STUDY DESIGN: We explored serum levels of ES and HIF-1α in 22 patients with histological-confirmed invasive placentation (GA: 29±5w, accreta: n=5; increta: n=11; percreta: n=6) by ELISA and Western blot. Samples (total n=30) were retrieved prospectively and in a serial fashion prior to blood transfusion or steroids. We controlled for pregnancy and possible GA variation using blood samples (n=43) of 10 healthy nonpregnant and 10 healthy pregnant (GA: 26±9w) subjects. Full-thickness myometrial-villous hysterectomy sections were immunostained and scored for ES, HIF-1α, VEGF, and cytokeratin-7 (CK7, epithelial cell marker). Myometrium opposite from the accreta insertion site and normal placental bed biopsies (n=4) served as tissue controls (CRL).
RESULTS: In CRL subjects, systemic ES levels were unaffected by pregnancy status or GA (P=.752), while serum HIF-1α was undetectable. Women with advanced trophoblast invasion (increta & percreta) had lower serum levels of ES compared with less invasion (accreta) (P=.009). The site of excessive trophoblast invasion (+CK7) lacked immunostaining for ES and HIF-1α relative to the deeper myometrium and the opposite myometrial site (P<.001). In an opposing pattern, VEGF was highly expressed at the site of excessive myometrial invasion and aberrant vascularization (P<.001).
CONCLUSION: The local imbalance among expression of ES and VEGF likely contributes to the invasive phenotype of the accreta trophoblasts. This effect seems to occur independent of HIF-1α.

106 The impact of the Bakri Balloon on the rate of cesarean hysterectomy at a single university hospital

Christopher Houlihan[1], Karanvir Virk[1], William Lowe[1], Pushpinder Dhillon[1], Edwin Guzman[1]
[1]Saint Peter's University Hospital, Department of OB/GYN, New Brunswick, NJ

OBJECTIVE: To evaluate the impact on the rate of Cesarean Hysterectomy when a Bakri Balloon was added as part of the management of a postpartum hemorrhage.
STUDY DESIGN: We reviewed all cases of postpartum hemorrhage at our hospital from January, 2004- December, 2010. We compared the incidence of Cesarean Hysterectomy between January, 2004 -September, 2007, prior to the availability of the Bakri Balloon at our hospital, and a similar period of time after the device was available, from October, 2007-December, 2010. The primary outcome was the rate of cesarean hysterectomy for postpartum hemorrhage in these two time periods. Cases of placenta accreta, increta, and percreta were excluded.
RESULTS: Between January, 2004 - September, 2007 there were 35 cases of Postpartum hemorrhage, of which 10 had a Cesarean Hysterectomy (28.5%). After the Bakri balloon was introduced (October, 2007-December, 2010), there were 45 cases of postpartum hemorrhage, of which 1 had a C-Hysterectomy (2.2%). The Bakri balloon was used in 23 of the 45 cases. The p-value by Chi Square analysis was 0.00068.
CONCLUSION: Since the introduction in our hospital of the Bakri balloon as an option in the treatment of postpartum hemorrhage, there has been a 92.3% reduction in the rate of Cesarean Hysterectomies performed.

107 Placental findings suggesting preeclampsia is at least two different diseases

David Nelson[1], Mandolin Ziadie[2], Donald McIntire[1], Kenneth Leveno[1]
[1]University of Texas Southwestern Medical Center, Obstetrics and Gynecology, Dallas, TX, [2]University of Texas Southwestern Medical Center, Pathology, Dallas, TX

OBJECTIVE: It has long been suspected that hypertension specific to pregnancy represents at least two different diseases depending on the timing during gestation when preeclampsia is first diagnosed. Early-onset preeclampsia has often been observed to be associated with placental insufficiency attributable to vascular abnormalities; in contrast, late-onset preeclampsia has been associated with excessive placentation manifest as hyperplasia. Our purpose was to evaluate the placental pathology in women with preeclampsia occurring at varying gestational ages.
STUDY DESIGN: This was a secondary analysis of a prospective observational study of placentas from pre-specified complicated pregnancies routinely submitted for standardized examination. For this study, a database of placental diagnoses of liveborn singleton gestations without major malformations was linked to a computerized obstetric database. The rates of standardized placental findings including vascular (atherosis; infarction) and non-vascular (hyperplasia) changes were evaluated according to gestational age and diagnosis of severe preeclampsia.
RESULTS: A total of 7,122 women with pregnancies complicated by preeclampsia were delivered at our institution between January 1, 2001 and September 30, 2007. Of these, 1,210 had placental examinations. Within this cohort, 209, 355, and 646 were diagnosed with preeclampsia at < 34, 34 - 36 6/7, and ≥ 37 weeks gestation, respectively. Selected placental findings in women with preeclampsia are shown in the Table.
CONCLUSION: The placentas of women with preeclampsia developing before 34 weeks gestation were significantly different from those with preeclampsia at term. The former group demonstrated placental findings predominantly consistent with insufficiency due to vascular abnormalities whereas placental hyperplasia was significantly associated with preeclampsia at term. Such differing placental findings support the hypothesis that preeclamsia is a different disease depending on the gestational age at diagnosis.

Table 1. Selected placental findings of women with preeclampsia.

	Gestational Age (weeks)			
Placental Findings	24 0/7 – 33 6/7 N= 209 (17)	34 0/7 – 36 6/7 N = 355 (29)	≥ 37 0/7 N = 646 (53)	P-value*
Consistent with insufficiency:				
Vascular Lesions	111 (53)	119 (34)	165 (26)	< 0.001
Hypoplasia	81 (39)	103 (29)	115 (18)	< 0.001
Consistent with hyperplacentation:				
Hyperplasia	11 (5)	46 (13)	113 (17)	< 0.001

Data presented as N (%)
* P-value for trend

108 Maternal and perinatal consequences of a primary elective cesarean delivery

Emily Miller[1], William Grobman[1]
[1]Northwestern University, Obstetrics and Gynecology, Chicago, IL

OBJECTIVE: To estimate cumulative risks of maternal and perinatal morbidity associated with the choice of elective cesarean for a first delivery.
STUDY DESIGN: A decision analytic model was designed to compare major adverse outcomes across a woman's reproductive life associated with the choice of primary elective cesarean versus a trial of labor at a first delivery. Maternal outcomes assessed included maternal transfusion, hysterectomy, thromboembolism, operative injury, and death. Perinatal outcomes assessed included cerebral palsy (CP) and permanent brachial plexus (BP) palsy in the offspring.
RESULTS: Choosing an initial cesarean resulted in a 0.3% increased risk of a major adverse maternal outcome in the first pregnancy. In each subsequent pregnancy, the difference in maternal morbidity increased between strategies, such that by the fourth pregnancy, the cumulative risk of a major adverse maternal outcome was nearly 10% in the elective primary cesarean group, three times higher than among women who initially underwent a trial of labor. Although the choice of an initial cesarean resulted in 2.4 and 0.41 fewer cases of CP and BP palsy, respectively, per 10,000 women in the first pregnancy, by a fourth pregnancy, the risk of either adverse neonatal outcome was higher among offspring of women who had chosen the initial elective cesarean (0.368% vs. 0.363%).
CONCLUSION: Maternal morbidity associated with the choice of a primary elective cesarean increases in each subsequent pregnancy and is

greater in magnitude than that associated with the choice of trial of labor. These increased risks are not offset by a substantive reduction in the risk of neonatal morbidity.

Composite adverse outcomes per pregnancy

	Elective cesarean in first pregnancy				Trial of labor in first pregnancy			
	1st pregnancy	2nd pregnancy	3rd pregnancy	4th pregnancy	1st pregnancy	2nd pregnancy	3rd pregnancy	4th pregnancy
Maternal outcomes	0.830%	1.148%	1.973%	5.777%	0.541%	0.558%	0.768%	1.606%
Neonatal outcomes	0.126%	0.307%	0.312%	0.368%	0.154%	0.354%	0.356%	0.363%

109 The association between mid-trimester cervical length and cesarean delivery at term

Emily Miller[1], William Grobman[1]
[1]Northwestern University, Obstetrics and Gynecology, Chicago, IL

OBJECTIVE: An ultrasonographically diagnosed short cervix has been associated with an increased risk of preterm birth, but the obstetric consequences of longer cervical lengths have been less well defined. The objective of this study was to determine the association between cervical length and cesarean delivery among women at term.

STUDY DESIGN: This is a cohort study of women with a singleton gestation who underwent routine mid-pregnancy transvaginal cervical length assessment and delivered at term. Women who underwent planned cesarean delivery without intent to labor were excluded from analysis. Women were grouped into quartiles based on cervical length, and the association of their cervical length quartile with cesarean delivery was determined in both univariable and multivariable analysis.

RESULTS: 5806 subjects were included in this analysis, of whom 58.1% were nulliparous. There were multiple differences among women in the different cervical length quartiles (Table). The frequency of cesarean delivery among the cohort was 18.9%. As cervical length increased, the chance of cesarean delivery increased as well (14.7%, 19.5%, 19.1%, and 22.4% from the 1st through 4th quartiles, respectively). After controlling for potential confounding factors, cervical length quartile remained significantly associated with an increased odds of cesarean for the second (aOR 1.49, 95% CI 1.18-1.88), third (aOR 1.47, 95% CI 1.16-1.85) and fourth (aOR 1.89, 95% CI 1.50-2.38) quartiles, compared to the first quartile. This relationship held true for nulliparous as well as multiparous women.

CONCLUSION: Increasing mid-trimester cervical length is associated with increasing frequency of cesarean delivery in both nulliparas and multiparas. Preparatory uterine changes that enable successful labor may be initiated as early as the mid-trimester.

Population characteristics and cervical length per quartile

	1st quartile n=1479	2nd quartile n=1456	3rd quartile n=1479	4th quartile n=1392	p value
Cervical length	3.6 (3.3-3.8)	4.2 (4.1-4.3)	4.7 (4.6-4.9)	5.5 (5.2-5.9)	<0.001
Maternal age	30.8 ± 5.6	31.2 ± 5.4	31.4 ± 5.3	31.6 ± 5.2	<0.001
Smoker					0.015
Never	1255 (87.9%)	1277 (91.2%)	1297 (90.6%)	1193 (89.4%)	
Former	151 (10.6%)	109 (7.8%)	127 (8.9%)	132 (9.9%)	
Current	32 (2.5%)	47 (3.4%)	47 (3.4%)	62 (4.8%)	
Mode of conception					0.067
Spontaneous	1342 (96.6%)	1334 (96.0%)	1322 (95.9%)	1227 (94.3%)	
IUI	13 (0.9%)	8 (0.6%)	10 (0.7%)	12 (0.9%)	
IVF	35 (2.5%)	47 (3.4%)	47 (3.4%)	62 (4.8%)	
Race/ethnicity					<0.001
White	671 (55.0%)	732 (60.2%)	772 (61.8%)	651 (56.0%)	
Black	181 (14.8%)	113 (9.3%)	117 (9.3%)	115 (9.9%)	
Latina	264 (21.6%)	269 (22.1%)	281 (22.5%)	309 (26.6%)	
Other	104 (8.5%)	103 (8.5%)	80 (6.4%)	87 (7.5%)	
Nulliparous	871 (58.9%)	821 (56.4%)	787 (53.2%)	686 (49.3%)	<0.001

Median (IQR), mean ± SD, or n (%).

110 Evidence to support the safety and efficacy of vaginal delivery of twins gestation complicated by very low birthweight of second twin

Eran Barzilay[1], Hila de Castro[1], Jigal Haas[1], Eyal Sivan[1], Eyal Schiff[1], Shali Mazaki-Tovi[1], Yoav Yinon[1]
[1]Sheba Medical Center, Tel-Aviv University, Obstetrics and Gynecology, Tel-Hashomer, Israel

OBJECTIVE: To determine whether neonatal outcome is associated with the mode of delivery in very low birthweight twins.

STUDY DESIGN: This was a retrospective cohort study. Inclusion criteria included: 1) twin gestation; 2) second twin birthweight of ≤1500 grams. Exclusion criteria included: 1) gestational age at delivery of less than 24 gestational weeks 2) fetal demise of one or both twins. A total of 206 twin gestations met the criteria and patients were classified into 2 groups according to the planned mode of delivery: 1. Cesarean delivery (n=152) and 2. Vaginal delivery (n=54). In the vaginal delivery group 24 pairs were cephalic-cephalic, 28 pairs were cephalic-non cephalic, and 2 pairs were non cephalic- non cephalic. The rates of Apgar score <7 at 5 minutes and cord blood PH<7.1 in either twin A or B were determined in the two groups.

RESULTS: The mean gestational age at delivery was 31 weeks in the cesarean delivery group compared to 30 weeks of gestation in the vaginal delivery group (p=0.01). However, the mean birthweight of both twins was similar among the two groups (Twin A: 1452 grams vs. 1358 grams, p=0.18 and Twin B: 1186 grams vs. 1182 grams, p=0.9 respectively). There were no significant differences between the cesarean and vaginal delivery groups in the rates of low Apgar score (Twin A: 4.0% vs. 1.9%, p=0.5 and Twin B: 9.7% vs. 3.7%, p=0.2) and cord PH < 7.1 (Twin A: 2.4% vs. 0%, p=0.3 and Twin B: 1.7% vs. 0%, p=0.4). A sub-group analysis of the vaginal delivery group revealed comparable rates of cesarean section (8.3% Vs 3.3%, p=0.4) as well as neonatal Apgar score < 7 among the cephalic-cephalic and cephalic-non cephalic groups (Twin A: 4.2% vs. 0%, p=0.3 and Twin B: 0 vs. 6.7%, p=0.2).

CONCLUSION: Vaginal delivery of very low birthweight twins is a safe regardless of second twin presentation. This information should provide reassurance for pregnant women and clinicians alike.

111 Decreased sleep duration in the third-trimester is not associated with excessive gestational weight gain

Kristin Knight[1], Eva Pressman[1], Loralei Thornburg[1]
[1]University of Rochester, OB/GYN, Division of Maternal-Fetal Medicine, Rochester, NY

OBJECTIVE: Obesity and excessive gestational weight gain (GWG) are significant public health problems that lead to an increased incidence of adverse perinatal outcomes. Decreased sleep duration is associated with increased rates of obesity in non-pregnant populations as well as with prolonged weight retention in postpartum women. We sought to determine if there is an association between decreased sleep duration and excessive GWG.

STUDY DESIGN: We conducted a prospective cohort study of non-diabetic women with singleton gestations from Feb 2011–Mar 2012. Maternal weight gain, 3rd-trimester sleep habits (collected over 7 days), and fetal/neonatal biometry were collected. Cohorts were defined as sleeping <7 and ≥7 hours/night on average. Student's T-test, Mann-Whitney U, and Chi-square analysis were used to compare groups.

RESULTS: 35 women sleeping <7 hours/night were compared with 124 women sleeping ≥7 hours/night in the 3rd trimester. The average nightly sleep duration was 6.2 hours and 8.7 hours, respectively (p<0.001). Demographic characteristics were similar in both groups. There were no significant differences in overall weight change (38 vs. 32 lbs, p=0.15) or incidence of weight gain exceeding that recommended by the IOM (65.7% vs. 61.3%, p=0.63). Those sleeping <7 hours/night had a higher percentage of total weight gain in the 1st trimester (23.6% vs. 14.2%, p=0.03), however the percentages of total weight gained in the 2nd and 3rd trimesters were similar. There were