2025 Reporting Period Measure Updates and Results Report

Severe Obstetric Complications Electronic Clinical Quality Measure CMS1028v2

Submitted By:

Yale New Haven Health Services Corporation — Center for Outcomes Research and Evaluation (YNHHSC/CORE)

Prepared For:

Centers for Medicare & Medicaid Services (CMS)

July 2025

Center for Outcomes Research and Evaluation Project Team

Elizabeth Triche, Ph.D. – Division Director

Valery Danilack-Fekete, M.P.H., Ph.D.* — Division Supervisor

Monika Grzeniewski, M.P.H. — Division Lead

Kathleen M.B. Balestracci, Ph.D., M.S.W. – Subject Matter Expert

Anna Felger, M.P.H. — Project Manager

Rachelle Zribi, B.A. — Team Lead

Madeline L. Parisi, B.A. — Research Project Coordinator

Ji Chen, Ph.D.* — Measure Lead Analyst

Zhen Tan, M.S.* — Measure Lead Analyst

Lisa G. Suter, M.D.* — Senior Director

Acknowledgements

This work is a collaborative effort, and the authors gratefully acknowledge The Joint Commission (TJC) and Raquel Myers, Melissa Hager, Ngozi Uzokwe, Stephanie Clark, Dan Green, and Rebekah Natanov at CMS for their contributions to this work.

^{*} Yale School of Medicine

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, 2,395¹ hospitals reported data for 3,270,794 deliveries. <u>Table 1</u> summarizes hospital-level outcomes, including the observed and the risk-standardized rate per

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	254 (516)	200		
10,000)	234 (310)	(89, 314)		
Risk Standardized Rate of Severe Obstetric	212 (225)	278		
Complications (per 10,000)	313 (225)	(170, 399)		
Severe Obstetric Complications Excluding Blood Transfusion-only Encounters				
Observed Rate of Severe Obstetric Complications (per	50 (386)	18		
10,000)	50 (560)	(0, 48)		
Risk Standardized Rate of Severe Obstetric	F2 (67)	44		
Complications (per 10,000)	52 (67)	(36, 58)		

<u>Table 2</u> 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	15,290	0.47
Transfusion-only Encounters		
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.

<u>Table 3</u> 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 cation(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)
ніV	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)	_	Ι
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)

_		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)
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)

_		Severe Obstetric Complication(s)		Severe Obstetric Complication(s) Excludin Blood Transfusion-Only Encounters	
Risk variable	Total N (%)	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	ICD10PCS	
30233F1	Vein, Percutaneous Approach	ICD10FC3	
30233P0	Transfusion of Autologous Frozen Red Cells into Peripheral Vein,	ICD10PCS	
302331 0	Percutaneous Approach	160101 65	
30233N1	Transfusion of Nonautologous Red Blood Cells into Peripheral	ICD10PCS	
30233111	Vein, Percutaneous Approach	165101 65	
30233N0	Transfusion of Autologous Red Blood Cells into Peripheral Vein,	ICD10PCS	
	Percutaneous Approach		
30233M1	Transfusion of Nonautologous Plasma Cryoprecipitate into	ICD10PCS	
	Peripheral Vein, Percutaneous Approach		
30233M0	Transfusion of Autologous Plasma Cryoprecipitate into	ICD10PCS	
	Peripheral Vein, Percutaneous Approach		
30233L1	Transfusion of Nonautologous Fresh Plasma into Peripheral	ICD10PCS	
	Vein, Percutaneous Approach		
30233L0	Transfusion of Autologous Fresh Plasma into Peripheral Vein,	ICD10PCS	
	Percutaneous Approach		
30233K1	Transfusion of Nonautologous Frozen Plasma into Peripheral	ICD10PCS	
	Vein, Percutaneous Approach		
30233K0	Transfusion of Autologous Frozen Plasma into Peripheral Vein,	ICD10PCS	
	Percutaneous Approach		
30233H1	Transfusion of Nonautologous Whole Blood into Peripheral Vein, Percutaneous Approach	ICD10PCS	
	Transfusion of Autologous Whole Blood into Peripheral Vein,		
30233H0	Percutaneous Approach		
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 rryoprecipitate (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	
11337000	Autotransiasion or whole blood (procedure)	SINGIVILDEI	