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Exploring Real-World Adherence and Cost Implications of Continuous Glucose Monitoring in Patients with Diabetes: Impact of Device Sourcing

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INTRODUCTION

- In 2021, approximately 29.7 million individuals in the United States (US) were living with diabetes, leading to significant direct and indirect costs totaling $413 billion in 2022 [1]
- Continuous glucose monitoring (CGM) offers individuals with diabetes near real-time feedback on how their glucose levels are affected by environmental, biological, lifestyle, and medication factors. Although finger pricks may be required for calibrations and unusual results, CGMs eliminate the need for frequent finger pricks [2]
- Previous studies have shown that adherence to a CGM is significantly associated with reductions in A1C, medical costs, and healthcare utilization [3-7]
- The predictors of CGM adherence are well studied and include age, percentage of time in range, the perceived necessity of CGM, body mass index (BMI), and gender [8]
- Because a durable medical equipment (DME) supplier or a pharmacy can fill a prescription for a CGM device, another potential factor influencing adherence may be the dispensing source of CGM

OBJECTIVE

- To evaluate the impact of dispensing sources on adherence rates and costs among patients with diabetes who obtained CGM supplies through DME supplier or pharmacy benefit

METHODS

Study Design	• Retrospective Cohort Study
Data Source	• Mariner Commercial Claims Database (represents 75.7 billion claims of all payer types across 165 million unique patients across the US)
Study Period	• Q1 2021 – Q1 2022
Inclusion/ Exclusion Criteria	• Diagnosis of type 1 or type 2 diabetes identified using International Classification of Diseases (ICD) codes: 9th revision (249.00-250.99, 790.2, 790.21, 790.22, 790.29, 791.5, 791.6) and 10th revision (E08.0 through E13.9) • ≥18 years or older with an initial CGM claim in the first quarter of 2021 (index date) • Continuous enrollment for 3 months prior to and 12 months after their index date without evidence of CGM claims before the index date • Patients with diagnosis codes for renal failure or cancer were excluded
Patient Cohorts	• **Pharmacy Cohort:** Patients who received their CGM device and subsequent supplies over the next 12 months through their pharmacy benefit. These patients were identified using the billing codes for the CGM devices and supplies • **DME Cohort:** Patients with diabetes who received their CGM device and supplies from a DME provider over the same 12-month period. Patients in both cohorts were identified using the prespecified CGM and supply codes
Outcome Measures	• **Adherence*:** 6-month, 9-month, and 12-month time point after index date *Assessed based on the Medication Possession Ratio model (the number of day supply/the total number of days in the given time) • **Healthcare Costs (Medical & Pharmacy Claims):** During 12-month study period after index date • **Reinitiation of CGM:** Patients who had discontinued the device for at least one quarter of the calendar year and resumed using the same type of CGM
Statistical Analysis	• **Propensity Score (PS) Matching:** Subjects were assigned to their respective cohorts by PS matching based on the matching variables* *Charlson Comorbidity Index (CCI) score (calculated using all existing claims for each patient over a 2-year period from the index date), age, gender, health insurance plan, 3-digit zip code mean family income, 3-digit zip code % insured, and 3-digit zip code unemployment rate • **Z-Tests:** Differences in adherence and reinitiation rates between the DME and Pharmacy cohorts (statistical significance level: P<0.05) • **T-Tests:** Differences in mean costs between the DME and Pharmacy cohorts (statistical significance level: P<0.05)

RESULTS

Study Cohorts

- Sample selection is provided in **Figure 1**
- The final study sample consisted of 3,716 individuals with diabetes (Pharmacy Cohort = 1,858; DME Cohort = 1,858), who were propensity score matched and newly prescribed a CGM device
- Participant characteristics are provided in **Table 1**

Figure 1. Sample Selection

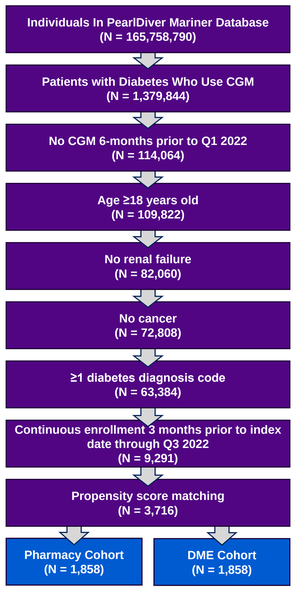


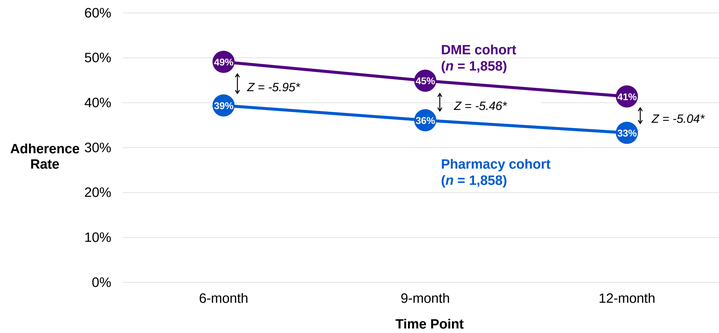
Table 1. Patient Characteristics

	DME Cohort (n=1,858)	Pharmacy Cohort (n=1,858)	Total Sample (n=3,716)
Age, mean (SD)	51.1 (18.4)	54.3 (16.7)	52.7 (17.6)
Gender			
Male, n (%)	889 (49.7)	900 (50.3)	1789 (48.1)
Female, n (%)	969 (50.3)	958 (49.7)	1927 (51.9)
Payer, n (%)			
Commercial	1,731 (93.2)	731 (39.3)	2,462 (66.3)
Medicare	39 (2.1)	522 (28.1)	561 (15.1)
Medicaid	70 (3.8)	407 (21.9)	477 (12.8)
Other/unspecified[a]	18 (0.9)	198 (10.7)	216 (5.8)
Diabetes type, n (%)			
Type 1	1,221 (65.7)	609 (32.8)	1,830 (49.2)
Type 2	224 (12.1)	407 (21.9)	631 (17.0)
Other/unspecified[b]	413 (22.2)	842 (45.3)	1255 (33.8)
CCI, mean (SD)	1.53 (1.38)	1.46 (1.53)	1.51 (1.45)

[a] Other payers/payments include: cash, employer groups, government, pharmacy benefit managers, processors, third-party administrators, or workers compensation.

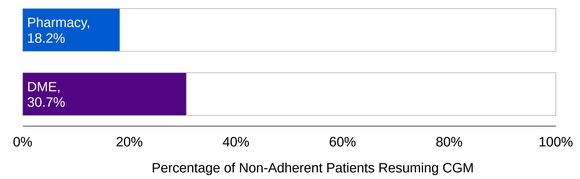
[b] Others/unspecified may include: diabetes of indeterminant etiology or rarer conditions, such as gestational diabetes mellitus, monogenic diabetes, or secondary diabetes.

Figure 2. Adherence



Note. * p < .05*

Figure 3. Reinitiation



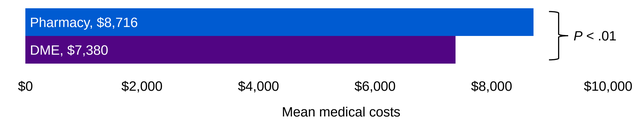
Adherence

- As can been seen in **Figure 2**, adherence rates decreased over time in both cohorts; however, adherence rates were higher at 6, 9, and 12 months for the DME Cohort relative to the Pharmacy Cohort (P<0.05)

Reinitiation

- In the DME Cohort, 334 out of 1,089 (30.7%) nonadherent patients resumed CGM, compared with 225 out of 1,238 (18.2%) nonadherent patients in the Pharmacy Cohort (**Figure 3**)
- The difference in reinitiation rate was significantly higher in the DME Cohort (z = 2.70; P<0.05)

Figure 4. Healthcare Costs by Cohort (12 months)



Healthcare Costs

- For adherent patients, the mean (SD) total allowable medical cost across the 12-month follow-up for the DME Cohort was $7,380 ($5,655) (**Figure 4**)
- For the Pharmacy Cohort, it was $8,716 ($7,408); the difference between the cohorts was statistically significant (t(2548.9) = -5.36, P<0.01)z

DISCUSSION

- Results of this real-world retrospective insurance claims analysis indicate that patients who obtained their CGM device and supplies through a DME supplier exhibited 25% higher adherence and incurred 15% lower healthcare costs than patients who did so through a pharmacy
- For individuals who experienced a lapse in therapy, 31% of DME patients restarted, while only 18% of pharmacy patients restarted
- DME providers' business model, which includes constant contact with patients to obtain consent for shipping and delivery, may be a reason for their higher adherence and reinitiation rates
- Given the effectiveness of CGM devices, the increasing prevalence of diabetes in the US and worldwide, and the ever-shifting insurance landscape, there is a need for further education among policymakers, providers, and insurance plans to ensure that patients receive and utilize CGM devices and supplies in the most cost-effective way

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Disclosures
Allaire has received consulting fees from CCS Medical; Dennis and Masturzo are employees of CCS Medical; Wittlin has nothing to disclose. The study was funded by CCS Medical.

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