Gynecology, Portland, OR, [2]University of California San Francisco, Department of Obstetrics & Gynecology, San Francisco, CA

OBJECTIVE: The purpose of this study was to determine the optimal gestational age of delivery of a patient with a prior stillbirth by accounting for common neonatal morbidities associated with early term delivery.

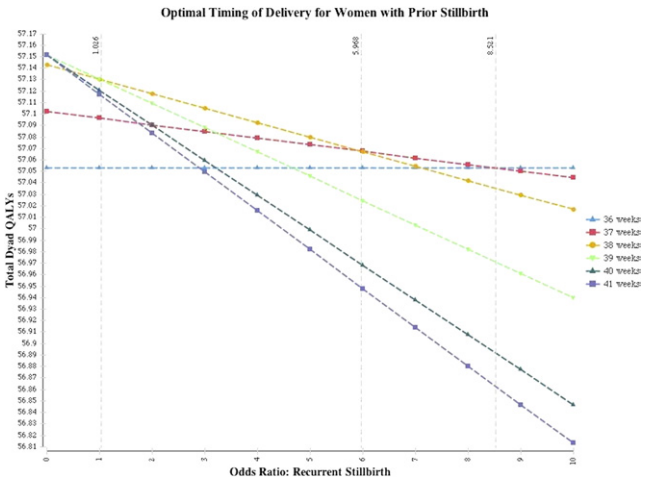
STUDY DESIGN: A decision-analytic model was designed using TreeAge software to determine the optimal gestational age for delivery of a theoretical cohort of 10,000 women with a history of a prior stillbirth. The model options ranged from delivery at 37 weeks up to 41 weeks' gestation. At each week the model accounts for expectant management with four possible outcomes: (1) spontaneous delivery; (2) medically-indicated delivery; (3) recurrent stillbirth; or (4) expectant management with scheduled induction. Probability and cost estimates were derived from published literature. Primary outcomes included recurrent antepartum stillbirth, neonatal death, respiratory complications, and cerebral palsy. Utility values were assigned to various outcomes and applied to life expectancy to generate quality-adjusted life years (QALYs).

RESULTS: Planned delivery at 38 weeks gestation leads to the best outcomes when considering risk of recurrent stillbirth, neonatal morbidities, and maximizing total QALYs (Table). In the cohort of 10,000 women, delivery at 38 weeks gestation leads to 6 fewer recurrent stillbirths than 39 weeks gestation, but 2 additional cases of neurodevelopmental morbidity. Sensitivity analyses confirm that delivery at 38 weeks was optimal assuming a women has a 1.03 to 5.97-fold greater risk for recurrent still birth in comparison to the general population. Above a 5.97-fold increase, delivery at 37 weeks gestation was shown to be optimal up to an 8.5-fold increased risk (Figure).

CONCLUSION: Scheduled delivery at 38 weeks gestation is consistent with optimal outcomes in women with prior stillbirth as it decreases the risk of recurrence, while acceptably balancing the risk of early term neonatal morbidities.

Neonatal outcomes by gestational age of delivery for women with prior stillbirth (in theoretical cohort of 10,000 women)

Gestational Age of Delivery	Stillbirth	Respiratory Complications	Major Neurodevelopmental Disorder
37	4	150	23
38	9	124	14
39	15	97	12
40	22	98	12
41	25	100	12



124 Buprenorphine vs methadone for maintenance of opioid addiction during pregnancy: a cost-effectiveness analysis

Jessica Fowler[1], Jenna Emerson[1], Allison Allen[1], Sarah Dilley[1], Nicholas Gideonse[2], Traci Rieckmann[2], Amanda Risser[2], Aaron Caughey[1]

[1]Oregon Health & Science University, Department of Obstetrics & Gynecology, Portland, OR, [2]Oregon Health & Science University, Department of Family Medicine, Portland, OR

OBJECTIVE: Recent estimates of opiate use in pregnancy have been reported as high as 7.4% in certain age groups. Methadone is currently the standard of care for opioid-dependency in pregnancy. Emerging evidence suggests that Buprenorphine should be considered a first-line treatment option. Studies have shown improved neonatal outcomes with Buprenorphine, yet low maternal retention rates in treatment. This model investigates maternal and neonatal outcomes and cost-effectiveness of Buprenorphine vs. Methadone for opioid-maintenance during pregnancy.

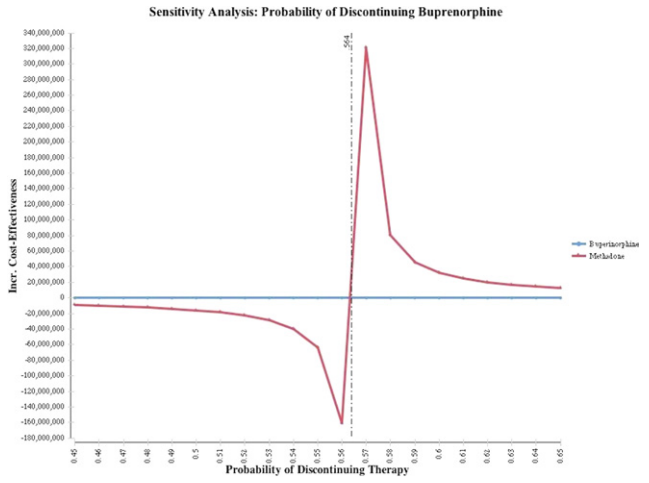
STUDY DESIGN: A decision-analytic and cost-effectiveness model was constructed using TreeAge software for opioid-dependent pregnant women started on either Buprenorphine or Methadone for replacement therapy. A comparison of each strategy in a theoretical cohort of 1,000 mother-baby dyads was performed. Primary outcomes included maternal retention in maintenance treatment, neonatal abstinence syndrome (NAS) and preterm birth. Probability and cost estimates were derived from published literature. Utility values were assigned to various outcomes and applied to life expectancy to generate quality-adjusted life years (QALYs).

RESULTS: Buprenorphine for maintenance therapy in an opioid-dependent mother led to better outcomes when considering NAS and preterm birth and maximizing total QALYs (Table). In a cohort of 1,000 women, treating with Buprenorphine resulted in 145 fewer cases of NAS, 44 fewer preterm births resulting in cost savings of over $12.4 million healthcare dollars. Sensitivity analysis confirms that Buprenorphine is dominant (costs less, better outcomes) up to a drop out rate of 56.4%, yet continues to be cheaper when compared to Methadone (Figure).

CONCLUSION: Buprenorphine should be considered a first-line treatment option for opioid-dependency in pregnancy in select individuals, as it leads to decreased incidence of NAS, preterm birth, decreased hospitalization and better utilization of healthcare dollars than Methadone.

Buprenorphine vs methadone for management of opioid dependence in pregnancy (theoretical cohort of 1000 women)

	Methadone	Buprenorphine
Retention in Treatment Group	888	694
Neonatal Abstinence Syndrome (NAS)	525	380
Preterm Birth (<37 weeks)	214	170
Cost	$42,541,655.34	$30,061,115.15
Mother-Baby Dyad QALYs	57,179.43	57,182.49



125 Adverse outcomes of teenage pregnancies

Jessica McPherson[1], Methodius Tuuli[1], Kimberly Roehl[1], Qiuhong Zhao[1], Anthony Odibo[1], Alison Cahill[1]

[1]Washington University in St. Louis, Obstetrics and Gynecology, St. Louis, MO

OBJECTIVE: Data on pregnancy outcomes of teenage women who deliver are limited. Given pelvic immaturity, there is concern for adverse events. The objective of this study was to compare pregnancy outcomes of women <18 years of age to those ≥18 years of age.

STUDY DESIGN: This was a retrospective cohort study of all consecutive women who underwent labor between 2004 and 2008. Pregnancy outcomes including vaginal laceration, postpartum hemorrhage (PPH), shoulder dystocia, umbilical cord gas pH <7.2 or <7.05, and neonatal intensive care unit (NICU) admission in women <18 years of age were compared to women ≥18. A second analysis comparing only term deliveries was performed. Exclusion criteria included multiple gestations and congenital anomalies. Univariable and multivariable analyses were performed; logistic regression analyses were used to adjust for confounders.

RESULTS: Of 8,390 women, 663 were <18 years of age. After adjusting for nulliparity, African American race, gestational hypertension, prior cesarean, and birthweight >4000 grams teen women were at an increased risk of vaginal laceration (aOR 1.59, CI 1.33-1.89), but there was no difference in postpartum hemorrhage, shoulder dystocia, umbilical cord gas pH <7.2 or pH <7.05, or NICU admission. There were 5,386 women who delivered at term, 500 were teenage women. After adjusting for nulliparity, African American race, gestational hypertension, gestational diabetes, prior cesarean, or birthweight >4000 grams there was no difference in laceration, postpartum hemorrhage, shoulder dystocia, umbilical cord gas pH <7.20 or pH <7.05.

CONCLUSION: Our results suggest, while the teenage pelvis may not be mature, risks of postpartum hemorrhage, shoulder dystocia, abnormal umbilical cord gases, or NICU admission are similar when comparing women <18 years of age and those ≥18 years of age. There is, however, an increased risk of vaginal laceration in teenage women.

Outcomes of teenage pregnancies: all deliveries

Outcomes	Age <18 (n=663)	Age ≥18 (n=7,727)	Unadjusted RR	Adjusted OR	P-value
Laceration	60.6%	40.6%	1.49 (1.40-1.60)	1.59 (1.33-1.89)	<0.01
PPH	1.4%	2.5%	0.54 (0.28-1.05)	0.61 (0.30-1.22)	0.16
Dystocia	2.9%	3.4%	0.84 (0.53-1.33)	1.06 (0.64-1.75)	0.83
pH <7.2	11.5%	10.4%	1.1 (0.89-1.38)	0.77 (0.60-1.01)	0.06
pH <7.05	0.9%	0.9%	1.04 (0.45-2.39)	1.09 (0.44-2.68)	0.85
NICU admission	2.0%	3.0%	0.67 (0.39-1.17)	1.01 (0.56-1.82)	0.95

Adjusted for nulliparity, African American race, gestational hypertension, prior cesarean, birthweight >4000 grams.

126 The impact of cervical length on the cost-effectiveness of vaginal progesterone as a preterm birth intervention

Jessica Page[1], Jenna Emerson[1], Alison Cahill[2], Allison Allen[1], Jessica Fowler[1], Leonardo Pereira[1], Aaron Caughey[1]

[1]Oregon Health & Science University, Obstetrics & Gynecology, Portland, OR, [2]Washington University in St. Louis, Obstetrics & Gynecology, St. Louis, MO

OBJECTIVE: To determine the cost-effectiveness of vaginal progesterone treatment for the prevention of preterm birth (PTB) over a wide range of short cervical length (CL) measurements.

STUDY DESIGN: Decision-analytic models were built using TreeAge software comparing vaginal progesterone to no intervention at four different CL ranges (10-14mm, 15-19mm, 20-24mm, 25-29mm) measured once at 20-24 wks. Baseline preterm birth probabilities were adjusted to reflect the relative risk associated with each CL range as well as the relative risk reduction with vaginal progesterone treatment as estimated from the literature. The primary outcome was preterm birth at <37wks, with secondary outcomes of preterm birth <28wks and <35wks as well as neonatal death and cerebral palsy. The cost-effectiveness threshold was set at $100,000/QALY (quality-adjusted life years).

RESULTS: Vaginal progesterone was found to be an effective and inexpensive intervention for preterm birth. The greatest reduction in PTB was observed in the 10-14mm CL group with a cost difference of $9,136 ($17,136 vs. $26,272). Vaginal progesterone remained dominant in all cervical length ranges with lower costs and fewer PTBs (15-19mm $13,846 vs. $20,660, 20-24mm $10,063 vs. $14,209, 25-29mm $7,702 vs. $10,183). Correspondingly, with the reduction in PTB, rates of cerebral palsy and neonatal death were decreased in the treatment arm.

CONCLUSION: Vaginal progesterone is an effective and relatively non-invasive treatment strategy for women with CL measurements of 10-30mm.

Outcomes and Costs Associated with Vaginal Progesterone for Prevention of Preterm Birth in a Theoretic Cohort of 100,000 Women with Short Cervix

Outcomes	10-14mm			15-19mm		
	Vaginal Progesterone	No Treatment	NNT	Vaginal Progesterone	No Treatment	NNT
PTB <37wks	52,000	58,000	17	39,000	44,000	20
PTB <28wks	1,170	2,339	86	881	1,763	113
Costs	$1,713,627,000	$2,627,185,000		$1,384,579,000	$2,066,036,000	
QALYs	2,705,988	2,701,922		2,707,438	2,704,374	
Outcomes	20-24mm			25-29mm		
	Vaginal Progesterone	No Treatment	NNT	Vaginal Progesterone	No Treatment	NNT
PTB <37wks	24,000	27,000	33	15,000	17,000	50
PTB <28wks	550	1,100	182	343	686	291
Costs	$1,006,274,000	$1,420,885,000		$770,199,000	$1,018,290,000	
QALYs	2,709,106	2,707,193		2,710,146	2,708,953	