IMPACT Diabetes: Evaluating Patient Outcomes in a Team Based Care Model

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BACKGROUND INFORMATION

- According to the *American Diabetes Association (ADA) Standards of Medical Care in Diabetes-2014*, incorporating an interprofessional model in disease management has been shown to optimize provider and team behavior and thereby contribute to A1c, blood pressure, and LDL-C reduction.[1]
- *ADA*-recommended strategies for these team models include goal setting, addressing language and cultural barriers to care, and integrating evidence-based guidelines.[1]
- The **IMPACT: Diabetes** grant provided an opportunity to develop and evaluate the impact of an interprofessional team approach on diabetes-related clinical outcomes in the safety-net population.
- This project integrated the pharmacist on the diabetes care team with the goal of improving care for uninsured patients from diverse ethnic backgrounds and varying levels of English proficiency.

OBJECTIVES

1. To more closely describe the diabetes team based care model including patients enrolled and pharmacist interventions during patient care visits.
2. To report patient outcomes, including impact on diabetes-related clinical markers such as A1c, cholesterol, and blood pressure.
3. To describe trends in diabetes control over time based on number of visits during the study period.

METHODS

1. Eighty-two program participants enrolled in the IMPACT: Diabetes program between July 1, 2011 and January 31, 2013 met our inclusion criteria. The criteria included at least 2 visits 3 months apart, age greater than 18 years, and an A1c >7%.
2. At enrollment, each patient completed a diabetes knowledge quiz,[2] the results of which were reviewed at subsequent visits.

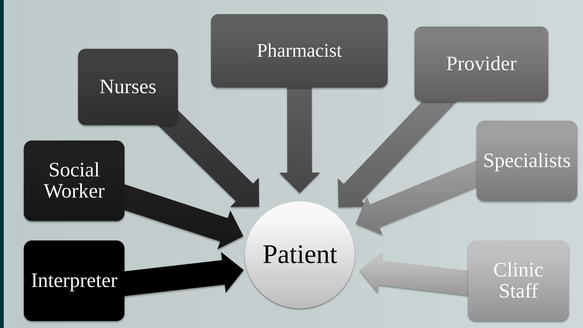

Figure 1. The interprofessional team providing care to the patient

METHODS

3. At each pharmacist visit, individualized assessments, interventions, referrals, and clinical outcomes were made and documented.
4. Data collection included retrospective chart review utilizing a web-based database tool. Statistical analysis included utilizing a paired T-test to calculate P values.

RESULTS

Table 1: Baseline Characteristics, n=82

Mean Age (years)	49.8 years	**Male** (%)	39%
Primary language (%)		**Ethnicity** (%)	
English	70%	Caucasian	34%
Spanish	23%	African American	35%
Other	7%	Hispanic/ Other	30%
Knowledge quiz score (%)		**Reason for referral** (%)	
Beginner	40%	Uncontrolled	82%
Proficient	50%	New Diagnosis	13%
Advanced	10%	Unknown	5%
Average number of visits per patient	5.5 (2,27)	**Number of medications at baseline**	5.7 (1,18)

Table 2: Medication Adjustments (total number of times)

Medications Increased	
Insulin	117
Biguanides	18
Statins	3
ACEI/ ARB	12
Aspirin	1
Medications Decreased (n=16)	
Insulin	7
Biguanides	3
Statins	0
ACEI/ARB	1
Aspirin	0
Medications Added (n=48)	
Insulin	21
Biguanides	16
Statins	10
ACEI/ARB	11
Aspirin	5

RESULTS

Table 3: Other Interventions (% of total visits)

Medication access	63%
Patient education	95%
Referral	22%
-ophthalmology, podiatry, primary care, social work, counselor	
Medication Discontinued	11%

Table 4: Clinical Measures

	n =	Baseline Mean	Final Mean (SD)	Mean Change (SD)	P-value
A1c (%)	61	9.6(1.8)	8.3(1.6)	-1.4(2.2)	<0.0001
BMI (kg/m^2)	78	34.6(7.6)	34.8(7.5)	0.5(1.7)	0.0125
Systolic blood pressure (mmHg)	80	129.5(21.0)	129.6(19.4)	0.3(18.2)	0.8872
Diastolic blood pressure (mmHg)	80	78.0(9.5)	77.6(10.6)	-0.7(10.5)	0.6006
LDL-C (mg/dL)	72	110.5(39.7)	81.3(23.1)	-24.1(37.3)	<0.0001
HDL-C (mg/dL)	77	41.5(13.9)	41.7(12.8)	1.2(7.3)	0.2716
Triglycerides (mg/dL)	77	273.5(269.9)	191.1(142.0)	-97.5(279.7)	0.0172
Total Cholesterol (mg/dL)	77	186.1(46.0)	155.8(28.1)	-35.2(42.2)	<0.0001

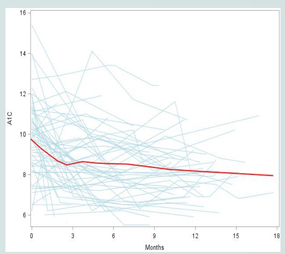

Figure 2. Trends in A1c over time

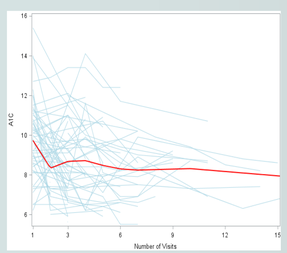

Figure 3. Trends in A1c by number of patient visits

DISCUSSION

- Pharmacists' interventions as a part of a diabetes care team led to statistically significant and clinically relevant improvements in key diabetes-related outcomes, including A1c, and LDL-C.
- BMI increased slightly during the study period, most likely due to insulin additions and titrations.
- Most patients were referred to this program for uncontrolled diabetes and had only basic knowledge of diabetes self management.
- Interventions included medication adjustments, resolution of medication access issues, patient education and referrals.
- Referral interventions were less common, but integral to the team-based model.
- Of the diabetes medication modifications, insulin titration was most frequently implemented by the pharmacist.
- A1c was reduced most in the first 3 months of program participation after 2-3 visits. After this initial period, the A1c did not notably fluctuate.
- There were several limitations to this study, including the retrospective design, no control group, and small sample size.

CONCLUSIONS

- Pharmacist-integrated services in a free-clinic setting, serving an uninsured population with over 50% of patients of ethnically diverse backgrounds known to suffer from health disparities, improved clinical markers which are known to reduce diabetes related morbidity and mortality .
- Based on the A1c lowering data, the pharmacist provides the most dramatic clinical impact within the first 3 months of program enrollment.
- With continued management by the team over the study period, these initial health benefits were maintained.
- Diabetes team interventions should incorporate a nutritionist and an exercise program to help improve weight management.
- Team diabetes care should include a pharmacist to incorporate their expertise in medication optimization, goal obtainment, education, access, appropriate referral to other team members, specifically with patients with new diagnosis or uncontrolled diabetes. The pharmacists should see patients for at least 2 to 3 visits.
- Further study is warranted to determine how often pharmacist visits should occur to maintain positive patient outcomes and to define which pharmacist interventions make the most impact.

REFERENCES

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2. Garret DG, Bluml BM. Patient self-management program for diabetes: first year clinical, humanistic and economic outcomes.J AM Pharm Assoc 2005:45(2):130-137.