

Supplementary Online Content

Sachs A, Guglielminotti J, Miller R, Landau R, Smiley R, Li G. Risk factors and risk stratification for adverse obstetrical outcomes after appendectomy or cholecystectomy during pregnancy. *JAMA Surg*. Published online January 18, 2017. doi:10.1001/jamasurg.2016.5045

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This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1. Definition of Surgical Procedures Based on the *International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) Codes*

Surgical procedure	ICD-9-CM code
Appendectomy	47.0
- Laparoscopic appendectomy	47.01
- Other appendectomy	47.09
Cholecystectomy	51.2
- Cholecystectomy and other partial cholecystectomy	51.21, 51.22
- Laparoscopic cholecystectomy and laparoscopic partial cholecystectomy	51.23, 51.24

eTable 2. Definition of Exclusion Criteria Based on *ICD-9-CM* Codes

Ectopic or molar pregnancy	ICD-9-CM codes
Hydatiform mole	630
Other abnormal product of conception	631
Ectopic pregnancy	633
Abortion	ICD-9-CM codes
Legally induced abortion	635
Illegally induced abortion	636
Unspecified abortion	637
Failed attempted abortion	638
Dilation and curettage for termination of pregnancy	69.01
Aspiration curettage of uterus for termination of pregnancy	69.51
Intra-amniotic injection for abortion	75.0

eTable 3. Definition of the Primary Composite Outcome Based on *ICD-9-CM* Codes

Obstetrical outcome	ICD-9-CM codes
First and second trimesters outcome	
- Miscarriage	632, 634
Third trimester outcome	
- Placental abruption	641.2
- Premature rupture of membranes	658.1, 658.2, 658.3
- Preterm labor (< 37 weeks of gestation)	644.0
- Preterm delivery (< 37 weeks of gestation)	644.2
- Intrauterine fetal death (IUFD)	656.4
Miscellaneous events	
- Infection of amniotic cavity	658.4

eTable 4. Definition of Maternal and Surgery Characteristics Based on *ICD-9-CM* Codes

	ICD-9-CM codes
Personal history of pre-term labor	V13.21
Current pregnancy with history of pre-term labor	V23.41
Multiple pregnancy	651.0, 651.1, 651.2, 651.8, 651.9
Cervical incompetence	654.5
Vaginitis and vulvovaginitis	616.1
Infections of genitourinary tract	646.6
Obesity	278.0, 649.1 ,V85.3, V85.4
Tobacco use	305.1, 649.0
Alcohol abuse	291, 303,305.0
Drug abuse	304, 305.2-305.9, 648.3
Peritonitis	540.0, 540.1, 567
Sepsis	995.91,995.92,785.52

eTable 5. Univariable Analysis of Risk Factors for Adverse Obstetrical Outcome in the Training Set

	No event (N=11,394)	Event (N=561)	P Value	Unadjusted OR (95%CI)
General characteristics				
Age (year) (missing = 1)			.016	
- 19 and less	1668 (14.6%)	81 (14.4%)		Reference
- 20 to 29	6728 (59.1%)	300 (53.5%)		0.92 (0.71-1.18)
- 30 to 39	2792 (24.5%)	165 (29.4%)		1.22 (0.93-1.60)
- 40 and more	205 (1.8%)	15 (2.7%)		1.51 (0.85-2.66)
Non-white race (missing = 2177)	4620 (49.5%)	256 (57%)	.002	1.35 1.12 1.64
Medicaid insurance (missing = 16)	5452 (47.9%)	299 (53.4%)	.012	1.25 (1.05-1.48)
Household income (missing = 202)			.11	
- First quartile (poorest)	3166 (28.3%)	176 (31.9%)		Reference
- Second quartile	3108 (27.7%)	150 (27.2%)		0.87 (0.69-1.09)
-Third quartile	2857 (25.5%)	142 (25.8%)		0.89 (0.71-1.12)
-Fourth quartile (richest)	2071 (18.5%)	83 (15.1%)		0.72 (0.55-0.94)
Maternal characteristics				
Obesity (BMI > 30 kg/m ²)	826 (7.2%)	24 (4.3%)	.015	0.57 (0.38-0.87)
Tobacco use	886 (7.8%)	32 (5.7%)	.074	0.72 (0.50-1.03)
Alcohol abuse or dependence	13 (0.1%)	*	.15	3.13 (0.71-13.91)
Drug abuse or dependence	96 (0.8%)	11 (2.0%)	.017	2.35 (1.25-4.42)

eTable 5 (continued)

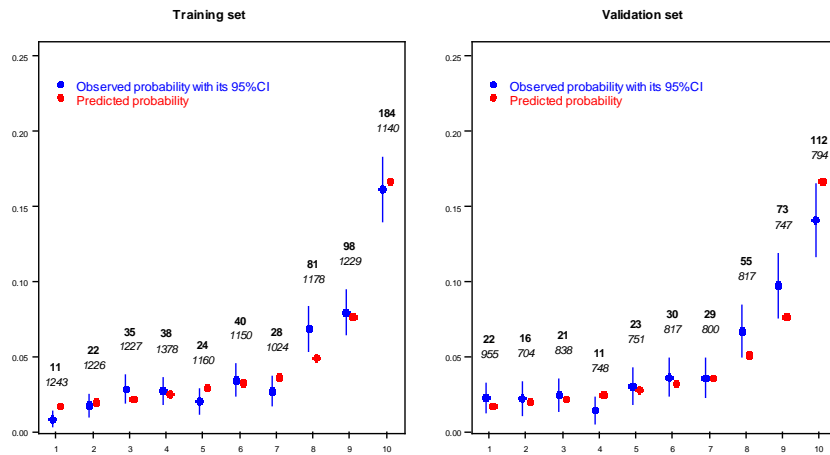
	No event (N=11,394)	Event (N=561)	P Value	Unadjusted OR (95%CI)
Pregnancy characteristics				
Urinary infection	733 (6.4%)	48 (8.6%)	.054	1.36 (1.00-1.85)
Vaginitis and vulvovaginitis	26 (0.2%)	*	.0001	6.33 (2.85-14.04)
Preterm labor during previous pregnancy	*	0 (0.0%)	>.99	--
Preterm labor during current pregnancy	*	*	.0008	13.63 (3.84-48.44)
Cervical incompetence	*	*	<.0001	20.52 (6.60-63.83)
Multiple gestation	62 (0.5%)	11 (2.0%)	.0005	3.66 (1.91-6.98)
Surgery characteristics				
Admission during weekend	3071 (27.0%)	139 (24.8%)	.26	0.89 (0.73-1.09)
Appendectomy, isolated (n= 4717) or associated with cholecystectomy (n= 29)	4409 (38.7%)	337 (60.1%)	<.0001	2.38 (2.00-2.83)
Open surgery	2296 (20.2%)	280 (49.9%)	<.0001	3.95 (3.33-4.69)
Disease severity				
Peritonitis	687 (6.0%)	128 (22.8%)	<.0001	4.61 (3.73-5.69)
Sepsis	91 (0.8%)	26 (4.6%)	<.0001	6.04 (3.87-9.41)

Footnote: Results are expressed as number (%).

(*) Numbers of observed cases are not presented because of HCUP data use agreement restrictions on small cell size

eFigure 1. Calibration Plots of the Final Logistic Regression Model in the Training and Validation Sets

The predicted probability of adverse obstetrical outcomes is calculated with the final logistic model developed in the training set and is categorized according to deciles. The plot displays the observed probability with its 95% confidence interval and the expected probability of adverse obstetrical outcomes according to deciles of predicted probability. The calibration is considered good if, for each decile, the predicted probability is included in the 95% confidence interval of the observed probability. The bold number indicates the number of events and the italic number the number of women in each decile.



eFigure 2. Density Histogram of the Score in the Training and Validation Sets

IQR stands for interquartile range.

