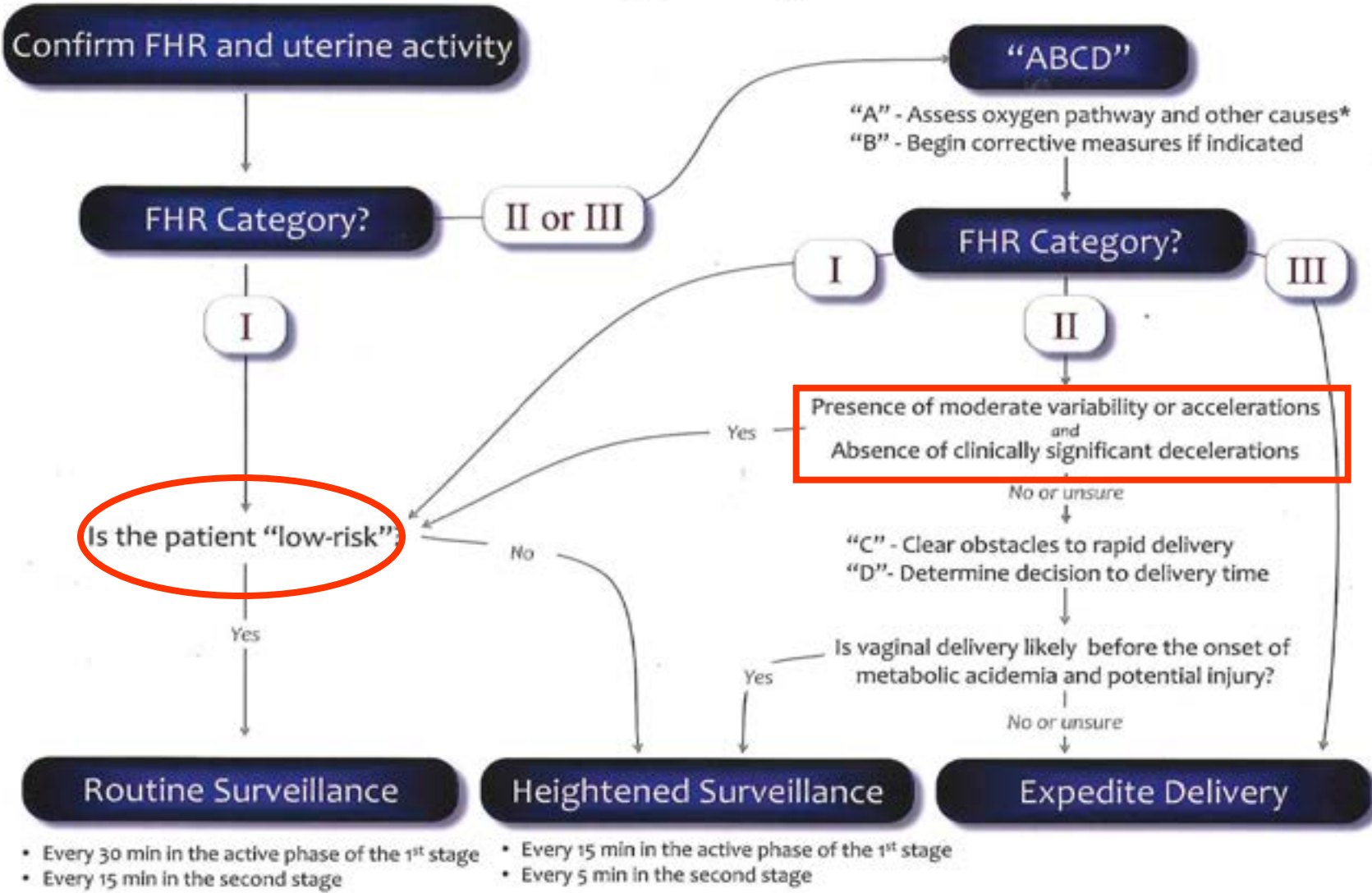


Management algorithm of intrapartum fetal heart rate (FHR) tracings based on the three-tiered category system. *Given the wide variation of FHR tracings in category II, this algorithm is not meant to represent assessment and management of all potential FHR tracings but to provide an action template for common clinical situations £See Table 2 for a list of various intrauterine resuscitative measures. Timing and mode of delivery based on feasibility and maternal-fetal status.

Intrapartum FHR Monitoring Management Decision Model[®]



Fetal Heart Rate Categories

I

Category I includes all of the following:

- Baseline rate 110-160 bpm
- Moderate variability
- No late decelerations
- No variable decelerations
- No prolonged decelerations

II

Category II includes all tracings not assigned to Category I or Category III

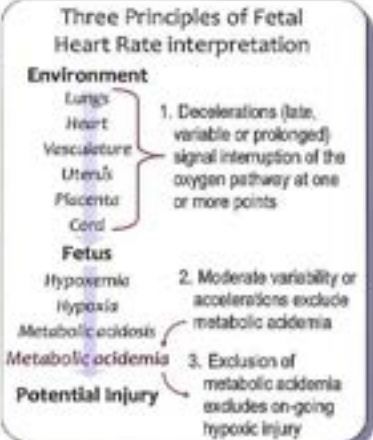
III

Category III includes at least one of the following:

- Absent variability with recurrent late decelerations
- Absent variability with recurrent variable decelerations
- Absent variability with bradycardia for at least 10 min
- Sinusoidal pattern for at least 20 min

A Practical "ABCD" Checklist Approach to FHR Management

	"A" Assess Oxygen Pathway	"B" Begin Corrective Measures	"C" Clear Obstacles to Rapid Delivery	"D" Determine Decision to Delivery Time
Lungs	<input type="checkbox"/> Airway and breathing	<input type="checkbox"/> Supplemental oxygen	Facility Confirm: <input type="checkbox"/> OR availability <input type="checkbox"/> Equipment availability	Consider <input type="checkbox"/> Facility response time <input type="checkbox"/> Location of OR
Heart	<input type="checkbox"/> Heart rate and rhythm	<input type="checkbox"/> Position changes <input type="checkbox"/> Fluid bolus	Staff Consider notifying <input type="checkbox"/> Obstetrician <input type="checkbox"/> Surgical assistant <input type="checkbox"/> Anesthesiologist <input type="checkbox"/> Neonatologist <input type="checkbox"/> Pediatrician <input type="checkbox"/> Nursing staff	Consider: <input type="checkbox"/> Staff availability <input type="checkbox"/> Training <input type="checkbox"/> Experience
Vasculature	<input type="checkbox"/> Blood pressure <input type="checkbox"/> Volume status	<input type="checkbox"/> Correct hypotension	Mother Consider <input type="checkbox"/> Informed consent <input type="checkbox"/> Anesthesia options <input type="checkbox"/> Laboratory tests <input type="checkbox"/> Blood products <input type="checkbox"/> Intravenous access <input type="checkbox"/> Urinary catheter <input type="checkbox"/> Abdominal prep <input type="checkbox"/> Transfer to OR	<input type="checkbox"/> Surgical considerations (prior abdominal or uterine surgery) <input type="checkbox"/> Medical considerations (obesity, hypertension, diabetes) <input type="checkbox"/> Obstetric considerations (parity, pelvimetry, placentation)
Uterus	<input type="checkbox"/> Contraction strength <input type="checkbox"/> Contraction frequency <input type="checkbox"/> Baseline uterine tone <input type="checkbox"/> Exclude uterine rupture	<input type="checkbox"/> Stop or reduce stimulant <input type="checkbox"/> Consider uterine relaxant	Fetus Consider: <input type="checkbox"/> Estimated weight <input type="checkbox"/> Gestational age <input type="checkbox"/> Presentation <input type="checkbox"/> Position	Consider: <input type="checkbox"/> Estimated fetal weight <input type="checkbox"/> Gestational age <input type="checkbox"/> Presentation <input type="checkbox"/> Position
Placenta	<input type="checkbox"/> Check for bleeding <input type="checkbox"/> Exclude abruption		Labor <input type="checkbox"/> Consider IUPC	Consider: <input type="checkbox"/> Arrest or protraction disorder <input type="checkbox"/> Remote from delivery <input type="checkbox"/> Poor expulsive efforts
Cord	<input type="checkbox"/> Vaginal exam <input type="checkbox"/> Exclude cord prolapse	<input type="checkbox"/> Consider amnioinfusion		

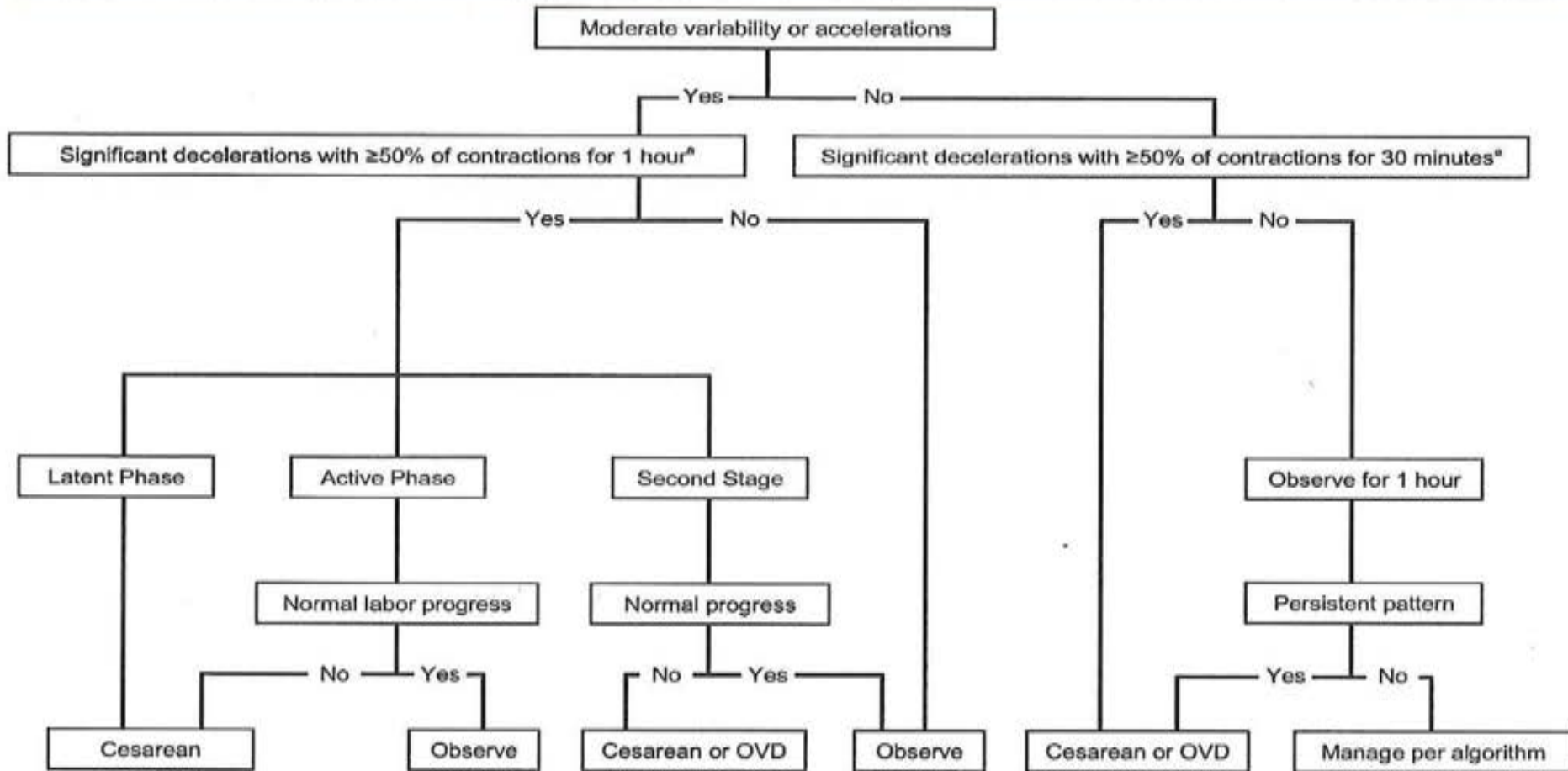


*Other Causes of Fetal Heart Rate Changes

Fetal	Maternal
<input type="checkbox"/> Fever	<input type="checkbox"/> Fever
<input type="checkbox"/> Infection	<input type="checkbox"/> Infection
<input type="checkbox"/> Medications	<input type="checkbox"/> Medications
<input type="checkbox"/> Anemia	<input type="checkbox"/> Hyperthyroidism
<input type="checkbox"/> Arrhythmia	
<input type="checkbox"/> Heart block	
<input type="checkbox"/> Congenital anomaly	
<input type="checkbox"/> Extreme prematurity	
<input type="checkbox"/> Preexisting neurologic injury	
<input type="checkbox"/> Sleep cycle	

FIGURE 1

Algorithm for management of category II fetal heart rate tracings



OVD, operative vaginal delivery.

^aThat have not resolved with appropriate conservative corrective measures, which may include supplemental oxygen, maternal position changes, intravenous fluid administration, correction of hypotension, reduction or discontinuation of uterine stimulation, administration of uterine relaxant, amnioinfusion, and/or changes in second stage breathing and pushing techniques.

Clark. Category II FHRT. Am J Obstet Gynecol 2013.

Clark, S. L., et al. (2013). Intrapartum management of category II fetal heart rate tracings: towards standardization of care. *American Journal of Obstetrics and Gynecology*, 209(2), p. 90; used with permission

TABLE

Management of category II fetal heart rate patterns: clarifications for use in algorithm

1. Variability refers to predominant baseline FHR pattern (marked, moderate, minimal, absent) during a 30-minute evaluation period, as defined by NICHD.
2. Marked variability is considered same as moderate variability for purposes of this algorithm.
3. Significant decelerations are defined as any of the following:
 - Variable decelerations lasting longer than 60 seconds and reaching a nadir more than 60 bpm below baseline.
 - Variable decelerations lasting longer than 60 seconds and reaching a nadir less than 60 bpm regardless of the baseline.
 - Any late decelerations of any depth.
 - Any prolonged deceleration, as defined by the NICHD. Due to the broad heterogeneity inherent in this definition, identification of a prolonged deceleration should prompt discontinuation of the algorithm until the deceleration is resolved.
4. Application of algorithm may be initially delayed for up to 30 minutes while attempts are made to alleviate category II pattern with conservative therapeutic interventions (eg, correction of hypotension, position change, amnioinfusion, tocolysis, reduction or discontinuation of oxytocin).
5. Once a category II FHR pattern is identified, FHR is evaluated and algorithm applied every 30 minutes.
6. Any significant change in FHR parameters should result in reapplication of algorithm.
7. For category II FHR patterns in which algorithm suggests delivery is indicated, such delivery should ideally be initiated within 30 minutes of decision for cesarean.
8. If at any time tracing reverts to category I status, or deteriorates for even a short time to category III status, the algorithm no longer applies. However, algorithm should be reinstated if category I pattern again reverts to category II.
9. In fetus with extreme prematurity, neither significance of certain FHR patterns of concern in more mature fetus (eg, minimal variability) or ability of such fetuses to tolerate intrapartum events leading to certain types of category II patterns are well defined. This algorithm is not intended as guide to management of fetus with extreme prematurity.
10. Algorithm may be overridden at any time if, after evaluation of patient, physician believes it is in best interest of the fetus to intervene sooner.

FHR, fetal heart rate; NICHD, Eunice Kennedy Shriver National Institute of Child Health and Human Development.

Clark. Category II FHRT. *Am J Obstet Gynecol* 2013.

Clark, S. L., et al. (2013) . Intrapartum management of category II fetal heart rate tracings: towards standardization of care. *American Journal of Obstetrics and Gynecology*, 209(2), p. 91; used with permission

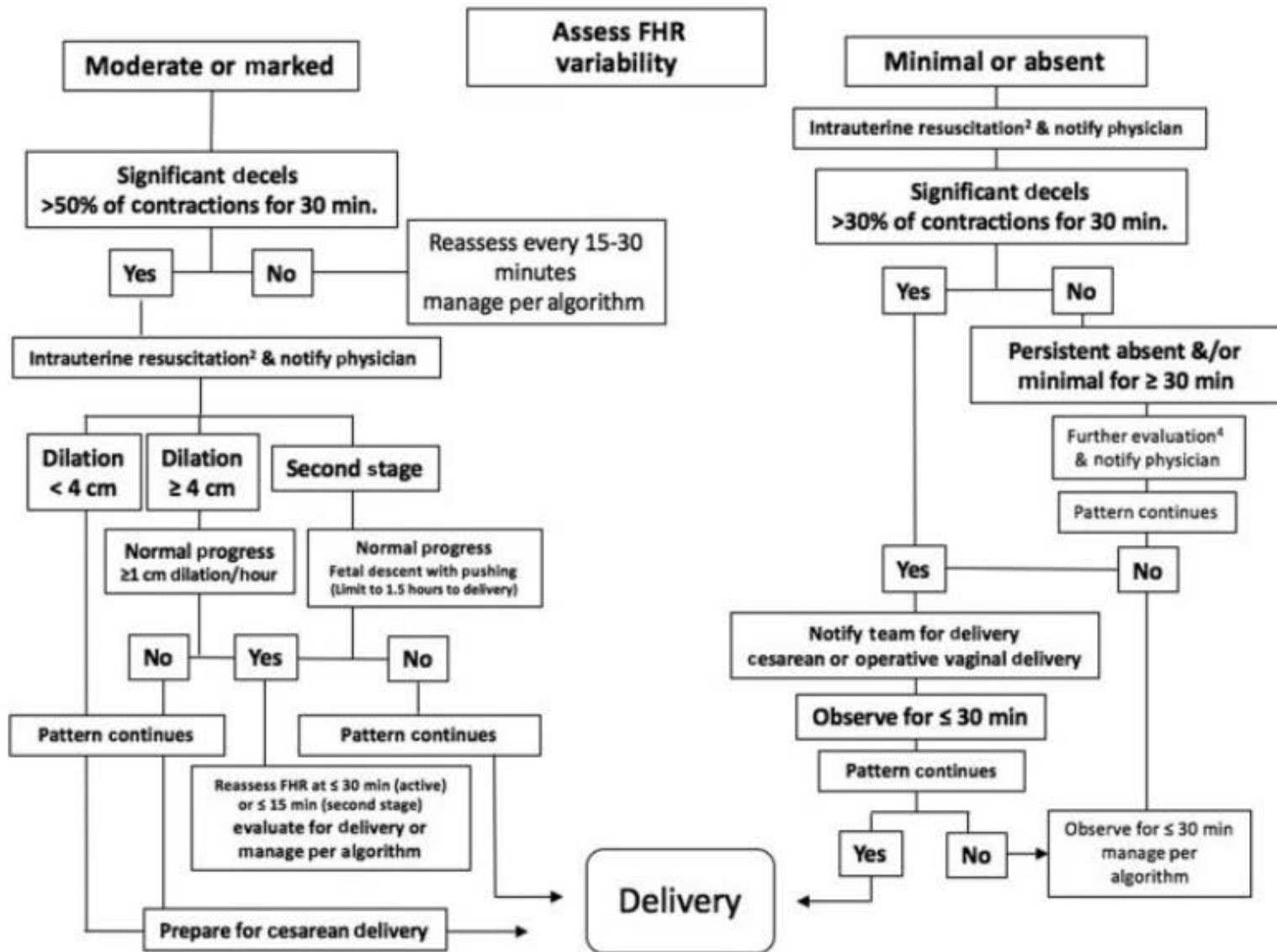


Fig. 1 Management outline for patients with Category II fetal heart rates associated with “significant decelerations” and normal fetal heart rate variability (moderate or marked) and abnormal variability (minimal or absent). FHR, fetal heart rate. Notes: 1. Resuscitative Measures may include: repositioning, O₂ (10L via mask), IV bolus, correction of hypotension. 2. Additional Interventions: consider amnioinfusion for variable decels. 3. Scalp stimulation and/or vibroacoustic stimulation.

A Standardized Approach for Category II Fetal Heart Rate with Significant Decelerations: Maternal and Neonatal Outcomes

Shields, et. al.