

Muskegon County Diabetes Network

An Initiative of the Muskegon Community Health Project

Adult Type 2 Diabetes in Muskegon County

A 3-year Study of Ambulatory Care

March, 2004

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Summary

At its spring seminar in April 1999, the Muskegon County Diabetes Network (MCDN) introduced a diabetic clinical care flow sheet to be utilized as a charting tool for tracking of outpatient components of diabetes care. Following development of the flow sheet, the MCDN developed a goal to provide an aggregate picture of current ambulatory practice for monitoring glycemic control and end organ complications in adult patients with Type 2 diabetes in Muskegon County. To accomplish this goal, an office chart study was undertaken to determine a baseline level of ambulatory clinical care diabetics received in Muskegon County, Michigan, during 1998. Re-measurement was undertaken twice (2000 and 2002) to evaluate effectiveness of the interventions and develop next steps.

Statistically significant improvements were noted when comparing the percentage of patients whose HbA1C values met the recommended goal of <7%. A similar finding was noted with fasting blood sugar levels. An improvement in the number of patients who met all 4 goals (on average) for HbA1C, fasting blood sugar, LDL and blood pressure was statistically significant over the three years.

Diabetes education or flowsheet utilization is strongly associated with improved clinic processes but that either alone is not significantly associated with improved test results (outcomes).

Method

Data collection methods for subsequent years were kept the same to ensure comparability. Random samples were drawn from eligible patients with at least one office visit during the measurement year. An eligible patient was defined as an established practice patient over age 20 with Type 2 diabetes residing in Muskegon County, Michigan. Newly diagnosed adults (within 12 months) or patients with gestational diabetes or an insulin pump were excluded.

Selection of criteria to measure was drawn from the 1998 Clinical Practice Recommendations published by the American Diabetic Association (ADA). In addition, evaluation of outcome data aligned with the ADA's recommended clinical goals, such as HbA1C values less than or equal to 7.0%. At least 5 charts were reviewed per physician using a data abstraction form (attachment A).

For 1998, 599 charts from 86 physicians were abstracted; for 2000, 856 charts from 69 physicians were abstracted and for 2002, 837 charts from 62 physicians were abstracted. Clinic and physician participation rates for all years was greater than 65% (attachment B) of eligible primary care physicians in Muskegon County. An eligible physician was defined as an internal medicine, family practice or general practice physician providing primary care to adults living in Muskegon County. The audit was conducted without collection of patient or physician identifiers in order to preserve confidentiality. The sample size was not sufficient to draw conclusions about individual physician practices or patients.

Following removal of all patient and physician identifiers, data forms were submitted to Jean Chang, Ph.D., Muskegon County Health Department, for analysis.

Findings

Demographics

Demographics (age, gender) of the patient records studied were highly consistent for all three years of the study. The number of office visits for any diagnosis during the calendar year increased in 2002; the mean was also highly consistent.

Demographics	1998 (N=599)	2000 (N=856)	2002 (N=837)	2002 Confidence Interval at 95%
Mean Age	61.4	62.4	62.2	*
Gender (% Female)	52%	55%	54%	+/- 3.4%
Mean # office visits	n/a	5.13	5.38	*

*Not available

Process Measures: Frequency of tests and procedures

The hemoglobin A1C (HbA1C) test measures the average blood sugar level for the past 2-4 months and is a good indicator of how well a patient is adhering to his or her recommended plan of care. The number of HbA1C tests increased significantly in 2002. The measurement of HbA1C tests in 1998 was not comparable due to collection on a scale of 1 to 4 or more tests.

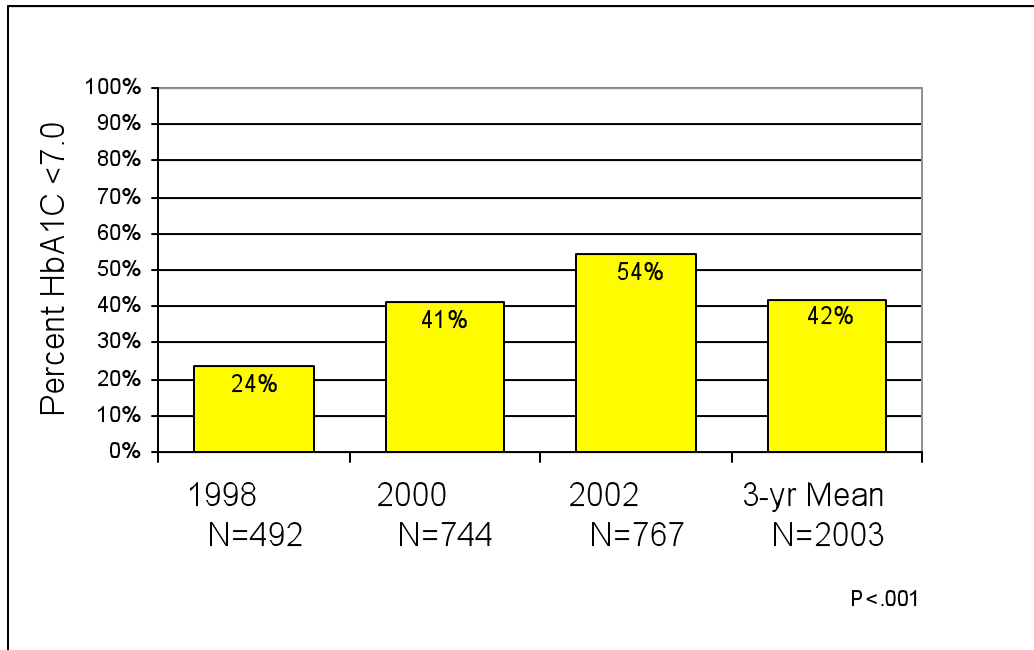
Criteria	ADA Recommended Frequency	1998 (N=599)	2000 (N=856)	2002 (N=837)	2002 Confidence Interval at 95%	Significance P (Chi-square)
Mean # HbA1C tests	2 – 4 per year	*	1.82	2.04	*	P<. 001
Foot exam	Annually	47.2%	73.1%	74.9%	+/- 3.0%	p<. 001
Urinalysis for protein	Annually	45.3%	64.3%	66.9%	+/- 3.2%	p<. 001
Retinal exam	Annually	24.3%	28.8%	40.3%	+/- 3.4%	p<. 001
Diabetes education (within last 5 years)	Initially and/or if goals not met	37.1%	28.3%	30.2%	+/- 3.1%	p<. 01
Glucose log reviewed	**	48.6%	61.6%	75.1%	+/- 3.4%	p<. 001
Flow sheet in chart	**	n/a	61.3%	68.6%	+/- 3.2%	p<. 001

*Not available

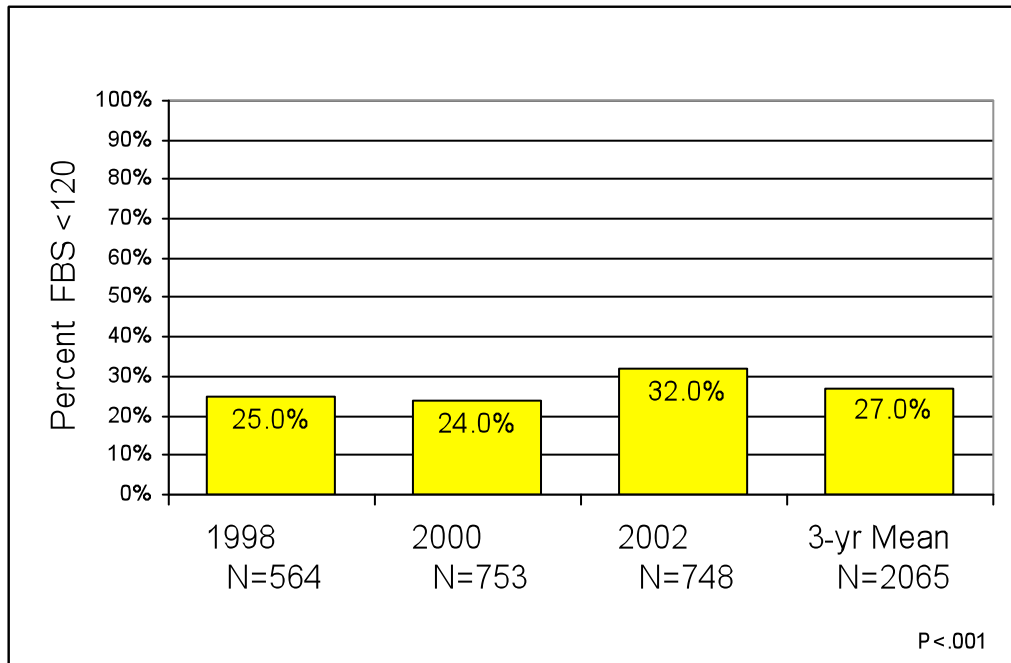
**Not a 2003 ADA Clinical practice recommendation

Outcome Data: HbA1C, Fasting Blood Sugar, LDL and Blood Pressure

The American Diabetic Association recommends an HbA1C goal below 7.0%. Based on the last result in the measurement year, the percentage of patients who met this goal improved significantly (P<. 001).



The ADA recommends patients achieve fasting blood sugars of 90 – 130 mg/dl. Based on the last result in the measurement year, the percentage of patients whose last FBS fell below 120 mg/dl improved significantly (P<. 001).

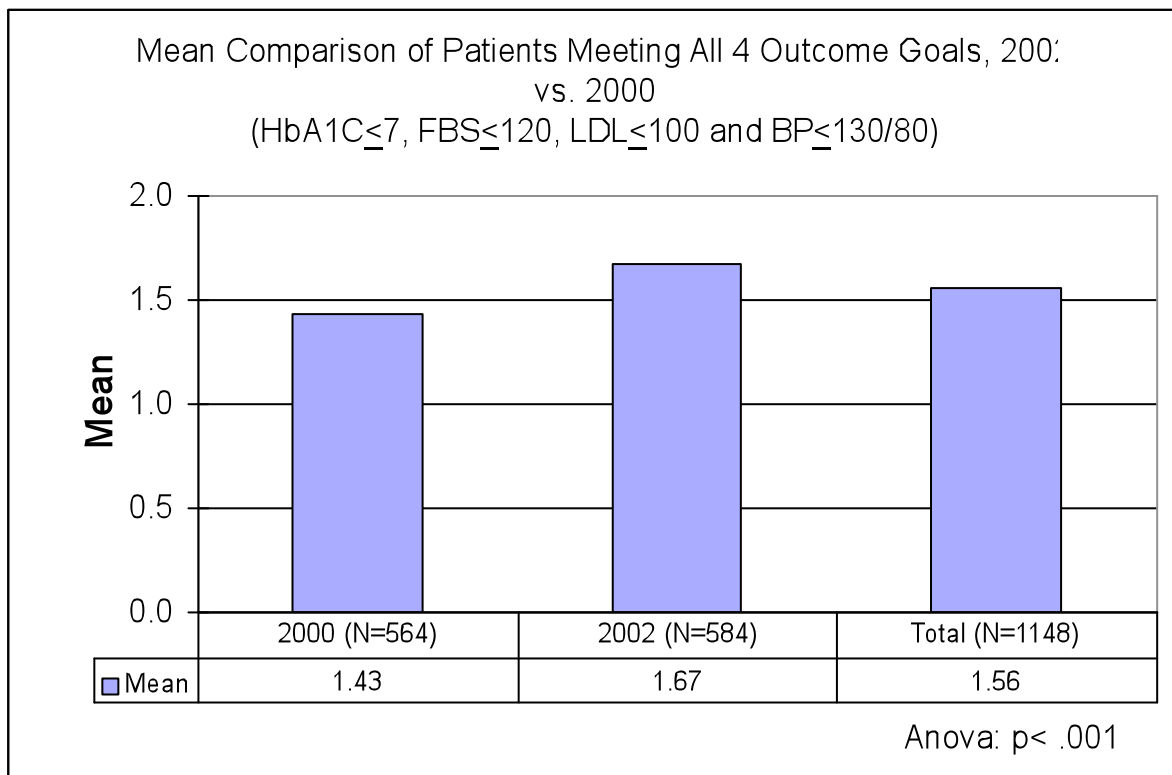


The ADA recommends lowering Low-Density-Lipoprotein (LDL) cholesterol levels below 100 mg/dl and blood pressure below 130/80mmHg to reduce cardiovascular events and mortality associated with diabetes.

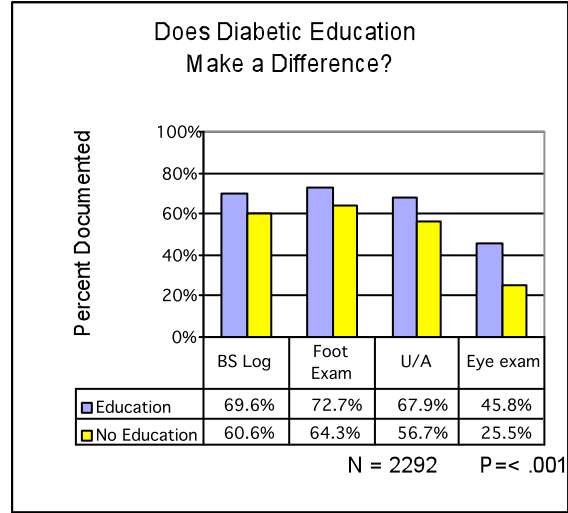
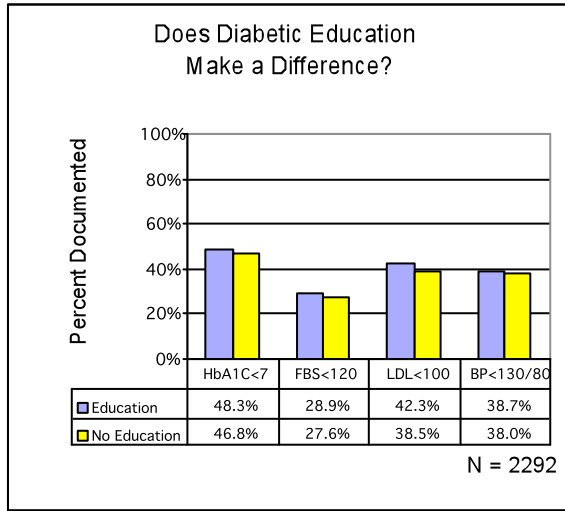
LDL and blood pressure data were new measures in 2000 and did not show statistically significant improvement based on two years of data. Additional trend data is needed to evaluate significant change.

Criteria	1998	2000	2002	2002 Confidence Interval at 95%
Last BP \leq 130/80	n/a	38.3% (n=845)	39.2% (n=830)	+/- 3.4%
Last LDL \leq 100	n/a	42.0% (n=665)	43.1% (n=664)	+/- 3.7%

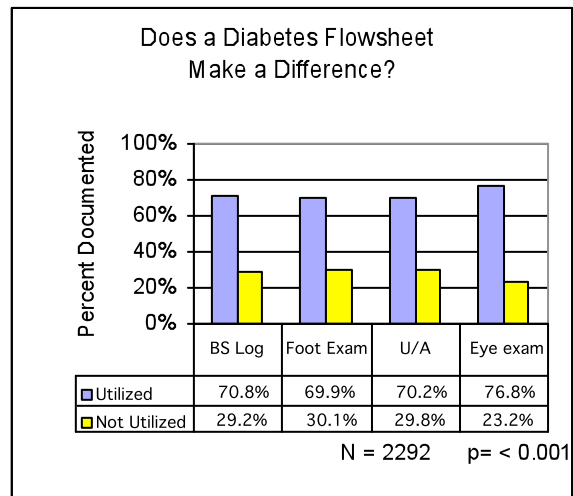
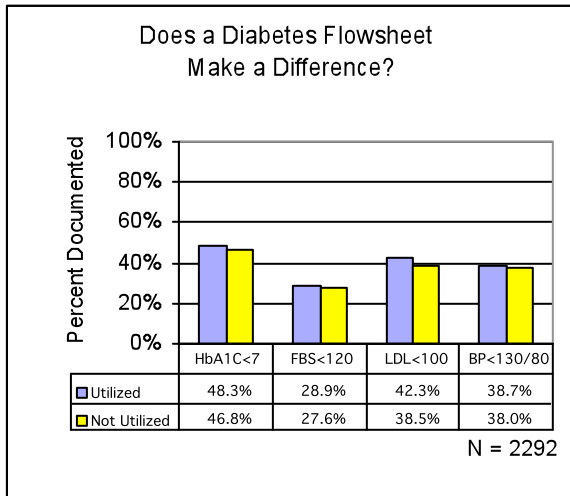
There was statistically significant improvement from 2000 to 2002 when comparing the mean of patients who met all 4 goals for HbA1C, fasting blood sugar, LDL and blood pressure.



It was hypothesized that patients who received diabetes education had better outcomes (i.e. test values) and better process measure compliance (i.e. test or screening frequencies). The findings suggest that patients who had received diabetic education did not necessarily improve their results, but were more likely to receive tests and screenings ($P = <.001$).



A second hypothesis was tested to see if the use of an office chart flowsheet promoted better patient outcomes and processes, similar to diabetic education. The findings were similar to the first hypothesis; use of an office chart flowsheet did not significantly improve the results, but its use was highly correlated with improved testing frequencies ($P = <.001$).



Key Findings

- The proportion of patients with a HbA1C <7% improved significantly over the three years.
- The proportion of patients with a fasting blood sugar <120 improved significantly over the three years
- The number of patients meeting all 4 outcome goals (HbA1C, fasting blood sugar, LDL and blood pressure) increased significantly from 2000 to 2002.
- Diabetes education and flowsheet utilization is strongly associated with improved clinic processes but that either alone is not significantly associated with improved test results (outcomes).

Limitations

The initial and follow-up studies are subject to several limitations. Samples drawn from independent physicians (not affiliated with either hospital network) were not included in 2002 as in the first two years due to reviewer unavailability and limited data access. Non-residents of Muskegon County as well as residents who seek care outside of the county were not included. Patients with diabetes who did not visit a participating physician (family practitioner or internist) at least once a year were not included. In 1998, glycohemoglobin was measured the same as HbA1C, which is a different laboratory method and may have inflated the average value reported. In 2000, glycohemoglobin values were excluded from the mean, so the improvement from 1998 to 2000 (percent reduction) may have appeared more significant. Credit was given for documented services only, hence services provided elsewhere but not substantiated in the primary care chart, may be underreported, especially for eye exams and diabetic education.

Next Steps

- Share final results with all primary care physicians in Muskegon County
- Enlist MCDN members to meet with optometrists to promote reporting of retinal exams to PCPs

Recommendations

- Continue promotion of the diabetes flow sheet as a charting tool
- Consider the use of focus groups to analyze barriers to receiving formal diabetic education
- Promote the development and use of registries for patients with diabetes
- Promote in-office testing of HbA1C and urine microalbumin
- Continue support from the Muskegon Health Project
- Continue leadership support of MCDN as a community health collaborative

Muskegon County Diabetes Network
Disease Management Work Group:

Chair:

F. Remington Sprague, M.D., F.A.C.P., Mercy General Health Partners

Members:

Ben Andringa, Bristol Myers Squibb

Chris Ammon, CPHQ, Mercy General Health Partners

William Granger, M.D., Medical Director, Blue Care Network

Luann Kraus, RN, CDE, Hackley Outpatient Diabetes Education Program

Katrina Olson, M.D., Bear Creek Health Center

John Polanyi, RPh, Hackley Hospital

Paul Ponstein, DO, Medical Director, Westshore Health Network

Louise Ypema, CPHQ, Hackley Primary Care Network

Muskegon County Diabetes Network
Data Work Group:

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Jean Chang, Ph.D., Muskegon County Health Department

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Prepared by Chris Ammon, CPHQ
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DIABETES FLOW SHEET

ATTACHMENT A

PATIENT NAME: _____ **D.O.B.** _____

ASSESSMENT	Goal	Frequency	Date	Result	Date	Result	Date	Result	Date	Result
Office Diabetes Visits		2–4/year								
Weight		Every visit								
Blood Pressure	<130/80	Every visit								
Foot Exam (visual)		Every visit								
Review Glucose Logbook		Every visit								
Review Treatment Goals		Every visit								

ASSESSMENT	Frequency	Date	Result	PREVENTION	Frequency	Date
Foot Exam with monofilament	Annual			Influenza vaccine	Annually	
Dilated Eye Exam	Annual			Pneumo Vaccine	Once if >65, twice if <65	
Dental Exam	Annual			Td booster	Every 10 years	

LABS	Goal	Frequency	Date	Result	Date	Result	Date	Result	Date	Result
A1C (HbA1C)	< 7.0	3 – 6 mos								

ANNUAL LABS	Goal	Date	Result	ANNUAL LABS	Date	Result
LDL	< 100			Urine Protein		
HDL	>45 men >55 women			Urine Microalbumin (if UA negative)		
Cholesterol	< 200			Creatinine		
Triglycerides	< 200			Other:		

EDUCATION COUNSELING	Frequency	Date	Date	Date	Date
Diabetes Educator: Referral and/or IN-OFFICE Education:	Initially and when goals are not met				
Physical Activity					
Foot Care					
Glycemic Monitoring					
Insulin					
Oral Medications / interactions					
Medical Nutrition Therapy					
Psychosocial Issues					
Sick Days					
(pre) Pregnancy					
Tobacco Cessation Advised					
Other:					

PHYSICIAN AND CLINIC PARTICIPATION

1998 PARTICIPATION

599 TOTAL CHARTS

7 CHARTS / PHYSICIAN

103 TOTAL PHYSICIANS ELIGIBLE

83% PARTICIPATED (86)

41 TOTAL CLINIC PRACTICES ELIGIBLE

73% PARTICIPATED (30)

2000 PARTICIPATION (limited to participation in 1998)

856 TOTAL CHARTS

12 CHARTS / PHYSICIAN

80 TOTAL PHYSICIANS ELIGIBLE

86% PARTICIPATED (69)

31 TOTAL CLINIC PRACTICES ELIGIBLE

77% PARTICIPATED (24)

2002 PARTICIPATION

837 TOTAL CHARTS

13 CHARTS / PHYSICIAN

93 TOTAL PHYSICIANS ELIGIBLE

67% PARTICIPATED (62)