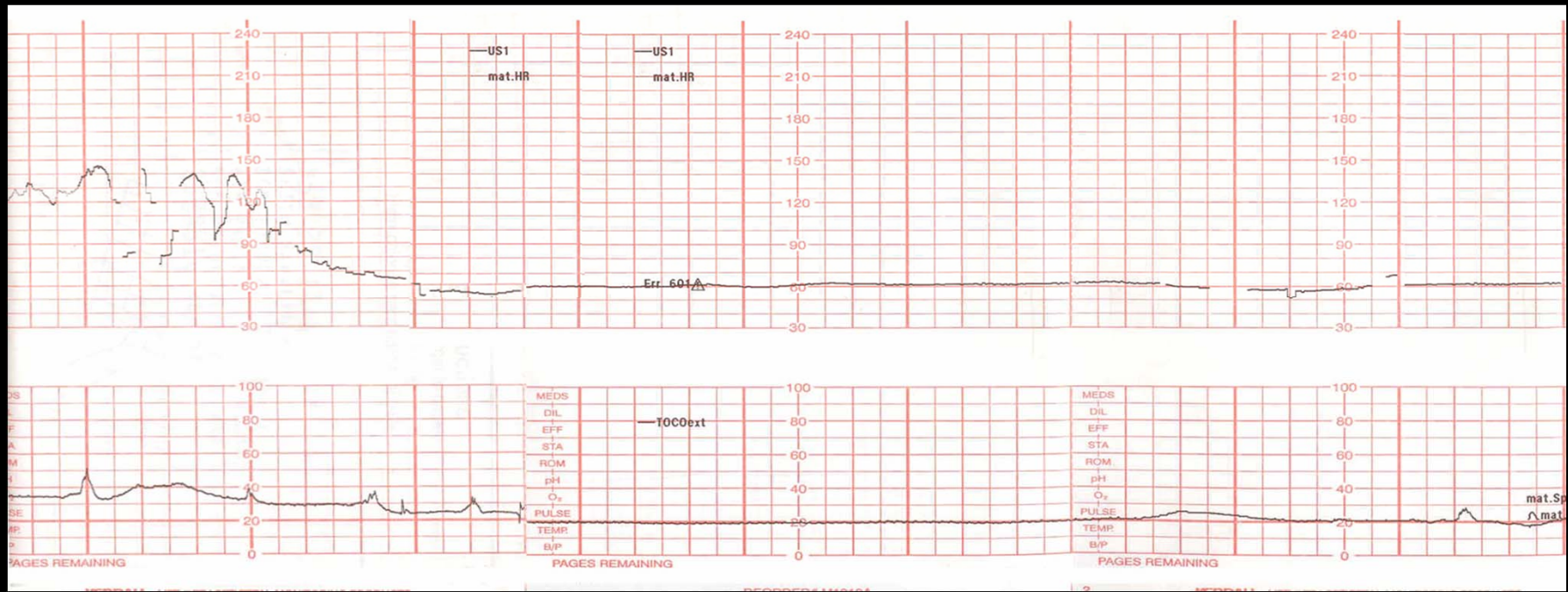


# Situational Awareness In FHR Monitoring Emergency Response



**Michael Fox RN, BSN, Director  
Perinatal Resource Group**

# Sounding The Alarm



Each year 1-3 % of term laboring patients undergo emergency cesarean delivery. Greater than 50% of emergent deliveries occur in response to or in association with FHR complications, commonly fetal bradycardia and/or prolonged decelerations.

# “Event to Delivery” Time

**Fetal  
Bradycardia:  
Sounding  
the Alarm**

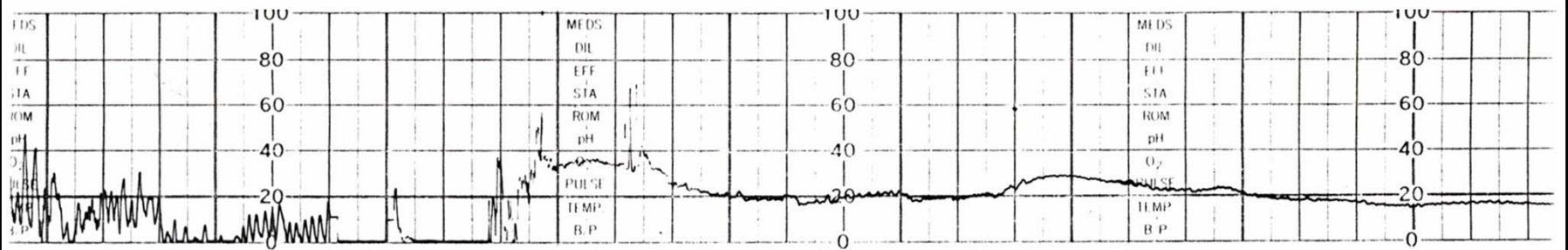
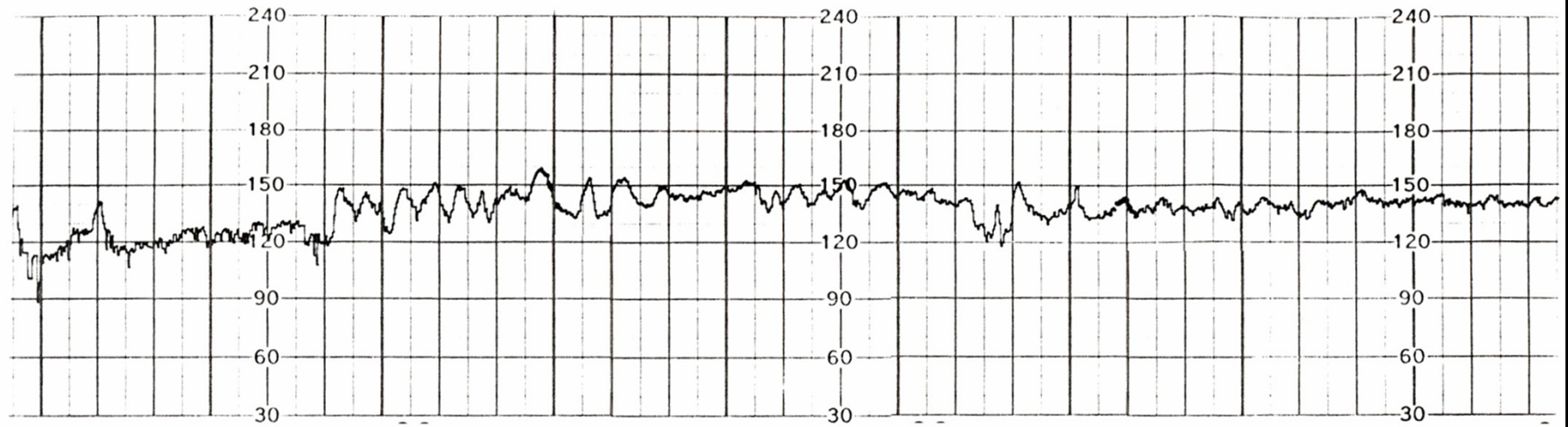


**When the alarm is sounded, decision-making usually accomplished in minutes or hours must now be made in seconds.**

# Patient Profile

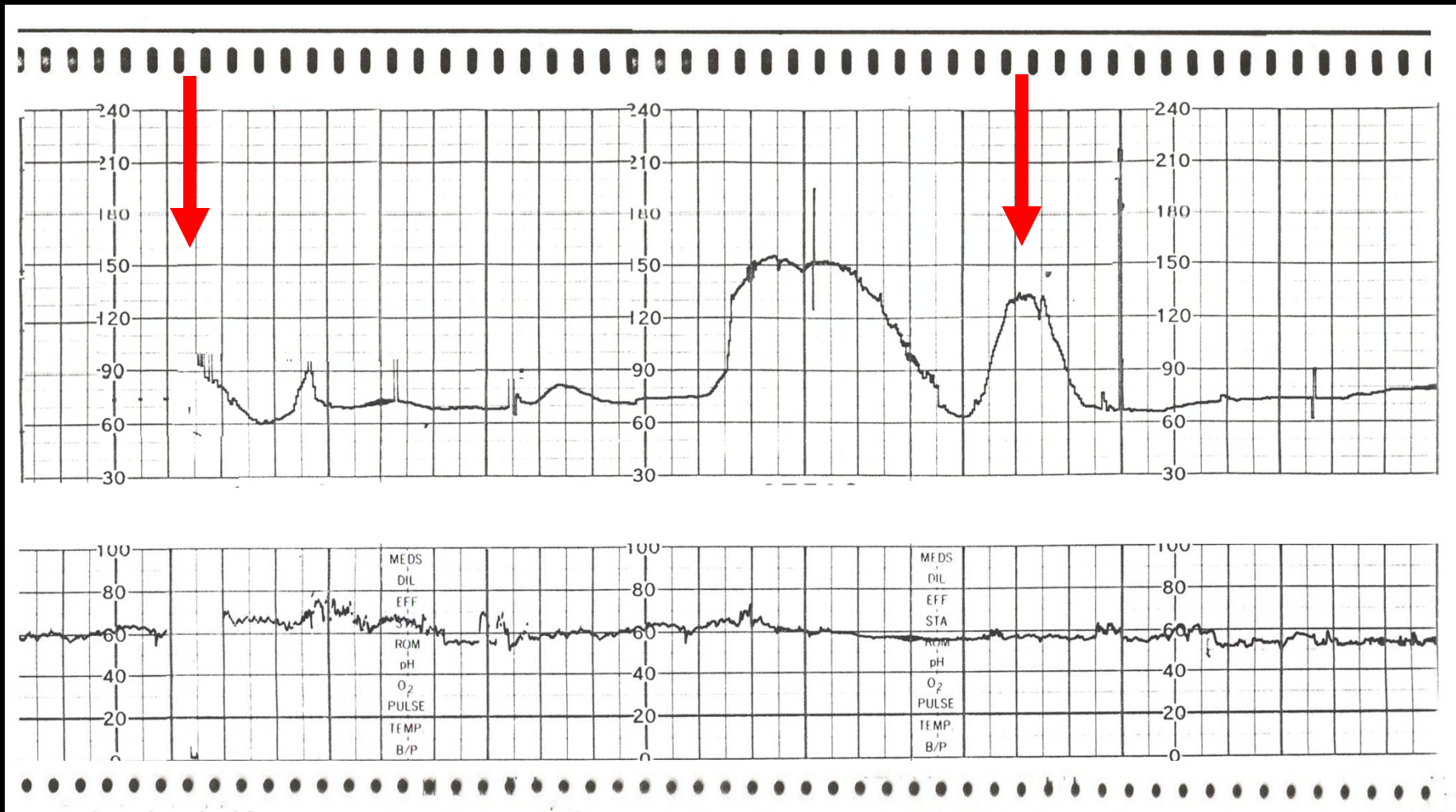
- 21 y.o.
- G<sub>1</sub> P<sub>0</sub>
- @ 41 <sup>1</sup>/<sub>2</sub> weeks

21:00

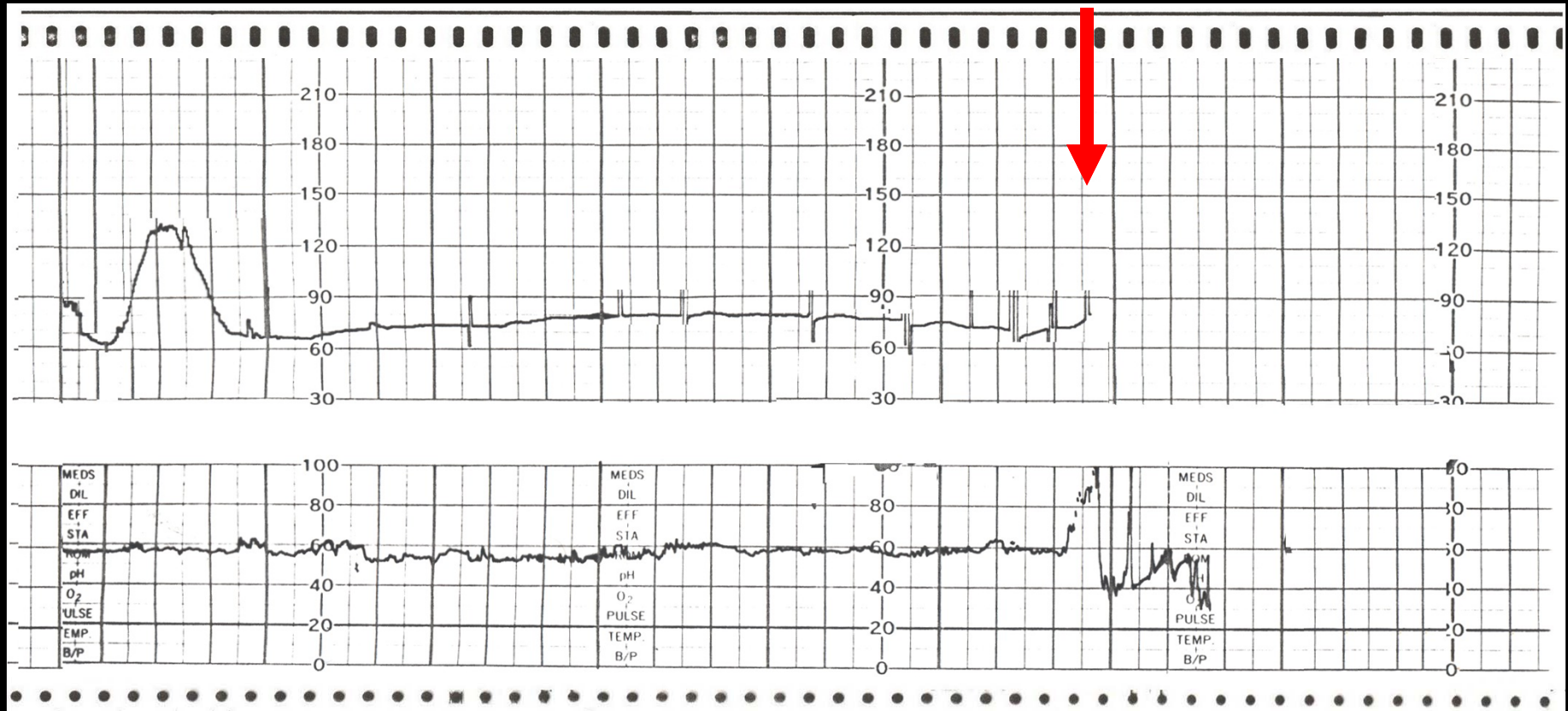




# 21:18 Patient in OR



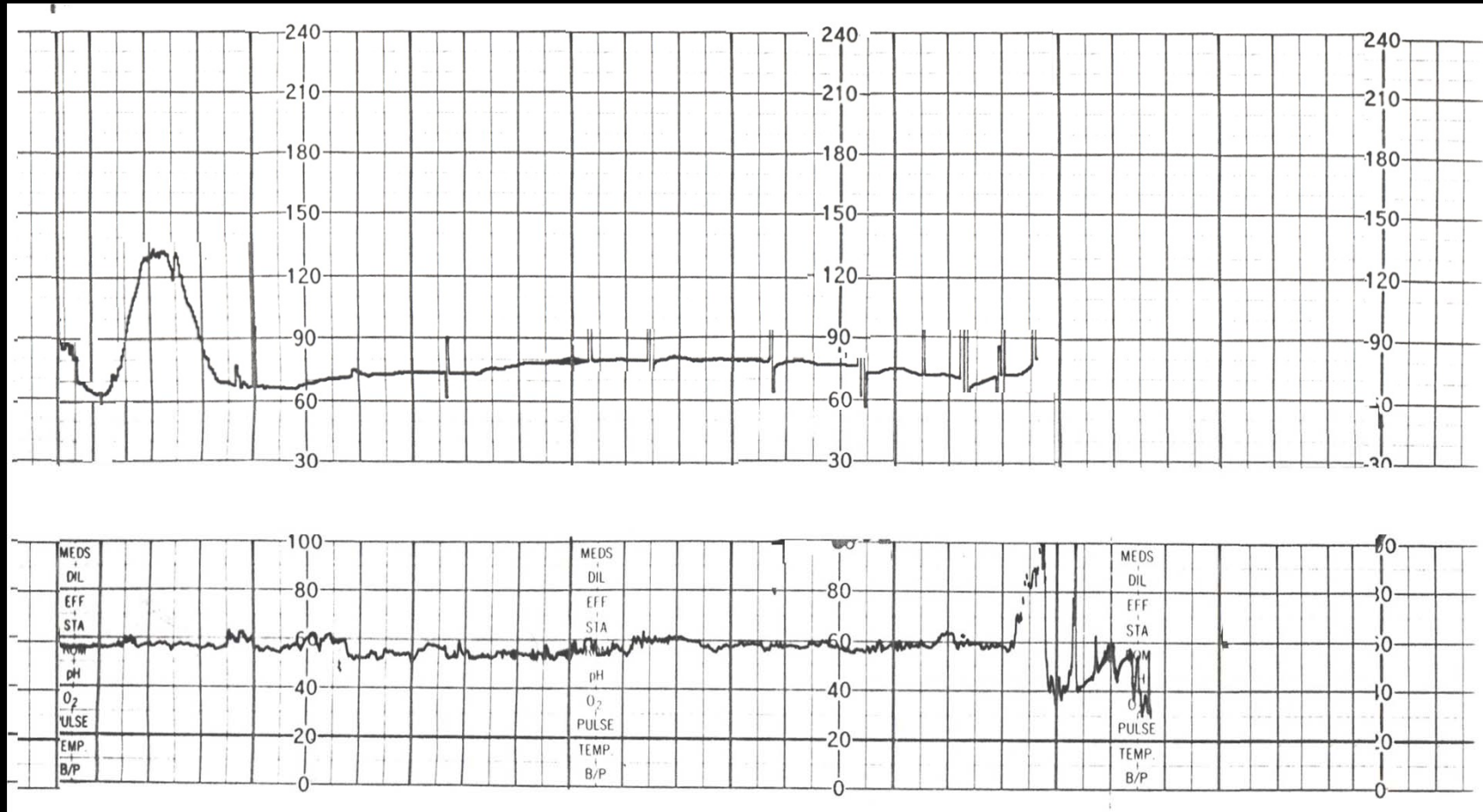
# Birth at 21:30

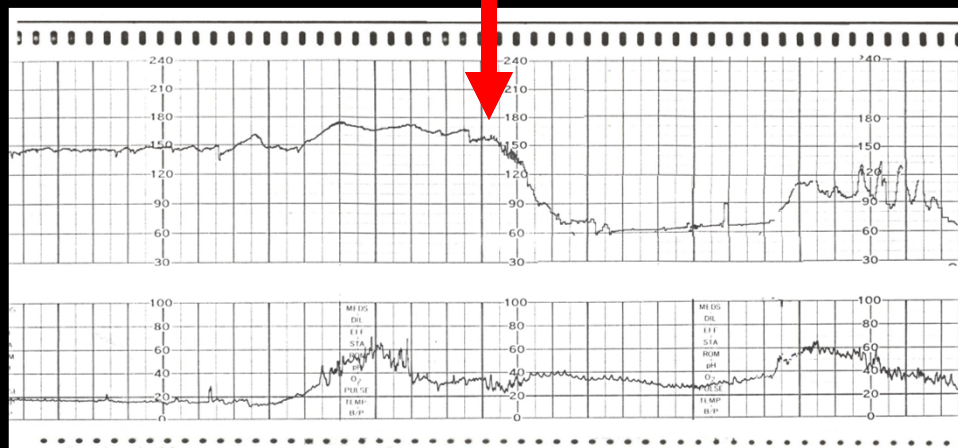


**Is this tracing associated with a significant acidosis?**



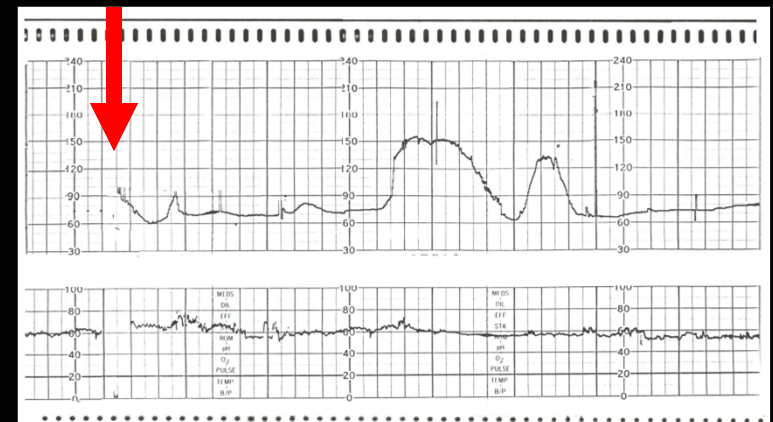
# Is This Tracing Associated With A Significant Acidosis?



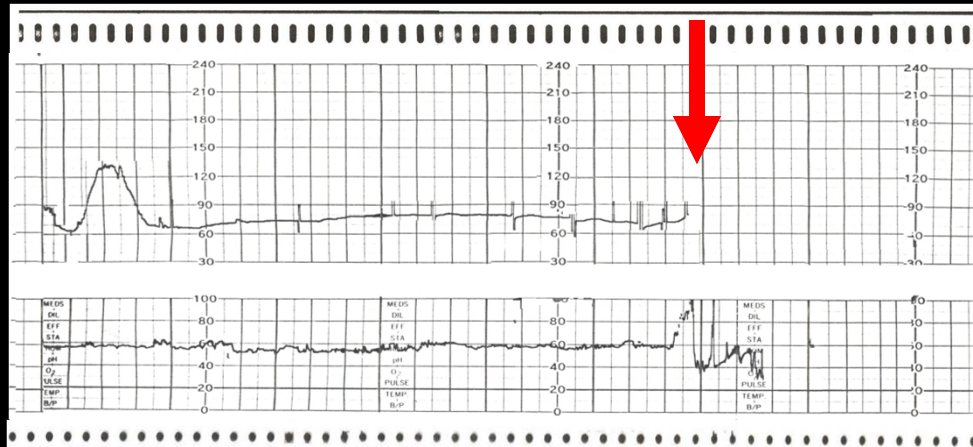


**Bradycardia begins @ 21:08**

**Patient in OR by 21:18  
10 minutes after  
bradycardia begins**



**Birth at 21:30.  
22 minutes after  
start of  
bradycardia**



# DELIVERY

- 4410 gram male
- Birth by stat C/S
- Apgar score of 1/6

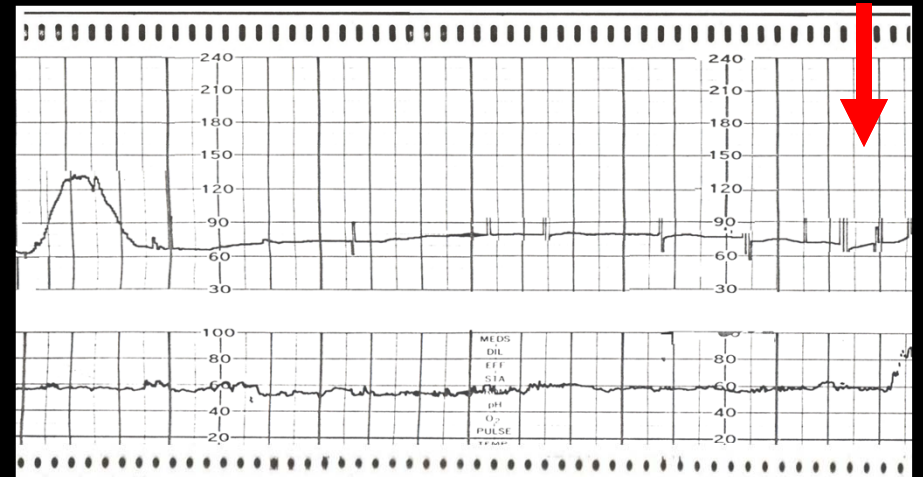
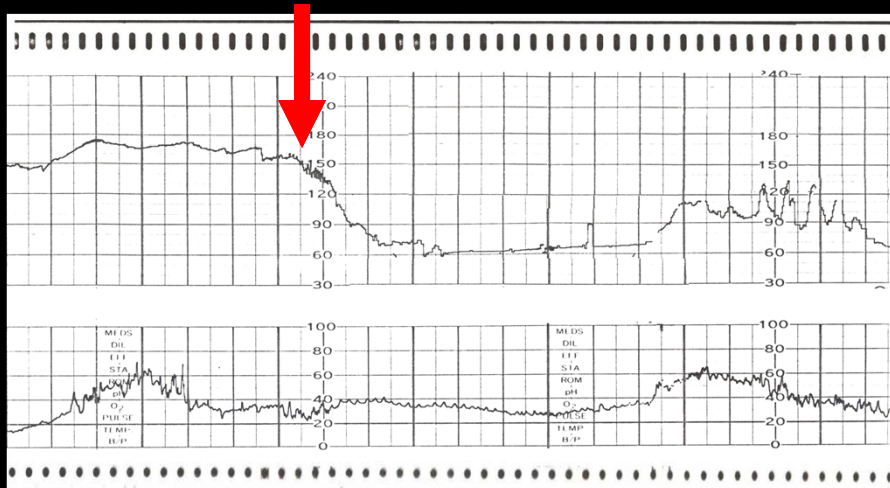


## Cord gases

- CUA: 6.92/64/24/-22
- CUV: 7.22/54/56/-7

Umbilical cord gases suggestive of a prolapsed cord

# “Event to Delivery” Time



Birth at 21:30

• 22 minutes after start of bradycardia

Cord gases

- CUA: 6.92/64/24/-22
- CUV: 7.22/54/56/-7

# **“Event To Delivery Time”**

## **Any Unwarranted Delay In:**

- Observing the emergent pattern**
- Recognizing it’s significance**
- Notifying the physician capable C/S**
- Ensuring a bedside evaluation**
- Initiating preparations for immediate delivery**
- Accomplishing delivery in a time frame in keeping with the urgency of the situation.**

# Studies show OB units differ in their ability to respond to significant changes in maternal and fetal condition



**Why? Because opportunities to:**

- Identify complications
- Mobilize help and resources
- Intervene in a timely fashion are commonly lost...

**Usually because of communication and teamwork failures.**

# Indications for Action

## Case 1



**Michael Fox RN, BSN, Director  
Perinatal Resource Group**

**Decision to Incision time 18 minutes  
(0859-0917)**

**Absent variability identified 0840**



**Event to Delivery Time 37 minutes  
(0840-0917)**

**“Event to Delivery” > Impact  
Outcome then “Decision to  
Incision Time”**



# The 3 R's of Emergent Delivery

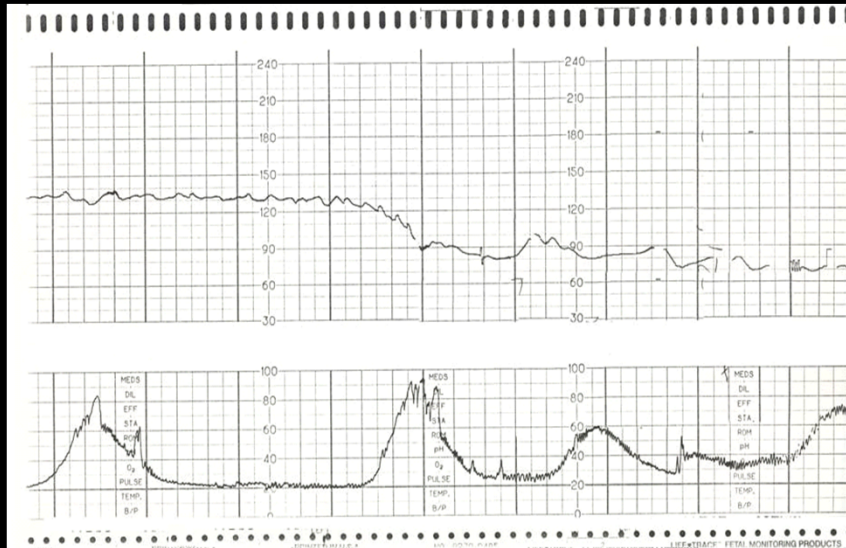
**R**ate

**R**oute

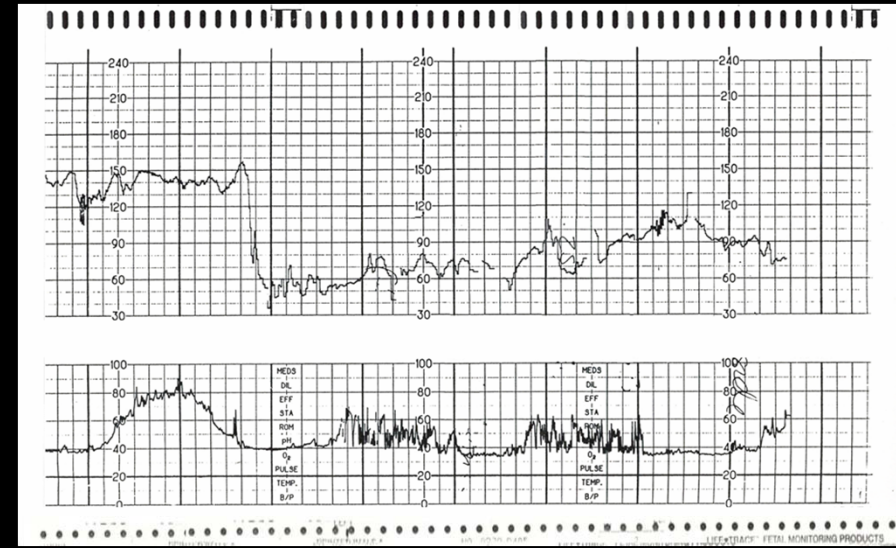
**R**oom

At the core of a timely and effective response to Fetal Bradycardia is the assessment of 3 key clinical variables. Simply remembered by the mnemonic, RATE, ROUTE, ROOM. In rapid sequence:

# RATE



**Emergent**



**Urgent – Non-Emergent**

**The FHR tracing is evaluated to determine if an emergent response is truly warranted or if conservative measures and continued observation is appropriate.**

# Route

From above...



....or below?

If the fetal heart rate suggests emergent delivery a SVE should immediately be performed, unless previa is suspected, to assess whether the fetus can be born vaginally or cesarean section is required.

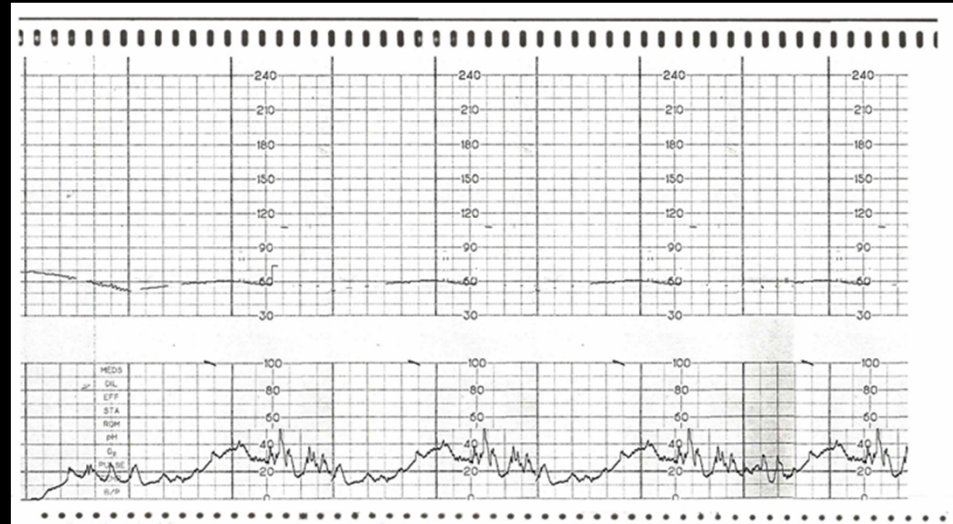


**If rapid vaginal delivery is possible, help and equipment (vacuum, forceps) should be brought to the patient. Moving the patient to the OR in this scenario may simply create an unnecessary delay in delivery.**

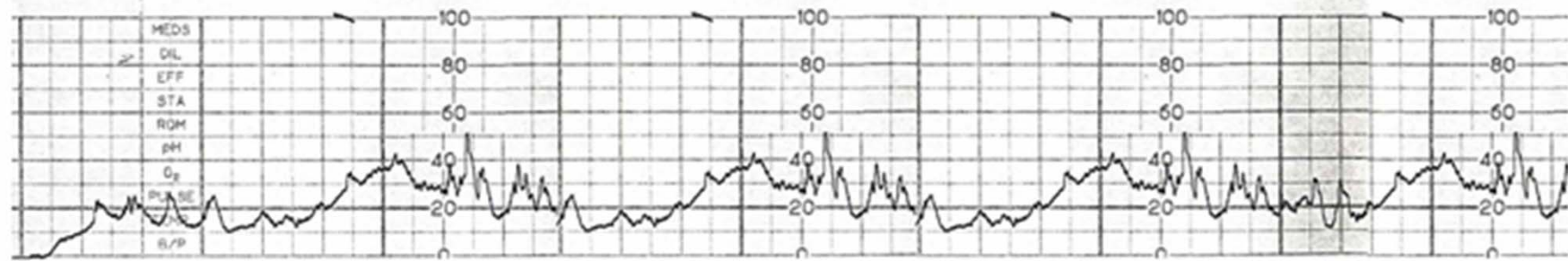
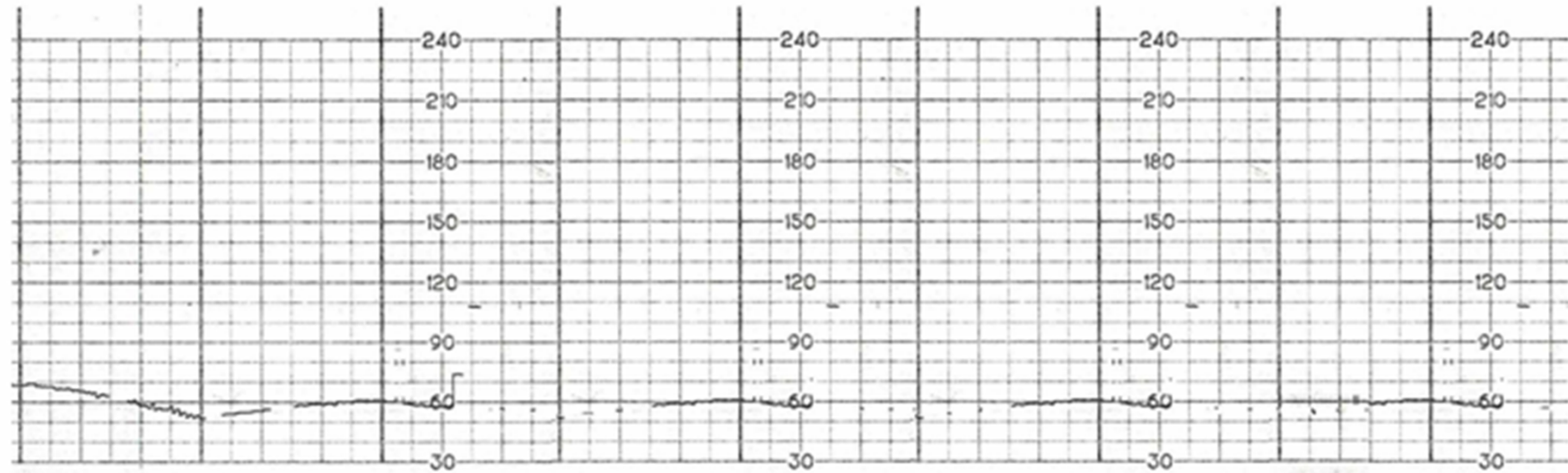


**If vaginal delivery is not imminent, move the patient to the operating room for assisted or surgical intervention.**

# Fetal Bradycardia



For bradycardia  $\leq 60$  bpm or  $\leq 80$  bpm (remote from delivery) **delivery within ten minutes is optimal time frame.** Outcomes from a large series of uterine ruptures indicate a window of opportunity between **12-17 minutes** is generally available depending on the status of the tracing and fetus prior to onset of the bradycardia.



**Nurses:** In my current clinical situation I am empowered to independently make the decision to move a patient to the OR if I feel the situation is emergent and there is no MD or CNM immediately available to make the decision.

a. Yes I am

b. No I am not

**MD:** I believe the nursing staff should be empowered to independently make the decision to move a patient to the OR if they feel the situation is emergent and there is no MD or CNM immediately available to make the decision.

a. Yes, they should

b. No, they should wait until an MD arrives and makes the decision to move to the OR.

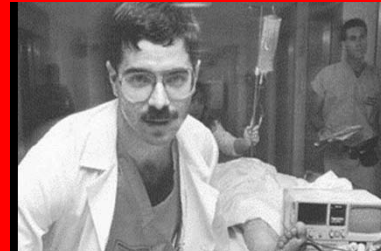


# The 1-2-3 “Guideline”

1 minute



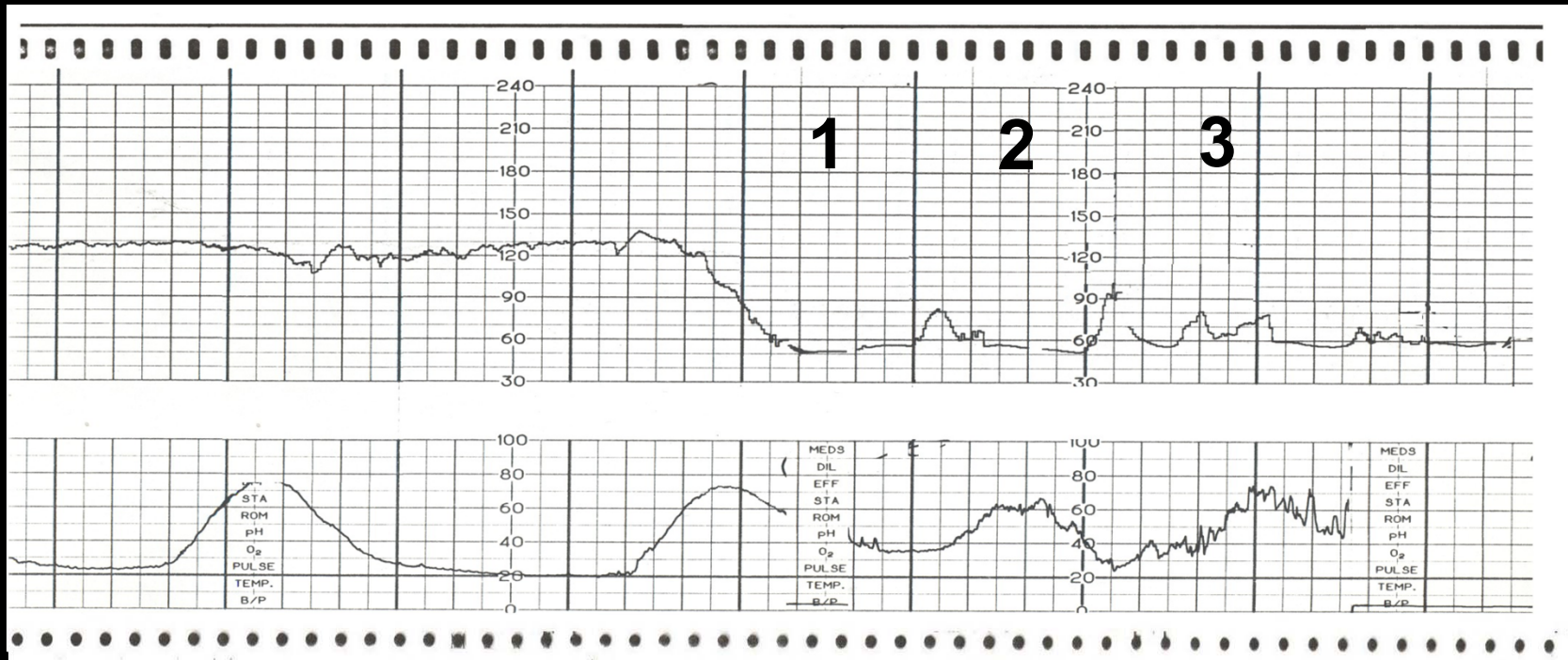
2 minutes



3 minutes



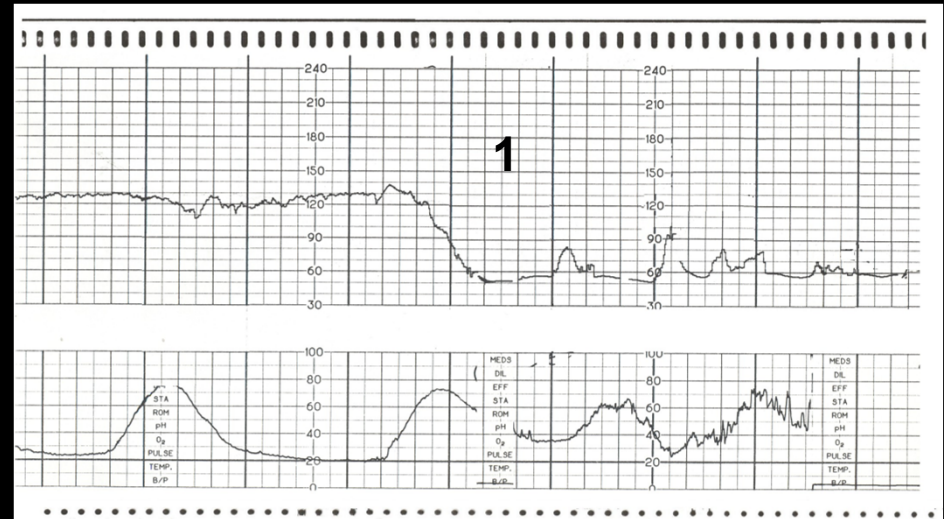
# The “1-2-3 Guideline”



**In the middle of the time pressure, chaos and sense of danger that accompanies bradycardia  
A simply way to think about when to move to the OR is to remember the 1-2-3 Guideline.**

# 1-2-3 Guideline

## 1st minute



During the first minute of a deceleration  $\leq 60$  bpm the bedside provider can observe the tracing for evidence the pattern is resolving, attempt to correct the source of the problem, and do a sterile vaginal exam. There is no exact order in which these interventions should be carried out and often they are initiated simultaneously, by multiple providers.

# **1-2-3 Guideline**

## **1st minute**

**Make sure however that in the first minute, a SVE is accomplished and the results are well communicated. This will quickly establish for everyone involved the likely route of delivery if it should be necessary.**

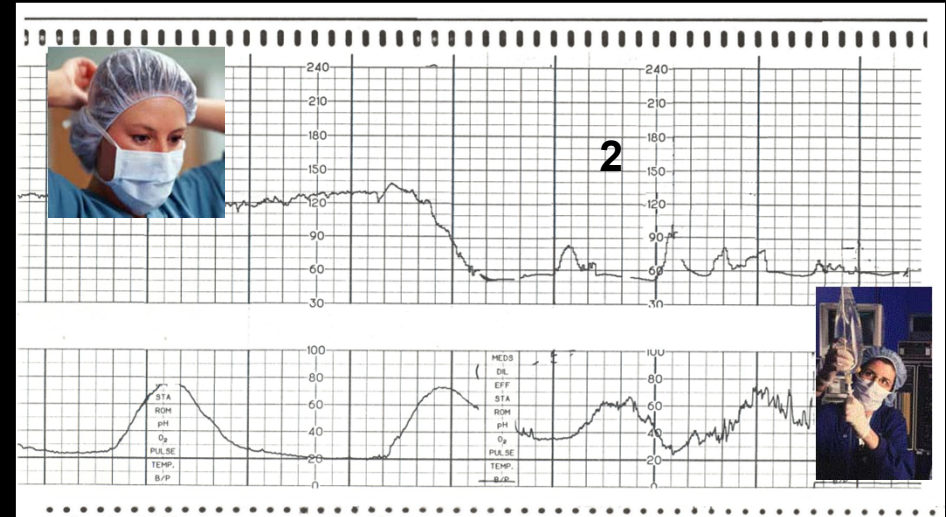
**From above...**



**...or below?**

# 1-2-3 Guideline

## 2nd minute



**By the start of the second minute additional help should be mobilized, and the room be made ready for easy exit in the event the pattern does not resolve.**

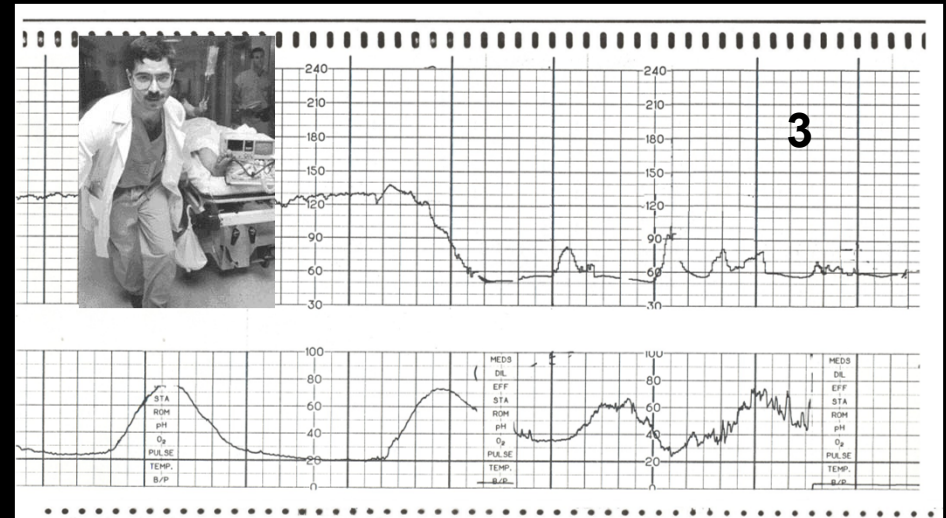
# 1-2-3 Guideline

## 3rd minute

By 3 minutes  
move to the OR

unless you have a good reason not too.

The choice of 3 minutes as a threshold for moving a patient is arbitrary. Pragmatic considerations simply suggest when a fetal bradycardia of 60 bpm or less does not resolve quickly the patient should be moved the OR and prepared for delivery.



**1-2-3 Guideline  
3rd minute**



**Move To the  
OR**



**Once in the OR, “resuscitative”  
measures can be continued while the  
patient is prepared for delivery.**

**Move To the OR**

# **Pre-surgical Preparations**



**By quickly moving the patient into the OR, skin preparation, Foley catheter placement can be accomplished while the anesthesiologist is preparing the patient for intubation (hemodynamic monitoring, cardiac monitoring, hyper oxygenation, line placement, drug administration.**





## **Moving to the OR Quickly Can Expedite Delivery**

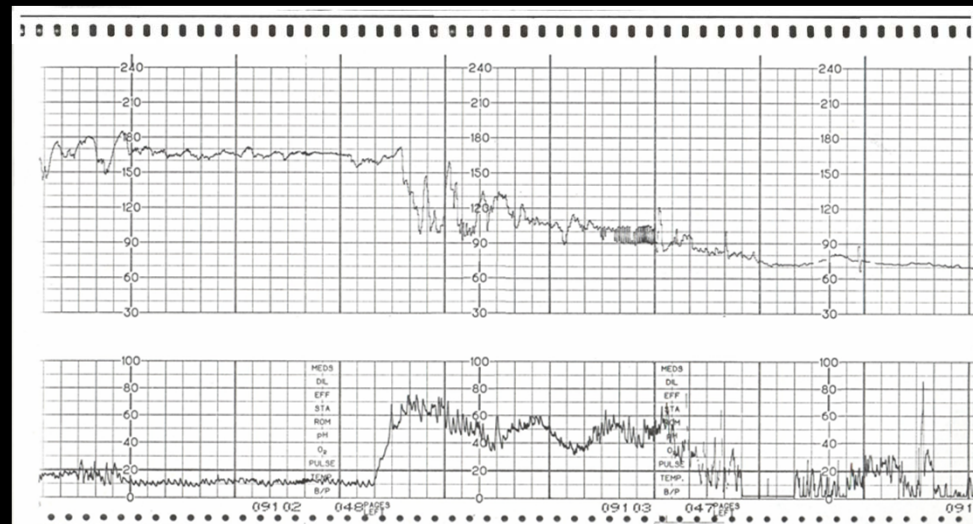


**This allows for pre-surgical preparations to be completed and shortens the time interval from arrival of the anesthesiologist to the beginning of surgery.**

# Case 2 Emergency Response

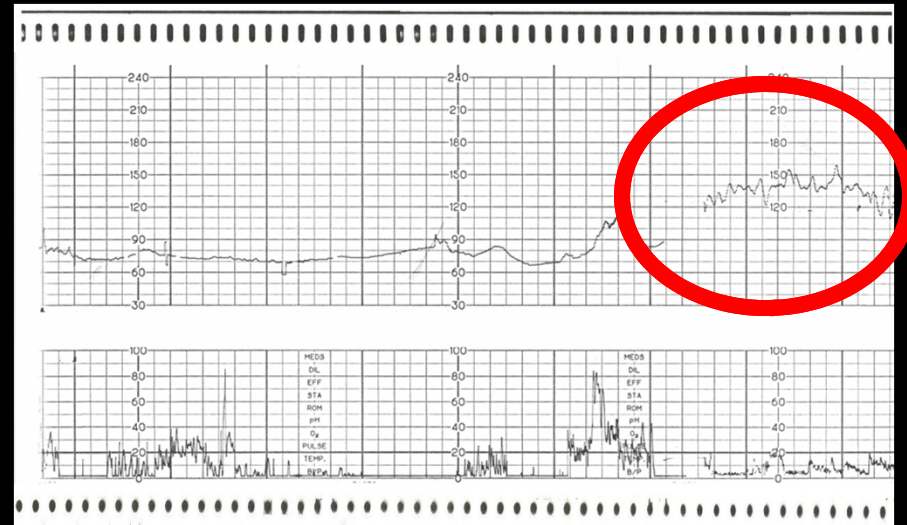


# Are all Fetal Bradycardia the Same?

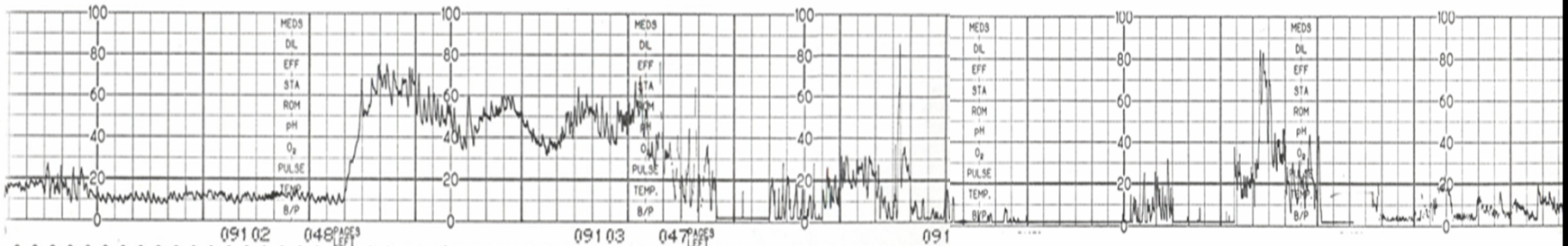
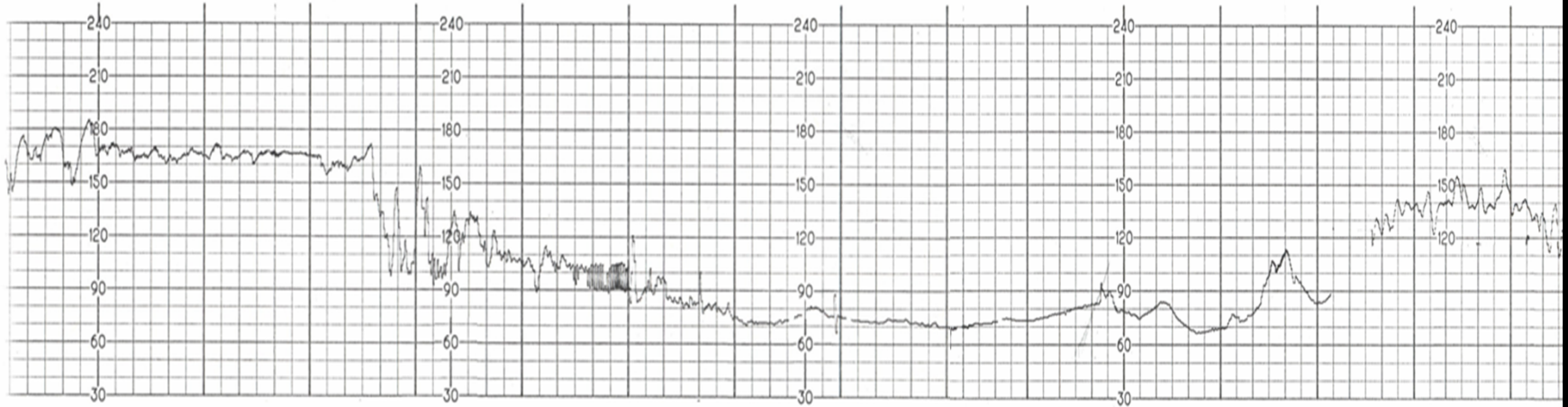


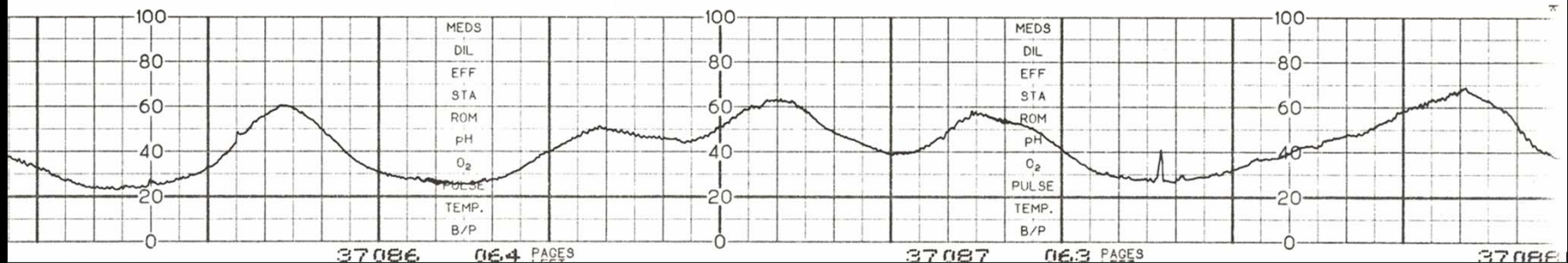
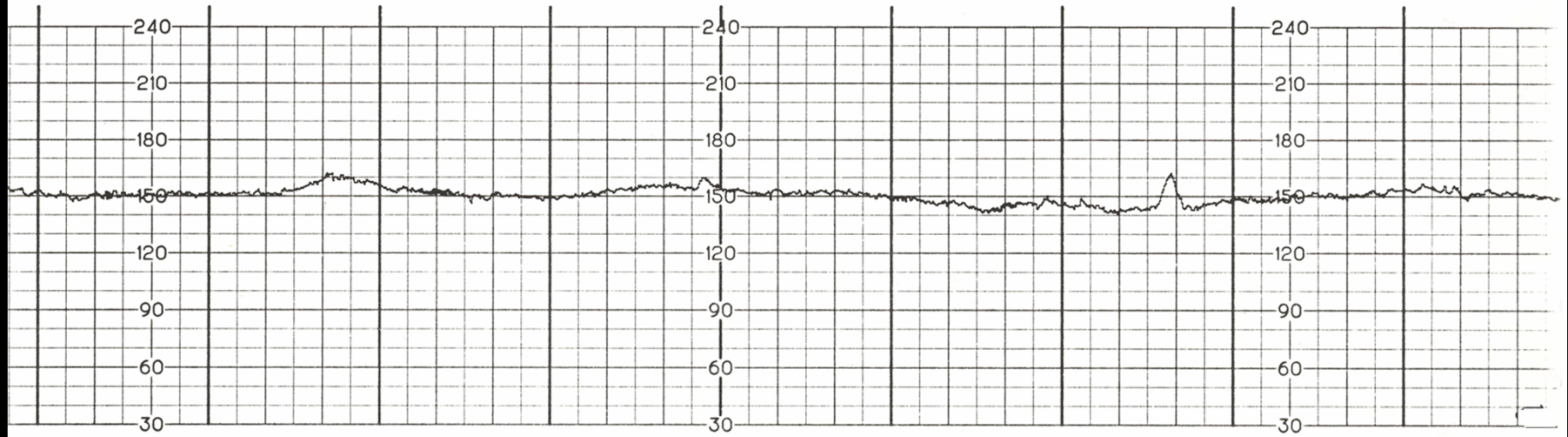
**Not all fetal bradycardia or prolonged decelerations will ultimately result in or require emergent delivery. Most fetuses with bradycardia will not experience a complete cessation of oxygen during the intrapartum period, and instead experience a short and intermittent reduction in oxygen delivery.**

# Once In the OR Re-evaluate

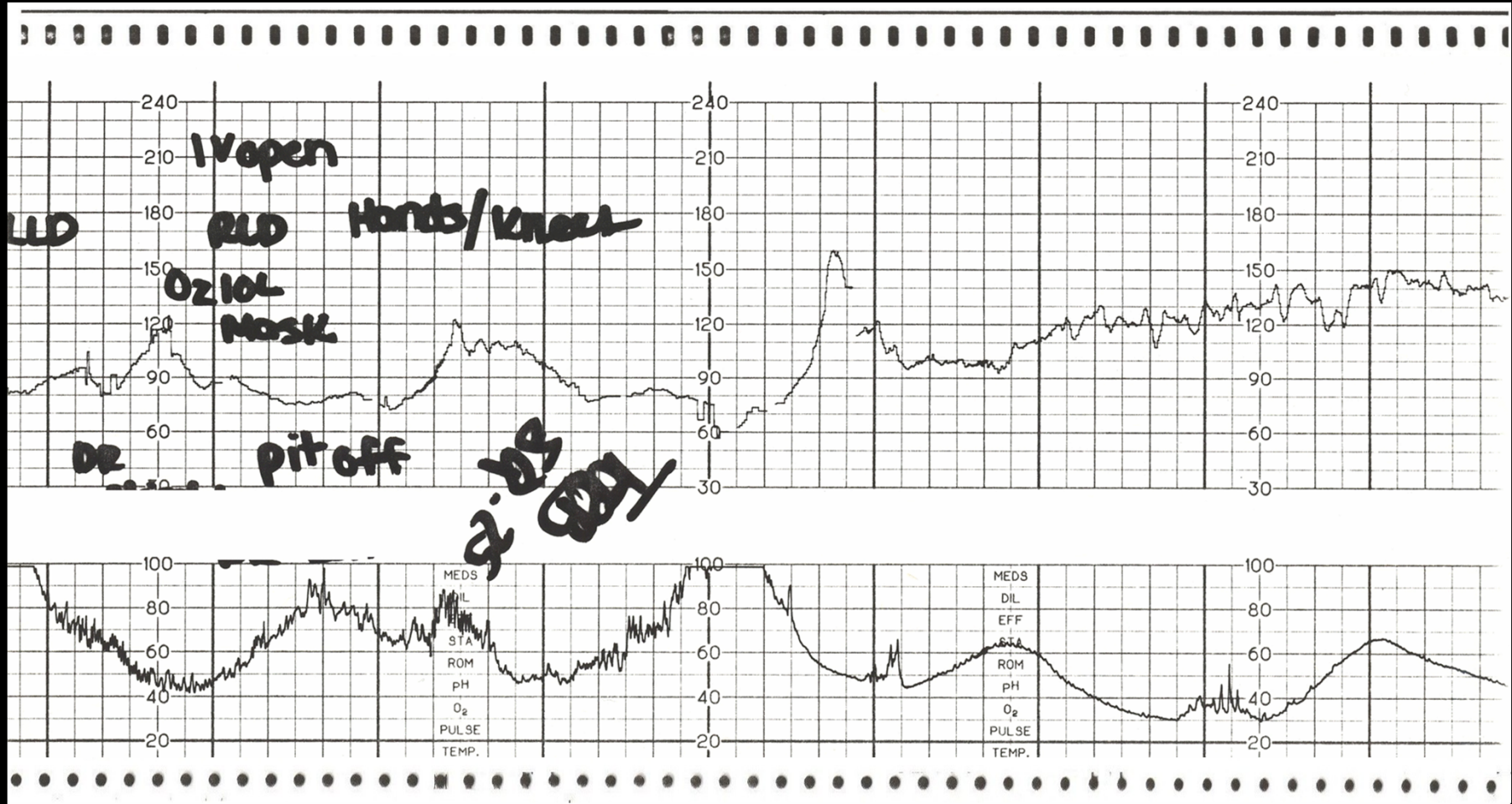


**This may explain why most fetal bradycardia will resolve with little or no intervention. If after transport to the OR the bradycardia resolves, the decision to deliver should be re-evaluated. Simply moving a patient to the OR should not be a fait accompli that delivery is required.**

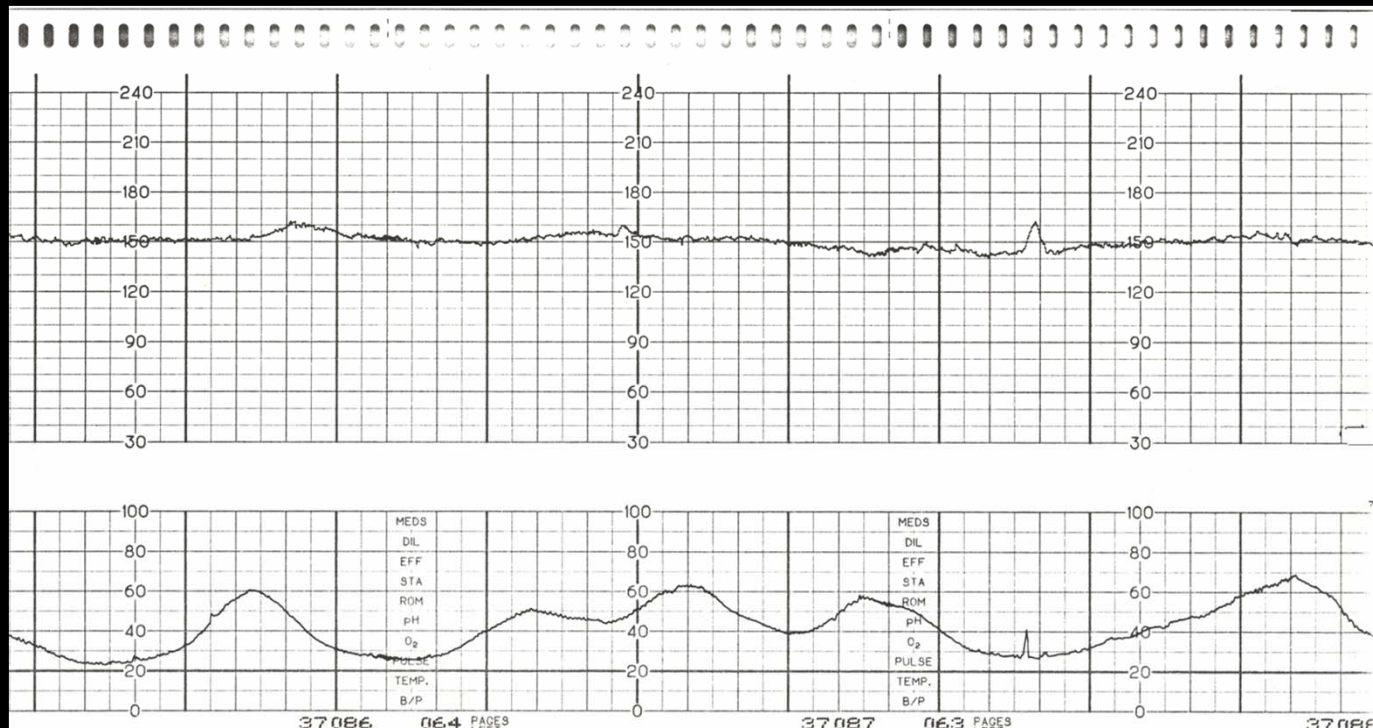




# What Is the Definition of Tachysystole



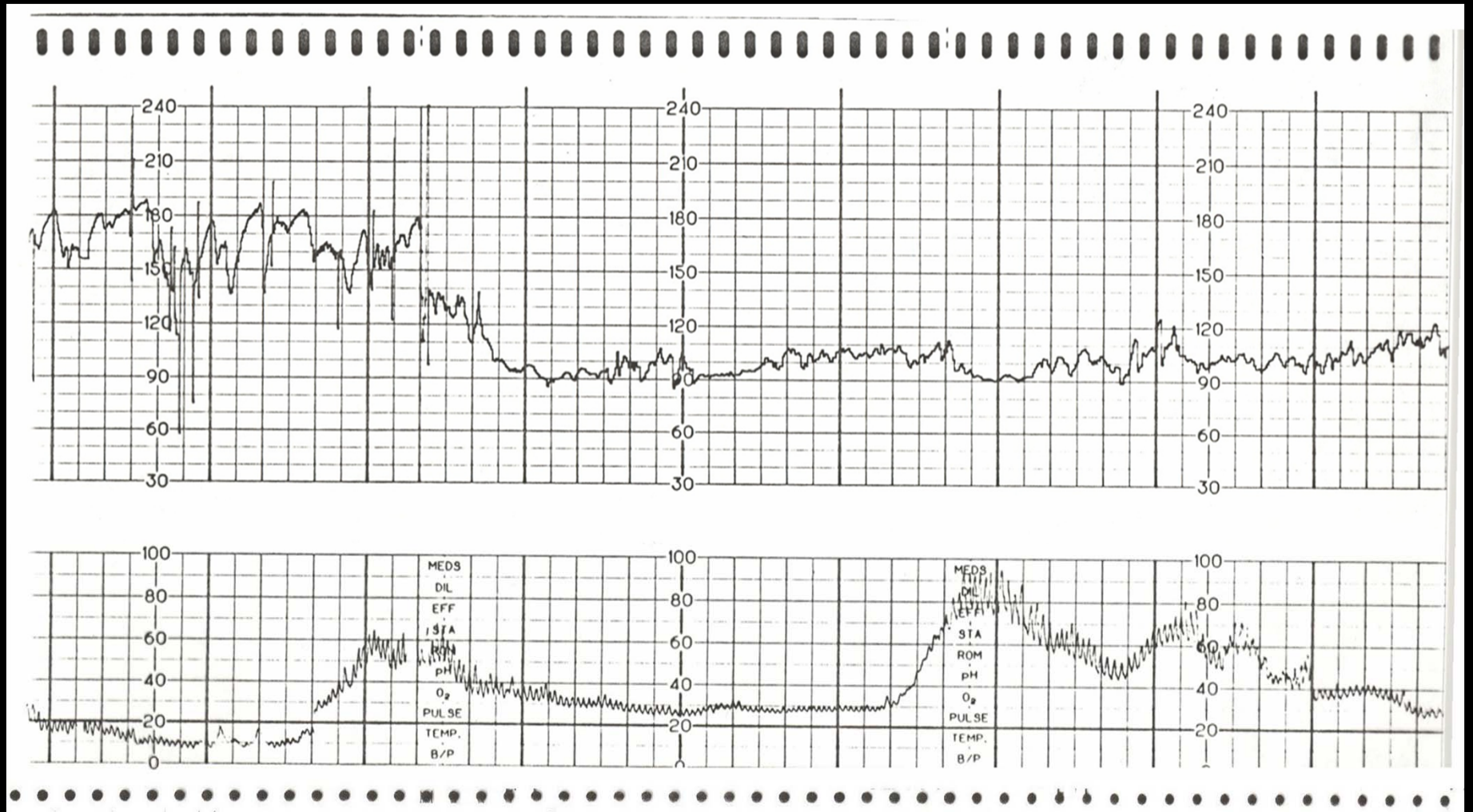
# What Is the Definition of Tachysystole



- a. **> 5 contractions in 10 minutes, averaged over a 30-minute window.**
- b. **> 5 contractions in 10 minutes**



# Second Stage Bradycardia

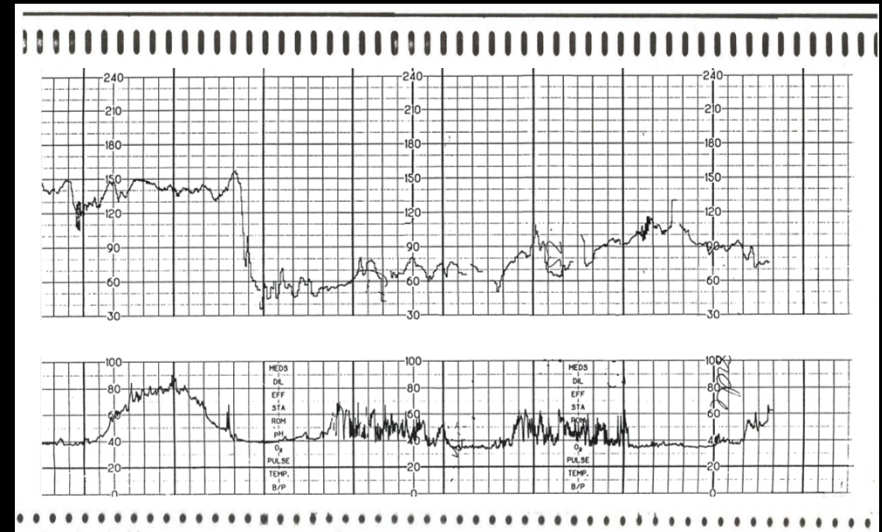


# Second Stage Bradycardia



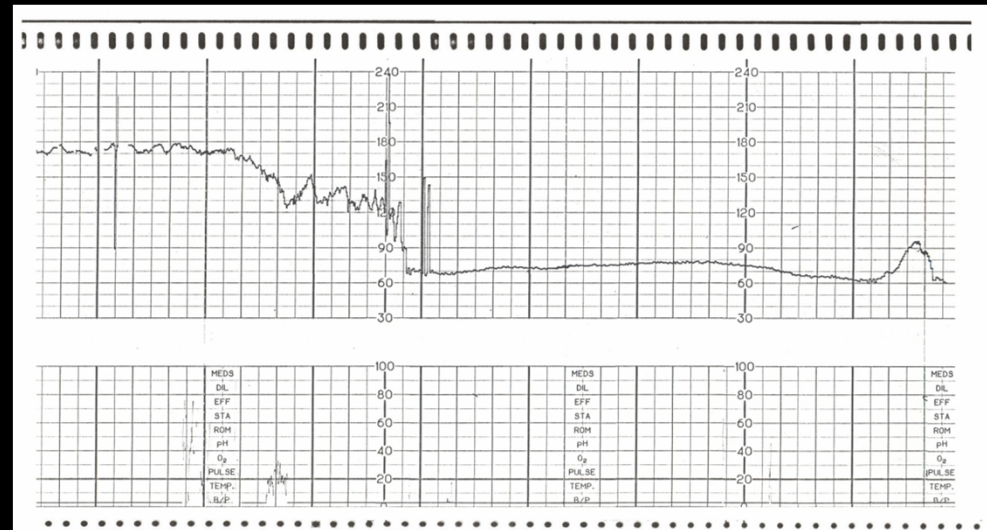
Late in the second stage of labor it is not uncommon for patients to have prolonged decelerations and "end stage bradycardia" which are likely the result, of head compression as the fetal vertex descends into the pelvis and is further compressed during pushing.

# Second Stage Bradycardia

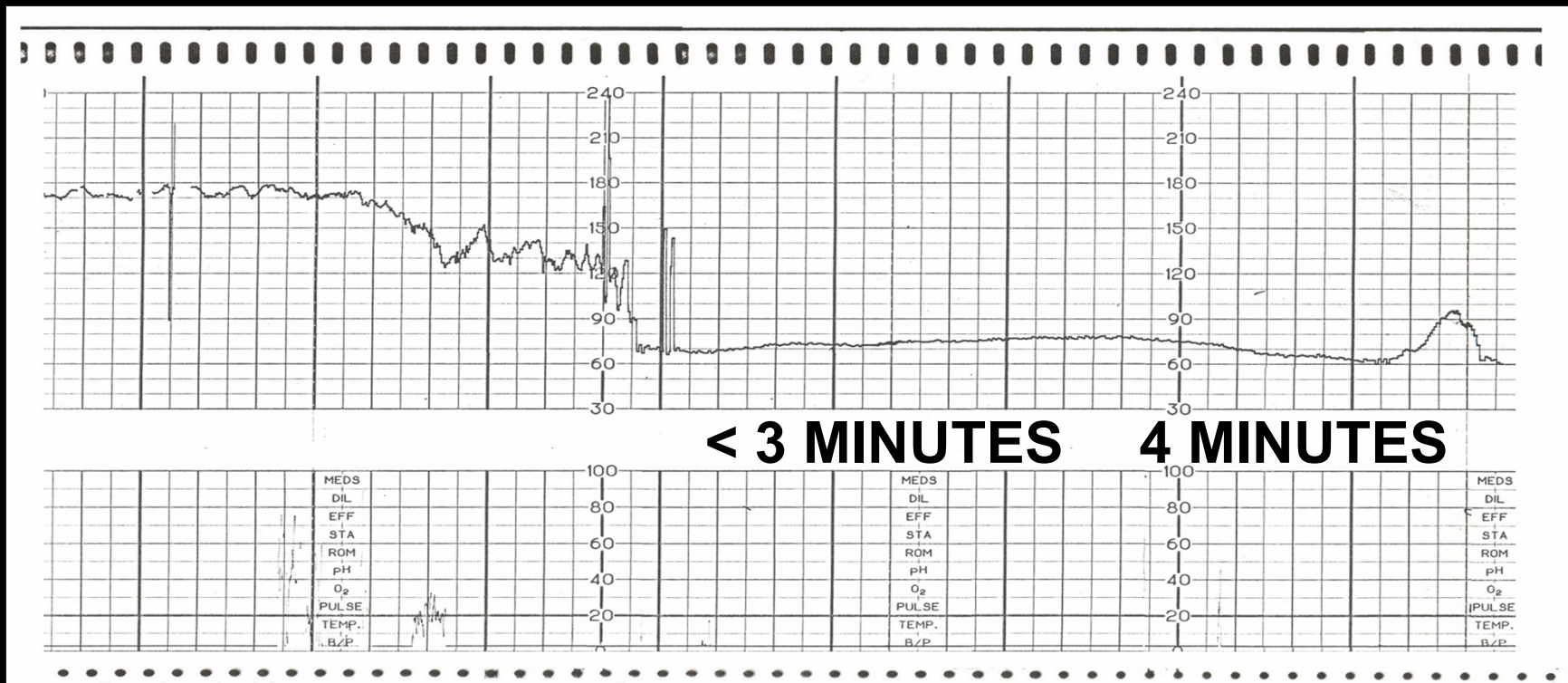


**It appears that these second stage reflex bradycardia, presumably from head, compression, that retain their reactivity during the deceleration, are less likely to be associated with a significant acidemia. As a result a more conservative management approach to these bradycardia in the second stage of labor may be considered.**

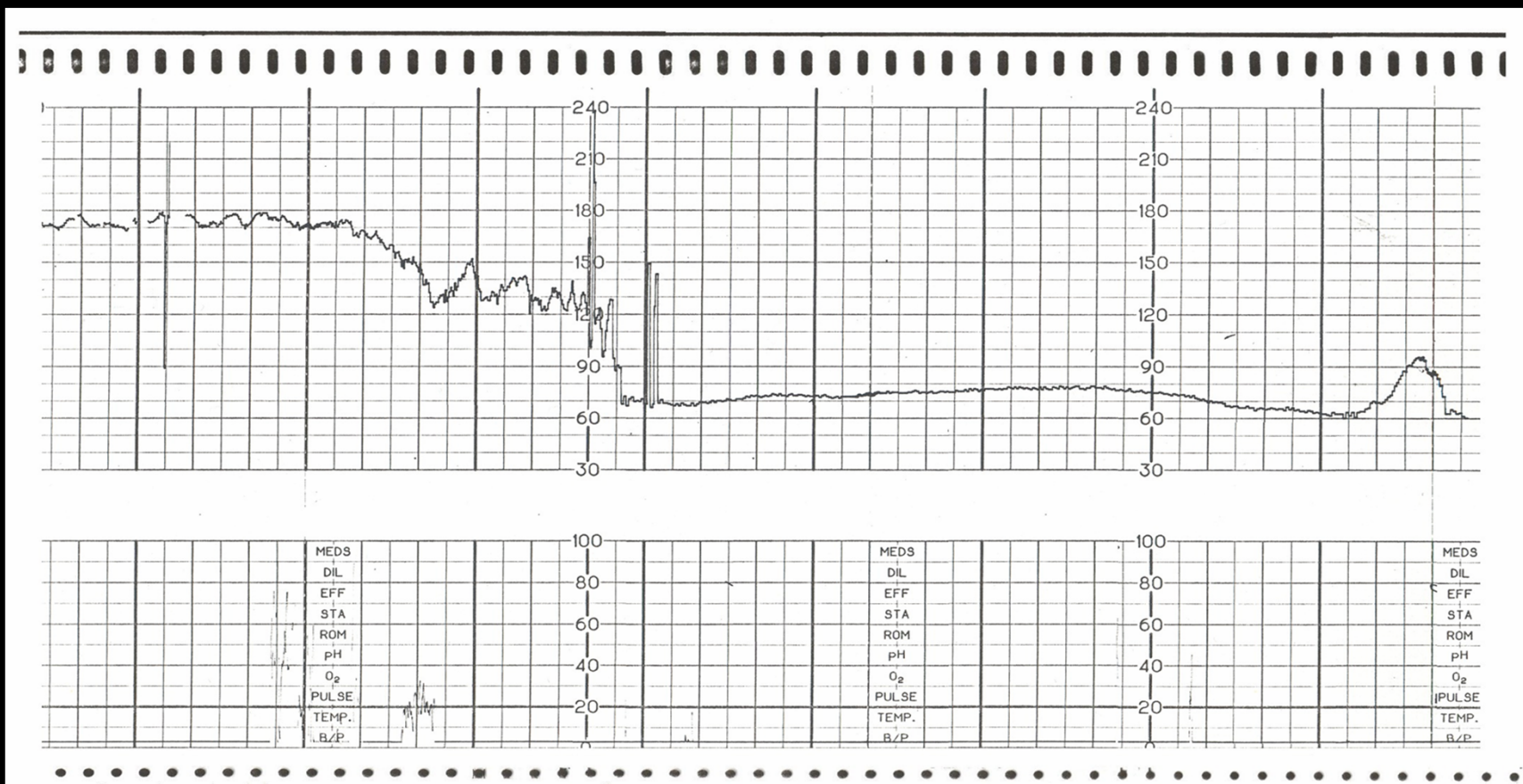
# Second Stage Bradycardia



Supporting these findings a study that looked at acid accumulation in term fetuses with second stage bradycardia found that the fetus most likely to become acidemic...

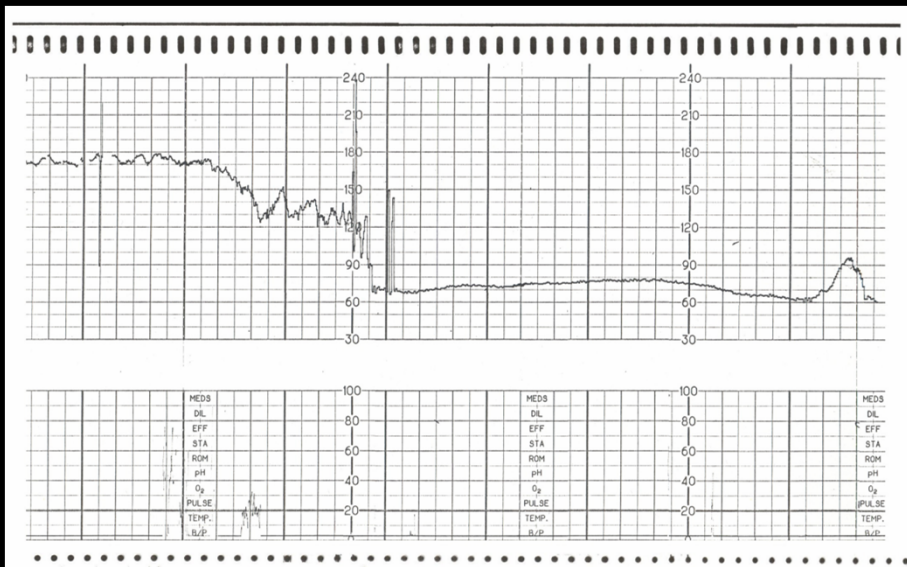


- Lose its variability in less than three minutes from the beginning of the bradycardia or,
- Will lose its fetal heart rate variability during the bradycardia for a total of more than 4 minutes

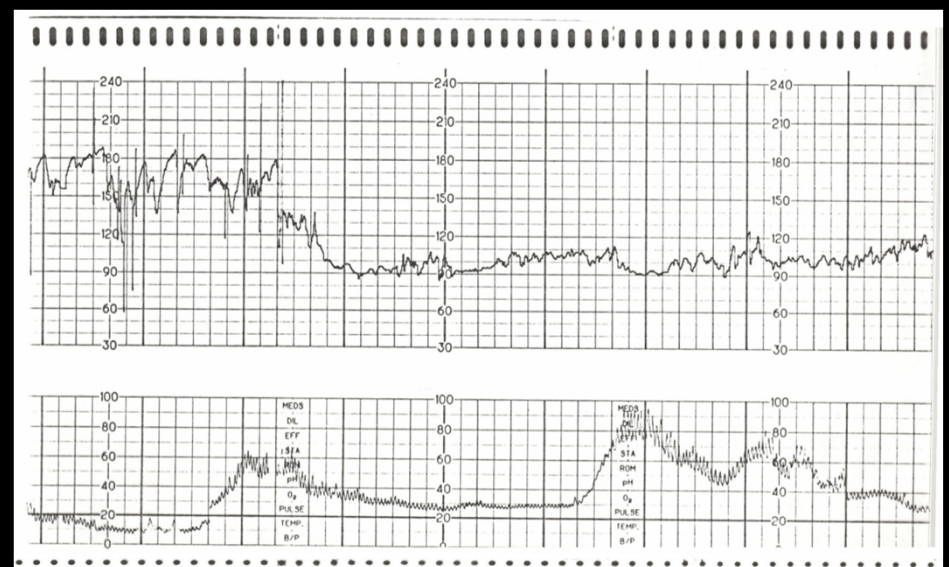


**In addition, the loss of variability was found to be more predictive of a severe acidosis than was the length of the bradycardia.**

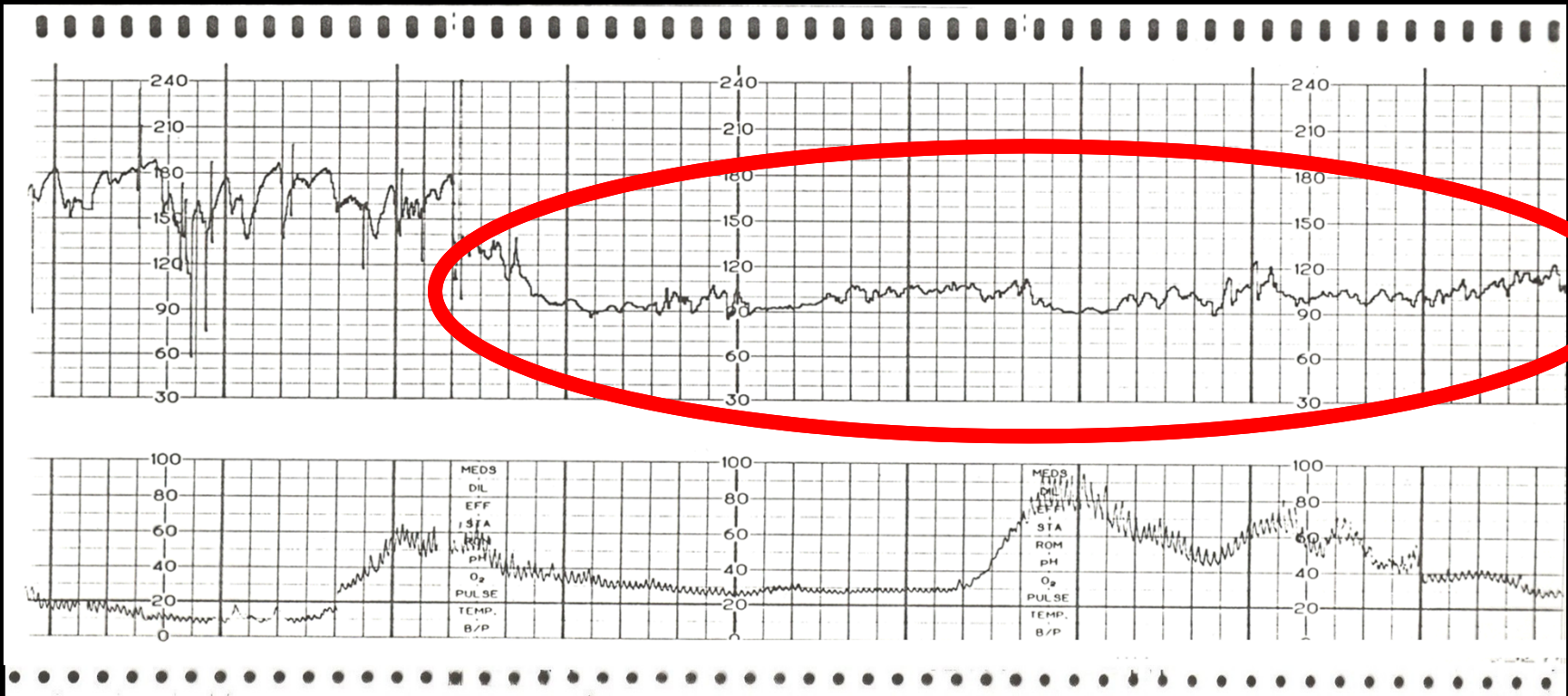
# Second Stage Bradycardia



**Emergent**



**Urgent – Non-Emergent**



As a general guideline as long as the reactivity during the deceleration is maintained (“moderate variability”) the patients can be allowed to continue pushing and attempt a vaginal delivery. This plan of care pre-supposes that unit has the ability to immediately rescue the fetus if the situation changes (the variability becomes minimal-absent or the deceleration deepens).



<b>FHR</b>	<b>Management</b>
<b>FHR ≤ 100 bpm</b>	<b>Near/Remote from delivery with moderate variability. May manage conservatively. Initiate pre-delivery preparations.</b>
<b>FHR &lt; 100 &gt; 80 bpm</b>	<b>Situation dependent Near delivery. Moderate Variability. Maintain ability to delivery emergently. Providers at ready state. Remote from delivery. Moderate variability. Providers at ready state. Prepare to deliver..</b>
<b>FHR ≤ 80 ≤ 60 bpm</b>	<b>Situation dependent. Near delivery. Moderate Variability . Maintain ability to delivery emergently. Providers at ready state. Remote from delivery. Moderate variability. Decision to deliver.</b>
<b>FHR ≤ 60bpm</b>	<b>Situation dependent. Near/Remote from delivery. Expedite delivery.</b>

**Right People... Right Place...  
Right time...**



**Doing the Right Things**