



American Medical Group Association®



HealthCare Partners.

Institute for Applied Research & Education

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

HealthCare Partners Medical Group and HealthCare Partners Institute Case Study

Organization Profile

HealthCare Partners Medical Group is an accountable care organization based in southern California with a staff model that employs 500 full-time physicians, of whom 20% are specialists. These physicians are located at approximately 66 sites across Los Angeles, Pasadena/San Gabriel Valley, South Bay, Long Beach, the San Fernando and Santa Clarita Valleys, and Orange County. The group provides healthcare services to both HMO enrollees and fee-for-service patients, and has contracts with most major HMOs and PPOs servicing the greater Los Angeles area. HealthCare Partners is one of the largest single providers of prepaid healthcare for seniors in California.

The HealthCare Partners Institute for Applied Research and Education works to improve community and nationwide healthcare by conducting research in health and wellness, with a focus on managed care and benchmarking best practices. The Institute's research is designed to improve clinical outcomes and patient experience through delivery system redesign, health policy, and education.

Project Summary

Building on an existing patient-centric program of COPD management that used traditional telephonic outreach by nurses, in 2011 HealthCare Partners conducted a remote monitoring pilot using interactive voice response (IVR) technology. The goals of this telehealth initiative were to optimize clinical resources and detect exacerbations at an earlier stage to improve quality of life for patients with COPD and reduce rehospitalizations and emergency department (ED) visits. The program has been implemented in 4 regions and will be rolled out across southern California in the near future.

Program Goals and Measures of Success

COPD is an escalating health problem for individuals, their families, and the public, which results in considerable morbidity and mortality. It is expected to be the third leading cause of death by 2030, according to the World Health Organization.¹ At HealthCare Partners, the COPD population is approximately 23,000 individuals. The economic burden of COPD is considerable, with inpatient hospitalization accounting for approximately half of the per member per month (PMPM) cost. COPD is consistently one of the top 10 diseases that results in hospital admissions and readmissions of HealthCare Partners patients. Moreover, the toll of COPD can extend beyond the physical; feelings of isolation, depression, and loss of independence are common.

In 2008, HealthCare Partners launched a self-management program for patients with COPD that focused on early symptom identification and medication management for exacerbations. This program was supported by registered nurses who initially met with patients in the clinic and conducted follow up via in-person meetings and telephone to ensure patients understood their COPD self-management plan and could implement the action plan if an exacerbation occurred.

To expand clinical capacity, improve response to exacerbations, and provide new tools for patient self-management, HealthCare Partners added IVR technology to remotely monitor patients' COPD symptoms. Remote monitoring with IVR provides a consistent and regular data flow that

indicates trends and alerts the clinical team when a patient's symptoms worsen, enabling earlier intervention. This telehealth technology augments appropriate clinical support and an exacerbation protocol, and can help patients self-manage their condition and become more engaged in their health. Telehealth has the potential to reduce costly inpatient care and avoid relocation of the patient from his or her personal residence to a higher cost setting (ie, a skilled nursing facility).

Goals and objectives

- Provide clinical parameters to medical staff that help reduce chronic disease exacerbations
- Expand nursing capacity and reduce time with IVR technology so nurses can focus their face-to-face and telephonic interactions on high-risk patients
- Offer scalable, user-friendly technology that helps older adults remain in their chosen residence
- Ease the burden/stress of caregivers treating patients with chronic disease while enhancing patient satisfaction

Clinical standards

The remote monitoring program uses IVR survey responses based on COPD symptoms corresponding to green, yellow, and red zones, which indicate increasing severity. Action plans are based on the National Jewish Health Research and Science Program COPD self-management plan.²

Data collection and measurement

The IVR system used by HealthCare Partners collects survey data from patients with COPD each week and generates 4 different reports, while avoiding timely and complicated set up since patients use their own phone system.

Outcomes

- Expands clinical capacity: Because nurse care managers receive alerts regarding their patient caseload (approximately 5% of surveys trigger nurse contact), they can focus clinical efforts on higher-risk patients. Also, IVR relieves the nurses of making routine telephone calls for ongoing monitoring. The nursing capacity is ~100 patients per registered nurse
- Encourages patients to monitor their condition and recognize warning signals
- Empowers clinicians to intervene sooner, potentially avoiding hospitalization and/or ED visits

The following table represents a preliminary return on investment (ROI) analysis provided by the Center for Connected Health (Partners Healthcare, Boston, MA) and the Center for Technology and Aging (Oakland, CA).

Summary					
	Year 1	Year 2	Year 3	Year 4	Year 5
Patient Enrollment	90	268	445	623	800
Total Operating Costs	\$171,914	\$142,425	\$142,937	\$177,298	\$176,455
Total Return	\$415,776	\$1,235,779	\$2,055,782	\$2,875,785	\$3,695,789
ROI	1.42	7.68	13.38	15.22	19.94

Population Identification

HealthCare Partners uses ICD-9-CM diagnosis codes to identify patients with COPD. Patients may also be identified from certain risk indicators (to be confirmed via spirometry), such as seniors with the diagnosis of asthma, recurrent acute bronchitis, frequent use of nebulizers or refills for inhalers, or long-term use of oxygen. The current COPD patient population comprises approximately 23,000 eligible patients with COPD, of which 14,617 (70%) are ≥65 years of age.

Demographics

- Enrolled patients (active) n=121 (total of 152 since project launched)
- Gender 96 female; 56 male
- Variety of ethnicities, races, and socioeconomic classes within southern California

BODE Index stratification statistics

- BODE 4: 10 patients
- BODE 3: 19 patients
- BODE 2: 21 patients
- BODE 1: 11 patients
- No BODE Index Quartile: 91 patients

BODE=body mass index, degree of air flow obstruction, dyspnea, exercise capacity.

The breakdown by geographic HealthCare Partner regions for patients in the IVR program without a BODE is as follows

- Region 1: 27 patients
- Region 2: 5 patients
- Region 3: 7 patients
- Region 4: 5 patients
- Region 5: 19 patients
- Region 6: 28 patients

COPD registry

Disease registry of patients with COPD

- 2010: 20,357
- 2011: 23,108

The Intervention

HealthCare Partners wanted its telehealth technology to be scalable and embraced by as many older, chronically ill adults as possible. Many patients have visual, auditory, and dexterity impairment. Therefore, it was imperative that the technology be easy to use. Specifically, the goal was to avoid burdensome set up, require no battery changes, and use no monitor displays, auditory signals, voice prompts, or Internet connections that could be challenging to this patient population.

Additionally, the group opted to have patients enter their symptoms using their telephone keypads instead of speaking into a phone (used with automated speech recognition [ASR] systems) because of potential speech impairment due to wheezing that is common with patients with COPD and could obscure symptom reporting.

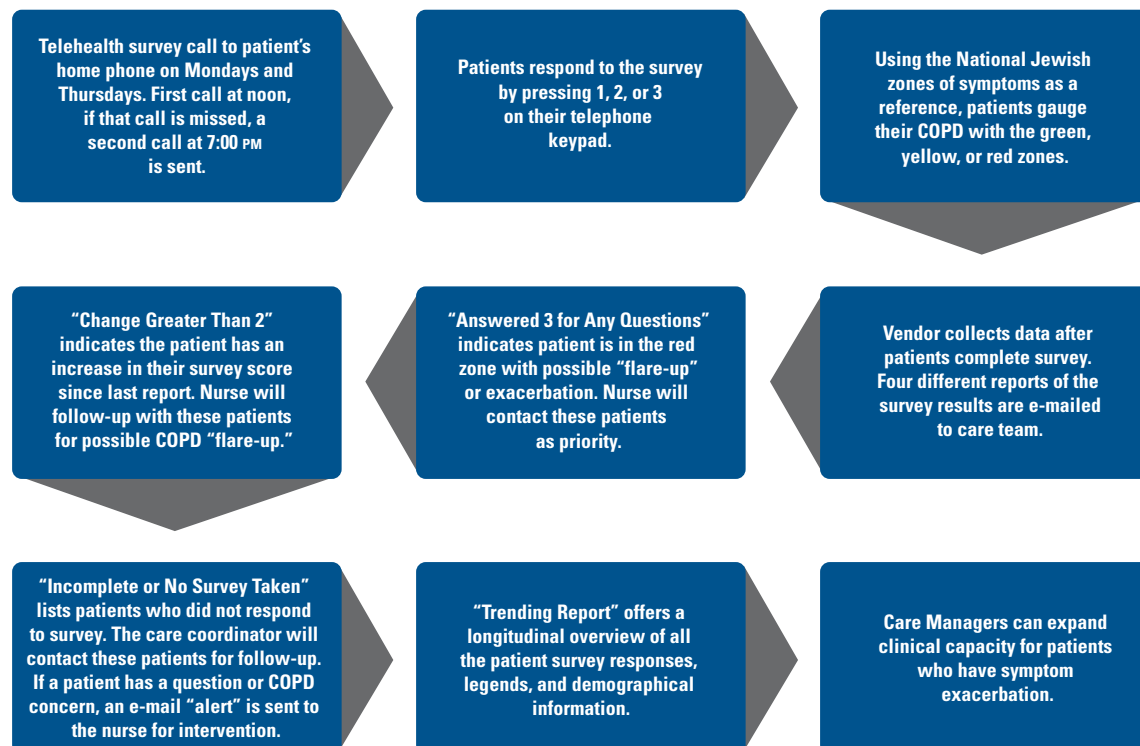
The IVR survey calls are based on COPD symptoms corresponding to green, yellow, and red zones (Figure 1). The red zone indicates an emergent situation requiring physician intervention, whereas the yellow zone indicates symptoms of lesser severity that necessitate case manager initiation of the action plan. The green zone is a baseline for the patient and does not require clinical involvement.

Patients complete the 9-question survey weekly. These individuals enter their disease symptoms based on categories of COPD exacerbations. Patients answer the questions using their telephone keypad: they press 1, 2, or 3, corresponding with the green, yellow, and red symptom zones. The calls occur at noon, and if there is no response, there is a back-up call at 7:00 PM. Patients are provided with rescue medications to help facilitate action plans for periods of acute exacerbation.

Reports from the IVR system are transmitted to the clinician in a format that allows for specific clinician action. For example, if a patient presses a 2, signifying a yellow zone, the nurse will initiate a COPD action plan, which may involve increasing the use of an inhaler, using pursed lip breathing techniques, or instruct patient to go to an urgent care center.

The reports list the patient's total score (9 to 27 total points), indicate a change greater than 2 points from the previous call, provide longitudinal trending, and flag situations where there was no answer or an incomplete survey. Clinicians use these reports for evaluation and outreach to patients with symptoms in the yellow and red zones.

Figure 1—Patient monitoring



The IVR program does not replace interactions with nurse care managers; instead, it is a value-added enhancement to COPD management. Before participating, all patients have a face-to-face meeting with their nurse care manager for assessment and education. When yellow or red zone symptoms or a change greater than 2 points are indicated during a survey, the nurse care manager initiates the appropriate action plan, which may include contacting the patient or notifying the primary care providers. However, the ability to focus their efforts on patients with flare-ups or exacerbations helps these nurses optimize their time and provide better care. Also, IVR surveys support administration of emergency prescriptions because patients are aware of their symptoms, can spot changes and exacerbations, and are prepared to take action.

Anonymous opinion surveys of patients indicated that they like the IVR technology because it is simple to use, requires little time, is not intrusive, and helps them become more aware of and involved in their own health. IVR has encouraged patients to report exacerbation symptoms via the survey calls. Previously, a patient might have been hesitant to call the nurse.

Anonymous opinion surveys of clinicians, completed every 3 months, indicate that most feel the IVR reports are easy to read and actionable, and that their patients feel more activated in their COPD care.

Workflow and staffing changes

HealthCare Partners added 1 full-time care coordinator to support the COPD telehealth program. The care coordinator serves as a liaison with clinicians, contacts patients who miss a survey or do not complete it, recruits eligible patients into the program, and conducts regularly scheduled training/meetings with care managers.

Information technology

HealthCare Partners uses the TeleVox IVR system, which is cost-effective (approximately 3 cents per call) and can be delivered in many different languages and dialects to meet patient needs.

Leadership Involvement and Support

The COPD telehealth initiative is directed by the nonprofit HealthCare Partners Institute for Applied Research and Education from a grant earned from the Center for Technology and Aging, and the Gordon and Betty Moore Foundation. The leadership team includes the director of the applied research institute, an associate medical director of the medical group (a pulmonologist), the director of disease management for the medical group, and the care coordinator. The Institute shares learning lessons and best practices with national and international audiences to promote enhanced care to older, chronically ill patients.

Lessons Learned

- Patients/family members need to know what they don't know, and then they can ask questions
- Clinical team members get answers and facilitate health enhancement with the patient at the helm
- Patients/family need to know how to monitor and treat symptom exacerbation, thereby being able to remain at their chosen residence
- Selecting the "right" patients for the patient-centered program who are prepared to take charge of their condition, learn about symptoms, and take action when clinically appropriate is important to success
- Changing the calling frequency for patient surveys from 3 calls per week to 2 calls per week had 2 positive results: patients are more inclined to answer the survey and feel it is less of an intrusion

Appendix

Stratification^{3*}

GOLD Severity	GOLD Severity FEV ₁ /FVC <0.70	Intervention	Treatment
I: Mild	<ul style="list-style-type: none"> • FEV₁ ≥80% predicted • With or without symptoms • Breathlessness when hurrying or walking up slight hill 	<ul style="list-style-type: none"> • Written materials, contact number, intake questionnaire, spirometry orders, intake clinician visit and medical education/inhaler classes, letter to physician, test MRC 	<ul style="list-style-type: none"> • Short-acting bronchodilator when needed
II: Moderate	<ul style="list-style-type: none"> • 50% ≤ FEV₁ <80% predicted • With or without symptoms • Breathlessness causing patient to stop after walking ~100 meters (or after a few minutes) on level ground 	<ul style="list-style-type: none"> • Above, in addition, home rescue pack, telephone outreach call as needed 	<ul style="list-style-type: none"> • Regular treatment with one or more bronchodilators • Rehabilitation • Add inhaled glucocorticoids if significant symptoms and lung function response or if greater than one distinct exacerbation
III: Severe	<ul style="list-style-type: none"> • 30% ≤ FEV₁ <50% predicted • With or without symptoms • Breathlessness causing patient to stop after walking ~100 meters (or after a few minutes) on level ground 	<ul style="list-style-type: none"> • Above, in addition, clinician visits and telephone calls more frequently as needed, pulmonary rehabilitation and/or intensive home-based program referral as needed, pulmonary consult if not already performed 	<ul style="list-style-type: none"> • Regular treatment with one or more bronchodilators • Treat complications • Rehabilitation • Long-term oxygen therapy • Consider surgery • Inhaled glucocorticoids if significant symptoms and lung function response or if greater than one distinct exacerbation
IV: Very Severe	<ul style="list-style-type: none"> • FEV₁ <30% predicted or presence of respiratory or right heart failure • Breathlessness resulting in patients' inability to leave the house, breathless after undressing, or presence of chronic respiratory failure or clinical signs of right heart failure 	<ul style="list-style-type: none"> • Above, in addition, clinician visits and telephone calls more frequently as needed, pulmonary rehabilitation and/or intensive home-based program referral as needed, pulmonary consult if not already performed 	<ul style="list-style-type: none"> • Regular treatment with one or more bronchodilators • Treat complications • Rehabilitation • Long-term oxygen therapy • Consider surgery • Inhaled glucocorticoids if significant symptoms and lung function response or if greater than one distinct exacerbation

*The highest level of stratification always trumps the lower.

FEV₁/FVC=forced expiratory volume in 1 second/forced vital capacity; MRC=Medical Research Council.

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