ASC Orthopedic Surgery Measure Submission to PQM: Figures and Tables

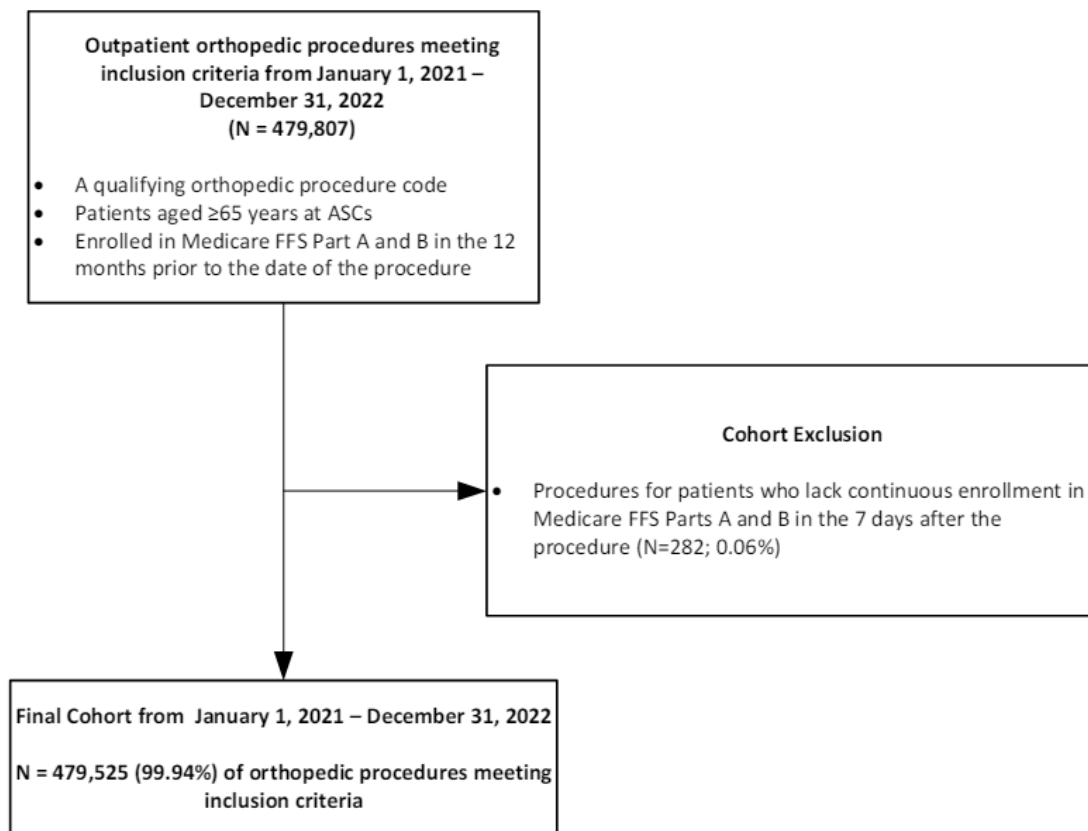## Table of Figures

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Figure 1. ASC Orthopedic Surgery: Cohort Flowchart

Figure 2. ASC Orthopedic Surgery: Logic Model

The conceptual model for outpatient orthopedic surgery quality at an ASC, shown below, shows the pathway by which facilities can modify the outcome (all-cause, unplanned hospital visits within 7 days of the orthopedic ASC procedure). For example, the model identifies that patient-level factors, such as comorbidities, increase the risk of unplanned hospitals visits (Bongiovanni et al., 2021). Better management of the risk associated with these comorbidities may be a potential avenue for facilities to reduce unplanned hospital visits. Provider-level factors (technical quality of the procedure, post-procedure provider accessibility), and facility-level factors (such as patient selection/risk assessment, pre- and post-discharge patient communication) may also contribute to the risk of unplanned hospital visits. Therefore, facilities may have opportunities to lower their unplanned hospital visit rates through quality-improvement efforts focused on patient, provider, and facility factors.

Facility/Provider Inputs

- Management of patient comorbidities/patient risk assessment
- Educating patients about symptoms to monitor, whom to contact with questions, and where and when to seek follow up care
- Facility/provider availability for patient follow up
- Ensuring high technical quality of the procedure
- Anesthesia choice/processes
- Following infection control processes
- Reconciling medications

Intermediate Outcomes/ Patient Outcomes

- Reduction in post-procedure complications
- Improved post-discharge follow up care
- Reduction in medication-related adverse events
- Improved patient self-management
- Improved overall patient health status

Facility/Health System Outcomes

- Reduced risk of post-discharge hospital visits

Table 1. ASC Orthopedic Surgery: Distribution of Measure Scores (2024 EM Dataset)

Characteristic	1/1/2021 – 12/31/2022
Number of facilities	2,961
Mean RSHV rate (SD)	2.20 (0.20)
Range (min – max)	1.01 – 3.68
25th percentile	2.12
50th percentile (median)	2.17
75th percentile	2.26

Table 2. ASC Orthopedic Surgery: Distribution of Measure Scores (2024 EM Dataset)

	Overall	Min	Decile 1	Decile 2	Decile 3	Decile 4	Decile 5	Decile 6	Decile 7	Decile 8	Decile 9	Decile 10	Max
Mean Score	2.20	1.01	1.88	2.05	2.12	2.15	2.17	2.18	2.20	2.27	2.35	2.62	3.68
Entities	2,961	-	296	296	296	296	296	297	296	296	296	296	-
Total number of procedures	479,525	-	130,182	62,806	30,971	23,194	12,331	7,742	31,979	37,052	48,494	94,774	-

Figure 3. ASC Orthopedic Surgery: Distribution of Measure Scores
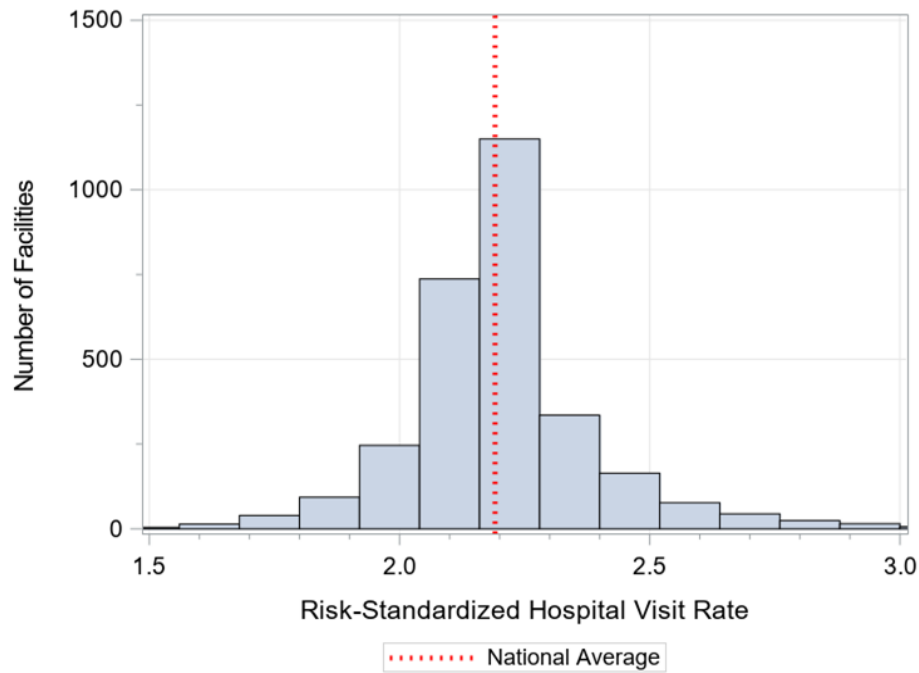
Table 3. ASC Orthopedic Surgery: Distribution of Signal-To-Noise Reliability (EM 2024 dataset)

Minimum Case Volume	Min-Max	25th Percentile	50th Percentile	75th Percentile
≥1 procedure (n=2,961 facilities)	0.019-0.982	0.185	0.531	0.798
≥35 procedures (n=1,754 facilities)	0.398-0.982	0.605	0.759	0.869

Table 4. ASC Orthopedic Surgery: Distribution of Signal-To-Noise Reliability (for Facilities With At least 35 Procedures)

Variable	Overall	Min	Decile 1	Decile 2	Decile 3	Decile 4	Decile 5	Decile 6	Decile 7	Decile 8	Decile 9	Decile 10	Max
Reliability	0.731	0.398	0.445	0.527	0.605	0.672	0.730	0.785	0.831	0.869	0.903	0.941	0.982
Measure score	2.21	2.15	2.22	2.19	2.19	2.22	2.23	2.24	2.20	2.19	2.19	2.17	1.62
Number of facilities	1,754	4	175	176	175	175	173	180	174	174	177	175	1
Number of procedures	465,902	140	7,454	10,455	14,261	19,043	24,863	34,940	45,576	61,468	88,313	159,529	2,898

Table 5. ASC Orthopedic Surgery: Frequency of Diagnosis Codes (Top 25) Associated with the Outcome (Post-Procedural Unplanned Hospital Visits)

Principal Diagnosis Code (ICD-10)	Principal Diagnosis Code Description	Frequency Count	Cumulative Percent
G8918	Other acute postprocedural pain	528	5.0
R55	Syncope and collapse	353	8.4
R339	Retention of urine, unspecified	297	11.2
K5900	Constipation, unspecified	284	13.9
R079	Chest pain, unspecified	164	15.5
R112	Nausea with vomiting, unspecified	162	17.0
R0789	Other chest pain	158	18.5
L7622	Postprocedural hemorrhage of skin and subcutaneous tissue following other procedure	156	20.0
A419	Sepsis, unspecified organism	141	21.3
M7989	Other specified soft tissue disorders	141	22.7
R0602	Shortness of breath	115	23.8
K5903	Drug induced constipation	108	24.8
I4891	Unspecified atrial fibrillation	107	25.8
R600	Localized edema	104	26.8
U071	COVID-19	104	27.8
R42	Dizziness and giddiness	101	28.8
J189	Pneumonia, unspecified organism	99	29.7
I10	Essential (primary) hypertension	97	30.6
N179	Acute kidney failure, unspecified	92	31.5
M25561	Pain in right knee	86	32.3
I2699	Other pulmonary embolism without acute cor pulmonale	85	33.1
R338	Other retention of urine	85	33.9
N390	Urinary tract infection, site not specified	81	34.7
Z4801	Encounter for change or removal of surgical wound dressing	81	35.5
E860	Dehydration	74	36.2

Table 6. ASC Orthopedic Surgery: Frequency of Model Risk Factors

Risk Factor (% unless otherwise indicated)	1/1/2021—12/31/2022
Total N	479,525
Age (years above 65): mean (SD)	7.56 (5.26)
Work Relative Value Units (work RVUs): mean (SD)	9.82 (5.55)
Cancer (CC 8-14)	19.43
Disorders of fluid/electrolyte/acid-base (CC 23, 24)	9.77
Other gastrointestinal disorders (CC 38)	36.08
Bone/joint/muscle infections/necrosis (CC 39)	1.77
Rheumatoid and osteoarthritis (CC 40, 41, 42)	54.04

Risk Factor (% unless otherwise indicated)	1/1/2021—12/31/2022
Dementia (CC 51-53)	3.20
Psychiatric disorders (CC 57-63)	18.35
Multiple sclerosis (CC 77)	0.34
Seizure disorders and convulsions (CC 79)	1.08
Congestive heart failure (CC 85)	5.39
Ischemic heart disease (CC 86-89)	17.31
Hypertension and hypertensive disorders (CC 94, 95)	57.73
Stroke (CC 99, 100)	1.56
Vascular disease (CC 106-109)	17.25
Chronic lung disease (CC 111-113)	13.11
Pneumonia (CC 114-116)	2.47
Other respiratory disorders (CC 118)	17.70
Chronic renal disease (CC 132, 134-140)	10.51
Chronic ulcers (CC 157-161)	2.87
Head injury (CC 166, 167, 168)	3.40
Major traumatic fracture or internal injury (CC 170-172)	4.17
Major symptoms, abnormalities (CC 178)	50.84
Minor symptoms, signs, findings (CC 179)	86.98
Morbid Obesity (CC 22 [remove ICD-10 E66.2])	2.96
Opioid abuse (ICD-10-CM individual codes)	0.66
Tobacco use disorder (ICD-10-CM individual codes)	3.29
Chronic anticoagulant use (ICD-10-CM individual codes)	6.54

Table 7. ASC Orthopedic Surgery: Facility-level Distribution of Patients with Social Risk Factors

Statistic	Dual Eligibility (Count)	Dual Eligibility (Percent)	High ADI (Count)	High ADI (Percent)
Minimum	0	0%	0	0%
10%	0	0%	0	0%
25%	0	0%	0	0%
50% (median)	1	1%	1	2%
75%	3	3%	7	9%
90%	8	9%	28	20%
Maximum	209	100%	783	100%

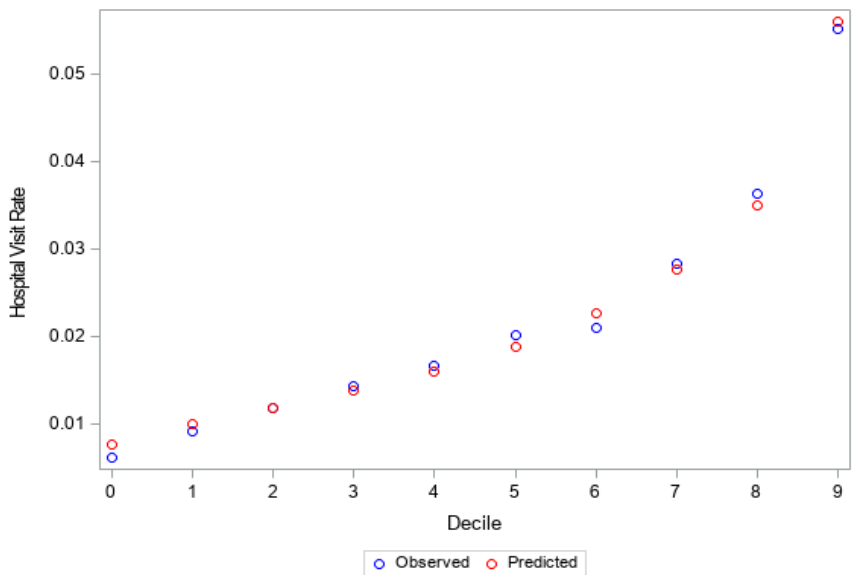**Table 8. ASC Orthopedic Surgery: Model Risk Variable Odds Ratios (ORs) and 95% CIs**

Risk Factor (% unless otherwise indicated)	1/1/2021 – 12/31/2022
Age (years above 65)	1.04 (1.03-1.04)
Work Relative Value Units	1.08 (1.08-1.09)
Cancer (CC 8-14)	0.91 (0.86-0.95)
Disorders of fluid/electrolyte/acid-base (CC 23, 24)	1.16 (1.10-1.24)
Other gastrointestinal disorders (CC 38)	1.12 (1.08-1.17)
Bone/joint/muscle infections/necrosis (CC 39)	1.35 (1.19-1.52)
Rheumatoid and osteoarthritis (CC 40, 41, 42)	1.11 (1.06-1.16)

| Risk Factor (% unless otherwise indicated)	1/1/2021 – 12/31/2022
Dementia (CC 51-53)	1.21 (1.11-1.33)
Psychiatric disorders (CC 57-63)	1.16 (1.10-1.22)
Multiple sclerosis (CC 77)	1.35 (1.01-1.79)
Seizure disorders and convulsions (CC 79)	1.51(1.31-1.73)
Congestive heart failure (CC 85)	1.19 (1.10-1.28)
Ischemic heart disease (CC 86-89)	1.11 (1.05-1.17)
Hypertension and hypertensive disorders (CC 94, 95)	1.04 (0.99-1.08)
Stroke (CC 99, 100)	1.18(1.04-1.34)
Vascular disease (CC 106-109)	1.16 (1.11-1.22)
Chronic lung disease (CC 111-113)	1.13(1.07-1.19)
Pneumonia (CC 114-116)	1.19 (1.08-1.32)
Other respiratory disorders (CC 118)	1.06 (1.01-1.12)
Chronic renal disease (CC 132, 134-140)	1.13 (1.06-1.19)
Chronic ulcers (CC 157-161)	1.31 (1.18-1.45)
Head injury (CC 166, 167, 168)	1.24 (1.13-1.35)
Major traumatic fracture or internal injury (CC 170-172)	1.13 (1.03-1.23)
Major symptoms, abnormalities (CC 178)	1.26(1.21-1.32)
Minor symptoms, signs, findings (CC 179)	1.11 (1.04-1.19)
Morbid Obesity (CC 22 [remove ICD-10 E66.2])	1.14 (1.03-1.26)
Opioid abuse (ICD-10-CM individual codes)	1.09 (0.90-1.33)
Tobacco use disorder (ICD-10-CM individual codes)	1.13 (1.03-1.25)
Chronic anticoagulant use (ICD-10-CM individual codes)	1.15 (1.08-1.23)

Notes: CC-related risk factors are defined by v24 of CC map.

OR=Odds ratio; CI=Confidence interval

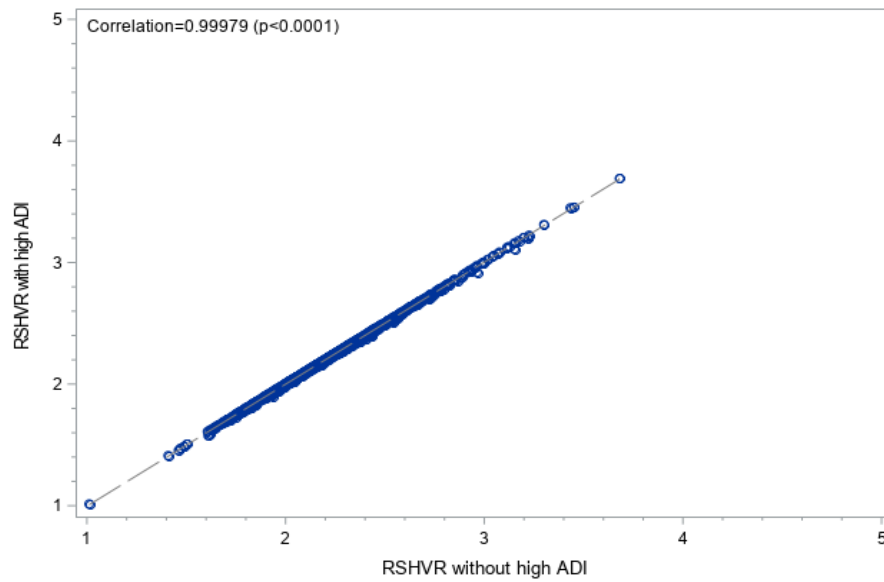**Figure 4. ASC Orthopedic Surgery: Risk-decile Plot (All Patients)**

Figure 5. ASC Orthopedic Surgery: Correlation Between Measure Scores Calculated with and without the DE Variable in the Risk Model
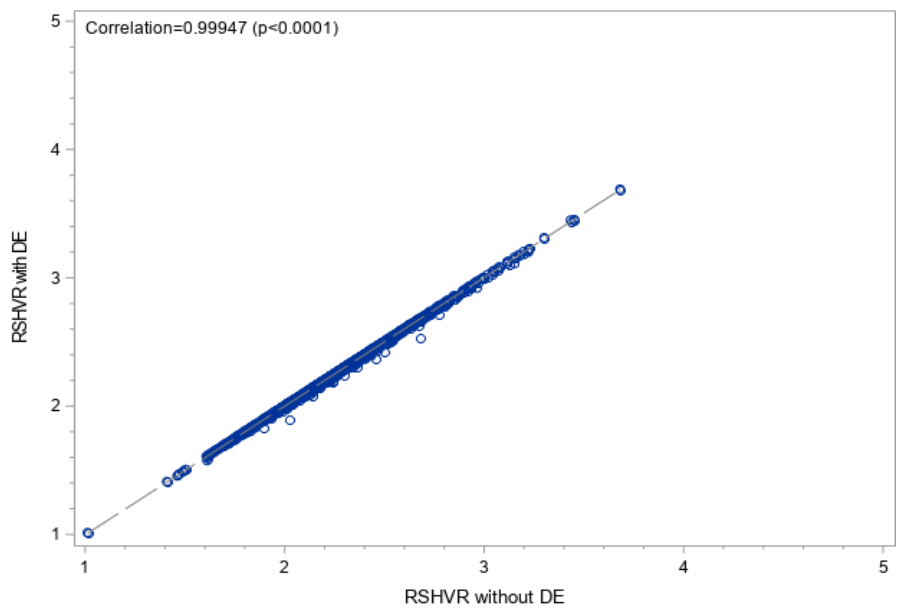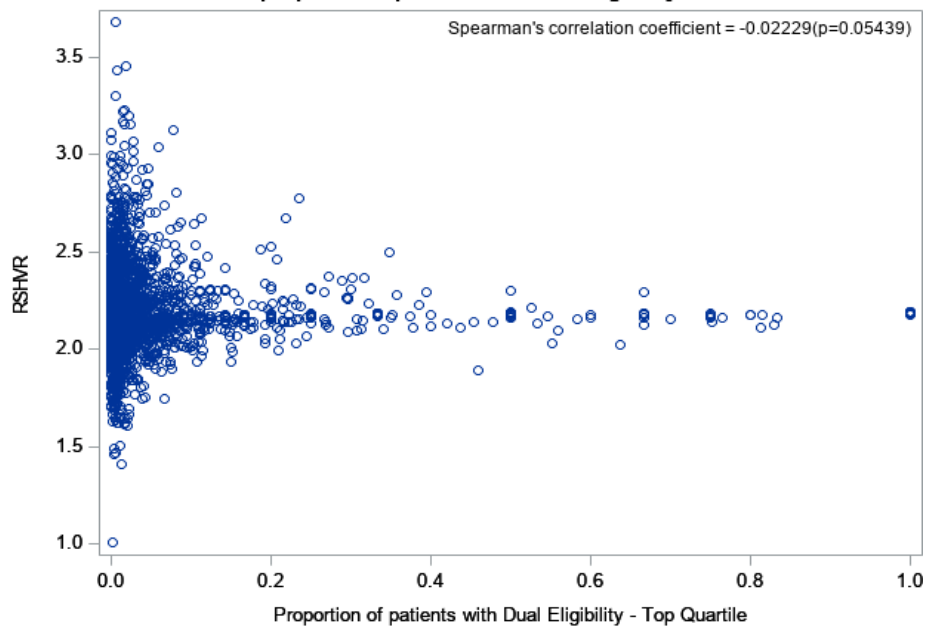
Figure 6. ASC Orthopedic Surgery: Correlation Between Measure Scores Calculated with and without the High ADI Variable in the Risk Model

Figure 7. ASC Orthopedic Surgery: Correlation Between Measure Scores and the Top Quartile of the Facility-Proportion of Patients with DE

Figure 8. ASC Orthopedic Surgery: Correlation Between Measure Scores and the Top Quartile of the Facility-Proportion of Patients with High ADI