ABSTRACT

BACKGROUND: Pay for performance (P4P) is a business model in which health plans pay provider organizations (medical groups) financial incentives based on attainment of clinical quality, patient experience, and use of information technology. The California P4P program is the largest P4P program in the United States and represents a potential revenue source for all participating medical groups. The clinical specifications for the California P4P program are based on the National Committee for Quality Assurance (NCQA), Health Plan Employer Data, and Information Set (HEDIS), and each clinical measure has its own benchmark. In 2005, participating medical groups were paid on the basis of 9 clinical measures that were evaluated in the 2004 measurement year. The cholesterol testing measure represented 4.44%-7.14% of the total P4P dollars available to participating medical groups from the health plans.

OBJECTIVES: To (1) compare the percentage of medical group members aged 18 to 75 years with diabetes (type 1 or type 2) who received a low-density lipoprotein cholesterol (LDL-C) test and attained LDL-C control (<130 mg per dl) after enrolling in a chronic disease care management (CDCM) program with similar members managed by routine care, and to (2) assess the potential effect of CDCM on the quality performance ranking and financial reimbursement of a medical group reporting these measures in the 2004 California P4P measurement year.

METHODS: This is a retrospective database review of electronic laboratory (lab) values, medical and hospital claims, and encounter data collected between January 1, 2003 and December 31, 2004 at 1 California medical group comprising 160 multispecialty providers. Requirements were continuous patient enrollment in 1 of the 7 health plans participating in P4P during the measurement year (2004) with no more than 1 gap in enrollment of up to 45 days. Patients aged 18 to 75 years were included in the diabetes cholesterol measure (denominator) if they had at least 2 outpatient encounters coded for a primary, secondary, or tertiary diagnosis of diabetes (International Classification of Diseases, Ninth Revision, Clinical Modification code 250.xx, 357.2, 362.0, 366.41, 648.0) or 1 acute inpatient (Diagnosis Related Group code 294 or 295) or emergency room visit for diabetes. Lab values were obtained from multiple sources, including archived lab databases during the same measurement period (numerator). The CDCM program provided education and recommendations for diet, lifestyle, and medication modification delivered by a multidisciplinary team of nurses, pharmacists, and dieticians, and this intervention was compared with routine care for patients not enrolled in the CDCM program.

RESULTS: Of the 54,000 health plan members enrolled in this medical group under capitated reimbursement, 1,859 patients (3.4%) met the California P4P specifications for eligibility for the diabetes cholesterol measures and were evaluated. Of these, 8.9% (165/1,859) were followed by the California P4P program and 91.1% (1,694/1,859) by routine care. The LDL-C lab testing rate for patients in the CDCM program was 91.5% (151/165), and the LDL-C goal attainment rate in the CDCM program was 98.2% (129/129) compared with 67.8% (1,148/1,694) and 55.7%, respectively, for routine care ($P < 0.001 for both comparisons). If the LDL-C lab testing and goal attainment rates for the CDCM group were compared with rates for peer medical groups, this medical group would have scored in the 75th and 90th percentiles, respectively, corresponding to an annual revenue potential of $28,512 for this medical group if the total incentive payment from the health plan was $1 per member per month (PMPM), or $57,024 if the total incentive P4P payment was $2 PMPM.

CONCLUSIONS: Preliminary data from 165 patients with diabetes managed in a CDCM program in a medical group operating under a small P4P financial incentive showed higher rates of LDL-C lab testing and goal attainment than from patients managed by routine care. Had these rates of LDL-C testing and goal attainment achieved in the CDCM program been extended to the entire P4P population with diabetes, this medical group would have generated incentive payments under the P4P program and ranked higher in publicly available quality scores.

KEYWORDS: Pay for Performance, Lipid management, Diabetes, Chronic Disease Care Management

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What is already known about this subject

- Pay for Performance (P4P) programs alone have not been shown to improve quality of care.
- Chronic disease care management (CDCM) programs have reportedly attained high rates of low-density lipoprotein cholesterol (LDL-C) testing (96.7%-97.3%) and goal LDL-C <100 mg per dl. (56.3%-83.3%) for patients with diabetes, but the study methods have lacked patient randomization.

What this study adds

- This is the first study to show the potential impact that CDCM may have on the P4P rankings and financial payouts for a medical group.

Pay for performance (P4P) is a business model by which health plans pay provider organizations (medical groups) for consistently demonstrating high levels of quality performance based on established criteria. The results of the P4P clinical measures are publicly available and are often discussed during contract negotiations between medical groups and health plans. California has the largest and most comprehensive P4P program; however, P4P programs exist nationwide. In fact, a recent survey demonstrated that most health plans that offer commercial health maintenance organization (HMO) products...
in metropolitan areas use P4P in their medical group contracts.\(^5\)

The Integrated Healthcare Association (IHA) is the statewide leadership group that developed and coordinates the California P4P process. According to IHA, the purpose of the California P4P initiative is to create a business model that financially rewards quality performance through a standardized measurement set.\(^6\) Clinical measures, patient satisfaction, and the ability of the medical group to integrate information technology into patient care are the criteria for payment in the California P4P model.\(^1,4\)

Currently, Aetna, Blue Cross of California, Blue Shield of California, CIGNA, Health Net, PacifiCare, and Western Health Advantage participate in the California P4P initiative.\(^1,4,7\)

In 2004, the California P4P program payments were weighted 40% for up to 9 clinical measures; 40% for patient satisfaction, as determined by the consumer assessment survey comprising 16 primary questions; and 20% for information technology, assessed by the ability of each medical group to integrate clinical electronic datasets for both population management and clinical decision making at the point of care.\(^6,7\)

The health plan provides payment on the basis of a dollar amount per member per month (PMPM) that is calculated in addition to the contracted PMPM amount for the delivery of care to members in the medical group.\(^7\) The medical group may receive incentive incremental P4P financial payment for scoring in any of the 3 category measures (clinical, patient experience, or information technology) and any number of the individual measures (i.e., as few as 1 of the possible 9 clinical measures) as long as the medical group scores in the appropriate percentile ranking as determined by the health plan.\(^7\)

The data for the 2004 measurement year were not reported until May 27 of the 2005 reporting year.\(^4,6\) IHA then compiled the 2004 report data and submitted final information to the health plans by July 2005. Health plans had until the end of 2005 to pay the participating medical groups on the basis of their performance in 2004. This timeline contributed to significant delays in the availability of final P4P reporting numbers and final payment to the medical group.

The amount paid to the medical group varies by each health plan that participates in the California P4P program. The payment amount is determined from the medical group’s score in the 20th to 50th percentile (depending on the health plan) or higher when compared with a statewide benchmark of California medical groups.\(^6\) In the first 5 years of the P4P program, more than $145 million in incentive payments was distributed to 210 medical groups, representing 35,000 providers and more than 7 million commercial HMO members in California, or an amount that averaged less than $1 PMPM.\(^1,6,8\)

Few published studies have evaluated the effect of P4P incentive payments on improvements in clinical quality.\(^9,10\) Medical groups participating in the California P4P initiative may increase revenue if consistent quality performance can be demonstrated for any of the 9 clinical measures and/or the nonclinical measures. The clinical specifications for the California P4P program are based on the National Committee for Quality Assurance (NCQA) Health Plan Employer Data and Information Set (HEDIS), and each clinical measure has its own benchmark (see Table 1).\(^1,4\)

Of the 11 possible clinical measures in the 2004 California P4P initiative, 4 were based on comprehensive diabetes care, making diabetes care the most heavily weighted of the clinical measures.\(^4\) Although 11 clinical measures are listed in IHA specifications for the 2004 measurement year, the cholesterol measures for cardiovascular disease and for diabetes low-density lipoprotein cholesterol (LDL-C) measures are combined for reporting and payment purposes (see Table 1; measures 1 and 3 are combined for payment purposes).\(^4\) The reason for the combined reporting of the diabetes cholesterol measure with the cardiovascular cholesterol measure is the extremely low reported numbers for the cardiovascular cholesterol clinical specifications.\(^4\)

All 11 clinical measures are included in the reporting of clinical quality to IHA, but plans may pay the medical group on only some or none of the clinical measures. For example, Health Net paid participating medical groups on 9 of the 11 possible clinical measures, while the remaining 6 health plans that participate in the California P4P initiative provided payment to medical groups on 7 of the 11 possible clinical measures.\(^7\)

The diabetes care measures not only evaluate the medical group’s ability to obtain laboratory values for glycosylated hemoglobin (A1C) and LDL-C for target patients, but also the medical group’s ability to attain goal A1C and LDL-C levels for its health plan members, as established by the California P4P initiative and HEDIS criteria.\(^6\) Under the comprehensive diabetes care clinical measures for the 2004 measurement year, goal levels for A1C were defined as <9% and for LDL-C as <130 mg per dL.\(^4\) Current practice guidelines from the American Diabetes Association and the National Cholesterol Education Program Adult Treatment Panel III (NCEPATP III) established goal A1C levels of <7% and LDL-C levels of <100 mg per dL for the treatment of diabetes and dyslipidemia, respectively.\(^11,12\)

All 7 health plans provided payout to medical groups for the diabetes testing measures in 2005 (2004 measurement year).

Mercy Medical Group (MMG) is a 160-provider, multispecialty medical group with clinics throughout the greater Sacramento area. MMG is affiliated with Catholic Healthcare West (CHW) Medical Foundation and the CHW Mercy Hospitals in the Sacramento region. The 7 HMOs that contract with MMG on the basis of capitation reimbursement represent approximately 54,000 of the total (52%) of about 104,000 health plan members; the remaining 50,000 health plan members (48%) receive care under fee-for-service contracts. All 7 HMOs that contract with MMG participate in the California P4P initiative. MMG has participated in the California P4P initiative since 2003 and began self-reporting P4P clinical measures in the 2004 measurement year (2005 reporting year).

MMG has been using the Mercy Heart Institute’s chronic disease
### Evaluation of the Relationship Between a Chronic Disease Care Management Program and California Pay-for-Performance Diabetes Care Cholesterol Measures in One Medical Group

#### TABLE 1 2005 California Pay for Performance (P4P) Clinical Specifications (2004 Measurement Year) and Weights for Health Plan Incentive Payments*

<table>
<thead>
<tr>
<th>Clinical Measure</th>
<th>Description</th>
</tr>
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</table>
| 1. Diabetes care LDL-C measurement and goal attainment† (counts as 2 independent measures) [4.44%-7.14%] | The percentage of enrolled members aged 18-75 years with diabetes (type 1 and type 2) who had:  
- LDL-C testing during the measurement year or the year prior to the measurement year.  
- LDL-C control <130 mg per dL during the measurement year or the year prior to the measurement year. |
| 2. Diabetes care A1C measurement and poor control (counts as 2 independent measures) [4.44%-7.14%] | The percentage of members aged 18-75 years with diabetes (type 1 and type 2) who had:  
- 1 or more hemoglobin A1C tests conducted during the measurement year.  
- hemoglobin A1C poor control >9%. |
| 3. Cholesterol management LDL-C testing and goal attainment† (counts as 2 independent measures) [0%] | The percentage of members aged 18-75 years as of December 31 of the measurement year who were discharged alive in the year prior to the measurement year for acute myocardial infarction, coronary artery bypass graft, or percutaneous transluminal coronary angioplasty and who had each of the following between 60 and 365 days after discharge:  
- LDL-C test  
- LDL-C <130 mg per dL. |
| 4. Childhood immunization status [4.44%-7.14% for MMR and VZV rates only] | The percentage of enrolled children who turned 2 years old during the measurement year who were identified as having completed 1 or more of the following antigen series by the time period specified and by their second birthday:  
- 4 DTaP/Dt  
- 3 IPV/OPV  
- 1 MMR  
- 3 H influenza type B  
- 3 hepatitis B  
- 1 chicken pox vaccine. Each antigen or antigen series is calculated and reported separately. |
| 5. Breast cancer testing [4.44%-7.14%] | The percentage of women aged 50-69 years who had a mammogram during the measurement year or year prior to the measurement year. |
| 6. Cervical cancer testing [4.44%-7.14%] | The percentage of women aged 18-64 years who received one or more Pap tests during the measurement year or the 2 years prior to the measurement year. |
| 7. Chlamydia testing for women [4.44%-7.14%] | The percentage of women aged 16-25 years who were identified as sexually active and who had at least 1 test for chlamydia during the measurement year. |
| 8. Use of appropriate medication for people with asthma [4.44%-7.14%] | The percentage of enrolled members aged 5-56 years during the measurement year who were identified as having persistent asthma during the year prior to the measurement year and who were appropriately prescribed medication during the measurement year. |

Adapted from the Integrated Health Care Association P4P 2004 Measurement Year/2005 Reporting and Payment Year Clinical Specifications.5,7  
* All of the descriptions and data presented here are labeled 2005 clinical measure specifications that pertain to the 2004 measurement year from January 1, 2004, through December 31, 2004. These clinical measures account for 40% of total incentive payments to medical groups for health plans.  
† The range of payment varies by health plan. The majority of plans paid 5.71% ± 7 clinical measures (40%). The minimum payment of 4.44% × 9 clinical measures (40%) is based on 1 health plan, and the maximum of 7.14% × 7 clinical measures (50%) is also based on only 1 health plan.  
‡ Cholesterol management refers specifically to CHD (secondary risk) patients. Although all 11 clinical measures are reported to IHA, P4P payouts are calculated on 9 clinical measures; the cholesterol and diabetes LDL-C testing and goal (<130 mg per dL) rates are combined, yielding up to 9 performance measures for P4P payment purposes.  
§ Only the most recent lab test may be used, whether it is obtained in the measurement year (2004) or in the year prior to the measurement year (2003).  
¶ Appropriately prescribed medication is defined as inhaled corticosteroids, nedocromil, cromolyn sodium, leukotriene modifiers, or methylxanthines. A1C = glycosylated hemoglobin; CHD = coronary heart disease; DTaP/Dt = diphtheria, tetanus, and pertussis/diphtheria tetanus vaccination; IHA = Integrated Healthcare Association; IPV/OPV = inactivated polio vaccine/oral polio vaccine; LDL-C = low-density lipoprotein cholesterol; MMR = measles, mumps, rubella; VZV = varicella-zoster virus or chicken pox.

Care management (CDCM) program since its inception in 1997. The institute’s CDCM program is a not-for-profit, hospital-based, telephone surveillance disease management (DM) program that supports patients throughout the greater Sacramento area. One facet of this program is a dyslipidemia risk-reduction program designed to educate and treat patients who are diagnosed with or who are at risk for developing cardiovascular disease. This program was developed collaboratively with MMG. The
first patients were enrolled in 1999, and approximately 1,000 patients are currently enrolled in the program. Physicians from the medical group make up the largest source of patient referrals and enrollment for the CDCM program. Initially, patients referred to the program are offered a 1-time patient education class, during which they receive information on cardiovascular disease, such as pathophysiology, risk factors, and ways to minimize risk, including dietary modifications and exercise recommendations. Follow-up includes ordering laboratory visits and prescribing lipid-lowering therapy as dictated by CDCM treatment protocol approved jointly by the medical group and the health plan. The treatment protocol has 3 treatment tracks to which the patients are assigned. Approximately 35% of the patients are identified as cases for primary prevention (i.e., no history of coronary artery disease [CAD] or diabetes or stroke), 25% as cases for secondary prevention (i.e., history of CAD, myocardial infarction, stroke, etc.), and 40% as diabetes risk-equivalent prevention. This treatment protocol was developed using the NCEP ATP III as its framework. A multidisciplinary approach was chosen to ensure the best possible care for the patient. Physicians, dietitians, nurses, pharmacists, exercise physiologists, and social workers were all involved in the development of the treatment protocol. The protocol methodology was reviewed and approved by various hospital and physician committees. Additionally, the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) reviewed the program and as of the fall of 2005, the program has been recognized by JCAHO as a hyperlipidemia-certified program.

The treatment protocol includes both pharmacologic (medication algorithm) and nonpharmacologic (therapeutic lifestyle management education) methods for reducing risk. Nurse and pharmacist care managers are used to care for patients using the protocol and are allowed, under the physician's signed order, to prescribe medications and order laboratory assessments as described in the protocol. Quality assessment takes place at regular intervals to assure the success of the program in achieving LDL-C targets while avoiding medication misadventure.

Enrollment and participation in the CDCM program in this medical group is voluntary. However, the referring physician in the medical group must provide a signed order that allows the CDCM program to care for the patient under the standardized treatment protocol. A diagnosis of dyslipidemia and a physician referral are the only criteria for enrollment in the CDCM lipid management program. There is no patient recruitment or other selection criteria. Once enrolled, patients are assessed, and an individualized care plan is established.

The purpose of this study was to (1) compare the percentage of medical group members aged 18 to 75 years with diabetes (type 1 or type 2) who received an LDL-C test and attained LDL-C control (<130 mg per dL) after enrolling in the CDCM program with similar members managed by routine care, and (2) assess the potential effect of CDCM on the quality performance ranking and financial reimbursement of a medical group reporting the diabetes cholesterol management measure of the 2004 California P4P initiative.

**Methods**

This study was approved by the Committee on Human Research at the University of California, San Francisco, and the Institutional Review Board at Catholic Healthcare West. MMG is a 160-physician, multispecialty medical group in the greater Sacramento area that participates in the California P4P program. MMG uses a team-based CDCM program to help manage cholesterol for patients in the medical group.

A medical group can use 2 methods to report P4P clinical data—passive and active reporting. Passive reporting involves using the claims and encounter data already submitted to the health plan to calculate and report the clinical measures. With this health plan reporting method, the medical group is completely reliant on the plan to report data to IHA on the medical group's behalf. In active reporting, the medical group uses internal records, including its claims, encounter, and electronic laboratory and pharmacy claims data to self-report the clinical measures to IHA.

MMG uses active (self-) reporting of P4P clinical measures. In order for a medical group to self-report clinical measures for the California P4P program, the medical group must undergo a rigorous audit process. An outside auditor approved by NCQA and IHA validates the self-reporting process used by the medical group. This audit process verifies that the medical group is accurately capturing data for the purposes of reporting P4P clinical measures by evaluating membership data, claims processing systems, data analysis, decision support processes, and the data linkage between electronic databases. This audit is performed every year.

Data collection and compilation for the California P4P clinical measures at this medical group are all electronic, using a combination of claims, encounter, and actual laboratory data. In 2004, MMG medical records were stored in paper charts, but encounter forms, claims, and some laboratory values were processed and stored electronically. The medical group used these electronic systems for P4P self-reporting. MMG started using an electronic medical record in 2006, but the P4P self-reporting process has not changed as a result. Laboratory data for LDL-C and A1C are stored electronically on a laboratory server and sent to the medical group on a monthly basis from the lab database vendor. Laboratory values may be obtained by the provider for individual patients in real time, but the group is dependent on the monthly laboratory reports for the purpose of P4P data aggregation.

New P4P measures for 2005 prompted targeted educational interventions and financial incentives by MMG to improve the medical group's performance for these measures. Because of the substantive changes in physician education and medical
group interventions that took place in 2005 and 2006, it was determined that 2004 data were associated with fewer confounding variables and were perhaps the most valid for evaluating the efficacy of the CDCM program in achieving P4P target goals compared with usual care provided during in-office physician visits.

**Pay for Performance Clinical Measure: Diabetes Care—LDL-C Testing and Control**

The purpose of the diabetes care clinical (2-part) measure is to determine the percentage of medical group members aged 18 to 75 years with diabetes (type 1 or 2) who received an LDL-C test and had an LDL-C <130 mg per dL.\(^4\)

### Inclusion Criteria

Patients included in this measure were commercial HMO members continuously enrolled in MMG and a P4P participating health plan during the measurement year (2004), with no more than 1 gap in enrollment of up to 45 days during that time.\(^3\) Patients with diabetes who were aged 18 to 75 years as of December 31, 2004 were included in the study. The eligible population for the diabetes care clinical measure was identified using pharmacy data and/or hospital/medical claims and encounter data.\(^3\) Complete pharmacy data were not available for MMG during the 2004 measurement year, and thus only the claims/encounter method was used to identify the eligible diabetes population. On the basis of the claims/encounter data, patients were identified as having diabetes if they had 2 face-to-face outpatient encounters for diabetes with different dates of service in an ambulatory setting or 1 face-to-face acute (inpatient or emergency department) visit for diabetes during 2003 or 2004.\(^4\) *International Classification of Diseases, Ninth Revision, Clinical Modification* codes, Diagnosis Related Group codes, and Current Procedural Terminology codes were used to identify diabetes as the primary, secondary, or tertiary reason for the visit and are listed in Table 2.\(^4\) These criteria determined the denominator for this measure. See Figure for a flow diagram describing patient selection.

The serum LDL-C value for the most recent cholesterol test and the number of patients with a LDL-C laboratory value in 2003 or 2004 were used for the numerator for this clinical measure.\(^4\) The medical group could use claims/encounter data to determine if the LDL-C was performed, or electronic laboratory data if at least the date and result of the LDL-C were included in the electronic information.\(^4\) Because the actual laboratory value is required to report “good” control, this medical group used the electronic laboratory data to determine the LDL-C level for patients in the eligible population. According to the 2005 Clinical Measure Specifications in the P4P program, patients who had no LDL-C performed in 2003 or 2004 were assumed to be in poor control.\(^4\) A triglyceride level >400 mg per dL would lead to inaccurate LDL-C calculations and, therefore, patients with a triglyceride level >400 mg per dL were considered to be in poor control but would meet the criteria for inclusion in the numerator for the proportion of patients who received LDL-C testing.\(^4\)

### Exclusion Criteria

Medicare Advantage members were not included in any of the clinical measures for the 2004 measurement year and were not included in the P4P population for the diabetes care measures.\(^4\) Patients not assigned to a primary care physician, and patients enrolled in a health plan that did not participate in P4P, were also excluded from the study population.

The same denominator value was used for the LDL-C testing and control measures (the eligible population of patients with diabetes), but the numerator was reported separately for each measure. A patient may appear in the numerator for both LDL-C testing and LDL-C good control.

Health plans that participate in the California P4P program make incentive payment to the participating medical group based on that medical group’s quality performance measures compared with peer medical groups within the state. Each clinical measure

---

### TABLE 2

<table>
<thead>
<tr>
<th>Description</th>
<th>ICD-9-CM Codes</th>
<th>DRGs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes diagnosis</td>
<td>250, 357.2, 362.0, 366.41, 649.0</td>
<td>294, 295</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>CPT Codes</th>
<th>UB-92 Revenue Codes</th>
</tr>
</thead>
</table>

Evaluation of the Relationship Between a Chronic Disease Care Management Program and California Pay-for-Performance Diabetes Care Cholesterol Measures in One Medical Group

**TABLE 3** Cholesterol LDL-C Testing and Goal (<130 mg per dL) Attainment Rates Reported to IHA for P4P Payment to Mercy Medical Group

<table>
<thead>
<tr>
<th>Clinical Measure</th>
<th>LDL-C Testing</th>
<th>LDL-C Control (&lt;130 mg per dL)</th>
<th>Total Patients in Measure*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cholesterol management (CHD secondary risk)†</td>
<td>81.1%</td>
<td>67.6%</td>
<td>2.0%</td>
</tr>
<tr>
<td></td>
<td>30/37</td>
<td>25/37</td>
<td>37/1,896</td>
</tr>
<tr>
<td>Diabetes care LDL-C measurement</td>
<td>69.9%</td>
<td>57.7%</td>
<td>98.0%</td>
</tr>
<tr>
<td></td>
<td>1,299/1,859</td>
<td>1,072/1,859</td>
<td>1,859/1,896</td>
</tr>
<tr>
<td>Total reported for P4P payment‡</td>
<td>70.1%</td>
<td>57.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>1,329/1,896</td>
<td>1,097/1,896</td>
<td>1,896/1,896</td>
</tr>
</tbody>
</table>

* The cholesterol management secondary risk and diabetes care LDL-C testing and goal (<130 mg per dL) rates are reported to IHA as separate measures; they are combined for the purposes of P4P payout to the medical group.
† The denominator for secondary risk is defined as a patient with a history of AMI, CABG, or PTCA in the prior year (see Table 1).
‡ Total % reported for P4P payment does not change if cholesterol management secondary risk is excluded from the data. IHA will round all submitted percentages to the nearest whole number when publicly reporting rates and comparing benchmarks. Total % determines payment in P4P program for the cholesterol measure.
AMI = acute myocardial infarction; CABG = coronary artery bypass graft; CHD = coronary heart disease; IHA = Integrated Healthcare Association; LDL-C = low-density lipoprotein cholesterol; P4P = pay for performance; PTCA = percutaneous transluminal coronary angioplasty.

Diabetes Care—LDL-C Testing and Control 2005 Incentive Payment Amounts

Payment is generally based on the medical group’s ability to score in the 50th percentile or higher when compared with other (peer) medical groups. Generally, if the medical group scores between the 50th and 74th percentile, it is paid one half of the total possible incentive payment, and groups in the 75th to 99th percentile receive the full incentive payment amount. As previously mentioned, each of the 7 health plans determines the percentile ranking for incentive payment. No health plan provides payment for percentile rankings below the 20th percentile. Payment is commonly provided on a PMPM basis and is determined by each health plan.
Health plan payout for the testing and goal attainment for the LDL-C measures varied for the 2005 report year (2004 measurement year). All participating plans paid medical groups for LDL-C laboratory testing (from a low of 4.44% to a high of 7.14% of total available P4P dollars), but only 1 plan paid medical groups for the proportion of patients with LDL-C <130 mg per dL. Both LDL-C testing and goal attainment rates were reported to IHA in 2005. On the basis of the 2005 payment amounts, all potential P4P payouts for the LDL-C testing measure in the data analysis were based on the lowest plan payout of 4.44% of the total available P4P dollars. This method reduced the potential for overestimation of missed revenue opportunity for calculations involving the LDL-C testing measure. Because only 1 health plan out of 7 paid on the LDL-C goal rate <130 mg per dL, this measure was assumed to have insignificant reimbursement to the medical group and therefore was not considered in the potential payment calculations.

**Data Analysis**

Data were collected retrospectively from claims and encounter forms to determine the eligible population, as defined by the diabetes care cholesterol measures. Laboratory data were obtained from the Mercy Laboratories electronic database. The entire eligible population (denominator) was identified, and then patients followed by the CDCM program were extracted from the whole P4P denominator and evaluated separately, using the available laboratory data. It was assumed that if a patient was not enrolled in the CDCM program, the patient received routine care. Patients enrolled in the CDCM program received care from their primary care providers as well as from CDCM team members. Queries using the Microsoft Access database were used to identify patients who had an LDL-C test performed and to determine the LDL-C value. This process was verified for accuracy by the NCQA- and IHA-approved P4P self-report auditor.

Statistical analysis was performed with Minitab release 14 statistical software. A chi-squared statistical test was used for all discrete data and 2-sample t test was used for continuous data to determine statistical differences between the CDCM program and the routine care group (P value was set to be <0.05 for statistical significance).

**Results**

**Demographics**

A total of 1,899 patients were evaluated in this study. The CDCM program enrolled 165 patients (8.9%), of whom 59.4% (98/165) were female. The average age for these patients was 57.8 years (Table 4). Of the total population for this measure, 91.1% (1,694/1,859) of the patients were managed by routine care, 49.5% of which (839/1,694) were female. The average age for the routine care group was 55.6 years (see Table 4).

**LDL-C Testing Rates**

The LDL-C testing rate for all P4P eligible patients (both CDCM program and routine care) in this medical group in 2004 was 69.9%. The LDL-C testing rate for patients in the CDCM program was 91.5% versus 67.8% for the routine care group (P <0.001, Table 4). When compared with peer groups, the patients in this medical group overall scored less than the 20th percentile for the lab testing rate (70% raw score), representing no revenue for this portion of the LDL-C testing measure. However, if the CDCM program patients’ LDL-C testing rate (92%) had been compared with peer groups, MMG would have scored higher than the 75th percentile. This score would have resulted in full payment from the health plans for this measure (see Table 5).

**LDL-C Goal Attainment Rates**

The LDL-C goal attainment rate (LDL-C <130 mg per dL) for all medical group patients (both CDCM and routine care patients) in 2004 was 57.7% (1,072/1,859). The LDL-C goal attainment rate for the CDCM program was 78.2%, significantly higher than the 55.7% rate for the routine care group (P <0.001; see Table 4). When compared with peer medical groups, MMG scored in the 75th percentile for the goal attainment rate, representing full revenue for this portion of the diabetes care LDL-C clinical measure from the 1 health plan that provided payout for the LDL-C goal attainment rate. However, if the CDCM goal
P4P measures for medical groups that have LDL-C goal attainment was considered negligible for the 2005 report year and was not included in this financial analysis. CDCM=chronic disease care management; LDL-C=low-density lipoprotein cholesterol; P4P=pay for performance; PMPM=per member per month.

## Discussion

In this medical group, patients with diabetes who were followed by the CDCM program had significantly higher rates for both LDL-C testing and goal attainment than did those in routine care. Results of other studies on the effectiveness of team-based lipid management have also shown high LDL-C lab testing rates (96.7%-97.3%) and LDL-C <100 mg per dL goal attainment (56.5%-83.3%) in lipid management. Limitations of these studies include no patient randomization, no comparator-control group, and no evaluation of end point outcomes such as morbidity or mortality. This is the first study to pair the clinical results of team-based CDCM with emerging P4P initiatives showing both improved quality reporting and potential increased revenue for placement between the 50th and 74th percentiles, and minimal or no payment if lower than the 50th percentile (only Blue Cross of California provided payments on a sliding scale to medical groups that scored between the 20th and 49th percentiles).  

All health plans made incentive payment to medical groups for LDL-C lab testing for the 2005 P4P reporting year, with a minimum of 4.44% of the total available PMPM dollar amount. Therefore, if $1 PMPM were provided to the medical group for all clinical measures, the payment amount for a medical group scoring in the 75th percentile or higher for the LDL-C testing rate would be $0.044 PMPM. However, if the medical group scored between the 50th and 74th percentiles for the LDL-C testing rate, the total payment would only be 2.22%, or $0.022 PMPM. If the medical group scored lower than the 20th percentile, then it would receive no payment for that clinical measure. If the contracted rate were $2 PMPM, then the diabetes LDL-C testing measure would represent a maximum payment of $0.088 PMPM.

The PMPM payout to the medical group is based on the number of commercial members that are enrolled in P4P participating health plans. This medical group had approximately 54,000 commercial members in 2004 that were members of P4P participating health plans, and therefore the payout for this LDL-C testing measure would be $0.044 PMPM x 54,000 members x 12 months = $28,512 for $1 PMPM to $56,024 for $2 PMPM. All 7 health plans provided incentive payments for the LDL-C testing rate, and only 1 health plan provided payment incentive for the LDL-C goal <130 mg per dL; therefore, the LDL-C goal payment was considered negligible for the 2005 report year and was not included in this financial analysis.  

### Table 5

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Routine Care &lt;20th</th>
<th>CDCM &gt;90th 75th</th>
<th>Medical Group Overall &lt;20th 75th</th>
<th>Threshold for Maximum Payout 75th</th>
<th>Payout Opportunity $28,512-56,024 x</th>
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<tbody>
<tr>
<td>Goal attainment at LDL-C &lt;130 mg per dL</td>
<td>75th &gt;90th 75th</td>
<td>75th 75th 75th</td>
<td>75th</td>
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* Percentile rankings are provided to the medical group as a range, not as discrete values on a continuous scale. Generally, if the medical group scores less than the 50th percentile, it is not eligible for P4P incentive payment; the 50th-74th percentile range pays half of the P4P financial incentive, and medical groups that score higher than the 75th percentile are eligible for the full P4P incentive.

† Payment amount is based on 4.44% of total clinical dollars ($0.044 for $1 PMPM or $0.088 for $2 PMPM) x 54,000 members x 12 months = $28,512 for $1 PMPM to $56,024 for $2 PMPM. All 7 health plans provided incentive payments for the LDL-C testing rate, and only 1 health plan provided payment incentive for the LDL-C goal <130 mg per dL; therefore, the LDL-C goal payment was considered negligible for the 2005 report year and was not included in this financial analysis.
for the medical group. Financially, had this medical group scored in the 75th percentile for both the LDL-C lab testing and goal attainment portions of the diabetes LDL-C measure, revenue would have increased from $0 payout to a hypothetical $28,512 for a $1 PMPM payment incentive. The results of the present study suggest that referring more patients to the CDCM program may be a viable way to improve the overall performance scores for the medical group.

Revenue sharing is one way to provide a financial incentive to increase medical group intervention in targeted DM programs. Currently, this hospital-based CDCM program does not generate revenue for the services it provides, but instead this not-for-profit hospital declares the expenses as a community benefit and part of its charity care obligation. This schema is consistent with the organization’s mission to provide direct services to the poor and to partner with others in the community to improve the quality of life in the community it serves.

Because the CDCM program receives referrals from outside MMG, a shared revenue model is not viable at this time since the program would then need to bill all referring providers in order to be compliant with the Omnibus Reconciliation Act of 1993. This law precludes preferential pricing for services to certain groups of physicians to avoid the potential for garnering referrals. As contracts with other medical groups are reviewed (or renegotiated) by the CDCM program, it might be worthwhile to develop a return-on-investment model to explore whether P4P revenue sharing would be beneficial to the program. Likewise, other medical groups wishing to contract for DM services may explore shared revenue as an incentive in contracting with a program that is structured to bill for services.

In 2006, all but 1 health plan provided payment for both LDL-C testing and LDL-C goal attainment <130 mg per dL for the 2005 measure year, making it even more important for medical groups to improve this clinical measure. Therefore, programs like the CDCM program that increase LDL-C testing and goal attainment <130 mg per dL are important from both a quality and financial perspective to P4P participating medical groups.

As previously described, a long time separates the reporting of the data to the health plans and the date that the payouts are received by the medical groups. Medical groups do not know their percentile rankings and actual payment amount from the health plan for up to 12 months after the close of the measurement year. This makes financial projections for the P4P initiative difficult to predict. However, medical groups who self-report do know the patients who are eligible for P4P reporting throughout the measurement year, allowing the groups to target the noncompliant patients in time to make a positive difference in the reported rate (e.g., referring noncompliant diabetes patients who miss an LDL-C lab test or are not at LDL-C goal to a CDCM program).

Reporting P4P clinical measures is a complicated and time-consuming process. A team of experts comprising physicians, data analysts, pharmacists, and other key organizational personnel is critical to successful self-reporting. Although self-reporting for MMG made the reporting process much more labor intensive, self-reporting was associated with improved MMG clinical measures compared with the passive report method that was used in the prior year for 2003. The self-report process also allows regular audits of the data so discrepancies can be clarified and gaps in care can be targeted at the organizational level.

The CDCM program described herein was an existing program and therefore did not incur any up-front costs to the medical group. Other medical groups would need to allocate funds to initiate targeted patient care (DM) programs. Since this P4P program does not pay for improvement but only for percentile ranking, poor-performing groups cannot earn P4P revenue to fund quality-improvement activities. This results in a potential situation in which the good get better and the poor do not improve enough to earn revenue. This situation has been previously described in the literature by Rosenthal et al. for the cervical cancer, breast cancer, and diabetes A1C clinical measures.

The P4P process is dynamic. In the 2005 and 2006 measurement years, MMG targeted multiple clinical measures for improvement, including breast cancer testing, cervical cancer testing, childhood immunizations, LDL-C testing rate and LDL-C goal attainment, A1C measurement, and A1C goal attainment. In targeting these measures, new strategies were employed to improve disease prevention and quality of care, including physician detailing (modeled after the CDCM program), patient letter campaigns (modeled after the CDCM program), use of patient advocates, increase in the number of patients enrolled in the CDCM program, and other chronic DM programs, such as the Diabetes Care program. Furthermore, physicians at MMG were given financial incentives for their ability to meet certain quality measurement markers, including LDL-C testing and goal attainment rates for the diabetes care measure. This targeted approach was associated with significant improvement for this medical group, which was recognized as a top 20% performing medical group in the subsequent (2005 measurement) year. We chose the 2004 measurement year for the present study in an effort to reduce the confounding effects of these other medical group interventions that did not exist in 2004.

P4P programs have gained international attention, and there is great interest in whether P4P measures improve the quality of health care provided to patients at the medical group level. Until further studies are published evaluating the effect of P4P, medical groups must develop creative ways to improve their quality measures in order to keep pace with peer organizations. Team-based CDCM programs may become sources of revenue as well as a means to avoid costs associated with lower-quality care.
Our results suggest but do not prove that a focused CDCM intervention is effective in generating incentive revenue in a P4P program. A large opportunity also remains to show that a focused CDCM intervention could generate sufficient incentive payment to cover its costs. The literature is speckled with mostly anecdotes of success, including the results of a P4P program established to improve diabetes care that reportedly had a return on investment of 1.6 to 1 in the first year and 2.5 to 1 in the second year of the sponsoring health plan. This descriptive report without a control group was conducted in the Rochester area of upstate New York during 2003 to 2004.

LDL-C <100 mg per dL for patients with diabetes was not a clinical measure in this P4P program in 2004 but is the widely accepted LDL-C goal rate, according to NCEP ATP III. The CDCM program showed a significantly higher rate of attainment of the LDL-C <100 mg per dL goal than did routine care. The Mercy Heart Institute’s CDCM program described in this paper was previously shown to improve LDL-C goal attainment for diabetically patients from 23.2% before the intervention to 36% after only 6 months in the program. This 56% rate of LDL-C goal attainment compares with 47% in the present study.

**Limitations**
First and foremost among the study limitations is the small sample size, with only 165 patients in the CDCM program. Second, an opportunity for selection bias exists since this was not a prospective study with random assignment. We also did not control for confounding factors such as comorbid conditions, type of lipid-lowering agents, patient financial status, motivation, or intervention from other specialists (e.g., endocrinologist or cardiologist). The intervention and comparison groups in the present study were statistically different for age and gender. However, while the CDCM group might be different from the comparison, the practical significance of any differences would pertain to the goal attainment rate and not the testing rate because the patients in both groups needed lipid testing.

Third, we did not measure the amount of time and resources required to operate the CDCM program and therefore could not perform a calculation of return on investment. We are therefore unable to determine if the estimated payout opportunity for this medical group under the P4P program could have covered the cost of the CDCM program. While the CDCM program described in this paper does not represent a cost to the medical group, there are real costs that include salary and benefits. Because the CDCM program is based in a not-for-profit hospital, however, the program has been justified, in part, by the community benefit required by California State Senate Bill 697 for it to maintain not-for-profit tax-exempt status.

Fourth, the CDCM program is not a mandatory program in this medical group, and there may be patients who choose not to participate, which would thereby reduce the opportunity for the CDCM program to elevate the entire medical group into the rankings that would generate P4P incentive payments. Fifth, since not all medical groups have access to team-based CDCM, these CDCM program results may not be generalizable to other medical groups.

**Conclusions**
This CDCM intervention in a medical group participating in P4P had a higher rate of LDL-C testing (92%) compared with routine care (68%) and a higher proportion of patients who attained LDL-C goal (<130 mg per dL) than did those treated in routine care (78% versus 56%, respectively). If all patients with diabetes who were measured by this P4P program had been enrolled in the CDCM intervention, this medical group would have attained the highest payout amount for the LDL-C testing measure and would have improved scores in public reporting of both P4P measures for LDL-C testing and LDL-C goal attainment.

**DISCLOSURES**
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Cutler served as principal author of the study. Study concept and design were contributed primarily by Cutler with input from Palmieri, Khalsa, and Stebbins. Data collection was primarily the work of Cutler with input from Khalsa and Stebbins; data interpretation was primarily the work of Cutler with input from Palmieri, Khalsa, and Stebbins. Writing of the manuscript and its revision was primarily the work of Cutler, with input from Palmieri, Khalsa, and Stebbins.

**REFERENCES**
Evaluation of the Relationship Between a Chronic Disease Care Management Program and California Pay-for-Performance Diabetes Care Cholesterol Measures in One Medical Group


