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Introduction

Abstracts in this section describe quality improvement projects conducted by Medicare peer review organizations (PROs), the Indian Health Service (IHS), and the Department of Veterans Affairs (VA).

The Texas Medical Foundation (TMF) obtained the information in PRO project abstracts from the Narrative Project Documents (NPDs) and data in HCFA's quality improvement project (QIP) electronic reporting system. For PRO and HCFA staff who have access to the QIP system and wish to see more detailed information, the project number is listed on PRO abstracts.

PRO projects are usually designed as before and after studies. PROs select quantifiable aspects of care, known as quality indicators, and use medical record or Medicare claims data to develop baseline data. The PROs then recruit health care providers to voluntarily participate in a quality improvement project. The providers develop and implement improvement plans and then the quality indicators are remeasured. For diabetes projects, common quality indicators include the percentage of patients receiving eye exams, foot exams, and screening for blood pressure, hemoglobin A1c, and urine protein or microalbumin.

The PRO projects were reviewed by TMF staff using a standardized tool. Criteria for inclusion in the compendium were:

- The project must have been completed, (i.e., post intervention data must have been collected and analyzed)
- The project must have had significant improvement in at least one measure which is related to one of the national Diabetes Quality Improvement Project (DQIP) measures. These measures address glycemic control, hypertension, eye exams, foot exams, lipid management, and diabetic nephropathy;
- The project must have valid measures, reliable data collection methods, and appropriate statistical analysis; and
- Each PRO's HCFA project officer must approve inclusion in the Compendium.

While a PRO may have measured aspects of care not addressed by DQIP such as patient education, those measures might not be included in the abstract. For selected projects, the PRO was given an opportunity to edit its abstract. For more detailed information, access the project's NPD or contact the PRO.

Abstracts from the IHS and the VA were written by staff from those organizations. Contact persons are listed on each abstract.

Summary Table

Overview of Projects

Abstract Number	Organization	Interventions	Patients	Setting	Measures	Page Number
1.	ACQIP: Alabama Quality Assurance Foundation, Delmarva Foundation for Medical Care, & Iowa Foundation for Medical Care	Ambulatory Care Quality Improvement Project: Groups received 4 data feedback sheets, the enhanced group received 3 toolkits that included physician education materials, patient educational materials, and office aids, project updates & educational reminders were sent in 6 ACQIP newsletters	Alabama, Iowa and Maryland Medicare patients, 65 years or older with a diagnosis of diabetes, sample size included 5,980 cases pre-intervention and 5,150 cases post-intervention	Individual fee-for-service primary care offices, 293 physicians agreed to collaborate from Alabama, Iowa and Maryland	Average office visits, foot exam, dilated eye exam, known hypertensives on ACE inhibitors, HbA1c, average serum creatinine, serum cholesterol, triglycerides, fasting blood glucose, nonfasting blood glucose	2-8
2.	California Medical Review, Inc.	Foot and eye toolkits were distributed to physicians: included patient list, articles, patient brochures, posters, stickers, a report comparing plans and an order form	300 Medicare diabetic patients in health plan for 2+ years, 65+years old, not on dialysis	~8,000 primary care physician offices serving 125,000 beneficiaries in 10 California health plans	Foot exams, dilated eye exams	2-12
3.	Colorado Foundation for Medical Care	Designed a toolkit for physicians and office staff, contained project findings, ADA standards, stickers, poster & order form, developed a flowsheet, held meetings	Diabetic Medicare risk beneficiaries, 65+ years or older, on insulin or similar medicine, 325 in baseline and 147 in follow-up sample	5 HMOs with Medicare risk contracts in Colorado	Total blood cholesterol, HbA1c, urinalysis, microalbumin, ACE inhibitors	2-13
4.	Florida Medical Quality Assurance, Inc.	Sent numerous letters to plan physicians, letters to members with foot care brochure, provider/staff education, beneficiary empowerment, brochures, stickers, reminder postcards, posters, meetings/visits	300 Medicare beneficiaries aged 65+ in Medicare risk plan for 2 years with diabetes	Physician offices serving 3 Florida MCOs, ~6,000 providers in these offices, MCO served ~36,000 Medicare diabetics	Hemoglobin A1c, foot exams, eye exams, average number of visits	2-15
5.	Georgia Medical Care Foundation	Used educational opinion leaders, practice feedback, provider education, patient reminders, included 4 toolkits for practitioners with audio cassettes, ADA wall chart and standards, algorithm, stickers	Patients had to be diagnosed with diabetes with one or more diabetes-related service, baseline consisted of 12,968 cases and interim remeasurement had 2,577 cases	Georgia counties that were not core urban counties (to exclude the high number of managed care) cases	Hemoglobin A1c	2-16
6.	HealthInsight	Conducted a meeting with the HMO staff, utilized ADA-based flowsheets, sent letters to providers, provided a training program	Medicare risk diabetic patients, 216 cases pre-intervention and 291 post-intervention	2 Medicare risk HMOs, served 45,000 of 184,000 Medicare beneficiaries (22.3% of Medicare diabetic population)	Foot exam, glycohemoglobin, microalbumin, lipid panel, retinal exam, urinalysis	2-17

Abstract Number	Organization	Interventions	Patients	Setting	Measures	Number
7.	Health Services Advisory Group, Inc.	Meetings with MCO medical directors, conferences for physicians, educators and others, designed flowsheet, distributed booklet on diabetes management	Medicare diabetic beneficiaries continuously enrolled in MCO. 380 cases in baseline sample and 767 follow-up cases	Targeted 35,000 Medicare diabetic beneficiaries in 6 MCOs which served 200,000 Medicare beneficiaries in Arizona, ~4,800 PCPs worked with the 6 MCOs	Blood pressure, foot exam, retinal exam, lipid profile, HbA1c, value of HbA1c, mean HbA1c	2-17
8.	Indian Health Service	Performed data feedback, generated summary reports for facility staff to use for QI activities and program planning	Persons with diabetes who live in the geographic region, enrolled in one of the clinics, seen for diabetic care	Primary care facilities within the Indian health network, including clinics operated by IHS, an agency of the US Public Health Service, tribally operated clinics and urban Indian clinics	Glycemic control, macro/microalbuminuria and serum creatinine, urinalysis done, + proteinuria, - proteinuria, microalbumin tested, serum creatinine done, serum creatinine >2.0 mg/dl	2-19
9.	Island Peer Review Organization	Held regular meetings, developed subcommittees on patient health literacy and education, provider education and system change process, developed a survey to ascertain patient knowledge and skills regarding diabetes self-management, utilized a certified diabetes educator	Patients had to have two ambulatory visits with a diabetes diagnosis during the designated timeframe	5 clinical sites in East Harlem, New York City a predominately African-American and Hispanic area with many elderly, included 3 hospital ambulatory clinics and 2 federally-supported community health centers	Foot exam, dilated eye exam, glycohemoglobin exam, urine protein exam, serum cholesterol exam, triglyceride exam, serum creatinine measurement	2-21
10.	MetaStar, Inc.	Met regularly with the clinic, implemented flowsheets, used foot posters, educated practitioners and patients, direct mailed patient reminders	Diabetic Medicare patients, 65+ years, established clinic patient, sample size was 135 for baseline and 119 for follow-up	17 outpatient clinics from one large multi-specialty group in south central Wisconsin that serves >1,700 diabetics	Dilated eye exam, recommendation of an eye exam, eye exam (w/ or w/o dilation), foot exam, one HbA1c annually, two HbA1c tests annually, average HbA1c results	2-23
11.	Michigan Peer Review Organization	Held visits with practice, implemented flowsheet	Medicare beneficiaries, 65+ years of age, seen by practice within 6 months, 114 cases pre-intervention and 109 cases post-intervention	Large ambulatory group practice that consisted of 17 physicians, several physician assistants and 13 research staff members in Michigan	HbA1c, annual urine protein dipstick, microalbumin test if negative dipstick, annual retinopathy, ophthalmology referral, foot exam, home glucose monitoring	2-24
12.	Mountain-Pacific Quality Health Foundation	Placed a one-page summary of diabetes care on each patient's chart, developed personalized patient education brochures	Patients with type II diabetes receiving care at the participating offices	28 outpatient care physician offices with more than 50 physicians involved	Blood pressure results, HbA1c, foot exams, dilated retinal exams, urine protein/microalbuminuria testing, lipid levels, whether or not patient is receiving an ACE-inhibitor or lipid lowering agent	2-26

Federally-Funded Diabetes Quality Improvement Projects

Abstract Number	Organization	Interventions	Patients	Setting	Measures	Page Number
13.	Northeast Health Care Quality Foundation	Mailed beneficiaries a letter about eye exams, mailed fact sheet on diabetic retinopathy to beneficiaries, mailed PRO newsletter to physicians, utilized flowsheet	2,048 diabetic Medicare beneficiaries selected from Part A & B claims data	Physician offices in Maine	Fundoscopy eye exams	2-28
14.	Oklahoma Foundation for Medical Quality, Inc.	Formed study group, distributed copies of ADA's Clinical Practice Recommendations, sent participants educational information	FFS and HMO Medicare beneficiaries with diabetes mellitus, had to receive care at one of the clinics for at least one year, 654 cases pre-intervention and 695 cases post-intervention	3 multi-practice clinics and 1 multi-site health group in Oklahoma	Blood pressure, ACE inhibitor treatment if hypertensive, referral for abnormal lipids, HbA1c, treatment for proteinuria with an ACE inhibitor, home glucose monitoring, elevated blood pressure, lipid profile, median of highest HbA1c	2-29
15.	Oregon Medical Professional Review Organization	Mailed out baseline data to HMOs along with Population-Based Guidelines for Diabetes Mellitus, a flowsheet was designed by a study group and distributed to physicians, members were provided with latest Diabetes Care Card and eye disease brochures	For the HMO population-patients had to be from 67 to 70 years of age, in one Medicare risk HMO for 2 years with 1 visit for diabetes, 765 cases in baseline and 814 cases in follow-up; For the FFS population-patients had to be Medicare beneficiaries with a diagnosis of diabetes aged 67 to 70, there were 6,702 cases in baseline and 6,448 cases in the remeasurement data	4 of Oregon's 5 risk HMOs participated	Blood pressure, visual foot inspection, complete foot exam, dilated retinal exam, microalbumin screening, HbA1c, cholesterol (LDL)	2-30
16.	Peer Review Systems, Inc.	Conducted a slide show for practice, suggested Diabetes Checkmate (reminder-card) and Diabetes Checkpoints (flowsheet), as tools for interventions, utilized reminder stickers	Diabetic Medicare beneficiaries, had to receive care during the designated timeframe, 133 cases in baseline and 95 in remeasurement	A large multi-specialty physician group of 30 PCPs serving managed care and FFS patients in Ohio	Blood pressure, foot exam, ophthalmology/optometry referral, hemoglobin A1c, cholesterol, urinalysis, mean of all HbA1c, patients with HbA1c < and > 8%	2-32
17.	The Sunderbruch Corporation-Nebraska	Developed a Diabetes Care Project-in-a-Box which included a flowsheet, stickers to identify records with flowsheets, posters and patient educational handouts, a PRO physician helped implement flowsheets and presented the Project-in-a-Box to the clinics	792 Nebraska Medicare beneficiaries with diabetes that were Part B-eligible, not enrolled in a Medicare HMO during designated timeframe	450 physicians from 38 clinics and 2 HMOs in Nebraska	Hemoglobin A1c	2-33

Abstract Number	Organization	Interventions	Patients	Setting	Measures	Page Number
18.	West Virginia Medical Institute, Inc.	A PRO physician visited practices and made phone calls to clinic administrators to discuss project and asked if a toolkit would be helpful, if so one was sent	65 years or older Medicare beneficiaries with diabetes mellitus seen once by a practitioner during study time, 259 cases pre-intervention and 267 cases post-intervention	8 Delaware primary care practices (internal medicine or family practice)	Hemoglobin A1c, foot exam, cholesterol, urinalysis for protein/albumin, ophthalmic exam	2-35
19.	West Virginia Medical Institute, Inc.	PRO held meetings with practices to discuss project, some were given informational packets including project overview and information on how to use the packet, a PRO physician called to see if a toolkit would be useful, if there was interest then the clinic was sent one	Patients had to be 18 years or older with diabetes mellitus, 363 cases were included for baseline and 285 cases were in the follow-up sample	10 West Virginia primary care practices that included internal medicine and family practice	Hemoglobin, foot exams, cholesterol, urinalysis, ophthalmic exam	2-36
20.	Veterans Health Administration	Computerized clinical reminders were utilized which had the option to implement conferences, select guideline champions and use patient report cards; results were fed back to the networks	Veterans diagnosed with diabetes mellitus; sample sizes were 9,578 in 1995, 13,557 in 1997, and 8,513 in 1998	Veterans Health Administration ambulatory care	Glycosylated hemoglobin performed and <10%, dilated retinal exam by eye specialist, foot visual exam, foot sensation checked, foot pulses checked, referral to foot specialist for high risk foot; blood pressure <140/90 if hypertension was diagnosed, LDL measured, LDL <130 mg/dl, urine protein evaluated	2-37
21.	Virginia Health Quality Center	For physician offices a flowsheet was introduced; for HMOs reminders were used on lab result forms to remind providers of tests to be performed; for beneficiaries the PRO developed a diabetes checklist to track diabetes care, posters were distributed	226 Medicare risk HMO beneficiaries	4 multi-physician practices in Virginia in a Medicare risk HMO	Eye exam, foot exam, microalbumin, HbA1c	2-39

Abstract Number: 1

Ambulatory Care Quality Improvement Project (ACQIP)

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Objective: The overall objective of ACQIP was to improve patient outcomes by improving the processes of care in the ambulatory setting for Medicare beneficiaries who have diabetes mellitus in the states of Alabama, Iowa, and Maryland. This objective was accomplished through the successful encouragement of individual quality improvement efforts by primary care providers and by motivating patients to play a more active role in their own care.

Design: In all three states, a random sample of 25 Medicare diabetics per collaborating physician was selected. Data were collected for an 18-month time period from medical record abstraction on the average number of office visits, foot exams, dilated eye exams, glycemic control, renal function, and lipid monitoring. The quality indicators were measured before (1/1/94-6/30/95) and after (1/1/97-6/30/98) interventions to improve diabetes care.

Setting: The setting for this project was individual fee-for-service primary care offices. Physicians who designated themselves as specializing in internal medicine, endocrinology, general medicine, osteopathy, or family practice were included. A total of 293 physicians agreed to collaborate from the three states.

Patients: To be included in the study, Medicare patients had to have a diagnosis of diabetes prior to the respective study period and be at least 65 years of age. Patients were excluded if they were on chronic renal dialysis, had a stay greater than 60 days in a skilled nursing facility, or if they died prior to the end of the respective study period.

Interventions: Each state had their physician collaborators divided into an enhanced group and a standard group. Both groups received 4 data feedback sheets that compared the individual physician's quality indicator rates to the statewide rates. The enhanced group additionally received 3 toolkits that contained physician educational materials, patient educational materials, and office aids. Frequent updates on the project and educational reminders were sent to the collaborating physicians in six ACQIP newsletters. HCFA produced four publications compiled from project data that highlighted influenza vaccination, cardiovascular disease, prevention of foot problems, and kidney disease for diabetics.

Main outcome measures and results: For the baseline measurement there were a total of 293 collaborating physicians and a total of 5,980 patients. For remeasurement there were a total of 211 physicians and 5,150 patients. Table 1 displays the baseline and remeasurement rates for the quality indicators for Alabama and Maryland (at this time abstraction in Iowa is not complete). Iowa's data will be included in a subsequent update. However, with the strong statistical significance of the measures thus far, it was important to report the results, although incomplete. The addition of Iowa's data is expected to confirm the statistical significance of the rates of improvement.

Table 1: Quality Indicator Rates

Quality Indicator	Baseline	Remeasurement
Average Office Visits	8.01	7.84
At Least 1 Foot Exam	42.3%	57.6%
At Least 1 Dilated Eye Exam	16.5%	20.1%
Known Hypertensives on ACE Inhibitors	38.3%	50.4%
At Least 1 A1c/Total Glycosylated Hemoglobin*	42.5%	75.5%

*HbA1c and total glycosylated hemoglobin are considered as one test on Table 1. In baseline, the abstractors were often unable to determine which test was performed due to absent specific documentation, absent reference ranges, or poor documentation in the progress notes. HbA1c and total glycosylated hemoglobin were recorded separately in remeasurement, but for comparison are reported herein the same way as in the baseline.

The rates of improvement in foot exams, dilated eye exams, A1c/total glycosylated hemoglobin, and known hypertensives on ACE inhibitors were highly statistically significant ($p < .001$). Table 2 displays a comparison of certain laboratory values for baseline and remeasurement for patients abstracted in Alabama and Maryland (at this time abstraction in Iowa is not complete. Iowa's data will be included in a subsequent update).

Table 2: Average laboratory values

Laboratory Value	Baseline	Remeasurement
Average Serum Creatinine	1.21	1.13
Average Serum Cholesterol	214	202
Average Triglycerides	199	188
Average Fasting Blood Glucose	163	157
Average Nonfasting Blood Glucose	177	170

The decreases in laboratory values for creatinine, cholesterol, and nonfasting blood glucose are also highly statistically significant ($p < .001$). The decreases for triglycerides and fasting blood glucose are also statistically significant ($p < .01$).

Conclusions: Overall, the quality indicators in the ACQIP project were significantly improved statistically in both physician groups, and the improvements were clinically quite important. Furthermore, preliminary analysis suggests a greater impact in the enhanced physician group. (More complete data of intervention strategies will be provided in a subsequent update.) In summary, ACQIP was a successful collaboration of primary care physicians, PROs, and HCFA in improving the process of care to Medicare beneficiaries with diabetes and clearly demonstrated the benefits of working together.

Abstract Number: 2

Medicare Managed Care Quality Improvement Project (MMCQIP), Project number C95BE

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Objective: The overall purpose of MMCQIP was to improve quality of care and patient outcomes for Medicare beneficiaries with diabetes who were enrolled in managed care plans. Interventions in California focused on improving diabetic foot and eye care.

Design: The number of patients receiving foot exams and dilated eye exams during a 12-month period was measured by medical record abstraction in a sample of patients from each health plan before (7/1/94-6/30/95) and after (1/1/97-12/31/97) interventions to improve diabetes care.

Setting: Approximately 8,000 primary care physicians' offices serving approximately 125,000 Medicare beneficiaries with diabetes in ten California health plans. Nine plans completed the study; one plan was purchased before follow-up data could be collected.

Patients: Medicare patients had to meet the following selection criteria to be included in the sample: diagnosis of diabetes prior to the respective study period, 65 years or older, continuously enrolled in the health plan for two or more years, and not receiving chronic dialysis. Random samples of approximately 300 eligible patients from each health plan were selected for the baseline measurement. For the post-intervention sample, three health plans again took random samples of 300 eligible patients and 6 plans used all or a subset of Medicare patients who met the project selection criteria from their 1997 Health Plan Employer Data and Information Set (HEDIS) diabetic retinal exam measure.

Interventions: CMRI and participating health plans worked together on a coordinated intervention effort so that a single message would be sent to all physicians, regardless of the number of health plans with which they contracted. Toolkits to inform physicians and provide them with tools to improve diabetes care were developed in collaboration with the American Diabetes Association, the California Diabetes Control Program, and the American Academy of Ophthalmology. Toolkit materials included a list of each physician's diabetic Medicare patients by health plan, articles on diabetic foot and eye care, informational patient brochures, educational office posters, stickers to be placed on diabetic patients' charts, and reports which compared frequency of foot and eye exams in participating California plans with frequencies in other states. A fax reorder form was enclosed to provide an efficient and easy way for physicians to order additional copies of materials that were most useful to them. Foot care toolkits were sent to approximately 6,500 primary care physicians in 1996 (one plan did not participate in the foot care intervention). Eye care toolkits were sent to 8,000 primary care physicians in early 1997.

Main outcome measures and results: Nine plans completed the project, eight of which participated in the foot care intervention. Five plans achieved statistically significant ($p < 0.05$) improvements in the proportion of patients receiving one or more documented foot exams (range: 9.4–20.8 percentage points), two plans had negligible changes in foot exams, and one plan had a statistically significant decrease of 7.6 percentage points. Average plan performance was 41.8% at baseline and 50.8% at follow-up for an average plan improvement of 9.0 percentage points. Improvements were also achieved for eye exams. The proportion of patients receiving at least one dilated eye exam increased by 4.5–38.9 percentage points in eight of the plans; increases were statistically significant for five plans. The ninth plan had essentially no change between baseline and follow-up measurements of eye exams. Average plan performance was 44.2% at baseline and 55.0% at follow-up for an average plan improvement of 10.8 percentage points.

Conclusions: MMCQIP in California was a successful collaboration of health plans, CMRI, and the Health Care Financing Administration (HCFA) to improve diabetes care. Improvements in the proportion of patients receiving foot and dilated eye exams were achieved by the majority of the plans. A single, coordinated intervention strategy among the health plans and a willingness to work together was a key to success in California where physicians are often bombarded with conflicting messages from the multiple plans with which they contract. The intervention toolkits were well received as evidenced by positive feedback from physicians and hundreds of orders for additional copies of intervention materials. Limitations of the project include the lack of a control group and use of medical record abstraction to collect information that is often not well-documented in the medical record. CMRI is now investigating reasons why some of the health plans did not achieve improvements. For example, the lack of improvement in eye exams for two plans is probably related to their issuing clinical guidelines recommending that low-risk patients receive dilated eye exams every two years instead of annually.

Abstract Number: 3

HMO Diabetes Mellitus Project, Project number PHQ5501

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Objective: To increase the rates of compliance with the guidelines of care for the American Diabetes Association (ADA) in Colorado by improving physician practice patterns for Medicare patients with diabetes mellitus in outpatient care.

Design: A non-randomized, baseline and remeasurement study.

Setting: In the Colorado project, the population consisted of five health maintenance organizations (HMOs) with Medicare risk contracts. The data were collected by the HMOs' outpatient physicians and from pharmacy records. The HMOs had 1,547 beneficiaries meeting the inclusion criteria for baseline and 4,550 patients who met the criteria for follow-up.

Patients: Each patient included in the project had to be age 65 and over, a Medicare risk beneficiary for the relevant year with no greater than a 45-day lapse in coverage, and using insulin and/or oral hypoglycemic medications. For baseline measurement there were 325 cases and for follow-up measurement 147 cases in the sample size.

Interventions: Colorado Foundation for Medical Care (CFMC) held meetings at the various HMOs to discuss the project and intervention strategies. Colorado designed a toolkit which was used to help physicians and office personnel manage diabetic Medicare patients while preventing diabetic complications. The toolkit contained a letter from CFMC's medical director explaining the toolkit, an Opportunity to Improve Care Brief that describes the problem and project findings, the 1997 ADA Standards of Medical Care for Patients with Diabetes Mellitus, identifying stickers for records, a poster explaining diabetic care key areas, patient brochures, and a reorder form. The Colorado Clinical Guidelines Collaborative worked with CFMC to design and implement a diabetes care flowsheet which was distributed to all Colorado physicians. During remeasurement, face-to-face meetings focused on identifying improvement opportunities were held while presenting data to the HMOs.

Main outcome measures and results:

	Baseline	Follow-up
Foot Examination	28%	38%
Dilated Eye Examination	20%	19%
Total Blood Cholesterol	66%	74%
HbA1c Once per Year	71%	79%
Urinalysis	53%	59%
Microalbumin	4%	24%*
ACE Inhibitors	45%	67%

* Statistically significant

Conclusions: All quality indicators improved except for dilated eye exams which slightly decreased. The greatest improvement occurred for microalbumin, which showed statistical significance. Through an interim evaluation, CFMC judged the effectiveness of their toolkit. Approximately 91% of respondents used the materials they ordered from CFMC. The top three items utilized were the CFMC brochure, the ADA brochure and the 1997 ADA guidelines. Chart stickers were utilized the least by respondents. CFMC believed that the greatest strength of the project was the collaboration formed with the HMOs along with the partnerships the HMOs formed amongst themselves.

Abstract Number: 4

Medicare Managed Care Quality Improvement Project (MMCQIP), Project number FLN00101

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Objective: To improve managed care organizations' (MCOs') processes for delivering ambulatory care to Medicare beneficiaries with diabetes mellitus in Florida by increasing the use of recommended prevention, screening, examination, monitoring, and follow-up strategies to reduce the morbidity and mortality associated with diabetes.

The project focused on the following indicators: increase primary care physician (PCP) visits, increase the number of foot exams, increase the number of dilated eye exams performed, and increase the number of glycosylated hemoglobin (HbA1c) laboratory tests completed for Medicare beneficiaries with diabetes.

Design: A randomized, before and after study.

Setting: Physician offices serving three MCOs throughout the state of Florida with a large concentration in southern Florida. There were approximately 6,000 providers in these offices which included the following specialties: Internal Medicine, Family Medicine, General Practice, Endocrinology, Ophthalmology, Optometry, and Podiatry. The MCOs had approximately 36,000 Medicare beneficiaries with diabetes.

Patients: Patients included in the project had to be Medicare beneficiaries age 65 and older continuously enrolled in a Medicare risk contracting plan for two years and with new onset or long standing diagnosis of diabetes mellitus within six months immediately preceding the 18-month study period. 300 beneficiaries were randomly selected from each participating MCO to establish baseline data and a second random sample of 300 Medicare beneficiaries was selected for remeasurement to evaluate the care provided.

Interventions: Florida implemented three interventions, all collaborative and all plan-wide over an 18-month period. The first focused on increasing the frequency of foot exams. A Health Care Financing Administration (HCFA) and peer review organization (PRO) letter of introduction to the MMCQIP was sent to all PCPs from the three plans. This letter was followed with a letter from the MCOs detailing the specifics of the importance of foot care, initial analysis of baseline data, and guidelines for the performance of an adequate foot exam. The plans sent bilingual (English/Spanish) letters to each diabetic Medicare member explaining the importance of foot care along with a brochure, "Smart Foot Care" developed by the Lower Extremity Amputation Prevention (LEAP) Program.

The second intervention was directed towards provider education and beneficiary empowerment. All the quality indicators were highlighted but emphasis was placed upon increasing the frequency of HbA1c testing, eye exams, foot exams, quantitative urine protein testing and office visits. The tools utilized were: a bilingual brochure, diabetic reminder stickers, and quarterly bilingual reminder postcards distributed to all MCO members with diabetes; and a letter of explanation to providers, a diabetic progress report, and office posters.

The third and final intervention educated physician office staff members on all the quality indicators and how to assist their physicians in delivering an improved level of care for diabetic beneficiaries. Tools of the second intervention were reintroduced and explained to the providers at meetings and/or one-on-one visits utilizing a slide show/story-board presentation. The office staff received a packet including: a certificate of appreciation, the intervention materials, and an informational sheet explaining how to use the materials.

Main outcome measures and results:

	Baseline	Follow-up
Hemoglobin A1c	47.4%	61.5%*
Foot Exams	62.1%	67.9%
Eye Exams	51.9%	59.0%
Average number of visits	8.6	9.5*

* Significant at the .05 level

Conclusions: MMCQIP and Ambulatory Care Quality Improvement Project (ACQIP) have helped lay the foundation for HCFA’s national Diabetes Quality Improvement Project (DQIP), Health Plan Employer Data and Information Set (HEDIS) diabetes measures and the proposed Quality Improvement System for Managed Care (QISMC) diabetes directive. The Florida MMCQIP pilot demonstrated the challenges associated with identifying specific disease populations, maintaining consistency with complex data abstractions and data sets, and creating sound measure comparisons. More importantly, this project demonstrated the opportunity for improvement and the ability of health systems, particularly managed care, to work cooperatively to bring about measurable improvement in diabetic disease management.

The successes of this project are only partially reflected in the statistical improvement noted in the core indicators. In addition, relationships have been strengthened, pathways have been established for future improvement projects, and the PRO is recognized as a true partner in quality improvement. Because of MMCQIP, Florida Medical Quality Assurance, Inc. (FMQAI) has established partnerships beyond those traditionally seen in Medicare Fee-for-Service (FFS) and Medicare MCOs. For example, FMQAI is collaborating with the Florida Department of Health and its Diabetes Control Group which includes representation from all physician providers, MCOs, American Diabetes Association (ADA), Agency Health Care Administration (AHCA, Florida), American Association of Diabetes Educators (AADE), pharmacists, etc. to promote improvement in diabetic care comprehensively throughout the state of Florida.

Abstract Number: 5

Improving Outpatient Diabetic Management Project, Project number ADIAB1

Georgia Medical Care Foundation

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Edward Espinosa, MPH • BJ Larson-Jones

Objective: To improve patient outcomes for those diagnosed with diabetes mellitus in Georgia by helping outpatient providers identify areas for improvement, especially by raising glycosylated hemoglobin rates.

Design: A randomized, before and after study.

Setting: The setting includes physician practices serving fee-for-service patients located in several Georgia counties. The counties selected were core urban counties so that the high number of managed care cases could be excluded from the project. Physicians within these counties who saw ten Medicare Part B diabetic patients in 1996 were selected for physician education interventions. The source of the fee-for-service data is the National Claims History Physician Supplier Medicare Part B data set.

Patients: Patients were included in the project if they were Georgia residents and diagnosed with diabetes (ICD-9-CM codes: 250.0-250.93, 357.2, 362.01-362.02, 366.41), with one or more diabetes related service. Exclusions included those who were in a skilled nursing facility for 60 days or more, or patients who expired before the end of the study's calendar year. For baseline measurement there were 12,968 cases in the sample size and 2,577 cases in the interim remeasurement data.

Interventions: Interventions included using educational opinion leaders, practice feedback, provider education, and patient reminders which all have proven to be more productive than mailouts and diabetic sessions that are more traditional in their approach. The peer review organization (PRO) used educational opinion leaders, such as the Georgia affiliate of the American Diabetes Association (ADA) and the National Kidney Foundation of Georgia, to endorse guidelines and narrate audio cassettes for educational purposes. Aggregate and county-specific feedback and practice-specific feedback were the two methods of practice feedback used during this project. Patient reminders included a Benefact newsletter with patient reminders about appropriate tests when they see their physician. The Georgia PRO mailed out a series of four toolkits to diabetic practitioners. Contents included audio cassettes, data on current practices versus recommendations, an ADA wall chart and standards of care, an algorithm for improving glycemic control and managing diabetic nephropathy, an ADA pocket chart, and patient reminder stickers for the medical record.

Main outcome measures and results: The following data is interim remeasurement from September 1998 through December 1998. No final follow-up data has been collected at this time.

	Baseline	Follow-up
HbA1c	29.4%	40.6%*

*p-value = 0.35

Conclusions: At the 28-month measurement, a 16% improvement was observed in the follow-up data which was slightly less than the anticipated goal of 20%. With the improvement seen at 28 months and with the numerous interventions, the goal of 20% should easily be attained by the end of the project.

Abstract Number: 6

HMO Longitudinal Diabetes, Project number 890007

HealthInsight

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Objective: To improve the rate of screening for preventive measures for diabetes mellitus patients in Nevada by increasing the rates for performance of foot exams, glycohemoglobin, microalbuminuria, lipid panels, and eye exams.

Design: A randomized, before and after study.

Setting: Two Medicare risk health maintenance organizations (HMOs) participated in the project. The project focused on physician offices and beneficiaries in southern Nevada. The two HMOs serve approximately 45,000 of the 184,000 Medicare beneficiaries in the state, with 4,400 patients being diabetic (22.3% of the Medicare diabetic population in Nevada).

Patients: Patients included in the project had to be Medicare-risk patients diagnosed with diabetes mellitus. The baseline measurement consisted of 216 cases, and 291 cases were analyzed for remeasurement.

Interventions: Intervention strategies and opportunities for improvement were determined through meetings with HMO staff. The HMOs planned to utilize ADA-based flowsheets in the records of diabetic patients. HMO A mailed letters to providers to emphasize the importance of using flowsheets and HMO B gave instructions on how to use the flowsheet during their “Diabetes Center of Excellence Training Program.” The monthly program was for all staff physicians, nurse practitioners, physician assistants, contracted physicians, and newly hired personnel.

Main outcome measures and results:

	HMO A	
	Baseline	Follow-up
Foot Exam	40.6%	50.4%
Glycohemoglobin	55.2%	72.2%*
Microalbuminuria	5.6%	12.8%*
Lipid Panel	48.3%	54.9%
Retinal Exam	27.3%	34.6%

	HMO B	
	Baseline	Follow-up
Foot Exam	21.9%	30.1%
Glycohemoglobin	38.4%	58.9%*
Microalbumin	8.2%	16.6%*
Lipid Panel	17.8%	41.1%*
Urinalysis	26.0%	39.5%

* Statistically significant, p<.05

Conclusions: Both HMOs had improvement in all of the above indicators. The HMOs showed statistically significant increases in glycohemoglobin and microalbuminuria, with HMO B also having significant improvement in raising lipid panel rates. Flowsheet utilization was less than expected (approximately 17%); it proved difficult to have providers complete the forms even when they are simple. One limitation to the project is the conclusion that there is a cause and effect correlation between the flowsheets and the quality indicator improvements. Improvements cannot be attributed to the use of flowsheets due to the low utilization rate. Increases in the measures could be explained by the exposure of the flowsheets alone, even if they were not used. Baseline data feedback to the HMOs might have also impacted the follow-up data.

Abstract Number: 7

Diabetes Mellitus-Random, Project number QH4943

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Objective: To improve the quality of physician office care provided to patients with diabetes by increasing the percentage of quality indicator services received. Six process, four education, and five follow-up indicators were established by Health Services Advisory Group (HSAG) and the Arizona Medicare managed care organizations (MCOs). These indicators included rate-based measures on: quarterly blood pressure measurements, ACE inhibitors, foot exams, retinal exams, referrals for abnormal eye exams, glycosylated hemoglobin, lipid profiles, hyperlipidemia treatment, screening for proteinuria microalbumin, and education on diet, medication, exercise and self monitoring of blood glucose.

Design: This was a randomized, pre/post intervention methodology aimed at measuring the impact of a set of interventions to improve physician office care for patients with diabetes enrolled in managed care plans.

Setting: This project targeted approximately 35,000 Medicare beneficiaries with diabetes enrolled in managed care. Data were collected from six Medicare-risk MCOs which provide care/coverage to approximately 200,000 Medicare beneficiaries in the state of Arizona. There are approximately 4,800 primary care physicians (PCPs) contracted with the six collaborating MCOs. Data were collected from the medical records of PCPs contracted with these MCOs.

Patients: Patients were identified using enrollment and pharmacy databases. A random unduplicated sample was selected from each MCO. Case criteria included all Medicare beneficiaries continuously enrolled in an MCO with ICD-9-CM codes 250-250.9. Deceased or disenrolled patients and those without a physician office visit were excluded. There were 380 cases in the baseline sample and 767 in the remeasurement sample.

Interventions: Monthly meetings were held with MCO Medical Directors and liaisons to keep them informed of the project's progress, share quarterly quality indicator results and obtain plan feedback. Additionally, HSAG organized two conferences for primary care physicians, diabetic educators, case managers, and others involved in the management of diabetes from the MCO community.

A standard form, "Clinical Quality Indicator Record for Diabetes" was designed by HSAG. This form provided for simplicity and consistency of documentation requirements for physicians contracting with more than one MCO. Additionally, this form could be submitted in lieu of the entire medical record.

To increase the beneficiary's understanding of the disease process, HSAG created a booklet for consumers on diabetes management. A white paper on the use of ACE inhibitors in primary care was distributed to Arizona's PCPs. Both the white paper and booklet were disseminated to all Arizona hospitals, MCOs and physicians. Additionally, an article was published in the American Journal of Medical Quality entitled "Outpatient Management of Diabetes Mellitus in Five Arizona Medicare Managed Care Plans."

The MCOs each implemented their own interventions which included: recording telephone hold messages specific to diabetes preventive care; contracting with the YMCA to develop an exercise program for diabetics; waiving co-payments for diabetic retinal eye examinations, glucometers and test strips; partnering with a pharmaceutical company and drug store chain in diabetic educational programs; distributing copies of HSAG's diabetes booklet; sending letters to patients defining indicators and their importance; developing member expectation cards with instructions for beneficiaries to ask for services needed; developing practice guidelines for distribution to primary care physicians; hiring certified diabetes educators as case managers; creating and distributing a

pocket-sized diabetes record for patients (to be completed by their PCPs); and placing reminder labels in all diabetic patient records.

Main outcome measures and results: Overall, the provision of quality indicator services increased 61% at remeasurement. Improvements ranged from 29% for process, 74% for follow-up, and 82% for education. The results demonstrate that improving the process of care lowers mean HbA1c and increases the proportion of patients with HbA1c values at or below 8.0. The table below lists the indicators specific to blood pressure, foot care, eye care, glycemic control, and lipids.

	Baseline	Follow-up
Blood Pressure Quarterly	41.3%	44.5%
Foot Exam Twice per Year	16.0%	34.2%
Retinal Exam Annually	52.6%	59.1%
Lipid Profile Annually	37.6%	40.3%
HbA1c Twice per Year	27.9%	43.6%
HbA1c < 8.0	41.6%	55.2%
Mean HbA1c	8.9	8.2

Conclusions: It is feasible to improve outpatient diabetes management in MCOs. All MCOs improved significantly in each indicator area and in the percentage of required services provided. Plans were also providing more services with greater efficiency at remeasurement. Comparative feedback is key to successful quality improvement.

Abstract Number: 8

Diabetes Medical Record Review

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Objective: To evaluate diabetes care activities according to an established set of diabetes care standards in multiple primary care settings using a uniform system of medical record review.

Design: The Indian Health Service (IHS) has developed a standardized process to assess diabetes care using medical record review. The assessment activities use a set of diabetes care standards which parallel the American Diabetes Association Clinical Practice Recommendations. Outcome measures, such as blood pressure and glycemic control, are also monitored. Charts are selected in systematic random fashion from over 176 Indian health clinics. Trained professional staff review records using a uniform set of definitions. EpiInfo, a microcomputer-based epidemiological software program, is used for analysis and reporting.

Setting: Primary care facilities within the Indian health network. This network includes clinics operated by the IHS, an agency of the US Public Health Service, tribally-operated clinics and urban Indian clinics. Over 70,000 American Indians (AI) and Alaska Natives (AN) with diabetes receive diabetes care within this network

Method: Each facility maintains a registry of active patients with diabetes, using uniform definitions. The IHS standards of Diabetes Care developed by the IHS National Diabetes Program in 1986 are updated periodically to reflect clinically significant scientific advances. The medical record review has also been developed over the years to measure the implementation of these standards. Standard clinical interventions, performance measures and intermediate outcomes are measured yearly in a randomized sample of medical records.

Interventions: Professional staff complete the medical record review following a standardized process. The abstracted data is entered into the EpiInfo software program. A summary report can be generated immediately and made available for facility staff use in quality improvement activities and program planning. Regional and national rates are constructed for each item after data are aggregated from each participating site.

Patients: Indian health facility staff are encouraged to maintain a diabetes registry. An active patient is defined as a person with diabetes who lives in the geographic region, is enrolled at the clinic, and is seen on a regular or infrequent basis for diabetes care. Each year a systematic random sample is drawn from each facility registry, using a sample size sufficient to yield estimates within approximately 10% of the true rate of adherence for that facility with confidence of 90% or greater.

Main outcome measures and results: A recent analysis of medical record reviews for 1995, 1996, and 1997 shows improvement in metabolic control as measured by HbA1c or calculated from the mean of the last three recorded blood glucose values. Table 1 categorizes the metabolic control patterns over the three-year period. There has been a significant improvement in metabolic control comparing HbA1c levels alone or combining the measured HbA1c levels with data calculated from mean blood glucose values.

Table 1: Categories of Glycemic Control by HbA1c in IHS Clients with Diabetes by Year (1995–1997)

	1995 %		1996 %		1997 %	
	Measured N=5,265	Calculated N=3,405	Measured N=6,527	Calculated N=2,723	Measured N=7,669	Calculated N=1,397
<7.0%	18.8	28.2	19.9	27.9	23.6	31.8
7.0–7.9%	15.3	15.5	16.1	16.4	18.1	13.7
8.0–8.9%	15.3	15.7	16.9	14.9	15.7	14.1
9.0–9.9%	14.7	14.6	14.8	13.6	14.1	12.3
>10.0%	35.9	26.1	32.4	27.2	28.6	28.1

Other intermediate outcome measures such as blood pressure are tracked annually. Regular blood pressure monitoring is an accepted practice standard within the IHS network and allows for the annual collection of the last three recorded blood pressures. Mean systolic and mean diastolic pressures are calculated separately. The proportion of clients with blood pressure under 140/90 mmHg in the IHS medical record review was 60% in 1995, 61% in 1996, and 63% in 1997. Annual surveillance of blood pressure trends can help primary care providers track blood pressure control efforts.

Nephropathy assessments are also measured annually using the frequency of macro and microalbuminuria testing and serum creatinine measures. Table 2 details the medical record review results for the three-year period, showing a positive trend in nephropathy assessments for a small proportion of patients with elevated serum creatinine.

Table 2: Assessment of Macro and Microalbuminuria and Serum Creatinine in IHS Clients with Diabetes (1995–1997)

Assessment Method	1995 n=9,557	1996 n=9,985	1997 n=9,626
Urinalysis Done	82%	82%	85%
+ Proteinuria	31%	28%	25%
– Proteinuria, Microalbuminuria Tested	9%	11%	14%
Serum Creatinine Done	85%	86%	91%
Serum Creatinine >2.0 mg/dl	4%	3%	3%

Conclusions: The IHS experience shows that standard ongoing monitoring of essential variables allows facilities to improve care. Medical record review using uniform definitions, data entry, and reporting can be implemented in multiple primary care settings. Uniformity of data definition and collection facilitate the aggregation of the data and comparison over time and among facilities. The IHS National Diabetes program is continuing enhancements to the data collection system with a five-site pilot of a fully automated system.

Abstract Number: 9

***The East Harlem Diabetes Initiative: A Health Care Quality Improvement Program
Project to Improve Ambulatory Diabetes Care to a Medically Underserved Community,
Project number DIAB***

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Alan Silver • Susan Hollander • Kathy Terry • Maryanne Daley

Objective: 1) To promote ongoing diabetes-care collaborative activities, 2) to develop a common set of quality indicators, 3) to improve glycohemoglobin, lipid profile, retinal exam, and other diabetes care measures among the major medical providers in East Harlem, New York City.

Design: “Before and after study:” an assessment of nine quality indicators and collaborator organizational structure prior to initiation of quality improvement project and after initial interventions.

Setting: East Harlem, New York City, a community of approximately 110,000 people is located in northeastern Manhattan. East Harlem is predominantly African-American and Hispanic and has many elderly citizens. East Harlem compares unfavorably with the rest of New York City in most socioeconomic and health status indicators. IPRO worked with the five major East Harlem health care delivery sites and a community provider/consumer organization: Boriken Neighborhood Health Center, Metropolitan Hospital Center (Health & Hospitals Corporation), Mount Sinai Hospital, North General Hospital, Settlement Health & Medical Services Inc., and the East Harlem Community Health Committee (EHCHC). The five clinical sites (three hospital ambulatory clinics and two federally-supported community health centers) have a combined ambulatory visit volume of approximately 1.1 million visits per year. The EHCHC is a 501(c)(3) organization whose mission is to improve the health status of East Harlem residents. In existence since 1976, it provides a forum for consumers and providers to collaborate, plan, implement and evaluate community-based health care interventions. Prior to the East Harlem Diabetes Initiative (EHDI), there had been no explicit setting to review primary care diabetes practice approaches.

Patients: IPRO identified eligible patients from site-specific administrative claims data. Patients must have had at least two ambulatory visits with an ICD-9-CM 250.xx encounter code during the baseline and impact years. IPRO requested approximately 120-240 records from each site. The baseline sample was from calendar year 1996 and the impact sample was from calendar year 1998. For the 1996 year, IPRO abstracted and fully analyzed 690 records. Seventy percent of the patients were female and 47% of the patients were at least 65 years old. Ninety-seven percent of the patients had ethnicity documented. Ninety-four percent of the total sample were either African-American or Hispanic. The distribution of patient insurance status for the 1996 patients was 40% Medicaid, 23% Medicare, 20% Medicare/Medicaid and 17% other/unknown. Distribution of the 1998 impact sample, n=669, was similar for gender and ethnicity (70% female, 95% either Hispanic or African-American) and differed for age ≥ 65 years (29%) and insurance status (55% Medicaid, 9% Medicare, 22% Medicaid/Medicare & 14% other/unknown). The differences were due, in part, to a request by the EHDI participants to not over-sample Medicare patients, as had been done for the baseline year sample.

Interventions: The EHDI participants started to meet regularly. Initial efforts focused on obtaining consensus on quality indicators, discussing barriers among perceived competing medical care sites and developing shared strategies for uniform delivery of care in a small geographic area. Baseline data spurred the collaborators to develop subcommittees for patient health literacy and education, provider education, and system process changes. The committee work led to IPRO being involved in a set of provider grand rounds and providing technical assistance in quality indicator tracking (through the use of site-specific specialized diabetes care summaries on the various ambulatory records). The EHDI participants identified the need to 1) implement local methods for patient identification of heretofore undiagnosed diabetics, 2) develop a survey to ascertain patient knowledge and skills regarding diabetes self-management, and 3) promote shared certified diabetes educator services in

diabetes patient education. The EHDI, under the sponsorship of the local medical school, replied to a special request-for-proposal from the New York State Department of Health (NYSDOH) to become a regional center of excellence in diabetes care.

Main outcome measures and results: There were nine quality indicators on process. Additionally, the project was also evaluated upon the continuation of an EHDI collaboration beyond the initial Health Care Financing Administration/IPRO involvement. IPRO nurse chart abstractors were trained on EHDI sample charts and then performed a beta-test chart review on another sample subset prior to full abstraction. The kappa statistic for major analytic variables was ≥ 0.60 for both the baseline and impact year abstractions. The nine indicators were the proportion of patients with at least one a) foot exam, b) dilated eye exam, c) glycohemoglobin exam, d) urine protein exam, e) serum cholesterol exam, f) triglyceride exam, g) serum creatinine measurement, h) influenza shot, i) diet counseling documentation during the baseline and impact 1-year periods. Unweighted total eligible sample baseline and impact measurements for the nine indicators respectively were: a) 57% vs. 62%, b) 48% vs. 52%, c) 75% vs. 83% d) 64% vs. 46%, e) 80% vs. 82%, f) 74% vs. 74%, g) 87% vs. 86%, h) 34% vs. 40%, i) 68% vs. 53%. There were no major differences in the process indicators for Medicare-only vs. other insurance status patients during the baseline and impact periods. Increases in foot exams, glycosylated hemoglobin and flu vaccination as well as decreases in urinary protein and dietary counseling indicators were significant at the $p < 0.05$ level. The glycosylated hemoglobin, urinary protein, and diet counseling measures remained significant after a Bonferoni adjustment for multiple comparisons. The EHDI collaboration was awarded a 5-year grant from the NYSDOH to continue its work and expand activities in the areas of health literacy, patient education, and community-based screening.

Conclusions: The quality indicators for a medically-undeserved community (such as retinal exams and glycohemoglobin evaluations) compared favorably with available managed care and NYSDOH benchmarks. The collaboration between the New York State peer review/quality improvement organization and the major health care providers was associated with improvements in diabetes process-of-care, particularly for the arguably single most important clinical indicator, glycohemoglobin evaluation. Preliminary qualitative feedback from EHDI participants and IPRO abstractors suggests that declines in urinary protein measurement and diet counseling may have been related to changes in outside laboratory reporting practices and poor chart documentation rather than significant decreases in the processes themselves. Focused quality improvement projects can lead to changes in process of care and can be a catalyst for longer-lasting commitments to multi-institutional involvement in community-based health care initiatives.

Abstract Number: 10

Wisconsin Outpatient Diabetes, Project number 102RET

MetaStar, Inc.

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Objective: To improve diabetic care provided to Medicare beneficiaries in Wisconsin. Seven quality indicators were defined, measured, and evaluated.

Design: A before and after study using a randomized sampling scheme.

Setting: The outpatient clinics from one large multi-specialty group in south central Wisconsin. Over 1,700 diabetics receive their primary care from this medical group at 17 clinics.

Patients: To be included in the project, patients had to be a resident of Wisconsin, 65 years or older, diagnosed with diabetes mellitus before the study period (ICD-9-CM codes: 250-250.93 or 251.8) and had to be an established patient at the group clinic. There were 700 Medicare diabetics that met the inclusion criteria for this project. Sample sizes of 135 for baseline and of 119 for follow-up were both randomly selected from those meeting the eligibility criteria. All data were chart abstracted.

Interventions: MetaStar met regularly with the clinic's Diabetic Work Group (physicians, health educators, utilization review (UR) personnel and nurses). The group worked closely with MetaStar representatives to develop and implement such actions as patient flowsheets, foot posters in all primary care providers' exam rooms, educating practitioners and patients on improved diabetes management, and direct-mailed patient reminders. The group also planned to collect physician-specific data after implementation, and to compare with Health Plan Employer Data and Information Set (HEDIS) measurements.

Main outcome measures and results: All seven quality indicators showed improvement at follow-up measurement, with statistically significant improvement ($p < 0.05$) in four indicators (see following table).

Quality Health Indicator	Baseline	Follow-up	Significance*
Percent of patients with documentation of an annual dilated eye exam	30% (41/135)	32% (38/119)	NS
Percent of study patients not receiving an annual eye exam with documentation that one was recommended to them	11% (8/72)	38% (20/53)	$p = .001$
Percent of study patients with documentation of an annual eye exam (with or without evidence of dilation)	47% (63/135)	56% (66/119)	NS
Percent of study patients with documentation of at least one foot exam	53% (71/135)	93% (111/119)	$p = .001$
Percent of study patients with documentation of at least one hemoglobin A1C test result	78% (105/135)	92% (110/119)	$p = .001$
Percent of study patients with documentation of at least two hemoglobin A1C test results annually	57% (77/135)	61% (73/119)	NS
Average patient hemoglobin A1C test result (average of patient averages)	8.23 (n=105)	7.42 (n=110)	$p < .0001$

* All comparisons were between baseline and follow-up. A chi-square test was used for all except the last indicator.

A t-test was used for the "average patient hemoglobin A1C test result" measure.

Conclusions: All measurements increased at follow-up, with foot exams, hemoglobin A1c and average hemoglobin A1c results showing statistically significant increases. Findings are limited by the fact that the project's clinical coordinator (who chairs both the Wisconsin Diabetes Control Program's Advisory Group and the American Academy of Ophthalmology's Diabetes 2000 program for Wisconsin) himself was a former clinic staff member and had served on its Diabetes Work Group. MetaStar did its own chart abstraction for this project; where abstraction services are not offered, recruitment may be more difficult.

MetaStar has replicated this project with additional clinics covering about 30% of the diabetic population in Wisconsin. While final data are incomplete, early results show substantial improvement on a number of indicators.

Abstract Number: 11

Non-Insulin Dependent Diabetes Mellitus, Outpatient, Project number QPRO16

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Objective: To increase the rates of compliance with diabetic quality indicators that help improve care outcomes for Medicare beneficiaries in Michigan with non-insulin dependent diabetes mellitus.

Design: Before and after study.

Setting: The project included a large ambulatory group practice in western Michigan. There are 17 physicians in the practice, numerous physician assistants and 13 members on the research staff.

Patients: Patients selected from the clinic by the research staff were Medicare beneficiaries, over 65 years old and had been seen by a physician in the practice over the last six months. Patients with end stage renal disease were excluded from the project; those with pre-existing ocular or renal complications or peripheral vascular disease were included and identified in the analysis sub-group. Baseline data included 114 cases and remeasurement data included 109 cases.

Interventions: The Michigan Peer Review Organization (MPRO) visited the group practice before baseline data were collected. After the baseline data were analyzed, another visit was held so the practice could discuss the findings and prepare their improvement plan. The group practice chose to utilize a flowsheet for their intervention. The flowsheet facilitated the assessment of patients with diabetes, driving a systematic process to ensure compliance with recommended tests and examinations. The flowsheet, based on the quality indicators, was supposed to be included in all records of diabetic Medicare beneficiaries. Instead the group practice inserted the flowsheets only in the patient records that were in the baseline data group. This allowed MPRO to compare the effectiveness of the flowsheet during analysis.

Main outcome measures and results:

	Baseline	Follow-up
HbA1c	11.4%	19.3%*
Annual Urine Protein Dipstick	40.4%	14.7%
Microalbumin Test if Negative Dipstick	0%	25%
Annual Retinoscopy	26.3%	31.2%
Referral to Ophthalmologist if Abnormal Retinoscopy	27.2%	63.6%*
Foot Exam Every Six Months	10.5%	11.1%
Home Glucose Monitoring	38.6%	45.9%

*p<.05

The follow-up data were further broken down to analyze the differences between patient records that had flowsheets and those that did not.

	No flowsheet	Flowsheet
Total Patients	73	36
HbA1c Every Six Months	15.1%	27.8%*
Annual Urine Protein Dipstick	0%	44.4%
Test for Microalbumin if Negative Dipstick	0%	25.0%
Annual Retinoscopy	16.4%	61.1%*
Refer to Ophthalmologist if Abnormal	33.3%	100%*
Foot Exam Every Six Months	1.4%	30.6%
Home Glucose Monitoring	34.3%	69.4%*

*p<.05

Conclusions: The following quality indicators increased at remeasurement: hemoglobin A1c, microalbumin test for a negative dipstick, retinoscopy, ophthalmologist referral, and home blood glucose monitoring. The increases for hemoglobin A1c and ophthalmologist referrals were statistically significant increases from baseline to remeasurement. Foot exams every six months basically remained flat with a change from 10.5% to 11.1%. Annual urine protein dipstick dramatically decreased from 40.4% to 14.7%. The flowsheet served as a reminder and a tool for documentation, and appeared to help increase the chance of the quality indicators improving. It is difficult to determine if certain quality indicators increased due to the flowsheets, or if just the rates of documentation increased. The data do show that the quality indicator rates can increase by implementing flowsheets. The project provided information regarding carrying out process projects in the outpatient setting; for example, the staff may not be familiar with quality improvement concepts or methods, or the information terminology may not fully support project data requirements. Project findings show that future projects can be successful by working with collaborators to develop and implement tools to improve the quality indicators.

Abstract Number: 12

The Chronic Disease Monitoring System: An Electronic, Office-Based System to Assist Physicians in Assessing and Improving Care, Project number MT0013

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Fran VanNatta

Objective: The objective of this ongoing project is to assist physicians in assessing care provided to patients with diabetes (and other chronic diseases) and, where opportunities to improve care are identified, to improve care.

Design: Because the number of participating physicians' offices is growing, several study designs are in use simultaneously. All participating offices are using a series of "before and after" comparisons to assess efforts to improve care. In addition, results at clinics targeting a specific quality improvement (QI) indicator are compared to results at clinics not targeting that specific indicator (i.e., a case-comparison design). Results at recently enrolled clinics are compared to results at longer-participating clinics using a staggered-start, time-series design.

Setting: Outpatient care in physicians' offices is the focus of this project. Participating clinics include primary care practices, federally qualified community health centers, and an urban American Indian clinic. Most participating offices have one to four physicians and offer fee-for-service (FFS) care; some larger offices, including a large managed care plan, are also participating. At the time this project description was prepared, there were 28 participating offices in Guam/Saipan, Hawaii, Montana, and Wyoming; more than fifty physicians were involved.

Patients: Approximately 4,500 patients with diabetes were receiving care at the participating offices; more than 90% of these patients had type 2 diabetes and approximately 40% were aged 65 years or older. Care for all of these patients is under continuous surveillance.

Interventions: A variety of interventions have been conducted. These interventions can be classified in two categories: passive and active. **PASSIVE:** As soon as the electronic monitoring system is established in a physician's office, a one-page summary of diabetes care is placed on each patient's medical record. This form is regularly updated by physician and designated office staff who maintain the electronic system. Thus, services that are due at the time a patient visits the clinic (e.g., laboratory tests or adult immunizations) are easily identified by the health care team. This category of intervention is passive in the sense that the health care team waits for a patient to visit the clinic before intervention activities begin. **ACTIVE:** The electronic system also allows physicians easily to identify patients who are overdue for important diabetes care services before patients initiate a clinic visit. For example, a list of patients with no record of a pneumococcal immunization, or a list of patients with evidence for proteinuria but not receiving an ACE inhibitor, can be produced at any time. Several offices have used such lists as the first step in generating personal doctor-to-patient letters to urge patients to schedule a clinic visit to receive important services. This is an active outreach category of intervention.

Both the passive and active interventions described above are supported by a growing number of materials that are being developed in collaboration with participating offices. For example, a foot assessment stamp developed at the request of one participating clinic is now being used at several sites to facilitate thorough documentation of foot examinations. And for another example, personalized patient education brochures initially developed for use at one office are now in use at several offices to emphasize to patients the importance of blood sugar, blood lipid and blood pressure control.

Main outcome measures and results: The electronic monitoring system tracks the most recent date-of-service and result of test/examination for blood pressure, HbA1c, foot exams, adult immunizations, dilated retinal exams, urine protein/microalbuminuria testing, and lipid levels. In addition, whether or not a patient is receiving an ACE inhibitor or lipid lowering agent is also tracked. All of the above measures of care are being used in this project. Because of the wide variety of intervention activities and the growing number of successful efforts at participating offices, the project team began

distributing a quarterly newsletter (the “Chronic Disease Monitoring System Quality Improvement Report”). The last page of this newsletter is reserved for reports of “Successful Quality Improvement” from participating offices. With each issue of the newsletter sent to participating clinics, a clinic-specific QI report is included. This clinic-specific insert helps each clinic see its own clinical performance measures in perspective of the minimum/maximum/median performance levels in all participating clinics. Examples of results from participating clinics include: a) at least seven offices have increased the pneumococcal immunization rate by ten to > 30 percentage points over baseline measurement within two months of active, doctor-to-patient letter outreach; b) one clinic more than doubled the proportion of patients receiving at least annual foot exams (from 27% in 1997 to 65% in 1998); and c) two clinics whose baseline median HbA1c levels of their patient populations were > 8% reduced those median levels 0.8 and 1.2 percentage points 10 to 12 months after initiating use of the electronic monitoring system. Other clinics are documenting increases in the frequency of dilated retinal exams, foot exams, and lipid level testing.

Conclusions: More than two dozen physicians’ offices are regularly monitoring diabetes care, documenting improvements in care, and demonstrating the importance of managing care regardless of whether the care is provided in a managed care or FFS setting.

IMPORTANT NOTE: This project is the result of an ongoing collaboration between the MPQHF, the Montana Department of Public Health and Human Services, and the physicians, nurses and other health care providers at participating sites.

Abstract Number: 13

Improving Preventive Eye Care for Medicare Diabetics, Project number PM0005

Northeast Health Care Quality Foundation
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Objective: To increase the number of annual dilated eye exams being performed on diabetic Medicare beneficiaries in Maine in order to decrease vision loss and retinal complications associated with diabetic retinopathy.

Design: A randomized, before and after study.

Setting: Data were collected from Medicare Part A and B claims. This beneficiary-based project focused on care provided in physician offices.

Patients: Medicare beneficiaries were selected from Part A and Part B claims data. From Part A data, patients must have had one hospitalization with the principal or secondary diagnosis of diabetes (ICD-9-CM code 250.xx) during the designated time frame. In Part B data, patients were selected if they had two separate claims with a diabetes or diabetic ancillary diagnosis (ICD-9-CM codes 250.xx, 357.2, 366.41, or 362.0x) or a glycosylated hemoglobin procedure code (HCPCS code 83036) during the time period. Approximately 2,048 patients were included in the sample size for baseline and remeasurement data.

Interventions: To reach maximum effectiveness, the peer review organization (PRO) decided to conduct both beneficiary- and provider focused-interventions. Medicare beneficiaries with diabetes were mailed a letter detailing the benefits of an annual eye examination and the Medicare benefits that cover the exam. Patients were urged to contact their primary care physician to discuss when they should have the exam and who should perform it. Beneficiaries were also mailed a fact sheet on diabetic retinopathy including coverage information. Physicians were mailed the PRO's newsletter which details the project and reminds physicians to refer their patients for their annual eye exam. A letter with statewide baseline data, an abstract of the American Diabetes Association's position statement and a diabetes care flowsheet were also mailed to all primary care physicians in Maine.

Main outcome measures and results:

	Baseline	Follow-up
Annual Fundoscopic Eye Exams	52.8%	57.7%*

* Statistically significant

Conclusions: The rate of annual fundoscopic eye exams increased by approximately 5% at remeasurement. The direct mailing intervention seems to have helped increase the rates of annual eye exams in Medicare beneficiaries. Increasing the rate of annual eye exams will help decrease the rate of vision loss and diabetic retinopathy complications in diabetic Medicare patients in Maine.

Abstract Number: 14

Outpatient Management of Diabetes Mellitus, Project number 7530

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Donna Piatt, RN, Project Coordinator

Objective: To increase the rates of compliance with the American Diabetes Association (ADA) guidelines in outpatient care for diabetic Medicare beneficiaries in Oklahoma by monitoring blood pressure, dilated eye exams, nephropathy screening, lipid profiles and glycemic control.

Design: A randomized, before and after study.

Setting: Three multi-practice clinics and one multi-site health group in Oklahoma participated in the project.

Patients: The project included both fee-for-service and health maintenance organization (HMO) patients. Patients had to be Medicare beneficiaries diagnosed with diabetes mellitus and must have received outpatient care at one of the participating clinics for at least one year. Patients were excluded from the project if they were under the age of 65, had end stage renal disease, or had received care for less than one year at one of the participating clinics. For baseline measurement 654 cases were included with 695 cases in the remeasurement data.

Interventions: A study group was formed to present the project to interested clinics. Clinics were given copies of the ADA's 1997 Clinical Practice Recommendations and pocket sized clinical practice recommendations. A packet was sent to each participant that included educational information about the project, and charts and tables comparing the clinic to the other participants. Clinics were asked to implement improvement plans. Feedback was provided through formal presentations to each of the four collaborators.

Main outcome measures and results:

	Baseline	Follow-up
Blood Pressure	85%	88%
ACE Inhibitor Treatment if Hypertensive	55%	64%
Treatment for Abnormal Lipids	73%	79%
Referral for Dilated Eye Exam	47%	58%
HbA1c	91%	94%
Treatment for Proteinuria with an ACE Inhibitor	58%	70%
Documentation of Home Glucose Monitoring	73%	71%
Blood Pressure Elevated	80%	86%
Lipid Profile	86%	84%
Median of Highest HbA1c	7.7	7.5

Conclusions: The majority of the quality indicators increased. Blood pressure monitoring, ACE inhibitor treatment for hypertensive diabetics, treatment for abnormal lipids, referrals for eye exams, hemoglobin A1c, proteinuria treatment with ACE inhibitors and median hemoglobin A1c all had positive outcomes at remeasurement. Home glucose monitoring documentation, patients with elevated blood pressure and lipid profiles did not improve at follow-up. Overall, the combined results indicate an improvement in care delivered to patients suffering from diabetes mellitus which in turn will reduce associated diabetic complications and mortality.

Abstract Number: 15

Diabetes, Project number 9640

Oregon Medical Professional Review Organization (OMPRO)
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 Ruth Michels, RN

Objective: To increase utilization of preventive services by patients with diabetes mellitus and, in return, decrease adverse outcomes associated with diabetes for Medicare risk health maintenance organization (HMO) patients in Oregon.

Design: A randomized, before and after study.

Setting: Four of Oregon’s five risk HMOs participated in the project. Providers were located in both rural and urban settings and served 17,033 of the state’s 73,528 Medicare beneficiaries diagnosed with diabetes mellitus. Clinics serving fee-for-service patients also participated in the project.

Patients: To be included in the HMO population, patients had to be from 67 to 70 years of age, continuously enrolled in one Medicare risk HMO for at least two years with one visit for diabetes mellitus. For the fee-for-service population, patients had to be a Medicare beneficiary with a diagnosis of diabetes mellitus. For the HMO population, there were 765 cases in the baseline data and 814 cases for follow-up. In the fee-for-service population for ages 67 to 70, there were 6,702 cases in the baseline data and 6,448 in the follow-up sample.

Interventions: Baseline data were presented to the five HMOs. The peer review organization (PRO) mailed out information comparing baseline results and a copy of the Population-Based Guidelines for Diabetes Mellitus to 4,300 primary care physicians, 500 health care professionals and 900 nurse practitioners in the state. The PRO then asked each HMO to submit improvement plans. The PRO worked with a study group to design a flowsheet that would remind providers to conduct preventive services that could also be used to collect information on the quality indicators. Physicians were given copies of guidelines and reports on utilization rates for the quality indicators. Members were provided with a copy of the latest Diabetes Care Card and brochures on self-care tips and diabetic eye disease.

Main outcome measures and results:

HMO Population

	Baseline	Follow-up
Blood Pressure	89.0%	89.0%
Visual Foot Inspection	24.0%	33.0%*
Complete Foot Exam	2.0%	31.0%*
Dilated Retinal Exam	30.0%	47.0%*
Microalbumin Screening	15.0%	39.0%*
HbA1c	71.0%	83.0%*
Cholesterol	71.0%	74.0%

* Significant increase

Fee-for-Service Population, Age Range 67–70

	Baseline	Follow-up
Dilated retinal exam	48.3%	52.7%*
Urinalysis	51.7%	2.4%
Microalbumin	47.8%	9.2%*
HbA1c	52.5%	65.6%*
LDL	40.8%	32.1%

* Significant increase

Conclusions: For the HMO population, all quality indicators showed improvement, except blood pressure which remained flat. Significant increases were seen in visual foot inspections, complete foot exams, dilated retinal exams, microalbumin screening and glycosylated hemoglobin rates. In the fee-for-service population, dilated retinal exams, microalbumin screening, and glycosylated hemoglobin significantly increased. LDL screening did not show improvement in the fee-for-service population. This type of broad-based project, which addresses diabetes management through multiple avenues, can be quite successful in improving the quality of care provided to patients suffering from diabetes mellitus in both the managed care and fee-for-service setting.

Abstract Number: 16

Ambulatory Care of Elderly Patients with Diabetes (Ohio Diabetes Project) Provider E, Project number 045

Peer Review Systems, Inc.
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Objective: To enhance the process of care for ambulatory patients in Ohio by measuring the quality of preventive health care delivered to Medicare patients with diabetes mellitus by identifying opportunities for improvement.

Design: A before and after study in which a random sample of data were taken from patient records at baseline and follow-up.

Setting: A large multispecialty physician group that serves both managed care and fee-for-service patients collaborated with Peer Review Systems (PRS) for this project. The physician group consists of approximately thirty primary care physicians.

Patients: To be included in the project patients had to receive care at the physician group from October 1, 1995 through September 30, 1996 and had to be Medicare beneficiaries diagnosed with diabetes mellitus (ICD-9-CM codes 250.00-250.93). Patients were excluded if they did not have a confirmed diagnosis of diabetes, were not living at the end of the study, or resided in a nursing home. For baseline data, there were 133 diabetics who met inclusion criteria, and 95 met the criteria for remeasurement.

Interventions: The physician group was asked to design and implement an improvement plan after reviewing the initial data that were collected. PRS conducted a slide presentation and distributed documents to share the project outcomes to the practice. The peer review organization (PRO) suggested interventions to the physician group which included Diabetes Checkmate and Diabetes Checkpoints. Diabetes Checkmate is a small reminder-card made for patients. This pocket-sized educational tool can be used as a log to track exams and lab tests, and like a Bingo card, patients that fill out all of the card are eligible to win prizes, such as tee-shirts or coupons. Diabetes Checkpoints is a flowsheet made for providers and office staff to remind them to perform exams and lab tests. The flowsheet will track patient data and simplify record keeping. The physician group decided to use Diabetes Checkpoints to design their own flowsheet that also incorporated other conditions, such as heart disease and asthma. After using the flowsheet, providers decided that the flowsheet was redundant to other information they were documenting so they replaced it with a sticker. The sticker serves to remind physicians of the quality indicators that need to be performed and also reminds office staff that the patient is a diabetic.

Main outcome measures and results:

	Baseline	Follow-up
Blood Pressure per Visit	99.7%	99.1%
Foot Exam per Visit	9.5%	22.2%
Ophthalmology/Optometry Referral	37.6%	39.0%
Hemoglobin A1c	61.0%	86.3%
Cholesterol	68.4%	66.3%
Urinalysis	42.9%	37.9%
Mean of All HbA1c	7.49	6.8
Patients with HbA1c<8%	68.4%	77.0%
Patients with HbA1c 8+%	31.6%	23.0%

Conclusions: PRS had success in improving rates for foot exam, and performance and mean level of, hemoglobin A1c. Rates of blood pressure, cholesterol, urinalysis, and referral for dilated eye exams did not change significantly. PRS believes that flowsheet placement affected utilization rates. The flowsheets might have been more successful at improving quality indicator rates if they were placed on the front of the record where they are more accessible and evident rather than inside the record.

Abstract Number: 17

Diabetes Care Project, Project number 066732

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 Sandy Jackson

Objective: To improve the processes of care in the ambulatory setting for Nebraska Medicare beneficiaries with diabetes mellitus by using intervention tools to facilitate improvement efforts and encourage compliance with American Diabetes Association guidelines.

Design: A pre- and post-intervention quality improvement project.

Setting: The project is designed for primary care physicians and health care professionals in the ambulatory care setting, and currently includes approximately 450 physicians from 38 clinics and two health maintenance organizations (HMOs). These physicians serve over 6,000 Nebraska Medicare beneficiaries with diabetes.

Patients: Patients involved in the project are Nebraska Medicare beneficiaries with diabetes and are identified by a) claims analysis or b) the participating HMOs. Patients identified through claims are defined as follows: 1) were Part B eligible from January 1, 1997 to March 31, 1998, 2) were not enrolled in a Medicare HMO from January 1, 1997 to March 31, 1998, 3) were alive as of March 31, 1998, and 4) had a diagnosis of diabetes on one Part A claim or a diagnosis for face-to-face services on two Part B claims during January 1, 1997 to March 31, 1998. These criteria generated a statewide population of 20,301 beneficiaries with diabetes. (Note: Due to claims limitations, patients involved in the HMO portion of the project are not currently included in the project data set. These organizations are participating through interventions and self-reported data and have approximately 1,500 Medicare members with diabetes.) The sample size consisted of 792 cases for baseline and remeasurement data.

Interventions: Based on experience with the Ambulatory Care Quality Improvement Project, TSCN developed a Diabetes Care Project-in-a-Box. Project-in-a-Box components include: the Diabetes Care flowsheet, colored stickers to identify records with flowsheets, current American Diabetes Association guidelines, diabetes foot care posters for exam rooms, and patient education handouts.

A strong influence on the success of this project was the role TSCN's principal clinical coordinator (PCC) played as a project champion by: implementing the flowsheets in his own practice; offering input into revisions of the flowsheet based on personal experience; performing baseline and remeasurement data collection and analysis; presenting the Diabetes Care Project-in-a-Box to physicians associated with his large primary care clinic; and mailing a colored graph and testimonial letter highlighting his success through use of the flowsheets to all primary care physicians in Nebraska. These steps were taken in an attempt to promote more widespread participation in the use of the flowsheets as a reminder mechanism (and data collection tool). He also offered lessons learned and successes from his personal experience. Despite the personalized approach to academic detailing, the PCC was not successful at implementing this project until he located a management-level nurse to assist him in championing the project. With her active participation, office processes were established and implementation began. Processes addressed by their collaboration included: identifying patients with diabetes; placing flowsheets in the charts; filling out the flowsheets when patients were seen; and copying and submitting the flowsheets to the peer review organization (PRO) for ongoing data feedback. Interventions used by this clinic in addition to the flowsheets included foot exam posters and medical record stickers.

Additional interventions implemented by other participants include: patient education initiatives such as use of exam room posters, reminder mailings, tracking cards and telephone follow-up; establishment of committees to monitor data on quality indicator performance; and physician education initiatives. Another focus area was educating physicians and patients about appropriate diabetes care. Staff from the peer review organization continue to provide on-going assistance with intervention implementation and data feedback.

Main outcome measures and results: A remeasurement from Medicare Part B claims was performed for 792 beneficiaries and 50 physicians (the same beneficiaries and physicians were included in baseline and remeasurement) from two long-term participating clinics.

	Baseline (1/1/96–12/31/96)	Follow-up (4/1/97–3/31/98)
HbA1c	58.2%	68.3%*

* Statistically significant improvement ($p < .001$)

Conclusions: The use of diabetes flowsheets may be an effective intervention to improve compliance with diabetes guidelines, as demonstrated by the statistically significant improvement in hemoglobin A1c rates. Experience with the Nebraska Diabetes Care Project indicates that successful implementation of the Diabetes Care flowsheets, and other interventions, may depend on recruitment of a project champion with the ability to communicate with both office staff and physicians.

Abstract Number: 18

Outpatient Diabetes Mellitus Project, Project number QI4994

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Cassie Watson, RN, BSN, Project Coordinator

Objective: To decrease the morbidity rate linked to diabetes mellitus in Delaware due to low compliance rates with the following quality indicators: glycosylated hemoglobin, foot exams, total cholesterol measurement, and urinalysis for protein/albumin measurement.

Design: Before and after study.

Setting: Eight Delaware primary care (internal medicine or family practice) practices caring for an estimated 2,021 Medicare beneficiaries with diabetes.

Patients: To be eligible for the project, patients had to be Medicare beneficiaries, 65 years or older, diagnosed with diabetes mellitus, and seen at least once by the physician or practitioner during the study interval. Between 25 and 41 records were selected from each practice, depending on the number of Medicare beneficiaries with diabetes. For baseline measurement the sample consisted of 258 Medicare beneficiaries seen between January 1, 1995 and June 30, 1996. The remeasurement sample included 267 patients seen between October, 1996 and March, 1998.

Interventions: The principal clinical coordinator (PCC) of the peer review organization (PRO) offered to visit the practices to present project findings. The PCC also made phone calls to the clinics' administrators to discuss the project and to ask if a physician toolkit would be beneficial. If the toolkit would be of assistance then it was sent to the interested clinic. Office staff's interventions included improvement plans which consisted of office staff education, a tracking sheet for monitoring quality indicators, signs urging patients with diabetes to remove their shoes for a foot exam, educational materials, and flowsheets.

Main outcome measures and results:

Indicator	Baseline	Follow-up
Hemoglobin A1c	82.20%	86.89%
Foot Examination	64.70%	82.77%
Cholesterol Measurement	82.90%	86.89%
Urinalysis for Protein/Albumin	68.20%	72.28%
Ophthalmic Exam	68.93%	76.03%

Conclusions: After intervention and remeasurement, all of the quality indicators showed improvement. Through educational materials and simple reminders, the overall care of diabetic patients can improve by concentrating on increasing the rate of compliance with the quality indicators. The challenges were trying to change the physicians' practice patterns and behavior. Provider education was a critical factor in modifying physicians' behavior.

Abstract Number: 19

Outpatient Diabetes Mellitus Project, Project number QI1001

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Objective: To measure the quality of ambulatory care for Medicare patients with diabetes mellitus for glycosylated hemoglobin, foot exams, cholesterol, urinalysis for protein and/or albumin, and eye exams.

Design: Before and after study.

Setting: Ten West Virginia primary care (internal medicine or family practice) practices with an estimated 2,850 Medicare beneficiaries with diabetes participated in the project.

Patients: Patients had to be 18 years or older and diagnosed with diabetes mellitus (ICD-9-CM code 250.xx). Each practice identified a random sample of up to 50 such patients who had been seen at least once between January 1, 1995 and June 30, 1996 for inclusion in the baseline sample. Patients seen during the year following baseline measurement were eligible for inclusion in the post-intervention sample. Altogether, there were 363 patients in the baseline sample and 285 in the post-intervention sample.

Interventions: The peer review organization (PRO) held a meeting with the collaborators to discuss baseline data and how the PRO could assist during the project. Intervention techniques were individualized for each collaborator. Some were given information packets which included an overview of the project including literature to support the measures, suggestions on how to utilize the given information, and participation checklists to evaluate the usefulness of the project. Each clinic was expected to develop and submit a process improvement plan. A Collaborator Involvement Scale was used to rate the response level and decipher which methods of data dissemination were most useful for clinics. After data were collected, a letter and report were sent to each collaborator detailing the project findings. The principal clinical coordinator then called each clinic to determine if a physician toolkit, which included education materials for providers and patients and office reminders, would be useful. If the clinic was interested in using the toolkit, then it was provided to the collaborator. One clinic revised the check sheet and divided the front page into items for which the nurse is responsible and those for which the physician is responsible. The back page had therapeutic goals and recommended data for lab, ophthalmology, and vaccinations. Another clinic conducted lectures for physicians on diabetes care. The clinic, which serves a high population of indigent diabetics, requested grants from foundations to help provide supplies (e.g., glucometers, strips, medications, tests) for patients to help ensure the quality indicators were met. This helps diabetic patients who lack monetary resources to better control their diabetic condition.

Main outcome measures and results:

	Baseline	Follow-up
Hemoglobin	72.50%	90.18%
Foot Exam	79.61%	89.47%
Cholesterol	85.40%	84.56%
Urinalysis	51.80%	55.09%
Ophthalmic Exam	58.40%	62.11%

Conclusions: With the exception of cholesterol, which was unchanged, all quality indicators increased at remeasurement. Hemoglobin A1c increased substantially by 17%. The West Virginia PRO's interventions were successful at improving compliance rates in five of the six quality indicators listed above.

Abstract Number: 20

Results of Quality Measures in Veterans with Diabetes Mellitus

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Clark Sawin, MD • Debby Walder, RN, MSN • Dean Bross, PhD • Leonard Pogach, MD.

Objective: To examine the regional variation in care and to improve the outcomes of veterans with diabetes mellitus, by having the Veterans Health Administration (VHA) Office of Quality and Performance (OQP) track diabetes-specific and general prevention measures across VHA's 22 networks and 145 facilities.

To decrease the significant morbidity and mortality that is associated with diabetes, a condition that affects about 15% of veterans receiving care in the VHA and accounts for 25% of the VHA outpatient pharmaceutical budget.

Design: A stratified, retrospective study.

Setting: The measures are derived from data obtained by trained abstractors employed by an independent contractor (West Virginia Medical Institute) as part of the Veterans Administration (VA) External Peer Review Program. In order to provide baseline data, OQP constructed a stratified sample of outpatients who received primary care between October 1, 1994 and September 30, 1995.

Patients: For each medical center, patients were classified either as having had less than three or three or more primary care visits during that year. They were then further classified as male or female and, if female, by age (less than 50 years, 50-69 years, and over 70 years). More women were sampled than were expected in the population in order to provide a sufficiently large sample size. A total of 87,600 records were reviewed to derive data for this baseline period. 9,578 of these patients had diabetes mellitus and three or more visits.

The Under Secretary for Health made specific agreements for improvement in these clinical measures as part of performance contracts with network directors, and their performance was monitored for improvement in the 4th quarter of fiscal year 1997 (July-September). During this period, records of 13,557 patients with diabetes were abstracted. A similar sample for fiscal year 1998 (June-August) consisted of 8,513 patients with diabetes mellitus.

Interventions: Coincident with the samples noted above, VHA Networks and facilities not only had agreed-upon performance contracts that included these measures but had also received evidence-based guidelines for diabetes mellitus that had been developed in collaboration with the executive committee of the National Diabetes Education Program. Furthermore, computerized clinical reminders were available at most facilities, which also had the option to implement conferences, select guideline champions, and use patient report cards. Results were periodically fed back to the networks.

Main outcome measures and results: Preventive measures appropriate to people with diabetes included the percentage of current tobacco users advised of health risks and offered tobacco counseling at least three times each year; percentage of patients who were immunized against influenza within the past year; and the percentage of patients who were immunized against pneumococcal disease.

Diabetes-specific measures included the percentage of patients with an annual glycosylated hemoglobin test performed; the percentage of patients who have an annual visual foot inspection, an annual palpation of pedal pulses, and an annual sensory evaluation; and the percentage of patients who have an annual eye exam by an eye care specialist. The measures were broadened in 1997 to include the percentage of patients with an annual lipid profile; percentage of patients with a glycosylated hemoglobin test with a value less than 10%; the percentage of patients with an annual serum creatinine and urine protein test (including a microalbumin test if the initial urine screening test for protein was negative or trace); and the percentage of patients with diagnosed hypertension who had a blood pressure level less than 140/90. Other monitors included the percentage of patients

with LDL-C levels less than 130 mg/dl and the percentage of patients with an “at risk” foot, defined as one abnormal component on the foot examinations, who were referred to the foot specialist.

The data are presented in Table 1 for the diabetes-specific measures and in Table 2 for the preventive measures. Improvement in process measures was more pronounced than for intermediate health outcome measures (including blood pressure, LDL-C levels and hemoglobin A1c levels).

Table 1: Diabetes-Specific Measures (Percentage of Patients with Intervention)

	1995 n=9,578	1997 n=13,557	1998 n=8,513
Glycosylated Hemoglobin Performed	60%	85%	91%
Glycosylated Hemoglobin <10%	76%	83%	87%
Dilated Retinal Examination by Eye Specialist	39%	55%	62%
Foot Visual Examination	77%	90%	95%
Foot Sensation Checked	37%	69%	78%
Foot Pulses Checked	50%	74%	84%
Referral to Foot Specialist for High-Risk Foot	N/A	N/A	80%
BP <140/90 if Hypertension Diagnosed	N/A	40%	44%
LDL Measured	N/A	47%	64%
LDL <130 mg/dl	N/A	62%	68%
Urine Protein Evaluated	N/A	23%	36%

Table 2: General Preventive Measures in Patients with Diabetes Mellitus (Percentage of Patients with Intervention)

	1995 n=9,578	1997 n=13,557	1998 n=8,513
Influenza Immunization	35%	58%	70%
Pneumococcal Vaccine	31%	56%	68%
Nutritional Counseling if BMI >27	52%	92%	95%
Smoking Cessation Intervention	40%	78%	90%

Conclusions: The measurement of performance for several diabetes-specific measures in the Veterans Health Administration, as well as for several general measures of preventive medicine, was associated with clear improvements in these measures. Accountability, when coupled with evidence and reminders, appears to be an effective method of achieving improvements in the care of patients with diabetes mellitus.

Abstract Number: 21

***Improving the Quality of Care of Diabetics in an HMO Physician Office Setting
Project number L00005***

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Objective: To improve the quality of care delivered in Virginia by health maintenance organization (HMO)-affiliated physician offices to Medicare patients with diabetes mellitus by increasing eye exam, foot exam, and microalbumin and hemoglobin A1c (HbA1c) exam rates.

Design: Cohort, pre-post design.

Setting: The project setting includes four multi-physician practices in Virginia in a Medicare risk HMO. The HMO is the largest Medicare risk HMO in the state and serves 7,000 beneficiaries. The four physician practices serve 60% of the HMO's Medicare beneficiaries with diabetes.

Patients: The HMO identified diabetic Medicare beneficiaries for the project through claims data. There were 226 patients included in the baseline and follow-up samples.

Interventions: A diabetes encounter flowsheet was introduced to physicians to complete and teach diabetic patient care. The flowsheet was created by researchers, along with physicians from the HMO, staff from the peer review organization, and the state chapter of the American Diabetes Association. The flowsheet concurrently served to collect quality indicator data as well as to remind practitioners of standards of diabetic care. Encounter flowsheets for every diabetic patient were placed in a notebook and kept at the nurses station. As the patient was seen, the flowsheet was pulled, completed, and returned to the binder.

HMO: In addition, a diabetes nurse educator from the HMO met with diabetic patients to educate them on exercise, diet and foot care. The HMO also sponsored a one-day conference for patients on proper self-care for diabetes. Reminders were used on lab result forms to remind providers about hemoglobin and microalbumin testing. The HMO also provided physician office staff with an in-service on diabetes and patient education.

Beneficiaries: The VHQC developed and produced a diabetes checklist, which it sent to all offices for beneficiaries to use to track their diabetes care. Posters encouraging foot and eye examinations were distributed to physician offices for display in their waiting rooms.

Main outcome measures and results:

	Baseline	Follow-up
Eye Exam	24%	26%
Foot Exam	9%	11%
Microalbumin	7%	16%*
HbA1c	59%	69%*

*Statistically significant (p < .05)

Conclusions: Microalbumin and HbA1c showed a statistically significant improvement. These two measures were targeted the most extensively during the intervention phase. The data results imply that indicators that receive active and multiple interventions, such as reminders on lab results, improve more than those that receive fewer interventions. Intense efforts focused on improving one quality indicator may prove to be more effective than diffusing the same level of effort across multiple indicators.