



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

University of Michigan Faculty Group Practice Case Study

Organization Profile

The University of Michigan Faculty Group Practice (FGP) was established in 1996 to combine the practice plans of 15 University of Michigan clinical departments into one integrated, multispecialty physician group. Today, FGP includes more than 1600 physicians and 1000 house officer members working in 62 specialties. Nearly 1.9 million outpatient visits were made in the 2011 fiscal year to the practice's 120 clinical locations within the southeastern Michigan and northern Ohio areas.

The University of Michigan Health System (UMHS) is currently in the process of implementing the Epic electronic medical record (EMR), to be known as MiChart. The MiChart ambulatory care, emergency department (ED), and billing and coding portions will be functional by the end of 2012. The previous UMHS-created EMR, CareWeb, will continue to be functional until the MiChart implementation is complete. Any paper documentation completed within UMHS is scanned into CareWeb and available for viewing throughout the health system.

Project Summary

The COPD Quality Improvement Project aims to improve quality of care, maximize quality of life, and reduce hospitalizations and ED visits. The template for FGP chronic disease programs, including COPD, includes developing an institutional guideline for care, measuring performance, and initiating changes in care based on observed problems and root cause analysis. The COPD project began in the fall of 2010.

The COPD Quality Improvement Steering Committee includes a pulmonary physician and quality improvement nurse (coleads), 2 primary care providers (PCPs), a respiratory therapist, a hospitalist, a data analyst, and a certified asthma nurse educator.

Program Goals and Measures of Success

Goals and objectives

FGP expanded its chronic disease programs to include COPD for several reasons

1. High readmission rates for patients with COPD (second only to congestive heart failure)
2. Regional insurer measurement of COPD indicators
3. National (Medicare) assessment of readmissions associated with COPD and other quality indicators
4. Significant interest on the part of both PCPs and pulmonologists to improve the care of patients with COPD

Original goals of the project were

- Accurate identification of patients with COPD
- Adherence to national standards of COPD care by frontline staff
- Active engagement of patients in disease self-management

These goals have been augmented with the following specifics

- Using validated registry data to measure the quality of patient care and give focus to improvement efforts

- Performing spirometry on all patients diagnosed with COPD and providing documentation in their EMR
- Providing patients with COPD with bronchodilators, influenza and pneumococcal immunizations, and documenting their tobacco use status

Clinical standards

The practice follows the UMHS COPD Clinical Care Guidelines, which are based on evidence from the following national guidelines

- The US Preventive Services Task recommendation statement for COPD screening using spirometry published in *Annals of Internal Medicine* in 2008¹
- The Clinical Efficacy Subcommittee of the American College of Physicians' 2007 publication on the diagnosis and management of stable COPD from the *Annals of Internal Medicine*²
- The 2004 *Standards for the Diagnosis and Management of Patients With COPD* from the American Thoracic Society and European Respiratory Society³
- The 2007 Global Strategy for the Diagnosis, Management, and Prevention of COPD, Executive Summary from the Global Initiative for Chronic Obstructive Lung Disease (GOLD), published in the *American Journal of Respiratory and Critical Care Medicine*. (Note that though there are more updated GOLD guidelines, they have not yet been incorporated into the Clinical Care Guidelines. The UMHS COPD Guideline group intends to complete an update once the latest COPD updates from the 2012 American Thoracic Society are available⁴)

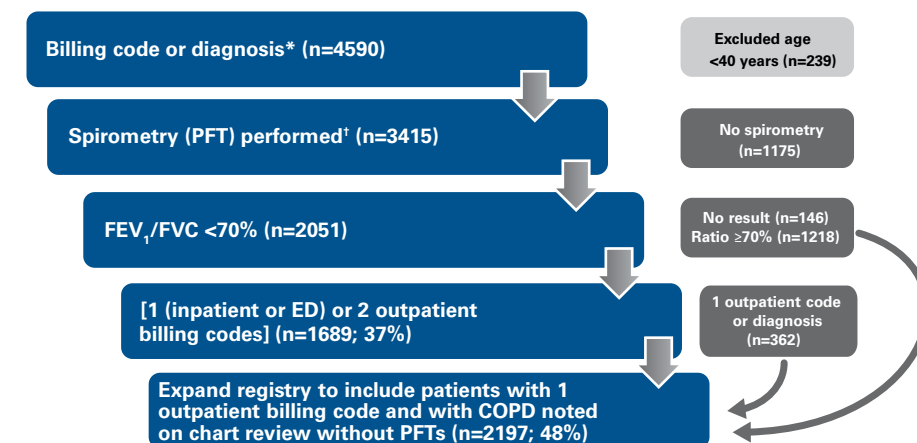
Data collection and measurement

FGP uses its COPD registry as the source of patient data.

Population Identification

As part of the UMHS, FGP has access to billing data (physician and hospital/clinic) and clinical data (problem summary list; dictated notes; tests such as spirometry if performed in central labs; facilities; and medications). The billing data are used to create the registry. The eligible population consists of established patients defined as follows (Figure 1):

Figure 1—University of Michigan COPD Registry Development



*Limited to patients seen twice in past 2 years with 1 visit in past 395 days to PCP or specialty.

†Office test or lab pulmonary functioning test within past 10 years.

The group is using administrative billing data (a combination of COPD ICD-9-CM diagnoses and CPT4 procedure codes documented on an inpatient admission, ED visit, and/or an outpatient evaluation and management visit) and clinical data (diagnosis entered in a problem summary list based on transcribed clinical notes (string text search) for COPD, chronic obstruct, emphysema, chronic bronchitis) to identify this cohort. The record is electronically examined to see if the patient has a documented spirometry test and forced expiratory volume in 1 second/forced vital capacity (FEV₁/FVC) ratio.

Demographics (as of September 2011)

- Enrolled patients n=1706
- Managed in primary care n=780
- Managed in specialty care n=485
- Jointly managed n=441

COPD registry

FGP's electronic outpatient data warehouse receives automated data feeds from the laboratory system, billing/claims data, medications, vital signs, registration/visit information, demographics, and insurance information. Also, validated automated processes are used for string text searching for pertinent clinical information (eg, diagnoses from the EMR's problem summary list, which is entered in free text and not as a codified data element). The data warehouse is automatically backed up. The warehouse now also includes preventive services data (breast cancer, cervical cancer, and colon cancer screening; and vaccinations, including influenza, pneumonia, and shingles).

Outcomes

The data that FGP gleans from its registry are used in 2 ways. One is for internal quality improvement and incentive work. Performance metrics for the patients in the registry are reported to FGP leadership and providers twice yearly. As of September 2011, the practice reported the following metrics compared with the previous March 2011 report

- Patients with an FEV₁/FVC ratio <70%: 89% (increase of 2%)
- Patients on a bronchodilator (anticholinergic, short- or long-acting beta-agonist, or methylxanthine): 86% (increase of 1%)
- Patients receiving the influenza vaccine: 65% (new metric for September 2011)
- Patients receiving the pneumococcal vaccine: 74% (increase of 1%)
- Patients with documentation of tobacco status: 76% (increase of 6%)
- Patients who are current tobacco users: 27% (unchanged)

Second, the data are used for reporting to the American Medical Group Association (AMGA) COPD Learning Collaborative. As of September 2011, FGP tracked for the collaborative previously diagnosed patients with COPD who had a COPD-related encounter in the prior 2 months (August and September 2011). For these patients, FGP reported the following

- 89% of these patients had spirometry testing
- 78% of patients with spirometry had an FEV₁/FVC ratio <70%
- 7% of these patients (FEV₁/FVC <70%) had COPD symptoms documented via billing codes in the past year
- 100% of patients with documented symptoms had been prescribed an inhaled bronchodilator (anticholinergic, short-, or long-acting beta-agonist)

The Intervention

To help healthcare providers identify patients who are not meeting chronic disease quality indicators, FGP developed a point-of-care reminder called a clinical actionable report (CAR). This was necessary because the health system has an in-house-developed EMR system that lacks the capability of providing electronic prompts for needed services. The report is populated by the registry with the patient's current data on important aspects of care that have been shown to be associated with better outcomes for chronic disease.

The report form includes

- Prompts for items for which the patient's current status is outside the goal
- Important aspects of care and patient status
- Patient's current lab values
- Potential actions (eg, current medications to change, follow-up documentation)

The CAR was originally designed and piloted using diabetes information. Physicians and staff found it so useful they requested similar reports for other conditions. However, recognizing that PCPs could receive multiple disease-specific reports with overlapping information and recommendations, FGP developed a multicondition CAR that provides information and flags for all targeted chronic diseases and preventive services (see Appendix A). The form automatically prints whenever a billing form is produced for a visit and is currently in use in many primary care clinics.

Unfortunately, COPD prompts could not be added to the CAR because of a shortage of information technology resources due to the upcoming conversion of the UMHS Epic EMR to MiChart. When MiChart goes live in August 2012, the functionality to prompt for appropriate disease-specific care will be embedded within the new system.

COPD metrics are currently communicated in twice-yearly patient status summary reports (covering January through June and July through December). These reports are prepared at the levels of the individual provider (see Appendix B), the health center, the specialty department/division, and the overall institution.

- Data regarding specific patients and reminders can help clinicians improve the effectiveness, efficiency, timeliness, and patient-centeredness of the clinical encounter
- Data on individual clinicians help assess their clinical performance and guide actions for positive recognition or assistance
- Data on health centers help identify sites with comparatively low scores and may indicate shortcomings in local systems that should be investigated and addressed (eg, staff may not routinely print out the actionable clinical reports)

Leadership involvement and support

UMHS devotes substantial resources and programs to advance quality improvement training in chronic disease for FGP. The quality improvement arm of the FGP is the Quality Management Program (QMP). The director of the QMP reports to the executive director and the board of directors of the practice and works with operational leaders in ambulatory care. Within the QMP are multidisciplinary steering committees that guide the development and execution of interventions to improve care for specific medical conditions. Each steering committee has 1 or 2 leaders who report to the director of the program. Additionally, a quality improvement nurse is provided to the committee by the health system's department of quality improvement, which funds that position. The quality improvement nurse provides chart review support, project management work, and feedback to the steering committee.

FGP's board oversees priorities for quality improvement, including (1) endorsing annual process improvement goals, (2) reviewing progress on institutional improvement objectives at designated intervals, (3) approving the list of quality indicators annually, and (4) reviewing quality indicators and patient satisfaction data.

In addition, the group received a National Asthma Control Initiative (NACI) Spirometry 360 Champions Train the Trainer program grant, which has provided spirometry educational materials, spirometry test overreading services, and logistical support for spirometry education at UMHS. The COPD Quality Improvement Steering Committee has led the charge to improve the quality of spirometry performed in the primary care setting at UMHS. This project continues to move forward with the combination of the resources of the grant and the work of the quality improvement nurse. Currently, 6 pilot sites have completed the Spirometry 360 education program led by UMHS clinicians trained by the NACI grant. These sites are beginning to perform spirometry and will be models for future spirometry education and improvements at other primary care sites.

The COPD project is supported through multiple institutional programs. The primary source of funding is FGP. The group allocates \$3,181,057 annually to primary care and targeted specialty clinics caring for patients in its chronic disease registries. The physician practice and health system explicitly decided not to pay money directly to physicians, because these efforts often focus on team-based care, and aggregating cases across multiple physicians at each health center provides a more stable population than trying to assess care for a single provider who may have a limited number of patients with a condition.

Lessons Learned

Challenges

UMHS found it challenging to rely on the use of ICD-9 codes to document COPD symptom management, as the project team felt it to be an inaccurate indicator of actual symptoms reported by patients and documented by physicians. A chart review completed by a UMHS resident physician found that the specific ICD-9 codes provided by AMGA to identify COPD exacerbations were used only 5% of the time in the documenting of symptoms in the medical record with a specificity of 98.5%. COPD symptoms were documented by the physician in the medical record in all but 2 of the 54 patients studied. It was determined that ICD-9 codes significantly underreport COPD symptoms compared with physician documentation in the medical record. The resident plans to release an abstract of his findings in the near future. Also, it was difficult getting the COPD Quality Improvement Steering Committee to meet regularly and move forward with quality initiatives. The struggle could be attributed to tight schedules and the overall newness of the group. Currently, meetings are held on a regular, monthly basis, and initiatives to improve care are progressing at a more rapid pace. In the course of its work with COPD, UMHS has learned valuable lessons. First, having nurses review patient cases to ensure the validity of the data is invaluable. The data from the registry have greater impact when they are clean and the quality issues have been substantiated with chart reviews. Second, it is important to align with champions in the clinical setting who will put energy into moving quality initiatives forward. Last, UMHS was reminded again of the importance of persisting even when improvement work stalls. This persistence pays off in valuable lessons learned and in the actual implementation of new initiatives.

Appendix A

Clinical Actionable Report

ACTIONABLE REPORT FOR:				CPI		Age 75		Registry: <input type="checkbox"/> Asthma <input type="checkbox"/> COPD* <input type="checkbox"/> CAD/Stroke <input checked="" type="checkbox"/> Diabetes <input type="checkbox"/> CHF <input type="checkbox"/> Kidney Dz* <input type="checkbox"/> Controlled Substance*				Future Appointments: GMP-CP-TC 06/06/11 PUL-BHA 06/06/11 PUL-BHA 06/06/11 RHEU-BHA 09/12/11			
Appt Date/Time: Clinic:				Today's Provider:				Patient's PCP*:							

Labs / Vitals	Weight		BP		Lab Results												Other Tests			Spirometry*				
	Date	Ibs.	Date	Result	Date	A1c	Chol	Trig	HDL	LDLC	UMA	URPT	Drug Test	EGFR	Scr	Na	K	Date	EF	NYHA	Date	FEV1	FVC	FEV1/FVC
	05/18/11	284	05/18/11	114/72	05/18/11									97	0.6	139	4.7	06/07/10	60					
	05/05/11	284	05/05/11	123/70	03/07/11									>60	0.52	140	4.5	05/14/08	70					
	03/21/11	280	04/11/11	112/56	02/23/11									97	0.6	140	4.7	08/21/02	55					
	02/23/11	280	03/21/11	118/76	02/21/11									>60	0.66	139	4.2							
	08/16/10	280	02/28/11	130/80	02/14/11									>60	0.66	139	4.4							
	06/07/10	280	02/23/11	139/85	01/21/11										0.6	138	3.5							
	05/10/10	280	02/23/11	129/85	01/20/11										0.6	136	3.6							
	04/06/10	265	02/01/11	131/79	01/19/11										0.5	137	4.0							
	03/09/10	280	12/15/10	130/77	01/18/11										0.6	138	3.6							
	01/06/10	290	10/11/10	112/72	01/17/11										0.6	134	3.8							
	12/18/09	291	09/13/10	124/64	01/16/11							NEG		82	0.7	134	4.5							
	11/09/09	270	08/16/10	132/75	01/12/11									>60	0.63	139	4.2							
	12/12/08	240	07/26/10	138/73	01/03/11							NEG												
09/29/08	250	07/06/10	144/88	09/13/10									82	0.7	140	4.4								
09/16/08	250	06/21/10	139/74	07/26/10	6.6	149		46	71															

Recommended Action Items	Labs:	<input type="checkbox"/> A1c <input type="checkbox"/> LDL-C <input type="checkbox"/> Urine Microalbumin
	Exams/Tests:	<input type="checkbox"/> Diabetic foot exam <input type="checkbox"/> Diabetic eye exam
	Medications:	
	Education:	<input type="checkbox"/> Self-management goal Comment:
	Preventive Health:	
	Immunizations:	
	Discuss/Referral:	

*Item has not been programmed yet
 This report is not intended to replace the medical record. The patient's PCP is assigned based on an algorithm and so may be different from the one listed in the medical records.
 To provide feedback to the FGP Quality Management Program (QMP) regarding this report please e-mail QMP-Feedback@med.umich.edu

Appendix B

Provider-Specific Report

UMHS COPD Registry—Provider Specific Patient List for DOCTOR

Data Current Through:

ED/OP Utilization: 4/30/2011

Remaining Elements: 6/1/2011

Patients with any FEV1/FVC < 70% or who have been clinically validated.

	N	PFT Billed	Broncho dilator Medication	Pneumo ccocal Vaccine	Tobacco Status Documented	Current Tobacco User
CLINIC	68	100%	84%	88%	94%	19%
FGP Total	1708	100%	86%	74%	76%	27%

Patients with any FEV1/FVC < 70% within the past 10 years or have been clinically validated by chart review (included in the measured rates above).

CPI	Patient Name	Age (years)	Provider Name	PSL COPD Diagnosis	Most Recent PFT Results:*			On Asthma Registry^	Broncho dilator Medication	Pneumo ccocal Vaccine	Tobacco Status Documented	Current Tobacco User
					Date	FEV1 % Predicted	FEV1/FVC					
				Y	5/3/2011	133	67			Y	Y	
					3/15/2006	93	66			Y	Y	
				Y	6/17/2011	49	45	Y	Y	Y	Y	
				Y	6/1/2010	73	65	Y		Y	Y	
				Y	2/12/2010	75	57		Y	Y		
				Y	1/3/2011	41	58		Y	Y	Y	Y
				Y	5/14/2010	88	61	Y	Y	Y	Y	
				Y	7/26/2011	60	47		Y	Y	Y	
				Y	9/12/2011	61	44		Y	Y	Y	

Patients with no PFT results but have been billed for COPD and/or have a PSL diagnosis of COPD.

CPI	Patient Name	Age (years)	Provider Name	PSL COPD Diagnosis^	Most Recent PFT Results:*			On Asthma Registry^	Broncho dilator Medication	Pneumo ccocal Vaccine	Tobacco Status Documented	Current Tobacco User
					Date	FEV1 % Predicted	FEV1/FVC					
				Y				Y	Y	Y	Y	Y
				Y					Y	Y	Y	Y
				Y					Y	Y	Y	Y
				Y							Y	Y
											Y	Y
				Y					Y	Y	Y	Y
										Y	Y	Y

References:

1. U.S. Preventive Services Task Force. Screening for chronic obstructive pulmonary disease using spirometry: U.S. Preventive Services Task Force Recommendation Statement. *Ann Intern Med.* 2008;148:529-534.
2. Qaseem A, Snow V, Shekelle P, et al; Clinical Efficacy Assessment Subcommittee of the American College of Physicians. Diagnosis and management of stable chronic obstructive pulmonary disease: a clinical practice guideline from the American College of Physicians. *Ann Intern Med.* 2007;147:633-638.
3. American Thoracic Society. Standards for the diagnosis and management of patients with COPD; 2004. <http://www.thoracic.org/clinical/copd-guidelines/resources/copddoc.pdf>. Accessed June 28, 2012.
4. Rabe KF, Hurd S, Anzueto A. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease: GOLD executive Summary. *Am J Respir Crit Care Med.* 2007;176:532-555.



Provided as an educational resource by AMGA and Boehringer Ingelheim Pharmaceuticals, Inc.

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(08/12) COPD415400MHC-J