An Evaluation of the Management of Chronic Disease by Oregon Health Plan Managed Care Plans, 2003–2004

Presented to

Oregon Department of Human Services,
Health Services, Office of Medical Assistance Programs

August 19, 2005

Presented by

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A Healthcare Quality Resource

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Executive Summary

In May 2003, the Oregon Department of Human Services, Health Services, Office of Medical Assistance Programs (OMAP), contracted with OMPRO to review the care and services provided by the fully capitated health plans (FCHPs) that participate in the Oregon Health Plan (OHP). This report, part of a series of studies performed under that contract, examines the quality of care received by OHP members with chronic conditions. The primary focus is on care for OMAP managed care (MC) enrollees. However, for purposes of comparison, the study also includes smaller samples of fee-for-service (FFS) patients, some of whom were in a disease management program and others not.

Diabetes and asthma were selected for review because of their high prevalence among the OHP population. OMAP determined that a medical chart review would be the best method to evaluate the quality of care and the management of these chronic conditions. In collaboration with OMAP, OMPRO designed the study to focus on outpatient care provided by OHP primary care providers. The study reviewed 396 charts for diabetes patients and 330 charts for asthma patients for the measurement year July 1, 2003, to June 30, 2004.

Overall, the results of the chart review study indicate that OHP healthcare providers are embedding evidence-based guidelines into daily clinical practice for disease management. Significant findings are highlighted below.

Diabetes

- 90 percent of the sample of OMAP MC enrollees with diabetes have type 2 diabetes, compared with approximately three-quarters of the FFS sample.
- More than three-quarters of MC enrollees with diabetes are clinically obese, considerably higher than the 50 percent rate found in the 2003 Behavioral Risk Factor Surveillance System (BRFSS) survey report on obesity among all Oregon adults.
- 89 percent of MC enrollees with diabetes had at least one HbA1c test in the measurement year, higher than the 2003 national Medicaid average of 74 percent. Slightly more than half of those tested have their blood sugar under optimum control.
- 74 percent of MC enrollees with diabetes received at least one screening for lipid disorders in the measurement year, in line with the national Medicaid average of 75 percent for 2003.
- 39 percent of MC enrollees with diabetes received a dilated eye exam, slightly below the national Medicaid average of 44 percent.
- 82 percent of MC enrollees with diabetes had documented self-management goals in their charts, but fewer than half had documented care plans in their charts.
- 21 percent of MC enrollees with diabetes were included in a disease management registry.

Asthma

- 86 percent of the sample of MC enrollees with asthma had a documented prescription for corticosteroid medication, whereas 98 percent had a prescription for a $beta_2$-agonist.
- About one-sixth of MC enrollees with asthma had a written asthma action plan in their chart, and a similar proportion was documented as having received a peak flow meter.

- Disease management and education were incorporated into outpatient visits for 70 percent of MC enrollees, compared with fewer than 50 percent of FFS patients.
- No enrollees with asthma were documented as being included in a disease management registry.

Introduction

Federal regulations require state Medicaid agencies to contract with an external quality review organization to provide an independent annual review of the quality outcomes, timeliness of service, and access to care provided by Medicaid managed care organizations (MCOs). In May 2003, the Oregon Department of Human Services, Health Services, Office of Medical Assistance Programs (OMAP), contracted with OMPRO to review the care and services provided by the fully capitated health plans (FCHPs) that participate in the Oregon Health Plan (OHP).

The focus of this external quality review (EQR) study is the quality of care received by OHP members with chronic conditions in managed care. The evaluation of the management of chronic disease through chart review complements other EQR studies, including the Oregon Medicaid Health Risk Health Status (HRHS) survey; the rapid cycle Comparative Assessment Reports for emergency department (ED) utilization, access to care, asthma care, and diabetes care; and the evaluation of statewide quality improvement activities by OHP MCOs.

Objectives and scope

The primary purpose of this study is to examine the care for OMAP managed care (MC) enrollees with chronic disease. Smaller samples of fee-for-service (FFS) patients who are in a disease management program (McKesson) and FFS patients who are not in a disease management program were included for comparison. This study does not provide FCHP-to-aggregate comparisons; however, it provides data that should prompt individual FCHPs to assess the preventive and maintenance services offered to their enrollees with chronic conditions.

The 13 FCHPs included in the study sample include

- CareOregon, Inc.
- Cascade Comprehensive Care, Inc.
- Central Oregon Individual Health Solutions
- Doctors of the Oregon Coast South
- Douglas County Independent Physicians Association
- FamilyCare, Inc.
- InterCommunity Health Network
- Lane Individual Practice Association
- Marion Polk Community Health Plan
- Mid-Rogue Independent Physician Association
- Oregon Health Management Services
- Providence Health Plan
- Tuality Health Alliance

Diabetes and asthma were selected for review because of their high prevalence in the OHP population. Evaluating how these diseases are being managed in the outpatient setting will highlight the areas where OMAP MCOs are promoting recommended screenings, patient education, and ongoing monitoring of care. Good outpatient care has been shown to prevent ED visits and/or inpatient admissions.

Diabetes is a serious chronic condition that can result in heart disease, blindness, amputation, kidney failure, and other debilitating or fatal conditions. In the United States, diabetes accounted for $44 billion in direct medical care costs in 1997 and an additional $54 billion in indirect costs due to disability, work loss, and premature mortality.[1] In Oregon, the prevalence of diabetes has risen from 4 percent in 1993 to 6 percent in 2003. Currently, close to 163,700 Oregonian adults have been told

[1] Centers for Disease Control and Prevention. National Diabetes Fact Sheet: National Estimate and General Information on Diabetes in the United States, 2002.

they have diabetes, and as many as another 66,900 may have the disease but not be aware that they have it.[2]

Among the OHP population, diabetes is particularly prominent. In the HRHS survey, nearly 12 percent of respondents reported having diabetes (11.6 percent), almost double the statewide prevalence of 6.3 percent in 2003, as reported in the Medicaid Behavioral Risk Factor Surveillance System (BRFSS) survey. For all age groups, the prevalence of diabetes among OHP enrollees is consistently higher than in the general population.[3]

Because diabetes and risk factors associated with complications are more common in the Medicaid population, early diagnosis and treatment are important. Control of blood glucose levels and management of dyslipidemia are helpful in preventing long-term complications. Screening for diabetic retinopathy has long been recognized as integral to good care. Providing preventive treatment can delay the onset and slow the progression of diabetic retinopathy, nephropathy, and neuropathy in patients.

Asthma is one of the most common chronic conditions in the United States. In 2001, asthma accounted for 1.9 million ED visits and 4,269 deaths in the nation. In Oregon, the prevalence of asthma has increased dramatically in the past 20 years. Statewide data show that 8.1 percent of adults report having asthma and 7.5 percent of children suffer from asthma.[4,5] The direct and indirect medical costs of this chronic condition are high: 1998 estimates indicate that asthma accounted for more than $125 million in direct and indirect costs in Oregon.[6]

The proportion of children receiving episodic primary care for this prominent, chronic childhood disease prompted an EQR focused clinical study of asthma among OHP enrollees in 1996. The results showed that, despite consistently high rates of documented treatment plans and prescriptions for beta-agonists, other quality indicators, such as administering influenza immunizations and providing education on the disease process and on proper use of medications, varied widely among the health plans. The study identified room for improvement in documenting treatment response, administering influenza immunization, providing education to patients and caregivers, assessing home smoking environments, recommending use of peak flow meters, and providing lung examinations.

According to the National Asthma Education and Prevention Program (NAEPP), asthma is readily treatable and can be managed effectively in the outpatient setting.[7] Observational studies offer evidence that inhaled steroids may decrease the risk of hospital admission by up to 50 percent.[8,9]

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[2] Oregon Diabetes Coalition. Oregon's Action Plan for Diabetes, 2005. Oregon Department of Human Services, Health Services, Oregon Diabetes Prevention and Control Program.

[3] Diabetes in the Oregon Health Plan population, 1999, updated 8/20/02. Oregon Department of Human Services, Health Services, Oregon Diabetes Prevention and Control Program.

[4] Self-reported asthma prevalence and control among adults—United States, 2001. *MMWR*. May 2, 2003 52(17);381–384.

[5] A View of Asthma in Oregon. Department of Human Services, Oregon Asthma Program. October 2001.

[6] Indicator for Quality Care in Health Systems: Guide to Improving Asthma Care in Oregon. Department of Human Services, Oregon Asthma Program. September 2002.

[7] National Heart, Lung, and Blood Institute/National Asthma Education and Prevention Program. Expert Panel Report 2: Guidelines for the diagnosis and management of asthma. In: National Institutes of Health pub. no. 97-4051. Bethesda, MD; 1997.

[8] Blais L, Ernst P, Boivin JF, et al. Inhaled corticosteroids and the prevention of readmission to hospital for asthma. *Am J Respir Crit Care Med.* 1998; 158(1):126–132.

Adherence to the guidelines for asthma management has been associated with lower admission rates. However, some admissions with asthma are unavoidable and appropriate. Environmental factors such as air pollution, occupational exposure to irritants, or other exposure to allergens have been shown to increase hospitalization rates or exacerbate asthma symptoms. Studies have shown that asthma hospitalization rates are associated with household income (at the area level) and with availability or lack of insurance (at the individual level).

The Results section of this report highlights noteworthy findings from the diabetes and asthma chart reviews, including areas where statistically significant differences were found between the MC and FFS patient samples. Appendix A arrays complete data from the diabetes and asthma chart extraction.

[9] Donahue JG, Weiss ST, Livingston JM, et al. Inhaled steroids and the risk of hospitalization for asthma. *JAMA* 1997; 277(11):887–891.

Methodology

Study design

OMAP determined that a medical chart review would be the best method to evaluate the quality of care and the management of chronic conditions. Chart abstraction was conducted onsite at 52 clinics in Oregon, whereas other records were submitted by mail. Clinic notification, onsite review, and mail-in record review were conducted over a seven-week period beginning in April 2005. Each FCHP received a list, by clinic, of the charts reviewed and the method of review.

OMAP and OMPRO designed the study to focus on care provided in the outpatient setting by the OHP primary care provider (PCP). When no PCP was assigned for a member or when a member received care from multiple providers, OMPRO determined the member's PCP by using the PCP Imputation Algorithm, developed by OMPRO for the Chronic Disease Data Clearinghouse. Appendix B shows the logic of this algorithm used to link enrollee records to PCPs.

The population was defined by diagnosis of asthma and diabetes from claims and encounter data between July 1, 2003, and June 30, 2004. Charts were selected for review through simple random sampling for both MC and FFS programs. MC sample sizes were the same for both diabetes and asthma. Table 1 shows the sample size and target number of chart reviews by program, derived from the HEDIS® program.[10] HEDIS specifies 411 as a sufficient sample size to assure data integrity. Sample sizes of less than 30 are reported with the understanding that the sample is generally too small to conduct statistical significance testing. OMPRO oversampled by 50 percent to ensure that the target of 411 charts for diabetes and for asthma would be met for the MC group.

Table 1. Sample size and chart review target for each chronic disease, by program.

	Sample	Target number of charts
MC	617	411
FFS with DM	45	30
FFS without DM	45	30

Denominator—eligible population

Enrollees were included in the study if they had been continuously enrolled in either an MC or FFS plan. Enrollment was considered continuous if the enrollee had been covered with no gaps in enrollment for six months during the measurement period by a single FCHP or under OHP FFS.

Inclusions for diabetes

To be included in the chart review for diabetes, an OHP enrollee had to have been diagnosed with the diabetes diagnosis codes or diagnosis related groups and with a combination of Current Procedural Terminology (CPT) and UB-92 revenue codes for a specific setting of care. Enrollees between 18 and 64 years old as of June 30, 2004, were included if they met one of two criteria:

- two face-to-face encounters with different dates of service in an outpatient or non-acute inpatient setting during the measurement year with a diagnosis of diabetes

or

- one face-to-face encounter in an acute inpatient setting during the measurement year

[10] HEDIS® is a registered trademark of the National Committee for Quality Assurance.

Inclusions for asthma

To be included in the chart review for asthma, an enrollee had to have been diagnosed with an ICD-9-CM code of 493* (family of 493) in the principal diagnosis and with a combination of CPT and UB-92 codes for a specific setting of care. Enrollees between 5 and 64 years old as of June 30, 2004, were included if they met one of three criteria:

- at least one ED visit during the measurement year with principal diagnosis of asthma

or

- at least one acute inpatient discharge with principal diagnosis of asthma

or

- at least four outpatient visits with asthma as a principal or secondary diagnosis

The tables in Appendix C list the specific combinations of diagnosis codes and CPT or UB-92 revenue codes that qualified enrollees for inclusion in the chart reviews for diabetes and asthma.

Exclusions

Enrollees with the following diagnoses were excluded from the study:

- gestational diabetes
- steroid-induced diabetes
- polycystic ovaries
- emphysema
- chronic obstructive pulmonary disease

See Appendix C for codes used to exclude enrollees from the chart reviews.

Data analysis

OMPRO used a t-test (normal approximation to the binomial) to determine, within each measure, which of the treatment groups—MC, FFS with disease management, and FFS without disease management—differed significantly from each other. Because of the limited sample size for FFS patients, statistical comparisons of MC and FFS patients could not be calculated in most cases. In some instances, benchmark HEDIS data were available to compare state and FCHP performance with national Medicaid performance rates. These benchmark comparisons, however, were not used in the analysis of statistical differences.

To determine inter-rater reliability, 10 patients were selected randomly for each condition and their charts were reviewed by three reviewers. To assess the overall consensus among the raters, the Kappa coefficient of agreement was calculated.[11] Landis and Koch (1977) attempted to indicate the degree of agreement that exists when Kappa is found to be in various ranges:[12]

0	Poor
0.0–0.2	Slight
0.2–0.4	Fair
0.4–0.6	Moderate
0.6–0.8	Substantial
0.8–1.0	Almost perfect

[11] Rosner B. *The Fundamentals of Biostatics.* 5th ed. Pacific Grove, CA: Duxbury; 2000:408.
[12] Landis JR, Koch GG. The measurement of observer agreement for categorical data. *Biometrics.* 1977;33(1):159–174.

Eleven points of contention for diabetes and 10 points of contention for asthma were used to determine the Kappa coefficients.

The reviewers' ratings exhibited statistically significant agreement (a=0.05, p=0.001). The computed Kappa coefficient for diabetes (K=.76) indicated substantial agreement among reviewers. The Kappa coefficient for asthma (K=.81) indicated an almost perfect level of agreement.

Results

A total of 396 charts were reviewed for the diabetes study and 330 charts for the asthma study, fewer than the desired goal of 411 charts for each sample. Identifying PCPs for the asthma sample and receiving requested charts for the diabetes sample proved challenging.

An evaluation of the data revealed that 177 enrollees, or 24 percent of the asthma sample, received only an ED visit in the measurement year, with no follow-up visit to a PCP. The NAEPP guidelines recommend that a patient with asthma be seen by a PCP within one month after an ED visit for asthma. Effectively, all patients except those who had an ED visit within the last month of the study period did not receive follow-up according to guidelines. In comparison, the HRHS survey found that almost 20 percent of respondents with current asthma said they had visited an ED or urgent care center in the previous 12 months. Given that the study design included only non-ED outpatient chart review, the 177 enrollees were not included in this study.

Table 2. Completed chart reviews for diabetes.

		Records reviewed		Records not reviewed	
	Total sample	**#**	**% of total**	**#**	**% of total**
MC	617	345	56.0	272	44.0
FFS with DM	45	27	60.0	18	40.0
FFS without DM	45	24	53.0	21	47.0
Total	**707**	**396**	**56.0**	**311**	**44.0**

Table 3. Completed chart reviews for asthma.

		Records reviewed		Records not reviewed	
	Total sample	**#**	**% of total**	**#**	**% of total**
MC	617	286	46.0	331	54.0
FFS with DM	45	29	64.0	16	36.0
FFS without DM	45	15	33.0	30	67.0
Total	**707**	**330**	**47.0**	**377**	**53.0**

Diabetes

The American Diabetes Association (ADA) reports that type 2 diabetes is the most common form of diabetes today. Figure 1 displays the findings from this study, showing that 90 percent of the sample of OMAP MC enrollees with diabetes have type 2 diabetes.

Prevention plays an important role in type 2 diabetes, which often has a relatively long asymptomatic period. The onset of type 2 diabetes is estimated to occur up to 10 years before clinical diagnosis. Some people do not realize they have the disease until a serious complication develops. By the time many adults are diagnosed with diabetes, they already have signs of diabetic eye disease or other complications. If not controlled, both type 1 and type 2 diabetes can lead to serious complications, including cardiovascular disease, blindness, neuropathy, and kidney damage.

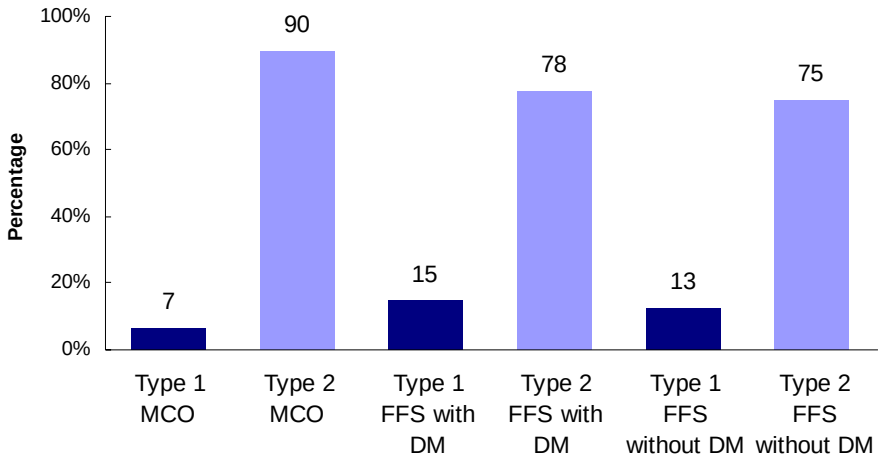

Figure 1. Percentage of identified diabetes types within OMAP population, by program.

Of considerable concern is the link between obesity and diabetes. The risk of developing type 2 diabetes increases with age, obesity, and lack of physical activity. OMPRO calculated enrollees' Body Mass Index (BMI) based on the height and weight information collected from the charts. Figure 2 shows that more than three-quarters of MC enrollees with diabetes are clinically obese (BMI ≥30). The findings for this sample are considerably higher than those of the 2003 Oregon BRFSS report on obesity among Oregon adults, including adults with diabetes. The BRFSS study found that 21.5 percent of all Oregon adults were obese, and more than 50 percent of adults with diabetes were obese. Differences between the MC sample and the two FFS groups are not significant.

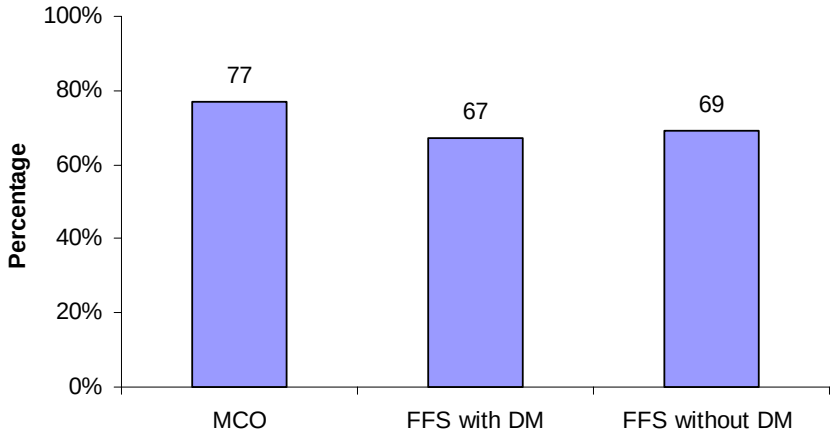

Figure 2. Percentage of diabetes patients with BMI ≥30, by program.

Decision support

The ADA recommends that people with diabetes have a HbA1c test at least twice a year. Study findings show that 89 percent of MC enrollees with diabetes had at least one HbA1c test in the measurement year. This rate is unchanged from the 2000 EQR study rate of 89 percent. OHP results are quite favorable compared to the 2003 national Medicaid average of 73.9 percent. Analysis

found that the current study rate of 89 percent increased when analysts augmented the chart review data with claims and encounter data to produce a hybrid rate of 93 percent. Table 4 shows that slightly more than half of those tested are in optimum control with HbA1c values ≤7.0.

Table 4. HbA1c values of MC enrollees (D=308).

	# at control level (N)	% at control level
≤7.0 (under control)	157	51
7.1–7.5	29	10
7.51–8.0	30	10
8.01–8.5	17	6
8.51–9.0	18	6
9.01–9.5	15	5
9.51–10.0	10	3
>10.0	28	9

LDL cholesterol

The ADA recommends that adults with diabetes be tested for lipid disorders at least annually and more often if needed to achieve goals with diabetes. Nearly three-quarters (74 percent) of MC enrollees received at least one low-density lipoprotein (LDL) screening in the measurement year. The national Medicaid average for measurement year 2003 was 74.8 percent. Augmenting the chart review data with claims and encounter data yielded a rate of 77 percent.

Eye exam

Screening for diabetic retinopathy is recommended for both type 1 and type 2 diabetes. The ADA recommends that patients with type 1 diabetes have an initial dilated and comprehensive eye examination by an ophthalmologist or optometrist within three to five years after the onset of diabetes. For people with type 2 diabetes, screening is recommended shortly following their diagnosis. The study found that 39 percent of MC enrollees with diabetes received a dilated eye exam. This rate is slightly lower than the 2003 national Medicaid average of 44 percent.

Flu vaccine

According to the Centers for Disease Control and Prevention, people with diabetes have a significantly greater risk of dying from pneumonia and flu. The ADA strongly recommends annual flu vaccines for those with diabetes. Nearly one-half (49 percent) of the FCHP enrollees received a flu shot. Patients have multiple opportunities to obtain flu vaccinations (for example, at pharmacies), and this rate reflects only those vaccinations documented in the outpatient medical record.

Self-management practices

Several study indicators address self-management behaviors. As shown in Figure 3, the study found that 57 percent of MC enrollees with diabetes controlled their condition with oral medication. Results are similar to those of the self-reported 2004 HRHS survey, in which 63 percent of respondents with diabetes said they used oral medication to manage their condition. The pattern of management by oral medication is consistent with the distribution of type 2 diabetes within the OMAP population.

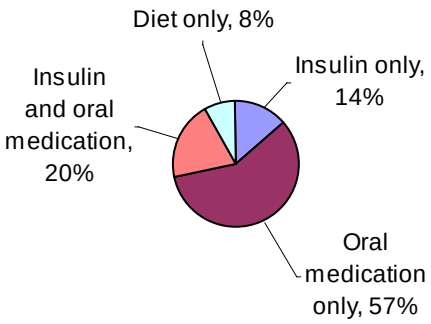

Figure 3. Diabetes management methods of MC enrollees.

Care plans

Self-management education includes traditional patient education but also involves helping patients set achievable goals and learn techniques of problem solving that may improve their outcomes and quality of life. Eighty-two percent of MC enrollees with diabetes had documented self-management goals in their charts. However, less than half of the MC sample had documented care plans in their charts (see Table 5). Written care plans are a valuable tool to inform patients how to become effective managers of their own health.

Table 5. Percentage of diabetes patients with care plan in medical chart, by program.

	Total # of reviews (D)	# with care plan (N)	% with care plan
MC	345	158	46 *
FFS with DM	27	9	33
FFS without DM	24	6	25

* Percentage is statistically significantly higher than the FFS without DM sample at p<0.05.

Smoking prevalence

About one-third (34 percent) of MC enrollees with diabetes smoke. Study findings are lower than the HRHS survey rate of 42 percent smoking prevalence. Nearly two-thirds (64 percent) of those with diabetes who smoke were advised to quit by their practitioner, and 33 percent were offered nicotine replacement therapy (NRT) and/or cessation counseling.

Clinical information systems

A comprehensive clinical information system can enhance the care of individual patients by providing timely reminders about needed services and summarized data to track and plan care. At the practice population level, a clinical information system identifies groups of patients who need additional care and facilitates performance monitoring and quality improvement efforts.
The study found that 21 percent of MC enrollees with diabetes were included in a disease management registry. The presence of registries may be a result of the two year-long statewide Oregon Diabetes Collaboratives.

Asthma

Decision support

NAEPP guidelines recommend that all people with persistent asthma be treated with a daily inhaled corticosteroid and a short-acting beta$_2$-agonist. Eighty-six percent of the MC sample had a documented prescription for corticosteroid medication, whereas 98 percent had a prescription for a beta$_2$-agonist. The results are quite favorable and demonstrate that providers are incorporating evidence-based guidelines into the management of patients with asthma. However, the contrast with the 2003 FCHP performance measurement rate of 64 percent and the national Medicaid average of 64 percent suggests a disparity between the number of prescriptions written, as documented in the medical records, and the number of prescriptions filled by patients, as documented by pharmacy claims data.

Self-management practices

NAEPP guidelines recommend a written asthma action plan (AAP) for all patients diagnosed with asthma. One-sixth (16 percent) of the MC enrollees had an AAP in their chart. A recent study found that optimal self-management, when it included a written AAP, led to a significant reduction in hospitalizations for asthma-related illnesses.[13] The AAP helps to inform patients about managing their daily medications, self-monitoring practices, symptom awareness, and any restriction of activities.

Another indicator of quality asthma care is peak flow monitoring. Seventeen percent of MC enrollees were documented as having received a peak flow meter. A recent study that emphasized peak flow monitoring found that patients with the intervention had significantly fewer direct medical costs, fewer unscheduled outpatient visits, and fewer work days missed because of asthma-related illnesses, as well as a significantly better quality of life.[14,15]

Table 6 shows that disease management and education were incorporated into outpatient visits for 70 percent of MC enrollees, compared with less than 50 percent of FFS patients. Documented disease management included at least one element of patient teaching or instruction regarding management of asthma. Specific instructions regarding asthma triggers and self-management goals were measured separately in this study. More than one-third (37 percent) of MC enrollees received trigger education, whereas 69 percent had a documented self-management goal.

[13] Gibson PG, Coughlan J, Wilson AJ, et al. The effects of limited (information-only) asthma education on health outcomes of adults with asthma. *Cochrane Database Syst Rev.* 2002;(2):CD001005.

[14] Lahdensuo A, Haahtela T, Herrala J, et al. Randomised comparison of guided self management and traditional treatment of asthma over one year. *BMJ.* 1996;312:748–752.

[15] Lahdensuo A, Haahtela T, Herrala J, et al. Randomised comparison of cost effectiveness of guided self management and traditional treatment of asthma in Finland. *BMJ.* 1998;316:1138–1139.

Table 6. Percentage of asthma patients with education on disease management, by program.

	Total # of reviews (D)	# with education (N)	% with education
MC	286	199	70 *
By age:			
5 to 17	*114*	*85*	*75*
18 to 64	*172*	*114*	*66*
FFS with DM	29	14	48
FFS without DM	15	6	40

* Percentage is statistically significantly higher than those of the FFS samples at p<0.05.

Smoking prevalence

Fifty percent of adult MC enrollees with asthma smoke. Nearly three-quarters (74 percent) of these enrollees were advised to quit by their practitioner, whereas 36 percent were offered NRT and/or cessation counseling. Study findings are consistent with the HRHS survey rate of 50 percent smoking prevalence for enrollees with asthma.

Clinical information systems

The study found no documented evidence that enrollees with asthma were included in a disease management or asthma management registry. Incorporating a registry into a provider practice is a valuable tool for identifying and tracking patients and transforming a reactive visit into a proactive, planned visit. Registries can remind providers of needed services, represent feedback on performance of both the clinic and the provider, and serve as a source of up-to-date information for encounters.

Discussion and Recommendations

Improving care for people with chronic conditions in the current healthcare delivery system presents challenges to providers. Providers are doing their best, but too often the systems in which they work make it difficult to provide good care. For example, 95 percent of patients with diabetes get care from PCPs in the context of episodic acute care, in response to an exacerbation or complication of the disease (reactive care).[16] This reactive approach to treating the chronically ill has resulted in patients receiving recommended and appropriate care in only half of all cases.[17]

Many providers are learning that moving from a system of reactive care to a planned care approach is an effective method to improve outcomes for their patients. The Chronic Care Model developed by Ed Wagner and colleagues at the MacColl Institute for Healthcare Innovation[18] presents a tested framework to help providers improve care for people with chronic conditions like asthma and diabetes. The model, made up of six elements—community resources, health organization, self-management support, delivery system design, decision support, and clinical information systems—strengthens interactions between patients and providers to produce better care and improved outcomes.

Decision support involves embedding evidence-based guidelines into daily clinical practice. The OMAP study findings demonstrate that Oregon providers are doing this in many areas of disease management. The HbA1c testing rate of 89 percent for MC enrollees with diabetes is well above the 2003 national Medicaid average of 73.9 percent, and 86 percent of MC enrollees with asthma had a documented prescription for a corticosteroid.

Taking decision support to the next level and sharing evidence-based guidelines and information with patients to encourage their participation would be the ideal approach to disease management. Again, study findings reveal that this approach is beginning to happen in both asthma and diabetes management. Disease management education occurred for 70 percent of MC enrollees with asthma, and 82 percent of enrollees with diabetes had a documented self-management goal.

A critical element of the Chronic Care Model that tends to emerge more slowly is implementation of clinical information systems. Experts agree that effective care for chronic illness is virtually impossible without information systems that assure ready access to key data on individual patients as well as on populations of patients.[19] Twenty-one percent of MC enrollees with diabetes were part of a disease management registry; in contrast, no enrollees with asthma were in a registry.

The study results indicate that many providers provide excellent disease management for OHP enrollees. MCOs have an opportunity to improve the quality of disease management through their disease management programs and performance improvement projects. Numerous best-practice examples, both locally and nationally, demonstrate improved outcomes of care by integrating one or more elements of the Chronic Care Model.

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[16] Institute for Healthcare Improvement. Commentary from expert host David K. McCulloch, MD, FRCP, Group Health Cooperative of Puget Sound. Available online at http://www.ihi.org/IHI/Topics/ChronicConditions/Diabetes/DiabetesExpertHostDavidMcCulloch.htm. Accessed July 21, 2005.

[17] McGlynn EA, Asch SM, Adams J, et al. The quality of health care delivered to adults in the United States. *N Engl J Med.* 2003;348(26):2635–2645.

[18] Wagner EH, Austin BT, Von Korff M. Organizing care for patients with chronic illness. *Milbank Q*. 1996;74(4):511–544.

[19] Greenlick MR. The emergence of population-based medicine. *HMO Pract*. 1995 Sep;9(3):120–122.

Appendix A. Data Tables from Diabetes and Asthma Chart Extraction

Index of tables

Table A-1. Diabetes charts not reviewed, by program.

Reason not reviewed	MC	FFS with DM	FFS without DM	Total
Patient does not have diabetes	14	0	1	**15**
Patient has gestational diabetes	1	0	0	**1**
Unable to locate the chart	8	0	0	**8**
Not the clinic's patient	48	1	1	**50**
No outpatient visit	77	2	5	**84**
No chart received	87	13	14	**114**
Other	24	2	0	**26**
No PCP	13	0	0	**13**
Total	**272**	**18**	**21**	**311**

Table A-2. Diabetes types of enrollees, by program.

	Type I		Type II		Unable to determine		Total reviews
	#	%	#	%	#	%	
MC	23	7	309	90	13	4	345
FFS with DM	4	15	21	78	2	7	27
FFS without DM	3	13	18	75	3	13	24
Total	**30**	**8**	**348**	**88**	**18**	**5**	**396**

Table A-3. Percentage of diabetes patients with height and weight measurement, by program.

	Total # of reviews (D)	# with measurement (N)	% with measurement
% with documented height			
MC	345	222	64
FFS with DM	27	15	56
FFS without DM	24	13	54
Total	**396**	**250**	**63**
% with documented weight			
MC	345	335	97
FFS with DM	27	26	96
FFS without DM	24	24	100
Total	**396**	**385**	**97**

Table A-4. Calculated Body Mass Index (BMI) for diabetes patients with documented height and weight.

	# with height and weight (D)	# with BMI calculated (N)	% with BMI calculated
MC			
BMI <18.5	220	1	0
BMI 18.5 to 24.9	220	17	8
BMI 25.0 to 29.9	220	32	15
BMI ≥30	220	170	77
FFS with DM			
BMI <18.5	15	0	0
BMI 18.5 to 24.9	15	3	20
BMI 25.0 to 29.9	15	2	13
BMI ≥30	15	10	67
FFS without DM			
BMI <18.5	13	0	0
BMI 18.5 to 24.9	13	1	8
BMI 25.0 to 29.9	13	3	23
BMI ≥30	13	9	69

Table A-5. Diabetes management methods of enrollees, by program.

	Insulin only		Oral meds only		Insulin and oral meds		Diet only		Unable to determine		Total reviews
	#	%	#	%	#	%	#	%	#	%	
MC	49	14	197	57	68	20	29	8	2	1	345
FFS with DM	5	19	10	37	7	26	3	11	2	7	27
FFS w/o DM	8	33	7	29	6	25	1	4	2	8	24
Total	**62**	**16**	**214**	**54**	**81**	**20**	**33**	**8**	**6**	**2**	**396**

Table A-6. Percentage of diabetes patients with annual LDL screening, by program.

	Total # of reviews (D)	# with screening (N)	% with screening
MC	345	257	74
FFS with DM	27	21	78
FFS without DM	24	14	58
Total	**396**	**292**	**74**
Of those who had LDL checked:			
MC			
LDL value ≥130	257	67	26
LDL value <130 and not 0	257	169	66
LDL under control (<100 and not 0)	257	97	38
Triglycerides too high	257	21	8
FFS with DM			
LDL value ≥130	21	4	19
LDL value <130 and not 0	21	13	62
LDL under control (<100 and not 0)	21	8	38
Triglycerides too high	21	4	19
FFS without DM			
LDL value ≥130	14	3	21
LDL value <130 and not 0	14	11	79
LDL under control (<100 and not 0)	14	5	36
Triglycerides too high	14	0	0

Table A-7. Percentage of diabetes patients on cholesterol medication, by program.

	Total # of reviews (D)	# with medication (N)	% with medication
MC	345	174	50
FFS with DM	27	15	56
FFS without DM	24	16	67
Total	**396**	**205**	**52**

Table A-8. Percentage of diabetes patients screened for microalbuminuria, by program.

	Total # of reviews (D)	# screened (N)	% screened	# not screened (N)	% not screened
MC	345	239	69	106	31
FFS with DM	27	18	67	9	33
FFS without DM	24	13	54	11	46
Total	**396**	**270**	**68**	**126**	**32**

Table A-9. Percentage of diabetes patients with annual (visual) foot exam, by program.

	Total # of reviews (D)[a]	# with exam (N)	% with exam
MC	342	233	68
FFS with DM	27	20	74
FFS without DM	24	15	63
Total	**393**	**268**	**68**

[a] Excludes patients with bilateral below knee amputation.

Table A-10. Percentage of diabetes patients with documented foot exam with monofilament, by program.

	Total # of reviews (D)[a]	# with exam (N)	% with exam
MC	343	120	35
FFS with DM	27	15	56*
FFS without DM	24	5	21
Total	**394**	**140**	**36**

[a] Excludes patients with bilateral below knee amputation.
* Percentage is statistically significantly higher than the MC and FFS without DM samples at p<0.05.

Table A-11. Percentage of diabetes patients with annual dilated retinal eye exam, by program.

	Total # of reviews (D)[a]	# with exam (N)	% with exam
MC	344	135	39
FFS with DM	27	10	37
FFS without DM	23	9	39
Total	**394**	**154**	**39**

[a] Excludes patients with blindness.

Table A-12. Percentage of diabetes patients with care plan in medical chart, by program.

	Total # of reviews (D)	# with plan (N)	% with plan
MC	345	158	46 *
FFS with DM	27	9	33
FFS without DM	24	6	25
Total	**396**	**173**	**44**

* Percentage is statistically significantly higher than the FFS without DM sample at p<0.05.

Table A-13. Percentage of diabetes patients with care plan adapted to meet cultural needs, by program.

	Total # of reviews (D)	# with plan adapted (N)	% with plan adapted
MC	158	18	11
FFS with DM	9	1	11
FFS without DM	6	0	0
Total	**173**	**19**	**11**

Table A-14. Percentage of diabetes patients in a disease management registry, by program.

	Total # of reviews (D)	# in registry (N)	% in registry
MC	345	74	21
FFS with DM	27	3	11
FFS without DM	24	2	8
Total	**396**	**79**	**20**

Table A-15. Percentage of diabetes patients with a documented self-management goal, by program.

	Total # of reviews (D)	# with goal (N)	% with goal
MC	345	282	82
FFS with DM	27	23	85
FFS without DM	24	19	79
Total	**396**	**324**	**82**

Table A-16. Percentage of diabetes patients (age ≥40) taking aspirin, by program.

	Total # of reviews (D)	# taking aspirin (N)	% taking aspirin
MC	289	152	53
FFS with DM	25	14	56
FFS without DM	22	12	55
Total	**336**	**178**	**53**

Table A-17. Percentage of diabetes patients with annual flu shot, by program.

	Total # of reviews (D)	# with shot (N)	% with shot
MC	345	169	49
FFS with DM	27	9	33
FFS without DM	24	7	29
Total	**396**	**185**	**47**

Table A-18. Percentage of diabetes patients who smoke, by program.

	Total # of reviews (D)	# who smoke (N)	% who smoke
MC	345	118	34
FFS with DM	27	12	44
FFS without DM	24	5	21
Total	**396**	**135**	**34**

Table A-19. Percentage of diabetes patients who smoke who were advised to quit, by program.

	Total # of reviews (D)	# advised to quit (N)	% advised to quit
MC	118	75	64
FFS with DM	12	7	58
FFS without DM	5	1	20
Total	**135**	**83**	**61**

Table A-20. Percentage of diabetes patients who smoke who were offered nicotine replacement therapy, by program.

	Total # of reviews (D)	# offered therapy (N)	% offered therapy
MC	118	30	25
FFS with DM	12	1	8
FFS without DM	5	0	0
Total	**135**	**31**	**23**

Table A-21. Percentage of diabetes patients who smoke who were offered cessation counseling, by program.

	Total # of reviews (D)	# offered counseling (N)	% offered counseling
MC	118	9	8
FFS with DM	12	1	8
FFS without DM	5	0	0
Total	**135**	**10**	**7**

Table A-22. Percentage of diabetes patients with annual HbA1c screening, by program.

	Total # of reviews (D)	# with screening (N)	% with screening
MC	345	308	89
FFS with DM	27	23	85
FFS without DM	24	20	83
Total	**396**	**351**	**89**

Table A-23. Enrollees' HbA1c values, by program.

	# at control level (N)	% at control level
MC (D=308)		
≤7.0 (under control)	157	51
7.1-7.5	29	10
7.51-8.0	30	10
8.01-8.5	17	6
8.51-9.0	18	6
9.01-9.5	15	5
9.51-10.0	10	3
>10.0	28	9
FFS with DM (D=23)		
≤7.0 (under control)	10	43
7.1-7.5	1	4
7.51-8.0	3	13
8.01-8.5	4	17
8.51-9.0	2	9
9.01-9.5	0	0
9.51-10.0	1	4
>10.0	1	4
FFS without DM (D=20)		
≤7.0 (under control)	15	75
7.1-7.5	4	20
7.51-8.0	0	0
8.01-8.5	0	0
8.51-9.0	1	5
9.01-9.5	0	0
9.51-10.0	0	0
>10.0	0	0

Table A-24. Asthma charts not reviewed, by program.

Reason not reviewed	MC	FFS with DM	FFS without DM	Total
Patient does not have asthma	10	0	2	12
Unable to locate the chart	11	0	0	11
Not the clinic's patient	42	0	3	45
No outpatient visit	32	0	0	32
No chart received	42	7	11	60
Other	6	2	1	9
No PCP	188	7	13	208
Total	**331**	**16**	**30**	**377**

Table A-25. Percentage of asthma patients with daily inhaled steroid, by program.

	Total # of reviews (D)	# with steroid (N)	% with steroid
MC	286	245	86
FFS with DM	29	21	72
FFS without DM	15	13	87
Total	**330**	**279**	**85**
MC By age:			
5 to 17	*114*	*88*	*77*
18 to 64	*172*	*157*	*91*
Total	***286***	***245***	***86***

Table A-26. Percentage of asthma patients with rescue medication, by program.

	Total # of reviews (D)	# with medication (N)	% with medication
MC	286	279	98
FFS with DM	29	29	100
FFS without DM	15	15	100
Total	**330**	**323**	**98**
MC By age:			
5 to 17	*114*	*112*	*98*
18 to 64	*172*	*167*	*97*
Total	***286***	***279***	***98***

Table A-27. Percentage of asthma patients with a peak flow meter, by program.

	Total # of reviews (D)	# with meter (N)	% with meter
MC	286	50	17
FFS with DM	29	5	17
FFS without DM	15	4	27
Total	**330**	**59**	**18**
By age:			
5 to 17	*114*	*23*	*20*
18 to 64	*172*	*27*	*16*
Total	***286***	***50***	***17***

Table A-28. Percentage of asthma patients with documented education on peak flow meter, by program.

	Total # of reviews (D)	# with education (N)	% with education
MC	50	27	54
FFS with DM	5	4	80
FFS without DM	4	1	25
Total	**59**	**32**	**54**
By age:			
5 to 17	*23*	*15*	*65*
18 to 64	*27*	*12*	*44*
Total	***50***	***27***	***54***

Table A-29. Percentage of asthma patients with documented education on asthma triggers, by program.

	Total # of reviews (D)	# with education (N)	% with education
MC	286	105	37
FFS with DM	29	10	34
FFS without DM	15	4	27
Total	**330**	**119**	**36**
By age:			
5 to 17	*114*	*48*	*42*
18 to 64	*172*	*57*	*33*
Total	***286***	***105***	***37***

Table A-30. Percentage of asthma patients with home smoking environment, by program.

	Total # of reviews (D)	# with home smoking (N)	% with home smoking
MC	286	59	21
FFS with DM	29	5	17
FFS without DM	15	2	13
Total	**330**	**66**	**20**
MC By age:			
5 to 17	*114*	*38*	*33*
18 to 64	*172*	*21*	*12*
Total	***286***	***59***	***21***

Table A-31. Percentage of asthma patients with education on disease management, by program.

	Total # of reviews (D)	# with education (N)	% with education
MC	286	199	70*
FFS with DM	29	14	48
FFS without DM	15	6	40
Total	**330**	**219**	**66**
MC By age:			
5 to 17	*114*	*85*	*75*
18 to 64	*172*	*114*	*66*
Total	***286***	***199***	***70***

* Percentage is statistically significantly higher than the FFS with DM sample at p<0.05.

Table A-32. Percentage of asthma patients with care plan or treatment plan in chart, by program.

	Total # of reviews (D)	# with plan (N)	% with plan
MC	286	45	16
FFS with DM	29	8	28
FFS without DM	15	1	7
Total	**330**	**54**	**16**
By age:			
5 to 17	*114*	*27*	*24*
18 to 64	*172*	*18*	*10*
Total	***286***	***45***	***16***

Table A-33. Percentage of asthma patients with care plan adapted to meet cultural needs, by program.

	Total # of reviews (D)	# with plan adapted (N)	% with plan adapted
MC	45	8	18
FFS with DM	8	0	0
FFS without DM	1	0	0
Total	**54**	**8**	**15**
MC By age:			
5 to 17	*27*	*8*	*30*
18 to 64	*18*	*0*	*0*
Total	***45***	***8***	***18***

Table A-34. Percentage of asthma patients in a disease management registry, by program.

	Total # of reviews (D)	# in registry (N)	% in registry
MC	286	0	0
FFS with DM	29	0	0
FFS without DM	15	0	0
Total	**330**	**0**	**0**
MC By age:			
5 to 17	*114*	*0*	*0*
18 to 64	*172*	*0*	*0*
Total	***286***	***0***	***0***

Table A-35. Percentage of asthma patients with documented self management goal, by program.

	Total # of reviews (D)	# with goal (N)	% with goal
MC	286	198	69
FFS with DM	29	18	62
FFS without DM	15	8	53
Total	**330**	**224**	**68**
MC By age:			
5 to 17	*114*	*85*	*75*
18 to 64	*172*	*113*	*66*
Total	***286***	***198***	***69***

Table A-36. Percentage of asthma patients with annual flu shot, by program.

	Total # of reviews (D)	# with shot (N)	% with shot
MC	286	107	37
FFS with DM	29	8	28
FFS without DM	15	5	33
Total	**330**	**120**	**36**
MC By age:			
5 to 17	*114*	*45*	*39*
18 to 64	*172*	*62*	*36*
Total	***286***	***107***	***37***

Table A-37. Percentage of asthma patients who smoke, by program.

	Total # of reviews (D)	# who smoke (N)	% who smoke
MC	286	92	32
FFS with DM	29	6	21
FFS without DM	15	2	13
Total	**330**	**100**	**30**
MC By age:			
5 to 17	*114*	*6*	*5*
18 to 64	*172*	*86*	*50*
Total	***286***	***92***	***32***

Table A-38. Percentage of asthma patients who smoke who were advised to quit, by program.

	Total # of reviews (D)	# advised to quit (N)	% advised to quit
MC	92	68	74
FFS with DM	6	2	33
FFS without DM	2	2	100
Total	***100***	***72***	***72***
MC By age:			
5 to 17	*6*	*5*	*83*
18 to 64	*86*	*63*	*73*
Total	***92***	***68***	***74***

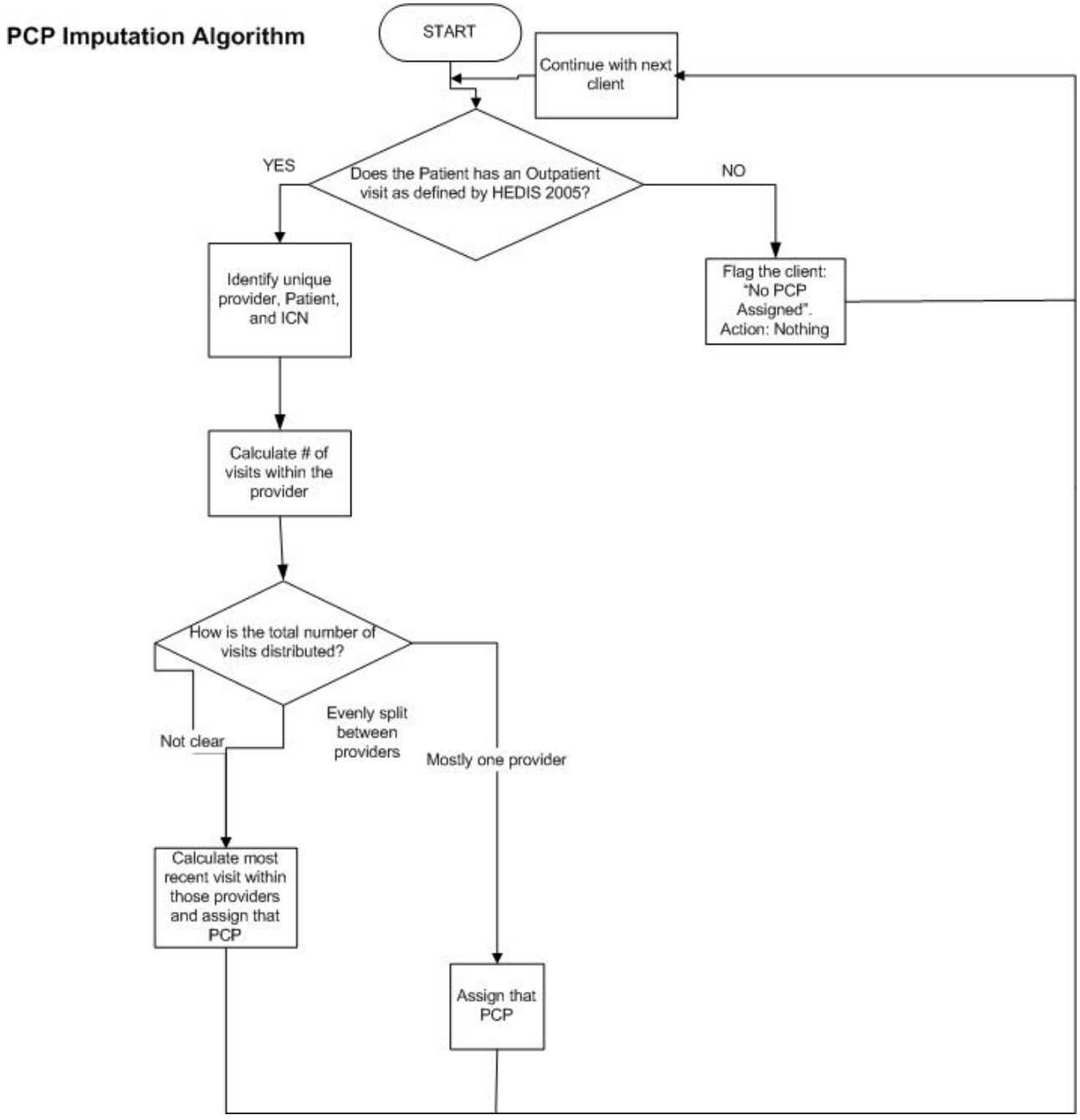
Table A-39. Percentage of asthma patients who smoke who were offered nicotine replacement therapy, by program.

	Total # of reviews (D)	# offered therapy (N)	% offered therapy
MC	92	24	26
FFS with DM	6	2	33
FFS without DM	2	2	100
Total	**100**	**28**	**28**
MC By age:			
5 to 17	*6*	*0*	*0*
18 to 64	*86*	*24*	*28*
Total	***92***	***24***	***26***

Table A-40. Percentage of asthma patients who smoke who were offered cessation counseling, by program.

	Total # of reviews (D)	# offered counseling (N)	% offered counseling
MC	92	8	9
FFS with DM	6	0	0
FFS without DM	2	1	50
Total	**100**	**9**	**9**
MC By age:			
5 to 17	*6*	*1*	*17*
18 to 64	*86*	*7*	*8*
Total	***92***	***8***	***9***

Appendix B. PCP Imputation Algorithm



Appendix C. Code Combinations for Inclusion in and Exclusion from Chart Reviews

Table C-1 shows the possible code combinations and settings of care for including enrollees with diabetes.

Table C-2 shows the possible code combinations and settings of care for including enrollees with asthma.

Tables C-3 and C-4 show the diagnosis codes for excluding these enrollees.

Table C-1. Diagnosis, procedure, and revenue code combinations for including OHP enrollees in the chart review for diabetes.

Diabetes diagnosis codes		Outpatient, or non-acute inpatient, codes		Acute inpatient codes	
ICD-9-CM (in any position of the diagnosis) 250, 357.2, 362.0, 366.41, 648.0	AND	**CPT codes** 92002–92014, 99201–99205, 99211–99215, 99217–99220, 99241–99245, 99271–99275, 99301–99303, 99311–99313, 99321–99323, 99331–99333, 99341–99355, 99384–99387, 99394–99397, 99401–99404, 99411, 99412, 99420, 99429, 99499	*or* **UB–92 revenue codes** 19X, 456, 49X–53X, 55X–59X, 65X, 66X, 76X, 77X, 82X–85X, 88X, 92X, 94X, 96X, 972–979, 982–986, 988, 989	**CPT codes** 99221–99223, 99231–99233, 99238–99239, 99251–99255, 99261–99263, 99291–99292, 99356–99357	*or* **UB–92 revenue codes** 10X–16X, 20X–22X, 80X, 987

or

DRGs		Outpatient, or non-acute inpatient, codes		Acute inpatient codes	
294, 295	AND	**CPT codes** 92002–92014, 99201–99205, 99211–99215, 99217–99220, 99241–99245, 99271–99275, 99301–99303, 99311–99313, 99321–99323, 99331–99333, 99341–99355, 99384–99387, 99394–99397, 99401–99404, 99411, 99412, 99420, 99429, 99499	*or* **UB–92 revenue codes** 19X, 456, 49X–53X, 55X–59X, 65X, 66X, 76X, 77X, 82X–85X, 88X, 92X, 94X, 96X, 972–979, 982–986, 988, 989	**CPT codes** 99221–99223, 99231–99233, 99238–99239, 99251–99255, 99261–99263, 99291–99292, 99356–99357	*or* **UB–92 revenue codes** 10X–16X, 20X–22X, 80X, 987

Table C-2. Diagnosis, procedure, and revenue code combinations for including OHP enrollees in the chart review for asthma.

Asthma diagnosis codes		Outpatient codes		
ICD-9-CM (in principal diagnosis) 493* (family of 493)	AND	**CPT codes** 99201–99205, 99211–99215, 99217–99220, 99241–99245, 99271–99275	*or*	**UB-92 revenue codes** 456,510,515517,520,521,523,526,76X,770,779,982, 983,988
		or		
		Acute inpatient codes		
		CPT codes 99221–99223,99231–99233, 99238, 99239, 99251–99255, 99261–99263, 99291, 99292, 99356, 99357	*or*	**UB-92 revenue codes** 10X–16X, 20X–22X, 72X, 80X, 987
		or		
		ED codes		
		CPT codes 99281–99285, 992883q	*or*	**UB-92 revenue codes** 450, 451, 452, 459, 981

Table C-3. Diagnosis codes for excluding OHP enrollees from the chart review for diabetes.

Diagnosis, in any position of the diagnosis	ICD-9-CM code or codes
Gestational diabetes	648.8
Steroid-induced diabetes	251.8, 962.0
Polycystic ovaries	256.4

Table C-4. Diagnosis codes for excluding OHP enrollees from the chart review for asthma.

Diagnosis	ICD-9-CM code or codes
Emphysema	492, 506.4, 518.1, 518.2
Chronic obstructive pulmonary disease	491.20, 491.21, 496, 506

Appendix D. Chart Abstraction Tools for Diabetes and Asthma

Diabetes Abstract

Review time frame: July 1, 2003–June 30, 2004

Pre-populated information: Patient ID# (from enrollment data), last name, first name, DOB, diagnosis (diabetes), clinic name

Table D-1. Diabetes abstract questions.

Question	Options	Instructions
Record not reviewed	1. Patient does not have diabetes 2. Unable to locate chart 3. Not our patient 4. No visits during review timeframe 5. No chart received 6. Other_____	"Other" might include patient deceased If a patient has both diabetes and asthma, review only for the diagnosis selected for review
1. Record the patient's most recent height	Height: ____inches	
2. Record the patient's most recent weight	Weight: _____pounds	
3. What type diabetes does the patient have?	1. Type I 2. Type II 3. unable to determine	As documented in the chart
4. How does the patient control the diabetes?	1. Insulin only 2. Oral meds only 3. Insulin and oral meds 4. Diet only 5. Unable to determine	Medication sheet and encounter notes
5. Is there a lab test for LDL for the time period 7/1/03 to 6/30/04?	1. Yes 2. No	If there is only one value and no date, answer "no"
6. If "yes" to Question 5, enter all LDL test dates for the time period 7/1/03 to 6/30/04	1. LDL date 1: _____ 2. LDL date 2: _____ 3. LDL date 3: _____ 4. Etc.	
7. Enter the value of the last (most recent) LDL	1. Last LDL value _____	Must have a date to determine most recent
8. Is the patient on an anti-hypercholesterolemia drug?	1. Yes 2. No	Lipid-lowering drugs—see drug list; use PDR to look up drugs if needed
9. If "no" to Question 8, give the reason	1. contraindication documented 2. no explanation 3. other_____	"Other" may be an LDL <100; on another drug
10. Is there a lab test for HbA1c during the time period 7/1/03 to 6/30/04?	1. Yes 2. No	If there is only one value and no date, answer "no"

Question	Options	Instructions
11. If "yes" to Question 10, enter all HbA1c test dates for the time period 7/1/03 to 6/30/04	1. HbA1c date 1: _____ 2. HbA1c date 2: _____ 3. HbA1c date 3: _____ 4. Etc.	
12. Enter the value of the last (most recent) HbA1c	1. Last HbA1c value _____	Must have a date to determine most recent
13. Was urine checked for protein and/or albumin?	1. Yes 2. No 3. Unable to determine	Look for UA in labs or note in encounter visits
14. Is there a diagnosis of current nephropathy documented?	1. Yes 2. No	
15. Was blood pressure taken at least once from 7/1/03 to 6/30/04?	1. Yes 2. No	
16. What were the last 2 blood pressure readings?	Systolic 1_____ Diastolic 1_____ Systolic 2_____ Diastolic 2_____	Use the two MOST recent values, even if BP taken more than once in the same encounter visit
17. Were the feet visually examined at least once from 7/1/03 to 6/30/04?	1. Yes 2. No 3. n/a: bilateral BKA	
18. Was neuropathy assessed at least once—a documented foot exam with monofilament?	1. Yes 2. No 3. n/a: bilateral BKA	
19. Was a dilated retinal eye exam done from 7/1/03 to 6/30/04?	1. Yes 2. No 3. n/a: blindness	
20. Is the patient on aspirin?	1. Yes 2. No 3. Contraindication documented	Medication sheet or encounter note
21. Was there a documented flu shot or documentation that the patient received a flu shot?	1. Yes 2. No	Medication sheet or encounter note
22. Does the patient smoke?	1. Yes 2. No 3. Unable to determine	
23. If the patient smokes, was the patient advised to quit smoking?	1. Yes 2. No	Must be a clear statement, not inferred
24. Was the patient offered nicotine replacement therapy to assist with quitting smoking?	1. Yes 2. No	Answer this question independently of the answer to Question 20

Question	Options	Instructions
25. Was the patient offered counseling, classes, or a treatment program to assist with quitting smoking?	1. Yes 2. No	Answer this question independently of the answer to Question 20
26. Is there a separate care plan or treatment plan in the chart?	1. Yes 2. No	
27. Is there documentation that the plan of care is culturally adapted? (language, foods, etc.)	1. Yes 2. No	Look for progress notes regarding interpreter services, dietary consultations or diet instruction forms in patient's language. If the reviewer cannot determine, answer "no"
28. Is there documentation of self-management goals?	1. Yes 2. No	
29. Is there documentation that the patient is in a diabetes registry?	a. Yes b. No	

Asthma Abstract

Review time frame: July 1, 2003–June 30, 2004

Pre-populated information: Patient ID# (from enrollment data), last name, first name, DOB, diagnosis (asthma), clinic name

Table D-2. Asthma abstract questions.

Question	Options	Instructions
Record not reviewed	1. Patient does not have asthma 2. Unable to locate chart 3. Not our patient 4. No visits during review timeframe 5. No chart received 6. Other	Select appropriate response. If "Other," make a notation on the review list. ("Other" might be patient deceased)
1. Was the patient prescribed a daily inhaled steroid?	1. Yes 2. No	See Appendix A
2. Was the patient prescribed a rescue medicine?	1. Yes 2. No	See Appendix B
3. Does the patient have a peak flow meter?	1. Yes 2. No	Select "yes" or "no." If "no," skip to Question 5
4. If the patient has a peak flow meter, is there documentation of patient education re: peak flow meter?	1. Yes 2. No 3. n/a	Look at the asthma action plan, medication list, or progress notes
5. Is there documentation of patient education re: asthma triggers?	1. Yes 2. No	Look at the asthma action plan, initial H&P, or progress notes
6. Is there documentation of patient education re: disease management?	1. Yes 2. No	Is there an asthma action plan form in the record? Is there a progress note regarding patient teaching?
7. Is there documentation of patient education re: home smoking environment?	1. Yes 2. No	Look for a cover sheet listing allergies and other pertinent patient data, the initial H&P, or progress notes
8. Does the patient smoke?	1. Yes 2. No 3. Unable to determine	Look on the asthma action plan, a health summary form, initial H&P, or progress notes. If "no," skip to Question 12
9. If the patient smokes, was the patient advised to quit smoking?	1. Yes 2. No	Look for the asthma action plan, medication list, initial H&P, or progress notes
10. Was the patient offered nicotine replacement therapy to assist with quitting smoking?	1. Yes 2. No	Look for the asthma action plan, medication list, initial H&P, or progress notes

Question	Options	Instructions
11. Was the patient offered counseling, classes, or a treatment program to assist with quitting smoking?	1. Yes 2. No	Look for the asthma action plan, initial H&P, progress notes, consult forms or letters from specialists or treatment programs. Questions 10 and 11 stand alone—Question 9 may be a "no" and the provider may still offer 10 or 11.
12. Was there a documented flu shot or documentation that the patient received a flu shot?	1. Yes 2. No	Medication sheet, immunization record, or note in encounter visit
13. Is there a separate care plan or treatment plan in the chart?	1. Yes 2. No	Is there a specific asthma action plan, care plan, or treatment plan form? If "no," skip to Question 15
14. If there is a separate care plan, is there documentation that the plan of care is culturally adapted? (language, foods, etc.)	1. Yes 2. No	Check the asthma action plan. Look for progress notes regarding interpreter services, dietary consultations or diet instruction forms in patient's language. If unable to determine, answer "no"
15. Is there documentation of self-management goals?	1. Yes 2. No	Look for the asthma action plan, treatment/care plan, or progress note regarding this discussion
16. Is there documentation that the patient is in a chronic disease or asthma registry?	1. Yes 2. No	This may be in the physician's progress note, nurse's or other support staff's note, or a computer printout of registry data

Appendix E. Data Elements Used in Chronic Disease Management Study

Diabetes

Table E-1. Diabetes data elements for analysis.

Variable	Type	Notes
NmbrPePrimId	Character	Unique ID for demographics
NameRecip1st	Character	First name
NameRecipMidInit	Character	Middle initial
NameRecipLast	Character	Last name
DateBrth	Date	Format: mm/dd/yyyy
NmbrSsnPer	Character	Social Security number
CodeSex	Character	Gender
CodeRace	Character	Ethnicity
CodeLangSpk	Character	Language spoken
PlanName	Character	Assign last enrolled plan name or number. If number is assigned, provide OMAP with the description of that number.
NmbrIdPlan	Character	F=FFS, H=Managed care
CodeRptEligProg	Character	OHP Standard or OHP Plus
DiseaseManagementFlag	Character	Possible values and their meanings: Yes=This enrollee is in the McKesson disease management program Blank=No or N/A (this field applies only to FFS clients)
AddrMailRecip1stLine	Character	Member address 1
AddrMailRecip2ndLine	Character	Member address 2
AddrMailRecipCity	Character	Member city
AddrMailRecipSt	Character	Member state
AddrResZip	Character	Member ZIP code
CodeCntyFipsRes	Character	
DateCovPhpBeg	Date or Text	If date: mm/dd/yyyy
DateCovPhpEnd	Date or Text	If date: mm/dd/yyyy

Asthma

Table E-2. Asthma data elements for analysis.

Variable	Type	Notes
NmbrPePrimId	Character	Unique ID for demographics
NameRecip1st	Character	First name
NameRecipMidInit	Character	Middle initial
NameRecipLast	Character	Last name
DateBrth	Date	Format: mm/dd/yyyy
NmbrSsnPer	Character	Social Security number
CodeSex	Character	Gender
CodeRace	Character	Ethnicity
CodeLangSpk	Character	Language spoken
PlanName	Character	Assign last enrolled plan name or number. If number is assigned, provide OMAP with the description of that number.
NmbrIdPlan	Character	F=FFS, H=Managed care
CodeRptEligProg	Character	OHP Standard or OHP Plus
DiseaseManagementFlag	Character	Possible values and their meanings: Yes=This enrollee is in the McKesson disease management program Blank=No or N/A (this field applies only to FFS clients)
AddrMailRecip1stLine	Character	Member address 1
AddrMailRecip2ndLine	Character	Member address 2
AddrMailRecipCity	Character	Member city
AddrMailRecipSt	Character	Member state
AddrResZip	Character	Member ZIP code
CodeCntyFipsRes	Character	
DateCovPhpBeg	Date	Format: mm/dd/yyyy
DateCovPhpEnd	Date	Format: mm/dd/yyyy