Appendix 1. Diagnosis Codes

Diagnosis	ICD9* Code	ICD10† Code	Hospital Procedure Code
Chronic hypertension	642.0, 642.1, 642.2, 401.9, 402, 403, 404, 405	O10.1, O10.2, O10.3, O10.4, O10.9, I10, I11, I12, I13, I15, I16	NA‡
Gestational hypertension	642.3, 642.9	O13.001, O13.002, O13.003, O13.003, O13.004, O13.009, O13.4, O13.3	NA
Preeclampsia	642.4, 642.5	O14.001, O14.002, O14.003, O14.004, O14.009, 016.001, O16.002, O16.003, O16.004, O16.009	NA
Superimposed preeclampsia	642.7	O11.001, O11.002, O11.003, O11.004, O11.009	NA
Type 1 Diabetes Mellitus	V58.67, 250.0, 250.01, 250.11, 250.13, 250.41, 250.43, 250.51, 250.53, 250.61, 250.63, 250.71, 250.73, 250.91, 250.93	O24.01, O23.02, O24.03, E10	NA
Type 2 Diabetes Mellitus	250.02, 250.10, 250.12, 250.40, 250.42, 250.50, 250.52, 250.60, 250.62, 250.70, 250.72, 250.90, 250.92	O24.1, O24.3, O24.8, O24.9, E11	NA
Gestational Diabetes	648.8	O24.4	NA
Pre-labor rupture of membranes	658.1, 658.2	O42	NA
Fetal growth restriction	656.5	O36.5	NA
Oligohydramnios	658.0	O41.0	NA
Chorioamnionitis	658.4	O41.12	NA
Postpartum hemorrhage	666	O72	NA
Blood transfusion			Nursing codes: transfuse red blood cells, transfuse massive transfusion red blood cells

McAdow M, Xu X, Lipkind H, Reddy UM, Illuzzi J. Association of oxytocin rest during labor induction of nulliparous women and its association with mode of delivery. Obstet Gynecol 2020;135.
The authors provided this information as a supplement to their article.

Endometritis	670.1	O86.12	
Deep vein thrombosis or pulmonary embolism	415.1, 673.0, 673.2, 453.4, 453.8, 673.3, 673.8	I26, O88.0, O88.2, O88.3, O88.8, I82.4, I82.6	
Puerperal cerebrovascular disorders	430, 431, 432, 433, 434, 436, 437, 671.5, 674.0, 997.02	I60- I68, O22.51, O22.52, O22.53, I97.81, I97.82, O87.3	
Eclampsia	642.6	O15	
Disseminated Intravascular Coagulation	286.6, 286.9, 666.3	D65, D68.8, D68.9, O72.3	
Meconium aspiration syndrome	770.11, 770.12	P24.0	
Neonatal infection (severe or moderate)	771.81, 771.83	P23, R65.2, P36.0, P36.10, P36.19, P36.2, P36.30, P36.39, P36.4, P36.5, P36.8, P36.9, P39.2, P39.8, P39.9, R78.81	
Birth trauma (severe or moderate)	767	P100, P101, P102, P103, P104, P108, P109, P110, P111, P112, P114, P115, P119, P122, P130, P131, P132, P133, P134, P140, P141, P142, P143, P148, P149, P150, P151, P510	
Neonatal seizure	779.0	P90	
Hypoxic ischemic encephalopathy	768.7	P9160, P9161, P9162, P9163	
Neonatal need for respiratory support			Respiratory therapy codes: Nasal cannula with blender, high humidity nasal cannula, head box oxygen (new born, nasal continuous positive airway pressure, noninvasive positive-pressure ventilation, Pressure Control, spontaneous breathing trial, pressure control ventilation, nasal cannula-titration, high flow nasal cannula flow titration, high flow nasal cannula oxygen titration,

			spontaneous continuous positive airway pressure ventilator, extubation

* International Classification of Diseases, Ninth Revision

† International Classification of Diseases, Tenth Revision

‡ NA, not applicable

Appendix 2. Statistical Approach to Prevent Creating an Over-Fit Regression Model

Because the number of oxytocin rests in our retrospective cohort lasting 4 to 8 hours and 8 hours or greater is low and the absolute number of cesarean deliveries is therefore low in those two groups, we performed the following steps to ensure that we did not over-fit our regression model.

First, as described in the text of the manuscript, we examined the distribution of oxytocin rests lasting 1 hour or longer and created three roughly equal tertiles. By combining these with our reference group of subjects unexposed to oxytocin rest and the group of subjects exposed to less than 1 hour of oxytocin, we have created 5 comparison groups. The third quintile included patients with oxytocin rest duration up to 2 hours. The fourth quintile included patients with oxytocin rest duration up to 8 hours, and the fifth quintile greater than eight hours. This resulted in groups of 642 patients, 284 patients, 106 patients, 89 patients, and 72 patients. The large time windows within these groupings results in reduced ability to make incremental comparison of durations of rest but allows equal distribution to ensure our model is properly fit. We have also evaluated oxytocin rest as a continuous variable and found that the association between increased duration oxytocin rest and decreasing cesarean rates persists and remains strong with a P value for trend of 0.0017.

Second, we have followed the procedure as outlined in Riley *et al*, which describes steps to prevent over-fitting a model (1). In order to minimize the degrees of freedom in our analysis

and therefore prevent over-fitting our model, we analyzed maternal age, gestational age, body mass index, and duration of latent phase as continuous variables. Based on our findings in table 1 of significant differences in baseline characteristics, we developed an initial regression model for mode of delivery including the following parameters: oxytocin rest duration, age, gestational age, body mass index (BMI), latent phase duration (on a logarithmic scale to normalize the data), hypertension, diabetes, prelabor rupture of membranes (PROM), additional cervical ripening during oxytocin rest, and National Institute of Child Health and Human Development (NICHD) fetal heart rate category at time of oxytocin rest. With these ten parameters (and 13 degrees of freedom), according to the equations in Riley *et al*, our model has a global Shrinkage factor of 0.91 and an apparent Nagelkerke's R^2 of 0.153. The difference between the adjusted and apparent Nagelkerke's R^2 is 0.014. Both of these numbers conform to the criteria specified in Riley *et al* to avoid including too many parameters in an initial model or over-fitting the model. Using the partial-F statistic to evaluate the full and reduced models, we subsequently eliminated additional cervical ripening, hypertension, and PROM sequentially to remove parameters that do not meaningfully contribute to the model, which resulted in an improved fit of the model and optimized parsimony. This refined model had global shrinkage factor of 0.93 and absolute difference in Nagelkerke's $R^2$of 0.01.

1. Riley RD, Snell KI, Ensor J, Burke DL, Harrell FE, Jr., Moons KG, et al. Minimum sample size for developing a multivariable prediction model: PART II - binary and time-to-event outcomes. Stat Med 2019 Mar 30;38(7):1276-96.

