

Diabetes EDAC Empiric Validity and Evidence of Performance Gap

Empiric Validity

We explored validation through meaningful comparisons of the Diabetes Excess Days in Acute Care (EDAC) measure scores with those from existing quality metrics where we would expect to see a relationship.

To identify candidate measures for construct validity testing, we identified quality measures that fell within the same causal pathway as the Diabetes EDAC outcome. From that candidate list of measures, we determined which measures had data available publicly, at the hospital level. We then assessed the relationship between those measures and the Diabetes EDAC measure score, as described below.

We examined correlations between Diabetes EDAC measure scores and components of the Overall Hospital Quality Star Rating, including the Readmission Group Score (with and without the related Hospital-Wide Readmission (HWR) measure), and the Patient Experience Group score. Because the Diabetes EDAC measure score is on a lower-is-better scale, and the Star Rating measures are on a higher-is-better scale, we hypothesized that the Diabetes EDAC measure would be negatively correlated (weakly to moderately) with Star Rating-related measures. We calculated Pearson's correlation coefficients for the association between the Diabetes EDAC measure and these existing quality/cost measures on the same measured entities. For these analyses, we used calendar year (CY) 2022/2023 data for the Diabetes EDAC measure scores, and April 2025 Star Rating preview data with measure dates of data ranging from 07/2020 - 06/2023. The full methodology for the Overall Hospital Quality Star Rating can be found at:

https://qualitynet.cms.gov/files/603966dda413b400224ddf50?filename=Star_Rtngs_CompMthdly_v4.1.pdf

We did not provide patient/encounter validity testing because this is a claims-based measure; the fields used to specify the measure are structured, used for reimbursement, and audited. Claims data are widely seen as valid and reliable for use in quality measurement.

Below we describe the rationale behind the measures that were selected as comparator measures for construct validity testing.

- **Overall Hospital Quality Star Rating Readmission Group Score:** The Readmission Group Score is calculated as the simple average of measures within the Readmission Group, which includes hospital-level (inpatient) readmission measures (such as the Hospital-Wide Readmission measure, and measures that capture readmission following chronic obstructive pulmonary disease [COPD] or coronary artery bypass grafting [CABG] surgery), EDAC measures for other conditions (such as heart failure and pneumonia), and hospital visit measures following outpatient procedures (Centers for Medicaid & Medicare Services, 2025). Because there is evidence of effectiveness of broad-based interventions to reduce unplanned readmissions (Kripalani et al., 2013), we hypothesized that hospitals with lower (better) Diabetes EDAC

measure scores would also perform better on the composite Readmission Group Score. We note that all of these measures include only Medicare Fee-For-Service (FFS) patients and therefore we hypothesized a weak association between the Diabetes EDAC measure scores and the Readmission Group Score. We further hypothesized that removing the HWR measure (whose cohort overlaps with the Diabetes EDAC measure) from the Readmission Group Score, would result in a weaker association.

- **Patient Experience Group Score:** The Patient Experience Group Score is calculated from eight components (Centers for Medicaid & Medicare Services, 2025) of the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey (Centers for Medicaid & Medicare Services, 2024), including important components of care coordination both during and after hospitalization, and for this reason it was selected as a compactor measure. For example, components of HCAHPS in the Patient Experience Group Score include patients' assessments of doctor and nurse communication, and if patients understood their care when they left the hospital. The Patient Experience Group Score also includes patient reports of receiving discharge instructions, and reports of staff explaining patients' medications. HCAHPS is calculated for a sample of patients aged 18 and over; we therefore expect a weak negative association between patient experience and Diabetes EDAC.

We eliminated other comparator measures for the following reasons:

- Measures related to diabetes but without data for the correct setting (outpatient vs inpatient, or health plan vs inpatient), such as poor HbA1C control, relative resource use for diabetics.
- Measures related to diabetes that were not within the logic model (e.g. Diabetes Hospital Admissions per 100,000 Population (PQI 16))
- Measures related to diabetes that were in the logic model but for which no data were available at the time of testing, or with data that were voluntarily reported (e.g. Hypo/Hyperglycemia eCQMs)

Table 1 below provides Pearson correlation coefficients that show the relationship between the Diabetes EDAC measure score and related measures. Pearson correlation coefficients between the Diabetes EDAC measure and the comparator measures (Readmission Group Score, Readmission Group Score excluding HWR, and the Patient Experience Group Score) were -0.254, -0.232, and -0.175, respectively (all p-values <.0001). These results show a significant association with the expected strength and in the expected direction with measures in the same casual pathway, which supports the validity of the Diabetes EDAC measure.

Table 1. Diabetes EDAC: Association (Pearson Correlation Coefficients) between Measure Scores and Comparator Measures for Hospitals with ≥ 25 Eligible Admissions (Diabetes EDAC dates: January 1, 2022-December 31, 2023)

Comparison Measure	Number of Hospitals	Pearson Correlation Coefficient	p-value
Star Rating Standardized Readmission Group Scores	2,252	-0.254	<.0001
Star Rating Standardized Readmission Group Scores Excluding Hospital-Wide Readmission	2,231	-0.232	<.0001
Star Ratings Standardized Patient Experience Group Score	2,238	-0.175	<.0001

Star Rating preview data from the April 2025 release on Hospital Care Compare with measure dates of data ranging from 07/2020 – 06/2023

References

Centers for Medicare and Medicaid Services. Overall hospital quality star rating 2025.

<https://data.cms.gov/provider-data/topics/hospitals/overall-hospital-quality-star-rating/#measure-included-by-categories>

Centers for Medicare and Medicaid Services. HCAHPS: Patients' perspectives of care survey. 2024.

<https://www.cms.gov/medicare/quality/initiatives/hospital-quality-initiative/hcahps-patients-perspectives-care-survey>

Kripalani S, Theobald CN, Anctil B, Vasilevskis EE. Reducing hospital readmission rates: current strategies and future directions. *Annu Rev Med.* 2014;65:471-85. doi: 10.1146/annurev-med-022613-090415. Epub 2013 Oct 21. PMID: 24160939; PMCID: PMC4104507

Performance Gap

Table 2 shows that there is meaningful variation in the distribution of Diabetes EDAC measure scores (Excess Days in Acute Care per 100 discharges) using the most recent testing data (January 1, 2022 - December 31, 2023). Because the measure score is calculated as the difference between the predicted days (summed across all patients at any one hospital and accounting for case mix) and expected days (what would be expected for the average hospital with the same case mix), and then normalized by dividing by admission volume, a hospital performing better than expected will have a negative measure score, a hospital performing as expected will have a measure score of zero, and a hospital performing worse than expected will have a positive measure score.

Table 2. Diabetes EDAC: Hospital Distribution of Risk-Adjusted Measure Scores per 100 Discharges, January 1, 2022 – December 31, 2023 (N = 4,193)

Category	Value
Number of Hospitals	4,193
Mean (SD)	15.3 (80.6)
Range (min. to max.)	-124.5 to 1612.9
10 th Percentile	-55.1
25 th Percentile	-29.5
50 th Percentile	1.6
75 th Percentile	40.3
90 th Percentile	87.7