

## Evaluating Diabetes Group Medical Visits in a Family Medicine Residency Program

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### Abstract

**Background:** Group medical visits (GMV) have been shown to improve metrics in patients with type 2 diabetes mellitus (DM). Overlook Family Medicine, a teaching residency program, anticipated that medical residents trained in the GMV model of care by interdisciplinary team members may improve cholesterol, HbA1C, BMI, and blood pressure in patients. The objective of this study was to compare metrics between group 1: GMV patients with DM whose primary care provider (PCP) was an attending physician/nurse practitioner (NP) and group 2: GMV patients with DM whose PCP was a family medicine (FM) medical resident receiving GMV training. We seek to provide guidance on implementation of GMV in residency teaching practices.

**Methods:** We performed a retrospective analysis to evaluate total cholesterol, LDL, HDL, TG, BMI, HbA1C, and BP in GMV patients between 2015-2018. We used a *t* test to compare outcomes between the two groups. Diabetes training was provided to family medicine residents by an interdisciplinary team.

**Results:** There were 113 patients enrolled in the study: 53 in group 1 and 60 in group 2. There was a statistically significant decrease in LDL and triglycerides, and an increase in HDL in group 2 ( $P < .05$ ). There was a clinically significant decrease in HbA1C in group 2 ( $-0.56$ ,  $P = .0622$ ).

**Conclusion:** Sustainability of GMV can be achieved with a champion diabetes education specialist. Interdisciplinary team members are integral in training residents and addressing patients' barriers. GMV training should be incorporated into family medicine residency programs to improve metrics for patients with diabetes. FM residents who received interdisciplinary training had improved metrics in GMV patients compared to patients whose providers did not. Therefore, GMV training should be incorporated into family medicine residency programs to improve metrics for patients with diabetes.

## Introduction

Group medical visits (GMV) have been shown to improve quality metrics in patients with type 2 diabetes mellitus (DM), empower patients to facilitate diabetes self-management, and develop fellowship among patients.<sup>1,2</sup> GMV in family medicine (FM) residency programs have not been well evaluated. A previous study surveyed FM program directors to determine whether GMV were offered. Although 79.2% of those surveyed agreed that training FM residents in the GMV model of care is important, only 59% (137/252) of program

directors reported that GMV were offered. Challenges cited included a lack of expertise and time among faculty to implement GMV.<sup>3</sup> Addressing challenges related to sustaining GMV has not been adequately discussed.<sup>4–6</sup>

Overlook Family Medicine (OFM), a teaching residency program, incorporated GMV in 2013. We anticipated an improvement in total cholesterol (TC), LDL, HDL, triglycerides (TG), body mass index (BMI), hemoglobin A1C (HbA1C), and blood pressure (BP) in GMV patients managed by FM residents trained in the GMV model of care. The objective of this study was to compare metrics between group 1: GMV patients with type 2 DM whose primary care provider (PCP) was an attending physician/nurse practitioner (NP), and group 2: GMV patients with type 2 DM whose PCP was a FM resident trained by interdisciplinary team members. We sought to provide guidance on implementation of GMV to improve metrics in patients with type 2 DM in residency teaching practices.

## Methods

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We conducted a retrospective study in adults with type 2 DM with a HbA1C  $\geq 6.5\%$ , who were enrolled in GMV from 2015 to 2018. A total of 25 GMV were offered in English and six in Spanish. Patients attended GMV according to their preferred language. Adults who attended at least one GMV were included. The baseline data included HbA1C, TC, LDL, HDL, and TG. BP and BMI were taken at each GMV. Metrics were compared between group 1 and group 2. Endpoint data were 0-6 months after the last GMV attended. GMV were held in the evening on weekdays at OFM. Approximately five patients attended each GMV, which did not replace the diabetes office visit. The patients' PCP was identified by the electronic medical record.

Two FM residents attended each GMV and moderated the "Know Your Numbers" GMV. A nutritionist, pharmacist, physical therapist, and yoga instructor moderated their topics. Attending physicians did not moderate GMV, however one attending and NP were present at each GMV. Diabetes care education was provided to medical residents by a clinical pharmacist, NP/Certified Diabetes Care and Education Specialist (CDCES), and a behaviorist during monthly conferences. Topics included diabetes self-management education, nutrition, pharmacotherapy, and motivational interviewing. PCPs recruited their patients and high-risk patients were identified using population health registries. Minitab v17 software was utilized to analyze data using a *t* test and Kolmogorov-Smirnov (K-S) determined distribution.

A survey generated by the NP/CDCES was administered to patients to assess patient-perceived value on a scale of 1 to 5, lowest to highest. Questions asked included "Was the topic useful?", "Was the speaker knowledgeable?", and "Was the program well-organized?" Patients listed two learned concepts and set two goals. We analyzed qualitative responses using a modified version of the consensual qualitative research method. The study was granted an exemption by Atlantic Health System's institutional review board.

## Results

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One hundred-eighteen patients participated in GMV and 113 were enrolled. Five were excluded due to relocation (1), prediabetes (3), and incomplete data (1). There were 53 patients in group 1 and 60 patients in group 2. There was a significant difference in ethnic groups represented in group 2 (Table 1). The average age in group 1 (67.5) was higher than in group 2 (58.9).

In group 1 there were no statistically significant changes in the metrics evaluated (Table 2). Group 2 had a reduction in TG: 176.8 mg/dl to 146.7 mg/dl, and LDL: 100.45 mg/dl to 94.45 mg/dl, and an increase in HDL: 45.8 mg/dl to 48.5 mg/dl ( $P < .05$ ). There was a clinically significant decrease in HbA1C in Group 2: 8.68% to 8.128% ( $P = .0622$ ; Table 2).

All 113 participants completed a qualitative survey at the conclusion of the GMV. In both groups, most

participants reported goals which reflected skill acquisition, and measurable behavioral changes (Table 3).

## Discussion

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GMV patients receiving care from FM residents had improved LDL, TG, HDL, and HbA1C. The difference in metrics between the groups may be attributed to the team-based diabetes education received by FM residents. Residents trained in the GMV model of care may have gained additional perspectives of the complexity of patient experience and confidence in their ability to teach and communicate.<sup>7</sup> The mean baseline HbA1c was lower in group 1 and the average age of patients was greater. Consequently, group 1 patients may have had less stringent HbA1C goals. Study limitations were that insurance status and language preference was not retrievable and some patients attended multiple GMV (n=39), while others attended a single GMV(n=74). However, the number of patients attending multiple GMV was similar in both groups (Table 1). Patient scheduling conflicts, insurance status, and lack of follow-up obtaining labs posed challenges. Consequently, an office-based community health worker (CHW) contacted patients with HbA1C  $\geq 9\%$  to screen for barriers. Approximately 50% of these patients preferred Spanish as a primary language and 35% were uninsured. Previous literature cited communication and scheduling as barriers to resident participation in GMV.<sup>5</sup> Therefore, evening office hours were replaced with the GMV to ensure participation. Residents invited their patients, which facilitated continuity and contributed to participant willingness to express goals.

Next steps include offering more GMV in Spanish, drawing labs at the GMV, and addressing SDOH. Sustainability and consistent resident training can be achieved with a champion NP/CDCES who ensures that GMV are a center wide initiative.<sup>8</sup>

This study demonstrates the impact of comprehensive, team-based care within a FM residency program that addresses the needs of the patient community.<sup>9</sup> FM residents who cofacilitated GMV and received interdisciplinary training had improved metrics in patients compared to patients whose providers did not. Therefore, we recommend GMV training as an adjunct for diabetes care in FM residency programs.

## Tables and Figures

**Table 1: Participant Demographics**

Characteristics	Attending-PCP Group 1 (n=53)	Resident-PCP Group 2 (n=60)	<i>P</i> Value
<b>Sex</b>			
Male	14 (26%)	25 (42%)	.088785
Female	39 (74%)	35 (58%)	.132688
<b>Age (Years)</b>	Average 67.5 Range 33-87 SD 11.5	Average 58.88 Range 35-83 SD 10.73	.000042
<b>Ethnicity</b>			
African American	19	12	.00001
White	14	16	.00001
Hispanic	11	21	.00001
Asian	4	5	.00001
Other	5	6	.00001
Single GMV	33	42	
Multiple GMV	20	18	

Abbreviations: PCP, primary care physician; SD, standard deviation; GMV, group medical visit.

**Table 2: Group 1 (Attending/NP) and Group 2 (Medical Resident) Metrics**

	Variable (N)	Average (Pre)	Average (Post)	P Value
Group 1	BMI (37)	30.9327±SD 6.38	30.97±6.589	.440
Group 2	BMI (41)	32.7978±SD 6.6191	32.48585±6.43	0.0418
Group 1	HbA1C (30)	8.36±1.7446	8.296±1.7895	.313
Group 2	HbA1C (32)	8.6838±2.195	8.128±1.559	.0622
Group 1	TChol (22)	185.18±50.3944	182.27±45.314	.320
Group 2	TChol (22)	193.227±41.355	173.4545±37.3895	.01273
Group 1	LDL (22)	110.09±48.5834	105.136±44.8981	.388
Group 2	LDL (22)	100.4545±39.8411	94.95±36.366	.01897
Group 1	HDL (22)	51.9090±11.77	53.54545±11.606	.162
Group 2	HDL (23)	45.8695±7.4676	48.565±9.5499	.01298
Group 1	Triglycerides (22)	126.31±58.55	123.18±57.37	.250
Group 2	Triglycerides (22)	176.826±78.610	146.727±66.459	.045
Group 1	BP systolic (39)	128.717±17.8569	125.5897±14.8007	.193
Group 2	BP systolic (40)	123.075±15.2354	123.875±15.9909	.364
Group 1	BP diastolic (39)	76.5128±7.9578	74.9487±9.0947	.227
Group 2	BP diastolic (39)	75.5897±11.0516	78.4871±8.4364	.03093

Abbreviations: NP, nurse practitioner; BMI, body mass index; HbA1C, hemoglobin A1C; Tchol, total cholesterol; LDL, low-density lipoprotein; HDL high-density lipoprotein; BP, blood pressure.

**Table 3: Qualitative Responses to Diabetes Education**

A	B	C	D
Domain	Frequency	Subcategories (Frequency)	Example(s)
Self-learning	186	Learning about diabetes (x25) Learning techniques (x32)	"I learned about my A1c goal". "[I learned] how to read labels".
Behavioral change	139	Increase helpful behavior (x53) Identify beneficial and detrimental behaviors (x44) Mindfulness (x20)	"Think about my goals and eat better – like healthy plate." "Learn more about my numbers and what to do and not to do."
Education	112	Improving disease management (x39)	"Be conscious of consequences of neglecting diabetes." "Inherited cholesterol is an extra challenge to manage."
Self-motivation	76	Self-encouragement (x37)	"Keep working trying to bring my numbers down." "Do not give up if you do not see results immediately."
Dietary changes	75	Portion control (x24) Carbohydrate/glucose control (x38)	"Diet and exercise can help me control my numbers."
Activity changes	75	Increase exercise (x26) Increase walking (x30)	"My goal is to exercise 30 minutes each day". Goal: "gradually walk faster - walk to church in 10 min from 15 min"
Weight loss	30	Setting specific weight loss goals (x20)	"To lose weight with exercise - walk 10 min a day." Goal: "lose weight – 5 lb. in 2 months."

Responses for the questions were reviewed to evaluate for dominant themes (domains). The frequency of responses within several domains (column A) was tabulated (column B). Statements that were repeated frequently within each domain are noted (column C). Examples of participant statements are noted in column D.

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