Oklahoma Health Care Authority

Comprehensive Diabetes Care Study

SoonerCare Choice
Quality Assessment and Performance Improvement (QAPI) Study

Executive Summary and Technical Specifications

Report for Fiscal Year 2009

Data Review Period: Calendar Year 2007

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oklahoma health care authority

APS HEALTHCARE

Comprehensive Diabetes Care Study

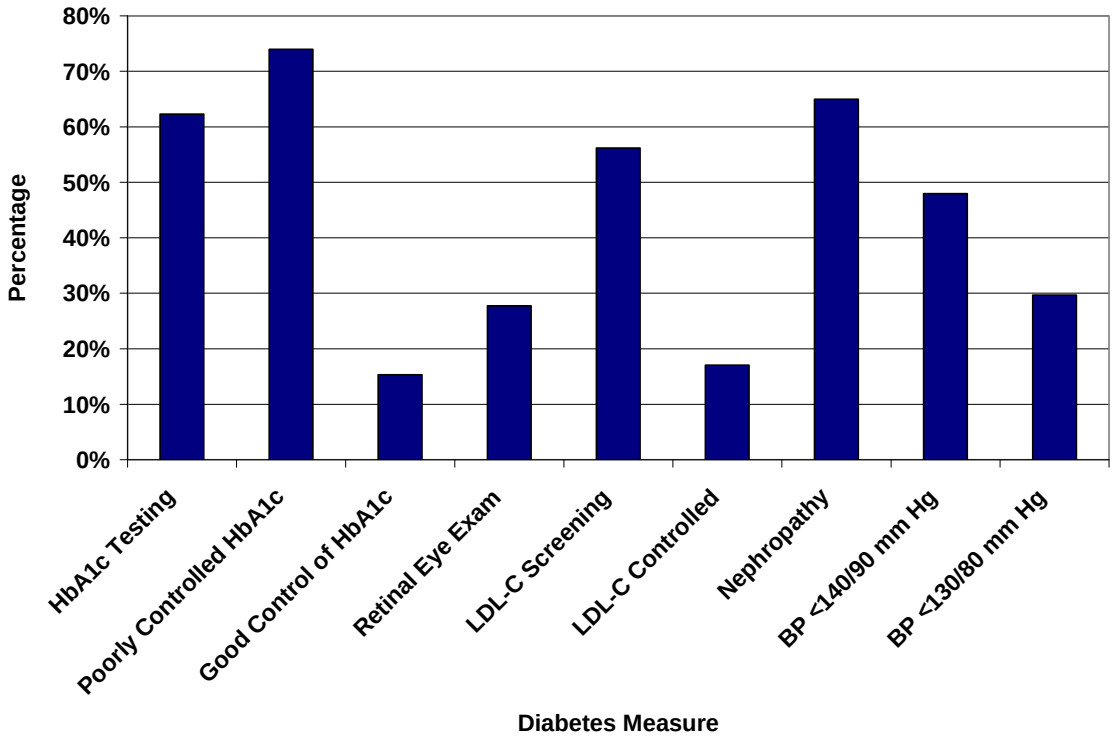
SoonerCare Choice

Executive Summary

Working in conjunction with the Oklahoma Heath Care Authority (OHCA), APS Healthcare (APS) adapted Health Plan Effectiveness Data and Information Set (HEDIS®) 2008 methodologies to monitor nine measures of diabetes care and to assess possible trends. HEDIS 2008 Comprehensive Diabetes Care Measures are as follows:

- Hemoglobin A1c (HbA1c) testing in 2007
- Poorly controlled hemoglobin A1c (HbA1c > 9.0%) in 2007
- Good control of hemoglobin A1c (HbA1c < 7.0%) in 2007
- Retinal eye exam performed in 2006 or 2007
- Low-density Lipoprotein Cholesterol (LDL-C) screening in 2007
- Low-density Lipoprotein Cholesterol controlled (LDL-C < 100 mg/dL) in 2007
- Medical attention for nephropathy in 2006 or 2007
- Blood pressure controlled at <140/90 mm Hg in 2007
- Blood pressure controlled at < 130/80 mm Hg in 2007

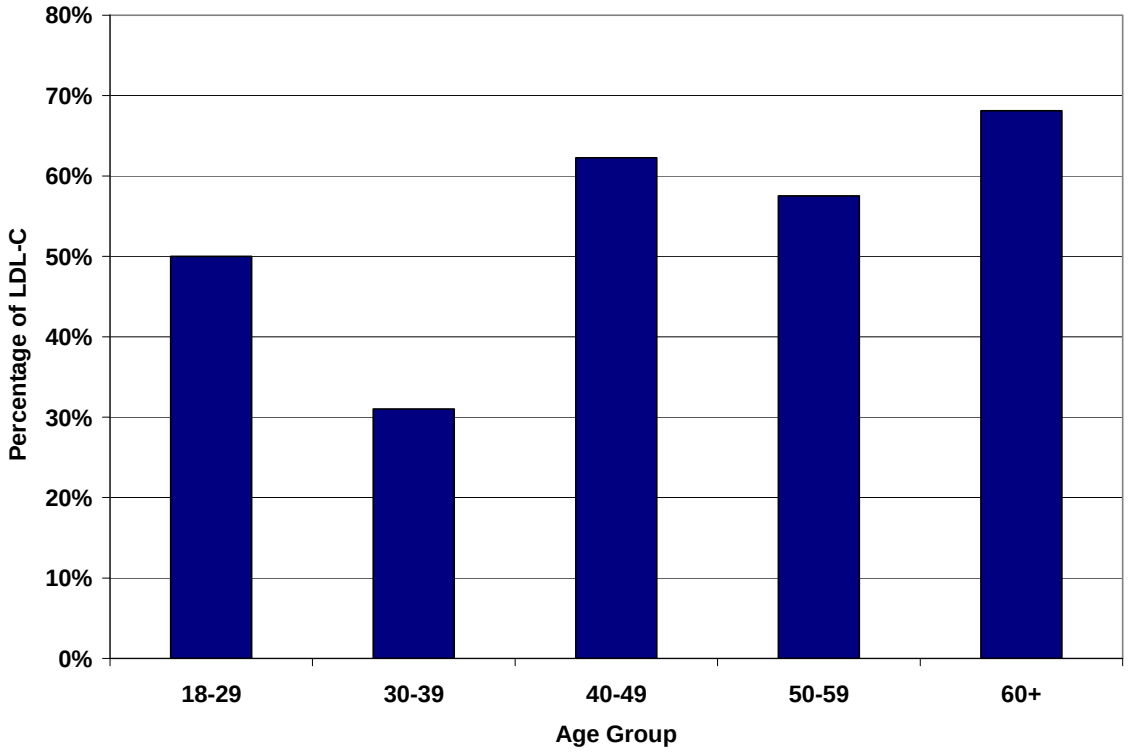
Of the nine diabetes indicators studied, the greatest adherence among members was for medical attention for nephropathy (65%). HbA1c testing followed closely, with 62.3% compliance. Shown below is the percentage of compliance for each measure.



Significant differences in the rate of members compliant with HEDIS diabetes care measures were found according to racial/ethnic group, age, and gender. The majority of the sampled members were Caucasian (65.2%), 70.1% were female, and 35.5% were between the ages of 50-59. Although the number of Hispanic members was small, Hispanics had the highest compliance rates for seven of the nine measures.

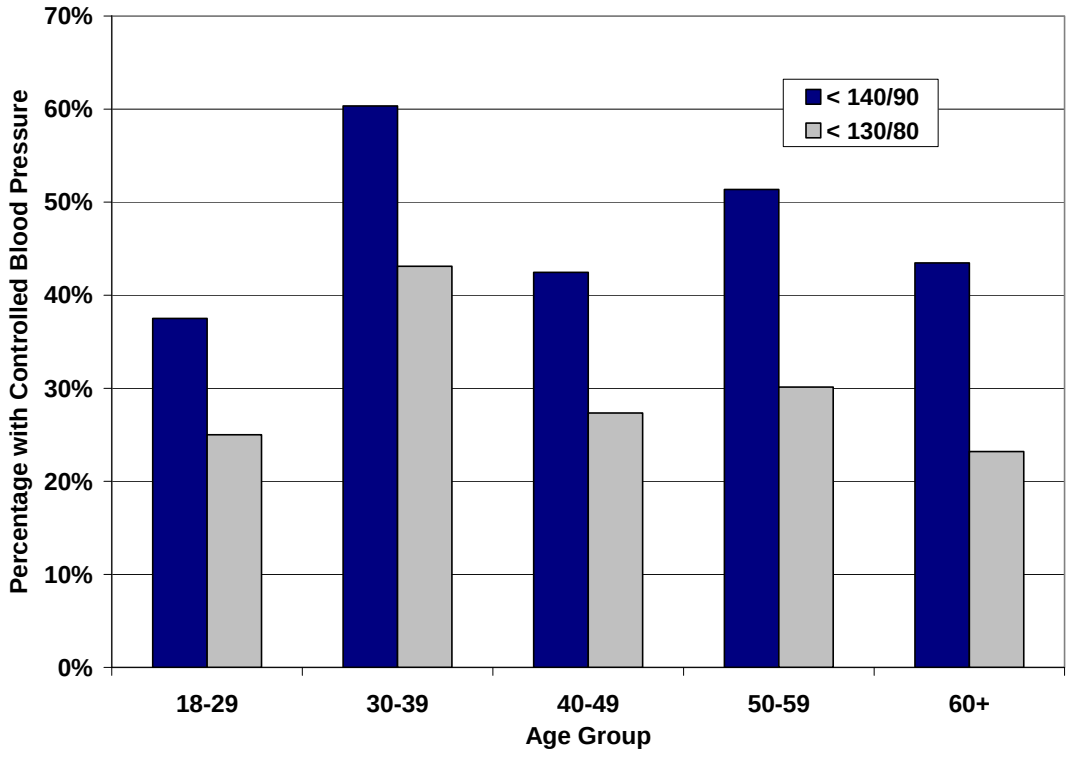
A comparison of HEDIS 2007 and HEDIS 2008 revealed that five of the nine measures remained relatively stable, yet the remaining measures demonstrated a decrease in compliance over the calendar year. A greater percentage of members demonstrated poor control of HbA1c, as evidenced by a 12% increase from CY 2007 to CY 2008. The number of members demonstrating good control of HbA1c, LDL-C control, and medical attention for nephropathy also decreased from 2007 to 2008.

The figure on the following page shows a comparison of the LDL-C screening by age group.



This figure shows in general more members in the older age groups were screened for LDL-C. Those aged 30-39 had a low rate of screening (31%). The LDL-C screening rate for the 60 years and up age group was more than double the rate of the 30-39 year age group.

The figure on the following page shows differences in blood pressure control by age group.



Members in the 30-39 year age group appeared to more successfully control blood pressure. Older members appeared to have more difficulty maintaining control below the 130/80 mm Hg level.

Additionally, SoonerCare Choice results were compared to HEDIS® 2008 national and regional Medicaid percentages and the compliance rates differed significantly on all diabetes care measures. For blood pressure controlled at <130/80 mm Hg, SoonerCare members were slightly above the national rate. For all other measures of diabetes care, SoonerCare Choice members scored significantly below the national Medicaid rates. SoonerCare Choice measures were comparable with the regional means for several of the measures. Rates for retinal eye exams, medical attention for nephropathy, and blood pressure controlled at <140/90 mm Hg were statistically equivalent to the regional means while blood pressure controlled at <130/90 mm Hg was higher for SoonerCare Choice members than the regional average.

This study points out both an overall need for improving diabetes care and monitoring among SoonerCare Choice members, as well as specific areas for intervention

that may have a positive impact. This information is used to assist the OHCA in the development of initiatives and strategies to further improve health care provided to members in the SoonerCare Choice program.

Comprehensive Diabetes Care Study
SoonerCare Choice

Technical Specifications

Diabetes is a disease where the body fails to produce insulin or the insulin produced is not sufficient to control blood glucose. An estimated 23.6 million Americans or 7.8% of the U.S. population have diabetes (Centers for Disease Control and Prevention, 2008). In the population aged 20 or older an estimated 23.5 million or 10.7% have diabetes.

Adults with diabetes are 2 to 4 times more likely to die of heart disease and have 2 to 4 times the risk of stroke than those without diabetes. Diabetes is the leading cause of kidney failure and the leading cause of blindness in adults 20 to 74 years of age (Centers for Disease Control and Prevention, 2008). Because of these risk factors, diabetes treatment and prevention continue to be a major concern for the Oklahoma Health Care Authority (OHCA).

Background to Study

The OHCA is the state agency charged with developing and administering the SoonerCare Choice program, a primary care case management (PCCM) program. In recent years, diabetes care for SoonerCare Choice members has been a focus of the OHCA's quality improvement efforts. The OHCA's quality improvement activities include outreach to members to educate them about recommended screenings and to help them obtain the screenings; and educational outreach to providers about their assigned members with the possible need for screenings.

Working in conjunction with the OHCA, APS Healthcare (APS) adapted Healthcare Effectiveness Data and Information Set (HEDIS®) 2008 methodologies to monitor nine measures of diabetes care and to assess possible trends. This study summarizes findings from those measures.

Method

HEDIS 2008 methodology adapted from *Technical Specifications Volume 2* was used to define the sample upon which the rates of comprehensive diabetes care were based. A sample was drawn from SoonerCare Choice members aged 18 to 75 who were diagnosed with diabetes during calendar year 2007. The members had to be eligible on December 31, 2007, and have no more than one gap in enrollment of up to 45 days in 2007.

The Comprehensive Diabetes Care Measures are as follows:

- Hemoglobin A1c (HbA1c) testing in 2007
- Poorly controlled hemoglobin A1c (HbA1c > 9.0%) in 2007
- Good control of hemoglobin A1c (HbA1c < 7.0%) in 2007
- Retinal eye exam performed in 2006 or 2007
- Low-density Lipoprotein Cholesterol (LDL-C) screening in 2007
- Low-density Lipoprotein Cholesterol controlled (LDL-C < 100 mg/dL) in 2007
- Medical attention for nephropathy in 2006 or 2007
- Blood pressure controlled at <140/90 mm Hg in 2007
- Blood pressure controlled at < 130/80 mm Hg in 2007

Under the direction of the OHCA, APS adapted the HEDIS 2008 hybrid guidelines for the comprehensive diabetes care measures. The HEDIS 2008 hybrid guidelines incorporate administrative claims data and comprehensive medical record review to provide a more complete picture of performed screenings and tests. The medical record review identified blood pressure notations, lab results, doctors' notes, and follow-up from referrals related to the measures described.

Study Objectives

The following objectives guided the study:

- Determine the rates of diabetes care measures for a sample of SoonerCare Choice members aged 18-75, following HEDIS 2008 guidelines.
- Examine the diabetes care measures by race/ethnicity, age group, and gender.

- Evaluate trends in the rates of diabetes care measures where available from previous years.
- Compare SoonerCare Choice documented rates of diabetes care to HEDIS national and regional Medicaid means.
- Identify the most commonly prescribed medications for sampled members.

Definitions of Measures

The measures used in this study are defined below.

Hemoglobin A1c (HbA1c) Tests

Using data from administrative claims and medical records, sample members' most recent HbA1c levels taken in 2007 were categorized according to HEDIS 2008 guidelines. The categories were: ≥9.0% (poor control), ≤7.0% (good control), between 9.0% and 7.0%, missing, or member not tested during 2007. Medical record documentation included the date the HbA1c test was performed and the result of the test, if a result was documented. If members did not have an HbA1c test performed during 2007 or were missing test results, they were assumed to have poor control over their HbA1c levels.

Retinal Exams

Documentation of a retinal or dilated eye exam by either an optometrist or ophthalmologist during 2007 or documentation of a *negative* retinal eye exam during 2006 was used to evaluate compliance for the measure. At a minimum, documentation in the medical record included a note or a letter from an eye care professional or primary care provider indicating the date on which the exam was performed; that it was performed by an eye care professional and the results; or a chart or photograph of retinal abnormalities. When fundus photography was used in the exam, documentation indicated the date performed and evidence that an eye care professional reviewed the results or the results were read by a qualified reading center operating under the direction of a medical director who was a retinal specialist.

Low-Density Lipoprotein Cholesterol (LDL-C) Test

Sample members' most recent LDL-C levels were categorized by adapting HEDIS 2008 guidelines. These categories were: screening performed, < 100 mg/dL (controlled), missing, or not tested during 2007.

At minimum, documentation included a note indicating the date the LDL-C test was performed and the result. If members did not have an LDL-C test performed during 2007 or were missing results, then they were considered to have uncontrolled LDL-C levels and were not included. If the LDL-C level was not available in the medical record, but the total cholesterol, high-density lipoprotein cholesterol, and triglyceride levels were available and the triglyceride level was less than or equal to 400 mg/dL, then the Friedewald equation was used to calculate LDL-C levels, specifically:

$$\text{LDL-C} = (\text{Total cholesterol}) - (\text{HDL}) - (\text{triglycerides}/5)$$

Medical Attention for Nephropathy

Documentation (consisting of a note indicating date and result) of adherence to the Medical Attention for Nephropathy measure included any of the following: end-stage renal disease; chronic or acute renal failure; renal insufficiency; diabetic nephropathy; dialysis; positive protein test or dipstick for gross protein macroalbuminuria; microalbumin lab test; or ACE inhibitor/ARB therapy during 2007.

Blood Pressure Control

Using the most recent data from medical records, sample members' lowest systolic and lowest diastolic blood pressure readings were categorized according to HEDIS 2008 guidelines. The categories included: blood pressure < 130/80 mm Hg; blood pressure < 140/90 mm Hg; blood pressure ≥ 140/90 mm Hg; missing; or blood pressure test not done in 2007. Blood pressure readings taken from outpatient visits (or on the same day as an outpatient visit) for the sole purpose of having a diagnostic test or surgical procedure were excluded. Readings taken at an emergency room visit were also excluded from the study. When multiple readings were recorded on the same day, the lowest reading was used in the study. These categories specifying blood pressure levels

were not mutually exclusive. That is, members with blood pressure below 130/80 also would be counted in the category for readings below 140/90.

Eligible Population and Sample Selection

From the administrative HEDIS data provided by the OHCA, APS alphabetized identified members with diabetes, and prepared the sampling frame, following HEDIS 2008 guidelines for systematic sampling. APS selected a sample of 411 members and an oversample of 10% (21 members) to comprise a total sample of 432 SoonerCare Choice members. From the OHCA's eligibility and claims data, APS pulled eligibility, enrollment, pharmacy and paid claims data, and then matched this information for these 432 members.

Medical Request Process

Record requests were sent for the 411 members in the primary sample and the 21 members in the oversample. Record requests were sent to all primary care providers to whom these members were assigned in calendar year 2007. In conjunction with the OHCA, APS sent providers medical record requests that included information on the nature of the study, directions for submitting medical records, and a timeline for submitting these records. A sample medical record request letter is included in Appendix A. If no response was received from the provider within the specified time frame, then at least three attempts to contact by telephone were made and documented. Additionally, medical record requests were re-sent as deemed appropriate.

For the 411 members for whom records were requested, APS received 329 charts. For 58 more members, all providers responded that they had not seen the member and had no records, bringing the overall response rate to 93.2%. APS reviewed the medical records and entered relevant information into a database to produce the HEDIS 2008 measures. A list of all requested records that were not received by APS was provided to the OHCA in a separate document.

Data Abstraction

APS designed a data abstraction tool to allow user-friendly and accurate medical records data collection for information relevant to the diabetes care measures in this

study. Medical record review protocols were developed, and reviewers were trained on these protocols and the data abstraction tool. Additionally, "refresher" training courses were conducted to ensure proper medical record review protocol was uniformly followed throughout the duration of the study.

APS employed one licensed practical nurse, one registered nurse and a supervisory registered nurse to review the medical records and document information related to the diabetes care measures in the data abstraction tool. Following HEDIS 2008 guidelines, specific documentation was required for the diabetes care measures, identified through medical record review. The reviewers documented any issues encountered during the medical record review, and these records were reviewed independently to ensure that the issues were resolved in a homogeneous manner. The information collected from this documentation will determine the need for revision of the medical record review protocol for future studies.

To ensure consistency within the data abstraction process, a sample of completed medical record reviews was selected from each reviewer. These were then reviewed by an independent registered nurse reviewer to ensure that all data collection protocols were followed to produce the highest quality data.

In addition, data cleaning techniques were designed to ensure the validity of the data. The data were examined to ensure that all information recorded was within the requested date range and that the reviews were not duplicated. If inconsistencies were identified, the data were corrected accordingly. All data cleaning techniques were completed before data analyses began.

Confidentiality and Disclosure of Information

The OHCA contracted with APS to conduct this study. Section 1160 of the Social Security Act, "Protecting Against Disclosure of Information," outlines disclosure of external review information by APS. In compliance, all employees of APS have signed confidentiality and disclosure agreements. Additionally, all employees of APS have completed Health Insurance Portability and Accountability Act (HIPAA) training and are educated on the appropriate handling of personal health information.

Access to member-specific data was limited to the project staff associated with this study and, for the duration of this study, APS only produced reports with de-identified data. Medical records were tracked and remained in a locked filing cabinet when not in use. Access to these medical records was limited to the project staff. After completion and acceptance of the final report by the OHCA, the medical records will be destroyed.

Results

Business Objects 6.5® along with Microsoft Excel 2003® and Access 2003® were used for analysis and reporting. Rates for each comprehensive diabetes care measure were calculated using the sample size of 411 as the denominator.

Rates for Diabetes Care Measures

Table 1 displays the percentage of SoonerCare Choice members who met the criteria for inclusion in the diabetes indicators shown below. Low rates of poorly controlled HbA1c were desired, indicating members had controlled HbA1c levels. High rates were desired on all other indicators.

Table 1. Percentage of Members with Selected Diabetes Indicators for Calendar Year (CY) 2007

Diabetes Indicator	Percent
HbA1c testing	62.3%
Poorly controlled HbA1c (>9.0%)	74.0%
Good control of HbA1c (< 7.0%)	15.3%
Retinal eye exam	27.7%
LDL-C screening	56.2%
LDL-C controlled (< 100 mg/dL)	17.0%
Medical attention for nephropathy	65.0%
Blood pressure controlled at < 140/90 mm Hg	47.9%
Blood pressure controlled at < 130/80 mm Hg	29.7%

Three measures were met by more than 50% of members – HbA1c testing, LDL-C screening, and medical attention for nephropathy. Although 62.3% of members had HbA1c testing, 74% also had poorly controlled HbA1c levels (>9.0%). According to HEDIS, members not tested (37.7%) were included in the poorly controlled HbA1c category.

Table 2 provides more information about the diabetes indicators presented in Table 1. First, measures were calculated using only the administrative claims data. Then the measures were calculated using both administrative claims data and medical record data. Ninety-five percent confidence intervals (CI) are presented for the percentage of SoonerCare Choice members who met criteria for inclusion in the diabetes indicators based on both administrative data and medical records data.

Table 2. Number and Percentage of Members with Selected Diabetes Indicators – CY 2007

Diabetes Indicator	Claims Data (*n**)	Percentage of Claims Data	Claims & Record Data (*n**)	Percentage of Claims & Record Data	95% CI – Claims & Record Data
HbA1c testing	244	59.4%	256	62.3%	57.6% - 67.0%
Poorly controlled HbA1c (>9.0%)**	NA	NA	304	74.0%	69.7% - 78.2%
Good control of HbA1c (<7.0%)**	NA	NA	63	15.3%	11.8% - 18.8%
Retinal eye exam	102	24.8%	114	27.7%	23.4% - 32.1%
LDL-C screening	215	52.3%	231	56.2%	51.4% - 61.0%
LDL-C controlled (<100 mg/dL)**	NA	NA	70	17.0%	13.4% - 20.7%
Medical attention for nephropathy	214	52.1%	267	65.0%	60.3% - 69.6%
Blood pressure controlled at <140/90 mm Hg**	NA	NA	197	47.9%	43.1% - 52.8%
Blood pressure controlled at <130/80 mm Hg**	NA	NA	122	29.7%	25.2% - 34.1%

* *n* = number of members identified
** These measures are based only on information obtained from medical record review.

Table 2 shows a small increase in the percentages of SoonerCare Choice members who received HbA1c testing, retinal eye exams, LDL-C screening, and medical attention for nephropathy when both administrative claims data and medical record data were used, compared with only administrative data. For five of the nine measures, no claims data were available.

Diabetes Care Measures by Race/Ethnicity

Figure 1 displays the racial/ethnic breakdown for the 411 sample members. The final SoonerCare Choice sample included 268 Caucasian members, 84 African American members, 38 American Indian members, 15 Hispanic members, and 6 Asian members.

Figure 1. Percentage of Sampled Members by Racial/Ethnic Group – CY 2007

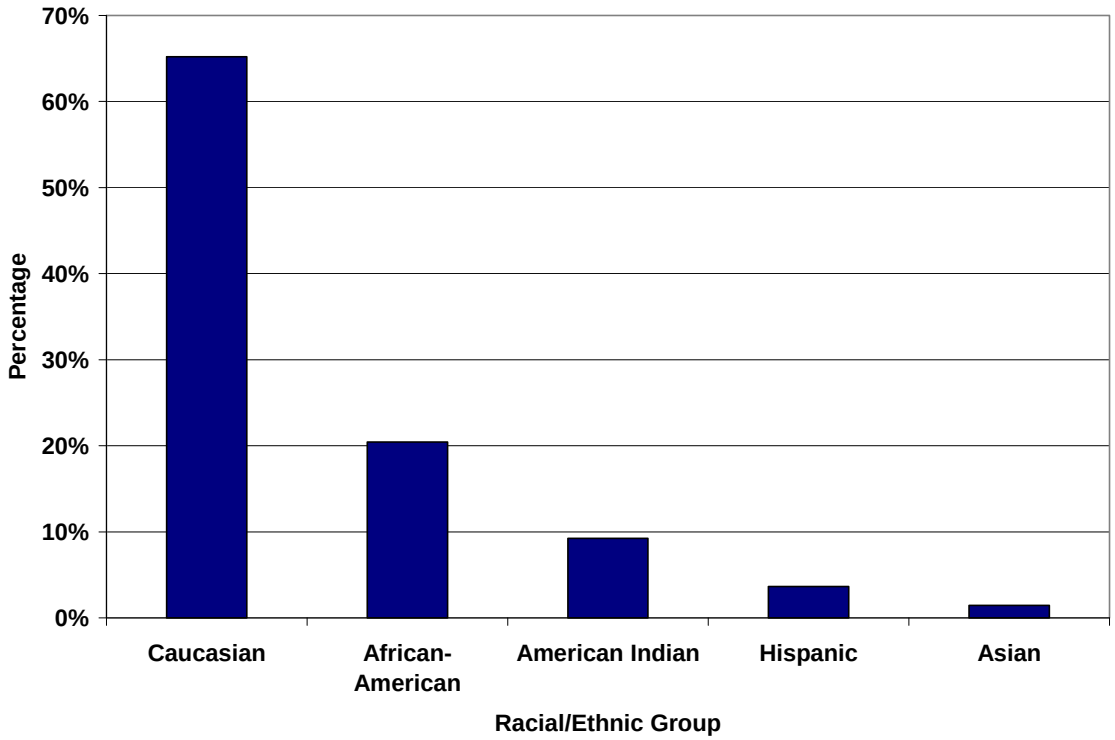


Table 3 displays the diabetes care indicators by racial/ethnic group. The racial/ethnic group for each member was obtained from administrative claims data. The small number of sample members who were Asian (6 members) precluded valid statistical inferences about this group. Chi-square tests were performed to determine if statistical differences existed between the percentages of Caucasian, American Indian, African American, and Hispanic members meeting criteria for the diabetes indicators. *P*-values for these chi-square tests are reported in Table 3. *P*-values shown in italics indicate significant differences. For all tests of significance in this report, *p*-values less than or equal to .05 are considered significant.

Table 3. Number and Percentage of Members with Selected Diabetes Indicators by Racial/Ethnic Group – CY 2007

Diabetes Indicator	Caucasian		African American		American Indian		Hispanic		*P*-value*
	n	%	*n*	%	*n*	%	*n*	%	
HbA1c testing	178	66.4%	49	58.3%	18	47.4%	9	60.0%	0.105
Poorly controlled HbA1c (>9.0%)	189	70.5%	70	83.3%	28	73.7%	12	80.0%	0.125
Good control of HbA1c (<7.0%)	46	17.2%	7	8.3%	6	15.8%	3	20.0%	0.248
Retinal eye exam	72	26.9%	24	28.6%	8	21.1%	9	60.0%	*0.033*
LDL-C screening	154	57.5%	45	53.6%	17	44.7%	12	80.0%	0.117
LDL-C controlled (<100 mg/dL)	51	19.0%	11	13.1%	4	10.5%	3	20.0%	0.406
Medical attention for nephropathy	173	64.6%	57	67.9%	22	57.9%	11	73.3%	0.654
Blood pressure controlled at <140/90 mm Hg	138	51.5%	30	35.7%	16	42.1%	9	60.0%	0.051
Blood pressure controlled at <130/80 mm Hg	88	32.8%	16	19.0%	11	28.9%	5	33.3%	0.115

* All *p*-values excluded data from Asian members since the low number of members precluded valid statistical inference.

Complete chi-square results are presented in Appendix B. Statistically significant differences in retinal eye exam were found between members of different racial/ethnic groups. Caucasian members had the highest rates of HbA1c testing. African American members had the highest rate of poorly controlled HbA1c (83.3%). Although there were only fifteen Hispanic members, they represented the highest percentage who received retinal eye exam, LDL -C screening, LDL-C controlled, medical attention for nephropathy, and blood pressure measures.

Table 4 displays the number of SoonerCare Choice members who met criteria for inclusion in the diabetes indicators, by age group. Five age groups were used: 18-29 years (32 members), 30-39 years (58 members), 40-49 years (106 members), 50-59 years

(146 members), and 60 years and older (69 members), with age computed as of December 31, 2007. The average age of sample members was 48.2 years, with ages ranging from 18 to 65 years.

Table 4. Number and Percentage of Members with Selected Diabetes Indicators by Age – CY 2007

Diabetes Indicator	18 - 29		30 - 39		40 - 49		50 - 59		60+		*P*-value*
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	
HbA1c testing	19	59.4%	26	44.8%	69	65.1%	92	63.0%	50	72.5%	*0.026*
Poorly controlled HbA1c (>9.0%)	28	87.5%	47	81.0%	79	74.5%	102	69.9%	48	69.6%	0.163
Good control of HbA1c (<7.0%)	3	9.4%	9	15.5%	20	18.9%	21	14.4%	10	14.5%	0.729
Retinal eye exam	9	28.1%	11	19.0%	31	29.2%	42	28.8%	21	30.4%	0.613
LDL-C screening	16	50.0%	18	31.0%	66	62.3%	84	57.5%	47	68.1%	*<.0001*
LDL-C controlled (<100 mg/dL)	4	12.5%	5	8.6%	20	18.9%	27	18.5%	14	20.3%	0.359
Medical attention for nephropathy	20	62.5%	38	65.5%	70	66.0%	90	61.6%	49	71.0%	0.742
Blood pressure controlled at <140/90 mm Hg	12	37.5%	35	60.3%	45	42.5%	75	51.4%	30	43.5%	0.112
Blood pressure controlled at <130/80 mm Hg	8	25.0%	25	43.1%	29	27.4%	44	30.1%	16	23.2%	0.135

* See Appendix B for a discussion of the inclusion of chi-square results for expected values < 5.

The chi-square statistic was used to test for equal proportions across age groups. The complete chi-square results are detailed in Appendix B. As shown in Table 4, there were statistically significant differences by age for two of the diabetes measures. Members in the oldest age group were more likely to have had HbA1c testing and LDL-C screening than members in the younger age groups.

The following three figures show noteworthy comparisons between age groups from the data in Table 4. Figure 2 shows the comparison by age group of those members who had evidence of LDL-C screening.

Figure 2. Percentage of Members with LDL-C Screening, by Age Group – CY 2007

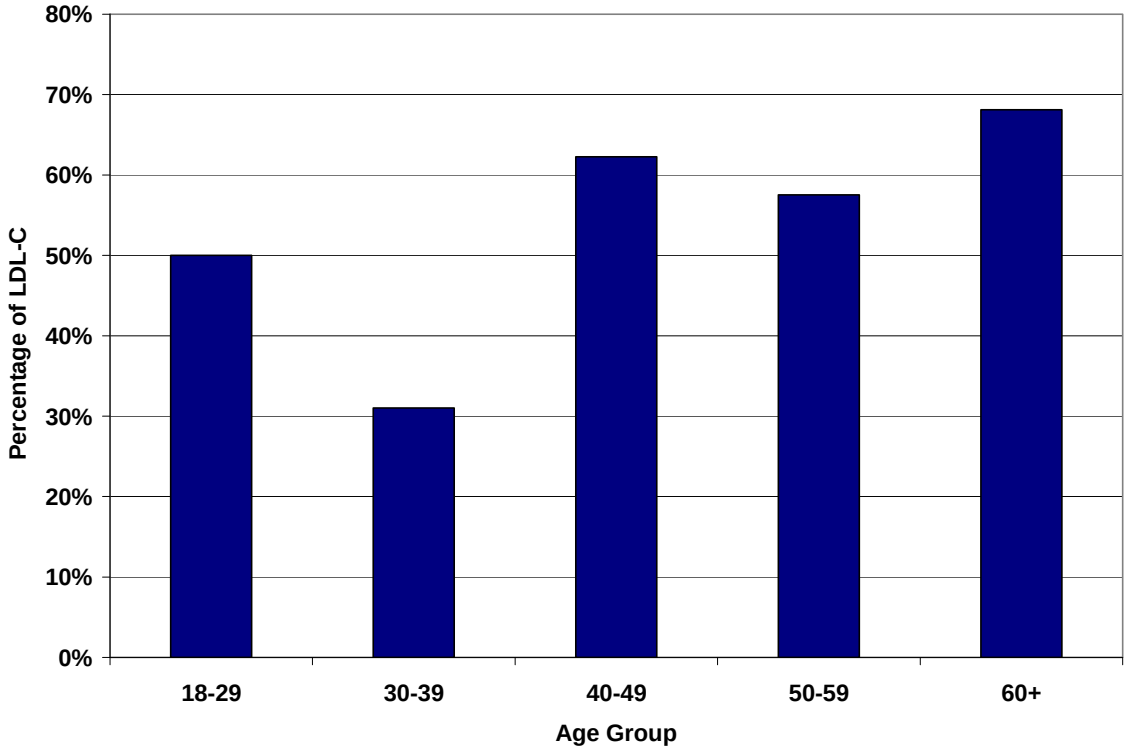
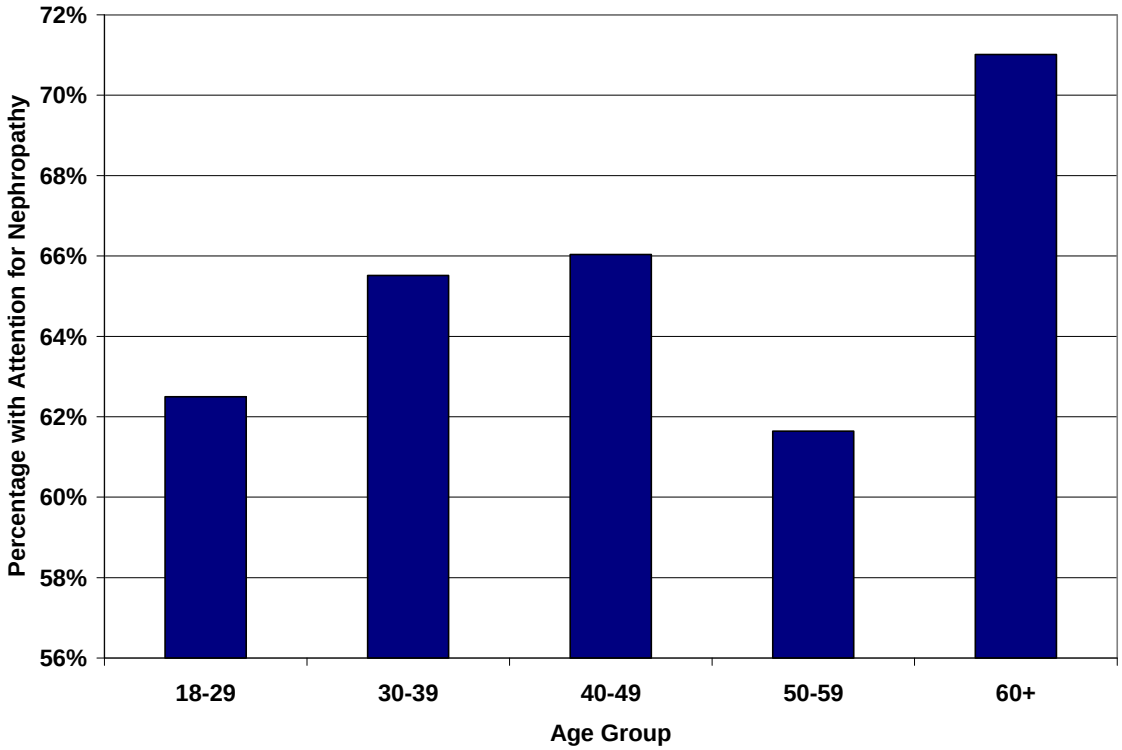


Figure 2 shows in general more members in the older age groups were screened for LDL-C. Those aged 30-39 had a low rate of screening (31%). The LDL-C screening rate for the 60 years and up age group was more than double the rate of the 30-39 year age group.

Figure 3 illustrates the differences in rates of medical attention for nephropathy by age group.

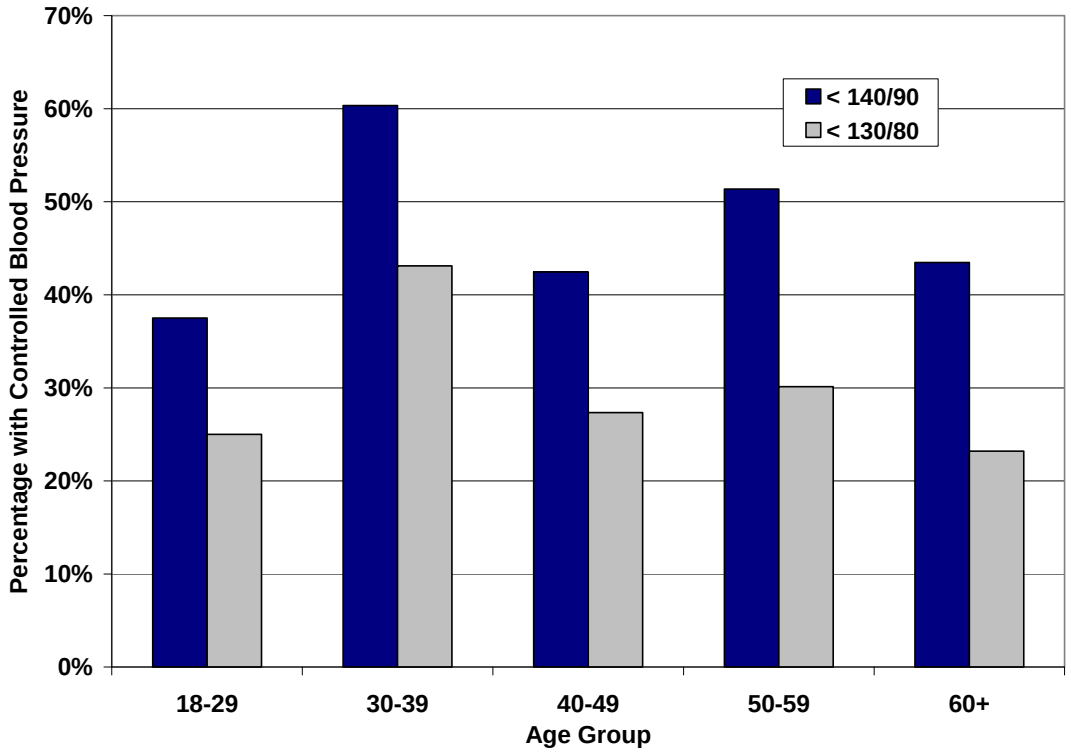
Figure 3. Percentage of Members with Medical Attention for Nephropathy, by Age Group –CY 2007



SoonerCare members over the age of sixty received the most medical attention for nephropathy (or evidence of nephropathy) out of all of the age groups.

Figure 4 illustrates the differences in rates on the blood pressure measures by age group.

Figure 4. Percentage of Members with Controlled Blood Pressure, by Age Group – CY 2007



NOTE: Blood pressure categories were not mutually exclusive.

Members in the 30-39 year age group appeared to more successfully control blood pressure. Older members appeared to have more difficulty maintaining control at the <130/80 mm Hg level.

Diabetes Care Measures by Gender

Table 5 displays the number of SoonerCare Choice members who met criteria for inclusion in the diabetes indicators by gender. There were 288 (70.1%) women and 123 (29.9%) men in the sample.

Table 5. Number and Percentage of Members with Selected Diabetes Indicators by Gender – CY 2007

Diabetes Indicators	Female		Male		*P*-value
	n	%	*n*	%	
HbA1c testing	183	63.5%	73	59.3%	.422
Poorly controlled HbA1c (>9.0%)	213	74.0%	91	74.0%	.996
Good control of HbA1c (<7.0%)	47	16.3%	16	13.0%	.393
Retinal eye exam	85	29.5%	29	23.6%	.218
LDL-C screening	168	58.3%	63	51.2%	.183
LDL-C controlled (<100 mg/dL)	56	19.4%	14	11.4%	*.046*
Medical attention for nephropathy	204	70.8%	63	51.2%	*<.001*
Blood pressure controlled at <140/90 mm Hg	140	48.6%	57	46.3%	.673
Blood pressure controlled at <130/80 mm Hg	88	30.6%	34	27.6%	.554

As shown in Table 5 and Figure 5 (following page), statistically significant differences (in italics) existed between the genders for those who had LDL-C controlled and received medical attention for nephropathy. Complete chi-square results are presented in Appendix B.

Figure 5. Percentage of Members Meeting Criteria, by Gender – CY 2007

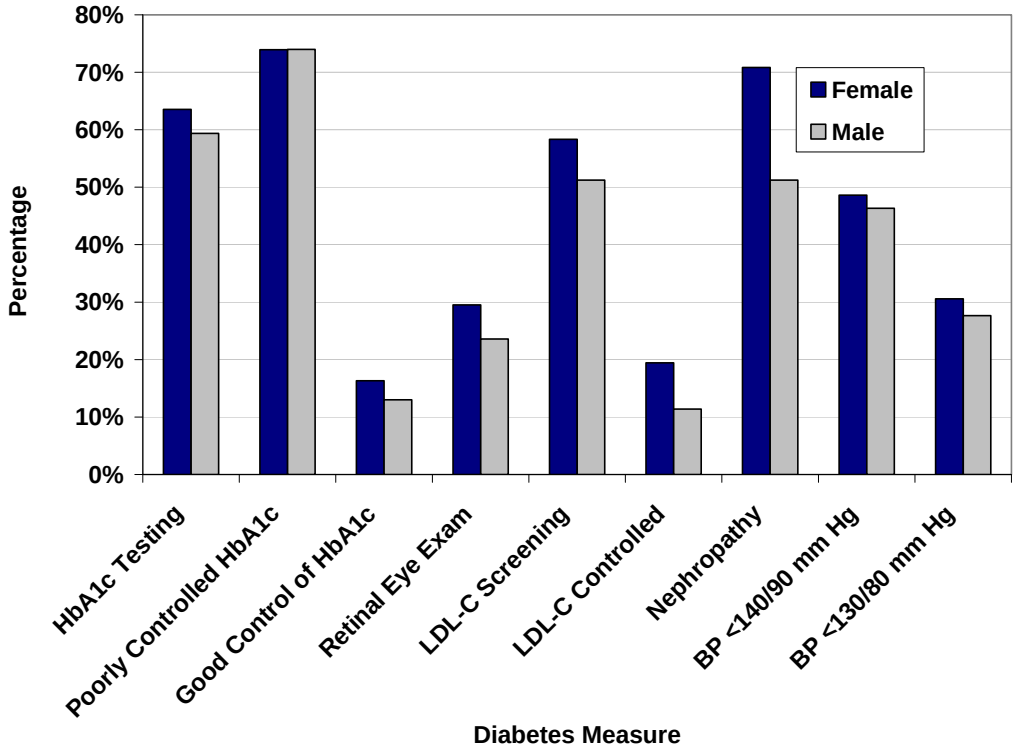


Table 5 and Figure 5 show that two of the nine indicators were statistically significant for gender – controlled LDL-C and medical attention for nephropathy. As mentioned above, women had significantly higher rates of controlled LDL-C (<100 mg/dL) and medical attention for nephropathy.

Comparison with Previous Data

The measures from the current study were compared to the previous year's study.

Table 6. Percentage of SoonerCare Choice Members with Diabetes Care Indicators by Year (2006– 2007)

	Percentages		
Diabetes Measure	**2006**	**2007**	***P*-value**
HbA1c Testing	62.8%	62.3%	.885
Poorly controlled HbA1c (>9.0%)	62.0%	74.0%	*<.001*
Good Control of HbA1c (<7.0%)	24.6%	15.3%	*<.001*
Retinal eye exam	26.8%	27.7%	.639
LDL-C Screening	58.4%	56.2%	.526
LDL-C Controlled (<100 mg/dL)	20.7%	17.0%	.181
Medical attention for nephropathy	80.8%	65.0%	*<.001*
Blood pressure controlled at < 140/90 mm Hg	47.7%	47.9%	.944
Blood pressure controlled at < 130/80 mm Hg	21.4%	29.7%	*.007*

There were significant differences between CY 2006 and CY 2007 on a number of the diabetes measures. From CY 2006 to CY 2007, there were more sampled members who had poorly controlled HbA1c and fewer members who had good control of HbA1c and medical attention for nephropathy. More members had blood pressure controlled at < 130/80 mm Hg for CY 2007 than in CY 2006. No other differences were statistically significant. The chi-square comparisons between years can be found in Appendix B.

NCQA Quality Compass HEDIS National and Regional Medicaid Percentiles

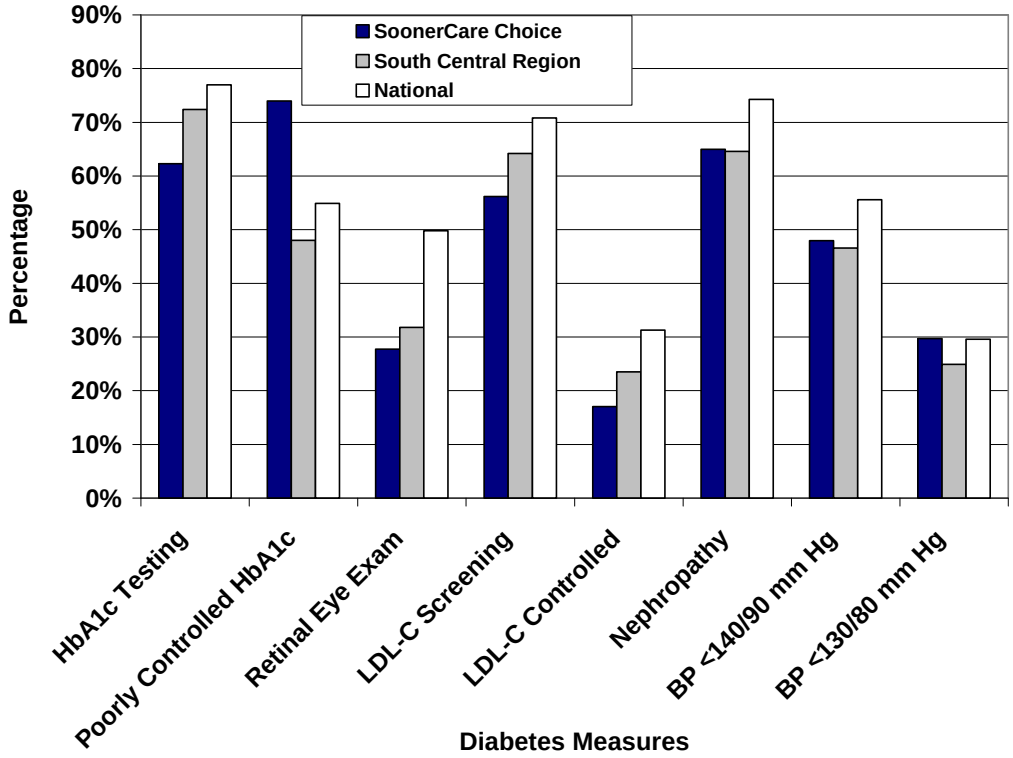
The National Committee for Quality Assurance (NCQA) Quality Compass Healthcare Effectiveness Data and Information Set (HEDIS) 2008 Percentiles are the national audit results for HEDIS measures during calendar year 2007. These provide a national comparison for the SoonerCare Choice diabetes care indicator rates.

Table 7 and Figure 6 display the SoonerCare Choice results and the regionally adjusted SoonerCare results alongside the national Medicaid means. The 95% confidence interval ($CI_{.95}$) indicates the likelihood that with repeated sampling, the true population rate for each measure would be captured 95% of the time.

Table 7. NCQA Quality Compass HEDIS National and Region Percentages Compared to Diabetes Care Percentages for SoonerCare Choice Members – CY 2007

Diabetes Indicators	SoonerCare Choice 2007 Percentages	South Central Region 2007 Percentages	HEDIS National Medicaid 2007 Percentages
HbA1c testing	62.3% $CI_{.95}$ = 57.6% - 67.0%	72.4%	77.0%
Poorly controlled HbA1c (>9.0%)	74.0% $CI_{.95}$ = 69.7% - 78.2%	48.0%	54.9%
Retinal eye exam	27.7% $CI_{.95}$ = 23.4% - 32.1%	31.8%	49.8%
LDL-C screening	56.2% $CI_{.95}$ = 51.4% - 61.0%	64.2%	70.8%
LDL-C controlled (<100 mg/dL)	17.0% $CI_{.95}$ = 13.4% - 20.7%	23.5%	31.3%
Medical attention for nephropathy	65.0% $CI_{.95}$ = 60.3% - 69.6%	64.6%	74.3%
Blood pressure controlled at <140/90 mm Hg	47.9% $CI_{.95}$ = 43.1% - 52.8%	46.6%	55.6%
Blood pressure controlled at <130/80 mm Hg	29.7% $CI_{.95}$ = 25.2% - 34.1%	24.9%	29.6%

Figure 6. NCQA Quality Compass HEDIS National and South Central Region Percentages Compared to Diabetes Care Percentages for SoonerCare Choice Members – CY 2007



* It should be noted that Good Control of HbA1c (<7.0%) was excluded from the Regional and Medicaid Review due to NCQA's review of the measure.

The HEDIS national percentages and the SoonerCare Choice percentages were significantly different for all diabetes care measures with the exception of blood pressure controlled at <130/80 mm Hg. SoonerCare Choice members had a slighter higher percentage of members with blood pressure control less than 130/80 mm Hg than the national percentage (29.7% and 29.6%, respectively). All other percentages for diabetes care measures for SoonerCare Choice members were significantly below the national Medicaid means. SoonerCare Choice measures were comparable with the regional means for the following measures: LDL-C controlled (<100 mg/dL), medical attention for nephropathy, and blood pressure controlled at <140/90 mm Hg. Blood pressure controlled at <130/90 mm Hg was higher for SoonerCare Choice members than the regional average.

Table 8 shows the most common classes of medications that were filled for members sampled with diabetes during calendar year 2007.

Table 8. Top 15 Prescription Medications Dispensed for Sampled SoonerCare Choice Members with Diabetes, Sorted by American Hospital Formulary System (AHFS) Therapeutic Class– CY 2007

AHFS Therapeutic Class	Members	Percentage
Opiate Agonists	270	65.7%
Angiotensin-Converting Enzyme Inhibitors	212	51.6%
Biguanides*	177	43.1%
HMG-COA Reductase Inhibitors	174	42.3%
Antidepressants	173	42.1%
Nonsteroidal Anti-Inflammatory Agents	147	35.8%
Insulins*	137	33.3%
Sulfonylureas*	134	32.6%
Beta-Adrenergic Blocking Agents	128	31.1%
Thiazolidinediones*	118	28.7%
Beta-Adrenergic Agonist	118	28.7%
Proton-Pump Inhibitors	109	26.5%
Centrally Acting Skeletal Muscle Relaxant	104	25.3%
Miscellaneous Anticonvulsants	103	25.1%
Macrolides	102	24.8%

* Medication used for treatment of diabetes.

Four of the top 15 drug classes were related to the treatment of diabetes. The American Diabetes Association® (2009) reported that medications may be used to lower blood glucose levels for treatment of type 2 diabetes. Eighty-three percent of the SoonerCare Choice sampled members filled a prescription medication related to the treatment of their diabetes during calendar year 2007.

Discussion

Medical attention for nephropathy had the highest percentage of adherence, with 65% of members sampled in this study demonstrating compliance with this measure. HbA1c testing and LDL-C screening showed adherence above 50% (62.3% and 56.2%, respectively).

Hybrid data collection methods (utilizing both administrative claims data and medical record review) were used for this study. However, the information collected through medical record review did not appear to markedly increase the volume of information already available through administrative claims data. Out of the 411 members in the sample only 12 to 16 members' records showed compliance that was not identified through the administrative claims data. The exception to this was the blood pressure data, which is only available through record review.

Members identified as American Indian showed the lowest rates of adherence to the majority of the diabetes care measures. This may be due to many of these members receiving services at Indian Health Services (IHS) or Tribal Facilities. Providers at these facilities are not required to list specific procedure codes because they receive per member per month (PMPM) case management fees and submit bundled encounters when covered services are provided. Over 83% of African Americans had poorly controlled HbA1c levels. Caucasian members had the highest rates of HbA1c testing (66.4%). Hispanic members had the highest level of LDL-C screening (80%).

Only two diabetes care measures showed significant differences by age group. Older members were more likely to have received HbA1c testing and LDL-C screening than members in the younger age groups.

Statistically significant differences existed between genders for LDL-C controlled, and medical attention for nephropathy. Women had higher rates of controlled LDL-C (19.4%) and of medical attention for nephropathy (70.8%).

Compared to the HEDIS national Medicaid percentages, the sample of SoonerCare Choice members differed significantly for all diabetes care measures with the exception of blood pressure controlled at <130/80 mm Hg. SoonerCare Choice members

showed significantly worse rates than the national mean percentage on all measures examined in the present study except blood pressure controlled at <130/80 mm Hg, where the rates were comparable.

SoonerCare Choice measures were comparable with the regional means for several of the measures. Rates for retinal eye exams, medical attention for nephropathy, and blood pressure controlled at <140/90 mm Hg were statistically equivalent to the regional means while blood pressure controlled at <130/90 mm Hg was higher for SoonerCare Choice members than the regional average.

Since diabetic complications can be devastating, it is important that individuals with diabetes strive to manage their health and control their diabetes in order to reduce the incidence of complications and lessen the severity of those that do develop. Health care providers are important sources of information regarding good health habits. The OHCA may consider exploring the extent to which incentives for diabetes care are currently being offered to SoonerCare providers. Such an inquiry could be accomplished with a simple survey to primary care providers and/or a group discussion to help brainstorm ideas for improving the incentive system. In addition, the OHCA might consider providing diabetes care education in the quarterly member newsletters.

Limitations

The rates found in this study are likely lower than the actual screening rates for SoonerCare members with diabetes. This is due to members who may obtain diabetes care services through the Indian Health Service or at free health clinics. These services would likely not be reflected in the administrative claims data.

Another limitation is that with the size of the sample for this study. When the sample is broken into many groups, clinically important differences may not be statistically significant. This is particularly true when the group sizes are uneven. For example, the number of Asian members was so small that statistical inferences could not be made.

References

American Diabetes Association. (2009). *Other Diabetes Medications*. Retrieved April 02, 2009 from http://www.diabetes.org/type-2-diabetes/oral-medications.jsp

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Appendix A: Request Letters

December 12, 2008

«Name»
«Complete_Street_Address»
«City», «State» «Zip_Code»

Attention: Medical Records

RE: Medical record request for Quality Assessment Review

The Oklahoma Health Care Authority (OHCA) has contracted with APS Healthcare to coordinate a Quality Improvement Project to assess the care rendered to diabetic patients.

Appropriate management and treatment of patients with diabetes can decrease the development of complications and co-morbid conditions associated with diabetes. Standardized measures from the Healthcare Effectiveness Data and Information Set HEDIS® will be calculated to facilitate national and regional rate comparisons with respect to the delivery of diabetes care.

To conduct this study, APS Healthcare requests the following information from the patient's medical record:

- Dated physician notes regarding delivery of diabetes care for calendar year 2007;
- Dated documentation reports from visits with a nephrologist or documentation of renal disease from 2007;
- Dated retinal exam reports by an eye care professional (optometrist or ophthalmologist), or documentation of a negative retinal or dilated eye exam that was performed by an eye care professional in 2006 and 2007;
- Dated blood pressure levels from 2007;
- Laboratory testing results for the following:
    - HbA1c testing and results in 2007;
    - Total cholesterol, LDL-C, HDL-C testing and results for 2007;
    - Urinalysis and/or Microalbuminuria testing and results in 2007.

The attached **Master List of Requested Medical Records** includes ***SoonerCare*** members that were assigned to you during some part of calendar year 2007. The medical records may be submitted to APS Healthcare by fax or mail.

Please submit the requested medical record documentation (including follow-up from referrals) to APS Healthcare by 12/24/2008. These records should include the documentation described above.

At the time of record submission, please place the individual **Medical Record Face Sheet** preceding the corresponding medical record so that we are able to accurately identify the medical record in our system. If you did not see this member during the dates requested, please submit written verification of this, along with the **Medical Record Face Sheet**.

Fax number:	1-800-762-1639
Mailing address:	APS Healthcare 4545 North Lincoln Blvd., Suite 24 Oklahoma City, Oklahoma 73105

Thank you for your participation and prompt response. If you have any questions, please do not hesitate to contact me at 405-556-9727.

Sincerely,

APS Healthcare

MIKE FOGARTY
CHIEF EXECUTIVE OFFICER

BRAD HENRY
GOVERNOR

STATE OF OKLAHOMA
OKLAHOMA HEALTH CARE AUTHORITY

December 9, 2008

To Whom It May Concern:

APS Healthcare is the contracted entity for external quality review for the Oklahoma Health Care Authority (OHCA). These contracted responsibilities include, but are not limited to, the review of medical records on the behalf of the Oklahoma Health Care Authority.

As per your contract with the OHCA, and as required under 42 CFR 431.107, the provider shall keep such records as are necessary to disclose fully the extent of services provided to members and shall furnish records and information regarding any claim for providing such service to the OHCA. The Oklahoma Health Care Authority, or an OHCA contracted entity, does not provide reimbursement for charges associated with the submission of medical records.

We appreciate the care you provide to SoonerCare members. Please contact Donna Huckleberry at this office for inquiries regarding the contractual obligation to furnish the requested records at (405) 522-7452, and Spencer Anthony at (405) 556-9738 for all other inquiries related to this request.

Sincerely,

Mike Fogarty

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Appendix B: Chi-square Tests

Chi-square Tests Between Racial/Ethnic Groups

The chi-square condition excluding expected values less than 5 was found to be overly strict under certain conditions. Cochran (1954, as reported in Agresti, Categorical Data Analysis, 1990, page 246) showed that when degrees of freedom are >1 that if 80% of the cells have expected values greater than 5 and that no cells have expected values of 0, the chi-square test is robust for expected values less than 5.

HbA1c testing

Actual Values	White	Black	AI/AN	Hispanic
Meeting Criteria	178	49	18	9
Not meeting criteria	90	35	20	6
Expected Values				
Meeting Criteria	168.1	52.7	23.8	9.4
Not meeting criteria	99.9	31.3	14.2	5.6
ChiSq p-value=	0.1052			

Poorly controlled HbA1c (>9.0%)

Actual Values	White	Black	AI/AN	Hispanic
Meeting Criteria	189	70	28	12
Not meeting criteria	79	14	10	3
Expected Values				
Meeting Criteria	197.9	62.0	28.1	11.1
Not meeting criteria	70.1	22.0	9.9	3.9
ChiSq p-value=	0.1250			

Good control of HbA1C (<7.0%)

Actual Values	White	Black	AI/AN	Hispanic
Meeting Criteria	46	7	6	3
Not meeting criteria	222	77	32	12
Expected Values				
Meeting Criteria	41.0	12.9	5.8	2.3
Not meeting criteria	227.0	71.1	32.2	12.7
ChiSq p-value=	0.2482			

Retinal eye exam

Actual Values	White	Black	AI/AN	Hispanic
Meeting Criteria	72	24	8	9
Not meeting criteria	196	60	30	6
Expected Values				
Meeting Criteria	74.8	23.4	10.6	4.2
Not meeting criteria	193.2	60.6	27.4	10.8
ChiSq p-value=	*0.0331*			

LDL-C screening

Actual Values	White	Black	AI/AN	Hispanic
Meeting Criteria	154	45	17	12
Not meeting criteria	114	39	21	3
Expected Values				
Meeting Criteria	150.9	47.3	21.4	8.4
Not meeting criteria	117.1	36.7	16.6	6.6
ChiSq p-value	0.1170			

LDL-C controlled (<100 mg/dl)

Actual Values	White	Black	AI/AN	Hispanic
Meeting Criteria	51	11	4	3
Not meeting criteria	217	73	34	12
Expected Values				
Meeting Criteria	45.7	14.3	6.5	2.6
Not meeting criteria	222.3	69.7	31.5	12.4
ChiSq p-value=	0.4058			

Medical attention for nephropathy

Actual Values	White	Black	AI/AN	Hispanic
Meeting Criteria	173	57	22	11
Not meeting criteria	95	27	16	4
Expected Values				
Meeting Criteria	174.0	54.5	24.7	9.7
Not meeting criteria	94.0	29.5	13.3	5.3
ChiSq p-value=	0.6539			

Blood pressure controlled at <140/90 mm Hg

Actual Values	White	Black	AI/AN	Hispanic
Meeting Criteria	138	30	16	9
Not meeting criteria	130	54	22	6
Expected Values				
Meeting Criteria	127.7	40.0	18.1	7.1
Not meeting criteria	140.3	44.0	19.9	7.9
ChiSq p-value=	*0.0510*			

Blood pressure controlled at <130/80mm Hg

Actual Values	White	Black	AI/AN	Hispanic
Meeting Criteria	88	16	11	5
Not meeting criteria	180	68	27	10
Expected Values				
Meeting Criteria	79.4	24.9	11.3	4.4
Not meeting criteria	188.6	59.1	26.7	10.6
ChiSq p-value=	0.1146			

Chi-square Tests Between Age Groups

HbA1c testing

Actual Values	18-29	30-39	40-49	50-59	60+
Meeting Criteria	19	26	69	92	50
Not meeting criteria	13	32	37	54	19
Expected Values					
Meeting Criteria	19.9	36.1	66.0	90.9	43.0
Not meeting criteria	12.1	21.9	40.0	55.1	26.0
ChiSq p-value=	*0.0258*				

Poorly controlled HbA1c (>9.0%)

Actual Values	18-29	30-39	40-49	50-59	60+
Meeting Criteria	28	47	79	102	48
Not meeting criteria	4	11	27	44	21
Expected Values					
Meeting Criteria	23.7	42.9	78.4	108.0	51.0
Not meeting criteria	8.3	15.1	27.6	38.0	18.0
ChiSq p-value=	0.1625				

Good control of HbA1C (<7.0%)

Actual Values	18-29	30-39	40-49	50-59	60+
Meeting Criteria	3	9	20	21	10
Not meeting criteria	29	49	86	125	59
Expected Values					
Meeting Criteria	4.9	8.9	16.2	22.4	10.6
Not meeting criteria	27.1	49.1	89.8	123.6	58.4
ChiSq p-value=	0.7291				

Retinal eye exam

Actual Values	18-29	30-39	40-49	50-59	60+
Meeting Criteria	9	11	31	42	21
Not meeting criteria	23	47	75	104	48
Expected Values					
Meeting Criteria	8.9	16.1	29.4	40.5	19.1
Not meeting criteria	23.1	41.9	76.6	105.5	49.9
ChiSq p-value=	0.6133				

LDL-C screening

Actual Values	18-29	30-39	40-49	50-59	60+
Meeting Criteria	16	18	66	84	47
Not meeting criteria	16	40	40	62	22
Expected Values					
Meeting Criteria	18.0	32.6	59.6	82.1	38.8
Not meeting criteria	14.0	25.4	46.4	63.9	30.2
ChiSq p-value=	*0.0003*				

LDL-C controlled (<100 mg/dl)

Actual Values	18-29	30-39	40-49	50-59	60+
Meeting Criteria	4	5	20	27	14
Not meeting criteria	28	53	86	119	55
Expected Values					
Meeting Criteria	5.5	9.9	18.1	24.9	11.8
Not meeting criteria	26.5	48.1	87.9	121.1	57.2
ChiSq p-value=	0.3594				

Medical attention for nephropathy

Actual Values	18-29	30-39	40-49	50-59	60+
Meeting Criteria	20	38	70	90	49
Not meeting criteria	12	20	36	56	20
Expected Values					
Meeting Criteria	20.8	37.7	68.9	94.8	44.8
Not meeting criteria	11.2	20.3	37.1	51.2	24.2
ChiSq p-value=	0.7424				

Blood pressure controlled at <140/90 mm Hg

Actual Values	18-29	30-39	40-49	50-59	60+
Meeting Criteria	12	35	45	75	30
Not meeting criteria	20	23	61	71	39
Expected Values					
Meeting Criteria	15.3	27.8	50.8	70.0	33.1
Not meeting criteria	16.7	30.2	55.2	76.0	35.9
ChiSq p-value=	0.1121				

Blood pressure controlled at <130/80 mm Hg

Actual Values	18-29	30-39	40-49	50-59	60+
Meeting Criteria	8	25	29	44	16
Not meeting criteria	24	33	77	102	53
Expected Values					
Meeting Criteria	9.5	17.2	31.5	43.3	20.5
Not meeting criteria	22.5	40.8	74.5	102.7	48.5
ChiSq p-value=	0.1346				

Chi-square Tests Between Genders

HbA1c testing

Actual Values	Female	Male
Meeting Criteria	183	73
Not meeting criteria	105	50
Expected Values		
Meeting Criteria	179.4	76.6
Not meeting criteria	108.6	46.4
ChiSq p-value=	0.4220	

Poorly controlled HbA1c (>9.0%)

Actual Values	Female	Male
Meeting Criteria	213	91
Not meeting criteria	75	32
Expected Values		
Meeting Criteria	213.0	91.0
Not meeting criteria	75.0	32.0
ChiSq p-value=	0.9957	

Good control of HbA1c (<7.0%)

Actual Values	Female	Male
Meeting Criteria	47	16
Not meeting criteria	241	107
Expected Values		
Meeting Criteria	44.1	18.9
Not meeting criteria	243.9	104.1
ChiSq p-value=	0.3935	

Retinal eye exam

Actual Values	Female	Male
Meeting Criteria	85	29
Not meeting criteria	203	94
Expected Values		
Meeting Criteria	79.9	34.1
Not meeting criteria	208.1	88.9
ChiSq p-value=	0.2183	

LDL-C screening

Actual Values	Female	Male
Meeting Criteria	168	63
Not meeting criteria	120	60
Expected Values		
Meeting Criteria	161.9	69.1
Not meeting criteria	126.1	53.9
ChiSq p-value=	0.1831	

LDL-C controlled (<100 mg/dL)

Actual Values	Female	Male
Meeting Criteria	56	14
Not meeting criteria	232	109
Expected Values		
Meeting Criteria	49.1	20.9
Not meeting criteria	238.9	102.1
ChiSq p-value=	*0.0465*	

Medical attention for nephropathy

Actual Values	Female	Male
Meeting Criteria	204	63
Not meeting criteria	84	60
Expected Values		
Meeting Criteria	187.1	79.9
Not meeting criteria	100.9	43.1
ChiSq p-value=	0.0001	

Blood pressure controlled at <140/90 mm Hg

Actual Values	Female	Male
Meeting Criteria	140	57
Not meeting criteria	148	66
Expected Values		
Meeting Criteria	138.0	59.0
Not meeting criteria	150.0	64.0
ChiSq p-value=	0.6732	

Blood pressure controlled at <130/80 mm Hg

Actual Values	Female	Male
Meeting Criteria	88	34
Not meeting criteria	200	89
Expected Values		
Meeting Criteria	85.5	36.5
Not meeting criteria	202.5	86.5
ChiSq p-value=	0.5538	

Chi-square Tests Between 2006 and 2007

HbA1c testing

Actual Values	2006	2007
Meeting Criteria	258	256
Not meeting criteria	153	155
Expected Values		
Meeting Criteria	258.5	257
Not meeting criteria	152.5	154
ChiSq p-value=	0.8854	

Poorly controlled HbA1c (>9.0%)

Actual Values	2006	2007
Meeting Criteria	255	304
Not meeting criteria	156	107
Expected Values		
Meeting Criteria	258.0	279.5
Not meeting criteria	153.0	131.5
ChiSq p-value=	*0.0002*	

Good control of HbA1c (<7.0%)

Actual Values	2006	2007
Meeting Criteria	101	63
Not meeting criteria	310	348
Expected Values		
Meeting Criteria	96.5	82
Not meeting criteria	314.5	329
ChiSq p-value=	*0.0009*	

Retinal eye exam

Actual Values	2006	2007
Meeting Criteria	110	116
Not meeting criteria	301	295
Expected Values		
Meeting Criteria	113.0	113.0
Not meeting criteria	298.0	298.0
ChiSq p-value=	0.6393	

LDL-C screening

Actual Values	2006	2007
Meeting Criteria	240	231
Not meeting criteria	171	180
Expected Values		
Meeting Criteria	236.0	235.5
Not meeting criteria	175.0	175.5
ChiSq p-value=	0.5257	

LDL-C controlled (<100 mg/dL)

Actual Values	2006	2007
Meeting Criteria	85	70
Not meeting criteria	326	341
Expected Values		
Meeting Criteria	79.0	77.5
Not meeting criteria	332.0	333.5
ChiSq p-value=	0.1811	

Medical attention for nephropathy

Actual Values	2006	2007
Meeting Criteria	332	267
Not meeting criteria	79	144
Expected Values		
Meeting Criteria	299.5	299.5
Not meeting criteria	111.5	111.5
ChiSq p-value=	*<0.0001*	

Blood pressure controlled at <140/90 mm Hg

Actual Values	2006	2007
Meeting Criteria	196	197
Not meeting criteria	215	214
Expected Values		
Meeting Criteria	135.5	196.5
Not meeting criteria	275.5	214.5
ChiSq p-value=	0.9443	

Blood pressure controlled at <130/80 mm Hg

Actual Values	2006	2007
Meeting Criteria	88	122
Not meeting criteria	323	289
Expected Values		
Meeting Criteria	104.5	105
Not meeting criteria	306.5	306
ChiSq p-value=	*0.0065*	