Legislative Summary

Quality of Care
for Adults with Diabetes

A report prepared for the
State of Colorado
Department of Health Care Policy and Financing
By *First Peer Review of Colorado, Inc.*
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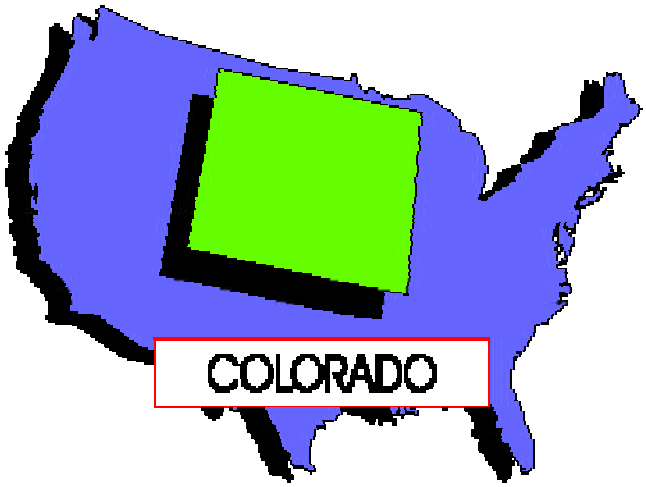


Legislative Summary
Quality of Care for Adults with Diabetes

This report presents the findings of a contracted study on the quality of health care services provided to Colorado Medicaid client members with diabetes. A focus on clients with diabetes is important because of the seriousness of the disease and the acute and long term health complications that can result. Diabetes can affect nearly every organ system of the human body. Diabetics are two to four times more likely to develop cardiovascular disease than non-diabetics. The risk of stroke is 2.5 times higher in diabetics. Additionally, diabetes is the leading cause of end-stage renal disease and of new cases of blindness among people 20 to 74 years of age. Estimates from 1992 indicate that diabetes was responsible for approximately 15 percent of the total health care expenditures (Rubin, Altman, and Mendelson, 1994). Studies indicate that many of the health complications diabetes causes are preventable or minimized through behavioral and preventive health services (Ho, et al., 1997). Quality improvement initiatives focused on diabetic clients could have a substantial impact on Colorado's publicly funded health care system. This study was conducted to provide a report on health services provided to Colorado Medicaid diabetic clients during the 1997 year and to serve as a resource in helping to further improve on the quality of services and programs aimed at reducing the effects of this disease. Patterns of care rendered to different Colorado Medicaid populations during this time period were examined and study measures based on accepted diabetic care practice guidelines were assessed. These tasks were conducted through the review of selected Colorado Medicaid client medical records.

To be initially eligible for inclusion into this study, a Colorado Medicaid client (or member) had to meet the following requirements:

- Age 22 or older as of January 1, 1997;
- Enrolled in the Colorado Medicaid program from January 1, 1997 through December 21, 1997;
- Maintained enrollment with the same health maintenance organization (HMO) during the described time frame or with the same non-HMO part of the Colorado Medicaid program. Non-HMO client groups receiving health care through the Colorado Medicaid program include the Primary Care Physician Program (PCPP) and the unassigned fee-for-service (UFFS) group;
- Had no more than one break in enrollment during the time period of January 1, 1997 through December 21, 1997;
- The allotted one break in Medicaid program enrollment could not be greater than 45 days in length;
- Had a specific documented medical encounter or claim that identified the Medicaid program client as having diabetes.

From a developed list of all Colorado Medicaid program clients who met these requirements, 433 clients were randomly selected for inclusion into the study. The medical records of these 433 Medicaid clients were reviewed by clinical and research staff. Of the 433 reviewed records, 279 clients were enrolled in an HMO participating in the Medicaid program, 73 clients were part of the Primary Care Physician Program (PCPP), and 81 clients were part of the Colorado Medicaid unassigned fee-for-service (UFFS) program group. Of the 279 clients enrolled in an HMO, 100 clients were from Colorado Access (CO Access), 102 were from Rocky Mountain HMO (RMHMO), 53 were from the Community Health Plan of the Rockies (CHPR), 7 were from HMO Colorado (HMOC), and 7 were from Kaiser Permanente (Kaiser). CHPR, HMOC, and Kaiser had few clients found to be initially eligible for study inclusion in comparison to other organizations / programs part of Colorado Medicaid. Thus, these groups were less represented in the final study sample.

As the goal of the study was to assess the quality of diabetic health services and make comparisons between Medicaid programs and health organizations providing such services, study sample sizes were adequate in achieving these goals, with the exception of the HMOC and Kaiser organizations. Sample sizes for these two HMOs were too small to make meaningful comparisons with other HMO groups.

Of the 433 reviewed client records, 104 (24.0%) were documented as Type I diabetics, 315 (72.8%) were documented as Type II diabetics, and there were 14 records (3.2%) where diabetes type was unable to be determined. There were no statistically significant differences in the breakdown of diabetes type across Medicaid programs or HMOs ($p < 0.05$). There were 3,224 documented episodes of care in the reviewed medical records. The number of care episodes for study clients ranged from one (32 clients) to 54 (one client). The majority of all medical record documentation regarding quality of care issues with diabetic patients occurred within the setting of the doctor's office.

Developed quality of care study measures, based on Colorado Clinical Guidelines Collaborative (CCGC) guidelines and recommendations (Appendix A) for treating adult patients with diabetes, were used in helping to measure the quality of care being provided to Medicaid clients with diabetes. Comparisons between HMO clients with PCPP and UFFS groups and comparisons between separate HMO client groups were desired to help determine if there are any differences between separate programs and health organizations participating in the Colorado Medicaid program. The developed quality of care measures used in this focused study were classified under the following categories:

- Physical Examination
- Laboratory Results
- Diabetic Management
- Preventive Care
- Education
- Physician Referral
- Compliance
- Barriers to Care.

The following 11 Tables and 1 Figure succinctly summarize overall program results for developed study measures. Each category of measures is represented by a specific table(s). Specific percentage results displayed in each table under the "All Programs Results" column refers to the percentage of all study records that had appropriate documentation for the specific study measure, as defined in the summary Table. Significant differences between program study groups (HMO, PCPP, UFFS) and between comparable HMO study groups (CO Access, CHPR, RMHMO) are also noted in each table. Meaningful comparisons involving the HMOC and Kaiser study groups were not possible due to their small study sample sizes. Noted differences in the summary Tables are based on a 95% confidence interval ($p < 0.05$).

Physical Examination Measures

There were 3,224 documented episodes of care (provider visit or hospitalization where a physical examination took place) during the study period in the reviewed medical records. On average, there were approximately seven episodes of care per study client. HMO reviewed records showed more varied provider types rendering care to study clients than PCPP and UFFS records. HMO records showed a significantly greater percentage of documented family practice physicians, general practitioners, internal medicine physicians, and nurse practitioners /

physician's assistants than PCPP and UFFS records. The provider types of "Diabetic Educator", "Nephrologist", "Dietician", and "Medical Assistant" were only noted in HMO client records. "Unspecified Type Physician" accounted for the greatest percentage of client records in regard to provider type for all three Medicaid programs and the comparable HMO study groups. Additionally, the physician office accounted for the majority of all documentations for all Medicaid programs and HMO groups. Table 1 displays an overall "All Programs" result for physical examination measures and summarizes significant differences seen in measures. Significant differences between Medicaid programs were seen in two measures and significant differences between HMO groups were seen in all four measures.

Table 1
Summary of Physical Examination Measures

Measure	All Programs Result	Noted Significant Differences Between Medicaid Program Groups	Noted Significant Differences Between Comparable HMO Groups
Percent of physical exams a blood pressure reading was obtained	86.0%	UFFS lower than HMO and PCPP groups	All results different CO Access – highest CHPR - lowest
Percent of blood pressure reading classified as normal	48.0%	None	CHPR – highest and different from RMHMO – lowest
Percent of physical exams a weight reading obtained	68.0%	HMO higher than PCPP and UFFS groups	CO Access – highest RM – middle CHPR – lowest
Percent of physical exams a foot Inspection was conducted	35.3%	None	CO Access – highest RMHMO – middle CHPR – lowest

Laboratory Results Measures

Table 2 presents overall program results for laboratory results measures and noted significant differences between study groups. The HMO study group result was significantly higher than the PCPP group result for three presented measures; glycosylated hemoglobin test values greater than 8.5 percent addressed, an annual urinalysis, and an annual microalbuminuria test. Regarding comparison of HMO study groups, CHPR had a significantly low value for four of the laboratory measures; at least one documented lipid profile, an annual urinalysis, a microalbuminuria test, and an annual history and physical examination.

Table 2
Summary of Laboratory Results Measures

Measure	All Programs Result	Noted Significant Differences Between Medicaid Program Groups	Noted Significant Differences Between Comparable HMO Groups
Average glycosylated hemoglobin test result: 7.5-8.5 = good, Greater than 8.5 - 9.5 = fair, Greater than 9.5 = poor	9.0	None	None
Percent of glycosylated hemoglobin tests greater than 8.5% addressed	75.3%	HMO higher than PCPP	None
Percent of study clients with at least one lipid profile test	53.1%	None	RMHMO – highest and different from CHPR – lowest
Percent of abnormal lipid test results followed up	77.0%	None	None
Percent of study clients with an annual urinalysis test	58.2%	HMO higher Than PCPP	CO Access – highest and different from CHPR – lowest
Percent of study clients with an annual microalbuminuria test	21.5%	HMO higher Than PCPP	RMHMO – highest and different from CHPR – lowest
Percent of positive microalbuminuria tests followed up	63.6%	None	None
Percent of study clients with an annual history and physical exam	66.9%	None	CHPR – lowest Different from other two comparable HMOs

Diabetes Management Measures

The PCPP group had a significantly higher percentage of records with no documentation of discussion on nutrition or exercise when compared to the HMO group (Table 3). CHPR also had a higher percentage of records with no documentation of discussion on the topics of home glucose monitorings, nutrition, or exercise when compared to Colorado Access and RMHMO.

A review of client medication revealed no significant differences between Medicaid programs in the percentages of clients being treated with the various medications available for diabetic

treatment. Oral hypoglycemic agents were the main medication used in treating diabetes for all three Medicaid program study groups. The Colorado Access study group had a significantly higher percentage of clients treated with insulin only than the other two comparable HMO study groups. The RMHMO group had a significantly higher percentage of clients being treated with insulin and an oral hypoglycemic agent than the other comparable HMO groups. CHPR had a significantly higher percentage of clients being treated with only an oral hypoglycemic than the RMHMO group.

Table 4 presents overall results for three management measures and noted group differences. The HMO study group had a significantly higher percentage in regard to annual eye exams than the PCPP and UFFS study groups. CHPR had lower percentage results than the other comparable HMO groups for the ACE inhibitor and eye exam measures.

Table 3
Summary of Disease Management Methods Documented in Study Client Records

Disease Management Methods	All Programs Result	Noted Significant Differences Between Medicaid Program Groups	Noted Significant Differences Between Comparable HMO Groups
Home glucose monitorings: Percent of clients with no documentations	25.2%	None	CHPR – highest Different from other two comparable HMOs
Discussion of nutrition with client: Percent of clients with no documentations	36.5%	PCPP higher than HMO group	CHPR – highest Different from other two comparable HMOs
Discussion of exercise with client: Percent of clients with no documentations	60.5%	PCPP higher than HMO group	CHPR – highest Different from other two comparable HMOs

Table 4
Summary of Diabetes Management Measures

Measure	All Programs Result	Noted Significant Differences Between Medicaid Program Groups	Noted Significant Differences Between Comparable HMO Groups
Percent of study clients with documented hypertension and being treated with medication	93.4%	None	None
Percent of study clients newly prescribed ACE Inhibitor medication	15.7%	None	CHPR – lowest Different from other two comparable HMOs
Percent of study clients with an annual eye exam	34.6%	HMO higher Than PCPP And UFFS groups	CHPR – lowest Different from other two comparable HMOs

Preventive Care Measures

Table 5 summarizes information collected on preventive care type measures. The HMO group had significantly higher percentages for all four measures presented. Regarding HMO study groups, Colorado Access had significantly higher percentages for the pneumococcal and influenza vaccines than RMHMO (middle in percentage level) and CHPR (lowest in percentage).

Table 5
Summary of Preventive Care Measures

Measure	All Programs Result	Noted Significant Differences Between Medicaid Program Groups	Noted Significant Differences Between Comparable HMO Groups
Percent of study clients with pneumococcal vaccine Previously or during study period	13.9%	HMO higher than PCPP and UFFS groups	CO Access – highest RMHMO – middle CHPR – lowest
Percent of study clients with an annual influenza vaccine	34.3%	HMO higher Than UFFS group	CO Access – highest different from other comparable HMOs
Percent of smoking study clients with documented discussion of smoking cessation counseling	30.1%	HMO higher Than PCPP group	None
Percent of women clients of child-bearing age with documented discussion of preconception counseling	18.3%	HMO higher Than PCPP group	None

Diabetes Education Measures

Table 6 summarizes results of study measures associated with educating the client about diabetes. Documentation supporting that education of some type on diabetes had been accomplished was noted in 51.3% of client study records. Documentation on specific types of education ranged from 10.6% (physiology) to 32.1% (diet) at the overall program level. No differences were seen between Medicaid programs in diabetes education. However, a comparison of HMO groups revealed that CHPR had a significantly lower percentage than Colorado Access and RMHMO groups. Comparing other specific education topics, the HMO group had a significantly higher result than the PCPP group regarding education on insulin administration. CHPR had a significantly lower result than other HMO groups for exercise and home glucose monitoring. Colorado Access also showed up as having a significantly lower value on the topic of physiology.

Table 6
Summary of Education Measures

Measure	All Programs Result	Noted Significant Differences Between Medicaid Program Groups	Noted Significant Differences Between Comparable HMO Groups
Diabetes	51.3%	None	CHPR – lowest and different from other groups
Exercise	18.9%	None	CHPR – lowest and different from other groups
Insulin administration	11.1%	HMO higher Than PCPP group	None
Diet	32.1%	None	None
Home glucose monitoring	30.7%	None	CHPR – lowest and different from other groups
Physiology	10.6%	None	CO Access – lowest and different from other groups
Medication	21.5%	None	None

Referrals Measures

There were 632 documented referrals in the 433 reviewed study records. Two hundred sixty-four clients accounted for these 632 referrals. The doctor's office was the setting where the referral was initiated for the great majority of documentations. The referral categories of "Eye Care", " Diabetic Education", "Podiatrist", and "Other" had the greatest number of counts. A number of categories were represented by either low or no counts for some study groups. Where cell counts were available, data showed no significant differences in regard to type of referral between Medicaid programs or between comparable HMO study groups. Table 7 shows overall program results for two referral measures. No differences were seen between Medicaid programs or between comparable HMO groups.

Table 7
Summary of Referral Measures

Measure	All Programs Result	Noted Significant Differences Between Medicaid Program Groups	Noted Significant Differences Between Comparable HMO Groups
Percent of referral appointments kept by study client	79.1%	None	None
Percent of referral appointments with documented communication between physicians	77.2%	None	None

Compliance Measures

Table 8 provides a summary of the compliance issues reviewed, overall program results for each specific measure, and notations where specific differences between study groups were recognized. The majority of all collected compliance information documentation occurred within the setting of the doctor's office. Overall program results varied in magnitude. Regarding Medicaid program differences, the UFFS study group was noted to have a significantly lower percentage of clients who had missed multiple appointments than the HMO study group. Additionally, the PCPP group had a lower documented compliance with medication than the HMO group. CHPR was found to have significantly lower study results than the other comparable HMO groups for three measures: clients with any documented missed appointments, documented compliance with diet, and documented compliance with exercise. The RMHMO study group result for compliance with medications was significantly lower than the Colorado Access study group result.

Table 8
Summary of Compliance Measures

Compliance Issue	All Programs Result	Noted Significant Differences Between Medicaid Program Groups	Noted Significant Differences Between Comparable HMO Groups
Client is able to participate in diabetes management	94.5%	None	None
Client's self management goals are recorded	11.6%	None	None
Any documented appointments missed by client	23.8%	None	CHPR group lower than other HMO groups
If there are missed appointments, the client missed more than one appointment	55.8%	UFFS group lower than HMO group	None
Documented client compliance with treatment goals	31.9%	None	None
Documented client compliance with diet	34.2%	None	CHPR group lower than other HMO groups
Documented client compliance with medications	49.9%	HMO group higher than PCPP group	RMHMO group lower than CO Access
Documented client compliance with exercise	16.9%	None	CHPR group lower than other HMO groups

Barriers to Care Measure

There were 84 documented instances of barriers to care in the 433 reviewed medical records. Sixty-five study clients were responsible for these documentations. The majority of all medical record documentation regarding barriers to care occurred within the setting of the doctor's office.

Most documented care barriers included language, non-compliance, developmental / learning problems, transportation, eye problems, mental retardation, wheel chair confinement, psychiatric condition, drug / alcohol dependency, and illiteracy. Table 9 shows the program results on the percentage of barriers to care that had supporting documentation of being addressed. Overall, 94.1% of barriers to care were addressed. Comparison of results between Medicaid programs and between HMO groups revealed no significant differences.

Table 9
Summary of Barriers to Care Measures

Measure	All Programs Result	Noted Significant Differences Between Medicaid Program Groups	Noted Significant Differences Between Comparable HMO Groups
Percent of barriers to Care addressed	94.1%	None	None

Significant differences (with 95% confidence) between Medicaid programs and between comparable HMOs varied depending on the area being studied. For the majority of care measures, there were no significant differences between Medicaid programs. HMOs were noted to have significantly higher values than one or both other Medicaid program groups (PCPP and UFFS) for the preventive care quality measures, and for eye exams under diabetes management measures. The HMO group also had significantly higher results than the PCPP group for measures represented in laboratory results, compliance, and diabetes education categories. Results regarding comparison of three applicable HMO study groups (Colorado Access, CHPR, RMHMO) also varied depending on the measure of interest. For numerous study measures under the categories of physical examination, laboratory results, diabetes management, preventive care, education, and compliance the CHPR had the lowest (or poorest) measure result of the comparable HMOs. Colorado Access was shown to have the highest (or best) result for several measures under the categories of physical examination, laboratory results, and preventive care. RMHMO and Colorado Access had similar results that were higher and significantly different from CHPR results for several study measures under the categories of diabetes management, diabetes education, and compliance.

Significant Differences of Care Associated with Client Characteristics

Study data were analyzed to determine if there were any significant differences in the provision of health care based on the client characteristics of age, sex, race, and the type of provider rendering care. No significant differences were found in quality measures regarding the type of provider providing diabetic care. Regarding age differences in study clients, a lower percentage of clients age 22 to 40 were found to have an annual lipid profile test (38.1%) and an annual urinalysis test (52.9%) during the study period than clients age 41 to 60 (60.4% and 64.9%). Study clients age 61 and older had a significantly lower percentage in regard to the microalbuminuria test (12.4%) than study clients age 41 to 60 (26.9%). The 22 to 40 age group also had a significantly lower percentage than the 61 and older age for pneumococcal vaccine coverage (6.0% versus 19.4%), and a significantly lower percentage than both other age groups for influenza vaccine coverage (16.7% versus 35.7% and 44.9%).

Only one significant result was noted regarding gender stratifications. Males were less likely to have at least one urinalysis test during the study period (46.4%) than females (61.7%). Four significantly different results were noted regarding significant care differences between race / ethnic groups. Caucasians had the lowest percentage point estimate (52.4%) for one or more

urinalysis test during the study period and their result was significantly different from the Hispanic study group (67.3%). African Americans had a significantly higher percentage of documented history and physical examinations (85.7%) than Caucasians (59.1%). A higher percentage of Asians received an influenza vaccine (75.0%) during the study period than other race / ethnic groups (20.0% to 41.5%). A higher percentage of Caucasians received advice on smoking cessation (38.7%) than Hispanics (20.6%).

Composite Scores

A composite score was developed based on results of developed study measures used in this focused study. Tables 10 and 11 display these composite results for the three Medicaid programs and for the three comparable HMOs. In referring to tables, a more complete description of study measures and individual group results can be reviewed in the Summary of Major Findings and Detailed Analysis Results sections of the report.

The study group (HMO, PCPP, UFFS) results for each specific measure were compared to the overall program measure results and then classified as "above average", " average", or "below average" based on statistically significant differences at the 95% confidence level ($p < 0.05$). Individual measure results that were classified as "above average" (indicating a better result) or "below average" (indicating a poorer result) had to be statistically above or below the overall program average for that measure of interest. For most study measures, a higher percentage indicated a better result. However, for some developed measures such as the average glycosylated hemoglobin value as well as the percentage of clients with no record documentation of provider discussion on topics home glucose monitoring, nutrition, and education, a higher percentage indicated a poorer result. An overall composite score was developed by converting categorized results into numerical scores. An "above average" classification was ranked as 3, an "average" classification was ranked as 2, and a "below average" classification was ranked as 1. Overall composite scores for each study group were computed by summing the ranks corresponding to all study measure results. Thus, a study group with results for all developed study measures comparable to overall program results would receive an "average" classification for all measures and a score of 80 (based on the 40 developed study measures). Similar overall composite scores were also developed for the three comparable HMOs (Colorado Access, CHPR, RMHMO), comparing specific measure results from each of these study groups to the overall HMO study group measure results.

Table 10 displays that the HMO study group had the highest overall composite score of 80, followed closely by the UFFS study group at 78, and the PCPP study group with the lowest overall composite score of 72. The PCPP group was "below average" for nine measures shown in the table and "above average" for one measure. The UFFS study group was "below average" for two measures. Table 11 shows results for the comparable HMO study groups when compared to overall "All HMOs" results. Colorado Access had the highest overall composite score (86), followed by RMHMO (78), and CHPR (62). Colorado Access was "above average" for six study measures while RMHMO was "below average" for two study measures. CHPR was "below average" for 19 study measures and "above average" for one study measure. Summarizing specific HMO results in terms of composite scoring (with a composite score based on all measures classified as "Average" equal to 80), Colorado Access was above average, RMHMO was generally close to average, and CHPR was below average.

Figure 1 displays a composite score for all study groups (with the exception of HMOC and Kaiser) based on comparisons made to overall program (All Programs) results. Composite scores for the PCPP, UFFS, and All HMOs study groups are the same as shown in Table 10. Composite scores for the individual HMOs (CO Access, CHPR, RMHMO) have changed slightly because of the change in comparison group. The Colorado Access study group had the highest composite score (90) followed by RMHMO, All HMOs, and UFFS study groups with generally similar composite scores (81, 80 and 78 respectively). The PCPP study group was next with a score of 72 followed by CHPR with a score of 65.

Table 10
Overall Composite Scores for Medicaid Programs

Study Measure	HMOs	PCPP	UFFS
Blood pressure reading obtained	Average	Average	Below Average
Blood pressure reading normal	Average	Average	Average
Weight reading obtained	Average	Average	Below Average
Foot inspection conducted	Average	Average	Average
Average glycosylated hemoglobin test value	Average	Average	Average
Glycosylated hemoglobin result > 8.5 addressed	Average	Average	Average
Annual lipid profile test	Average	Average	Average
Abnormal lipid profile test followed up	Average	Average	Average
Annual urinalysis test	Average	Below Average	Average
Annual microalbuminuria test	Average	Below Average	Average
Positive microalbuminuria test followed up	Average	Average	Average
Annual history and physical examination	Average	Average	Average
Documented home glucose monitorings	Average	Average	Average
Documented discussion of nutrition with client	Average	Below Average	Average
Documented discussion of exercise with client	Average	Below Average	Average
Documented hypertension being treated with medication	Average	Average	Average
Newly prescribed ACE inhibitor medication	Average	Average	Average
Annual eye examination	Average	Below Average	Average
Pneumococcal vaccine coverage	Average	Below Average	Average
Annual influenza vaccine coverage	Average	Average	Average
Documented counseling of smoking cessation	Average	Average	Average
Documented counseling of preconception issues	Average	Below Average	Average
Documented education on diabetes	Average	Average	Average
Documented education on exercise	Average	Average	Average
Documented education on insulin administration	Average	Below Average	Average
Documented education on diet	Average	Average	Average
Documented education on home glucose monitoring	Average	Average	Average
Documented education on physiology	Average	Average	Average
Documented education on medication	Average	Average	Average
Referral appointments kept	Average	Average	Average
Referrals have communication between providers	Average	Average	Average
Client able to participate in diabetes management	Average	Average	Average
Clients with recorded self management goals	Average	Average	Average
Documented missed appointments with provider	Average	Average	Average
Clients who missed multiple provider appointments	Average	Average	Average
Compliance with treatment goals	Average	Average	Average
Compliance with diet	Average	Average	Average
Compliance with medications	Average	Below Average	Average
Compliance with exercise	Average	Average	Average
Barriers to care addressed	Average	Above Average	Average
Overall Composite Score	**80**	**72**	**78**

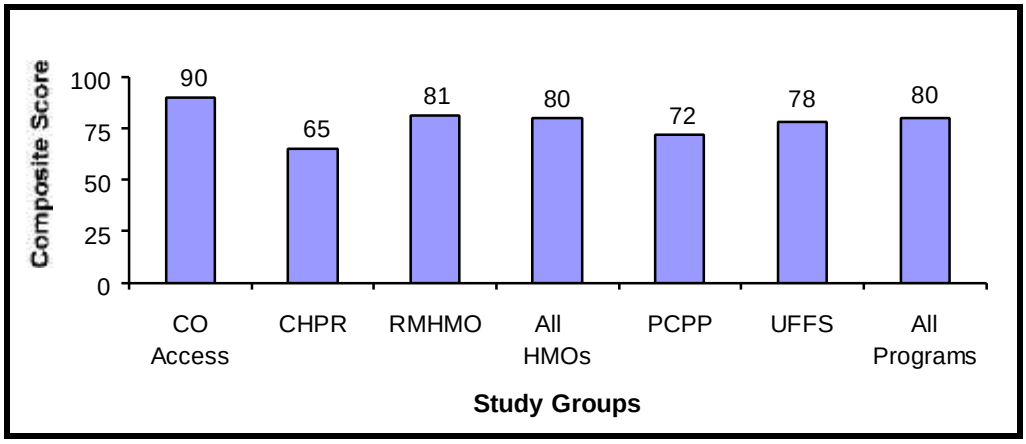
Note: Classifications of " Above Average, " Average" , and " Below Average" for each specific study measure were based on comparisons between specific study groups to the overall program measure results and then classified based on statistically significant differences at the 95% confidence level ($p < 0.05$). A study group measure result significantly better than the overall program result was given an " Above Average" classification. A group measure result significantly poorer than the overall program result was given a " Below Average" classification.

Table 11
Overall Composite Scores for Comparable HMOs

Study Measure	CO Access	CHPR	RMHMO
Blood pressure reading obtained	Above Average	Below Average	Average
Blood pressure reading normal	Average	Average	Average
Weight reading obtained	Above Average	Below Average	Average
Foot inspection conducted	Above Average	Below Average	Average
Average glycosylated hemoglobin test value	Average	Average	Average
Glycosylated hemoglobin result > 8.5 addressed	Average	Average	Average
Annual lipid profile test	Average	Average	Average
Abnormal lipid profile test followed up	Average	Average	Average
Annual urinalysis test	Above Average	Below Average	Average
Annual microalbuminuria test	Average	Below Average	Average
Positive microalbuminuria test followed up	Average	Average	Average
Annual history and physical examination	Average	Below Average	Average
Documented home glucose monitorings	Average	Below Average	Average
Documented discussion of nutrition with client	Average	Below Average	Average
Documented discussion of exercise with client	Average	Below Average	Average
Documented hypertension being treated with medication	Average	Average	Average
Newly prescribed ACE inhibitor medication	Average	Below Average	Average
Annual eye examination	Average	Below Average	Average
Pneumococcal vaccine coverage	Above Average	Below Average	Below Average
Annual influenza vaccine coverage	Above Average	Below Average	Below Average
Documented counseling of smoking cessation	Average	Below Average	Average
Documented counseling of preconception issues	Average	Average	Average
Documented education on diabetes	Average	Below Average	Average
Documented education on exercise	Average	Below Average	Average
Documented education on insulin administration	Average	Average	Average
Documented education on diet	Average	Average	Average
Documented education on home glucose monitoring	Average	Below Average	Average
Documented education on physiology	Average	Average	Average
Documented education on medication	Average	Average	Average
Referral appointments kept	Average	Average	Average
Referrals have communication between providers	Average	Average	Average
Client able to participate in diabetes management	Average	Average	Average
Clients with recorded self management goals	Average	Average	Average
Documented missed appointments with provider	Average	Above Average	Average
Clients who missed multiple provider appointments	Average	Average	Average
Compliance with treatment goals	Average	Average	Average
Compliance with diet	Average	Below Average	Average
Compliance with medications	Average	Average	Average
Compliance with exercise	Average	Below Average	Average
Barriers to care addressed	Average	Average	Average
Overall Composite Score	**86**	**62**	**78**

Note: Classifications of " Above Average, " Average" , and " Below Average" for each specific study measure were based on comparisons between specific HMO study groups to the overall HMO program measure results and then classified based on statistically significant differences at the 95% confidence level ($p < 0.05$). An HMO group measure result significantly better than the overall HMO program result was given an " Above Average" classification. An HMO group measure result significantly poorer than the overall HMO result was given a " Below Average" classification.

Figure 1
Overall Composite Scores of Study Groups
Based on Comparison to Overall Program Results



Note: An " average" classification for each overall program study measure gives the overall program group (entire study group) which all other study groups were compared to a base score of 80.

Recommendations

It is important, when reading and evaluating the findings of this study, to keep interpretations in perspective. The provided health services reviewed for this study were delivered prior to the Colorado Clinical Guidelines Collaboratives's development of specific guidelines and recommendations for the care and treatment of adults with diabetes. Study results can be used as a baseline measure and should be beneficial in evaluating programs at later points in time. Noted differences in study measures are also possibly related to differences in illness burden levels in the separate study groups. Research methods used to account for such differences were not a part of this focused study. Looking for differences between client study groups was based on the use of statistical methods. Conducting repeated statistical tests to detect differences between study groups increases the possibility of obtaining a significant outcome (finding a difference). Due to the nature of statistical testing, the possibility of finding a significant difference between specific study groups is increased when, in fact, there is no difference. Further, whether identified differences are actually meaningful depends on the specific measure, its associated use, and the impact the difference could make. Study results taken in total, however, should provide helpful information on patterns of care and the quality of diabetic care being rendered in a program / organization context. While keeping these issues in perspective during review of the results of this study, the following recommendations have been developed.

1. The importance of complete and comprehensive medical record documentation should be continued to be communicated to all Colorado Medicaid providers and participating HMOs. The probable truth regarding this study is that there were many more health services provided to Colorado Medicaid clients than have been documented in the reviewed records. From an information research perspective though, no documentation means that the service was not rendered. In rendering health care in an HMO oriented environment, there is typically less incentive for providers to document all services being provided to program clients. Complete documentation will assure providers and health organizations that credit is correctly given for the services that have been rendered and assist in the coordination of care being delivered to clients. Use of patient visit check forms and development of business processes that account for comprehensive record documentation should help in producing better results in future reviews.

2. Diabetic education programs should continue to be stressed and expanded. Study measures results relating to education on various topics associated with diabetes (exercise, diet, insulin administration, home glucose monitoring, diabetes physiology, and medication) were typically low for all Programs and specific HMOs. Successful treatment of diabetes involves changing the behavior of patients as well as providing the needed medication and medical checks. Repetitive consultation on lifestyles issues such as diet, nutrition, exercise, and smoking help to change behavior and improve the management of this disease. Continuing education should also help in patient noncompliance problems typically seen with many diabetics. Diabetic clients who understand their condition are more likely to have less complications.

3. Controlling blood glucose levels should continue to be stressed to diabetic clients by the entire team of health providers rendering diabetic health services. Average glycosylated hemoglobin values study results for all programs and HMOs indicate that all client groups could significantly improve in controlling blood glucose. Controlling blood glucose levels has been shown to reduce diabetic complications. Programs that stress controlling blood glucose in conjunction with the correct medication, proper diet, and exercise are mandatory for the successful treatment of diabetes.

4. Emphasize (at the program, health care organization, and provider level) the use of developed CCGC diabetic care guidelines as a resource to help all parties involved provide the recommended care to diabetic clients in all demographic groups.

5. Promote the sharing of information on programs and methods that are having some success in improving the health of diabetic clients. Sharing of information on programs that are having some success in improving the health of diabetic clients can be beneficial to all organizations that are part of the Colorado Medicaid program.

6. Periodically review and disseminate information to medical providers regarding new medications, new therapies, and new technologies being developed for the care of people with diabetes.

7. Work to develop target goals for future percentage results of study measures. The Health Care Financing Administration's (HCFA) quality improvement system for managed care (QISMC) guidelines for improving care is one methodology that could be used to begin development of performance goals in quality improvement programs. Using this methodology, improvement goals are based on the amount of improvement that is possible. Significant improvement is defined as when the performance gap (the percent of the client group of interest where the measure has failed) for a specific quality measure has been reduced by at least 10 percent. As an example, the target goal would be met for annual eye exams if the percentage improved from 30 percent to 37 percent, because the percentage of clients not receiving an annual eye exam would have dropped from 70 percent to 63 percent, a 10 percent reduction. The Bureau of Primary Health Care's Diabetes Collaborative (BPHCDC) is another program that could be reviewed in a program methodology selection process. A collaborative process is encouraged between the Colorado Department of Health Care Policy and Financing and participating health organizations in reviewing and selecting an appropriate goal setting methodology. Once various programs are reviewed and a specific method is decided upon, performance goals can be determined and future assessments can be conducted based on randomized samples of study populations.