

The American College of Obstetricians and Gynecologists Committee on Obstetric Practice

The Society for Maternal–Fetal Medicine

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Nonmedically Indicated Early–Term Deliveries

ABSTRACT: For certain medical conditions, available data and expert opinion support optimal timing of delivery in the late–preterm or early–term period for improved neonatal and infant outcomes. However, for nonmedically indicated early–term deliveries such an improvement has not been demonstrated. Morbidity and mortality rates are greater among neonates and infants delivered during the early–term period compared with those delivered between 39 weeks and 40 weeks of gestation. Nevertheless, the rate of nonmedically indicated early–term deliveries continues to increase in the United States. Implementation of a policy to decrease the rate of nonmedically indicated deliveries before 39 weeks of gestation has been found to both decrease the number of these deliveries and improve neonatal outcomes; however, more research is necessary to further characterize pregnancies at risk for in utero morbidity or mortality. Also of concern is that at least one state Medicaid agency has stopped reimbursement for nonindicated deliveries before 39 weeks of gestation. Avoidance of nonindicated delivery before 39 weeks of gestation should not be accompanied by an increase in expectant management of patients with indications for delivery before 39 weeks of gestation. Management decisions, therefore, should balance the risks of pregnancy prolongation with the neonatal and infant risks associated with early–term delivery.

Historically, the American College of Obstetricians and Gynecologists (the College) and the Society for Maternal–Fetal Medicine have advocated delaying deliveries until 39 completed weeks of gestation or beyond. Further, the College has stated that a mature fetal lung maturity profile is not an indication for delivery in the absence of other clinical indications (1). Yet, the rate of nonmedically indicated early–term (37 0/7–38 6/7 weeks of gestation) deliveries continues to increase in the United States (2). In contrast, the late–preterm (34 0/7–36 6/7 weeks of gestation) birth rate, which increased 25% from 1990 to 2006, has leveled off and started a slow decrease from

9.1% in 2006 to 8.8% in 2008 (3). There are medical indications in pregnancy for which there is evidence or expert opinion to support expedient delivery in the early-term period versus expectant management (Box 1) (4). In contrast, suspected macrosomia, well-controlled gestational diabetes, and documented pulmonary maturity with no other indication are all examples of conditions that are not indications for an early-term delivery. This document will focus on neonatal and infant outcomes and the potential neonatal complications related to nonmedically indicated early-term delivery. In this document, 36 weeks of gestation means 36 0/7–36 6/7 weeks of gestation, 37 weeks of gestation means 37 0/7–37 6/7 weeks of gestation, 38 weeks of gestation means 38 0/7–38 6/7 weeks of gestation, 39 weeks of gestation means 39 0/7–39 6/7 weeks of gestation, and 40 weeks of gestation means 40 0/7–40 6/7 weeks of gestation.

Box 1. Examples of Medical Indications for Late-Preterm or Early-Term Deliveries

- Preeclampsia, eclampsia, gestational hypertension, or complicated chronic hypertension
- Oligohydramnios
- Prior classical cesarean delivery or prior myomectomy
- Placenta previa or placenta accreta
- Multiple gestations
- Fetal growth restriction
- Pregestational diabetes with vascular disease
- Pregestational or gestational diabetes--poorly controlled
- Placental abruption
- Chorioamnionitis
- Premature rupture of membranes
- Cholestasis of pregnancy
- Alloimmunization of pregnancy with known or suspected fetal effects
- Fetal congenital malformations

Neonatal and Infant Morbidity and Mortality

The risk of adverse outcomes is greater for neonates delivered in the early-term period (37/38 weeks of gestation) compared with neonates delivered at 39 weeks of gestation (Box 2). Because pulmonary development continues well into early childhood, respiratory morbidity is relatively common in neonates delivered in the early-term period. A retrospective cohort study by the Consortium on Safe Labor, which included

233,844 births, found that among all infants delivered at 37 weeks of gestation, regardless of indication, there were higher rates of respiratory failure (adjusted odds ratio [OR], 2.8; 95% confidence interval [CI], 2.0–3.9) and ventilator use (adjusted OR, 2.8; 95% CI, 2.3–3.4) compared with infants delivered at 39 weeks of gestation (5). In addition, higher rates of respiratory distress syndrome, transient tachypnea of the newborn, pneumonia, and surfactant and oscillator use were reported for infants delivered at 37 weeks of gestation compared with those delivered at 39 weeks of gestation. Slightly higher rates of respiratory failure (adjusted OR, 1.4; 95% CI, 1.0–1.9) and ventilator use (adjusted OR, 1.2; 95% CI, 1.0–1.5) were reported for infants delivered at 38 weeks versus 39 weeks of gestation; however, the differences did not reach statistical significance and there was no commonly reported difference in any other measure of respiratory morbidity between these two groups (5).

In a secondary analysis of data from the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development, neonates delivered during the early-term period by cesarean delivery, in the absence of indications for delivery, were associated with a higher risk of a composite outcome of neonatal respiratory and nonrespiratory morbidities compared with neonates delivered at 39 weeks of gestation (6). Of these nonmedically indicated deliveries, 35.8% were performed before 39 weeks of gestation. The rate of composite morbidity was higher for neonates delivered at 37 weeks of gestation (adjusted OR, 2.1; 95% CI, 1.7–2.5) and at 38 weeks of gestation (adjusted OR, 1.5; 95% CI, 1.3–1.7) compared with neonates delivered at 39 weeks of gestation. In addition, the morbidity for neonates delivered at 38 4/7–38 6/7 weeks of gestation remained significantly increased (relative risk, 1.21; 95% CI, 1.04–1.40). These findings suggest that scheduled cesarean delivery even a few days before 39 weeks of gestation should be avoided.

Box 2. Neonatal Morbidities Associated With Early-Term Delivery

- Respiratory distress syndrome
- Transient tachypnea of the newborn
- Ventilator use
- Pneumonia
- Respiratory failure
- Neonatal intensive care unit admission
- Hypoglycemia
- 5-minute Apgar score less than 7
- Neonatal mortality

In a large cohort of *planned term deliveries* (defined as deliveries not initiated by labor or ruptured membranes) during a 3-month period in 27 hospitals across the United States, neonatal intensive care unit (NICU) admission rates were higher among neonates delivered in the early-term period (7). A comparison of NICU admission rates for neonates delivered at 37 weeks of gestation or 38 weeks of gestation with those for neonates delivered at 39 weeks of gestation revealed that 31% of 17,794 deliveries had no medical indication. Admission to the NICU, which can be dependent on a variety of factors, was required for 17.8% of infants delivered without medical indication at 37 weeks of gestation and for 8% delivered without medical indication at 38 weeks of gestation, compared with 4.6% of infants delivered at 39 weeks of gestation or beyond ($P < .001$ for deliveries at 38 weeks and 39 weeks of gestation).

Another large study found that although the rates of meconium aspiration were lower among neonates delivered at 37 weeks of gestation (adjusted OR, 0.62; 95% CI, 0.52–0.74) and 38 weeks of gestation (adjusted OR, 0.70; 95% CI, 0.62–0.79) compared with neonates delivered at 39 weeks of gestation, the rates of hyaline membrane disease were higher at 37 weeks of gestation (adjusted OR, 3.12; 95% CI, 2.90–3.38) and 38 weeks of gestation (adjusted OR, 1.30; 95% CI, 1.19–1.43) (8). When these two etiologies of pulmonary disease were examined as the combined metric of need for neonatal ventilation, the rates of disease were increased at both 37 weeks of gestation (adjusted OR, 2.02; 95% CI, 1.88–2.18) and 38 weeks of gestation (adjusted OR, 1.15; 95% CI, 1.08–1.23). Additionally, in this study, the risk of a 5-minute Apgar score less than 7 decreased from 1.01% at 37 weeks of gestation to 0.69% at 38 weeks of gestation and 0.61% at 39 weeks of gestation ($P < .001$). Alternatively, the risk of birth weight greater than 4,000 g increased from 2.0% at 37 weeks of gestation to 4.6% at 38 weeks of gestation and 7.9% at 39 weeks of gestation ($P < .001$).

Mortality rates are also higher among neonates and infants delivered during the early-term period compared with those delivered at full term (9). Using 39 weeks of gestation as the reference group, the relative risk of neo-natal mortality is 2.3 (95% CI, 2.1–2.6) at 37 weeks of gestation and 1.4 (95% CI, 1.3–1.5) at 38 weeks of gestation (Table 1). Mortality rates are also significantly higher among infants delivered at 37 weeks of gestation and 38 weeks of gestation compared with those delivered at 39 weeks of gestation (Table 1). These increased mortality rates need to be balanced against the ongoing risk of stillbirth from week to week in the early-term pregnancy. In one recent study that compared the risk of neonatal mortality at a given week of gestation to the risk of expectant management, including stillbirth and neonatal mortality at the next week of gestation, there was an increased risk of mortality from delivery at 37 weeks of gestation (14.4 per 10,000 live births) compared with expectant management up to 38 weeks of gestation (12.6 per 10,000 live births,

P<.05) (10). At 38 weeks of gestation, the risk of mortality was 10.5 per 10,000 live births compared with 11.6 per 10,000 live births from expectant management up to 39 weeks of gestation. This risk difference of 1.1 per 10,000 pregnancies reached statistical significance (95% CI, 0.03–2.18 per 10,000 deliveries), but would require 9,042 deliveries at 38 weeks of gestation to prevent one death.

Table 1. Neonatal and Infant Mortality Rates Associated With Late–Preterm and Early–Term Deliveries				
Gestational Age (wk)	Neonatal Mortality Rate (Per 1,000 Live Births)	Relative Risk (95% CI)	Infant Mortality Rate (Per 1,000 Live Births)	Relative Risk (95% CI)
34*	7.1*	9.5 (8.4–10.8)	11.8	5.4 (4.9–5.9)
35*	4.8	6.4 (5.6–7.2)	8.6	3.9 (3.6–4.3)
36*	2.8	3.7 (3.3–4.2)	5.7	2.6 (2.4–2.8)
37*	1.7	2.3 (2.1–2.6)	4.1	1.9 (1.8–2.0)
38*	1.0	1.4 (1.3–1.5)	2.7	1.2 (1.2–1.3)
39*	0.8	1.00 [†]	2.2	1.00 [†]
40*	0.8	1.0 (0.9–1.1)	2.1	0.9 (0.9–1.0)

Abbreviation: CI, confidence interval.

*P<.001