



**Best Practices in
Managing Patients With
Chronic Obstructive
Pulmonary Disease
(COPD)**

FirstHealth of the Carolinas Case Study

Profile

FirstHealth of the Carolinas is a private, nongovernmental, nonprofit healthcare network located in Pinehurst, NC, with a primary service area of 4 counties and a primary and secondary service area of 15 counties in the mid-Carolinas. The system's 3 hospitals maintain a collective 582 beds, and all major medical and surgical specialties are offered. Numerous subspecialties include open heart and valve surgery, neurosurgery, neonatology, behavioral health services, and bariatric surgery. FirstHealth has an active medical staff of 290 of whom more than 94% are board certified. Additional services and facilities include a heart center, rehabilitation center, dental clinics, sleep disorders centers, family care centers, hospice and hospice services, home health services, critical care transport, emergency medical services, a convenient care clinic, and an insurance plan.

In 2012, there were 27,678 total hospital discharges and 108,463 hospital emergency department (ED) visits; 39,803 visits to FirstHealth Family Care Centers; and 19,390 patients were served by emergency medical services.

FirstHealth has been acknowledged for excellence in healthcare on many occasions. *U.S. News & World Report* ranked Moore Regional Hospital fifth best hospital in North Carolina and a high performer in cancer, cardiology and heart surgery, diabetes and endocrinology, gastroenterology, geriatrics, nephrology, neurology and neurosurgery, pulmonology, and urology. *Becker's Hospital Review* named FirstHealth Moore Regional Hospital one of the 100 Great Community Hospitals, and the hospital is included in its annual list of 101 Hospitals with Great Orthopedic Surgery Programs.

Program Summary

FirstHealth's Hospital to Home Transitions of Care pilot program aimed to create a seamless continuum of care on 2 medical floors of FirstHealth's flagship facility, Moore Regional Hospital, for inpatients with COPD and congestive heart failure (CHF) being transferred to home care and ultimately to self-management. This initiative was the first part of a larger pilot to manage care transitions for all patients with chronic disease. In response to opportunities for improvement in care identified in the first year of the pilot, an arm of the pilot focused efforts on improving COPD education for healthcare providers, patients, and caregivers. The overall objectives were to improve patients' well-being and build their skills, knowledge, and confidence in self-management while reducing costs by avoiding preventable readmissions and ED visits.

Program Goals and Success Measures

Goals and objectives

The 5 primary goals of the COPD education arm of the Hospital to Home Transitions of Care pilot were to

1. Increase opportunities for bedside inpatient COPD education
2. Integrate COPD education system wide
3. Increase evidence-based utilization of spirometry in COPD management
4. Increase appropriate use of pulmonary rehabilitation
5. Decrease all-cause readmissions and ED visits through enhanced education and transitional care support

Clinical standards

A variety of evidence-based standards in transitional care and clinical practice were integrated into the Hospital to Home Transitions of Care pilot to improve quality and reduce costs. In preparation for the pilot, the home care team conducted a systematic review of current literature in transitional care and summarized 5 of the most cited models: the Care Transitions Program,¹ Transitional Care Model,²⁻⁵ Project BOOST,⁶ Project Re-Engineered Discharge (RED),⁷⁻⁸ and the Institute for Healthcare Improvement's Transforming Care at the Bedside.⁹ Interventions that revealed positive effects on desired measures and aligned with available resources were incorporated to develop the FirstHealth Home Care Chronic Disease Transitional Care Model (Figure 1). Many of the successful interventions shared key components, such as the use of the teach-back method, home visits, and assessment of patient readiness and activation.

Figure 1

FirstHealth Home Care Chronic Disease Transitional Care Model			
HOSPITAL	HOME HEALTH	COMPLEX CARE MANAGEMENT	CARE MANAGEMENT
Admission to Hospital Patients identified upon admission Transitional planning begins Postacute needs assessed	Chronic Disease Pathways Pathway determined by patient activation Telemonitoring and coaching for activation Multidisciplinary visits and conferencing	Payer-Neutral Complex Care Management Low activated patients One or more hospitalizations within 3 months No longer eligible for home health services	Care Management Primary care medical home model Identify high-risk patients Assist in ongoing coordination of care
Multidisciplinary Rounding Daily rounding Hospitalists, RN, OM, liaisons, and PharmD Patient's needs identified and discussed	Patient's Goals and Concerns Addressed Establishes patient trust and buy-in Demonstrates continuity of care Aligns healthcare and personal goals	Complex Care Management Pathways Pathway determined by patient activation Progressive resetting of goals Telemonitoring or self-monitoring equipment	Home Visit Medication reconciliation with PharmD review Telemonitoring or self-monitoring equipment Transitional care summary to PCP
Standardized Patient Education Unit RNs begin education Standardized educational material Self-management skills initiated	Risk-Driven Care Plan Smoking cessation Nutritional counseling Behavioral health nurse intervention	Structured Phone Calls Disease-specific assessments Frequency determined by patient activation Focus on developing self-management skills	Individualized Care Plans Disease-specific education Self-management skills reinforced Reduce unnecessary expenses
Medication Review and Reconciliation Facilitated by pharmacist Medication counseling (if indicated) Recommendations to hospitalists	Medication Self-Management Meds reconciled to hospital EMR Discrepancies addressed within 24 hours PharmD review for complex med regimens	Self-Management Skills Coaching for activation Self-monitoring and reporting of health indicators Effective symptom management	Ongoing oversight Review of claims data Strengthen linkage with PCP Reduce variations in care
Home Health Referral Liaison establishes patient relationship Assesses needs for palliative care/hospice Begins teaching of "Red Flags"	Teaching of "Red Flags" Signs and symptoms to report to MD Emergency care plans implemented Instruction on who to call for "Red Flags"	Reinforcement Strategies Ongoing follow-up with PCP Ongoing medication compliance Ongoing nutritional compliance	SELF-MANAGEMENT
Home Care Coaching Patient activation measure administered Identify patient's goals and concerns PHQ-2 depression assessment	7-Day PCP Follow-up Facilitated Verify appointment made Verify transportation to and from Confirm visit was made	Transition From Complex Care Management Next level of care based on patient activation Long-term care planning No hospitalizations within 3 months	
Patient Transitioned to Home Health Transition coordinated by liaison Home health access to hospital EMR 7-day PCP follow-up facilitated	Transitions from Home Health Next level of care based on patient activation Facilitate appropriate referrals Confirmation of completed transition		Self-Management Quarterly follow-up phone calls Self-monitoring of health indicators Effective symptom management Maintain lifestyle changes Ensure ongoing compliance with PCP

RN=registered nurse; OM=office manager; PharmD=pharmacist with doctorate; PHQ-2=Patient Health Questionnaire-2; PCP=primary care provider; EMR=electronic medical record; MD=doctor.

In order to reflect nationally recognized best practices in COPD management, the home care service revised the patient education COPD booklet and created booklets for lowly activated patients and highly activated patients (Appendix), based upon the Patient Activation Measure® (PAM).¹⁰ The lowly activated booklet now serves as a common foundation in the clinical management of patients with COPD across care settings. The booklet was primarily developed from evidence-based standards from the Quality Insights of Pennsylvania in partnership with OASIS Answers, Inc.,¹¹ the Agency for Healthcare Research and Quality,¹² and the Global Initiative for Chronic Obstructive Lung Disease (GOLD).¹³ The highly activated patient booklet is based on the same evidence-based guidelines, but is distributed only to home health patients who meet the highly activated PAM criteria.¹⁰

Data collection and measurement

Patient and control group data, including demographics, were collected from FirstHealth's EMR system, Physician Portal. Group measures from EMR include

- All-cause rates of rehospitalization and ED utilization
- Average hospital length of stay
- Discharge disposition to postacute care services
- Frequency of scheduled follow-up appointments with PCP
- Percentage of patients with documented spirometry
- Percentage of patients with prescribed bronchodilator
- Referrals to pulmonary rehabilitation

Population Identification

Demographics and disease severity

The main source of pilot participants were patients admitted to 2 medical floors of Moore Regional Hospital with a primary or secondary diagnosis of COPD (ICD-9-CM codes 491.20 through 491.22, 492.8, or 493.20 through 493.22, 496) as well as patients readmitted with COPD regardless of hospital floor location, identified through concurrent review of readmissions. The control group included patients with a primary or secondary diagnosis of COPD regardless of hospital floor location.

Readmitted patients with COPD were identified through concurrent patient review of all 30-day all-cause rehospitalizations, while new admissions were identified through a daily patient registry listing all patients meeting the identified pilot diagnostic codes. New admissions were then assigned to the pilot or control group based on their assigned medical floor. All patients were identified through the patient registry and concurrent review methods.

Pilot patients

*Demographics**

- Enrolled patients: n=57
- Gender: 53% (n=30) female
- Average age: 70 years

Disease severity, patients with documented spirometry (n=22)

- Mild: FEV₁ >80% of predicted: 0% (n=0)
- Moderate: FEV₁ between 50% and 80%: 41% (n=9)
- Severe: FEV₁ between 30% and 49%: 27% (n=6)
- Very severe: FEV₁ <30%: 27% (n=6)
- Normal: 5% (n=1)

FEV₁=forced expiratory volume in 1 second.

*Of the 57 pilot patients with COPD, 39% (n=22) had documented spirometry results within the hospital EMR system compared with 33% (n=16) in the control group. This incidence is likely higher; however, testing could not be confirmed without access to patient information outside the health system. All pilot and control patients with an FEV₁/forced vital capacity (FVC) <70% and who were symptomatic received a prescription for an inhaled bronchodilator.

Control patients

Demographics

- Enrolled patients: n=49
- Gender: 63% (n=31) female
- Average age: 69 years

Disease severity, patients with documented spirometry (n=16)

- Mild: FEV₁ >80% of predicted: 19% (n=3)
- Moderate: FEV₁ between 50% and 80%: 25% (n=4)
- Severe: FEV₁ between 30% and 49%: 44% (n=7)
- Very severe: FEV₁ <30%: 12% (n=2)

Intervention

Background

Hospitalization and subsequent discharge represent a period of vulnerability for patients. Medication regimens are commonly altered, with patients asked to discontinue or hold some medications, change dosage strength and frequency, or begin new medications. Self-care responsibilities also increase in importance, including understanding signs and symptoms of disease exacerbation and proactive management of exacerbation. Ineffective planning, patient education, and coordination of care can compromise patient safety and satisfaction and contribute to a greater likelihood of hospital readmission.

In a 2009 report to Congress, the Medicare Payment Advisory Committee reported that 18% of Medicare hospital admissions result in readmissions within 30 days, with \$15 billion spent on readmissions and \$12 billion on preventable hospital admissions.¹⁴ Compounding this matter, following hospital discharge, nearly half (49%) of hospitalized patients experience at least 1 medical error in medication management, diagnostic workup, follow up on inpatient tests, and continuity of care.¹⁵ Half of adverse drug events resulting from medication mismanagement are considered preventable and result from a breakdown in communication during the hospital-to-home transition of care.¹⁶

These data support the critical role of inpatient education and transitional care in reducing readmission rates and improving overall patient care. Patient/family education is a key recommendation of GOLD guidelines and vital to successful COPD management.¹³ Advantages of education include patient/caregiver knowledge; symptom control; and fewer, less severe exacerbations. Patient education should be reviewed and reinforced at all points of care across the continuum, particularly during hospitalization when the patient and/or caregiver are motivated by an acute care experience.

Program modifications

The initial project overview of the COPD patient education arm of the care transitions pilot focused solely on inpatient rounding of the pilot population by pulmonary rehabilitation staff. Staff would conduct basic education (eg, inhaler usage, signs and symptoms of exacerbation, oxygen use, medications, pacing, coughing techniques) as well as screen for eligibility for pulmonary rehabilitation and other appropriate postacute care services. However, the care team determined at its first planning session that expanded efforts were needed to address additional care gaps identified in the first year of the care transitions pilot.

The team wanted to determine if the first year's spirometry utilization rates indeed reflected real-world practices in the primary care setting or were the result of a limitation of access to outpatient records. The team partnered with the health system's physician liaisons to survey PCPs within the service area to inquire if they have access to spirometry within the practice and whether spirometry is commonly conducted as clinically indicated. Survey results indicated that the majority of PCPs have access to spirometry within the practice. However, they rarely conduct in-practice spirometry because of time limitations, patient preparation, variations in interpretation, and lack of understanding when spirometry vs formal pulmonary function testing is indicated. As a result, spirometry training and education for PCPs became an additional pilot aim.

Furthermore, through discussion of the proposed pilot workflow, the team recognized that, to avoid potential delay in transition to pulmonary rehabilitation, a discharge order set checklist for pulmonary rehabilitation needed to be created within the computerized physician order entry (CPOE) system so that patients present to rehab with the required labs. The order set provides prompts that spirometry, EKG, CBC, and chest x-ray must be completed and documented within the past year.

Lastly, during the planning process for year 2 of the pilot, the team recognized the need for consistent messaging and education to effectively move the patient along in the transitions of care. As mentioned above, during the first year of the care transitions pilot, home health COPD patient education materials were refined into 2 booklets, one for the lowly activated patient and the other for highly activated patients. This process aided in tailoring patient education efforts to the patient's individual perspective of readiness for self-management. Additionally, this approach provided the staff with a common language and understanding of patient readiness. However, these tools were not pushed through the entire health system. As such, the planning team, which included members of pulmonary rehabilitation and quality, collaborated with the health system's corporate patient education, medical nursing directors, and home health staff to review and update the lowly activated COPD patient education booklet and establish plans for system wide adoption.

While individual patients' specific transitions of care vary based on a variety of health-related factors, the pilot team typically maintained the following specific steps to help ensure optimal, successful care coordination and effective, efficient transitions of care:

- Every morning, a patient registry is automatically run, identifying all inpatients with the primary/secondary diagnosis of COPD
- The vice president of quality forwards this report daily to the pulmonary rehabilitation program coordinator and pilot project manager, in addition to any readmissions, for inclusion in the pilot. Patients admitted to the 2 designated medical floors are eligible patients for the pilot
- The project manager inputs the pilot and control group data into a tracking database
- The pulmonary rehabilitation coordinator conducts daily rounds on pilot patients, introducing essential COPD self-management basics, as outlined in the system wide COPD patient education booklet. The coordinator also assesses the patient's appropriateness for pulmonary rehabilitation based upon eligibility criteria and offers referrals, if desired, and discusses additional services for postacute care
- After completing daily rounds, the coordinator enters the provided patient education, referrals, and recommendations in the progress notes of the patient's medical record. The coordinator may also discuss recommendations with the patient's outcomes manager, nurse, and/or attending hospitalist, further facilitating care coordination

- The pulmonary rehabilitation coordinator and/or other pulmonary rehabilitation staff continue daily rounds through discharge to home
- Prior to discharge, any needed diagnostics for admission to pulmonary rehabilitation are ordered and scheduled, as noted in the CPOE Pulmonary Rehabilitation Order Set
- Following discharge, pilot patients transition to pulmonary rehabilitation or other postacute care services
- At enrollment and throughout the pulmonary rehabilitation program, patients receive medication reconciliation and management; a progressive, medically managed exercise regimen; patient and family education based on patient-driven goals and evidence-based standards, as well as emotional support
- After this period, if the patient remains stable, he or she is transitioned to self-management. This entire follow-up phase is projected to last 9 to 12 months

Staff education

Equally important to enhancing inpatient COPD patient education opportunities was the mission to help healthcare providers succeed in providing the optimal respiratory care for their patients, including the use of routine diagnostic spirometry. As such, the care team partnered with an expert community board-certified pulmonologist to conduct 3 Spirometry 101 continuing medical education (CME) sessions. Primary care, family care, internal medicine, and pulmonology providers were invited to participate in the first educational session. Two subsequent sessions were conducted for hospitalist providers on-site in the hospitalist conference room to maximize attendance. The CME session included a review of clinical indications, spirometry techniques and measurements, and interactive discussion of case studies for practical interpretation. It was reinforced that, together with the presence of symptoms, spirometry helps stage COPD severity and can be an instrumental guide to effective management in primary care.

Furthermore, in preparation for the implementation of the updated, system wide COPD patient education booklet, departmental nursing directors prepped the nursing staff on key educational updates and where to locate the updated materials. Additionally, the hospitalist service providers were briefed on pulmonary rehabilitation service offerings, the new CPOE order set, and asked to ensure notation of COPD stage upon admission, if possible, to facilitate assessment of pulmonary rehabilitation eligibility.

Workflow and staffing changes

As a result of the second year pilot study, the following has occurred, without hiring additional staff to sustain the FirstHealth Transitional Care Model, and enhanced COPD education for healthcare providers, patients, and caregivers:

- Refinement of a standardized COPD patient education booklet that is used across the system
- Implementation of daily rounding of patients with COPD on the 2 pilot floors
- Development and implementation of a pulmonary rehabilitation CPOE order set
- Enhanced transition referrals after discharge (eg, diabetes self-management, exercise, cardiac rehabilitation, or pulmonary rehabilitation)
- Development and execution of spirometry CME sessions to appropriately diagnose COPD, assess disease severity, measure lung function, guide changes in management, detect other respiratory problems, and adhere to evidence-based COPD management

Information technology

Several information technology tools were used during the year 2 pilot, including CPOE and the patient registry established primarily for patient identification. The CPOE system facilitated direct entry of medical orders for patients transitioning to pulmonary rehabilitation. The orders were thereby instantly communicated to other departments responsible for fulfilling the order to include radiology and laboratory. Utilization of CPOE decreases delay in order completion and reduces potential errors in order entry or duplication of orders.

The patient registry used in the pilot was a basic, automatic, daily electronic query of admitted patients meeting the diagnostic criteria. Through the patient registry, the care team was readily able to identify the pilot population.

Leadership Involvement and Support

FirstHealth's Vice President of Quality is the primary senior champion for the Hospital to Home Transitions of Care pilot and the subsequent second year of the pilot. She continues to play a critical role in encouraging collaboration and ensuring needed staff resources are allocated to support the successful implementation of the pilot. Furthermore, she serves as a mentor to the pilot team and an advocate within hospital administration by maintaining ongoing awareness of, and dedication to, the pilot within the organization.

Results

- For pilot patients, acute care hospital all-cause readmissions postdischarge were 26% (n=5) 0 to 30 days, 11% (n=6) for 31 to 60 days, and 7% (n=4) for 61 to 90 days
- In a nonmatched control comparison* of patients admitted with COPD, acute care hospital all-cause readmissions postdischarge were 24% (n=12) for 0 to 30 days, 14% (n=7) for 31 to 60 days, and 10% (n=5) for 61 to 90 days
- Average hospital length of stay for the pilot group was 4.8 days compared with 5.7 days in the control group
- Pilot patients experienced 6 ED visits 0 through 90 days postdischarge, with an ED utilization rate of 11% compared with 10 ED visits (20%) in the control group
- 37 pilot patients (65%) had a documented follow up scheduled with their PCP on hospital discharge compared with 29 control patients (59%)
- 98% of pilot patients (n=56) were prescribed an inhaled bronchodilator, with 96% (n=47) of patients in the control group

*The program sought to have a comparison group of patients with the same diagnosis who did not receive the rounding by pulmonary rehabilitation. Although the groups were not matched, they were relatively comparable, as demonstrated by the demographic information and severity of disease.

Lessons Learned

Challenges

- Follow up with PCP within 7 days of discharge improved in the pilot population compared with year 1 (65% [n=37]); however, FirstHealth will continue work to overcome this challenge by reminding inpatient nursing and home health staff to help facilitate appointments

- All-cause readmission rate within 0 to 30 days postdischarge continues to be the time frame in which the highest volume of readmissions is experienced within 90 days postdischarge. It is hoped that FirstHealth's new Transitional Care Clinic and other related efforts will aid in improving this finding and the patient's overall health and quality of care
- Further efforts are needed to increase the use of spirometry in COPD management to build on provider educational efforts conducted in this pilot
- Sustain inpatient pulmonary rehabilitation rounding despite limited personnel resources
- Continue referral of appropriate patients to pulmonary rehabilitation among hospitalist staff
- Maintain a transitional care climate (ie, thinking outside the acute care setting of appropriate community services and supports)

Lessons

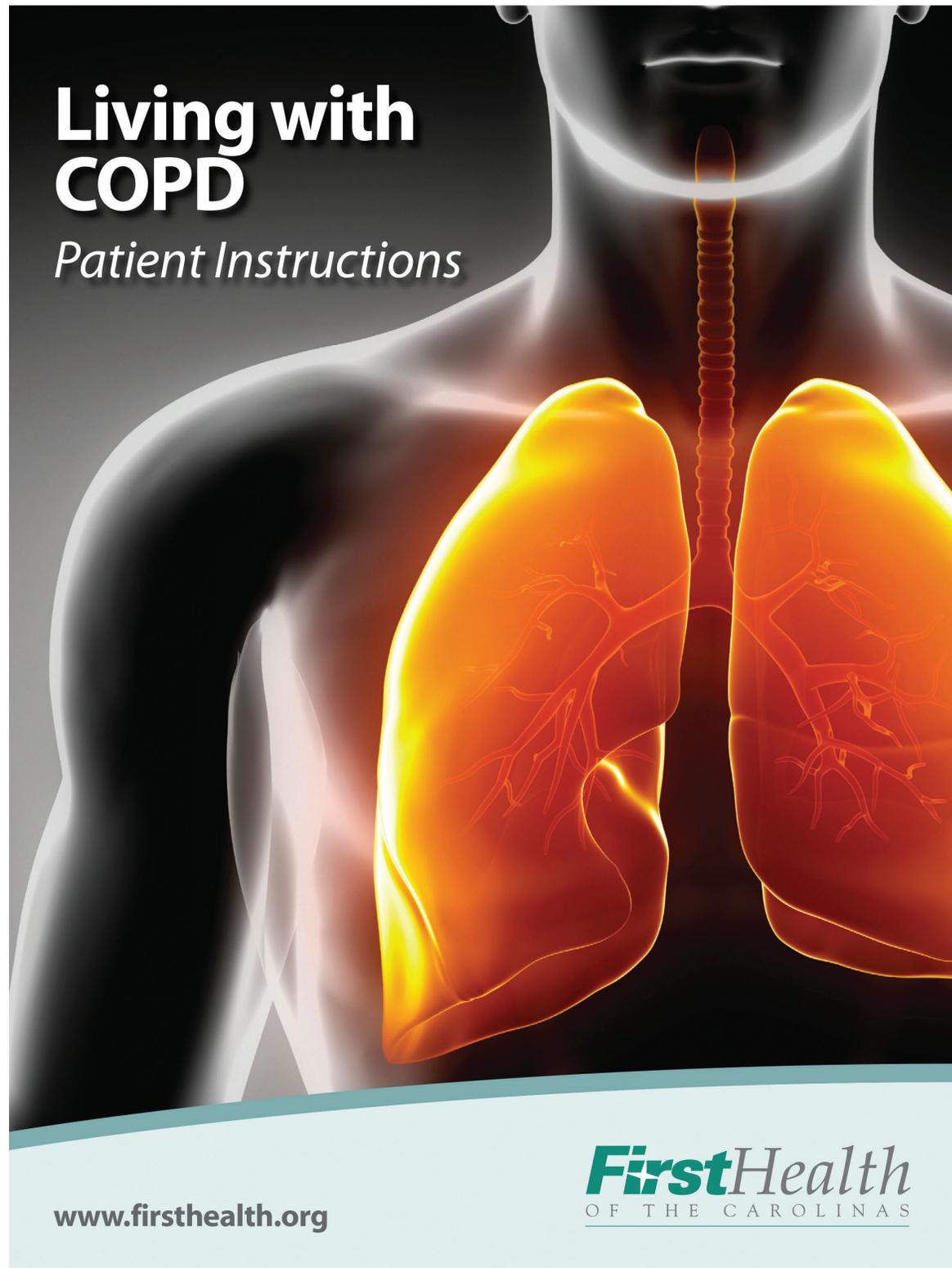
- Appropriately transitioning patients throughout the care continuum and tailoring efforts to the patient's level of activation is still a relatively new concept that requires a change in thinking
- Additional processes to ensure that patients are scheduled for and attend a postdischarge follow-up appointment with their PCP are needed to facilitate effective hospital-to-home transitions
- An executive-level champion is vital to any system effort and was the key to FirstHealth's success with this pilot
- A system-wide shared EMR database would increase the ability to smoothly transition patients throughout care settings. FirstHealth is currently implementing initial steps to participate in a state-level health information exchange to help remedy this issue

Next Steps

- Encourage increased involvement of direct patient care staff as care transition focus expands to additional patients with chronic disease
- Purchase new spirometers for use in pulmonary rehabilitation, PCP training, and rotation among onboarding PCP practices/Transitional Care Clinic
- Develop and implement an on-site spirometry training program for FirstHealth Family Care Centers/Transitional Care Clinic
- Incorporate COPD quality improvement measures into the Transitional Care Clinic EMR template
- Examine continued inpatient rounding by pulmonary rehabilitation as staffing permits or other supportive resources, such as a condition-specific patient navigator
- Consider partnership with local community college to use senior pulmonary rehabilitation students to assist in on-site training
- Consider piloting COPD rescue kits within the new Transitional Care Clinic
- Reiterate with staff the importance of scheduling PCP discharge appointments
- Examine streamlined patient education regarding inhaler use among inpatient respiratory therapy staff

Appendix

Patient Education COPD Booklet



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