# 2025 Reporting Period Measure Updates and Results Report

# Severe Obstetric Complications Electronic Clinical Quality Measure CMS1028v2

**Submitted By:**

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**Prepared For:**

Centers for Medicare & Medicaid Services (CMS)

**July 2025**

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## Acknowledgements

## Introduction

This report describes the Centers for Medicare & Medicaid Services' (CMS's) Severe Obstetric Complications (SOC) electronic clinical quality measure (eCQM) annual updates in measure methodology for the 2024 Performance Year/2025 Reporting Period. This period includes deliveries for calendar year 2024 and is the first year of mandatory reporting.

The measure includes inpatient hospitalizations for patients from 8 to under 65 years old delivering a live born or stillborn baby ≥ 20 weeks gestation. This measure risk adjusts for 34 patient-level conditions and is the first risk-standardized outcome eCQM that CMS has implemented. The measure assesses two outcomes, which are reported as rates per 10,000 deliveries:
1. Any SOC: Severe medical (i.e., sepsis, eclampsia, respiratory, cardiac, etc.) and procedural (i.e., hysterectomy) obstetric complications, including blood transfusions, and death during delivery hospitalization.
2. SOC excluding Transfusion-Only Cases: Severe obstetric complications excluding encounters where blood transfusion was the only complication.

The original measure methodology report is available in the "Specifications & Measure Resources" section on the Severe Obstetric Complications page here on eCQI Resource Center.

## Measure Updates

**Gestational Age.** The measure now allows for three approaches to determine gestational age (GA):
1. The GA is calculated using the American College of Obstetricians and Gynecologists ReVITALize guidelines.
2. The GA is obtained from a discrete field in the electronic health record. This option is only used when the calculated GA is not available.
3. The GA is based on ICD-10 or SNOMED codes indicative of weeks gestation. This option is only used when results from items #1 and #2 (see above) are not available.

**Blood Transfusion Value Set**: The Blood Transfusion value set (OID 2.16.840.1.113762.1.4.1029.213) to be used for the 2024 Performance Year/2025 Reporting Period contains 82 codes. It was determined that 33 of these codes are inconsistent with the intent of the measure and will erroneously place the patient in the numerator. These 33 codes referred to transfusions of products other than blood, such as immunoglobin. The 49 appropriate Blood Transfusion Value Set codes that should be included in CMS 1028v2 can be found in the Appendix.

## Measure Results

In the 2025 Reporting Period, 2,395[1] hospitals reported data for 3,270,794 deliveries. Table 1 summarizes hospital-level outcomes, including the observed and the risk-standardized rate per

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[1] 22 hospitals were excluded from measure calculations, including risk model, due to erroneous data

10,000 deliveries for severe obstetric complications and severe obstetric complications excluding blood transfusion-only encounters.

**Table 1. Hospital-Level Observed and Risk Standardized Severe Obstetric Complication Rate, N= 2,395 hospitals**

| Outcome | Mean (SD) | Median (25%tile (Q1), 75%tile (Q3)) |
|---|---|---|
| **Severe Obstetric Complications** | | |
| Observed Rate of Severe Obstetric Complications (per 10,000) | 254 (516) | 200 (89, 314) |
| Risk Standardized Rate of Severe Obstetric Complications (per 10,000) | 313 (225) | 278 (170, 399) |
| **Severe Obstetric Complications Excluding Blood Transfusion-only Encounters** | | |
| Observed Rate of Severe Obstetric Complications (per 10,000) | 50 (386) | 18 (0, 48) |
| Risk Standardized Rate of Severe Obstetric Complications (per 10,000) | 52 (67) | 44 (36, 58) |

Table 2 summarizes observed (unadjusted) delivery-level outcomes, including any severe obstetric complication, severe obstetric complications excluding blood transfusion-only encounters, and individual clinical or procedural events during the delivery hospitalization identified as a severe obstetric complication. Frequencies and percentages of deliveries with each of the outcomes are presented. Singular numerator events are not mutually exclusive; delivery encounters in which multiple numerator events occurred are included in the frequency for each numerator event experienced. Overall, patients in 2.49% of delivery hospitalizations had a severe obstetric complication. Patients in 0.47% of delivery hospitalizations had a severe obstetric complication other than a blood transfusion. Of the individual severe obstetric complications assessed, patients in 2.19% of delivery hospitalizations experienced a blood transfusion; the next most frequent severe complications were acute renal failure (0.14% of deliveries) and sepsis (0.1% of deliveries).

**Table 2. Observed Frequencies of Delivery-Level Outcomes (N= 3,270,794)**

| Outcome | N with outcome | % with outcome |
|---|---|---|
| **Overall Outcomes** | — | — |
| Severe Obstetric Complications | 81,605 | 2.49 |
| Severe Obstetric Complications excluding Blood Transfusion-only Encounters | 15,290 | 0.47 |
| **Outcome Components** | — | — |
| Blood transfusion | 71,561 | 2.19 |
| Acute Renal failure | 4,557 | 0.14 |

| Outcome | N with outcome | % with outcome |
|---|---|---|
| Sepsis | 3,234 | 0.10 |
| Adult respiratory distress syndrome | 2,920 | 0.09 |
| Shock | 2,754 | 0.08 |
| Hysterectomy | 2,419 | 0.07 |
| Disseminated intravascular coagulation | 1,753 | 0.05 |
| Ventilation | 1,019 | 0.03 |
| Pulmonary edema | 863 | 0.03 |
| Eclampsia | 788 | 0.02 |
| Air and thrombotic embolism | 555 | 0.02 |
| Acute heart failure | 490 | 0.01 |
| Puerperal cerebrovascular disorder | 431 | 0.01 |
| Cardiac arrest/Ventricular fibrillation | 299 | 0.01 |
| Conversion of cardiac rhythm | 208 | 0.01 |
| Death | 170 | 0.01 |
| Severe anesthesia complications | 162 | <0.01 |
| Acute myocardial infarction | 160 | <0.01 |
| Amniotic fluid embolism | 153 | <0.01 |
| Sickle cell disease with crisis | 95 | <0.01 |
| Heart failure/arrest during procedure or surgery | 58 | <0.01 |
| Temporary tracheostomy | 24 | <0.01 |
| Aortic aneurysm | 21 | <0.01 |

**Risk Model**

The SOC eCQM is risk adjusted to account for patient-level factors that are clinically relevant, have strong relationships with the outcome, and are outside of the control of the reporting entity. The risk variables consist of 34 conditions present on admission to hospital, including two vital signs and two lab results obtained upon hospital arrival.

Table 3 shows frequencies with coefficients and adjusted odds ratios (ORs) with 95% confidence intervals (CI) for the variables in the hierarchical logistic regression model, which accounts for risk factors, the natural clustering of observations within hospitals, and hospital-specific random effects. Adjusted ORs illustrate that placental conditions (placenta previa, placental abruption, placental accreta spectrum) greatly increase the risk of a severe obstetric complication. These data also indicate that pulmonary hypertension and renal disease, with adjusted ORs greater than 3, considerably elevate the risk of a severe obstetric complication.

**Table 3. Risk Variables Frequencies with Coefficients* and Odds Ratio for Risk Models for Both Severe Obstetric Complications Outcomes**

| — | | Severe Obstetric Complication(s) | | Severe Obstetric Complication(s) Excluding Blood Transfusion-Only Encounters | |
|---|---|---|---|---|---|
| **Risk variable** | **Total N (%)** | **Estimate (β1)** | **OR (95% CI)** | **Estimate (β1)** | **OR (95% CI)** |
| Intercept | — | -4.572 | 0.01 (<0.01, 0.01) | -6.616 | <0.01 (<0.01, <0.01) |
| Anemia | 429,855 (13.14) | 0.558 | 1.75 (1.71, 1.78) | 0.314 | 1.37 (1.31, 1.43) |
| Asthma | 172,205 (5.26) | 0.116 | 1.12 (1.09, 1.16) | 0.443 | 1.56 (1.48, 1.64) |
| Autoimmune Disease | 6,740 (0.21) | 0.093 | 1.10 (0.98, 1.23) | — | — |
| Bariatric Surgery | 15,711 (0.48) | 0.015 | 1.02 (0.93, 1.10) | -0.285 | 0.75 (0.63, 0.91) |
| Bleeding Disorder | 64,325 (1.97) | 0.580 | 1.79 (1.72, 1.85) | 0.571 | 1.77 (1.65, 1.90) |
| BMI >= 40 | 99,245 (3.03) | 0.037 | 1.04 (1.00, 1.08) | 0.250 | 1.28 (1.20, 1.37) |
| Cardiac Disease | 28,037 (0.86) | 0.666 | 1.95 (1.85, 2.04) | 1.202 | 3.33 (3.10, 3.57) |
| Economic Housing Instability | 32,003 (0.98) | 0.202 | 1.22 (1.15, 1.30) | 0.400 | 1.49 (1.34, 1.66) |
| Gastrointestinal Disease | 37,906 (1.16) | 0.334 | 1.40 (1.33, 1.47) | 0.493 | 1.64 (1.49, 1.80) |
| Gestational Diabetes | 234,640 (7.17) | -0.001 | 1.00 (0.97, 1.03) | 0.002 | 1.00 (0.95, 1.06) |
| HIV | 2,218 (0.07) | 0.037 | 1.04 (0.85, 1.26) | — | — |
| Hypertension | 97,343 (2.98) | -0.139 | 0.87 (0.84, 0.90) | -0.169 | 0.84 (0.79, 0.90) |
| Long Term Anticoagulant Use | 7,372 (0.23) | 0.291 | 1.34 (1.21, 1.49) | — | — |
| Maternal Age in Years | — | — | — | — | — |
| Age <20 | 127,464 (3.90) | Reference | — | Reference | — |
| Age 20-25 | 550,445 (16.83) | -0.200 | 0.82 (0.79, 0.85) | -0.054 | 0.95 (0.86, 1.05) |
| Age 25-30 | 890,975 (27.24) | -0.330 | 0.72 (0.69, 0.74) | -0.072 | 0.93 (0.84, 1.03) |
| Age 30-35 | 1,004,340 (30.71) | -0.292 | 0.75 (0.72, 0.77) | 0.076 | 1.08 (0.98, 1.19) |

| Risk variable | Total N (%) | Severe Obstetric Complication(s) | | Severe Obstetric Complication(s) Excluding Blood Transfusion-Only Encounters | |
|---|---|---|---|---|---|
| | | Estimate (β1) | OR (95% CI) | Estimate (β1) | OR (95% CI) |
| Age 35-40 | 561,723 (17.17) | -0.166 | 0.85 (0.82, 0.88) | 0.266 | 1.30 (1.18, 1.44) |
| Age 40+ | 135,847 (4.15) | 0.025 | 1.03 (0.98, 1.07) | 0.534 | 1.71 (1.53, 1.90) |
| Mental Health Disorder | 302,665 (9.25) | 0.040 | 1.04 (1.02, 1.07) | 0.096 | 1.10 (1.05, 1.15) |
| Multiple Pregnancy | 39,563 (1.21) | 0.859 | 2.36 (2.27, 2.45) | 0.303 | 1.35 (1.24, 1.48) |
| Neuromuscular | 13,210 (0.40) | 0.327 | 1.39 (1.27, 1.51) | 0.702 | 2.02 (1.75, 2.33) |
| Obstetrical VTE | 661 (0.02) | 0.190 | 1.21 (0.85, 1.71) | — | — |
| Other Preeclampsia | 284,341 (8.69) | 0.198 | 1.22 (1.19, 1.25) | 0.272 | 1.31 (1.25, 1.38) |
| Placenta Previa | 11,793 (0.36) | 1.231 | 3.42 (3.21, 3.65) | 0.750 | 2.12 (1.89, 2.37) |
| Placental Abruption | 23,736 (0.73) | 1.351 | 3.86 (3.70, 4.04) | 0.916 | 2.50 (2.29, 2.73) |
| Placental Accreta Spectrum | 3,003 (0.09) | 3.263 | 26.13 (23.92, 28.54) | 3.831 | 46.12 (41.65, 51.07) |
| Preexisting Diabetes | 48,509 (1.48) | 0.125 | 1.13 (1.08, 1.19) | 0.157 | 1.17 (1.08, 1.27) |
| Preterm Birth | 325,930 (9.96) | 0.385 | 1.47 (1.44, 1.50) | 0.787 | 2.20 (2.10, 2.29) |
| Previous Cesarean | 422,984 (12.93) | 0.268 | 1.31 (1.28, 1.33) | 0.070 | 1.07 (1.03, 1.12) |
| Pulmonary Hypertension | 675 (0.02) | 1.500 | 4.48 (3.68, 5.46) | 1.663 | 5.27 (4.19, 6.64) |
| Renal Disease | 7,225 (0.22) | 1.128 | 3.09 (2.87, 3.33) | 1.632 | 5.11 (4.64, 5.63) |
| Severe Preeclampsia | 116,272 (3.55) | 0.751 | 2.12 (2.06, 2.18) | 1.122 | 3.07 (2.91, 3.24) |
| Substance Abuse | 110,291 (3.37) | 0.077 | 1.08 (1.04, 1.12) | 0.254 | 1.29 (1.20, 1.38) |
| Thyrotoxicosis | 9,021 (0.28) | 0.123 | 1.13 (1.01, 1.27) | 0.339 | 1.40 (1.15, 1.71) |
| **Grouped: Autoimmune Disease or HIV | 8,954 (0.27) | — | — | 0.120 | 1.13 (0.95, 1.34) |

| Risk variable | Total N (%) | Severe Obstetric Complication(s) | | Severe Obstetric Complication(s) Excluding Blood Transfusion-Only Encounters | |
|---|---|---|---|---|---|
| | | Estimate (β1) | OR (95% CI) | Estimate (β1) | OR (95% CI) |
| **Grouped: Long Term Anticoagulant Use or Obstetrical VTE | 7,779 (0.24) | — | — | 0.674 | 1.96 (1.68, 2.29) |
| Labs – Hematocrit | — | — | — | — | — |
| Result <33 | 646,651 (19.77) | 1.029 | 2.80 (2.75, 2.84) | 0.185 | 1.20 (1.15, 1.25) |
| Result >=33 | 2,258,404 (69.05) | Reference | — | Reference | — |
| Missing | 365,739 (11.18) | 0.209 | 1.23 (1.13, 1.35) | 0.141 | 1.15 (0.97, 1.37) |
| Labs – WBC | — | — | — | — | — |
| Result <14 | 2,493,430 (76.23) | Reference | — | Reference | — |
| Result >=14 | 304,856 (9.32) | 0.152 | 1.16 (1.14, 1.19) | 0.387 | 1.47 (1.40, 1.55) |
| Missing | 472,508 (14.45) | 0.122 | 1.13 (1.04, 1.23) | 0.003 | 1.00 (0.85, 1.19) |
| Vitals – Heart Rate | — | — | — | — | — |
| Result <110 | 2,538,812 (77.62) | Reference | — | Reference | — |
| Result >=110 | 219,628 (6.71) | 0.231 | 1.26 (1.23, 1.29) | 0.489 | 1.63 (1.55, 1.72) |
| Missing | 512,354 (15.66) | -0.063 | 0.94 (0.88, 1.00) | -0.037 | 0.96 (0.85, 1.09) |
| Vitals – Systolic BP | — | — | — | — | — |
| Result <140 | 2,382,284 (72.84) | Reference | — | Reference | — |
| Result >=140 & <160 | 350,956 (10.73) | 0.271 | 1.31 (1.28, 1.34) | 0.164 | 1.18 (1.12, 1.24) |
| Result >=160 | 77,353 (2.36) | 0.481 | 1.62 (1.56, 1.68) | 0.340 | 1.41 (1.31, 1.51) |
| Missing | 460,201 (14.07) | 0.218 | 1.24 (1.17, 1.33) | 0.273 | 1.31 (1.15, 1.50) |

*Coefficients are estimated by a hierarchical logistic regression model with hospital-specific random intercept.

**Due to low prevalence of select risk variables, Human Immunodeficiency Virus (HIV) was combined with autoimmune disease, and obstetric venous thromboembolism (VTE) was combined with long-term anticoagulant medication use.

## Appendix

**CMS1028v2 Blood Transfusion Value Set Codes, Consistent with Numerator Criteria**

| Code | Description | Code System |
|---|---|---|
| 30243T1 | Transfusion of Nonautologous Fibrinogen into Central Vein, Percutaneous Approach | ICD10PCS |
| 30243T0 | Transfusion of Autologous Fibrinogen into Central Vein, Percutaneous Approach | ICD10PCS |
| 30243R1 | Transfusion of Nonautologous Platelets into Central Vein, Percutaneous Approach | ICD10PCS |
| 30243R0 | Transfusion of Autologous Platelets into Central Vein, Percutaneous Approach | ICD10PCS |
| 30243P1 | Transfusion of Nonautologous Frozen Red Cells into Central Vein, Percutaneous Approach | ICD10PCS |
| 30243P0 | Transfusion of Autologous Frozen Red Cells into Central Vein, Percutaneous Approach | ICD10PCS |
| 30243N1 | Transfusion of Nonautologous Red Blood Cells into Central Vein, Percutaneous Approach | ICD10PCS |
| 30243N0 | Transfusion of Autologous Red Blood Cells into Central Vein, Percutaneous Approach | ICD10PCS |
| 30243M1 | Transfusion of Nonautologous Plasma Cryoprecipitate into Central Vein, Percutaneous Approach | ICD10PCS |
| 30243M0 | Transfusion of Autologous Plasma Cryoprecipitate into Central Vein, Percutaneous Approach | ICD10PCS |
| 30243L1 | Transfusion of Nonautologous Fresh Plasma into Central Vein, Percutaneous Approach | ICD10PCS |
| 30243L0 | Transfusion of Autologous Fresh Plasma into Central Vein, Percutaneous Approach | ICD10PCS |
| 30243K1 | Transfusion of Nonautologous Frozen Plasma into Central Vein, Percutaneous Approach | ICD10PCS |
| 30243K0 | Transfusion of Autologous Frozen Plasma into Central Vein, Percutaneous Approach | ICD10PCS |
| 30243H1 | Transfusion of Nonautologous Whole Blood into Central Vein, Percutaneous Approach | ICD10PCS |
| 30243H0 | Transfusion of Autologous Whole Blood into Central Vein, Percutaneous Approach | ICD10PCS |
| 30233T1 | Transfusion of Nonautologous Fibrinogen into Peripheral Vein, Percutaneous Approach | ICD10PCS |
| 30233T0 | Transfusion of Autologous Fibrinogen into Peripheral Vein, Percutaneous Approach | ICD10PCS |
| 30233R1 | Transfusion of Nonautologous Platelets into Peripheral Vein, Percutaneous Approach | ICD10PCS |
| 30233R0 | Transfusion of Autologous Platelets into Peripheral Vein, Percutaneous Approach | ICD10PCS |

| Code | Description | Code System |
|---|---|---|
| 30233P1 | Transfusion of Nonautologous Frozen Red Cells into Peripheral Vein, Percutaneous Approach | ICD10PCS |
| 30233P0 | Transfusion of Autologous Frozen Red Cells into Peripheral Vein, Percutaneous Approach | ICD10PCS |
| 30233N1 | Transfusion of Nonautologous Red Blood Cells into Peripheral Vein, Percutaneous Approach | ICD10PCS |
| 30233N0 | Transfusion of Autologous Red Blood Cells into Peripheral Vein, Percutaneous Approach | ICD10PCS |
| 30233M1 | Transfusion of Nonautologous Plasma Cryoprecipitate into Peripheral Vein, Percutaneous Approach | ICD10PCS |
| 30233M0 | Transfusion of Autologous Plasma Cryoprecipitate into Peripheral Vein, Percutaneous Approach | ICD10PCS |
| 30233L1 | Transfusion of Nonautologous Fresh Plasma into Peripheral Vein, Percutaneous Approach | ICD10PCS |
| 30233L0 | Transfusion of Autologous Fresh Plasma into Peripheral Vein, Percutaneous Approach | ICD10PCS |
| 30233K1 | Transfusion of Nonautologous Frozen Plasma into Peripheral Vein, Percutaneous Approach | ICD10PCS |
| 30233K0 | Transfusion of Autologous Frozen Plasma into Peripheral Vein, Percutaneous Approach | ICD10PCS |
| 30233H1 | Transfusion of Nonautologous Whole Blood into Peripheral Vein, Percutaneous Approach | ICD10PCS |
| 30233H0 | Transfusion of Autologous Whole Blood into Peripheral Vein, Percutaneous Approach | ICD10PCS |
| 426290002 | Transfusion of washed red blood cells (procedure) | SNOMEDCT |
| 425513008 | Transfusion of leucoreduced red blood cells (procedure) | SNOMEDCT |
| 288170000 | Packed blood cell transfusion (procedure) | SNOMEDCT |
| 225284006 | Transfusing whole blood under pressure (procedure) | SNOMEDCT |
| 180208003 | Intravenous blood transfusion of platelets (procedure) | SNOMEDCT |
| 180207008 | Intravenous blood transfusion of packed cells (procedure) | SNOMEDCT |
| 180206004 | Intra-arterial blood transfusion (procedure) | SNOMEDCT |
| 117078000 | Transfusion of platelet concentrate (procedure) | SNOMEDCT |
| 116863004 | Transfusion of red blood cells (procedure) | SNOMEDCT |
| 116861002 | Transfusion of fresh frozen plasma (procedure) | SNOMEDCT |
| 116795008 | Transfusion of cryoprecipitate (procedure) | SNOMEDCT |
| 71493000 | Transfusion of packed red blood cells (procedure) | SNOMEDCT |
| 54790000 | Transfusion of blood component (procedure) | SNOMEDCT |
| 33389009 | Transfusion of whole blood (procedure) | SNOMEDCT |
| 13569004 | Transfusion of plasma (procedure) | SNOMEDCT |
| 12719002 | Platelet transfusion (procedure) | SNOMEDCT |
| 11397000 | Autotransfusion of whole blood (procedure) | SNOMEDCT |