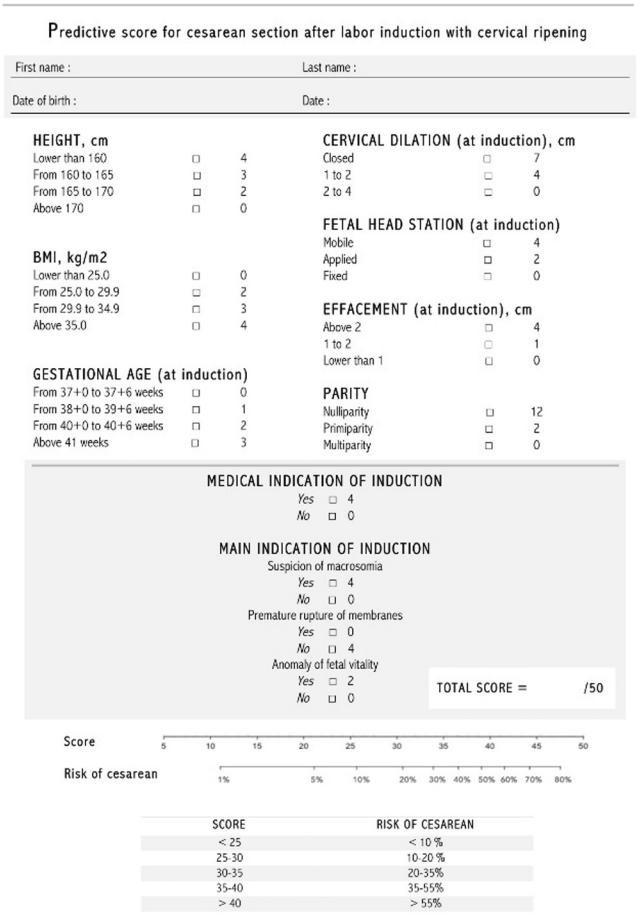

Table 1: Multivariate regression odds estimates for cesarean delivery

	Adjusted OR	Pr OR > 1
Height, cm		
Lower than 160	2.03 [1.28- 3.07]	1.00
From 160 to 164.9	1.63 [1.11-2.32]	0.99
From 165 to 169.9	1.33 [0.90-1.89]	0.92
Above 170	reference	
BMI, kg/m2		
Lower than 25.0, normal weight	reference	
From 25.0 to 29.9, overweight	1.31 [0.89-1.85]	0.91
From 30.0 to 34.9, class 1 obesity	1.45 [0.87-2.24]	0.92
Above 35.0, class 2 and 3 obesity	1.78 [0.92-3.05]	0.97
Parity		
Nulliparity	6.07 [3.91-9.11]	1.00
Primiparity	1.25 [0.73-2.01]	0.77
Multiparity	reference	
Gestational age at induction		
From 37+0 to 37+6 weeks	reference	
From 38+0 to 38+6 weeks	1.31 [0.75-2.13]	0.81
From 39+0 to 39+6 weeks	1.43 [0.81-2.36]	0.88
From 40+0 to 40+6 weeks	1.55 [0.88-2.52]	0.94
Above 41 weeks	2.07 [1.28-3.18]	1.00
Indication for induction		
Medical indication (ref="no")	2.09 [0.89-4.26]	0.95
Premature rupture of membranes (ref="yes")	1.66 [1.13-2.35]	0.99
Suspicion of macrosomia (ref="no")	1.77 [0.98-2.93]	0.97
Anomaly of fetal vitality (ref="no")	1.32 [0.95-1.78]	0.95
Cervical dilation at induction, cm		
Closed	3.33 [1.95-5.30]	1.00
1 to 2	1.82 [1.11-2.84]	0.99
3 to 4	reference	
Station at induction		
Mobile	1.88 [1.23-2.77]	1.00
Applied	1.43 [0.97-2.02]	0.96
Fixed	reference	
Effacement at induction, cm		
Above 2	2.01 [1.33-2.94]	1.00
1 to 2	1.40 [0.95-2.01]	0.95
Lower than 1	reference	

28 Duration of 2nd stage of labor induction and maternal/perinatal outcomes in full-term low-risk nulliparas

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OBJECTIVE: Allowing a longer second stage (SS) increases the number of vaginal deliveries (VD) but women with longer SS are more likely to have a cesarean delivery (CD) and adverse maternal/perinatal outcomes than those with shorter SS. We sought to quantify the association of the duration of SS with CD and maternal/perinatal morbidity in a contemporary cohort of low-risk nulliparas who underwent induction of labor (IOL) at full term (FT).

STUDY DESIGN: Planned secondary analysis of a multicenter RCT of IOL at 39 wks vs. EM until at least $40^{5/7}$ wks but no later than $42^{2/7}$ in low-risk nulliparas with singleton gestations from '14-'17. Those with viable non-anomalous neonates who underwent IOL with oxytocin were included in this analysis regardless of study arm and receipt of cervical ripening. Duration of SS (defined as time from complete dilation to delivery) was examined by 1-hr intervals from <2 to ≥5 hrs in relation to CD, as well as to both a maternal and perinatal composite of adverse outcomes. Categorical variables including epidural use were compared using Cochrane-Armitage trend or Chi-Square tests, and continuous variables using the Jonckheere-Terpstra test of trend. Poisson regression was used for multivariable adjustments and to test for variation by use or not of epidural.

RESULTS: Of 3058 eligible women who underwent IOL, 2431 had information on duration of SS: the median duration of SS was 1.2 hrs (IQR 0.6-2.3), with 69% lasting <2 hrs, 15% 2-2.9 hrs, 8.2% 3-3.9 hrs and 7.7% ≥5 hrs (Table 1). Overall 79% had an epidural. Mean BMI but not presence of a modified Bishop score <5 or epidural use was associated with SS duration. The frequencies of CD and the maternal and perinatal composites all increased with increasing SS duration (Table 1); still most women delivered vaginally even with SS duration ≥4-5hrs. After multivariable adjustment (Table 2), longer SS durations (compared to <2 hrs) were associated with increases up to 45 times for CD but only up to 2.2-2.4 times for the maternal and perinatal composites (Table 2). The strength of the associations appeared to be greatest after 3 hrs. Findings were not modified by epidural use (all p-values for interaction >0.48).

CONCLUSION: In contemporary low-risk nulliparas who underwent IOL at FT, risk for CD increases markedly with SS duration but out of proportion to maternal and perinatal morbidity; most women deliver vaginally even after 3 hrs. Findings did not differ by epidural use. These data are valuable for counseling about a protracted SS.

Table 1 Duration of 2nd stage and outcome frequency (N=2431)

	<2 hrs n=1676	2-2.9 hrs n=358	3-3.9 hrs n=200	4-4.9 hrs n=87	5+ hrs n=100	P-Value for trend
Maternal outcomes						
Cesarean delivery	17 (1.0)	12 (3.3)	35 (17.5)	25 (28.7)	49 (49.0)	<.001
Operative vaginal delivery	95 (5.7)	44 (12.0)	50 (25.0)	22 (25.3)	20 (20.0)	<.001
Vaginal delivery (all)	1659 (99.0)	356 (99.7)	165 (82.5)	62 (71.3)	51 (51.0)	<.001
Maternal composite*	244 (14.6)	89 (24.2)	54 (27.0)	23 (26.4)	35 (35.0)	<.001
Length of postpartum hospital stay	2 (2-2)	2 (2-2)	2 (2-2)	2 (2-3)	2 (2-3)	<.001
Neonatal outcomes						
Neonatal composite**	105 (6.3)	33 (9.0)	20 (10.0)	12 (13.8)	9 (9.0)	.003
NICU admission	158 (9.4)	52 (14.1)	33 (16.5)	11 (12.6)	16 (16.0)	<.001

*Composite of peripartum infection,3rd or 4th degree laceration, blood transfusion, B-lynch, uterine/hypogastric artery ligation, embolization, hysterectomy, ICU admission, or death
**Composite of perinatal death, the need for respiratory support within 72 hours after birth, 5 minute Apgar score ≤3, hypoxic ischemic encephalopathy, seizure, infection (confirmed sepsis or pneumonia), meconium aspiration syndrome, birth trauma (bone fracture, neurologic injury, or retinal hemorrhage), intracranial or subgaleal hemorrhage, hypotension requiring vasopressor support, shoulder dystocia or neonatal hypoglycemia

Table 2: Association of duration of 2nd stage and outcomes

	<2 hours (ref)	2-2.9 hrs RR (95%CI)	3-3.9 hrs RR (95%CI)	4-4.9 hrs RR (95%CI)	≥5 hrs RR (95%CI)
Maternal outcomes					
Cesarean delivery	--	**3.2 (1.6, 6.6)**	**17.0 (9.7, 29.7)**	**27.8 (15.4, 50.2)**	**45.2 (27.1, 75.2)**
Operative vaginal delivery	--	**2.1 (1.5, 3.0)**	**4.6 (3.3, 6.2)**	**4.5 (3.0, 6.8)**	**3.5 (2.3, 5.5)**
Vaginal delivery (all)	--	0.98 (0.96, 0.99)	**0.8 (0.8, 0.9)**	**0.7 (0.5, 0.8)**	**0.5 (0.4, 0.6)**
Maternal composite	--	**1.7 (1.4, 2.2)**	**1.9 (1.4, 2.4)**	**1.9 (1.3, 2.8)**	**2.4 (1.8, 3.2)**
Postpartum hospital stay > 2 days	--	**1.8 (1.1, 2.8)**	**5.3 (3.7, 7.7)**	**8.5 (6.8, 12.6)**	**11.7 (8.5, 16.0)**
Neonatal outcomes					
Neonatal composite	--	**1.5 (1.0, 2.2)**	**1.7 (1.1, 2.7)**	**2.2 (1.3, 3.9)**	1.5 (0.8, 2.8)
NICU admission	--	**1.5 (1.1, 2.0)**	**1.8 (1.3, 2.5)**	1.3 (0.7, 2.3)	**1.7 (1.1, 2.8)**

*Adjusted for race/ethnicity, ARRIVE randomized group, epidural and maternal BMI