



Summary of Selected Annotations on Adverse Outcomes of Non-Medically Indicated Deliveries <39 weeks

Respiratory Distress/Ventilator Support

[Hansen AK, Wisborg K, Uldbjerg, N, Henriksen TB. Risk of respiratory morbidity in term infants delivered by elective caesarean section: cohort study. *BMJ*. 2008;336:85-7.](#)

- Cohort study with prospectively collected data.
- Compared with newborns intended for vaginal delivery, there was an increased risk of respiratory morbidity for infants delivered via elective cesarean at 37 weeks, 38 weeks and 39 weeks gestation.
- Risk of serious respiratory morbidity showed the same increased risk pattern but with higher odds ratios. There was a fivefold increase in serious respiratory morbidity at 37 weeks.

[Bates, E, Rouse, DJ, Mann, ML, Chapman, V, Carlo WA, Tita ATN. Neonatal outcomes after demonstrated fetal lung maturity before 39 weeks of gestation. *American Journal of Obstetrics & Gynecology*. 2010;116\(6\):1288-1295.](#)

- Retrospective cohort study of women with singleton pregnancy delivered at 36 0/8 -38 6/7 weeks after positive fetal lung maturity testing from 1999-2008.
- Measurement using composite neonatal outcome included death, adverse respiratory outcomes, hypoglycemia, treated hyperbilirubinemia, generalized seizures, necrotizing enterocolitis, hypoxic ischemic encephalopathy, periventricular leukomalacia, and suspected or proven sepsis.
- 459 neonates delivered 36-38 weeks. Risk of composite adverse neonatal outcome was 6.1% for 36-38 group compared to 2.5% for 39-40 week group.
- Early delivery significantly associated with increased risk of the composite outcome and several individual outcomes including RDS (OR 7.6), treated hyperbilirubinemia (OR 11.2) and hypoglycemia (OR 5.8).

[Hansen AK, Kirsten W, Uldbjerg N, Henriksen TB. Elective caesarean section and respiratory morbidity in the term and near-term neonate. *Acta Obstetrica et Gynecologica*. 2007;86:389-394.](#)

- Literature review. Selection of 9 eligible studies.
- Out of 6 studies with results on elective cesarean and TTN, three studies found a 2-3 fold increase in risk of TTN when comparing delivery by elective CS with vaginal delivery. Adjustment for gestational age was made in two of these six studies. Incidences of TTN varied from 0.3 to 3% for infants delivered vaginally and from 0.9 to 12% for infants delivered by elective cesarean.

Sepsis

[Tita A, Landon MB, Spong CY, Lai Y, Leveno KJ et al. Timing of elective repeat cesarean delivery at term and neonatal outcomes. *The New England Journal of Medicine*. 2009; 360\(2\): 111-119.](#)

- Retrospective cohort study of repeat cesarean sections performed at 19 centers from 1999-2002 comparing babies born at 37, 38 and 39 completed weeks of gestation.
- Rates of adverse respiratory outcomes, mechanical ventilation, newborn sepsis, hypoglycemia, admission to the NICU, and hospitalization for 5 days or more were increased by a factor of 1.8 to 4.2 for births at 37 weeks and 1.3 to 2.1 for births at 38 weeks.

[Laughon SK, Reddy UM, Sun L, Zhang, J. Precursors for late preterm birth in singleton gestations. *Obstetrics and Gynecology*. 2010; 116\(5\): 1047-1055.](#)

- Retrospective cohort comparing 15,136 late preterm births to 170,593 term deliveries.
- Respiratory morbidity and neonatal sepsis, as well as admission to the neonatal intensive care unit (NICU) and median NICU length of stay all decreased with advancing gestational age, regardless of the reason for late preterm delivery.

Feeding problems

[Bodner K, Wierrani F, Grunberger W, Bodner-Adler B. Influence of the mode of delivery on maternal and neonatal outcomes: a comparison between elective cesarean section and planned vaginal delivery in a low-risk obstetric population. *Archives of Obstetrics and Gynecology*. 2011; 286\(6\): 1193-8.](#)

- 178 women with elective cesarean compared to next parity and age matched women with spontaneous labor. Focus on low-risk obstetrical women.

- Maternal problems with breastfeeding occurred more frequently in elective cesarean group. Separation of mother and baby, post-procedure immobility and wound pain considered possible factors influencing this finding.

[O'Shea, M, Klebanoff, MA, Signore, C. Delivery after previous cesarean: long-term outcomes in the child. *Seminars in Perinatology*. 2010; 34\(4\): 281-292.](#)

- Literature review of previous studies on maternal and neonatal outcomes as a result of cesarean section.
- In 6/7 studies, women who delivered by cesarean were less likely to initiate breastfeeding.
- In the largest of the studies, women who experience a SVD were more likely to initiate breastfeeding.

[Zanardo, V, Svegliado, G, Cavallin, F, Arturo G, Cosmi, E, Litta, P, Trivisanuto, D. Elective cesarean delivery: does it have a negative effect on breastfeeding? *BIRTH*. 2010; 37:275-279.](#)

- Retrospective cohort of 2,137 term infants delivered at a tertiary center from Jan-Dec 2007.
- Breastfeeding prevalence in the delivery room was significantly higher after vaginal delivery when compared to that after cesarean deliver (71.5% to 3.5%).
- Longer interval occurred between birth and first breastfeeding in newborns delivered by cesarean.
- Compared with elective cesarean delivery, vaginal delivery was associated with higher breastfeeding rate at discharge and at follow up at 7 days, 3 months, and 6 months of life.

NICU Admission

[Clark SL, Miller DD, Belfort MA, Dildy, GA, Frye, DK, Meyers, JA. Neonatal and maternal outcomes associated with elective term delivery. *American Journal of Obstetrics and Gynecology*. 2009; 156e1-156e4.](#)

- Prospective observational study conducted in 27 hospitals over the course of 3 months in 2008.

- 17,794 deliveries, 4645 elective deliveries, 17.8% of infants delivered electively without medical indication at 37-38 weeks and 8% of those delivered electively at 38-39 weeks required admission to a newborn special care unit for an average of 4.5 days.
- Results compared to 4.6% of infants delivered at ≥ 39 weeks that required admission to a newborn special care unit ($P < .001$).

[Hoffmire CA, Chess PR, Saad TB, Glantz JC. Elective delivery before 39 weeks: the risk of infant admission to the neonatal intensive care unit. Maternal Child Health Journal. 2011. Epub ahead of print retrieved from http://www.ncbi.nlm.nih.gov/pubmed/21660603.](http://www.ncbi.nlm.nih.gov/pubmed/21660603)

- Retrospective cohort study. Completed chart reviews of 1,577 singleton deliveries between 36-38 weeks gestation at a single hospital. Outcome of interest was NICU admission.
- Elective delivery increased with increasing gestational age.
- Infants born via elective vaginal delivery (RR 1.4), elective cesarean (RR 2.05) or non-elective cesarean (RR 2.00) are at significantly increased risk of NICU admission compared to infants born via non-elective vaginal delivery.

[Horowitz K, Feldman D, Stuart B, Borgida A, Victor Fang YM, Herson V. Full-term neonatal intensive care unit admission in an urban community hospital: the role of respiratory morbidity. The Journal of Maternal-Fetal and Neonatal Medicine. 2011; 24\(11\): 1407-1410.](#)

- Retrospective cohort study of NICU admissions in single facility from 2006-2008. 202 infants in NICU with respiratory morbidity compared to 9,590 controls that had not been admitted to NICU.
- Data suggests that cesarean delivery is the most important predictor of NICU admission.
- Infants delivered prior to 39 weeks were more likely (4.54%) to be admitted to the NICU for respiratory morbidity than infants delivered at or later than 39 weeks (2.6%).

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