Optimizing Health by Advancing the Quality of Medication Use

Measure Overview and Rationale:
Proportion of Days Covered Composite [Health Plan] (PDC-CMP)

Description

The composite percentage of individuals ≥18 years of age who met the Proportion of Days Covered (PDC) threshold of 80% for diabetes medications, RAS antagonists, and statins during the measurement year.

This is a composite health plan performance measure that combines rates from the following component measures:

- Component 1: Proportion of Days Covered: Diabetes All-Class (PDC-DR)
- Component 2: Proportion of Days Covered: Renin Angiotensin System Antagonists (PDC-RASA)
- Component 3: Proportion of Days Covered: Statins (PDC-STA)

Additional Information

Intended Use	Performance measurement for health plans.

Composite Calculation

Step 1	Calculate each component rate separately for the PDC-DR, PDC-RASA, and PDC-STA measures using the PQA specifications and associated value sets. Note: Individuals are counted separately in the denominator and numerator of each component measure, even if they are included in the denominator and numerator of multiple component measures.
Step 2	Aggregate measure rates from each component measure by summing the denominators and numerators of each component measure. This is the composite denominator and numerator.
Step 3	Calculate the composite measure rate as the composite numerator divided by the composite denominator.

Rationale

The PDC Composite was developed in response to stakeholder support for a summary indicator of adherence focused on medications for treatment of common chronic conditions. Integration of measures into a composite is a natural progression in the measurement lifecycle, allowing continued measurement of important quality concepts while reducing the total number of measures required in a given program. For this reason, the PDC composite is anticipated to improve continued usability of PDC measures in quality programs.

Each of the 3 component measures are listed on the following pages, along with the respective rationale supporting each individual component measure.

Component 1: Proportion of Days Covered: Diabetes All Class (PDC-DR)

Description

The percentage of individuals ≥18 years of age who met the Proportion of Days Covered (PDC) threshold of 80% for diabetes medications during the measurement year.

A higher rate indicates better performance.

PQA Endorsed 2008 (NQF-Endorsed #0541).

Additional Information

Intended Use	Performance measurement for health plans.
Data Sources	Prescription claims, medical claims.
Denominator	Individuals ≥18 years of age with ≥2 prescription claims for any diabetes medications on different dates of service in the treatment period.
Exclusions	Hospice, end-stage renal disease (ESRD), ≥1 prescription claims for insulin during the treatment period.
Numerator	Individuals who met the PDC threshold of 80% during the measurement year.

Rationale

Diabetes mellitus is a chronic disease that has reached epidemic proportions in the U.S. and can lead to increased rates of heart disease, stroke and death. The UKPDS trial is the seminal research to link lowered A1c with health outcomes.[1] For those patients who require chronic medication therapy, adherence to hypoglycemic agents can lower blood sugar and decrease complications such as visual loss and renal failure.[2, 3] The 2018 American Diabetes Association Standards of Medical Care in Diabetes support strategies to improve medication adherence, and the guidelines state: "In general barriers to medication adherence (such as cost and side effects) should be identified and addressed."[4] The updated 2021 American Diabetes Association standards continue to support medication adherence.[5] Moreover, there are several studies showing improved clinical outcomes for patients who are adherent to their medications.

Roebuck and colleagues in 2011 showed that an increase in medication adherence (defined as the 80% threshold) reduced total annual health care spending, primarily through decreased inpatient hospital days and emergency department visits. Regarding patients with diabetes, adherence decreased annual medical spending by $4,413, providing a benefit-cost ratio of 6.7:1.[6] Another article by Roebuck and colleagues in 2018 assessed medication adherence on health service utilization in a Medicaid population. In this research, adherence was measured at a PDC level of 80% as defined by the Pharmacy Quality Alliance.[7]

Finally, a 2016 article by Boye and colleagues examined the association between adherence and outcomes. The results showed at higher adherence levels, all-cause acute care and outpatient costs declined. The mean outpatient and acute-care costs were $17,298 and $13,373 with a PDC ≥80% compared to $28,086 and $32,340 with a PDC <20% (P<0.005). The results were progressive based on each PDC interval (<20%; ≥20%-40%; ≥40%-60%; ≥60%-80%; ≥80%). Additionally, diabetes-related costs showed the same general trend.[8]

Patient impact analyses and cost estimates were conducted for the PDC-DR measure for PDPs and MA-PDs (2011–2015) as part of the 2018 National Impact Assessment of CMS Quality Measures.[9] Approximately 520,000 additional diabetes patients were adherent versus baseline, with associated savings of $659.5 million–$3.8 billion. These patient impact analyses and cost estimates were updated in the 2021 National Impact Assessment.[10] Updated estimates were 893,811 more beneficiaries adherent than expected and costs avoided of $3.4 billion–$7.2 billion.

Component 2: Proportion of Days Covered: Renin Angiotensin System Antagonists (PDC-RASA)

Description

The percentage of individuals ≥18 years of age who met the Proportion of Days Covered (PDC) threshold of 80% for RAS antagonists during the measurement year.

A higher rate indicates better performance.

PQA Endorsed 2008 (NQF-Endorsed #0541).

Additional Information

Intended Use	Performance measurement for health plans.
Data Sources	Prescription claims, medical claims.
Denominator	Individuals ≥18 years of age with ≥2 prescription claims for any RAS antagonists on different dates of service in the treatment period.
Exclusions	Hospice, end-stage renal disease (ESRD), ≥1 prescription claims for sacubitril/valsartan during the treatment period.
Numerator	Individuals who met the PDC threshold of 80% during the measurement year.

Rationale

Renin-angiotensin system antagonists (RASAs), including angiotensin-converting enzyme (ACE) inhibitors, angiotensin II receptor blockers (ARBs), and direct renin inhibitors are commonly used in the treatment of hypertension. RASAs are also important for the chronic treatment of hypertension and proteinuria in patients with diabetes, in which these drugs have been shown to delay renal failure and heart disease.[2] The 2017 American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines recommend ACE inhibitors and ARBs as first-line monotherapy for the treatment of hypertension along with thiazide diuretics and dihydropyridine calcium channel blockers (CCBs).[11] These recommendations are consistent with the 2018 and 2021 American Diabetes Association guidelines.[4, 5] According to these guidelines, medication nonadherence is a major contributor to poor control of hypertension and a key barrier to reducing mortality. Moreover, there are several studies showing improved clinical outcomes for patients who are adherent to their medications.[3]

One study examined patients who previously had a myocardial infarction. Those who achieved adherence to statins, beta-blockers, and ACE inhibitors/ARBs—measured by proportion of days covered (PDC) greater than 80%—had significantly better disease-free survival.[12] Another study showed that poor adherence to ACE inhibitors/ARBs was associated with a 20% increased risk of recurrent AMI.[13] A study by Roebuck and colleagues in 2018 assessed medication adherence on health service utilization in a Medicaid population.[7] This study found that the impact of adherence (PDC ≥80%) among Medicaid enrollees with hypertension was associated with a 15% reduction in inpatient hospitalizations, a 9% reduction in emergency department visits, and a 5% reduction in outpatient physician or clinic visits. In 2019 Axon et al.[14] analyzed the association of RASA adherence (PDC ≥80%) with healthcare utilization and expenditures among commercially-insured adults (N= 4,842,058). Adherence was associated with fewer inpatient (RR=0.612, 95% CI=0.607-0.617) and outpatient visits (RR=0.995, 95% CI=0.994, 0.997); and lower inpatient (CR=0.614, 95% CI=0.613-0.615) and total (CR=0.876, 95% CI=0.874-0.878) healthcare costs.

In 2019, Lloyd et al.[15] estimated the cost of medication nonadherence (PDC <80%) among Medicare fee-for-service beneficiaries with hypertension among other chronic diseases (N=14,657,735). Medication nonadherence was calculated to be 25% for hypertension. The authors estimated the avoidable health care costs that could be saved if nonadherent beneficiaries with hypertension became adherent was $13.7 billion annually.

Patient impact analyses and cost estimates were conducted for the PDC-RASA measure for PDPs and MA-PDs (2011–2015) as part of the 2018 National Impact Assessment of CMS Quality Measures.[9] Approximately 2.5 million additional RASA patients were adherent versus baseline, with associated savings

of $2.1 billion–$19.8 billion. These patient impact analyses and cost estimates were updated in the 2021 National Impact Assessment.[10] Updated estimates were 3.0 million more beneficiaries adherent than expected and costs avoided of $18.2 billion–$25.7 billion.

Component 3: Proportion of Days Covered: Statins (PDC-STA)

Description

The percentage of individuals ≥18 years of age who met the Proportion of Days Covered (PDC) threshold of 80% for statins during the measurement year.

A higher rate indicates better performance.

PQA Endorsed 2008 (NQF-Endorsed #0541).

Additional Information

Intended Use	Performance measurement for health plans.
Denominator	Individuals ≥18 years of age with ≥2 prescription claims for any statin or statin combination product on different dates of service in the treatment period.
Exclusions	Hospice and end-stage renal disease (ESRD).
Numerator	Individuals who met the PDC threshold of 80% during the measurement year.

Rationale

HMG-CoA reductase inhibitors, also known as statins, are recommended for the management of dyslipidemia and primary prevention of cardiovascular disease (CVD) in several treatment guidelines.[16-20] By lowering LDL cholesterol, statins decrease the risk of CVD morbidity and mortality.[21] Although long-term treatment with statins is effective in preventing CVD, patients often do not take their medications as prescribed. Numerous studies have shown improved clinical outcomes for patients who are adherent to their medications.[3] Specifically, in patients with dyslipidemia, adherence studies have shown a strong relationship between adherence to statins and reduced risk of CVD events, and lower overall health services utilization and costs.

One study evaluated the association between medication adherence levels and major adverse cardiovascular events (MACE) or atherosclerotic disease (ATH) over two years. Claims data with 4,015 post-MI patients and 12,976 patients with ATH from a large US health insurance company was analyzed. In the post-MI cohort, fully adherent (PDC≥80%) patients had a significantly lower rate of MACE than non-adherent patients (18.9% vs. 26.3%; hazard ratio [HR]: 0.73; p=0.0004). In the ATH cohort, fully adherent patients (PDC≥80%) had a significantly lower rate of MACE than non-adherent patients (8.42% vs. 17.17%; HR: 0.56; p<0.0001). This study showed PDC ≥80% adherence in the post-MI population was associated with a lower rate of MACE and ATH.[22] Another study aimed to evaluate the relationship between statin adherence and ischemic stroke (IS) in patients with diabetes. A cohort of 52,868 statin initiators with diabetes (1995–2006) using Finnish health registers was evaluated. Adherence to statins (PDC ≥80%) was associated with a 23% decreased incidence of IS (95% CI 14–32%) compared with non-adherence (PDC <80%). This association remained broadly unchanged when stratified by sex, age, history of atherosclerotic cardiovascular disease or IS. There was a dose–response relationship between adherence level and the risk of IS (RR 0.63 [0.53–0.75] for PDC ≥80% versus PDC <20%, p for trend <0.0001). Sensitivity analyses supported the robustness of the analysis.[23]

Roebuck and colleagues in 2011 showed an increase in medication adherence (defined as the 80% threshold) reduced total annual health care spending primarily through decreased inpatient hospital days and emergency department visits. Regarding dyslipidemia, adherence decreased annual medical spending by $1,860 for a benefit-cost ratio of 3.1.[6] Another article by Roebuck and colleagues in 2018 assessed medication adherence on health service utilization in a Medicaid population. In this research, adherence was measured at a PDC level of 80% as defined by the Pharmacy Quality Alliance. Medication adherence was significantly and negatively associated with outpatient physician and clinic visits for dyslipidemia.[7]

In 2014, Choudhry et al.[12] conducted a retrospective analysis to evaluate the relationship between medication adherence (PDC ≥80%) and post-myocardial infarction adverse coronary events (N=4,117).

Compared with patients randomized to usual care, patients who were adherent to statins, beta-blockers, and ACE/ARBs were significantly less likely to experience first major vascular event or revascularization (hazard ratio [HR] range, 0.64-0.81). In contrast, non-adherent patients showed no benefit (HR range, 0.98-1.04; P≤0.01 for the difference in HRs between adherent and non-adherent patients). Similar findings were observed with statin adherence. In 2019 Chinthammit et al.[24] evaluated the association of statin adherence (PDC ≥80%) with healthcare utilization and expenditures among commercially insured adults (N= 4,450,308). Adherence was associated with fewer inpatient visits (RR=0.746, 95% CI=0.739-0.753) and lower inpatient (CR=0.780, 95% CI=0.779-0.782) and total (CR=0.975, 95% CI=0.973-0.977) healthcare costs.

Patient impact analyses and cost estimates were conducted for the PDC-STA measure for PDPs and MA-PDs (2011–2015) as part of the 2018 National Impact Assessment of CMS Quality Measures.[9] Approximately 2.8 million additional statin patients were adherent versus baseline, with associated savings of $1.5 billion–$3.3 billion. These patient impact analyses and cost estimates were updated in the 2021 National Impact Assessment. Updated estimates were 4.0 million more beneficiaries adherent than expected and costs avoided of $5.4 billion–$13.7 billion.[10]

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