



## Is neonatal injury more likely outside of a 30-minute decision-to-incision time interval for cesarean delivery?

**Not according to this study.** For Category 1 and 2 deliveries occurring within (vs outside) 30 minutes, there was a higher likelihood of overall 5-minute Apgar score less than 7 (odds ratio [OR] 3.10; 95% confidence interval [CI] 1.93–4.96) and umbilical artery pH level less than 7.10 (OR 3.40; 95% CI 2.38–4.87). For Category 1 deliveries only, no difference was found in Apgar scores or umbilical artery pH levels.

*Tolcher M, Johnson RL, El-Nashar SA, West CP. Decision-to-incision time and neonatal outcomes: A systematic review and meta-analysis. Obstet Gynecol. 2014;123(3):536–548.*

### ► EXPERT COMMENTARY

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Cesarean section is one of the most common surgical procedures worldwide. In a review of more than 13 million deliveries, cesarean delivery for nonreassuring fetal heart rate tracing occurred in about 3% of cases.<sup>1</sup> Most of these urgent deliveries occur without known predisposing factors.<sup>1</sup> A source of consternation for clinicians related to labor and delivery is the decision-to-incision time (DIT) interval for cesarean delivery for nonreassuring fetal heart rate tracing.

Previously, The American College of Obstetricians and Gynecologists (ACOG)

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suggested the DIT interval should be 30 minutes or less, for prolonged DIT increased the likelihood of neonatal injury.<sup>2</sup> A DIT interval of more than 30 minutes became the sine qua non for poor neonatal outcomes and the linchpin for obstetric litigation.<sup>3</sup> Starting in the 1990s, publications indicated that neonatal morbidity is not related to DIT and adverse neonatal outcomes may occur with a DIT interval of only a few minutes.<sup>4</sup> Most studies, however, were hampered by small sample size.

In an attempt to clarify whether neonatal outcomes differed among cesarean deliveries performed before or after 30 minutes lapsed, Tolcher and colleagues recently published a systematic review and meta-analysis evaluating all published reports that assessed adherence to a DIT policy for cesarean deliveries to be performed within 30 minutes of a nonreassuring fetal heart rate tracing. They reported on the number of emergent (Category 1) and urgent (Category 2) cesarean deliveries accomplished within 30 minutes and compared neonatal outcomes for cesarean deliveries before and after the 30-minute DIT.

Some important observations:

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### FAST TRACK

Though this meta-analysis did not link adverse neonatal outcomes with decision-to-incision within 30 minutes, cesarean delivery for nonreassuring fetal heart-rate tracing should be done after intrauterine resuscitation, and expeditiously



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- First, all the studies were observational; only one paper focused exclusively on pre-term infants, and only five of the identified 34 publications, involving 22,936 women, were determined to be “high quality.”
- Second, one of five neonates (21%) requiring emergent cesarean delivery were not delivered within 30 minutes. And 64% of urgent deliveries were not performed within 30 minutes.
- Third, and most surprisingly, in the 13 studies that included neonatal outcomes, 5-minute Apgar scores less than 7 and cord pH values less than 7.10 were significantly more common among neonates delivered within 30 minutes than among neonates delivered outside of 30 minutes. When the authors limited analysis to infants requiring emergent versus urgent delivery, however, the difference in Apgar scores and pH values was nonsignificant.

Several strengths of this analysis should be mentioned. The careful study design—meticulous and systematic evaluation of all publications and adherence to established publication evaluation and meta-analysis reporting protocols—strengthen the validity of these results. This report is clinically useful because the authors not only evaluated time frames from decision-to-incision but also reported and correlated neonatal outcomes.

Despite the multiple strengths, some weaknesses are worth mentioning. No maternal outcomes were reported. Mothers who require emergent cesarean delivery are at increased risk for adverse outcomes due to the requirement for general anesthesia and urgency with which the surgery is performed. The report only focused on 5-minute Apgar scores less than 7, neonatal intensive care admissions, and cord pH values less than 7.10 as adverse neonatal outcomes. The absence of additional adverse outcomes, as well as long-term neonatal and infant outcomes, hampers our ability to present the patient with all the facts. Lastly, the authors promulgated the classification of degree of

### WHAT THIS EVIDENCE MEANS FOR PRACTICE

The ideal decision-to-incision time is probably best determined individually and may not encompass a “one-size-fits-all” approach. More studies are needed to elucidate this critical clinical question. In the meantime, we suggest: **1)** consulting colleagues if interpretation of the tracing is uncertain, especially with preterm parturients, **2)** intrauterine resuscitation, including tocolytics and amnio-infusion when appropriate, **3)** scalp or vibroacoustic stimulation to elicit acceleration, **4)** administering ephedrine if hypotensive, **5)** expeditious delivery considering the clinical situation and logistics, **6)** documenting decision-to-incision time in operative notes, and **7)** sending umbilical arterial and venous blood for acid-base analysis and the placenta to pathology for evaluation.

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urgency for cesarean delivery proposed by Lucas and colleagues<sup>5</sup> without providing evidence that this classification is linked with clinically meaningful outcomes.

While a randomized trial would be unethical, a fact acknowledged by the authors, prospective cohort studies with long-term neonatal and infant follow-up could provide us with much needed information that would help us counsel our patients. The frequency with which cesarean deliveries are performed requires us to offer our patients the best and most comprehensive information available. ❌

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