CTG Interpretation

Preparation

Determine indication for fetal monitoring

Discuss fetal monitoring with the woman and obtain permission to commence

Perform abdominal examination to determine lie and presentation

Give the woman the opportunity to empty her bladder

The woman should be in an upright or lateral position (not supine)

Check the accurate date and time has been set on the CTG machine

Maternal heart rate must be recorded on the CTG at commencement of the CTG in order to differentiate between maternal and fetal heart rate

Cont…

- CTG paper speed at 1cm/min
- Sensitivity displays at 20 beats per minute/cm
- Set FHR range display at 50 – 210 bpm
- Ensure date and time are correct on commencement of CTG
- Check that date and time settings on CTG tracings are regularly validated
- Label CTGs with the mother’s name, date, time commenced and hospital record number

CTG RECOMMENDATIONS

In addition, medical expert consensus recommends:

- Midwives should not undertake continuous CTG monitoring in the absence of medical supervision
- On commencement of CTG monitoring, women should be advised, in general terms, how to read their tracing
- Where central monitoring is in use, the woman should be able to recognise the significance of the alarm/light if it activates, so that staff can be summoned if they do not react to the alarm

Consider

- Intrapartum / antepartum trace.
- Stage of labour
- Gestation
- Fetal presentation?Malpresentation.
- Any augmentation
- IOL Medications

INTERPRETATION OF FEATURES OF CTG

Features	Baseline rate (Beats/min) Baseline Rate	Variability Baseline variability	Deceleration Decelerations	Acceleration Accelerations
Reassuring	110-160	Over 5	None	Present
Non-reassuring	100-109 161-180	Under 5 for 40-90 min	Early Typical variable	Absence of unknown significance
Abnormal	Under 100 Over 180	Under 5 for over 90 min	Late Atypical variable	Absence of unknown significance

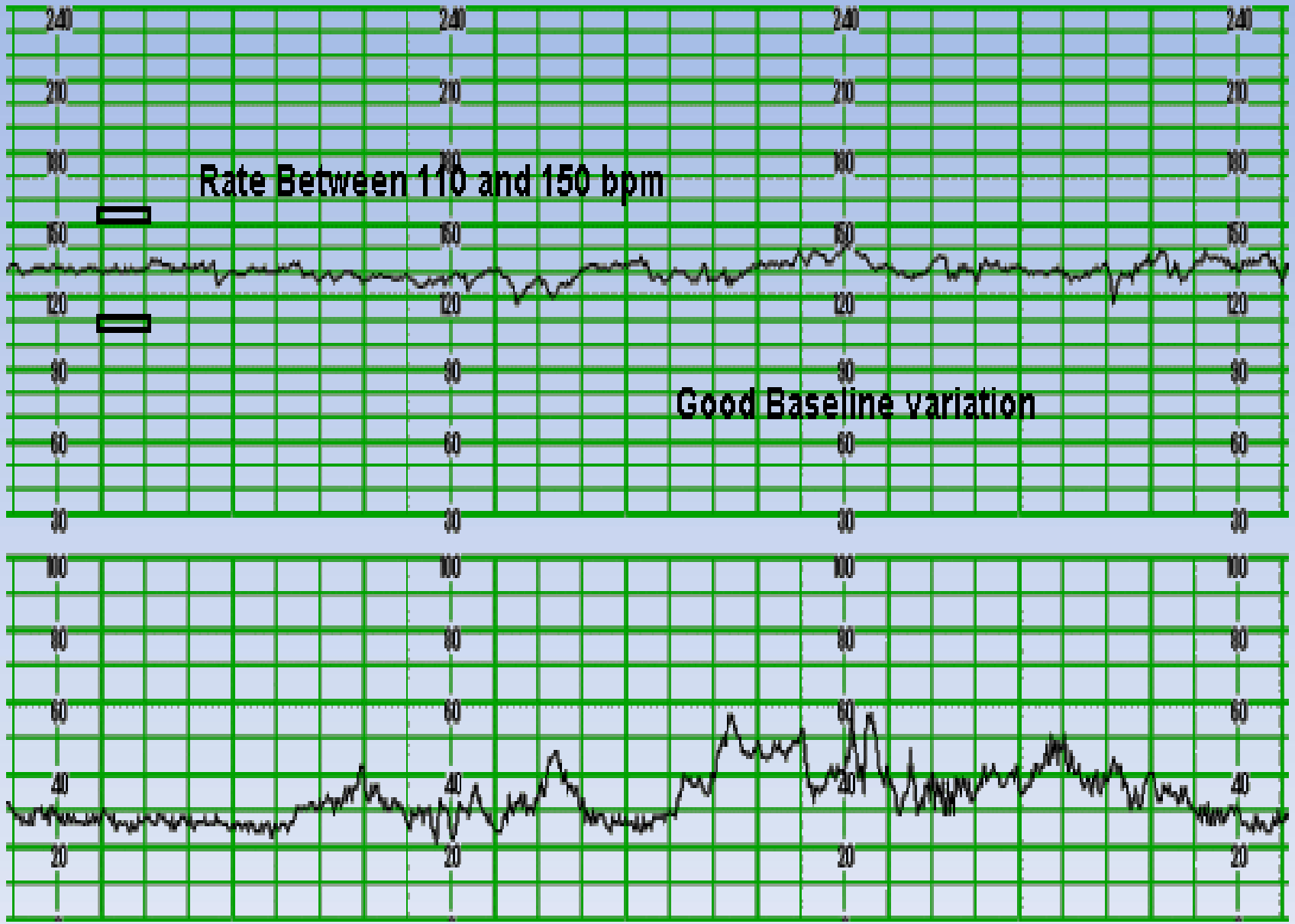
Overall impression & plan of action

CATEGORY	DEFINITION	ACTION
Normal	Rate, variability, and deceleration all reassuring	None
Suspicious	One non reassuring feature	Conservative measures
Pathological	Two non-reassuring OR One abnormal feature	Fetal scalp sampling or deliver the baby

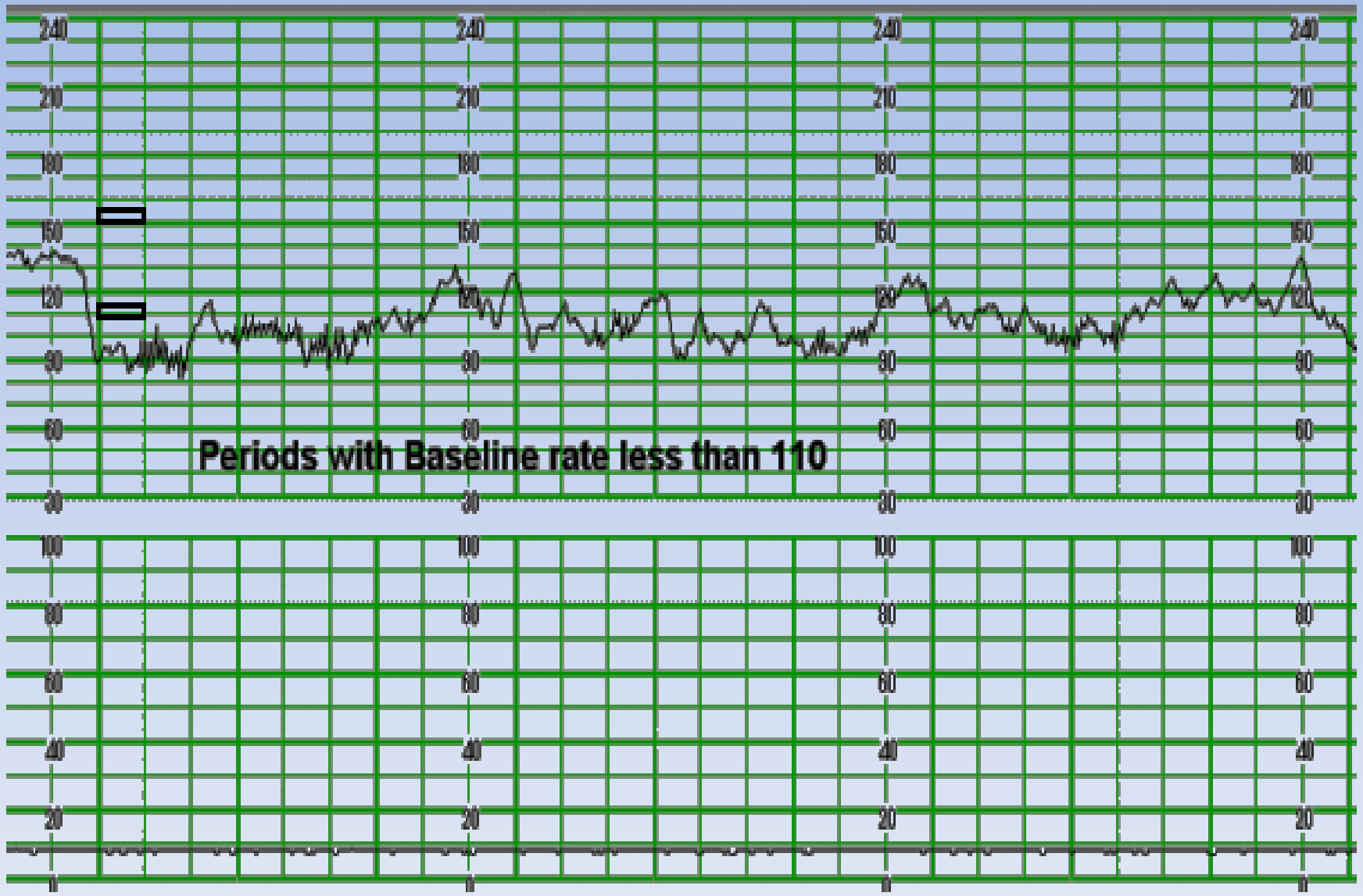
Baseline Rate

- The baseline FHR should be determined over 5 to 10 minutes and expressed in bpm
- Normal 110 – 160 bpm
- Bradycardia <110 bpm
- Tachycardia >160 bpm
- The mean of the FHR when this is stable, excluding accelerations and decelerations.
- The minimum baseline duration must be at least 2 minutes.
- If minimum baseline duration is < 2 minutes then the baseline is indeterminate.

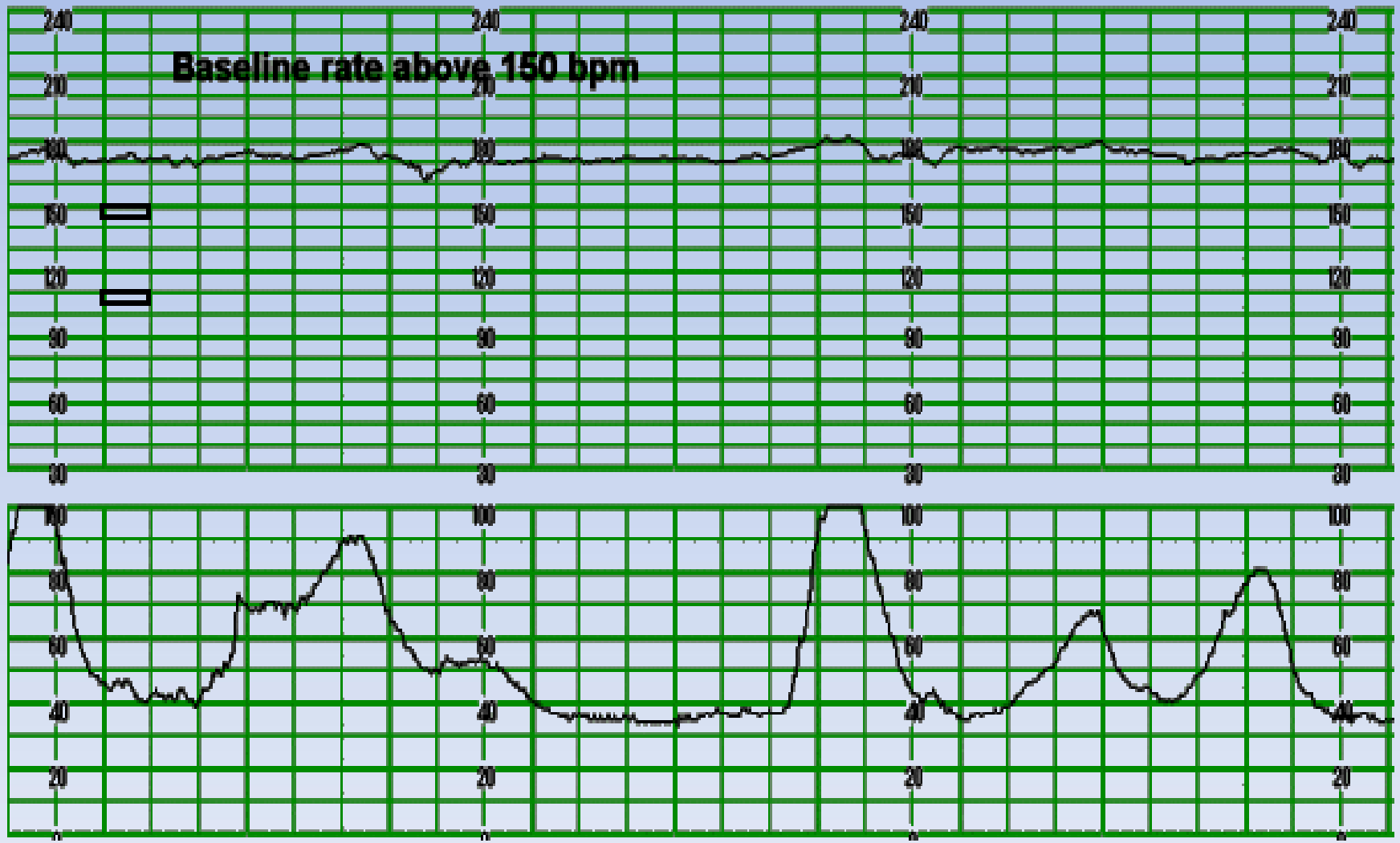
Baseline Fetal Heart Rate



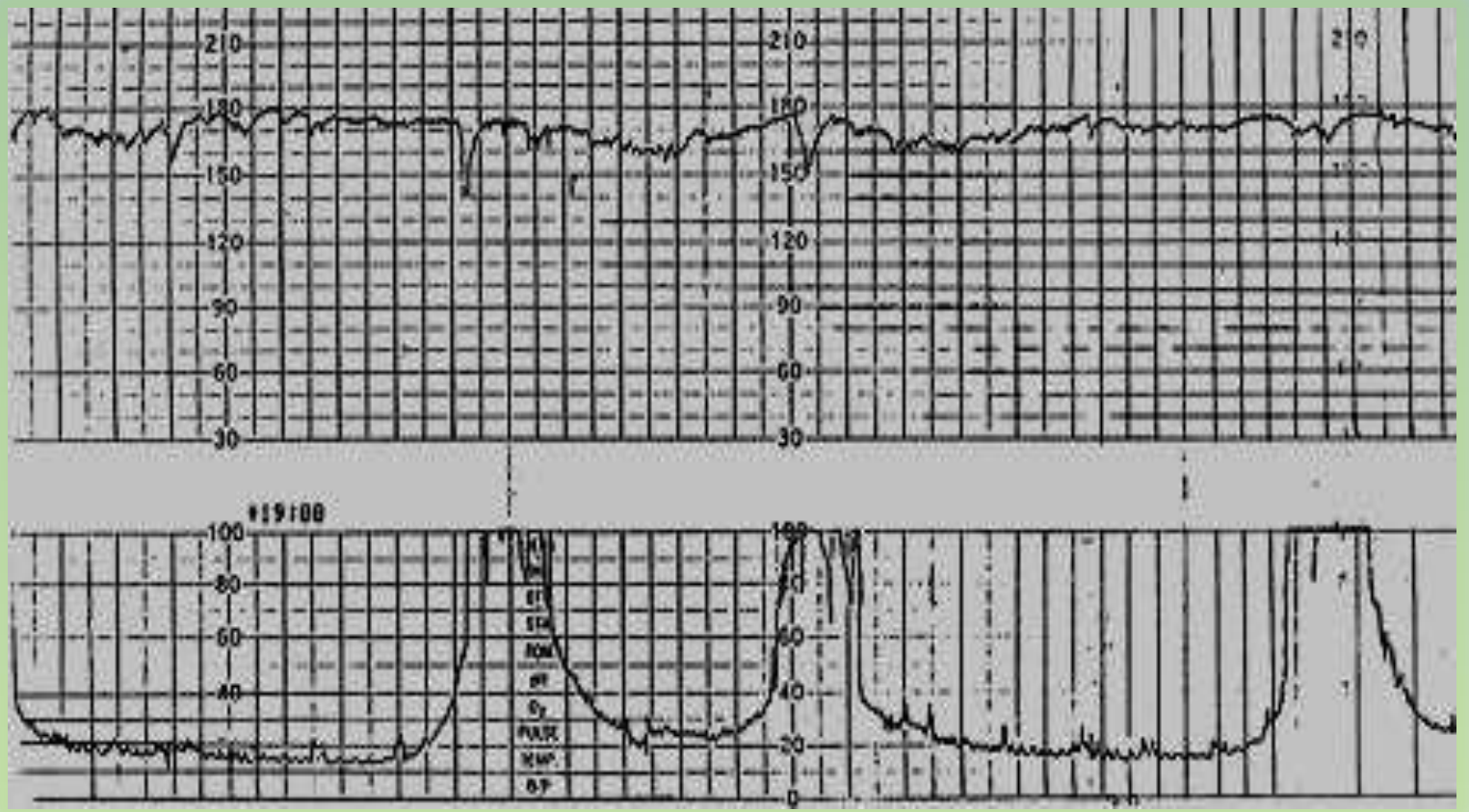
Fatal Bradycardia



Fetal Tachycardia



Fetal Tachycardia



Fetal tachycardia with possible onset of decreased variability during the second stage of labor. Fetal heart rate is 170 to 180 bpm. Mild variable decelerations are present.

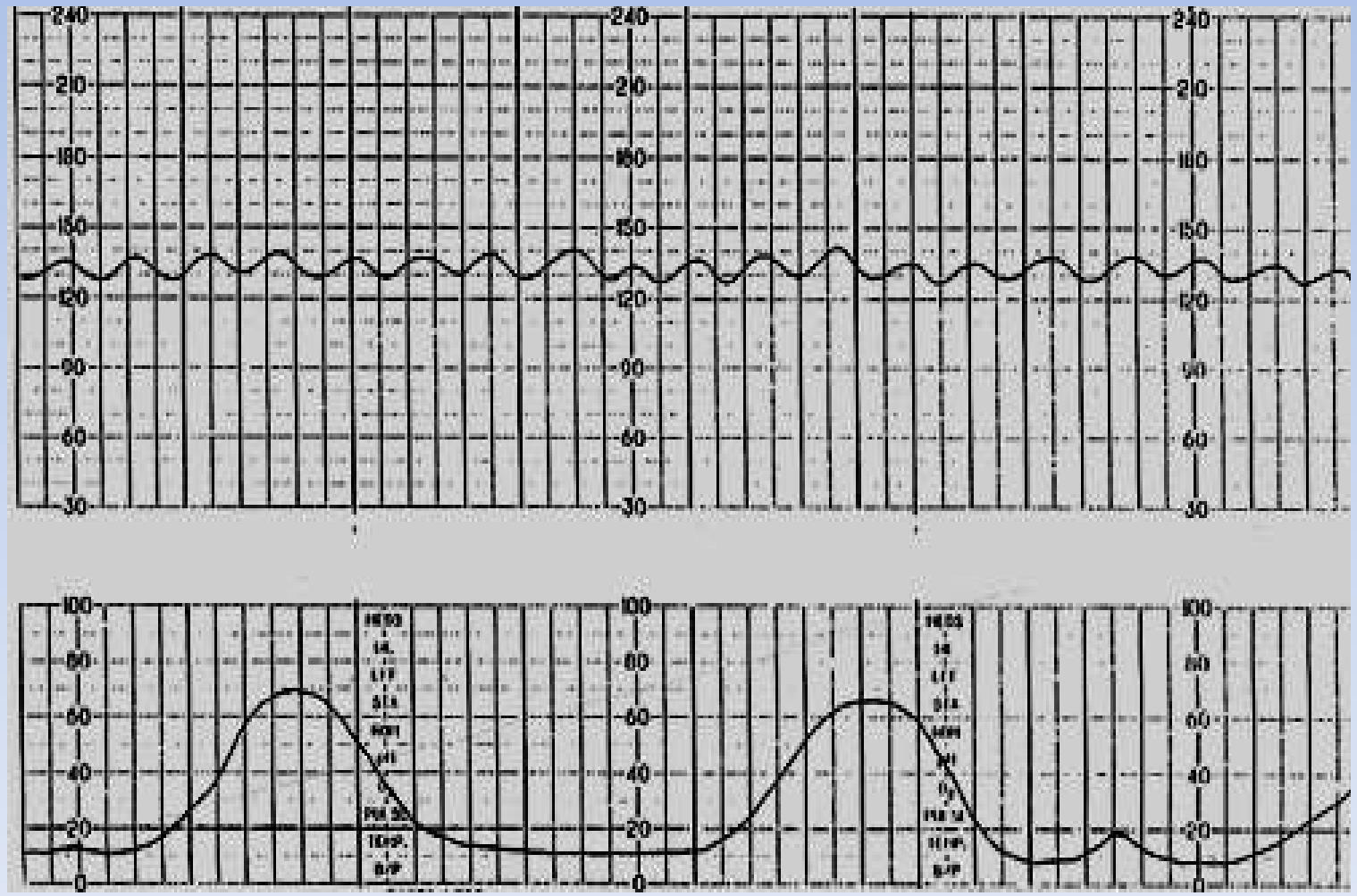
Fetal Tachycardia

Fetal tachycardia that is due to fetal tachyarrhythmia associated with congenital anomalies, in this case, ventricular septal defect. Fetal heart rate is 180 bpm. Notice the "spike" pattern of the fetal heart rate.

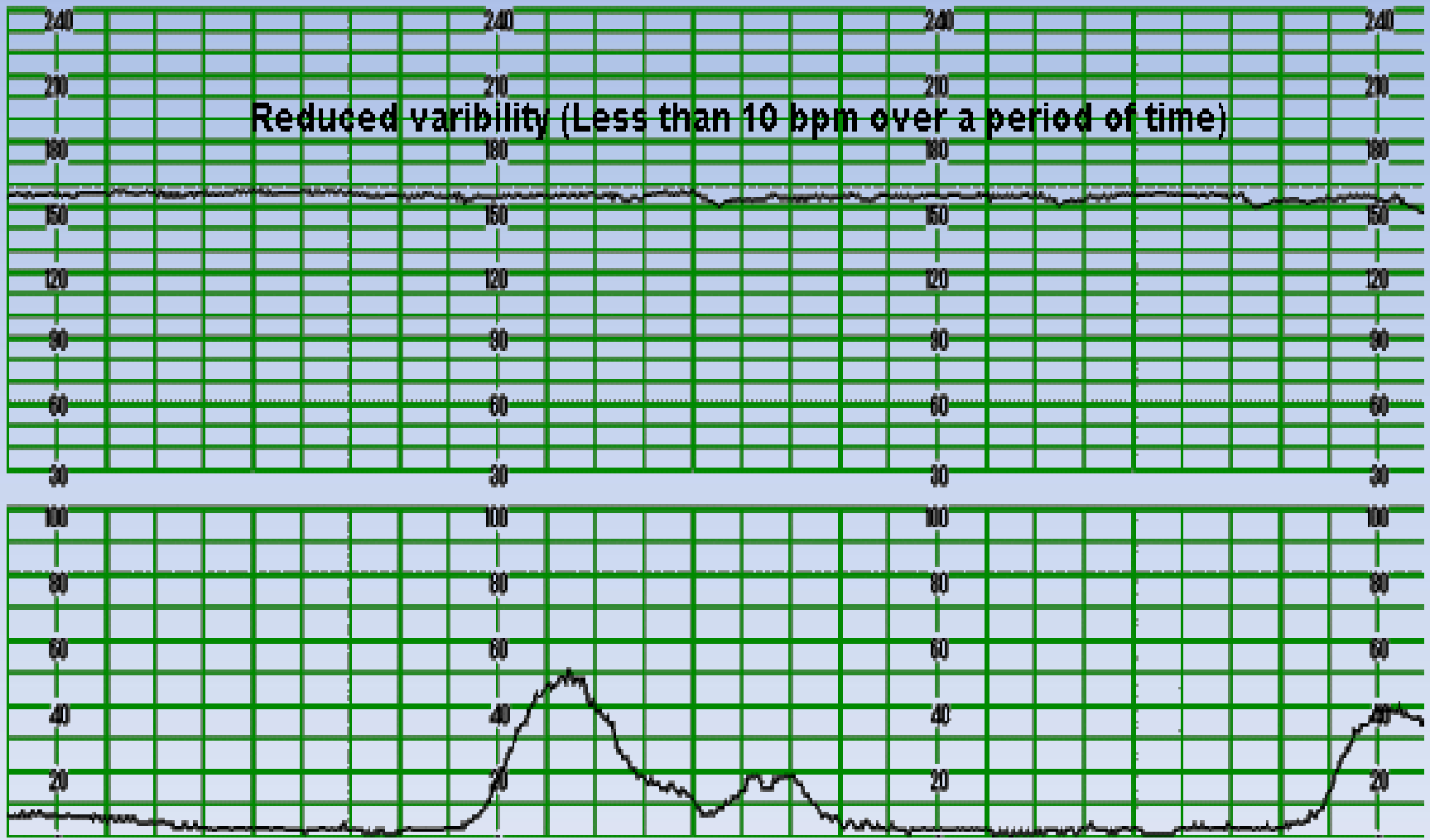
Baseline variability

- Fluctuations in the fetal heart rate of more than 2 cycles per minute. No distinction is made between short-term variability (or beat-to-beat variability) and long-term variability
- Grades of fluctuation are based on amplitude range
  Absent variability …. Amplitude range undetectable
- Normal 5 – 25 bpm (moderate)
- Increased > 25 bpm (marked)
- Reduced 3 – 5 bpm (minimal)
- Absent < 3 bpm

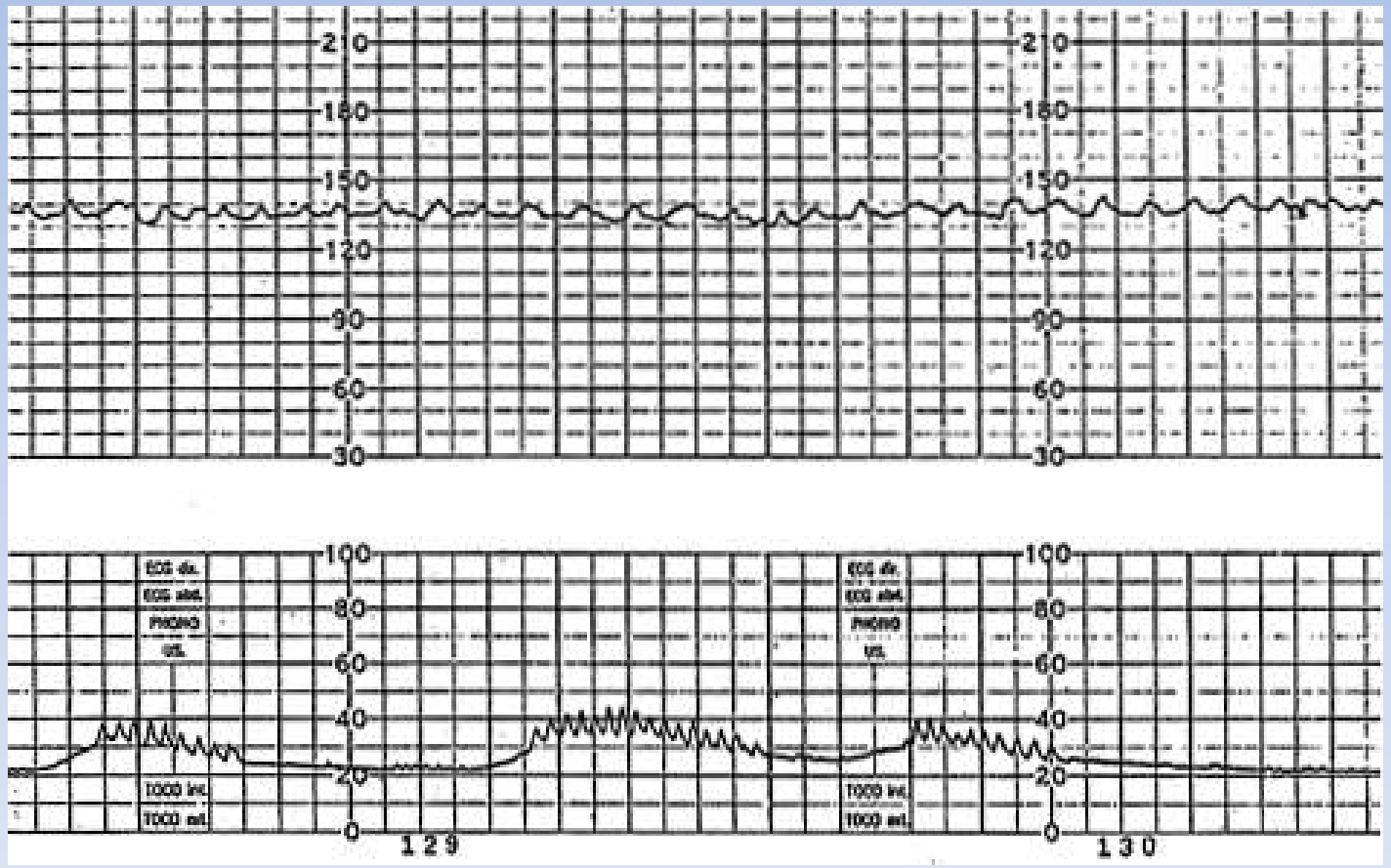
Baseline FHR Variability



Reduced variability



Reduced variability



Sleeping pattern

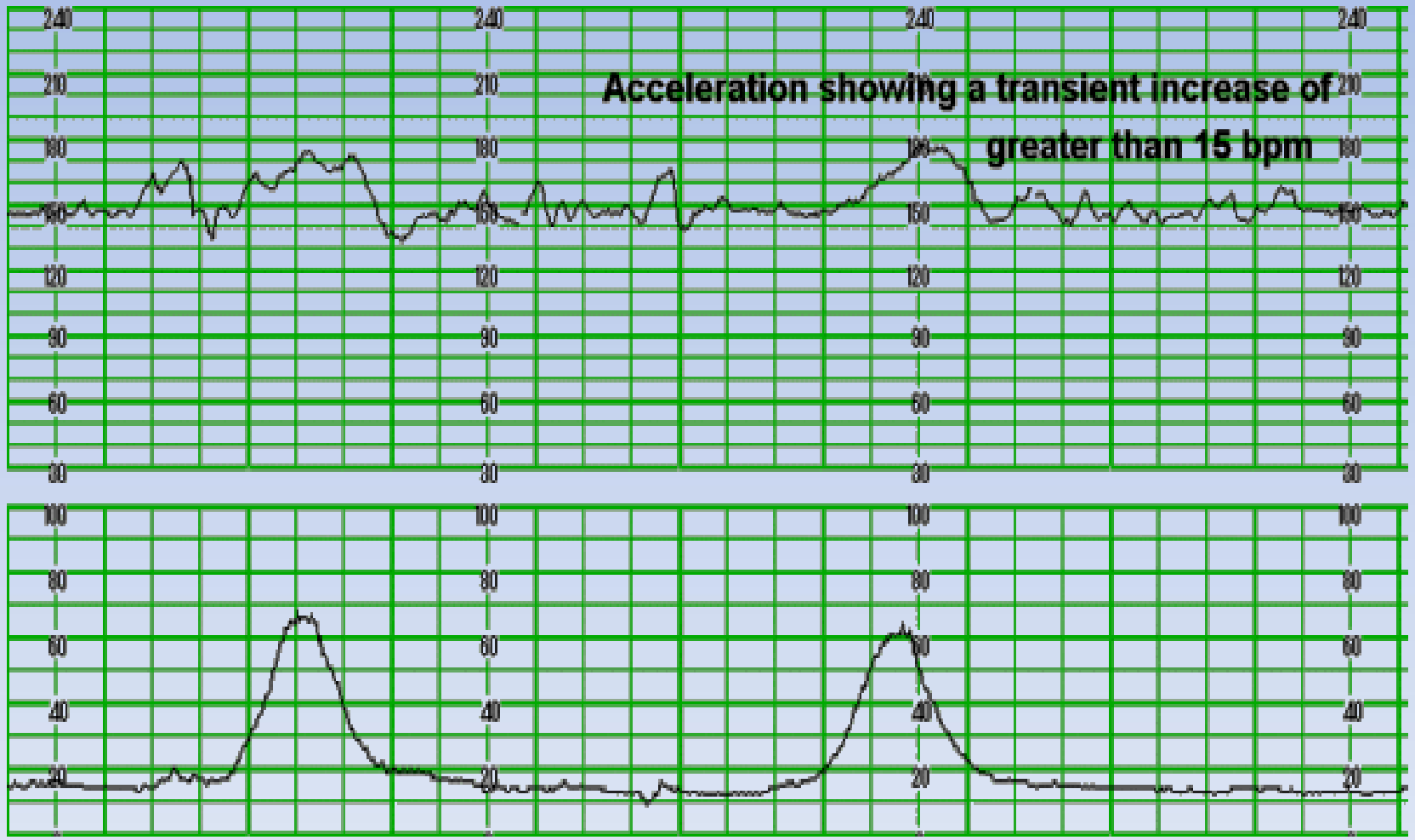
Accelerations

- Transient increases in FHR of 15 bpm or more above the baseline and lasting 15seconds or more
- The significance of no accelerations on an otherwise normal FHR recording is not known
- The duration of the acceleration is defined as the time from the initial change in heart rate from the baseline to the time of return to the FHR to baseline.

Adequate accelerations

- <32 weeks' : ≥10 BPM above baseline for ≥10 seconds
- >32 weeks' : ≥15 BPM above baseline for ≥ 15 seconds

accelerations



d e c e l e r a t i o n s

Transient episodes of slowing of FHR below the baseline of more than 15 bpm lasting at least 15 seconds

- ***Episodic patterns*** *are those not associated with uterine contractions*
- ***Periodic patterns*** *are those associated with uterine contractions.*

d e c e l e r a t i o n s

- ***Quantitated*** *by the depth of the nadir in BPM below the baseline. The duration is quantitated in minutes and seconds from the beginning to the end of the deceleration.*

  The type of the deceleration is distinguished on the basis of its waveform.

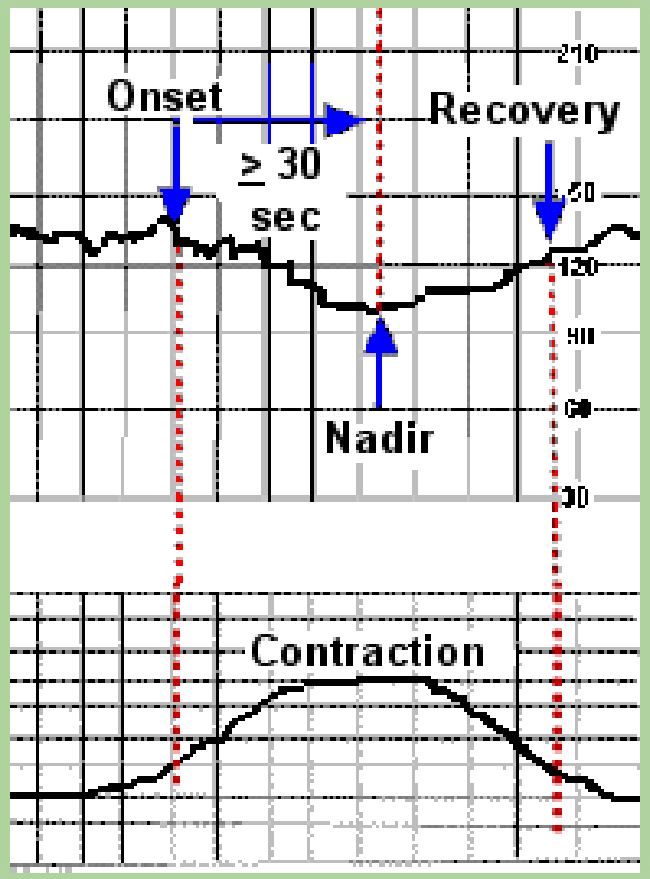
Decelerations

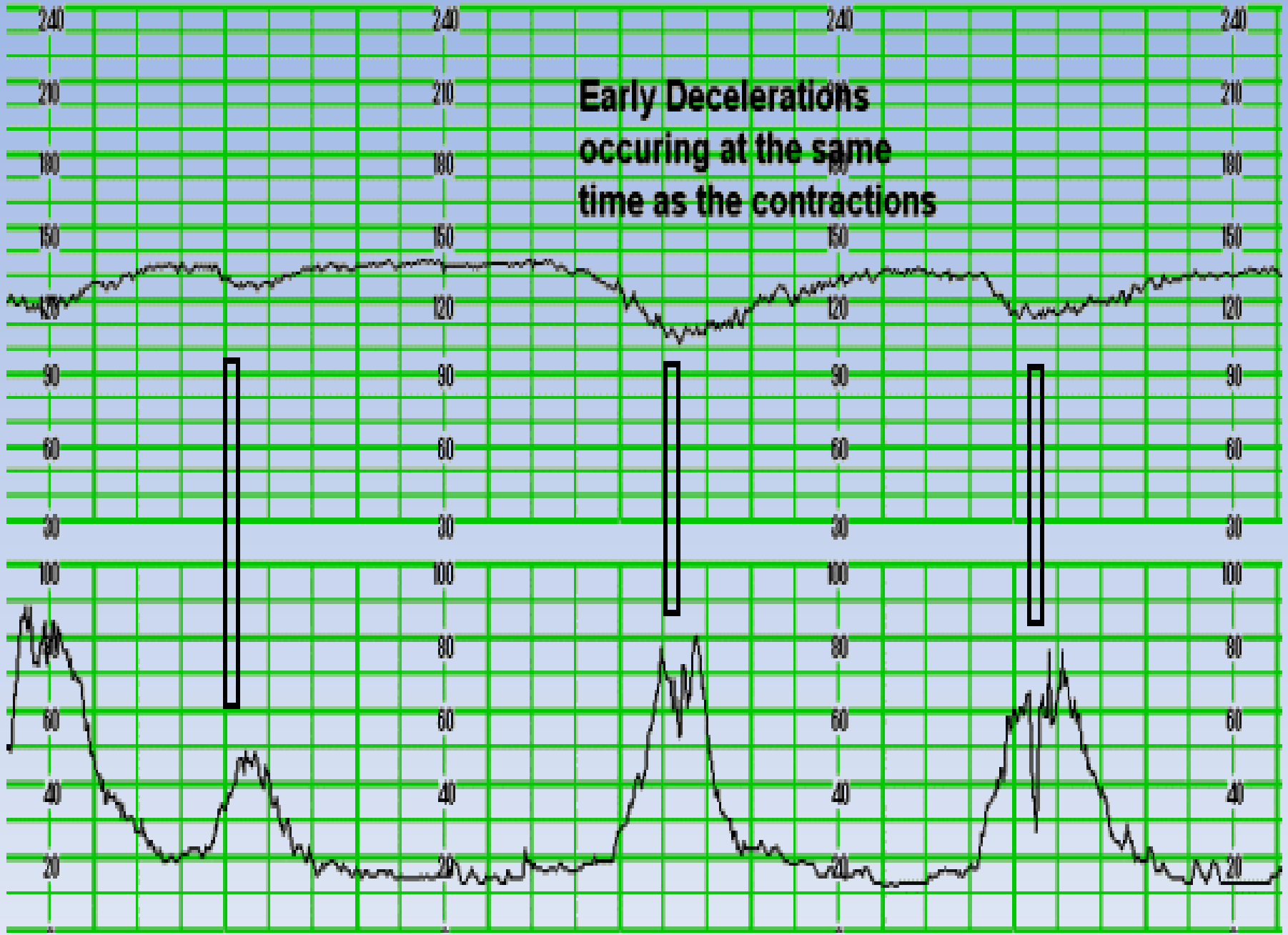
Periodic patterns

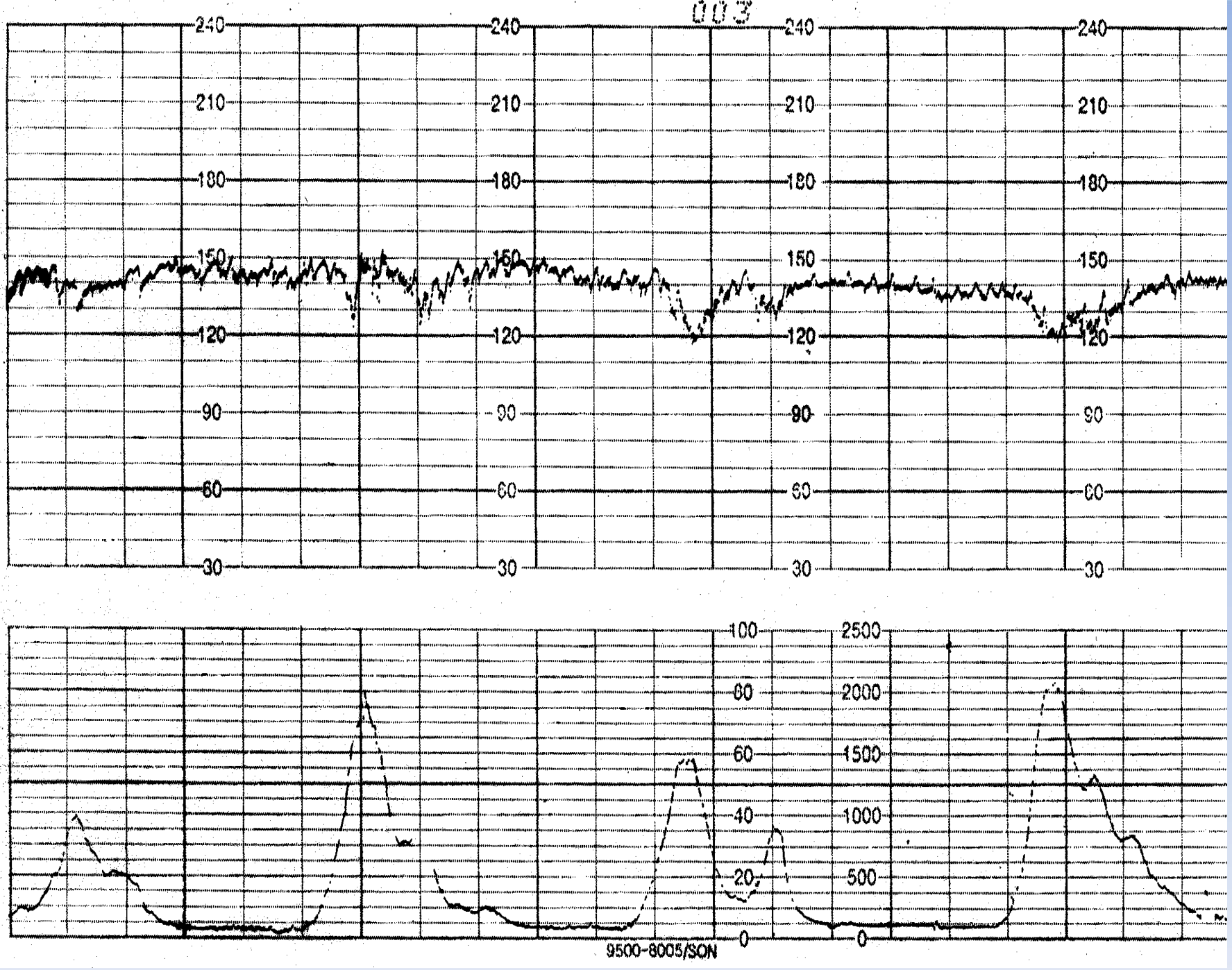
- *Early Decelerations*
  - uniform, repetitive decrease of FHR with slow onset early in the contraction and slow return to baseline by the end of the contraction
- *Late Decelerations*
  - Uniform, repetitive decreasing of FHR with, usually, slow onset mid to end of the contraction and nadir more than 20 seconds after the peak of the contraction and ending after the contraction
  - In the presence of a non-accelerative trace with baseline variability < 5 bpm, the definition would include decelerations < 15 bpm

Early decelerations

- *Gradual decrease in FHR with onset of deceleration to nadir ≥30 seconds.*
- *The nadir occurs with the peak of a contraction.*




Early Decelerations
occuring at the same
time as the contractions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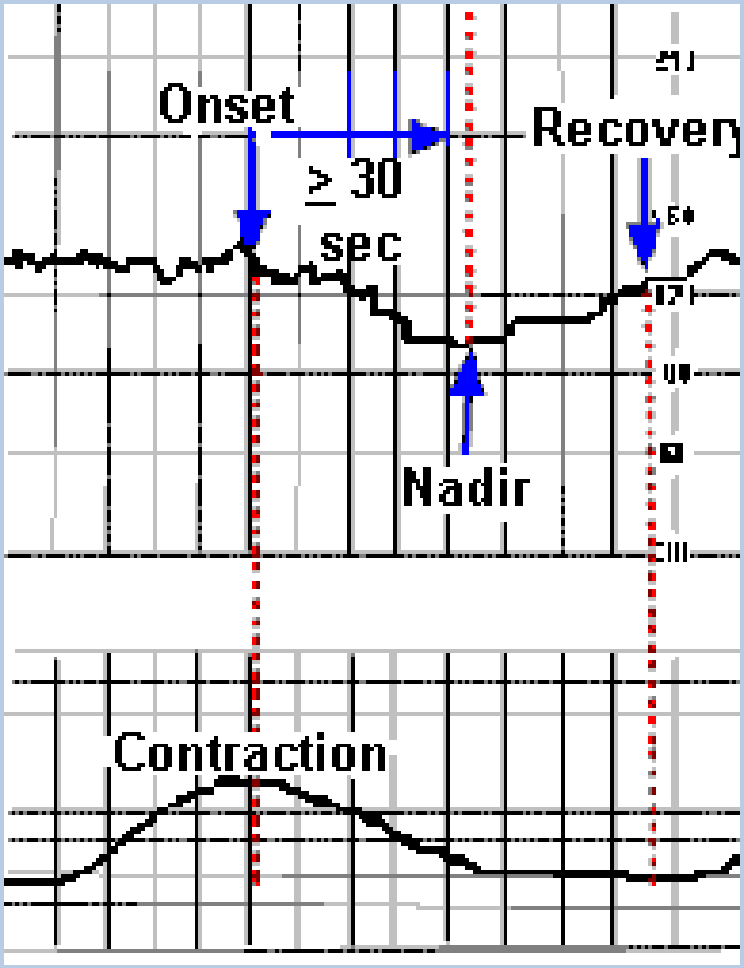
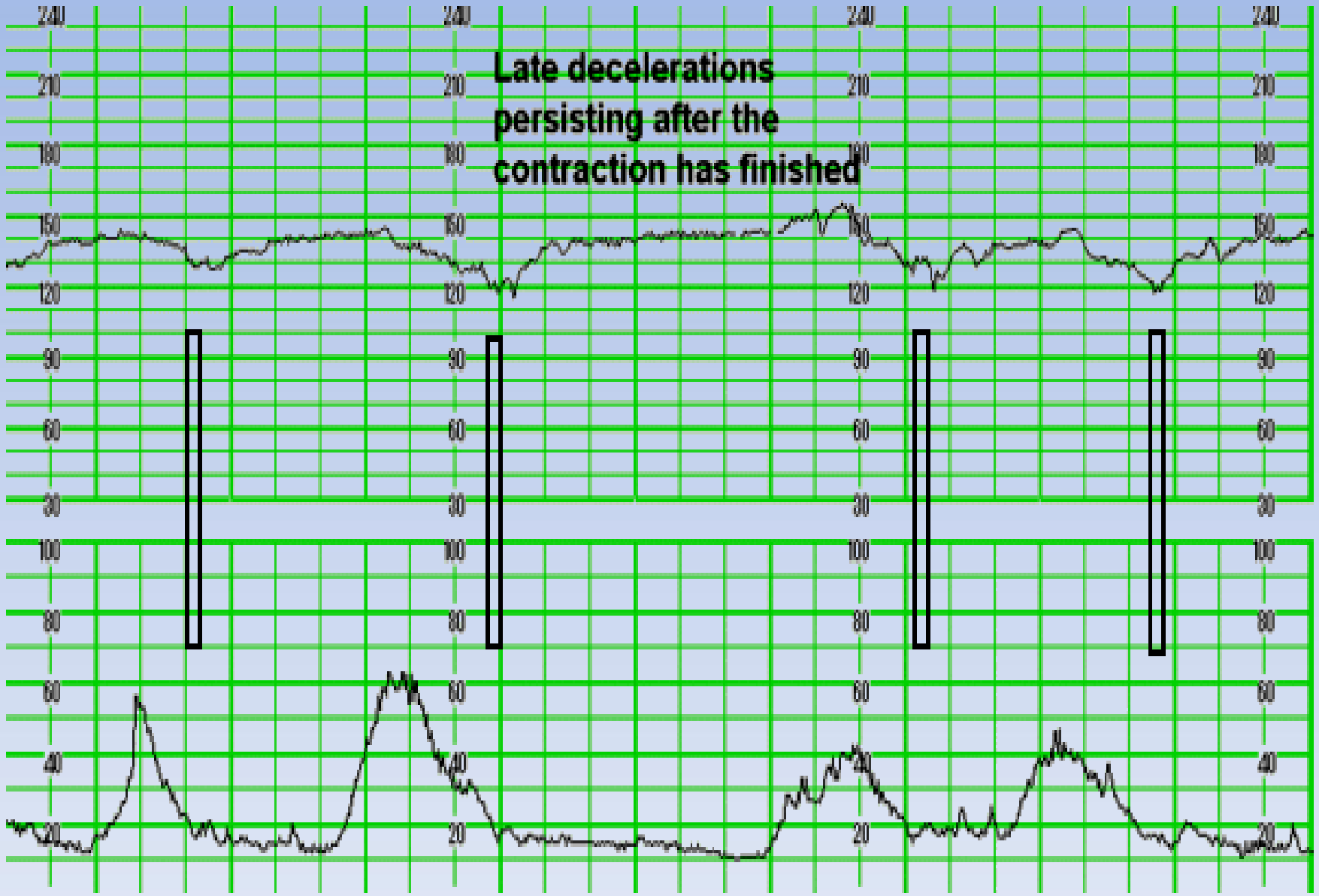
LATE DECELERATIONS

- Uniform, repetitive, decreasing of FHR with, usually, slow onset mid to end of the contraction, nadir more than 20 seconds after the peak of the contraction and ending after the contraction
- In the presence of a non-accelerative trace with baseline variability < 5 bpm, the definition would include decelerations < 15 bpm

Late Deceleration

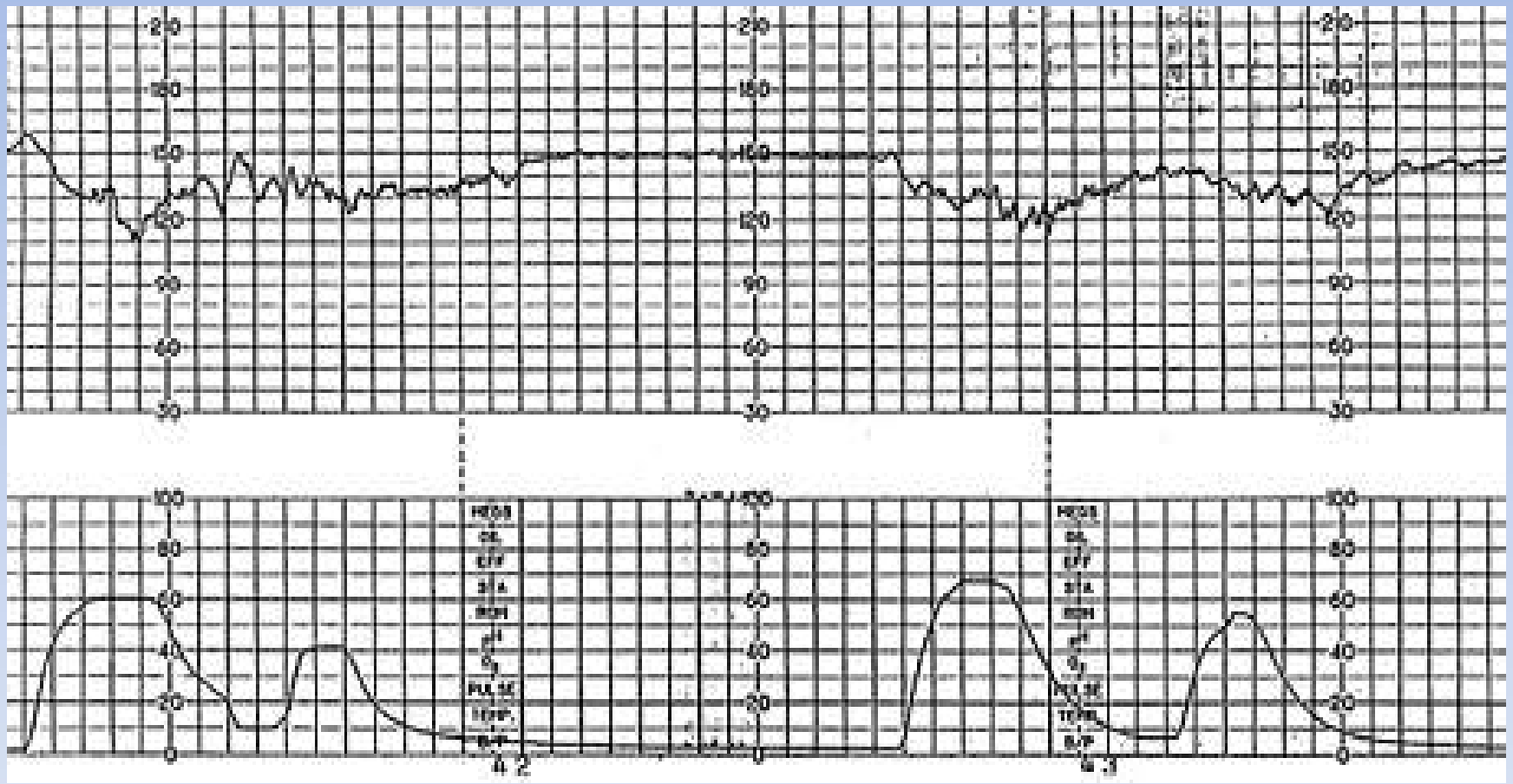
Gradual decrease in FHR with onset of deceleration to nadir ≥30 seconds. Onset of the deceleration occurs after the beginning of the contraction, and the nadir of the fetal heart occurs after the peak of the contraction.




Late decelerations
persisting after the
contraction has finished

Late Deceleration

preservation of beat-to beat variability



Late deceleration related to bigeminal contractions. B-to-B variability is preserved. Note the prolonged contraction pattern with elevated uterine tone between the peaks of the contractions, causing hyperstimulation and uteroplacental insufficiency

Late Deceleration
no variability

Late deceleration with loss of variability. This is an ominous pattern, and immediate delivery is indicated.

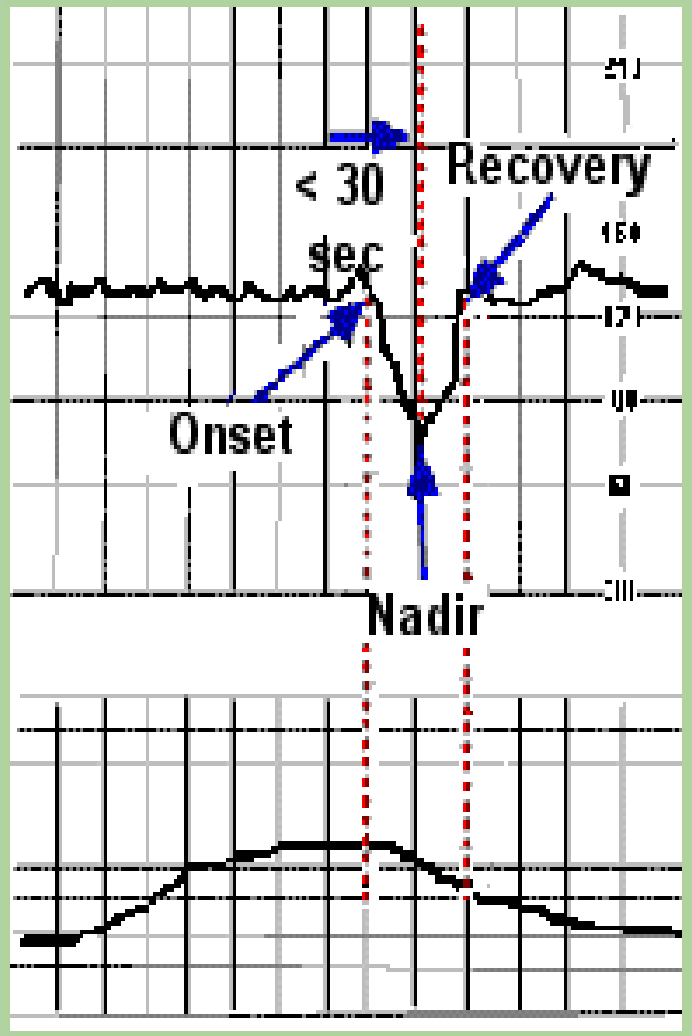
Variable decelerations

Variable decelerations

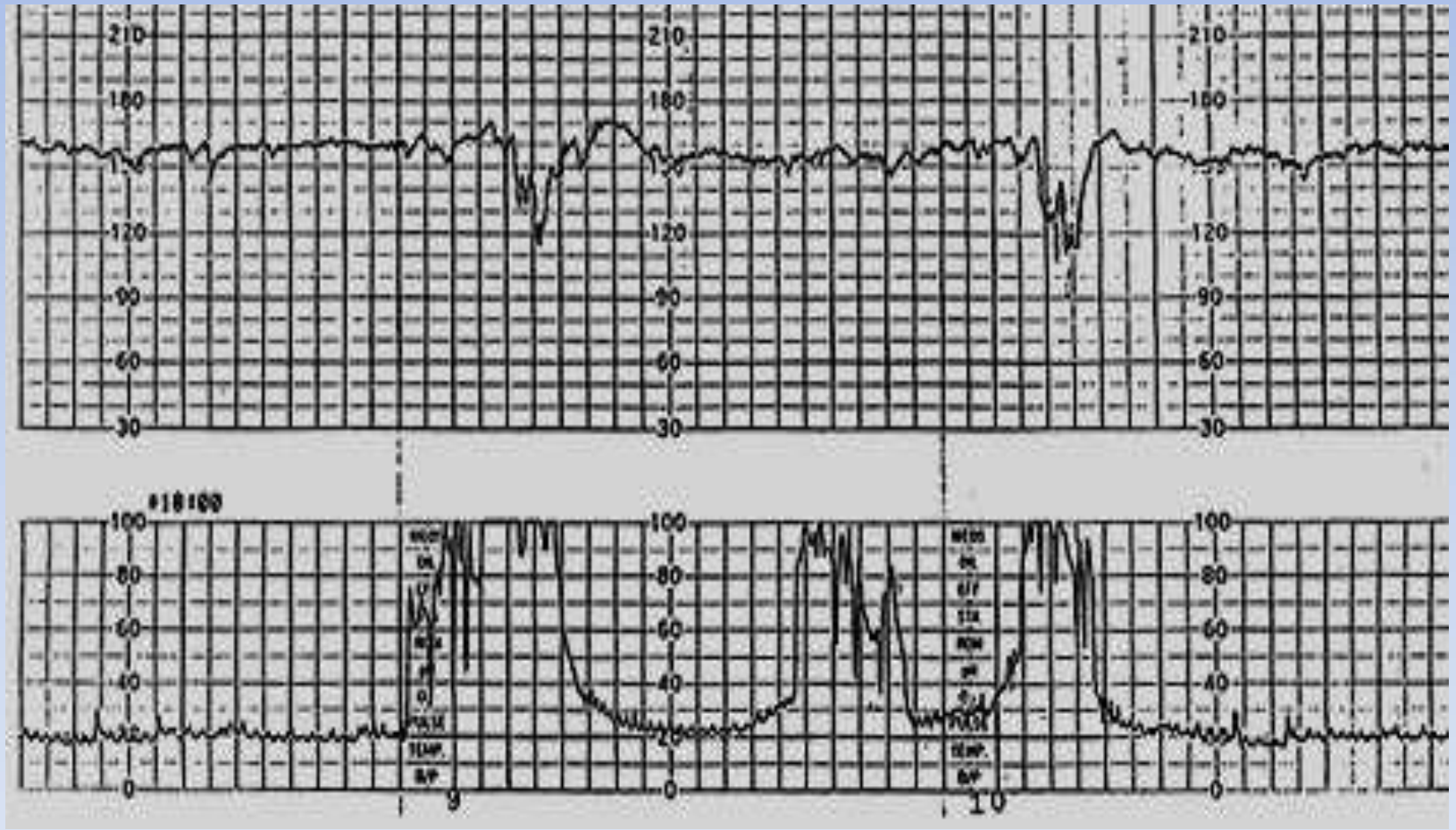
- Intermittent periodic slowing of FHR with rapid onset and recovery.
- The time relationship with contractions is variable but they most commonly occur in association with contractions
- *Vagal* in origin, medical experts suggest variable decelerations result from stimuli such as *cord or head compression*

Variable decelerations

- *Abrupt decrease in FHR of ≥ 15 bpm measured from the most recently determined baseline rate.*
- *The onset of deceleration to nadir is less than 30 seconds.*
- *The deceleration lasts ≥ 15 sec and less than 2 minutes.*
- *A shoulder, if present, is not included as part of the deceleration.*



variable Deceleration

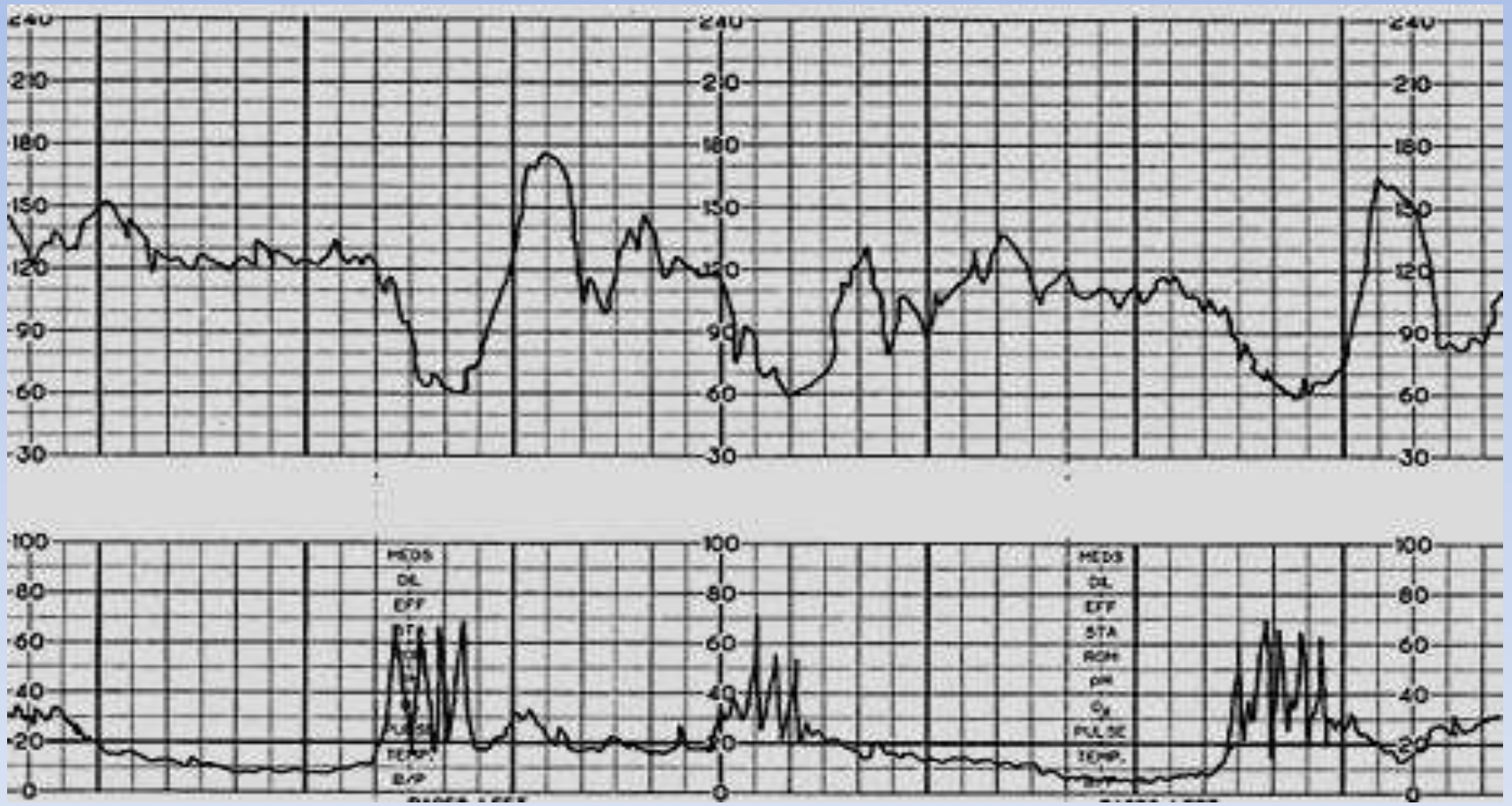


Variable deceleration with pre- and post-accelerations ("shoulders"). Fetal heart rate is 150 to 160 beats per minute, and beat-to-beat variability is preserved

Complicated Variable decelerations

- Rising baseline rate or fetal tachycardia
- Reducing baseline variability
- Slow return to baseline FHR after the end of the contraction
- Large amplitude (by 60 bpm or to 60 bpm) and / or long duration (60 secs)
- Loss of pre and post deceleration shouldering (abrupt brief increases in FHR baseline)
- Presence of post deceleration smooth overshoots (temporary increase in FHR above baseline)

variable Deceleration



Severe variable deceleration with overshoot. However, variability preserved.

Prolonged decelerations

- Decrease of FHR below the baseline of more than 15 bpm for longer than 90 seconds but less than 5 minutes

Prolonged deceleration

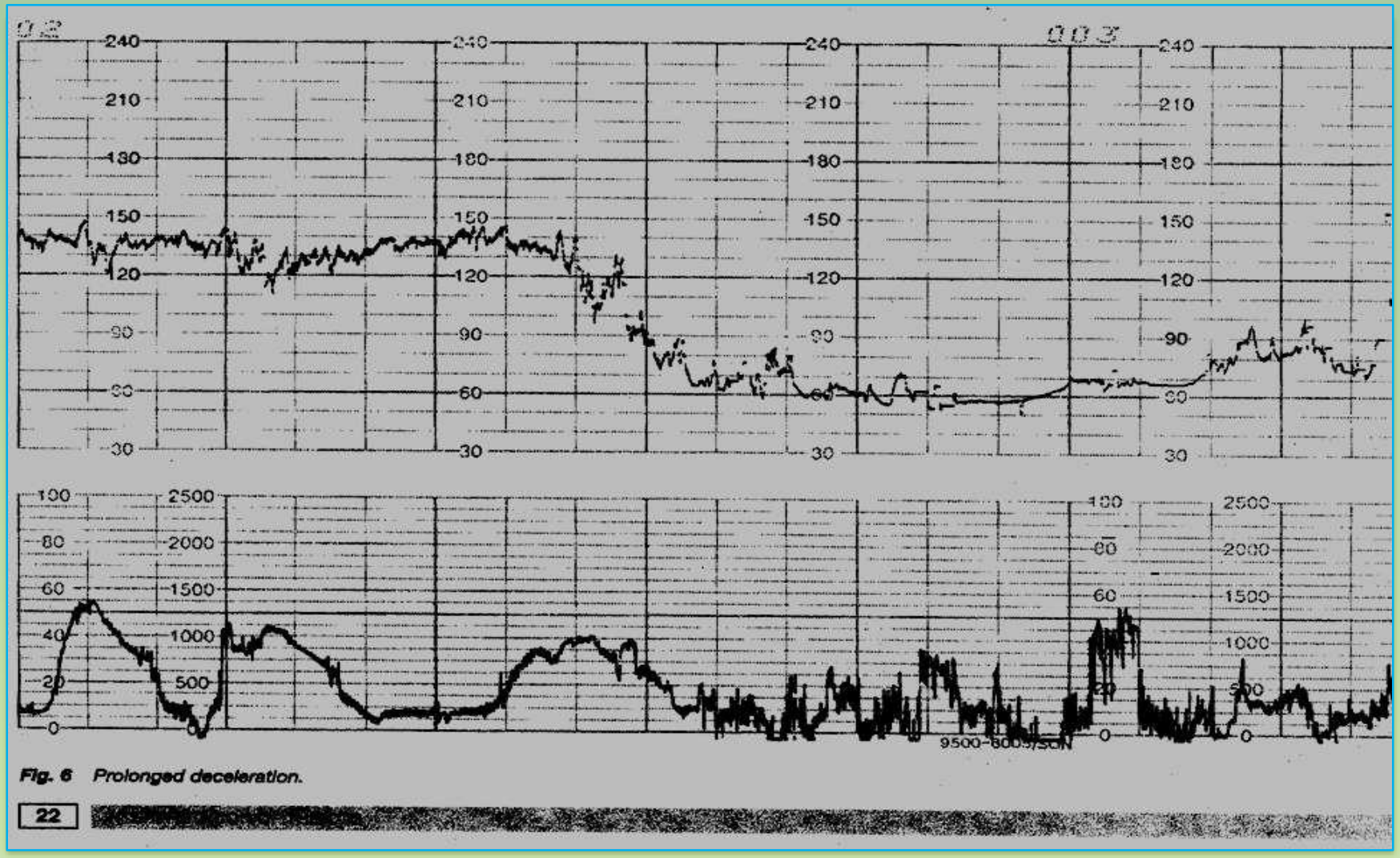


Fig. 6 Prolonged deceleration.

Sinusoidal pattern

Fig. 2 Sinusoidal pattern.

Saltatory pattern