Understanding the relationship between primary care provider (PCP) encounter cadence, medication adherence, and diabetes control

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Background

As healthcare in the U.S. moves toward value-based models, recommendations for primary care office visits must also adapt. Currents guidelines for treatment of type 2 diabetes mellitus (T2DM) do not include recommendations for how frequently patients should be seen by their primary care provider (PCP).[1] The generally accepted cadence for regular visits is every three months; however, there is scant evidence to support the rationale for this frequency.[2]

Objective

To evaluate the association between diabetes specific PCP encounter cadence, and adherence to non-insulin diabetes medications (NIDM) and HbA1c control, among Medicare Advantage patients newly diagnosed with T2DM

Methods

Study Design: Retrospective cohort
Data Source: Administrative medical, pharmacy, laboratory and enrollment data for individuals with Medicare Advantage Prescription Drug plan coverage from Humana
Study Sample:
- A cohort of 7,106 persons 65 to 85 years of age, newly diagnosed with T2DM between July 1, 2012 and June 30, 2013 (Index period, Figure 1) with continuous enrollment throughout the study period
  - Index date; date of incident T2DM diagnosis, measured during Index period
  - Newly diagnosed T2DM was defined by National Center for Quality Assurance (NCQA), Healthcare Effectiveness Data and Information Set (HEDIS) specifications.[3]

Exclusion Criteria:
- Patients with evidence of T2DM or a Charlson Comorbidity Index (CCI) score >3 during the the baseline period, or cancer, chronic kidney disease, end stage renal disease, hospice, or disability during the study period were excluded from the analysis.

Measures:
- Independent measure (measured during the 24 months following index date; Cadence period, Figure 1)
  - PCP encounter cadence was measured using two methods:
    1. Total PCP encounters (frequency)
    2. Number of quarters with a PCP encounter (regularity)
- Dependent measures (measured 25-36 months following the index date; Outcomes period, Figure 1)
  - NIDM adherence was measured using the proportion of days covered (PDC).
    - Adherence to medications defined as PDC ≥ 80.0%
  - HbA1c control was defined by NCQA, HEDIS specifications.[4]
    - HbA1c control (<8.0%)
    - Only patients with an HbA1c score in the Exposure/cadence and the Outcomes periods were included in the HbA1c control analysis.
- Covariates (measured during the Baseline period, with the exception of NIDM adherence, HbA1c control, and insulin use, which were measured in the Exposure/Cadence period)
  - Patient demographics: age, sex, race/ethnicity, rural/urban residency
  - Plan characteristics: Medicaid dual eligible, low income subsidy recipient, special needs program participant
  - CCI score and other chronic conditions (i.e., hypertension, coronary artery disease, heart failure, chronic obstructive pulmonary disease)
  - Adherence to NIDM and additional maintenance medications (i.e., renin-angiotensin system antagonists, statins) and insulin use

Statistical Analyses:
- Logistic regression models measured the association between PCP encounter cadence and dependent measures, and controlled for above-mentioned covariates.
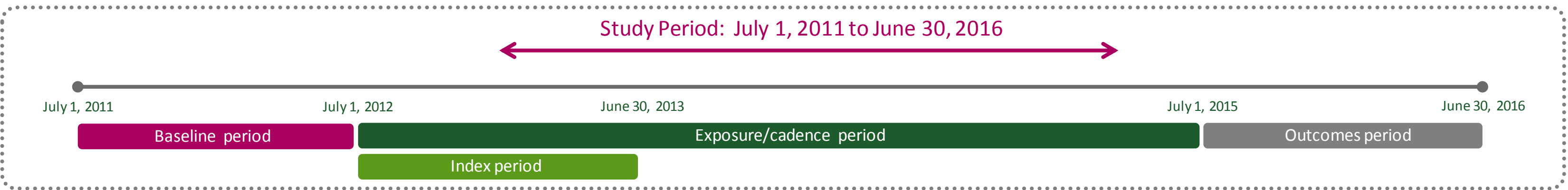
Results

Figure 1. Study Design

Study Period: July 1, 2011 to June 30, 2016

July 1, 2011 — July 1, 2012 — June 30, 2013 — July 1, 2015 — June 30, 2016

Baseline period — Exposure/cadence period — Outcomes period — Index period

Table 1. Patient Characteristics

Characteristic[a]	Total
N	7,106
Age	
Mean (SD)	72.4 (4.8)
Sex	
Female	3,639 (51.2%)
Race/Ethnicity	
White/Caucasian	5,748 (80.9%)
Black/African American	933 (13.1%)
Other	425 (6.0%)
Residency	
Rural	953 (13.4%)
Plan Characteristics	
Medicare-Medicaid Dual Eligibility	537 (7.6%)
Low Income Subsidy Recipient	829 (11.7%)
Special Needs Program Participant	148 (2.1%)
Charlson Comorbidity Index	
0	2,694 (37.9%)
1	1,995 (28.1%)
2	1,340 (18.9%)
3	1,077 (15.2%)
Comorbid Conditions	
Hypertension	3,799 (53.5%)
Coronary Artery Disease	880 (12.4%)
Heart Failure	159 (2.2%)
COPD	463 (6.5%)
NIDM adherence[b]	
Adherent	1,894 (26.7%)
Non-adherent	5,212 (73.3%)
HbA1c control[b,c]	
HbA1c <8.0%	2,750 (89.4%)
HbA1c ≥8.0%	326 (10.6%)
Insulin use[b]	
Insulin	275 (3.9%)

[a] Measured during the Baseline period; [b] Measured during the Exposure/cadence period; [c] Mean HbA1c value calculated only for patients with HbA1c score in both the Exposure/cadence and the Outcomes periods, (n=3,076); COPD, chronic obstructive pulmonary disease; ED, emergency department; HbA1c, glycated hemoglobin; PCP, primary care provider; SD, standard deviation

Table 2. NIDM Adherence in the Exposure/cadence and Outcomes Periods

Exposure/cadence Period	Outcomes Period		
	Non-adherent	Adherent	Total
Non-adherent	4,537 (63.9%)	675 (9.5%)	5,212 (73.3%)
Adherent	337 (4.7%)	1,557 (21.9%)	1,894 (26.6%)
Total	4,874 (68.6%)	2,232 (31.4%)	7,106 (100.0%)

Table 3. HbA1c Control in the Exposure/cadence and Outcomes Periods

Exposure/cadence Period	Outcomes Period		
	Not in Control	In Control	Total
Not in Control	138 (4.5%)	188 (6.1%)	326 (10.6%)
Control	119 (3.9%)	2,631 (85.5%)	2,750 (89.4%)
Total	257 (8.4%)	2,819 (91.6%)	3,076 (100.0%)

Table 4. Adjusted Odds of NIDM Adherence, for those Non-adherent in the Exposure/cadence Period (n=5,212)

PCP Encounter Cadence	OR	95% CI
Total PCP encounters	1.12	1.10, 1.15
Number of quarters with PCP encounter	1.27	1.22, 1.33

Each additional diabetes related PCP encounter increased the likelihood of adherence to NIDM by 12%, for those who were previously non-adherent.

Each additional quarter with a diabetes related PCP encounter increased the likelihood of adherence to NIDM by 27%, for those who were previously non-adherent.

Table 5. Adjusted Odds of HbA1c Control, for those Not in Control in the Exposure/cadence Period (n=326)

PCP Encounter Cadence	OR	95% CI
Total PCP encounters	1.06	1.00, 1.12
Number of quarters with PCP encounter	1.13	0.98, 1.30

A directional relationship was observed between PCP encounter cadence and HbA1c control (<8.0%), for those who were previously not in control (≥8.0%).

Conclusions

- Frequency and regularity of PCP encounters were associated with an improvement in adherence to NIDM.
- This study contributes to the data needed to establish evidence-based guidelines for PCP encounter cadence, for those newly diagnosed with T2DM.

Limitations

- Limitations common to claims data apply to this study (e.g., coding errors, missing data, fixed variables).
- Newly diagnosed T2DM patients were identified to the extent such information was available from administrative claims.
- Unmeasured confounding variables may have had an impact on patient outcomes.
- This study utilized data from a Medicare Advantage population newly diagnosed with T2DM from a single health plan; therefore, results may not be generalizable to other populations.

References

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Humana.