Urban Indian Health Institute

A Division of the Seattle Indian Health Board

Urban Diabetes Care and Outcomes Audit Report: Aggregate Results from Urban Indian Health Organizations 2005-2009

The mission of the Urban Indian Health Institute is to support the health and well- being of Urban Indian communities through information, scientific inquiry and technology.

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Please contact the Urban Indian Health Institute with your comments: info@uihi.org or 206-812-3030. You can also fill out the form on page 35 with comments or questions.

ACKNOWLEDGEMENTS

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The UIHI would like to thank the staff at the urban Indian health organizations for the excellent work they do daily on behalf of their communities.

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EXECUTIVE SUMMARY

INTRODUCTION

The purpose of this report is to provide a description of the annual diabetes audit data collected by participating IHS-funded urban Indian health organizations (UIHO). This report's format is based on the Indian Health Service's Diabetes Best Practice Guidelines. First developed in 2001 by a workgroup coordinated by the IHS Division of Diabetes Prevention and Treatment, best practices are based on the latest scientific research as well as diabetes success stories and experiences within AI/AN communities. Included are selected "key measures" from the Best Practice Guidelines, with accompanying aggregated data from participating UIHO between the years 2005-2009.

METHODS

The data examined for this report were collected for the annual Diabetes Audit of medical records performed at participating UIHO from 2005 through 2009. The Diabetes Audit data collected and submitted by participating urban Indian health organizations were provided to the Urban Indian Health Institute by the IHS Division of Diabetes Prevention and Treatment for analysis and reporting purposes.

RESULTS

The number of facilities participating increased each year between 2005 and 2009. In 2009, 31 facilities participated in the annual Diabetes Audit, representing over 3,600 urban American Indian/Alaska Native patients with diabetes nationwide.

Some key findings include:

- 12 out of 17 key measures from 8 clinical best practices were analyzable using Diabetes Audit data.
- In 2009, 60% of audited patient with diabetes received nutritional instruction from a Registered Dietitian or other provider.
- During the past 5 years, the percentage of audited patients with diabetes screened for depression increased from 31% to 68%.
- In 2009, approximately 42% of audited patients with diabetes had a Hemoglobin A1c measure <7.0%.
- Over 90% of audited urban patients with diabetes each year were overweight or obese.
- Less than 30% of audited patients with diabetes had a record of an annual dental exam for each of the past five years.
- 2009 Diabetes GPRA Targets related to A1c outcomes, LCL cholesterol, and controlled blood pressure were met by participating urban Indian health organizations combined.

DISCUSSION

This report indicates that the collection of diabetes best practices indicators have remained stable or increased during the past 5 years for most clinical indicators. Nutrition instruction, foot examinations, and ace inhibitor use, as well as weight, blood pressure, and A1c assessment, have remained stable during this time period, while a greater number of audited patients have a record of "ideal" blood pressure (<130/80) in 2009 than in previous years. Additionally, depression screening rates have significantly increased during this time period. Although this report highlights continued improvement in meeting the current diabetes best practices guidelines, it also suggests some areas that need work, particularly the assessment and treatment of patients with diabetes and moderate kidney disease, and in assuring patients with diabetes receive regular dental care.

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INTRODUCTION

BACKGROUND

Diabetes Mellitus is a major cause of chronic disease among American Indians and Alaska Natives (AI/AN), and the prevalence of diagnosed diabetes among AI/AN adults is more than twice that of the overall U.S. adult population.[1] In an effort to reduce the burden of diabetes among AI/AN, Congress established the Special Diabetes Program for Indians (SDPI) in 1998.[2] This program provides funding specifically to aid in the prevention and treatment of diabetes in AI/AN communities.

In an effort to gain a better understanding of the trends in diabetes services and outcomes among AI/AN people, Indian health agencies nationwide conduct an annual medical chart review, also known as the IHS Diabetes Care and Outcomes Audit (or "Diabetes Audit"). Information collected by these agencies is submitted to the Indian Health Service's (IHS) Division of Diabetes Treatment and Prevention (DDTP). This information is used for diabetes surveillance and to help create a clinical picture of the AI/AN population who receive diabetes care and services through the Indian health system.

The purpose of this report is to provide a description of the annual Diabetes Audit data collected by participating SDPI recipients that are part of the network of IHS-funded urban Indian health organizations (UIHO). The Urban Indian Health Institute collaborated with the IHS DDTP in the development of this report.

REPORT CONTENT

This report's format is based on the Indian Health Service's Diabetes Best Practice Guidelines.[3] First developed in 2001 by a workgroup coordinated by the IHS DDTP, best practices are based on the latest scientific research as well as diabetes success stories and experiences within AI/AN communities. The best practices are focused in both clinical (e.g. weight management) and community (e.g. school health) settings. This report presents at a glance the performance of UIHO diabetes programs as a whole in terms of the clinical best practices using Diabetes Audit data to track select key measures.

The following information included in this report is for **clinical** best practices* since the Diabetes Audit primarily focuses on clinical care outcomes rather than community outcomes.

- Description of the topic and its relevance to diabetes: A brief description of the clinical best practice is included at the beginning of each section to provide a background on the topic's relevance to diabetes care and to diabetes disease outcomes. All background information comes from the best practice guidelines themselves.
- Key Measures: Two measures were selected by the IHS workgroup for each best practice topic area as important indicators that can be used to measure a diabetes program's progress and outcomes. When Diabetes Audit data can be used to evaluate these measures, a graph of aggregate urban data is included in this report, including a brief description of the results. Data from sources other than the Diabetes Audit are needed to assess some key measures, and information is not available in this report for these indicators. For some best practice topics, one or two "*alternative key measures*" are presented graphically using Diabetes Audit data. These alternative measures are based on the key clinical recommendations and offer additional tracking opportunities.
- Key Clinical Recommendations: A list of the major clinical recommendations in each best practice topic area is also included in this report. More in-depth information for each can be found in the best practice guidelines.[3] For some topic areas, graphical displays of data related to these clinical recommendations are also included when available from the Diabetes Audit, and are labeled "*alternative key measures*".

Descriptive tables with additional pertinent clinical indicators are also available in Appendix A.

*Pharmaceutical Care is not included in this report as no relevant data are available from the Audit.

INTRODUCTION

URBAN AI/AN AND URBAN INDIAN HEALTH ORGANIZATIONS

American Indians and Alaska Natives (AI/AN) are a diverse and growing population. Over the past half-century, AI/AN have increasingly relocated from rural communities and reservations into urban centers both by choice and by force, through federal policy.[4] Despite this geographical shift, urban AI/AN have not always been included in the Indian health community, nor are they customarily recognized as a minority population in local and national assessments.[4] Data describing health and healthcare service trends among urban AI/AN such as that provided by the Diabetes Audit thus are of great value in the ongoing effort to understand the strengths and needs of the population.

IHS-funded urban Indian health organizations (UIHO) are private, non-profit corporations that are governed by AI/AN majority Boards of Directors and serve as health and social service hubs for AI/AN in select cities. These organizations provide a wide array of culturally appropriate health care services to AI/AN and low-income patients. While the scope and delivery of health care services vary among facilities, all receive SDPI funding to provide diabetes care. This report includes information on the 31 UIHO that participated in the IHS Diabetes Audit in 2009*.

METHODS

Data Source

The data examined for this report were collected for the annual Diabetes Audit of medical records performed at participating UIHO from 2005 through 2009. Guided by written instructions, diabetes coordinators or trained staff at each of the participating organizations performed the audit. Some facilities audit 100% of Diabetes Registry charts, while other facilities use a systematic random sampling scheme with a sufficient sample size to provide estimates within 10 percent of the true estimate.[5]

Target Population

Data for this report come from patient registries of the urban sites that participated in the Diabetes Audit. The organizations were instructed to include data from AI/AN patients with diagnosed diabetes who received diabetes health care services and who had a least one primary care visit during the past 12 months. They were instructed to exclude patients who met any of the following criteria: received primary referral or contract care paid by IHS, arranged other health care services with non-IHS monies, received primary care at another IHS or tribal facility, lived in a jail or nursing home and received care there, attended a dialysis unit (if on-site dialysis was not available), had gestational diabetes, had pre-diabetes only, or had moved, died or were non-contactable after three tries in 12 months.

Survey Design

The IHS Diabetes Audit is based on consensus-derived standards of care, also known as the IHS Standards of Care for Patients with Type 2 Diabetes.[5] These standards were first developed in 1986, and are regularly reviewed and updated by the IHS DDTP.[5] Using the audit, health facilities can assess their performance on a number of key measures known to describe the health of people with diabetes, including: demographic characteristics, vital statistics, examinations and educational services, therapy services, immunizations, and laboratory data.

Data Collection

Two options for data collection were made available to the health organizations: 1) a manual diabetes audit or 2) a computerized diabetes audit. The manual diabetes audit data were collected by gathering information from paper charts using the IHS DDTP audit data collection form.

The computerized diabetes audit extracts data from the IHS Resource and Patient Management System (RPMS), an integrated electronic system for the management of clinical and administrative information used by the IHS.

*Data from IHS urban demonstration sites are not included in this report.

INTRODUCTION

Data Collection, cont.

Starting in 2008, all participating programs submitted data via a secure web application (the WebAudit) directly to the IHS DDTP. In previous years, some programs submitted data to their local IHS area office. Partly as a result of this change, more urban programs are represented in this national report starting in 2008, although they may have collected and submitted data previously.

Diabetes Audit data collected and submitted by participating urban Indian health organizations through 2009 were provided to the Urban Indian Health Institute by the IHS DDTP for analysis and reporting purposes.

Descriptive Statistics

Stata 10 (StataCorp LP, College Station, Texas) was used to perform all statistical analyses. Because some facilities audit a random sample of their patients with diabetes, a weighting procedure was applied to calculate accurate estimations of audit statistics. This is necessary when combining data from multiple sites and when not all patients are audited.

IHS Best Practice Guidelines

This aggregate diabetes report is based on IHS Best Practice Guidelines.[3] The IHS best practices offer diabetes programs guidance on providing effective services to AI/AN. Originally developed in 2001 by a workgroup convened by IHS, the best practices are updated and expanded as needed, most recently in 2009. There are currently 19 best practices aimed at both community and clinical settings. Each best practice includes the following topics: guidelines; key recommendations; information about monitoring and evaluating a program, including key measures; additional tools and resources; and recommendations for improving IHS programs.
More about IHS best practices can be found here: http://www.diabetes.ihs.gov/index.cfm?module=toolsBestPractices.

Comparison to National Standards: GPRA and Healthy People 2010

A comparison of select indicators to national standards is also included in this report. Passed in 1993, the Government Performance Results Act (GPRA) was designed to address a broad range of concerns regarding government accountability and performance in the management of government-funded public needs projects. The general purpose of GPRA is to improve the confidence of Americans in the Federal government by holding Federal agencies accountable for achieving program results.[6] The Indian Health Service reports on a range of health topics for GPRA, including diabetes.

Healthy People 2010 (HP 2010) is a national health promotion and disease prevention initiative established by Health and Human Services. HP 2010 was designed to measure health-related outcomes and progress over time and was developed through a broad consultation process, built on scientific knowledge and other government health initiatives pursued over the past two decades.

HP 2010 was designed to achieve two overarching goals: to help individuals of all ages increase life expectancy and improve their quality of life and to eliminate health disparities. In addition to these overarching goals, HP 2010 identifies twenty-eight major focus areas including one that addresses diabetes. The diabetes focus area and its goals to reduce disease and improve the quality of life are further detailed within seventeen objectives, five of which can be tracked using data from the Diabetes Audit.

More about GPRA and HP 2010, their target measures, and urban aggregate data can be found in Appendix B.

INTRODUCTION

Limitations

Each year, only a selection of patients with diabetes is included in the IHS Diabetes Audit. This is a limitation when examining trends using these data, as the patient population may be different year-to-year. Any changes in patient outcomes (such as lab values) seen over the years should not necessarily be taken as a result of the programs themselves, but rather may be a result of changes in the patient population that is audited each year.

Another limitation pertains to the lack of general demographic data for all registry patients. The audit does not collect information on the socioeconomic indicators of education, income, employment status, or mobility. Understanding the baseline distribution of these variables and changes over time could provide important information concerning the diabetes registry and hence, the audit population.

Finally, the amount of missing information for a few select variables should be considered. It is important to note the varying scope of health care services offered by UIHO facilities. For example, not all sites provide clinical services. Additionally, the availability of laboratory-related services may be either lacking or provided off-site, and retrieving follow up laboratory values may pose challenges.

KEY DIABETES AUDIT MEASURES

There are certain key Diabetes Audit measures, or indicators that are frequently examined, and are included throughout this report. Results for these key audit measures may be found both in the body and in the final tables of Appendix A. These measures include:

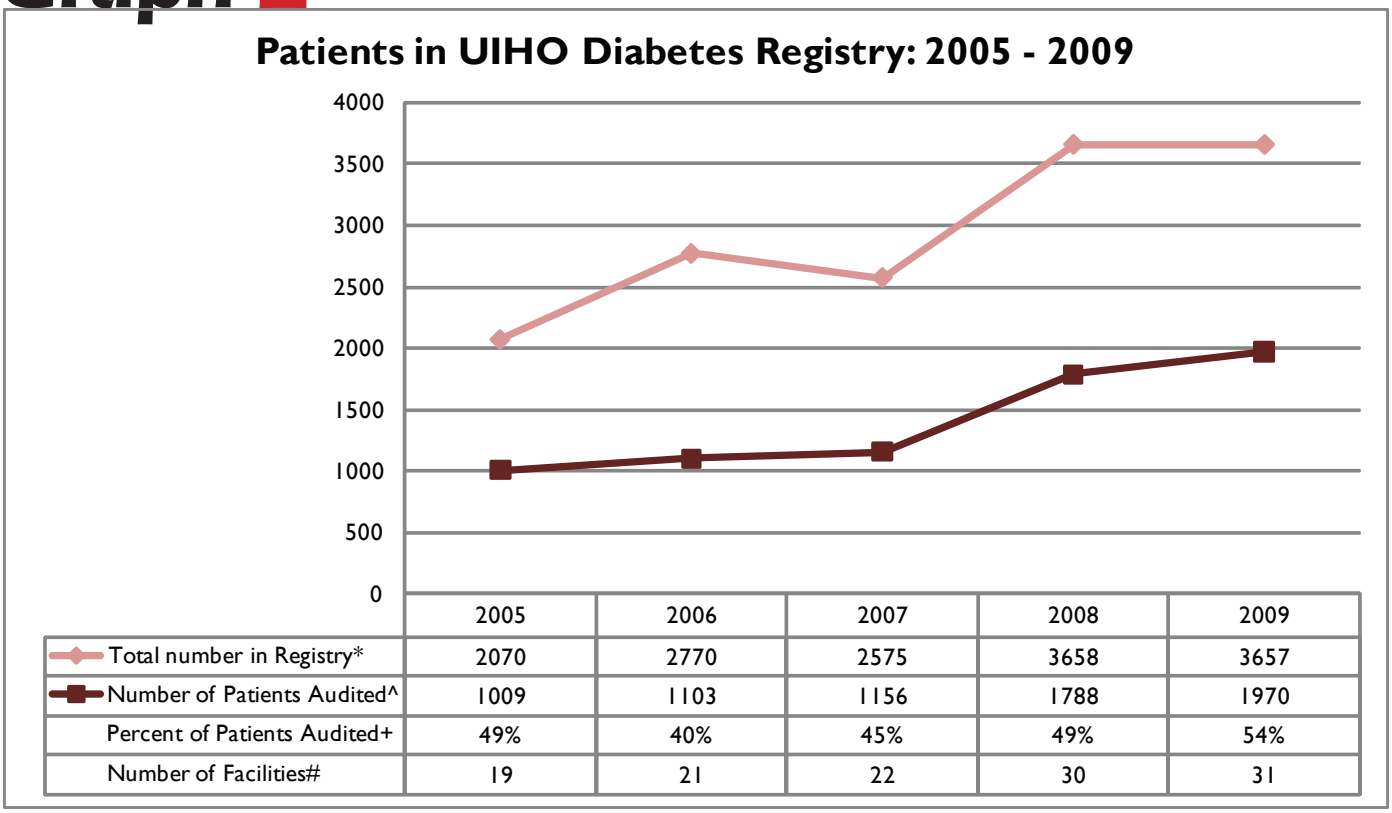
	Graph	Table
➤ Demographics of Audited Patients		Page 37
➤ Hemoglobin A1c Results	Page 22	Page 41
➤ Blood Pressure Results	Page 16	Page 38
➤ Blood Lipid Values	Page 18	Page 41
➤ Nutrition Education	Page 13	Page 39
➤ Exercise Instruction		Page 39
➤ Other Diabetes Education		Page 39

DIABETES REGISTRY

URBAN INDIAN HEALTH ORGANIZATIONS (UIHO)

The following graph displays the number of urban facilities reporting each year, the number of patients audited, and the number of patients included in the diabetes registries from all participating facilities.

Graph 1



	2005	2006	2007	2008	2009
Total number in Registry*	2070	2770	2575	3658	3657
Number of Patients Audited^	1009	1103	1156	1788	1970
Percent of Patients Audited+	49%	40%	45%	49%	54%
Number of Facilities#	19	21	22	30	31

*Sum of all patients in each reigstry
^Sum of all patients in audit
+Number of patients audited/number of patients in registry
#Number of urban Indian health organizations participating

BEST PRACTICE I
ADULT WEIGHT MANAGEMENT

Overweight and obesity can lead to poor health outcomes of individuals with diabetes through increasing insulin resistance and raising blood glucose levels. Obesity contributes to long term complications of diabetes such as reduced circulation, and to chronic health conditions such as high blood pressure and kidney disease. For individuals with diabetes and those with pre-diabetes, maintaining healthy weight can decrease insulin resistance, lower glucose levels, and reduce the need for medication. Healthy weight can also reduce the long-term risk of heart disease, high blood pressure, and other chronic conditions.*

KEY CLINICAL PRACTICE RECOMMENDATIONS RELATED TO ADULT WEIGHT MANAGEMENT

- ✓ Recognize the patients who should be excluded from weight loss therapy.
- ✓ Assess for overweight and obesity.
- ✓ Use lifestyle approaches for long-term weight loss success such as nutrition, physical activity, behavior change, pharmacologic therapy, weight loss surgery, and weight maintenance.

MEASURES USED FOR TRACKING ADULT WEIGHT MANAGEMENT

- ✓ Page 13: Key Measure 1 - Percentage of diabetes patients with documented nutrition education from a Registered Dietitian or other provider in the past 12 months.

- ✓ Page 14: Key Measure 2 - Percentage of diabetes patients with a documented assessment for overweight/obesity in past 12 months. Percentage of overweight/obese patients with diabetes.

*All background information for Best Practices reference the IHS Best Practice Guidelines[3] only unless otherwise noted.

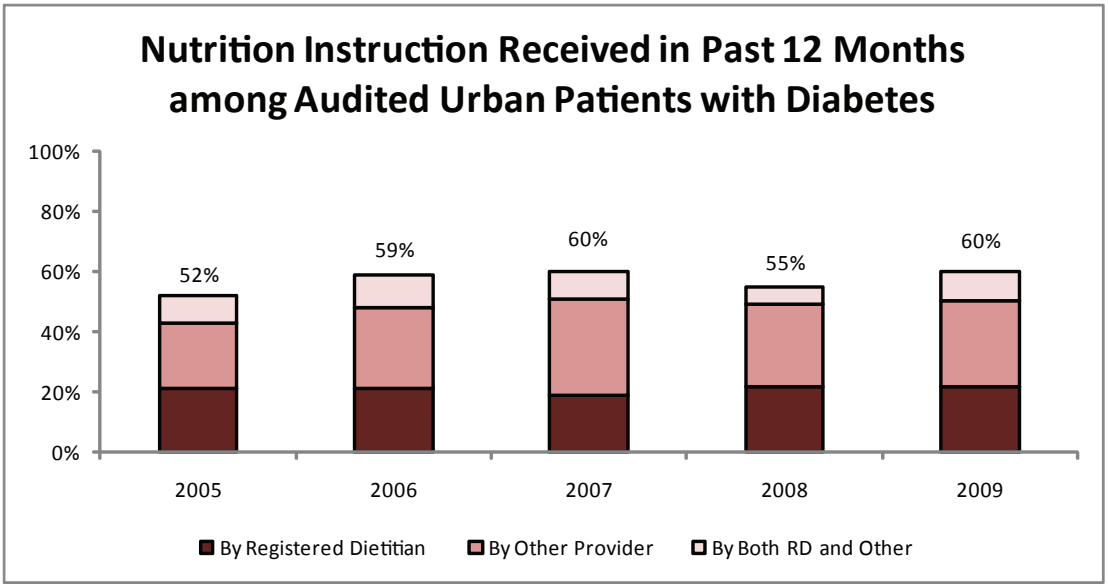
BEST PRACTICE I
ADULT WEIGHT MANAGEMENT

BEST PRACTICE KEY MEASURES RELATED TO ADULT WEIGHT MANAGEMENT

Key Measure 1: Percentage of diabetes patients with documented nutrition education from a Registered Dietitian or other provider in the past 12 months.

*Nutrition education provided by a Registered Dietitian or other professional can help patients learn specific methods to safely reduce their caloric intake and make other needed dietary changes. Dietary changes alone can lead to moderate weight loss which in turn can significantly improve health outcomes among people with diabetes.**

Graph 2



Description of Graphic: In 2009, 60% of audited urban patients nationwide had a record of receiving nutrition instruction from a Registered Dietitian or other provider, similar to earlier years. More than half of these (33%) received instruction from a Registered Dietitian, with or without additional education from another provider. In 2009, eight urban sites had a record of nutrition education for more than 90% of their patients (data not shown).

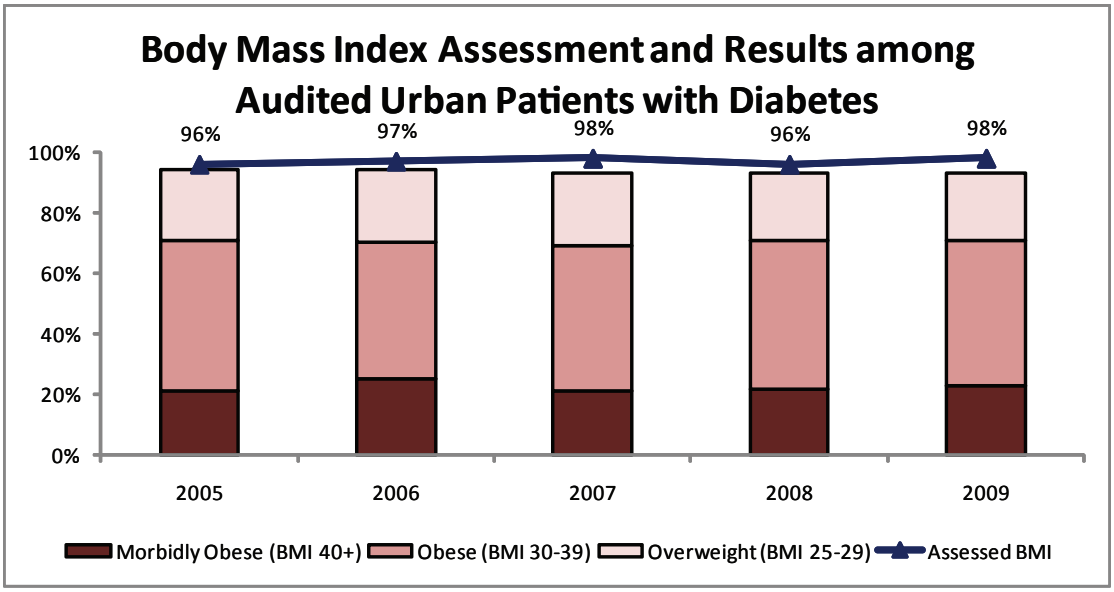
*All background information for Key Measures reference the IHS Best Practice Guidelines[3] only unless otherwise noted.

BEST PRACTICE I
ADULT WEIGHT MANAGEMENT

Key Measure 2: Percentage of diabetes patients with a documented assessment for overweight/obesity in past 12 months.

Obtaining measures of a patient's height and weight can help determine individual risk profiles due to overweight/obesity. Regular measures of height and weight can be used to set goals for future weight loss and weight maintenance and are crucial to successful diabetes care and management.

Graph 3



Description of Graphic: More than 98% of audited urban patients had a record of being assessed for overweight/obesity in 2009, similar to earlier years. Over 90% of assessed patients were overweight or obese, with almost one-quarter considered morbidly obese (BMI 40+).

BEST PRACTICE II
CARDIOVASCULAR DISEASE

Cardiovascular disease (CVD) includes high blood pressure, cerebrovascular disease (or stroke), and coronary heart disease (which can lead to heart attack). People with diabetes have a higher risk of developing CVD, and CVD is the leading cause of death among individuals with diabetes. High blood pressure and elevated cholesterol and triglyceride levels are major risk factors for CVD. Blood pressure and lipid control through the use of medication and lifestyle modification (healthy diet, increased physical activity, no smoking) has been shown to significantly reduce the risk of developing heart disease, stroke, and peripheral vascular disease among people with diabetes.

KEY CLINICAL PRACTICE RECOMMENDATIONS RELATED TO CARDIOVASCULAR DISEASE

- ✓ Control blood glucose.
- ✓ Assess smoking status, provide counseling, and implement a cessation program.
- ✓ Provide medical nutrition therapy (MNT).
- ✓ Provide patient education to encourage daily physical activity.
- ✓ Conduct BMI screening and assist with weight management.
- ✓ Assess emotional health.
- ✓ Assess, control, and treat high blood pressure (hypertension).
- ✓ Measure, evaluate, and treat lipids.
- ✓ Provide aspirin and antiplatelet therapy.
- ✓ Stop or slow the progression of albuminuria.
- ✓ Assess and treat anemia related to chronic kidney disease.
- ✓ Identify and treat sleep apnea.

MEASURES USED FOR TRACKING CARDIOVASCULAR DISEASE

- ✓ Page 16: Key Measure 1 - Percentage of diabetes patients who have recent blood pressure measurements that are at goal in past 12 months.
- ✓ Page 17:Alternative Measure 1 - Percentage of patients who smoke that were referred for or provided with smoking cessation counseling.
- ✓ Page 18:Alternative Measure 2 - Mean blood lipid values among audited patients with diabetes.

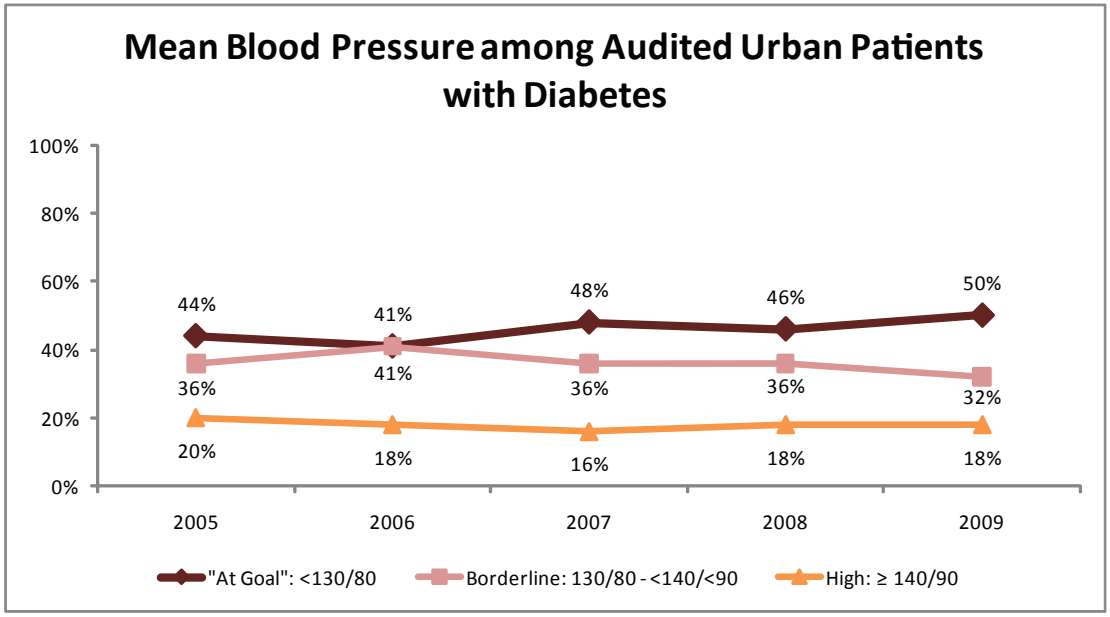
BEST PRACTICE II
CARDIOVASCULAR DISEASE

BEST PRACTICE KEY MEASURES RELATED TO CARDIOVASCULAR DISEASE

Key Measure 1: Percentage of diabetes patients who have recent blood pressure measurements that are at goal in past 12 months.

Reduction of blood pressure through medication and/or lifestyle changes is a key intervention for patients with diabetes and hypertension. Blood pressure should be assessed at each visit to determine if it is being adequately controlled with current interventions.

Graph 4



Description of Graphic: In 2009, 50% of all audited urban patients whose blood pressure was recently assessed had mean values <130/80 ("at goal"), more than in the previous five years. The majority of other audited patients had mean blood pressures that are considered borderline hypertension (between 130/80 and 140/90). Approximately 18% of audited patients each year with documentation had high mean blood pressures (≥140/90).

* * *

Key Measure 2: Percentage of diabetes patients with documented CVD or hypertension education in past 12 months.

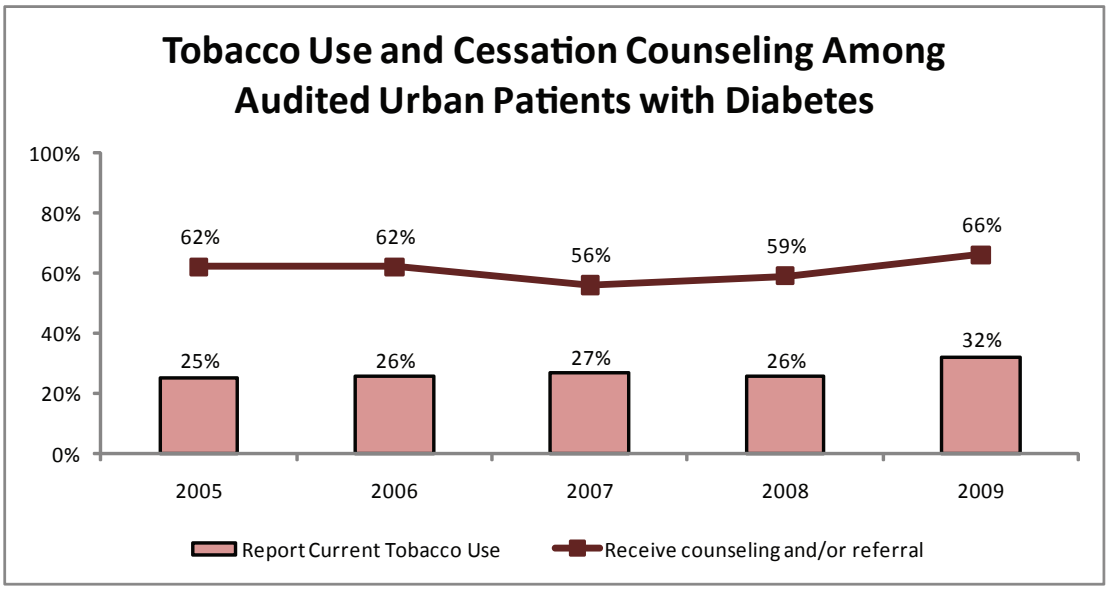
This Key Measure is not analyzable using current IHS Diabetes Audit data.

BEST PRACTICE II
CARDIOVASCULAR DISEASE

Alternative Measure 1: Percentage of patients who smoke that were referred for or provided with smoking cessation counseling.

One of the key clinical recommendations related to cardiovascular disease is to assess tobacco use and to provide cessation counseling when needed. Smoking is a significant risk factor for CVD, and cessation counseling has been shown to be a cost-effective and safe intervention.

Graph 5



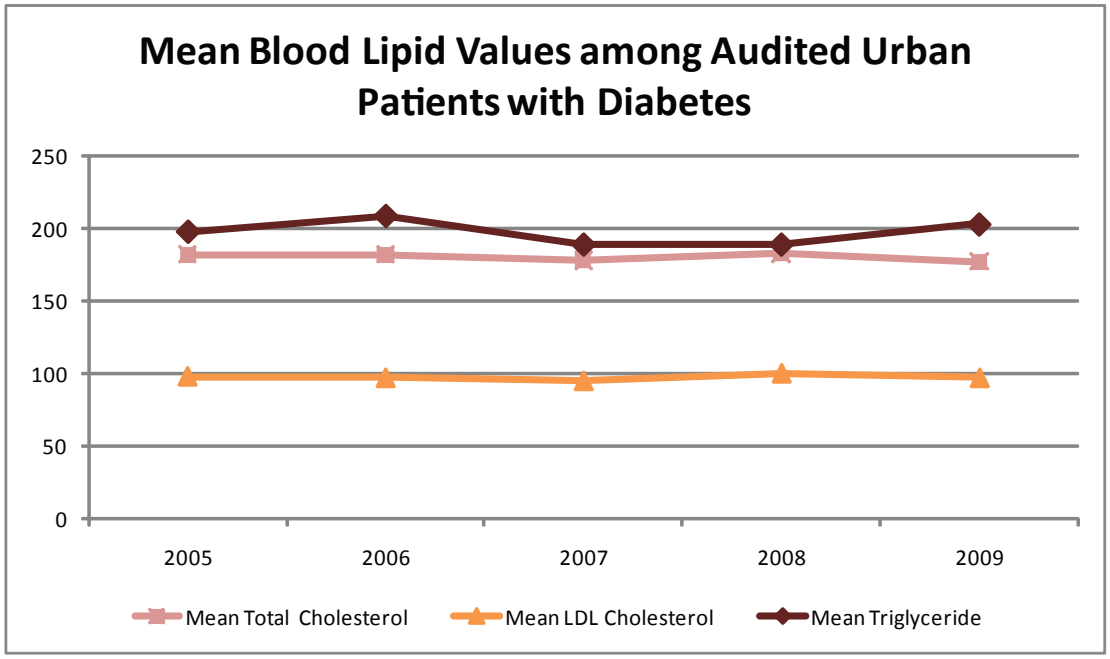
Description of Graphic: Between one-quarter and one-third of audited urban patients with diabetes reported current tobacco use between years 2005-2009. The majority of these patients each year received tobacco counseling or were referred to someone else for counseling. There is no record in the Diabetes Audit of the number of patients with diabetes that quit using tobacco throughout the year.

BEST PRACTICE II
CARDIOVASCULAR DISEASE

Alternative Measure 2: Tracking of mean blood lipid levels among patients with diabetes.

One key clinical best practice recommendation related to cardiovascular disease is to measure, evaluate and treat lipids. Lipids, or fats carried in the blood, include total cholesterol, LDL and HDL cholesterol, and triglycerides. While cholesterol is itself necessary for life, too much can clog arteries and contribute to heart disease. Total cholesterol is a measure of all the cholesterol in the blood, while LDL, or low-density lipoprotein, cholesterol is one type (the "bad" type). Triglycerides are another type of lipid that can contribute to cardiovascular disease when levels are too high.

Graph 6



Description of Graphic: Mean lipid values have not changed significantly over the past five years. Mean LDL cholesterol values have remained less than 100 mg/dl, considered the cut-off for ideal LDL cholesterol. Ideal triglyceride values are less than 150 mg/dl, however the mean for all audited urban patients ranged between 189 and 209. Total cholesterol should preferably be under 200 mg/dl, and the mean values for all audited urban patients have been under this at 177-183. Between 55% - 60% of audited patients over the past five years who had been assessed had LDL cholesterol levels less than 100 mg/dl (data not shown).

BEST PRACTICE III
CHRONIC KIDNEY DISEASE

Diabetes is the most common cause of kidney disease, a serious condition that can lead to progressive and irreversible damage to the kidneys over time. If not diagnosed and treated in an early stage, kidney disease may require dialysis or a kidney transplant, and can contribute to cardiovascular disease and premature death. Chronic kidney disease, however, can be prevented or successfully managed if diagnosed early. Prevention and control methods include early detection, close monitoring and control of blood sugar levels, weight loss, treatment of related diseases, such as hypertension and cholesterol, and patient education aimed at changing lifestyle and nutritional practices.

KEY CLINICAL PRACTICE RECOMMENDATIONS RELATED TO CHRONIC KIDNEY DISEASE

- ✓ Identify patients at risk for chronic kidney disease (CKD) in order to prevent or prolong the development of end-stage kidney disease.
- ✓ Provide kidney disease education to the community to increase awareness of kidney protective measures and reduce end-stage kidney disease rates.
- ✓ Control blood pressure (BP).
- ✓ Include a registered dietitian and a pharmacist on the multi-disciplinary care team.
- ✓ Develop clear mechanisms to facilitate vascular access placement, transplant referral, and diagnostic imaging.

MEASURES USED FOR TRACKING CHRONIC KIDNEY DISEASE

- ✓ Page 20: Key Measure 2 - Percentage of diabetes patients with hypertension who have been prescribed a renin angiotensis system antagonist (e.g. ACE inhibitor, ARB) in the past twelve months.
- ✓ Page 21: Key Measure 3 - Percentage of diabetes patients whose eGFR is <60 ml/min in the past twelve months, that met recommended therapeutic goals.
- ✓ Page 22: Alternative Measure 1 - Percentage of diabetes patients with ideal glycemic control (A1c <7.0%).
- ✓ Page 23: Alternative Measure 2 - Percentage of diabetes patients who were assessed for poor kidney function (by age).

BEST PRACTICE III
CHRONIC KIDNEY DISEASE

BEST PRACTICE KEY MEASURES RELATED TO CHRONIC KIDNEY DISEASE

Key Measure 1: Percentage of diabetes patients whose most recent blood pressure (BP) was <130/80.

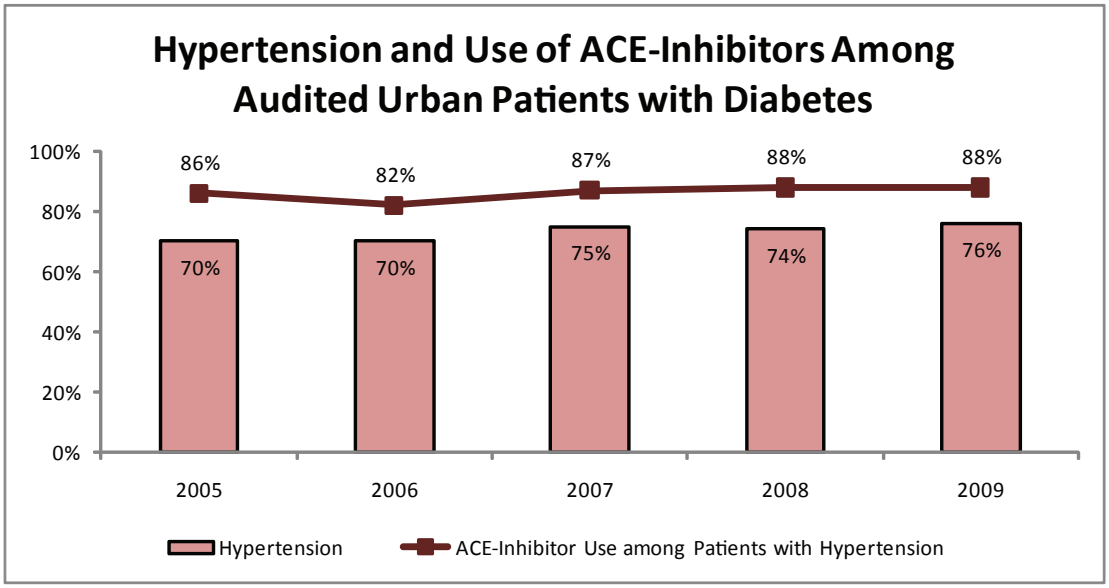
See Cardiovascular Disease, Key Measure 1 (pg 16) for a similar measure.

* * *

Key Measure 2: Percentage of diabetes patients with hypertension who have been prescribed a renin angiotensin system antagonist (e.g. ACE inhibitor, ARB) in the past twelve months.

Controlling blood pressure is an important means of reducing a patient's risk for kidney disease. Over time, high blood pressure damages small vessels in the kidneys which are critical to filtering the body's waste products and regulating fluid levels. Ace-Inhibitors and ARBs have been shown to protect kidneys more than other types of medication for hypertension.[7]

Graph 7



Description of Graphic: 70% - 76% of audited patients with diabetes had a diagnosis of hypertension or were on medication to control blood pressure during 2005-2009, and more than 82% of these patients each year had documentation of taking an ACE-Inhibitor or ARB during the past twelve months. These numbers, however, should be interpreted with caution. Because the audit question used to assess hypertension allows the reporter to respond affirmatively if there is a diagnosis OR there is a record of medication, these estimates may overestimate the burden of hypertension in the community if patients were using the medication for prevention rather than treatment of hypertension.

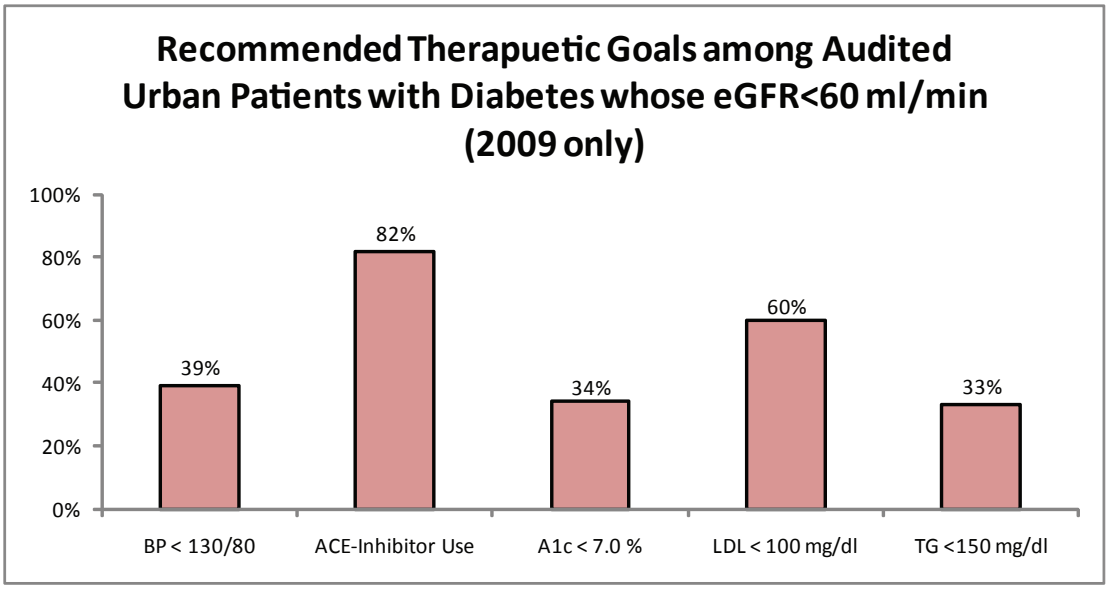
BEST PRACTICE III
CHRONIC KIDNEY DISEASE

Key Measure 3: Percentage of diabetes patients whose eGFR is <60ml/min in the past twelve months, that met recommended therapeutic goals:

- BP <130/80 mmHg
- Use of renin angiotensin system antagonists (e.g. ACE inhibitor, ARB)
- A1c <7.0 mg/dL
- LDL <100 mg/dL or <70 pending risk factors
- TG <150mg/dL
- Control phosphorus (bone disease), and
- Hgb 11-12 g/dL (when treating anemia with an erythropoietin-stimulating agent).

The estimated glomerular filtration rate (eGFR) is a measure of kidney function. A rate less than 60ml/min indicates a moderate amount of kidney damage has already occurred. Not all therapeutic goals can be measured using the audit data, and information on phosphorus and hemoglobin is not available. Only 2009 data are presented due to changes in how the information is collected in the Audit each year.

Graph 8



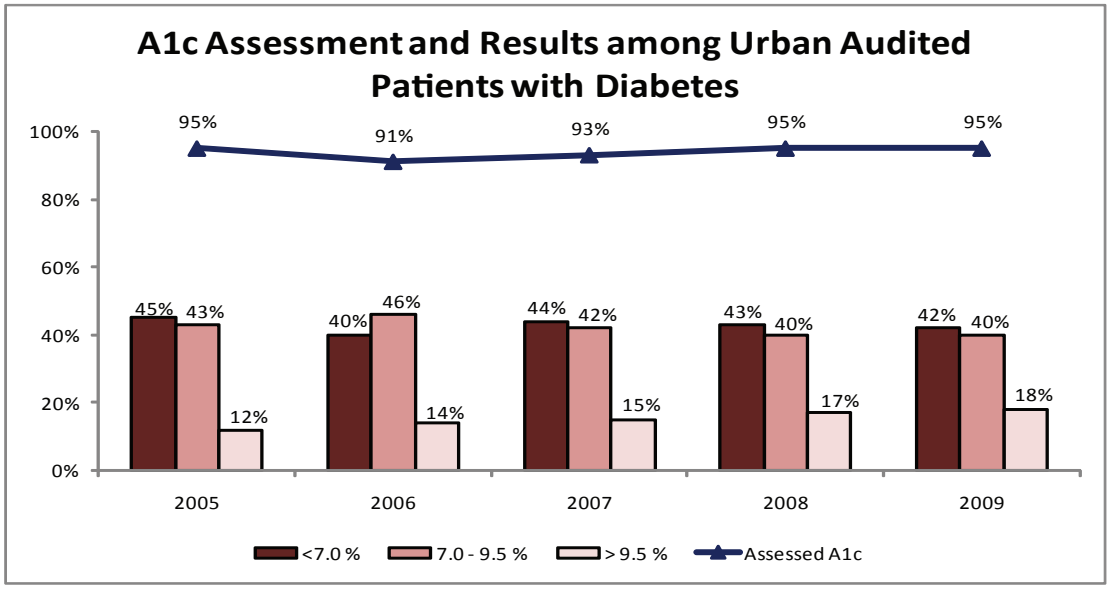
Description of Graphic: Among urban audited patients with signs of moderate kidney disease (eGFR<60ml/min), most are not meeting recommended therapeutic goals for blood pressure, blood glucose, and lipid control. Most patients (82%) had been prescribed an ACE-Inhibitor, however only 39% had a mean blood pressure less than 130/80. Blood lipid levels (LDL cholesterol and triglyceride) were above recommended levels for 40% and 67% of patients, respectively. 98% of patients with eGFR<60 ml/min had a record of a recent A1c (data not shown) and of those, 34% had adequate blood glucose control (A1c<7.0%).

BEST PRACTICE III
CHRONIC KIDNEY DISEASE

Alternative Measure 1: Percentage of diabetes patients with ideal glycemic control (A1c <7.0%).

Hemoglobin A1c is a long-term measure of a patient's blood glucose level. It is used to assess the amount of glucose (sugar) that is circulating in the blood over a period of weeks or months.[7] The American Diabetes Association recommends most patients with diabetes maintain their A1c level at 7.0% or less for successful diabetes management and to prevent vascular complications due to diabetes.[7]

Graph 9



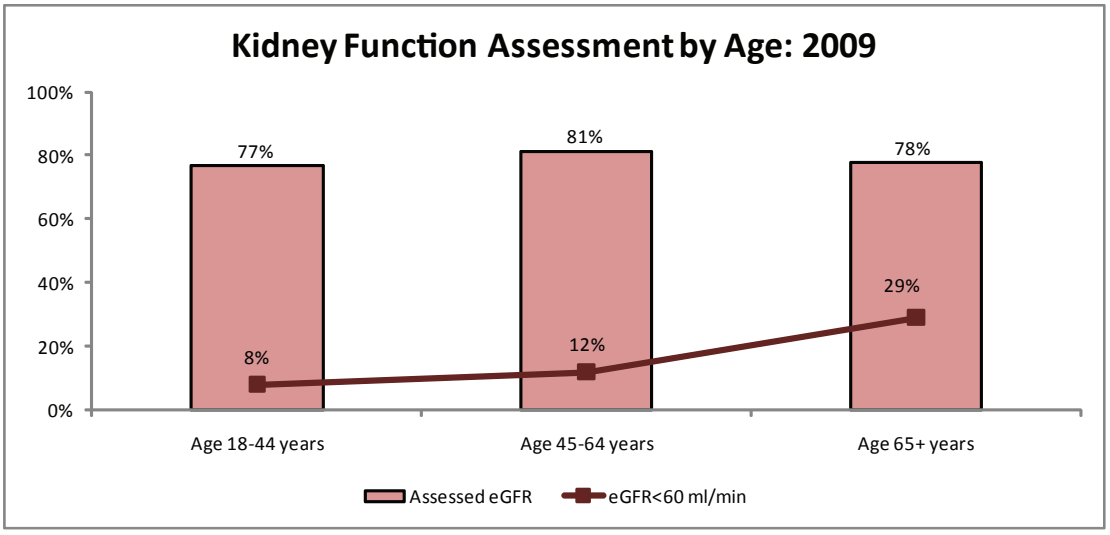
Description of Graphic: Between 90% - 95% of audited patients each year have a record of a recent A1c assessment. Eight urban sites in 2009 had an A1c lab result for 100% of patients (data not shown). Among patients with A1c tests, less than half (42% - 45%) had measures under 7.0%, and 40-46% of patients had A1c values between 7.0% - 9.5%. This compares favorably with the 2009 GPRA goals of 39% (patients with A1c <7.0%) and 19% (patients with A1c >9.5%). See Appendix B for more information about GPRA.

BEST PRACTICE III
CHRONIC KIDNEY DISEASE

Alternative Measure 2: Percentage of diabetes patients who were assessed for poor kidney function.

Serious kidney damage can be prevented or delayed if caught early, and there are common laboratory tests available to monitor kidney function. It is recommended that the estimated glomerular filtration rate (eGFR) be assessed each year in patients with diabetes. Only 2009 data are presented due to changes in how the information is collected in the audit.

Graph 10



Description of Graphic: In 2009, the majority of urban audited patients with diabetes were assessed for kidney disease: approximately 79% of patients of all ages had a record of an evaluation. The percent of patients with signs of kidney disease (eGFR<60ml/min) increased with age, ranging from 8% among patients age 18-44 years to 29% among patients age 65 years and older.

BEST PRACTICE IV
DEPRESSION

There is a strong relationship between diabetes and depression. Up to one-third of people living with diabetes will also develop depression in the years following diabetes diagnosis, and people with depression are at a higher risk of developing diabetes in the future. Diabetes outcomes, including diabetes self-management and control of blood sugar and A1c levels, are often worse for people with both diabetes and untreated depression. Thus, diagnosis and treatment of depression are vital to improving both the physical and psychological health of those living with diabetes. Coordinated care between primary health and behavioral health is optimal when treating an individual with both diabetes and depression.

KEY CLINICAL PRACTICE RECOMMENDATIONS RELATED TO DEPRESSION

- ✓ Educate providers on how to screen for and treat depression.
- ✓ Screen for depression among patients with diabetes.
- ✓ Provide depression care and treatment, and recognize when to refer patients for expert care.
- ✓ Commit to improving depression care in people with diabetes.
- ✓ Dedicate funds to improve depression care in people with diabetes.
- ✓ Coordinate depression care between behavioral and primary care settings.
- ✓ Help patients connect to community resources which can alleviate life stresses contributing to depression.
- ✓ Organizations must commit to improving depression care in people with diabetes.
- ✓ Educate the community on the connection(s) between diabetes and depression, and that good treatments are available.

MEASURE USED FOR TRACKING DEPRESSION

- ✓ Page 25: Key Measure 1 - Percentage of diabetes patients who were screened for depression in the past twelve months.

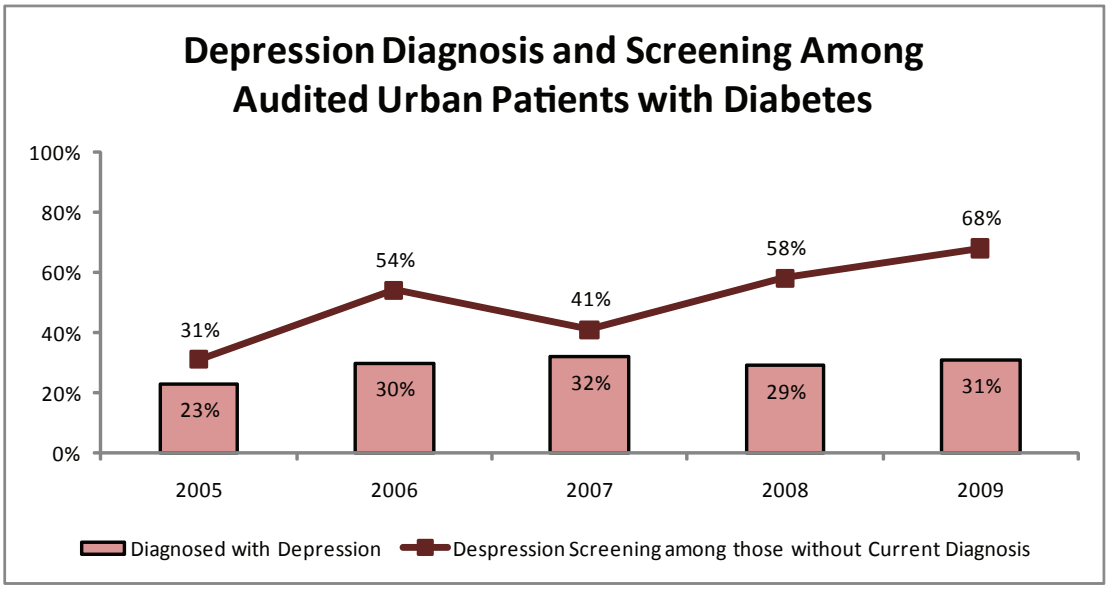
BEST PRACTICE IV
DEPRESSION

BEST PRACTICE KEY MEASURES RELATED TO DEPRESSION

Key Measure 1: Percentage of diabetes patients who were screened for depression in the past twelve months.

Simple screening tools are available to identify patients who may be at risk for depression. These can be incorporated into a clinic's system of care.

Graph 11



Description of Graphic: Between 2005-2009, 23-32% of audited patients with diabetes had a current diagnosis of depression. Depression screening among audited patients without a current diagnosis of depression increased during this time period from 31% in 2005 to 68% in 2009.

* * *

Key Measure 2: Percentage of diabetes patients with depression diagnosed in the past twelve months who received appropriate treatment.

This Key Measure is not analyzable using current IHS Diabetes Audit data.

BEST PRACTICE V
EYE CARE

People living with diabetes are at increased risk of serious eye problems including glaucoma, cataracts, and diabetic retinopathy. Although diabetic retinopathy is the most common cause of blindness among working-age adults in the United States, it is possible to prevent or delay its progression. Since initial eye damage can occur without symptoms, the only means of diagnosing early eye disease is through regular dilated eye exams by a professional. Treating glucose levels and other diabetes-related issues is important in preventing eye disease, as high A1c levels, high blood pressure, kidney failure, obesity and anemia are all associated with an increased risk of retinopathy.

KEY CLINICAL PRACTICE RECOMMENDATIONS RELATED TO EYE CARE

- ✓ Provide a diabetic retinopathy (DR) education component in all diabetes education programs for patients and family.
- ✓ Adhere to the accepted standards of care for DR surveillance.
- ✓ Use a qualifying examination for DR surveillance:
    - Dilated eye examination by an optometrist or ophthalmologist
    - Qualifying photographic retinal examination
        - o Dilated seven standard field stereoscopic examination (Early Treatment Diabetic Retinopathy Study-ETDRS)
        - o Other photographic method formally validated to ETDRS.
- ✓ Recognize early when to refer patient for consideration of treatment. Monitor risk factors and treatments.
- ✓ Provide ophthalmology referral for all cases determined to be at risk for vision loss and possible candidates for treatment. Provide visual rehabilitation for patients with vision loss.

MEASURE USED FOR TRACKING EYE CARE

- ✓ Page 27: Key Measure 1 - Percentage of diabetes patients with a documented qualifying eye exam in past twelve months.

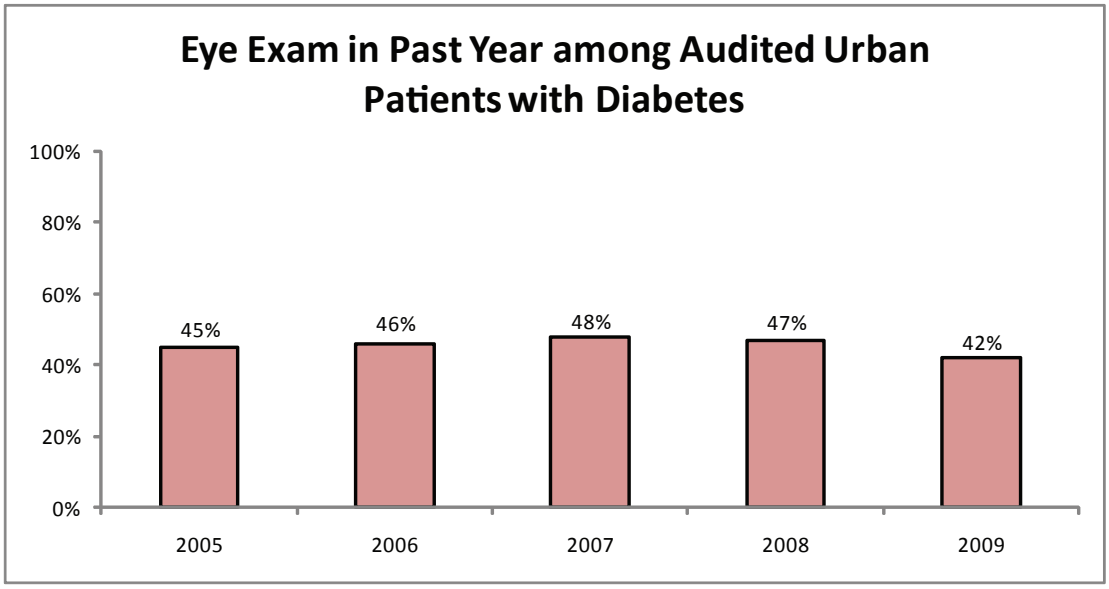
BEST PRACTICE V
EYE CARE

BEST PRACTICE KEY MEASURES RELATED TO EYE CARE

Key Measure 1: Percentage of diabetes patients with a documented qualifying eye exam in past twelve months.

Through early detection and treatment, serious vision loss from diabetes can be reduced by approximately 95%. Patients with diabetes should receive an examination for retinopathy soon after diagnosis, and annually from then on.

Graph 12



Description of Graphic: In each of the past five years, less than half (42% - 48%) of urban audited patients with diabetes have a record of receiving a qualifying eye exam in the previous year. This compares with the 2009 IHS GPRA goal, which is 47% of patients to receive an annual qualifying eye exam. Access to specialty care, recognized as a serious problem for urban American Indians and Alaska Natives, may be a factor in obtaining an eye exam.

* * *

Key Measure 2: Percentage of diabetes patients receiving appropriate retinal treatment in the past twelve months, for example:

- retinal laser treatment
- vitrectomy procedure.

This Key Measure is not analyzable using current IHS Diabetes Audit data.

BEST PRACTICE VI
FOOT CARE

Foot ulcers and amputations are among the most preventable complications for people living with diabetes. Nerve damage can cause numbness, pain, burning, or reduced feeling in the feet and legs, and can reduce circulation that is critical for wound healing. Regular foot examinations combined with education about proper foot care have been shown to decrease the risk of ulcerations and amputations by as much as 80%. Controlling glucose, blood pressure, and lipids can also help to reduce the risk of foot complications.

KEY CLINICAL PRACTICE RECOMMENDATIONS RELATED TO FOOT CARE

- ✓ Educate and instruct patients on the importance of proper foot care.
- ✓ Conduct a comprehensive annual foot exam in all patients with diabetes to identify risk factors predictive of ulcers and amputations.
- ✓ Provide podiatry care and recognize when to refer.
- ✓ Develop a mechanism for providing appropriate footwear.
- ✓ Assess, classify, and manage foot ulcers.
- ✓ Develop clear mechanisms for referring patients to home care, field health workers, podiatry care, footwear specialists, vascular assessment, and surgical consultation.
- ✓ Develop a team approach to diabetes care to include foot care.
- ✓ Train field health personnel in foot risk assessment and risk-specific foot care education.
- ✓ Include specific foot outcome measures in annual performance-based objectives.

MEASURE USED FOR TRACKING FOOT CARE

- ✓ Page 29: Key Measure 1 - Percentage of diabetes patients with documented foot exams in the past twelve months.

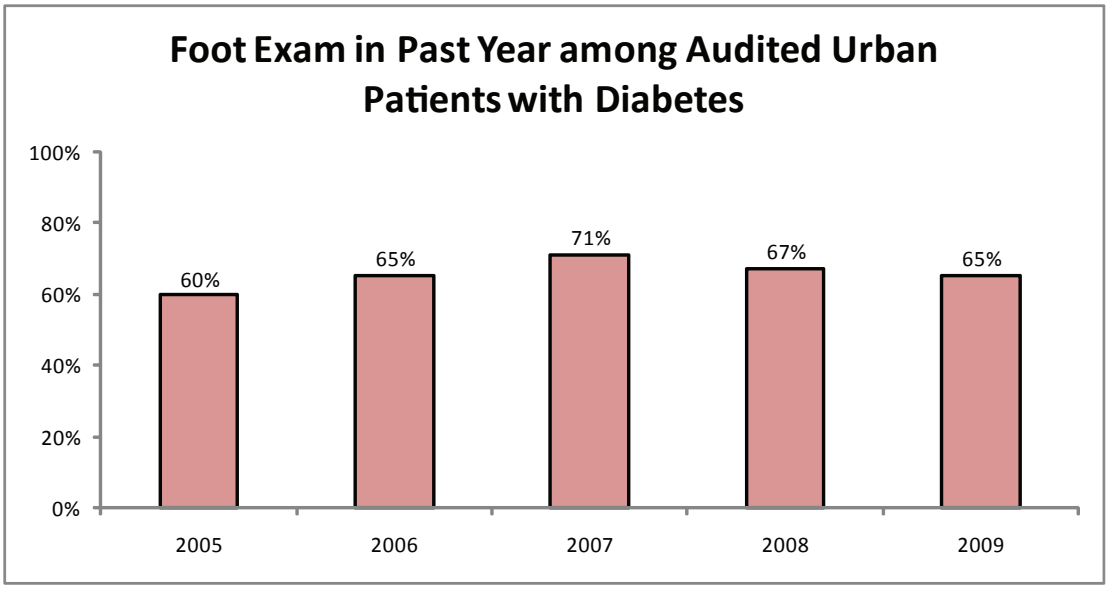
BEST PRACTICE VI
FOOT CARE

BEST PRACTICE KEY MEASURES RELATED TO FOOT CARE

Key Measure 1: Percentage of diabetes patients with documented foot exams in the past twelve months.

A trained provider can assess for reduced sensation, physical abnormalities, and vascular flow during a foot exam. Finding early signs of reduced circulation or other risks allows for timely intervention. Education about proper self-care, podiatry care, proper footwear, and referrals can all help reduce the chances of serious complications.

Graph 13



Description of Graphic: The majority of audited urban patients with diabetes in the past five years had a record of a recent foot exam during the previous year (60% - 71%). In 2009, there were seven urban sites that had a record of foot exams for 90% or more of their patients (data not shown).

* * *

Key Measure 2: Percentage of diabetes patients with documented risk-appropriate foot care education in the past twelve months.

This Key Measure is not analyzable using current IHS Diabetes Audit data.

BEST PRACTICE VII

ORAL HEALTH

High glucose levels can lead to serious oral health problems including periodontal disease, tooth decay, delayed healing, and fungal infections. The most significant issue is periodontal disease, which involves the gums and bones surrounding the teeth, and can result in tooth loss. In addition to tooth loss, periodontal disease also contributes to increased difficulties with blood glucose control among people with diabetes. Prevention and treatment of disease are critical, and clinical interventions include assuring access to regular dental care, providing education on oral hygiene and self-care, and taking measures to control blood sugar.

KEY CLINICAL PRACTICE RECOMMENDATIONS RELATED TO ORAL HEALTH

- ✓ Establish priorities for dental treatment and oral health education for people with diabetes.
- ✓ Provide patient education to prevent and reduce adverse oral health outcomes.
- ✓ Conduct annual dental examinations and cleanings, and restore caries in all people with diabetes.
- ✓ Provide recalls (follow-up visits) to maintain periodontal health.

MEASURE USED FOR TRACKING ORAL HEALTH

- ✓ Page 31: Key Measure 1 - Percentage of diabetes patients with a documented oral health exam in past twelve months.

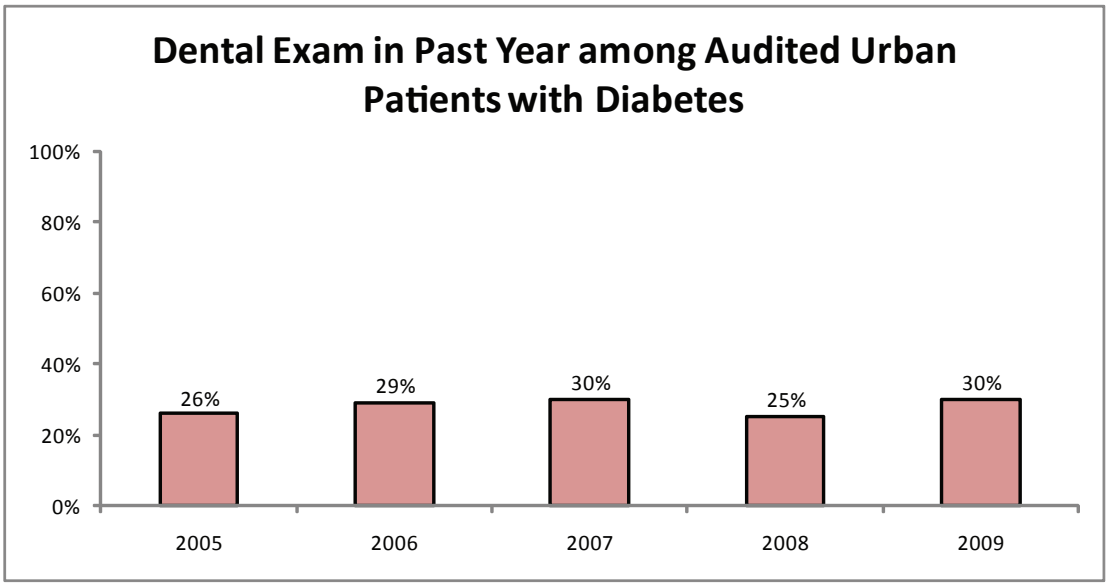
BEST PRACTICE VII
ORAL HEALTH

BEST PRACTICE KEY MEASURES RELATED TO ORAL HEALTH

Key Measure 1: Percentage of diabetes patients with a documented oral health exam in past twelve months.

Primary care providers have a role in ensuring patients with diabetes receive regular dental exams. A systematic method of documenting patient's reports of dental exams can be maintained, and can help providers to encourage patients to follow through on needed exams.

Graph 14



Description of Graphic: Less than one-third of audited urban patients with diabetes each year had a record of a recent dental exam. However, these figures may underestimate the number of patients that received dental exams during the past 12 months since patients may have received exams outside the UIHO that were not documented in patient records. Access to care may be a significant factor in a patient's ability to obtain dental services.

* * *

Key Measure 2: Whether a dental provider actively participates in the diabetes team to address oral health-related issues.

This Key Measure is not analyzable using current IHS Diabetes Audit data.

BEST PRACTICE VIII

YOUTH AND TYPE 2 DIABETES

The rate of diabetes and pre-diabetes in youth is growing at an alarming rate. During the 14 year period between 1990-2004 the prevalence of type 2 diabetes increased 128% among American Indian and Alaska Native adolescents. Since individuals who develop diabetes at younger ages are at an increase risk of developing debilitating and costly diabetes complications, such as kidney disease, diabetic retinopathy, heart attack, and stroke, efforts to prevent or delay the onset of diabetes are crucial. Preventative measures that should be encouraged include promotion of breastfeeding, a decrease of the exposure to high glucose levels in utero, and the reduction of obesity in childhood and adolescence through increased physical activity and improved nutrition. Early identification and education of adolescents with impaired glucose tolerance can also be important in preventing youth from developing more advanced disease.

KEY CLINICAL PRACTICE RECOMMENDATIONS RELATED TO YOUTH AND TYPE 2 DIABETES

- ✓ Promote breastfeeding of infants for at least two months.
- ✓ Reduce in utero exposure to elevated blood glucose levels.
- ✓ Find cases early, make diagnoses, and make appropriate referrals.
- ✓ Treat youth with type 2 diabetes.
- ✓ Establish programs to increase physical activity and encourage healthy eating early in life.

MEASURES USED FOR TRACKING YOUTH AND TYPE 2 DIABETES

- ✓ Page 33: Key Measure 1 - Percentage of diabetes patients aged six to seventeen years with documented nutrition and physical activity education in the past twelve months.
- ✓ Page 33: Key Measure 2 - Percentage of diabetes patients aged six to seventeen years with A1c less than 7.0% in the past twelve months.

BEST PRACTICE VIII

YOUTH AND TYPE 2 DIABETES

BEST PRACTICE KEY MEASURES RELATED TO YOUTH AND TYPE 2 DIABETES

Key Measure 1: Percentage of diabetes patients aged six to seventeen years with documented nutrition and physical activity education in the past twelve months.

Like adults, adolescents can benefit from individual education that explains why and how to make behavioral changes aimed at improving their health. Increasing physical activity and improving nutritional intake are safe and effective interventions that can help prevent or delay more severe chronic health problems due to diabetes.

- Of the 20 youth audited between 2005-2009, 14 had a record of receiving both nutrition and physical activity education.
- Among the 11 sites with at least one audited patient under age 18 years, 8 sites provided nutrition and physical activity education to all audited youth.

* * *

Key Measure 2: Percentage of diabetes patients aged six to seventeen years with A1c less than 7.0% in the past twelve months.

Early identification of youth with poorly controlled diabetes can help providers make appropriate interventions before advance disease develops. Tracking A1c should thus start when an individual is diagnosed, regardless of age.

- Of the 20 youth audited between 2005-2009, 16 had a record of a A1c test within past 12 months.
- Among these 16 youth with A1c lab tests, results showed:

A1c result	Number of Youth
<7.0 mg/dl	10
7.0–9.5 mg/dl	5
>9.5 mg/dl	1

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APPENDIX A
TABLES

Table 1. Demographics of Audited Patients with Diabetes, 2005-2009

Year	2005		2006		2007		2008		2009	
No. charts audited	1,009		1,103		1,156		1,788		1,970	
	No.	%+	No.	%+	No.	%+	No.	%+	No.	%+
Sex										
Male	410	42%	426	41%	451	42%	697	42%	779	43%
Female	599	58%	677	59%	705	58%	1,091	58%	1,191	57%
Age (years)										
< 18 years	1	0.2%	3	0.3%	3	0.1%	8	0.2%	5	0.1%
18-44 years	290	28%	306	26%	324	25%	497	26%	563	26%
45-64 years	551	54%	619	57%	637	56%	988	56%	1,095	57%
≥ 65 years	166	18%	175	17%	190	19%	295	18%	307	16%
Diabetes duration (years)										
< 5 years	423	39%	426	41%	454	42%	693	42%	703	36%
5 – 9 years	271	26%	282	23%	300	24%	453	24%	468	25%
≥ 10 years	256	28%	297	29%	312	29%	465	28%	527	31%
Missing	59	8%	98	7%	90	5%	177	7%	272	8%
Diabetes Type										
Type 1	26	3%	21	3%	29	2%	49	2%	36	2%
Type 2	982	97%	1,081	97%	1,125	98%	1,736	98%	1,934	98%

+Weighted estimate

APPENDIX A
TABLES

Table 2. Vital Statistics of Audited Patients with Diabetes, 2005-2009										
Year	2005		2006		2007		2008		2009	
No. charts audited	1,009		1,103		1,156		1,788		1,970	
	No.	%+	No.	%+	No.	%+	No.	%+	No.	%+
Body Mass Index (BMI)*										
< 25	78	7%	75	6%	75	6%	133	7%	134	6%
25 - 29	217	21%	240	23%	260	24%	377	21%	443	22%
30 - 40	462	47%	472	43%	541	47%	818	47%	918	47%
≥ 40	212	20%	277	24%	247	21%	396	21%	438	23%
Missing	40	4%	39	3%	33	2%	64	4%	37	2%
Hypertension ^										
Yes	660	70%	712	70%	804	75%	1,248	74%	1,433	76%
No	330	28%	382	29%	348	25%	528	26%	537	24%
Missing	19	2%	9	1%	4	0%	12	0.3%	0	0%
Blood pressure (mmHg)										
<130/<80	419	40%	427	37%	442	42%	666	40%	795	44%
130/80 - <140/<90	295	33%	339	37%	328	32%	505	32%	514	29%
140/90 - <160/<95	119	13%	129	14%	126	10%	246	13%	248	13%
160+/95+	37	5%	30	3%	43	3%	63	3%	83	3%
Missing	139	10%	178	10%	217	12%	308	12%	330	11%

+Weighted estimate
*Weight in kiograms / (height in meters)^2; normal < 25, overweight 25 - 29, obese ≥ 30; morbidly obese ≥ 40
^Documented diagnosis or taking prescription medication

APPENDIX A
TABLES

Table 3. Exams in Past Year among Audited Patients with Diabetes, 2005-2009

Year	2005		2006		2007		2008		2009	
No. charts audited	1,009		1,103		1,156		1,788		1,970	
	No.	%+	No.	%+	No.	%+	No.	%+	No.	%+
Eye Exam										
Yes	523	45%	485	46%	534	48%	856	47%	886	42%
No	420	43%	547	42%	606	51%	877	51%	1,039	56%
Refused	62	12%	61	11%	16	1%	40	1%	45	2%
Foot Exam										
Yes	653	60%	722	65%	789	71%	1,210	67%	1,257	65%
No	326	32%	337	26%	350	27%	557	32%	695	34%
Refused	27	7%	39	9%	15	1%	13	1%	18	1%
Dental Exam										
Yes	281	26%	344	29%	372	30%	535	25%	621	30%
No	664	65%	681	58%	759	69%	1,160	71%	1,269	68%
Refused	58	9%	70	13%	24	1%	70	2%	80	2%

+Weighted estimate

Table 4. Diabetes Education among Audited Patients with Diabetes, 2005-2009

Year	2005		2006		2007		2008		2009	
No. charts audited	1,009		1,103		1,156		1,788		1,970	
	No.	%+	No.	%+	No.	%+	No.	%+	No.	%+
Diet Instruction										
By Registered Dietitian	206	21%	233	21%	215	19%	336	22%	326	22%
By Other Staff	300	22%	296	27%	426	32%	652	27%	789	28%
By Both RD and Other	175	9%	193	11%	166	9%	187	7%	229	10%
No Diet Instruction	288	38%	347	36%	338	38%	581	42%	575	36%
Refused	38	9%	31	4%	10	1%	25	2%	51	4%
Exercise Instruction										
Yes	680	65%	669	59%	745	55%	1,099	54%	1,269	59%
No	319	34%	306	27%	394	43%	655	45%	667	39%
Refused	8	1%	122	14%	16	1%	24	1%	34	2%
Diabetes Education (other)										
Yes	797	75%	854	78%	920	76%	1,317	70%	1,483	71%
No	202	24%	157	12%	226	23%	433	28%	449	26%
Refused	8	1%	89	11%	10	0.5%	26	2%	38	3%

+Weighted estimate

APPENDIX A
TABLES

Table 5. Immunizations among Audited Patients with Diabetes, 2005-2009										
Year	2005		2006		2007		2008		2009	
No. charts audited	1,009		1,103		1,156		1,788		1,970	
	No.	%+	No.	%+	No.	%+	No.	%+	No.	%+
Influenza Vaccine in past yr										
Yes	616	60%	609	53%	633	58%	1,099	60%	1,191	60%
No	332	35%	418	40%	451	38%	557	33%	639	33%
Refused	59	5%	67	6%	70	5%	118	6%	140	6%
Pneumococcal Vaccine ever										
Yes	613	58%	646	58%	682	65%	1,103	65%	1,277	69%
No	372	40%	424	39%	437	33%	615	32%	618	28%
Refused	22	1%	22	1%	35	2%	51	2%	75	3%
Td Vaccine in past 10 years										
Yes	577	61%	621	65%	671	70%	1,090	70%	1,207	71%
No	410	37%	453	32%	463	29%	657	28%	733	28%
Refused	17	1%	12	1%	16	0.5%	23	1%	30	1%

+Weighted estimate

Table 6. Laboratory Services among Audited Patients with Diabetes, 2005-2009										
Year	2005		2006		2007		2008		2009	
No. charts audited	1,009		1,103		1,156		1,788		1,970	
	No.	%+	No.	%+	No.	%+	No.	%+	No.	%+
Labs done in past year:										
A1c	943	95%	974	91%	1,048	93%	1,647	95%	1,806	95%
Total Cholestrol	791	78%	847	78%	911	82%	1,363	83%	1,484	80%
LDL Cholesterol	726	73%	794	74%	863	79%	1,317	79%	1,475	78%
Triglycerides	778	76%	836	77%	918	82%	1,365	83%	1,501	81%

+Weighted estimate

APPENDIX A
TABLES

Table 7. Laboratory Results among Audited Patients with Diabetes, 2005-2009

Year	2005		2006		2007		2008		2009	
No. charts audited	1,009		1,103		1,156		1,788		1,970	
	No.	%+	No.	%+	No.	%+	No.	%+	No.	%+
A1c (%)										
<7.0	394	43%	413	37%	454	41%	706	41%	742	40%
7.0 – 9.5	397	41%	393	42%	396	39%	626	38%	700	38%
> 9.5	152	12%	168	13%	198	14%	315	16%	364	17%
Missing	66	5%	129	9%	108	7%	141	5%	164	5%
Mean A1c+	7.6		7.7		7.7		7.8		7.8	
Total Cholesterol (mg/dl)										
< 200	550	57%	579	56%	628	59%	937	60%	1,046	60%
200 – 239	164	13%	193	16%	207	17%	283	15%	296	15%
≥ 240	77	8%	75	6%	76	5%	143	9%	142	5%
Missing	218	22%	256	22%	245	18%	425	17%	486	20%
Mean Total Cholesterol+	182		182		178		183		177	
LDL Cholesterol (mg/dl)										
< 100	377	40%	433	42%	469	47%	690	43%	800	46%
100 – 129	223	22%	233	22%	252	22%	375	24%	417	21%
130 – 160	99	8%	94	8%	101	6%	174	9%	187	8%
> 160	27	3%	34	2%	38	3%	78	4%	71	3%
Missing	283	27%	309	26%	296	21%	471	21%	495	22%
Mean LDL Cholesterol+	98		97		95		100		97	
Triglyceride (mg/dl)										
< 150	295	32%	326	32%	405	38%	622	40%	665	38%
150 – 199	183	18%	213	20%	190	18%	284	17%	342	17%
200 – 400	241	22%	238	20%	261	23%	365	21%	380	20%
> 400	59	5%	59	5%	62	4%	94	5%	114	6%
Missing	231	24%	267	23%	238	18%	423	17%	469	19%
Mean Triglyceride+	198		209		189		189		203	

+Weighted estimate

APPENDIX A
TABLES

Table 8. Use of Standard Therapies among Audited Patients with Diabetes, 2005-2009										
Year	2005		2006		2007		2008		2009	
No. charts audited	1,009		1,103		1,156		1,788		1,970	
	No.	%+	No.	%+	No.	%+	No.	%+	No.	%+
Diabetes Treatment										
Diet/Exercise Alone	109	8%	140	6%	142	7%	174	7%	214	7%
Oral Agent Only	640	62%	653	60%	647	54%	1,031	52%	1,106	54%
Insulin Only	93	12%	107	13%	122	15%	232	19%	208	15%
Oral Agent and Insulin	149	17%	173	19%	208	22%	325	21%	399	22%
Refused/Unknown	18	1%	30	2%	28	2%	26	1%	24	1%
Missing	0	0%	0	0%	9	0.5%	0	0%	19	0.5%
Chronic Aspirin*										
Yes	696	77%	716	75%	747	76%	1,210	79%	1,251	70%
No	254	22%	316	22%	358	23%	467	20%	602	28%
Refused/Adverse Rx	12	0.6%	21	2%	11	0.2%	18	1%	29	2%
Missing	3	0.2%	14	1%	0	0%	14	0.4%	0	0%
Lipid Lowering Agent										
Yes	541	56%	577	56%	613	58%	953	57%	1,048	60%
No	451	44%	506	42%	520	41%	785	41%	888	38%
Refused/Adverse Rx	10	0.3%	14	1%	22	1%	33	1%	34	2%
Missing	7	0.4%	6	1%	1	0%	17	0.4%	0	0%
ACE Inhibitor										
Yes	663	70%	685	67%	773	75%	1,262	75%	1,388	74%
No	336	29%	393	30%	376	25%	498	24%	560	25%
Refused/Adverse Rx	9	0.4%	11	1%	6	0.5%	15	1%	22	1%
Missing	1	0.2%	14	2%	1	0%	13	0.3%	0	0%

+Weighted estimate
*Among patients age 30 and older

APPENDIX A
TABLES

Table 9. Tobacco Use among Audited Patients with Diabetes, 2005-2009

Year	2005		2006		2007		2008		2009	
No. charts audited	1,009		1,103		1,156		1,788		1,970	
	No.	%+	No.	%+	No.	%+	No.	%+	No.	%+
Current tobacco use										
User	303	25%	327	26%	349	27%	534	26%	602	32%
Non-user	643	67%	735	71%	746	70%	1,191	71%	1,233	63%
Not documented	61	8%	41	3%	61	3%	63	2%	135	5%
Cessation referral*										
Yes	188	62%	191	61%	219	56%	326	60%	415	66%
No	86	32%	118	36%	112	40%	163	32%	127	22%
Refused	20	4%	11	3%	15	3%	36	8%	60	12%
Missing	9	1%	7	1%	3	0.2%	9	1%	0	0%

+Weighted estimate
*Among current tobacco users

Table 10. Depression among Audited Patients with Diabetes, 2005-2009

Year	2005		2006		2007		2008		2009	
No. charts audited	1,009		1,103		1,156		1,788		1,970	
	No.	%+	No.	%+	No.	%+	No.	%+	No.	%+
Active Diagnosis of Depression										
Yes	244	23%	325	30%	363	32%	616	29%	715	31%
No	712	69%	767	69%	792	68%	1,160	71%	1,255	69%
Missing	53	8%	11	1%	1	0%	12	0.2%	0	0%
Depression Screening*										
Yes	115	31%	342	54%	384	41%	637	58%	819	68%
No	595	69%	416	46%	399	59%	472	39%	424	31%
Refused	0	0%	6	0.2%	5	0.3%	12	1%	12	1%
Missing	2	0.1%	3	0.1%	4	0.2%	39	2%	0	0%

+Weighted estimate
*Among those without diagnosis of depression

APPENDIX B

NATIONAL STANDARDS: GPRA AND HEALTHY PEOPLE 2010

The table below provides information on how audited patients at all UIHO combined compare with the 2009 IHS GPRA goals and Healthy People 2010 targets.

Table 11. Selected Indicators by year compared with 2009 IHS GPRA Goals and HP 2010 Targets

Year	2005	2006	2007	2008	2009	2009 IHS GPRA Goal	HP 2010 Target
No. charts audited	1,009	1,103	1,156	1,788	1,970		
	%+	%+	%+	%+	%+		
A1c < 7.0%	43%	37%	41%	41%	40%	39%	
A1c > 9.5% (lower is better)	12%	13%	14%	16%	17%	19%	
Blood pressure (mmHg) < 130/80	40%	37%	42%	40%	44%	36%	
LDL Cholesterol done	73%	74%	79%	79%	78%	75%	
Retinopathy assessment (eye exam)	45%	46%	48%	47%	42%	47%	75%
Foot exam	60%	65%	71%	67%	65%		75%
Dental exam	26%	29%	30%	25%	30%		75%
Chronic aspirin*	77%	75%	76%	79%	70%		30%
A1c done	95%	91%	93%	95%	95%		50%

*Among patients age 30 and older

APPENDIX B

NATIONAL STANDARDS: GPRA AND HEALTHY PEOPLE 2010

GPRA AND HP 2010 INDICATORS AND DEFINITIONS

GPRA Indicators for Diabetes	Definition
Poor Glycemic Control	Last recorded Hemoglobin A1c > 9.5 %
Ideal Glycemic Control	Last recorded hemoglobin A1c < 7.0 %
Ideal Blood Pressure Control	Mean of last three recorded blood pressures <130/ <80 mmHg
Assessed for Dyslipidemia in preceding 12 months	Proportion of audited sample with low density lipoprotein (LDL) cholesterol tested in preceding 12 months
Assessed for Nephropathy in preceding 12 months	Proportion of the audited sample with both an estimated glomeruler filtration rate (GFR) and a quantitative urinary protein assessment. Audit data can not currently be tracked over recent years for this indicator
Assessed for Retinopathy in preceding 12 months	Proportion of the audited sample in which a retinal exam was documented in the preceding 12 months

More about IHS GPRA indicators can be found here:
http://www.ihs.gov/NonMedicalPrograms/quality/index.cfm?module=gpra_list

HP 2010 Focus Area Diabetes Objectives	Target
5-12. Increase the proportion of adults with diabetes who have a glycosylated hemoglobin measurement at least once a year.	50%
5-13. Increase the proportion of adults with diabetes who have an annual dilated eye examination.	75%
5-14. Increase the proportion of adults with diabetes who have at least an annual foot examination.	75%
5-15. Increase the proportion of persons with diabetes who have at least an annual dental examination.	75%
5-16. Increase the proportion of adults with diabetes who take aspirin at least 15 times per month.	30%

More about HP 2010 can be found here: http://www.healthypeople.gov/