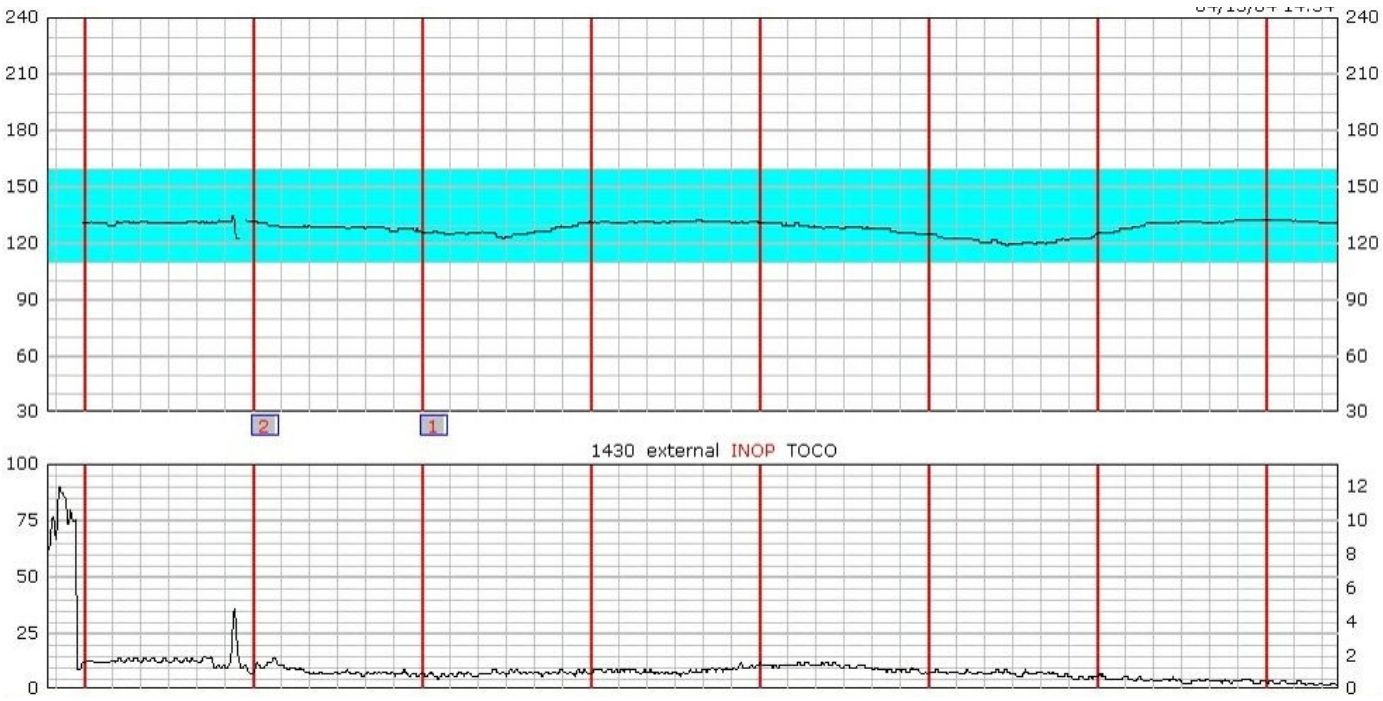
Electronic Fetal Monitoring Case Studies

Case Study 1: MS. PS

Ms. PS is a 24 yo G2P0100 at 32.4 weeks gestation admitted for severe preeclampsia. She has a history of a classical Cesarean Delivery at 24.2 in a pregnancy complicated by HELLP syndrome with a subsequent neonatal demise. At admission, her fetal tracing had a baseline of 135 with minimal variability, no accelerations, and no decelerations 4 hours ago. She has received one dose of Betamethasone for fetal lung maturity approximately 3 hours ago. Ultrasound reveals a fetus with 4%ile growth and a lagging abdominal circumference. There is absence of end-diastolic flow in the umbilical artery. She is currently on magnesium sulfate at 2 g/hr, and has received one dose of intravenous Labetolol, 20 mg, approximately two hours ago. Her current blood pressure is 153/97, pulse 86, temperature 99.1, respirations 18, O2 saturation is 96% on room air. Her deep tendon reflexes are 3+/4, her lungs are clear, and she has had 250 ml of urine output in the last 4 hours. Her urinalysis reveals 3+ proteinuria. Her liver enzymes are within normal limits and her platelets are 112. She presently denies headache, visual changes, shortness of breath, chest pain, or right upper quadrant pain. Below is her current fetal tracing:



Please answer the following questions: Please answer each question.

1. What is the baseline of the FHT? The baseline is the average heart rate rounded to the nearest five bpm.

a. 120
b. 125
c. 130
d. 135

e. 140

2. Describe the variability. Minimal variability should be very worrisome in the clinical context, though it may be blunted by both magnesium sulfate and betamethasone.

a. Absent.
b. Minimal.
c. Moderate.
d. Marked.

3. Are there accelerations present? There are no accelerations present.

a. No.
b. Yes.

4. Are there decelerations present? There are repetitive late decelerations which are ominous in this setting.

a. None.
b. Variable.
c. Early.
d. Late.
e. Prolonged.

5. Are contractions present? Though subtle, her contractions are every 3-4 minutes.

a. None.
b. Occasional.
c. Regular.
d. Hyperstimulation.

6. Is this FHT reassuring? This tracing requires immediate intervention

a. Yes. It is reassuring and reactive.
b. It is overall reassuring, but not reactive.
c. This tracing is nonreassuring and requires intervention.

Case 1 Interventions

Which of the following interventions are appropriate in this context?

1. Turn patient to left, lateral side. This relieves compression on the IVC increasing cardiac output and therefore uterine perfusion.

a. No.
b. Yes.

2. Change maternal position to various positions until fetal improvement. This only useful with cord compression of which there is no evidence.

a. No.
b. Yes.

3. Fluid bolus, lower maternal head. These efforts may help improve maternal cardiac output and therefore uterine perfusion, though this could precipitate pulmonary edema and should be used cautiously

a. No.
b. Yes.

4. Vasopressor (e.g. Ephedrine). There is no evidence of maternal hypotension.

a. No.
b. Yes.

5. Supplemental Oxygen. Though controversial, O2 may be of benefit to the fetus in this case.

a. No.
b. Yes.

6. Stop Magnesium Sulfate. Stopping magnesium here will not benefit the fetus and may harm the mother.

a. No.
b. Yes.

7. Give tocolytic (e.g. Terbutaline). There are rarely times when this will prove beneficial and there is no evidence of hypertonus.

a. No.
b. Yes.

8. Perform vaginal exam. Though not contraindicated, this is not likely to be beneficial.

a. No.
b. Yes.

9. Perform emergent Cesarean delivery or operative vaginal delivery if the possible Intrauterine resuscitation should be attempted first.

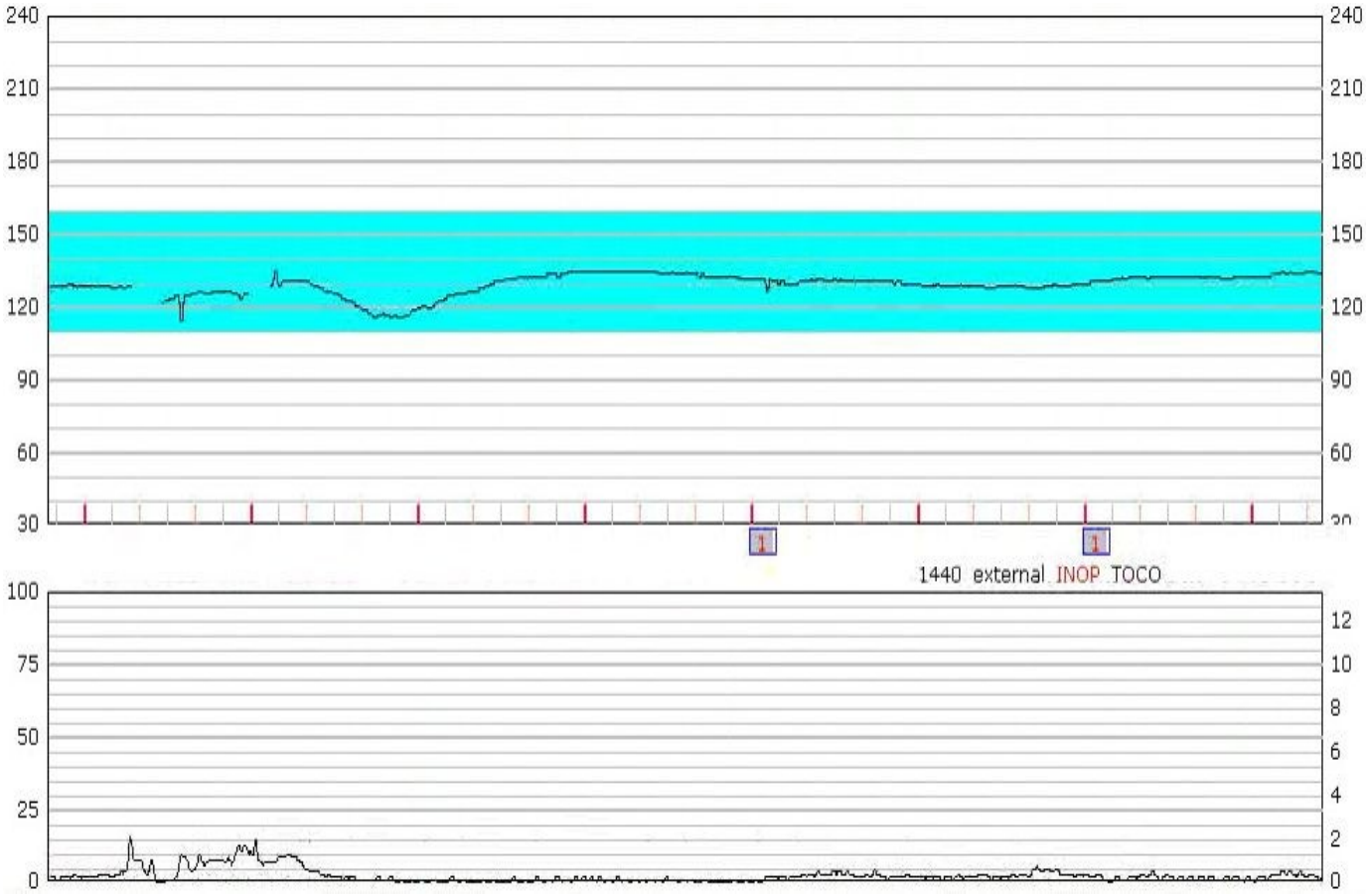
a. No.
b. Yes.

10. Perform fetal scalp stimulation. Fetal scalp stimulation should never be performed in the presence of late decelerations.

a. No.
b. Yes

Case 1: Ms. PS continued . . .

Ten minutes after completing the previous interventions, the following fetal tracing is obtained:



Please answer below: Please answer each question.

1.What is your current assessment? In spite of the previous interventions, this tracing is as bad and possibly worse than before.

a. Improved from before and now overall reassuring.
b. The same or possibly worse and persistently nonreassuring.

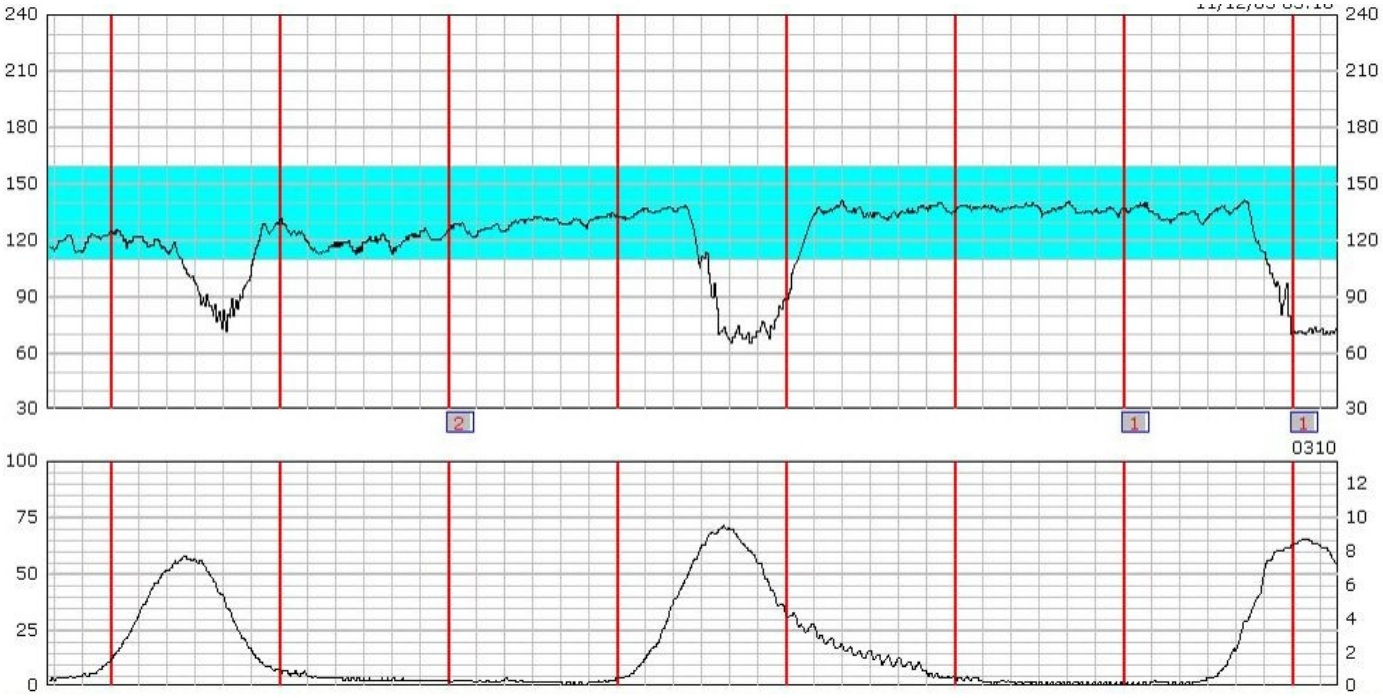
2. Which of the following is appropriate at this time. After attempting intrauterine resuscitation and failing, urgent delivery is indicated.

a. No further intervention required.
b. Continue the interventions already being undertaken.
c. Deliver immediately by Cesarean delivery.

Case Study 2: Ms. CD

Ms. CD is a 37 yo G4P3003 at 40.2 who presented in active labor with spontaneous rupture of membranes. On initial exam, she is 5 cm dilated, 80% effaced, and the vertex is at 0 station. There is light meconium staining of the amniotic fluid. She has had three previous vaginal deliveries. Her pregnancy has been otherwise normal. Her pulse is 104, BP 123/78, respirations 20, and pulse oximetry is 99%. Below is her current fetal tracing one hour after admission:

Based upon the section of FHT that follows, please answer the questions below:



Please answer the following questions: Please answer each question.

1. What is the baseline of the FHT? The baseline is the average heart rate rounded to the nearest five bpm.

a. 120
b. 125
c. 130
d. 135
e. 140

2. Describe the variability. Moderate variability here represents a well-oxygenated fetus in spite of the concurrent decelerations.

a. Absent.
b. Minimal.
c. Moderate.
d. Marked.

3. Are there accelerations present? There are no accelerations present.

a. No.
b. Yes.
c. Yes, and the strip is reactive.

4. Are there decelerations present? There are recurrent variable down to 70 bpm with each contraction.

a. None.
b. Variable.
c. Early.
d. Late.
e. Prolonged.

5. Are contractions present? Her contractions are every 3 minutes.

a. None.
b. Occasional.
c. Regular.
d. Hyperstimulation.

6. Is this FHT reassuring? This tracing requires immediate intervention.

a. Yes. It is reassuring and reactive.
b. It is overall reassuring, but not reactive.
c. This tracing is nonreassuring and requires intervention.

Case 2 Interventions

Which of the following interventions are appropriate in this context?

1. Turn patient to left, lateral side. The correct approach is to rotate through various positions until cord compression is relieved. This may be left, lateral, but not necessarily.

No.

Yes.

2. Change maternal position to various positions until fetal improvement. This is useful with cord compression of which the variable decels may represent.

No.

Yes.

3. Fluid bolus, lower maternal head. These efforts may help improve maternal cardiac output and therefore uterine perfusion, though this could precipitate pulmonary edema and should be used cautiously.

No.

Yes.

4. Vasopressor (e.g. Ephedrine). There is no evidence of maternal hypotension.

No.

Yes.

5. Supplemental Oxygen. Though controversial, O2 may be of benefit to the fetus in this case.

No.

Yes.

6. Start amnioinfusion. An amnioinfusion is indicated for recurrent severe variable decelerations.

No.

Yes.

7. Give tocolytic (e.g. Terbutaline). There are rarely times when this will prove beneficial and there is no evidence of hypertonus.

No.

Yes.

8. Perform vaginal exam. An exam may reveal the presence of a prolapsed cord and will allow the physician to know whether operative delivery is possible.

No.

Yes.

9. Perform expeditious (emergent) delivery (operative vaginal delivery or Cesarean delivery) Intrauterine resuscitation should be attempted first.

No.

Yes.

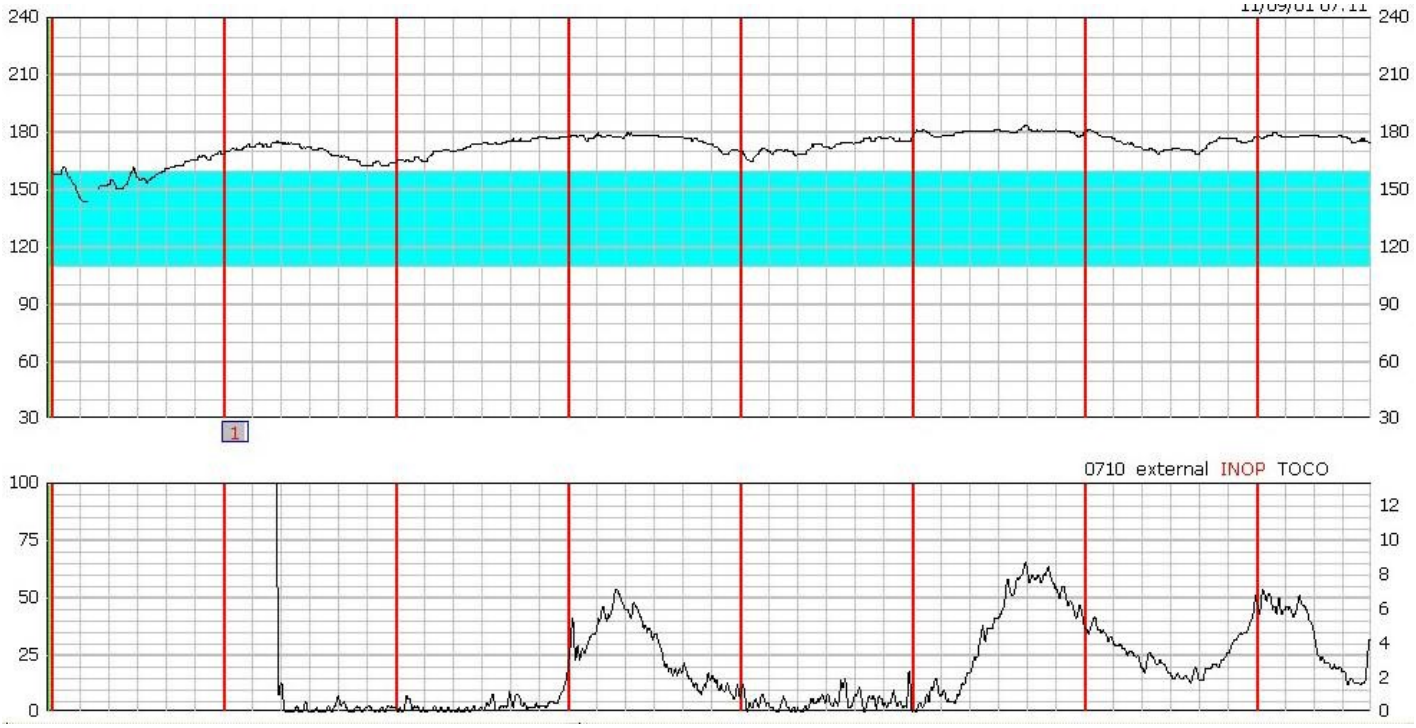
10. Perform fetal scalp stimulation. Fetal scalp stimulation should never be performed in the presence of recurrent variable decelerations.

No.

Yes.

Case study 2 continued . . .

Ten minutes after completing the previous interventions, the cervix is 6 cm dilated and the following fetal tracing is obtained:



Please answer below: Please answer each question.

1. What is your current assessment? In spite of the previous interventions, this tracing is as bad and possibly worse than before.

a. Improved from before and now overall reassuring.
b. The same or possibly worse and persistently nonreassuring.

2. Which of the following is appropriate at this time. After attempting intrauterine resuscitation and failing for this new pattern, urgent delivery is indicated.

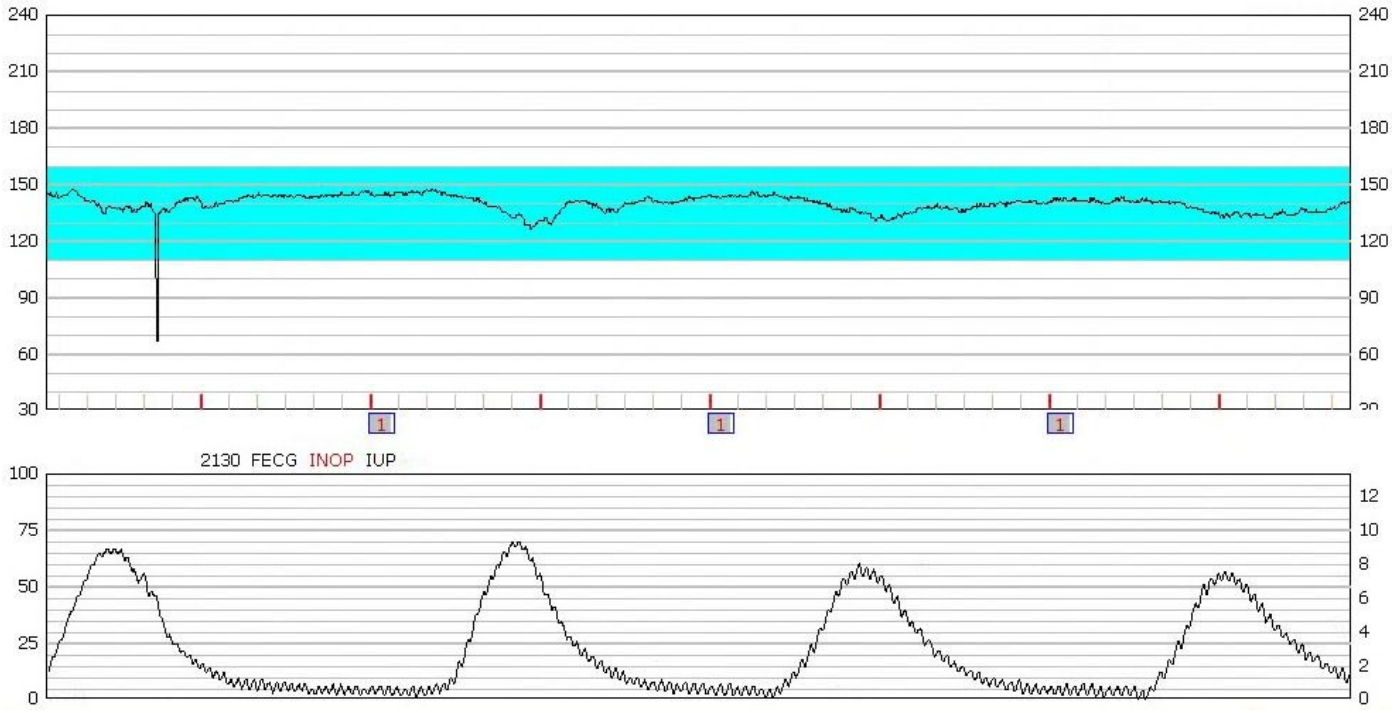
a. No further intervention required.
b. Immediately try new interventions for this change in the tracing.
c. Deliver immediately by Cesarean delivery

Case Study 3: Ms. GA

Ms. GA is a 31 year old G4P1203 with intrauterine pregnancy at 35.3 weeks presenting with regular uterine contractions and spontaneous rupture of membranes 8 hours ago. Her medical history is significant for hypothyroidism and one previous cesarean section with two successful vaginal births after cesarean (VBAC). She has desired a trial of labor in this pregnancy. Her labor was augmented after four hours of no cervical change and currently her Pitocin is on 4 mu/min.

Below is her current fetal tracing:

Based upon the section of FHT that follows, please answer the questions below:



Please answer the following questions: Please answer each question.

1. What is the baseline of the FHT? The baseline is the average heart rate rounded to the nearest five bpm.

a. 120
b. 125
c. 130
d. 135
e. 140

2. Describe the variability. Minimal variability must be interpreted in context with the clinical picture.

a. Absent.
b. Minimal.
c. Moderate.
d. Marked.

3. Are there accelerations present? There are no accelerations present

a. No.
b. Yes.
c. Yes, and the strip is reactive.

4. Are there decelerations present? There are repetitive early decelerations which are not worrisome in and of themselves.

a. None.
b. Variable.
c. Early.
d. Late.
e. Prolonged.

5. Are contractions present? Her contractions are every 2 minutes.

a. None.
b. Occasional.
c. Regular.
d. Hyperstimulation.

6. Is this FHT reassuring? This tracing overall is reassuring.

a. Yes. It is reassuring and reactive.
b. It is overall reassuring, but not reactive.
c. This tracing is nonreassuring and requires intervention.

Case 3 Interventions

Which of the following interventions are appropriate in this context?

1. Turn patient to left, lateral side. There is no evidence of poor uterine perfusion.

a. No.
b. Yes.

2. Change maternal position to various positions until fetal improvement. This only useful with cord compression of which there is no evidence.

a. No.

b. Yes.

3. Fluid bolus, lower maternal head. There is no evidence of maternal hyotension.

a. No.
b. Yes.

4. Vasopressor (e.g. Ephedrine). There is no evidence of maternal hypotension.

a. No.
b. Yes.

5. Supplemental Oxygen. O2 supplementation is of no benefit here.

a. No.
b. Yes.

6. Stop Magnesium Sulfate. Stopping magnesium here will not benefit the fetus and may harm the mother.

a. No.
b. Yes.

6. Start amnioinfusion. Amnioinfusion is indicated only to treat severe variables.

a. No.
b. Yes.

7. Give tocolytic (e.g. Terbutaline). There are rarely times when this will prove beneficial and there is no evidence of uterine hypertonus.

a. No.
b. Yes.

8. Perform vaginal exam. Though not contraindicated, this is not likely to be beneficial.

a. No.
b. Yes.

9. Perform expeditious (emergent) delivery (operative vaginal delivery or Cesarean delivery) Though not contraindicated, this is not likely to be beneficial.

a. No.
b. Yes.

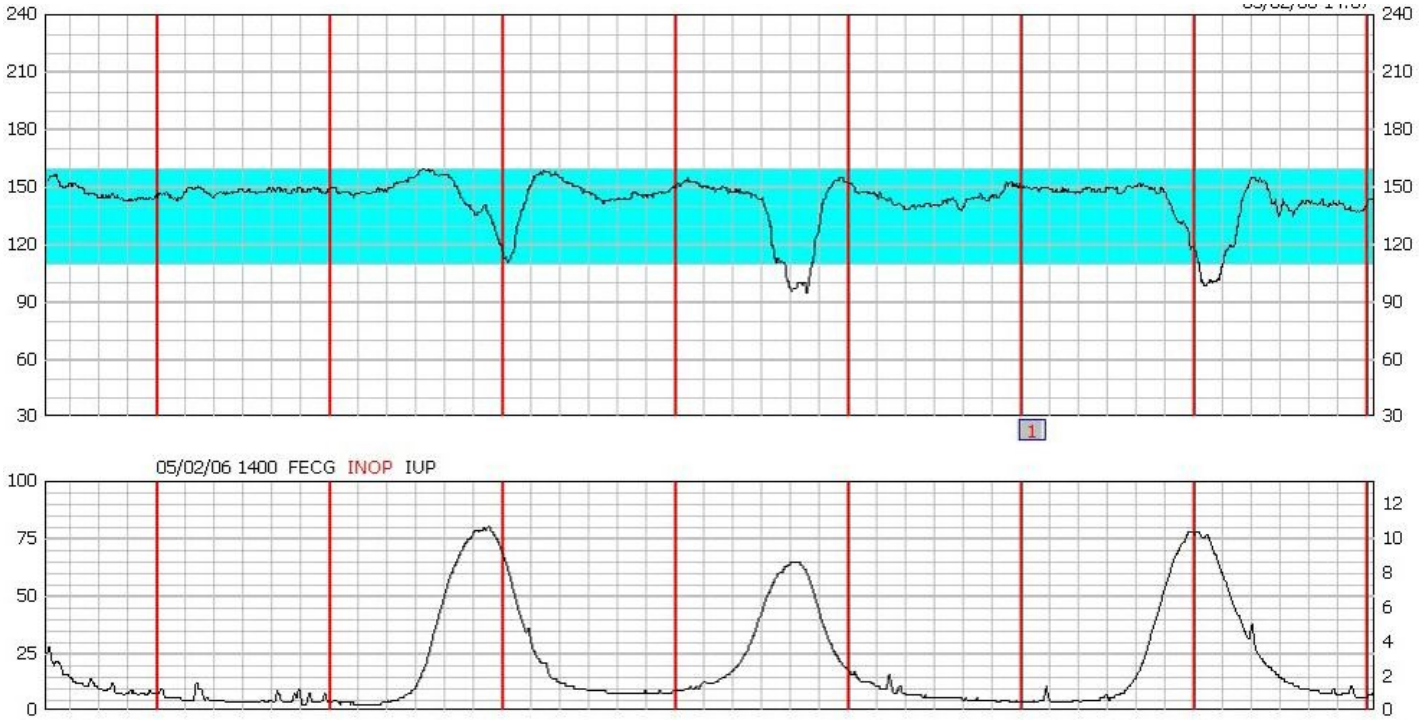
10. Perform fetal scalp stimulation. There is no evidence of fetal distress requiring emergent delivery.

a. No.

b. Yes.

Case study 3 continued . . .

Ten minutes after completing the previous interventions, at which time the patient was 9cm dilated, the following fetal tracing is obtained:



Please answer below: Please answer each question.

1. What is your current assessment? The tracing overall is reassuring with moderate variability and the patient is close to delivery.

a. Overall reassuring.
b. The same or possibly worse and nonreassuring.

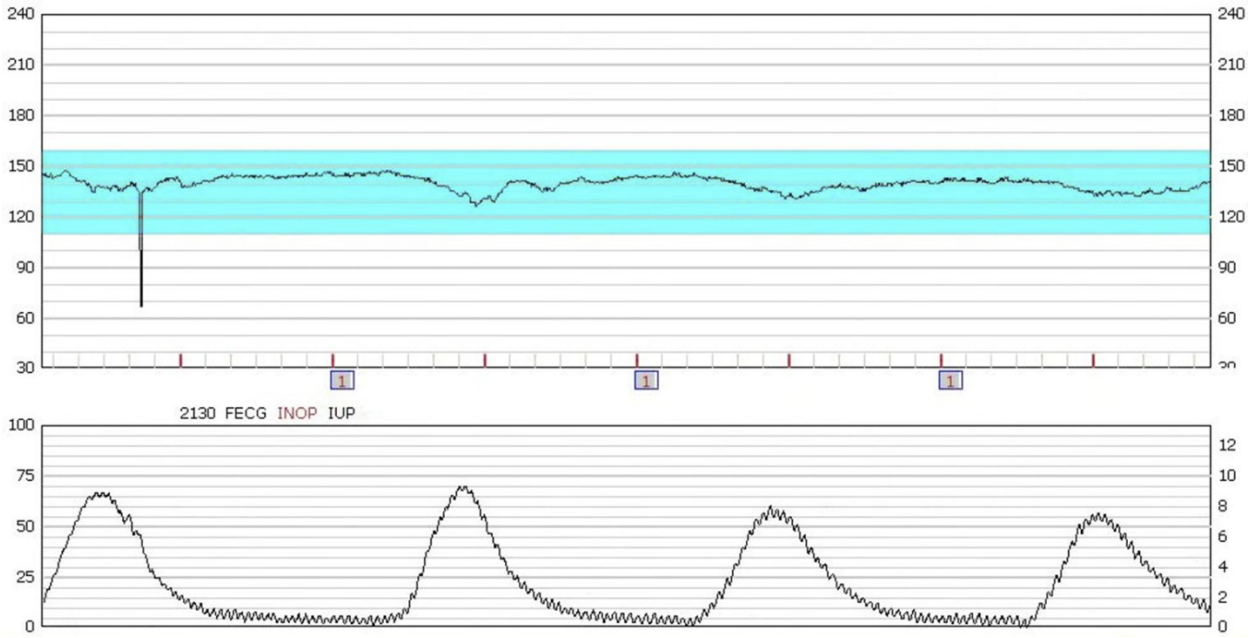
2. Which of the following is appropriate at this time. If delivery does not occur soon and this pattern persists, then new interventions may be appropriate.

a. No further intervention required.
b. Examine cervix and anticipate vaginal delivery.
c. Deliver immediately by Cesarean delivery.

Case 4: Ms. RB

Ms. RB is a 29 year old G1 at 40.5 who underwent induction of labor secondary to oligohydramnios. At 4cm dilation, she underwent artificial rupture of membranes and the amniotic fluid was noted to have moderate meconium staining. Her obstetric history has been unremarkable. Currently she is on 12 mu/min of Pitocin. Below is her current fetal tracing:

Below is her current fetal tracing: Based upon the section of FHT that follows, please answer the questions below:



Please answer the following questions: Please answer each question.

1. What is the baseline of the FHT? The baseline is the average heart rate rounded to the nearest five bpm.

a. 150
b. 155
c. 160
d. 165
e. 170

2. Describe the variability.

a. Absent.
b. Minimal.
c. Moderate.
d. Marked.

3. Are there accelerations present? There are no accelerations present.

a. No.
b. Yes.
c. Yes, and the strip is reactive.

4. Are there decelerations present? There are variable decelerations present.

a. None.
b. Variable.
c. Early.
d. Late.
e. Prolonged.

5. Are contractions present? Yes, there are more than 5 contractions in 10 minutes, which defines hyperstimulation.

a. None.
b. Occasional.
c. Regular.
d. Hyperstimulation.

6. Is this FHT reassuring? This tracing requires immediate intervention.

a. Yes. It is reassuring and reactive.
b. It is overall reassuring, but not reactive.
c. This tracing is nonreassuring and requires intervention.

Case 4 Interventions

Which of the following interventions are appropriate in this context?

1. Turn patient to left, lateral side. This relieves compression on the IVC increasing cardiac output and therefore uterine perfusion.
   a. No.
   b. Yes.
2. Change maternal position to various positions until fetal improvement. This is useful with cord compression but the main problem is hypoperfusion with hyperstimulation.
   a. No.
   b. Yes.
3. Fluid bolus, lower maternal head. These efforts may help improve maternal cardiac output and therefore uterine perfusion.
   a. No.

b. Yes.

4. Vasopressor (e.g. Ephedrine). There is no evidence of maternal hypotension.

a. No.

b. Yes.

5. Supplemental Oxygen. Though controversial, O2 may be of benefit to the fetus in this case.

a. No.

b. Yes.

6. Start amnioinfusion. Amnioinfusion is indicated only for the treatment of severe variables.

a. No.

b. Yes.

7. Give tocolytic (e.g. Terbutaline). If the tachycardia is taken as evidence of fetal distress, then giving a tocolyic may hasten the resolution of the hyperstimulation.

a. No.

b. Yes.

8. Perform vaginal exam. Though not contraindicated, this is not likely to be beneficial.

a. No.

b. Yes.

9. Perform expeditious (emergent) delivery (operative vaginal delivery or Cesarean delivery) Intrauterine resuscitation should be attempted first.

a. No.

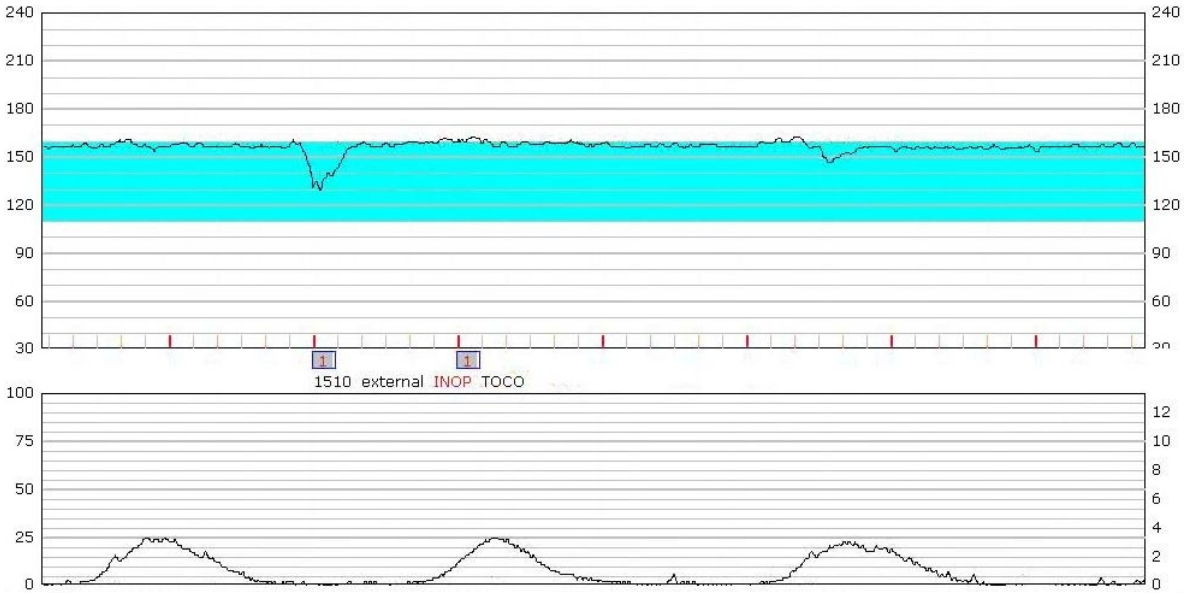
b. Yes.

10. Perform fetal scalp stimulation. Fetal scalp stimulation should never be performed in the presence of tachycardia.

a. No.

b. Yes.

Case 4: Ms. RB continued . . . Thirty minutes after completing the previous interventions, the following fetal tracing is obtained:



Please answer below: Please answer each question.

1. What is your current assessment? The tracing has improved with correction of the hyperstimulation.

a. Improved from before and now overall reassuring.

b. The same or possibly worse and persistently nonreassuring.

2. Which of the following is appropriate at this time. The tracing is now overall reassuring and labor should be allowed to progress.

a. No further intervention required.

b. Continue the interventions already being undertaken.

c. Deliver immediately by Cesarean delivery.

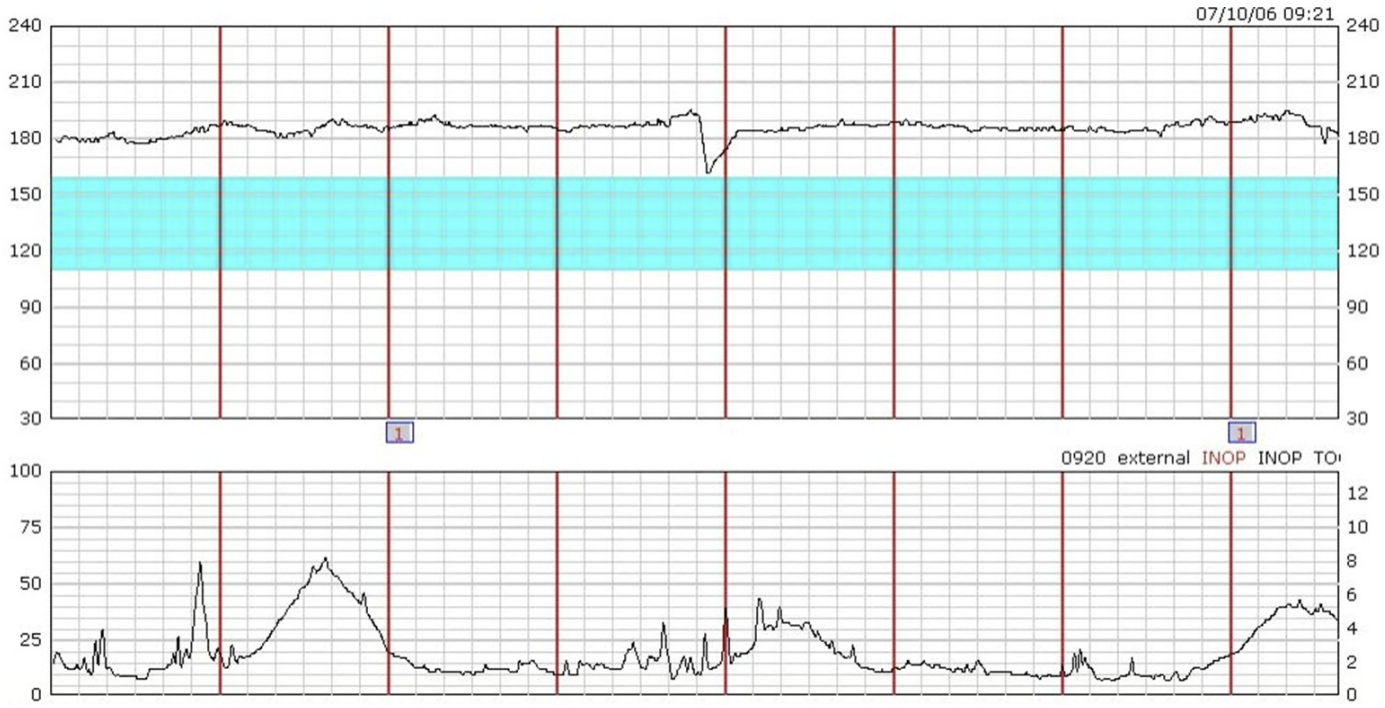
Case 5: Ms. AR

Ms. AR is a 19 yo G1P0 at 39.5 weeks gestation admitted for rupture of membranes. She presented 8 hours ago with a nonspecific history complaining of pain and occassional contractions. On history, she reports leaking some fluid over the last two or three days. Her prenatal history is complicated by previous substance abuse and she now is on Methadone maintenance (90 mg daily). She is Hepatitis C positive. Her medical and surgical history is otherwise negative. Her GBS status is unknown.

On exam, she is grossly ruptured and the cervix is 2 cm dilated, 50% effaced, and the vertex is -3 station. She has no fundal tenderness at the time of admission. Her WBC is 14.6. Her temperature at admission is 98.9 degrees. She is admitted and started on Pitocin for augmentation of labor and Penicillin G secondary to suspected prolonged rupture of membranes.

Currently, you are called to see her with the fetal tracing below. Her pulse is 118 bpm, her temperature is 100.6 degrees. She has fundal tenderness on exam. Below is her current tracing:

Based upon the section of FHT that follows, please answer the questions below:



Please answer the following questions: Please answer each question.

1. What is the baseline of the FHT? The baseline is the average heart rate rounded to the nearest five bpm.

a. 165
b. 170
c. 175
d. 180
e. 185

2. Describe the variability. The variability is moderate.

a. Absent.
b. Minimal.
c. Moderate.
d. Marked.

3. Are there accelerations present? There are no accelerations present.

a. No.
b. Yes.
c. Yes, and the strip is reactive.

4. Are there decelerations present? There is an occasional variable deceleration.

a. None.

b. Variable.
c. Early.
d. Late.
e. Prolonged.

5. Are contractions present? Her contractions are every 3 minutes.

a. None.
b. Occasional.
c. Regular.
d. Hyperstimulation.

6. Is this FHT reassuring? This tracing requires immediate intervention

a. Yes. It is reassuring and reactive.
b. It is overall reasurring, but not reactive.
c. This tracing is nonreassuring and requires intervention.

Case 5 Interventions Which of the following interventions are appropriate in this context?

1. Turn patient to left, lateral side. If the tachycardia is due to maternal fever, then there is no evidence of uteroplacental insufficiency.

a. No.
b. Yes.

2. Change maternal position to various positions until fetal improvement. There is no significant evidence of cord compression, so this maneuver is not likely to be beneficial.

a. No.
b. Yes.

3. Fluid bolus, lower maternal head. We are not treating hypoperfusion or uteroplacental insufficiency.

a. No.
b. Yes.

4. Vasopressor (e.g. Ephedrine). There is no evidence of maternal hypotension.

a. No.
b. Yes.

5. Supplemental Oxygen.

O2 is likely of no benefit to the fetus in this case.

a. No.
b. Yes.

6. Start antibiotic coverage for chorioamnionitis.

Penicillin alone is not adequate for chorioamnionitis. She should also be given acetominophen.

a. No.
b. Yes.

7. Give tocolytic (e.g. Terbutaline).

There are rarely times when this will prove beneficial and there is no evidence of hypertonus.

a. No.
b. Yes.

8. Perform vaginal exam.

Though not contraindicated, this is not likely to be beneficial and frequent exams may cause or exacerbate infection.

a. No.
b. Yes.

9. Perform expeditious (emergent) delivery (operative vaginal delivery or Cesarean delivery)

Intrauterine resuscitation and treatment of the fever should be attempted first.

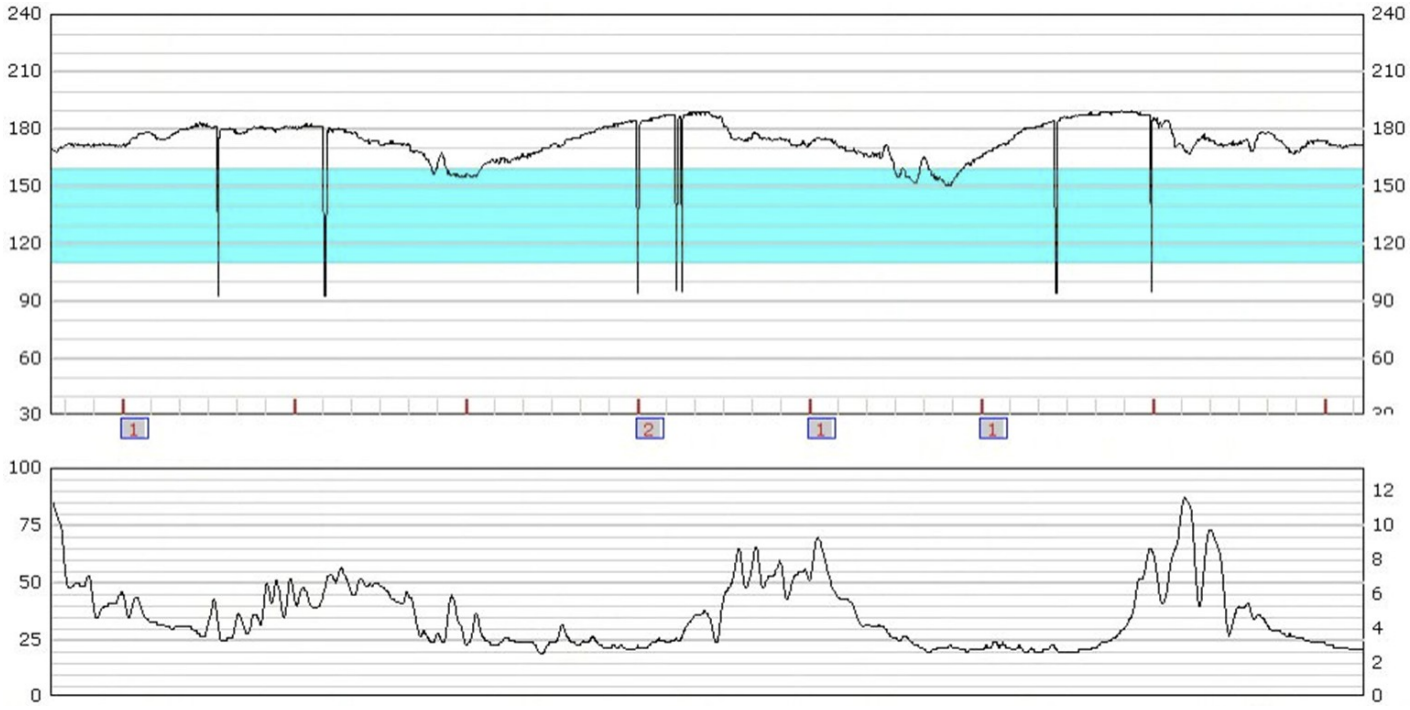
a. No.
b. Yes.

10. Perform fetal scalp stimulation.

Fetal scalp stimulation should never be performed in the presence of tachycardia.

a. No.
b. Yes.

Case study 5 cont..Thirty minutes after completing the previous interventions, the following fetal tracing is obtained:



Please answer below: Please answer each question.

1. What is your current assessment? In spite of the previous interventions, this tracing is as bad and possibly worse than before.

a. Improved from before and now overall reassuring.
b. The same or possibly worse and persistently nonreassuring.

2. Which of the following is appropriate at this time. After attempting intrauterine resuscitation and failing, urgent delivery is indicated.

a. No further intervention required.
b. Continue the interventions already being undertaken.
c. Deliver immediately by Cesarean delivery.