox"/>
4. Do you see signs of dyspnea?	<input type="checkbox"/>	<input type="checkbox"/>
5. Does the chest rise and fall symmetrically?	<input type="checkbox"/>	<input type="checkbox"/>
6. Are the nail beds normal?	<input type="checkbox"/>	<input type="checkbox"/>
7. Is there clubbing of the fingers?	<input type="checkbox"/>	<input type="checkbox"/>
8. Is a cough present?	<input type="checkbox"/>	<input type="checkbox"/>
9. Is the skin dry?	<input type="checkbox"/>	<input type="checkbox"/>
10. Does the patient have dyspnea while talking?	<input type="checkbox"/>	<input type="checkbox"/>
11. Is cyanosis present?	<input type="checkbox"/>	<input type="checkbox"/>
12. Is nasal flaring present?	<input type="checkbox"/>	<input type="checkbox"/>
13. Is the patient extremely apprehensive or agitated?	<input type="checkbox"/>	<input type="checkbox"/>
14. Is crepitus present upon palpation?	<input type="checkbox"/>	<input type="checkbox"/>

How long have you known you have COPD? _____

Have you ever had Pneumonia? _____ When? _____

Abnormal Breath Sounds:	Right	Left	Inspiratory	Expiratory	Both
Rales	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rhonchi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wheezes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

History of Patient Status for Last 14 days:

- ☐ Patient admitted to _____ for _____ on _____
Facility Diagnosis Date
- ☐ Patient discharged to home on _____
Date

Co-Morbidities: _____

Home Assessment Tool for COPD: Page 2 of 5

Patient Name: _____

Patient Date of Birth: _____

Nutritional:

Diet: _____

Height: _____ Weight: _____

Appetite: _____

How many meals do you eat a day? _____

Supplements: _____

Alcohol Consumption: _____

Who prepares the meals? _____

Who does the food shopping? _____

Do you have any problems with paying for the groceries? _____

Meals on Wheels? _____

Pain: (Scale of 0-10)

Pain level: _____

Pain medication: _____

Pain Location: _____

Do you have any of the following on a daily basis?

Sputum? _____

Wheezing? _____

Cough? _____

Nasal discharge? _____

Sinus Congestion? _____

Dyspnea? _____

Orthopnea? _____

Smoking – History and Willingness to Quit:

☐ Smoker _____ Packs per day

☐ Chewing Tobacco

Willingness to quit ☐ High ☐ Medium

☐ Low

☐ Previous Smoker ☐ Non Smoker

Have you ever tried to quit smoking? _____

When? _____

Does anyone who lives with you smoke? _____

Do they want to quit? _____

Immunization:

Flu ☐ Yes ☐ Unknown ☐ No Date _____

Pneumonia ☐ Yes ☐ Unknown ☐ No Date _____

TB ☐ Yes ☐ Unknown ☐ No Date _____

Indoor Pollutants:

☐ Cigarette Smoke ☐ Household Cleaning Products ☐ Strong Odors

☐ Dust ☐ Burning Fireplace ☐ Dogs ☐ Cats ☐ Other Animals

Current Exercise Program: ☐ Yes ☐ No

What is your normal level of activity? _____

Have you been able to resume your normal level of daily activity since your discharge from the hospital? _____

How are you sleeping at night? _____ # of hours? _____

Do you require sleep during the day? _____ # of hours? _____

Do you feel rested when you wake up? _____ Do you use O2 when you sleep? _____

C-PAP? _____ BiPAP? _____

Respiratory Treatment:

Home Assessment Tool for COPD: Page 3 of 5

Patient Name: _____ **Patient Date of Birth:** _____

How many pillows does the patient use in order to breath while they sleep? _____

How many steps can the patient climb without a feeling of respiratory distress? _____

How far can the patient walk without a feeling of respiratory distress? _____

How many bouts of cold, flu, bronchitis or pneumonia did the patient have in the last year that resulted in hospitalization? _____

How do you get to your doctor's appointments? _____

Do you need transportation assistance? _____

Who is your main support person? _____ Other support? _____

Do you have a home medical alert system? _____

Medications

Drug	Dose	Route	Frequency

How do you keep track of your meds? _____ Who helps you w/ meds? _____

Do you have problems paying for your meds? _____ Why? _____

Patient is compliant with medication: ☐ Yes ☐ No

Treatments

Inhaler Teaching: _____

Review of Medication Regimen: _____

Nebulizer Teaching: _____

Patient/Caregiver demonstrated proper technique in use and care of multi-dose inhaler and nebulizer: ☐ Yes ☐ No

Patient/Caregiver demonstrated independence in oxygen use and verbalized compliance with safety precautions to use with oxygen: ☐ Yes ☐ No

Home Assessment Tool for COPD: Page 4 of 5

Patient Name: _____

Patient Date of Birth: _____

Home Environment

Structural barriers _____

Safety Issues _____

Pets _____ Where do your pets sleep? _____

Personal Hygiene _____ Who helps you with your bath? _____

Who cleans your house? _____ Vacuums? _____

Heating and ventilation issues? _____

Need for adaptive equipment? _____

PsychoSocial

Language barriers? _____ Ability to read? _____

Visual/Hearing barriers? _____ Learning needs? _____

Patient coping? _____ Family coping? _____

Abuse/Neglect issues? _____ Hx of Depression? _____

Recent Loss/Grief issues? _____

Patient/Family Teaching

Date

Teach Back Completed Y/N

Living Well with COPD _____

Action Plan _____

Smoking Cessation/5A's _____

Flu Vaccine _____

Equipment/O2 use and cleaning _____

Medications _____

Home exercise program _____

Management of ADL's _____

Nutrition _____

Coping Skills _____

Community Resources _____

Follow-Up:

Next PCP appt _____ Next pulmonologist appt _____

Pulmonary Rehab _____ Next CM visit _____ Phone Call _____

Goals: 1. _____

2. _____

3. _____

Summary for Physician:

Home Assessment Tool for COPD: Page 5 of 5

Patient Name: _____

Patient Date of Birth: _____

Dry Powder Inhaler Tool	PT. INDEPENDENT	NOT PROFICIENT
Remove mouthpiece		
Open inhaler housing		
Remove the capsule from its packaging		
Place the capsule in the well		
Pierce the capsule once		
Exhale completely turning away from the inhaler		
Position mouthpiece properly		
Make seal with lips		
Keep tongue out of the way		
Inhale deeply/listen for vibration of capsule		
Hold breath for count of 10/or as long as able		
Exhale turning away from inhaler		
Repeat inhalation to get all med benefit		
Discard used capsule (spiriva only)		
Close the device		
Store in warm, dry place		
Know when to get Rx refilled		
For Advair, exclude steps 3-5		
Advair only: able to open diskus		
Advair only: able to click mouthpiece into place		
Advair only: rinse and spit with H2O after each use		

Dry Powder Inhaler Tool	PT. INDEPENDENT	NOT PROFICIENT
Remove the mouthpiece cover		
Shake the inhaler vigorously prior to use		
Exhale fully		
Correctly holding the inhaler device		
Correct placement of mouthpiece		
Activating the inhaler & simultaneously breathing in slowly and deeply		
Hold breath for count of 10 or as long as able		
Wait 1 minute between inhalations if multiple puffs ordered		
Repeating steps 3-8 for subsequent inhalations		
Cleaning of mouthpiece weekly		
Knowing when to get Rx refilled		

Observation Form

Date: _____ Site: _____

TIME (Minute by Minute)	LOCATION	ACTIVITY	OTHER

APPENDIX F: PRHI COPD Patient Study Questionnaire

This purpose of this questionnaire is to determine factors that may increase the risk of a COPD patient to be readmitted to the hospital within 30 days from a previous admission with similar symptoms. It is applicable to all patients admitted for a COPD exacerbation, pneumonia, shortness of breath, or other unspecified pulmonary problems regardless if a diagnosis of COPD has been made. Your participation in this study is greatly appreciated.

Demographics/History

1. ☐ Male ☐ Female
2. ☐ White ☐ Black ☐ Asian ☐ Indian ☐ Hispanic ☐ Other
3. Age Range
☐ 18 – 30
☐ 31 – 50
☐ 51 – 65
☐ 66 – 80
☐ 81 or older
4. Educational Level
☐ Less than high school
☐ High School
☐ Some College
☐ Graduated College
☐ Graduate School
5. Do you have any types of breathing problems or lung diseases? (check all that apply)
☐ Emphysema
☐ Chronic Bronchitis
☐ COPD
☐ Asthma
☐ Other Lung Disease _____
6. If you answered **yes** to emphysema, chronic bronchitis or COPD please indicate how long ago you were first told you had these conditions? _____
7. If you answered **no** to emphysema, chronic bronchitis or COPD, has your doctor ever evaluated you for a lung disease?
☐ Yes
☐ No
8. Has a doctor ever used a machine called a spirometer to evaluate your breathing?
☐ Yes
☐ No

9. How much do your lung problems limit your ability to participate in activities you want to?
__A lot
__Some
__Not Much/Not at all
10. How much exercise, including walking, do you get on a typical day?
__A lot
__Some
__Not much/None at all
11. How frequently are you around small children?
__A lot
__Sometimes
__Rarely
12. Indicate all of the vaccinations below you have had in the past year.
__Flu
__Pneumonia
__Other: _____
__None
13. Do you have allergies?
__Yes
__No
14. If you answered **yes** to allergies, please check all that apply.
__Pets
__Grass, ragweed, etc.
__Food: _____
__Medications: _____

15. What other health problems do you have? Check all that apply.
__Heart or blood pressure problems
__Diabetes
__Arthritis/Osteoporosis
__Depression/Anxiety
__Other: _____
__None
16. Number of admissions for **COPD exacerbations** within the past year:
__0
__1
__2
__3 – 5
__more than 5

17. Number of admissions for **pneumonia** within the past year:
- ☐ 0
 - ☐ 1
 - ☐ 2
 - ☐ 3 – 5
 - ☐ more than 5
18. Number of admissions for **other reasons** in the past year:
- ☐ 1
 - ☐ 2
 - ☐ 3 – 5
 - ☐ more than 5
19. Day of week and time you came to the Emergency Department or were directly admitted
- ☐ M-F 9am – 5pm
 - ☐ M-F 5pm - Midnight
 - ☐ M-F Midnight - 9am
 - ☐ Sat/Sun 9am - 5pm
 - ☐ Sat/Sun 5pm - Midnight
 - ☐ Sat/Sun Midnight – 9am
20. What symptoms did you experience that made it necessary to come to the hospital (check all that apply)?
- ☐ Shortness of breath
 - ☐ Chest pain or tightness
 - ☐ Cough
 - ☐ Fever
 - ☐ Other: _____
21. Did anything specific happen that you think may have caused your symptoms or made them worse (check all that apply)?
- ☐ Strenuous activity
 - ☐ Caught a cold
 - ☐ Exposed to things I'm allergic to
 - ☐ Around sick people
 - ☐ Oxygen/other equipment failure: _____
 - ☐ Other: _____
22. Do you have an Action Plan that your doctor gave you to use when you began to experience worsening symptoms?
- ☐ Yes
 - ☐ No
23. If you answered **yes** to the question above, did you use the Action Plan?
- ☐ Yes ☐ No

24. If you did not use your Action Plan, please indicate why not. _____

25. Did you use your inhaler, nebulizer or other medications to try to lessen your symptoms?

☐ Yes, but it didn't work

☐ No, because I didn't think it would work

☐ No, I didn't think to try

☐ No, I didn't have the inhaler, nebulizer, other medications available

☐ Other: _____

26. When, if at all, did you call your doctor's office about your condition prior to admission?

☐ Called at the first sign that I was getting sick

☐ Called several times as I got worse

☐ Only called when I was really feeling sick

☐ Didn't call – just went to the emergency department

☐ Other: _____

27. If you called your doctor's office, what did they advise you to do?

☐ Start your Action Plan

☐ Rest, see if symptoms improve

☐ Changed or added to medications over the phone

☐ Scheduled me for an appointment at a later time

☐ Told me to come in to the office as soon as possible

☐ Told me to go to the emergency room

☐ Other: _____

28. Which inhalers, nebulizers or other medications are you supposed to be using since the last admission to the hospital?

☐ Spiriva

☐ Serevent

☐ Advair

☐ Combivent

☐ Albuterol

☐ Alupent

☐ Pulmicort

☐ Other: _____

29. Are there any inhaler or nebulizer medications indicated above that you are supposed to be using that you are not using?

☐ Yes ☐ No

30. If Yes, which medications?

31. Medication: _____

Please indicate ALL of the reasons below for not taking the medications:

☐ Did not fill prescription due to cost

☐ Did not fill prescription due to inability pick them up at the pharmacy

☐ Do not see much benefit from the medication

- ☐ Don't like the side effects
- ☐ Not taking for other reason: _____

32. Medication: _____

Please indicate ALL of the reasons below for not taking the medications:

- ☐ Did not fill prescription due to cost
- ☐ Did not fill prescription due to inability pick them up at the pharmacy
- ☐ Do not see much benefit from the medication
- ☐ Don't like the side effects
- ☐ Not taking for other reason: _____

33. Medication: _____

Please indicate ALL of the reasons below for not taking the medications:

- ☐ Did not fill prescription due to cost
- ☐ Did not fill prescription due to inability pick them up at the pharmacy
- ☐ Do not see much benefit from the medication
- ☐ Don't like the side effects
- ☐ Not taking for other reason: _____

34. Medication: _____

Please indicate ALL of the reasons below for not taking the medications:

- ☐ Did not fill prescription due to cost
- ☐ Did not fill prescription due to inability pick them up at the pharmacy
- ☐ Do not see much benefit from the medication
- ☐ Don't like the side effects
- ☐ Not taking for other reason: _____

35. Has anyone ever showed you how to use your inhalers or nebulizers?

- ☐ Yes – all inhalers and nebulizers
- ☐ Some inhalers and nebulizers
- ☐ No one have ever shown me how to use

36. Has anyone ever watched you use your inhalers and nebulizers to make sure you were using them correctly?

- ☐ Yes, all inhalers and nebulizers
- ☐ Some inhalers and nebulizers
- ☐ None

37. How confident are you that you are using your inhaler (or all of your inhalers) properly?

- ☐ Very confident
- ☐ Somewhat confident
- ☐ Not sure

38. Indicate ALL of the below who were the most helpful in explaining to you how to use your inhalers and nebulizers:

- ☐ Nurse in hospital

- ☐ Respiratory Therapist
- ☐ Doctor in hospital
- ☐ Other hospital staff: _____
- ☐ Your primary care physician
- ☐ Nurse or other staff in the MD office
- ☐ Home health nurse
- ☐ Pharmacist
- ☐ Another patient
- ☐ Friend or family member
- ☐ Other: _____

39. If you are using a metered dose inhaler, do you use a spacer with your inhaler?

- ☐ Yes, all of the time
- ☐ Yes, most of the time
- ☐ No, I have one but don't use it
- ☐ No, I don't have one
- ☐ No, was never given one
- ☐ Don't know what a spacer is

40. Do you currently smoke?

- ☐ Yes ☐ No

41. If you currently smoke, has anyone ever encouraged you to stop smoking while in the hospital the last time?

- ☐ Yes ☐ No

42. If Yes:

- ☐ I received educational materials
- ☐ A nicotine patch or other medication was used to help me stop smoking
- ☐ I participated in a class on smoking cessation

43. If you are currently smoking, when did you start again after discharge?

- ☐ Immediately after discharge
- ☐ After a few days
- ☐ When the patches or other medication ran out
- ☐ Other: _____

44. Have you ever participated in programs to help you with your COPD?

- ☐ Pulmonary rehabilitation
- ☐ Exercise Class
- ☐ Smoking Cessation Program
- ☐ Support Group
- ☐ Other: _____
- ☐ Never participated in a program