Interpretation of CTG & CFHM during Antepartum & Intrapartum Periods

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Risk Factors to Consider

- Postdated pregnancy
- IUGR
- Other conditions associated with placental insufficiency e.g. AP / PP
- No liquor / thick MSL at ROM
- At term / preterm PROM
- Suspicious FHR trace before
- Rupture of uterus

Pathological factors affecting the fetal heart rate

- Maternal thyroid status: thyrotoxicosis
- Structural abnormalities of fetal heart
- Infection e.g. Chorioamnionitis
- APH
- Fetal anaemia / anomalies
- Cord compression accidents
- Oligohydramnios

Clinical factors affecting fetal heart rate

- Duration of first stage of labour
- Maternal fever
- Epidural Anaesthesia
- Maternal age
- MSL
- Maternal smoking
- Medication: Pethidine, Bricanyl

Factors Influencing Fetal Heart Rate (1)

Main regulators of fetal heart rate:

Physiological

A) Autonomic nervous system

-- Parasympathetic nervous system (slow HR)

-- Sympathetic nervous system (increase HR)

Factors Influencing Fetal Heart Rate (2)

B) Baroreceptor

-- sensitive to arterial blood pressure

-- present in the major arteries and the aorta

-- responsible for dramatic bradycardia seen in response to *cord compression*

C) Chemoreceptor

-- responding to blood gas tension (PO_2)

Factors Influencing Fetal Heart Rate (3)

D) Rest (sleep) / Activity (wake) cycles

Rest (sleep)

-- Little or no breathing movement

-- Little body movement

-- Decreased FHR

Activity (wake)

-- Fetus moves its limbs

-- Makes breathing movements

-- Exhibit a rise in FHR

Factors Influencing Fetal Heart Rate (4)

Non-physiological

1) Hypoxia
2) Prematurity
3) Drugs (sedatives, antihypertensives, anaethetics)
4) Local anaesthetic
5) Congenital malformation of CNS
6) Cardiac arrhythmias

Definitions (1)

- *Baseline heart rate*

- *Baseline variability*

  Physiological control of fetal heart rate

  -- 4/52 heart begins to beat

  -- 15/52 HR about 150 bpm

  -- 30/52 HR about 135 bpm until term

Definitions (2)

- *Prolonged bradycardia*

  Definition: FHR *< 100 / min for 3 min* or *< 80 for 2 min*

  Causes: -- cord compression / prolapse

  -- Abruptio placentae

  -- Scar rupture

  -- Uterine hyperstimulation

  -- Vagal stimulation (PV exam)

Definitions (3)

Course:

-- In the absence of pathologies - most cases show recovery within *6 min*, and return return to baseline within *9 min*

-- If recovered within 6 min with good variability - observe

-- If not recovered by 9 min arrange for urgent delivery

Definitions (4)

- *Tachycardia*

  Definition: Baseline HR > 150 bpm due to

  Fetal:

  -- movement

  -- arousal

  -- hypoxia

  -- anaemia / hypovolaemia

Definitions (5)

Maternal:

-- dehydration

-- sympathetic activation e.g. fever

-- Betamimetics e.g. bricanyl

Definitions (6)

- *Acceleration*

  Definition: transient increased in HR *≥15 bpm* for *≥15 seconds*, *≥2 accelerations* within 20 min denotes reactive pattern.

- *Deceleration*

  Definition: transient slowing of heart rate below baseline of *≥15 bpm* for *≥15 seconds*

Definitions (7)

- *Early deceleration (type I dip)* - onset with contraction, mirror image of contraction

  -- compression on fetal head: rise in ICP stimulates the vagal nerve

  -- seen in late stage of labour, malposition, vaginal examination, ARM

  -- In non-hypoxic fetus increased variability ± rebound acceleration

Definitions (8)

Pathological in the following situations

-- not in labour / infrequent contractions

-- head not engaged / not in OP or OT position

-- poor / delayed recovery

-- baseline shift / decreased baseline variability

Definitions (9)

-- no accelerations in between / with fetal movements

-- “ W” configuration (biphasic)

Note: with silent pattern, any deceleration of whatever degree is ominous - terminal pattern

Definitions (10)

- *Late deceleration (type II dip)*

  Definition: onset 30-60 seconds after onset of contractions, nadir & recovery all out of phase

  -- *oxygen* in retroplacental reservoir used up during contraction → hypoxaemia till full reoxygenation after relaxation

Definitions (11)

-- speed of recovery reflect *blood flow* -
↑speed of recovery → ↑blood flow to placenta (good placental perfusion)

-- decreased variability and shift in baseline after deceleration implies *hypoxia*

Definitions (12)

- *Variable deceleration*

  -- cord compression, tends to vary because of the site and manner of compression *vary each time*

  -- seen in oligohydramnios, malpresentation, cord presentation and prolapse, cord complications, OP position

Definitions (13)

-- compression on vein before artery → initial decrease in venous return → *tachycardia*

-- when artery also compressed → baroreceptor activated → *bradycardia*

-- released of the compression → increase arterial flow → *tachycardia*

Definitions (14)

-- acceleration before and after the deceleration called "*shouldering*" - denotes healthy fetus

-- progression to: tachycardia, ↓ variability, loss or exaggerated "shouldering", late recovery, biphasic deceleration - denotes pathological changes

Definitions (15)

- *Sinusoid pattern*

  Definition: frequent < 6 *cycles / min*, amplitude ≤ 10 *bpm*, duration ≥ 20 *mins*

  Cause:

  -- healthy fetus - rhythmic mouth movements (disappear after 2-3 mins)

  -- fetal anaemia - Hb Barts, Rh, infection

  -- fetal hypoxia

Definitions (16)

Differentiation:

Healthy fetus suggested by:

-- *accelerations of FHR* in response to stimulation

-- *reactivity* or normal baseline variability before / after

-- *saw-tooth pattern* rather than smooth rounded pattern

Definitions (17)

- *Silent pattern*

  -- baseline variability of *0 - 5 bpm*

- *Terminal pattern*

  -- *persistent silent pattern* not responding to stimuli, with or without shallow decelerations

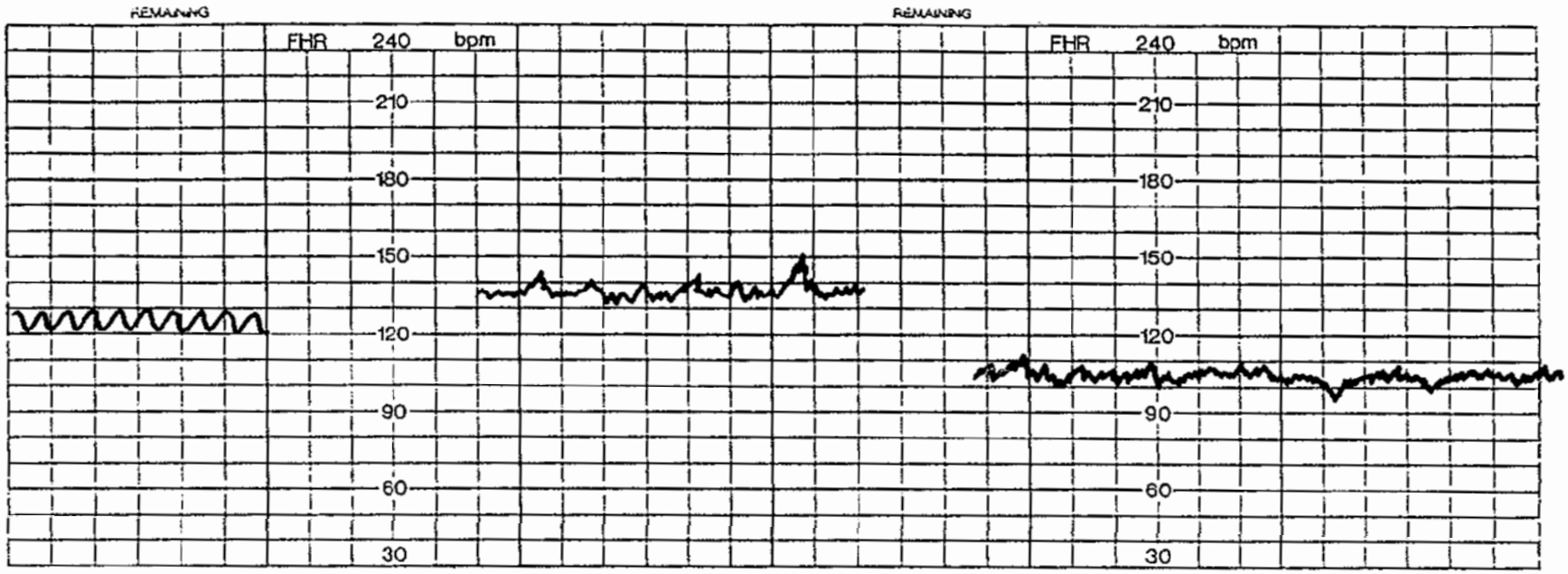
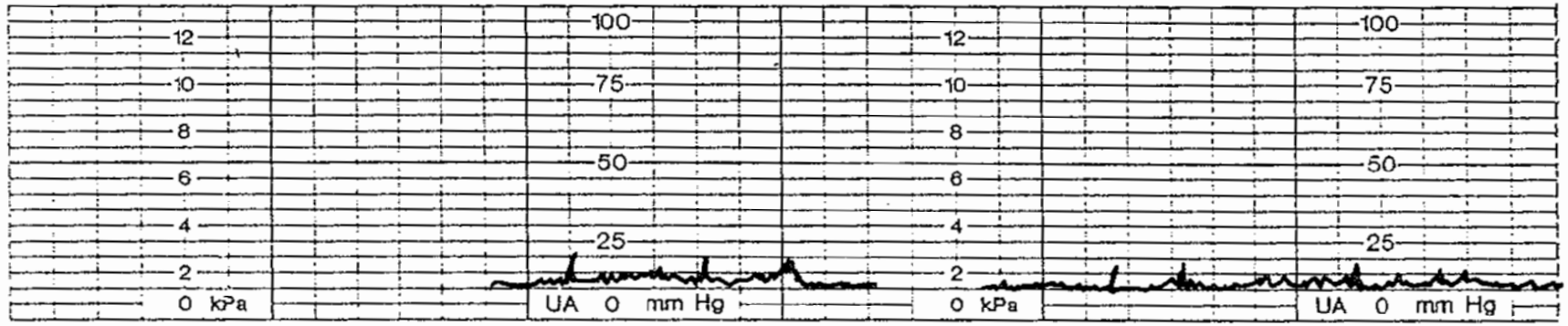
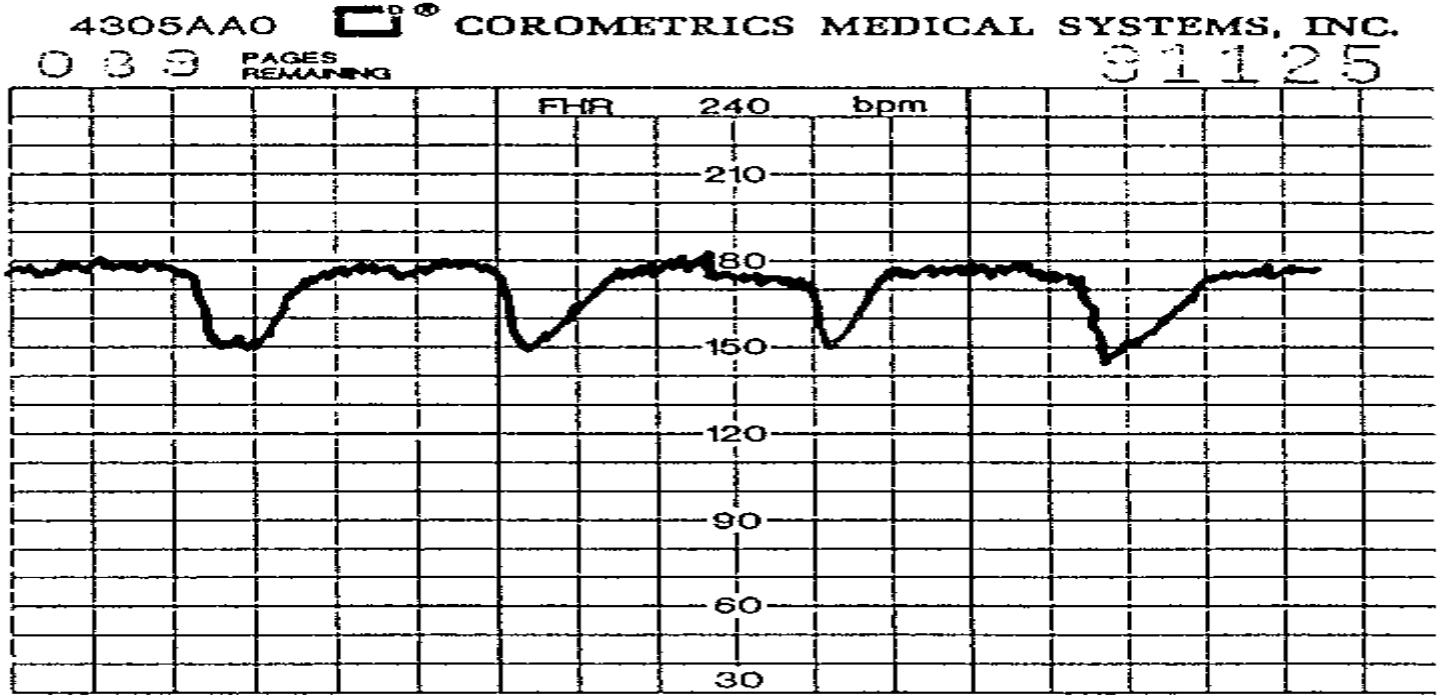


FIG. 1

FIG. 2

FIG. 3

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FHR
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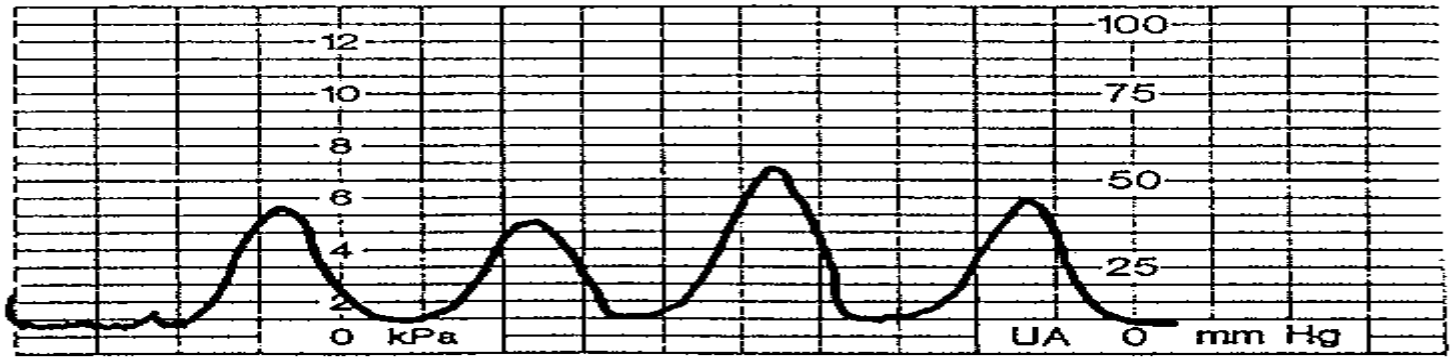
FIG. 4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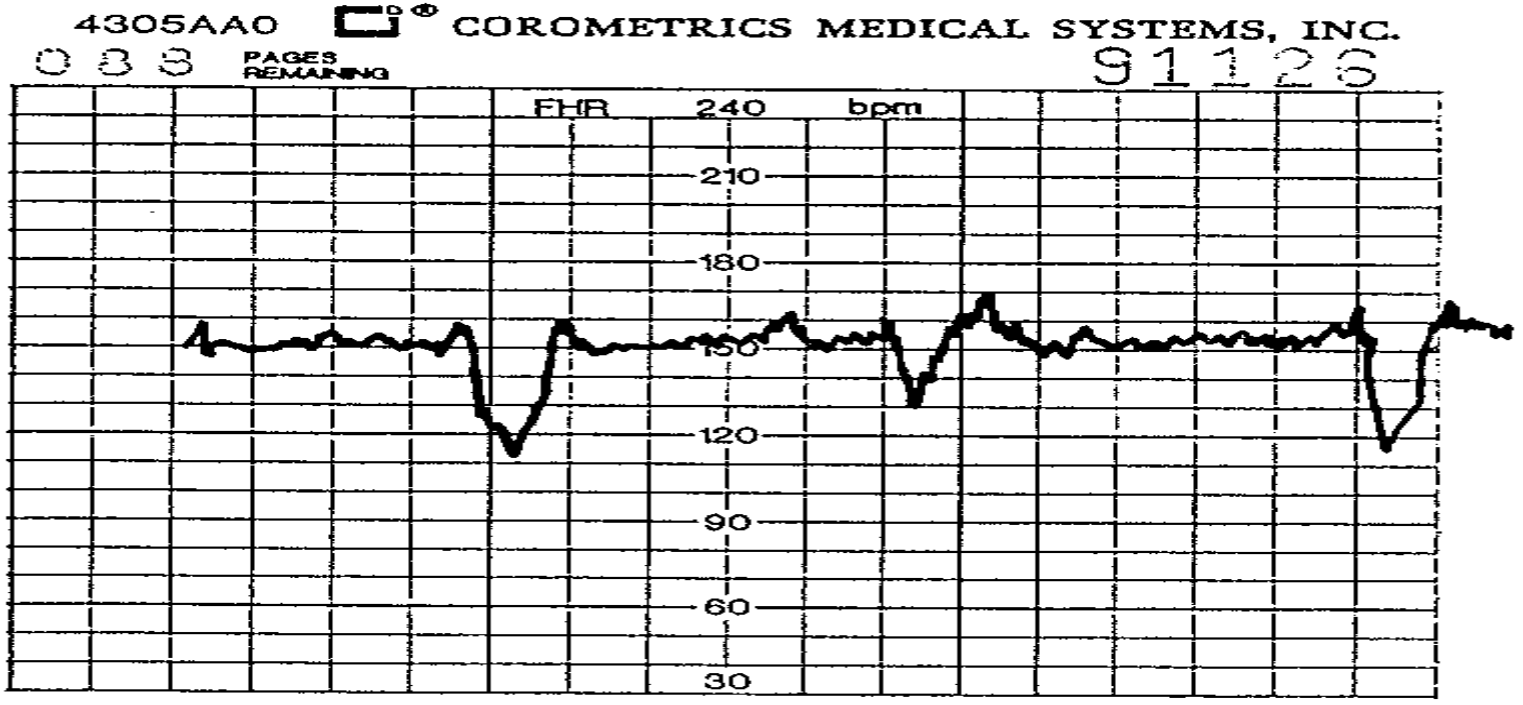
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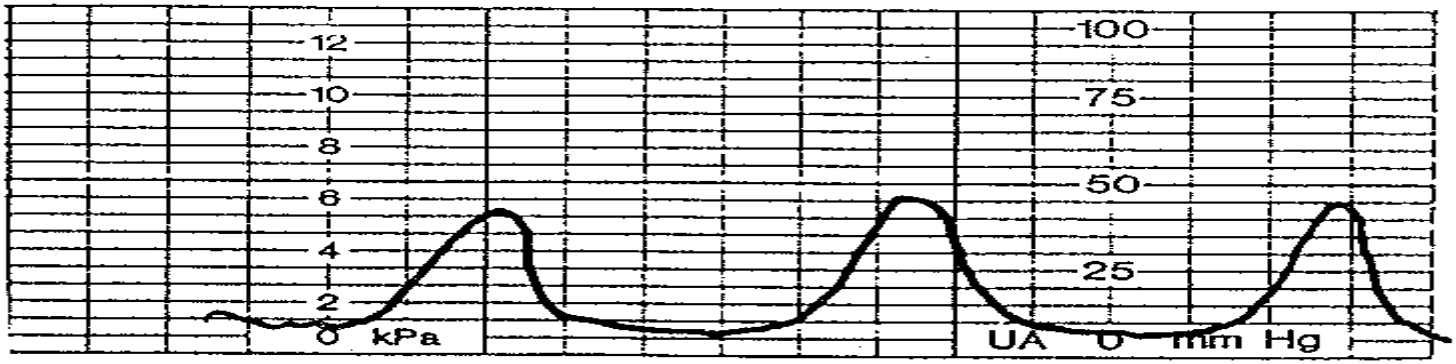
FIG. 5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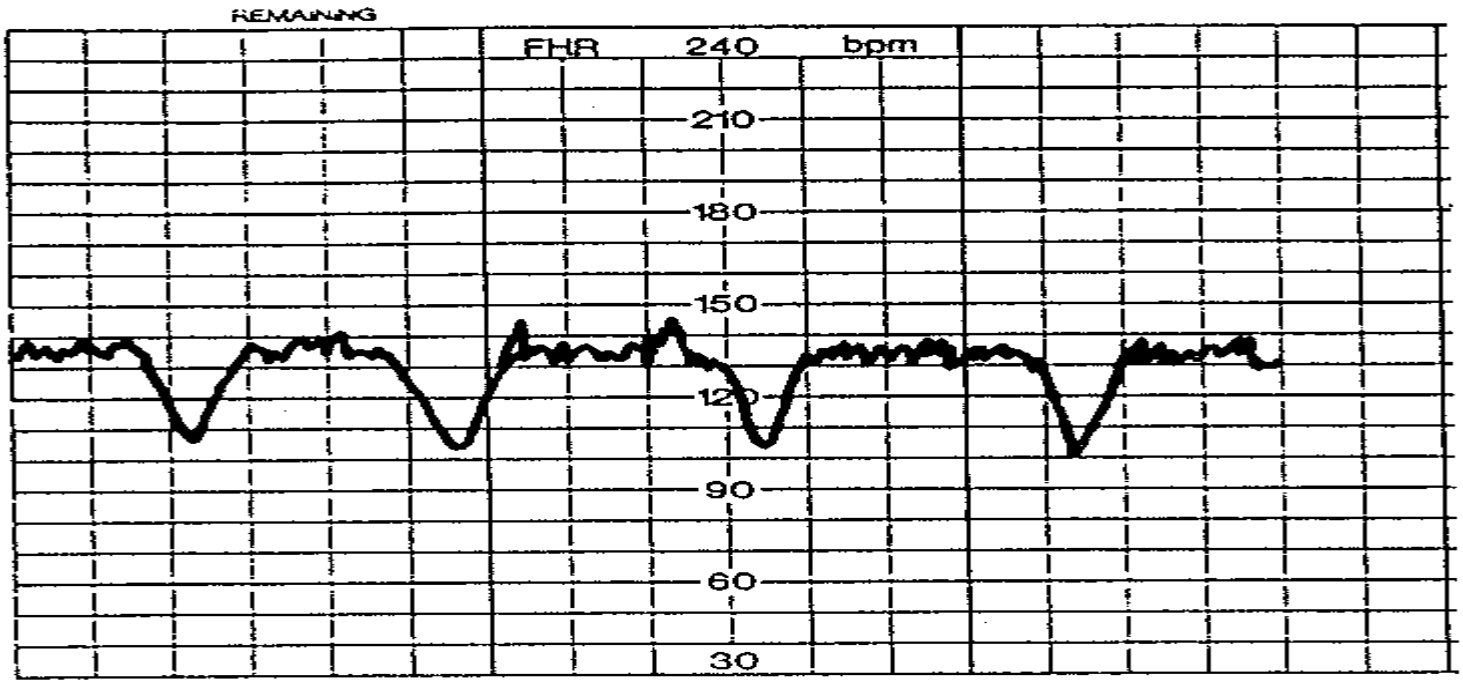
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FIG. 6


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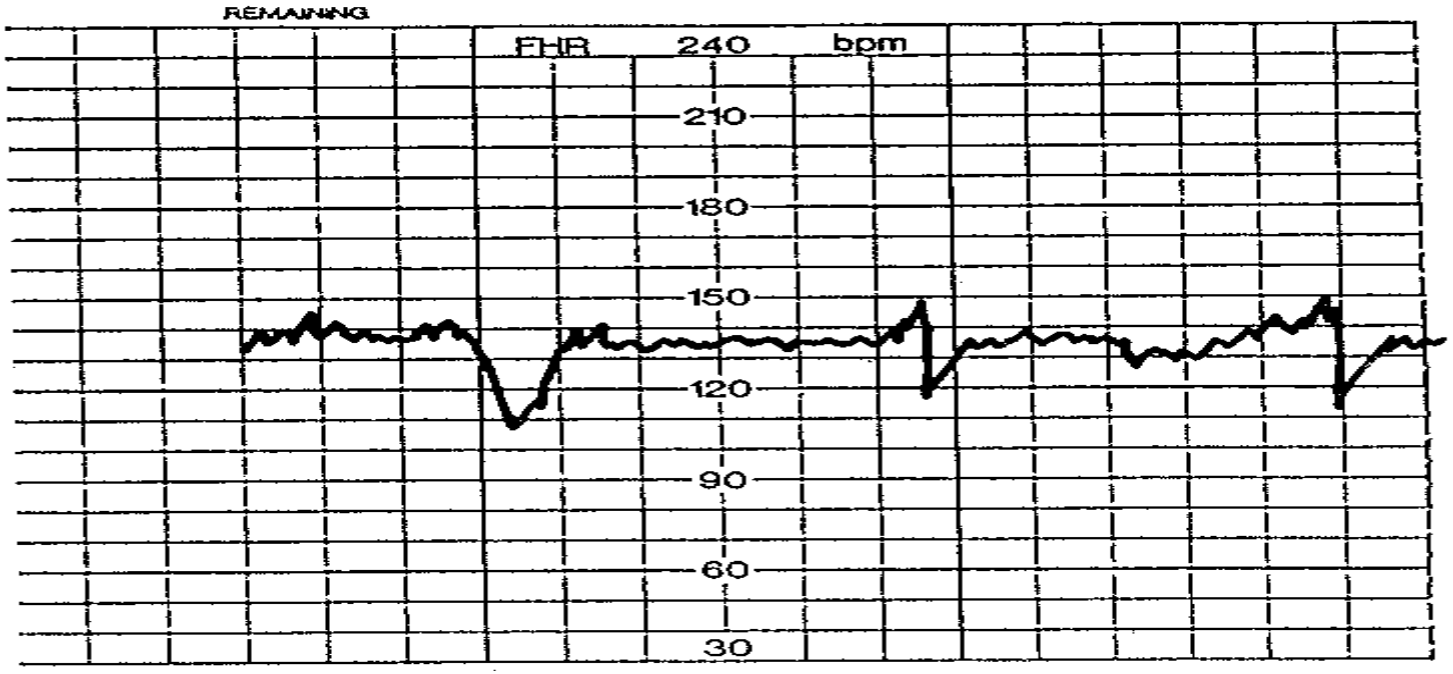
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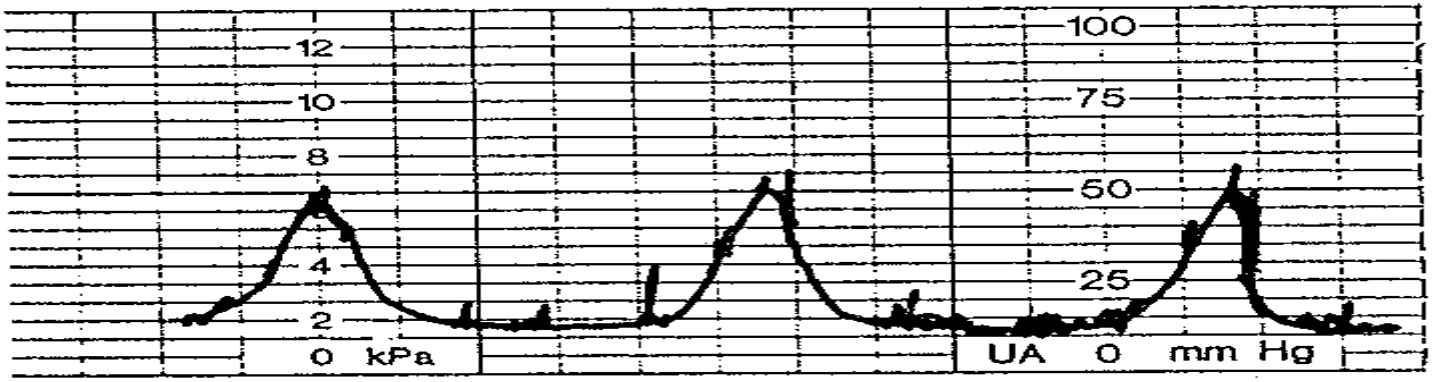
FIG. 7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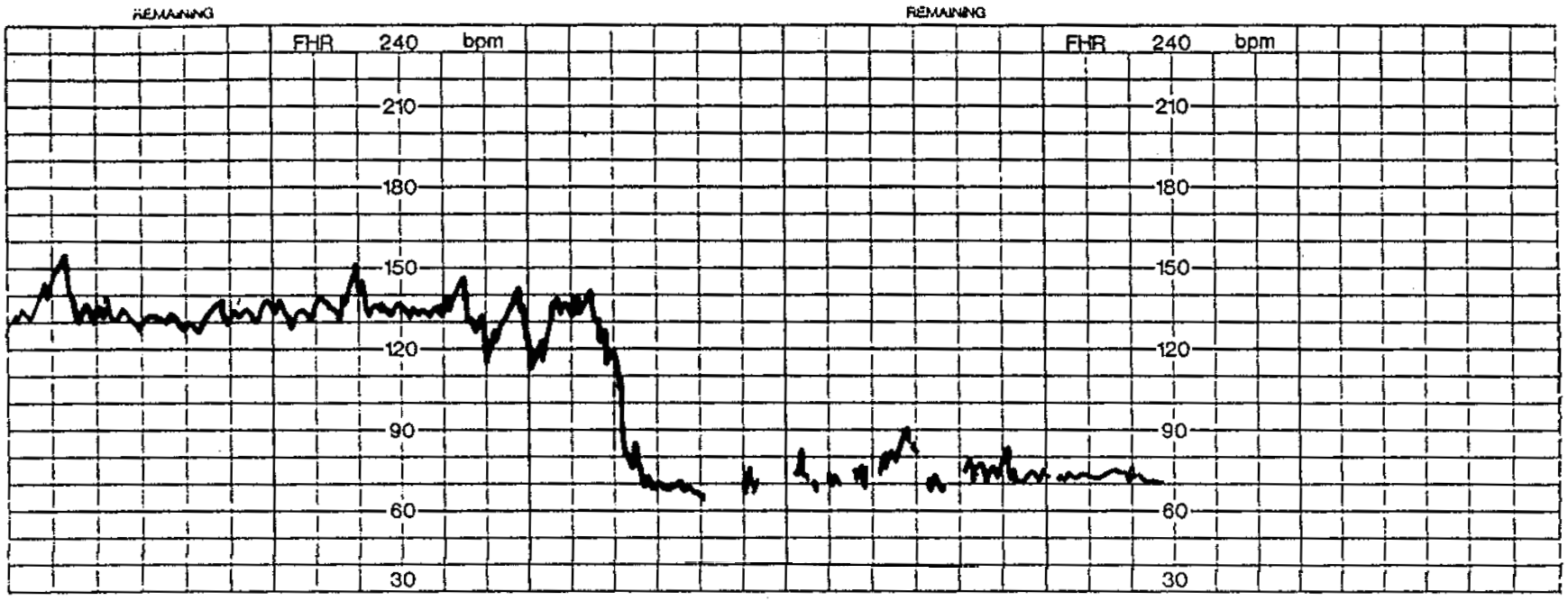
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REMAINING
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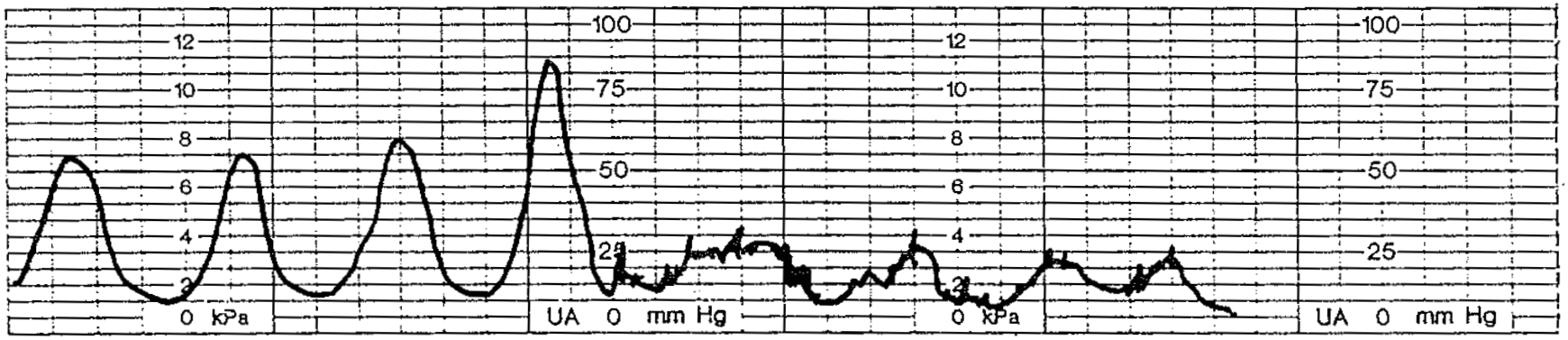
FIG. 8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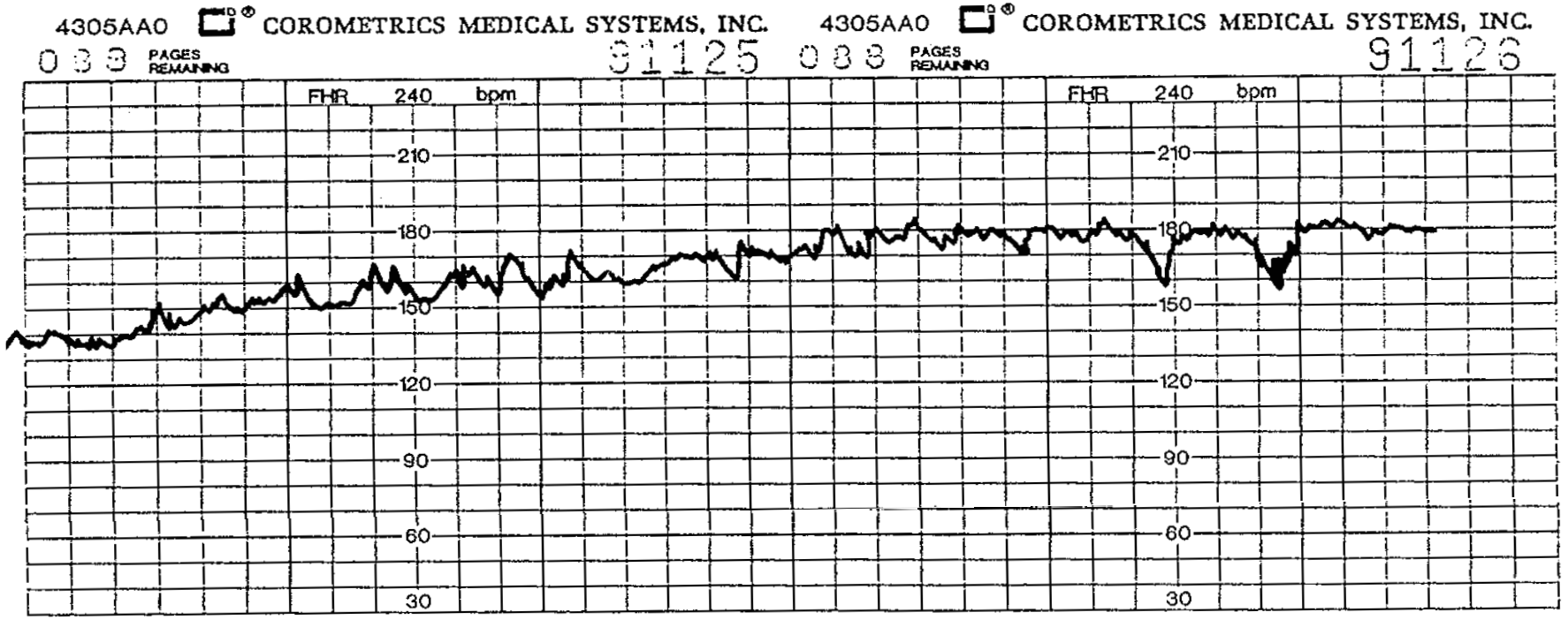
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088 PAGES REMAINING
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FHR 240 bpm
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FIG. 9


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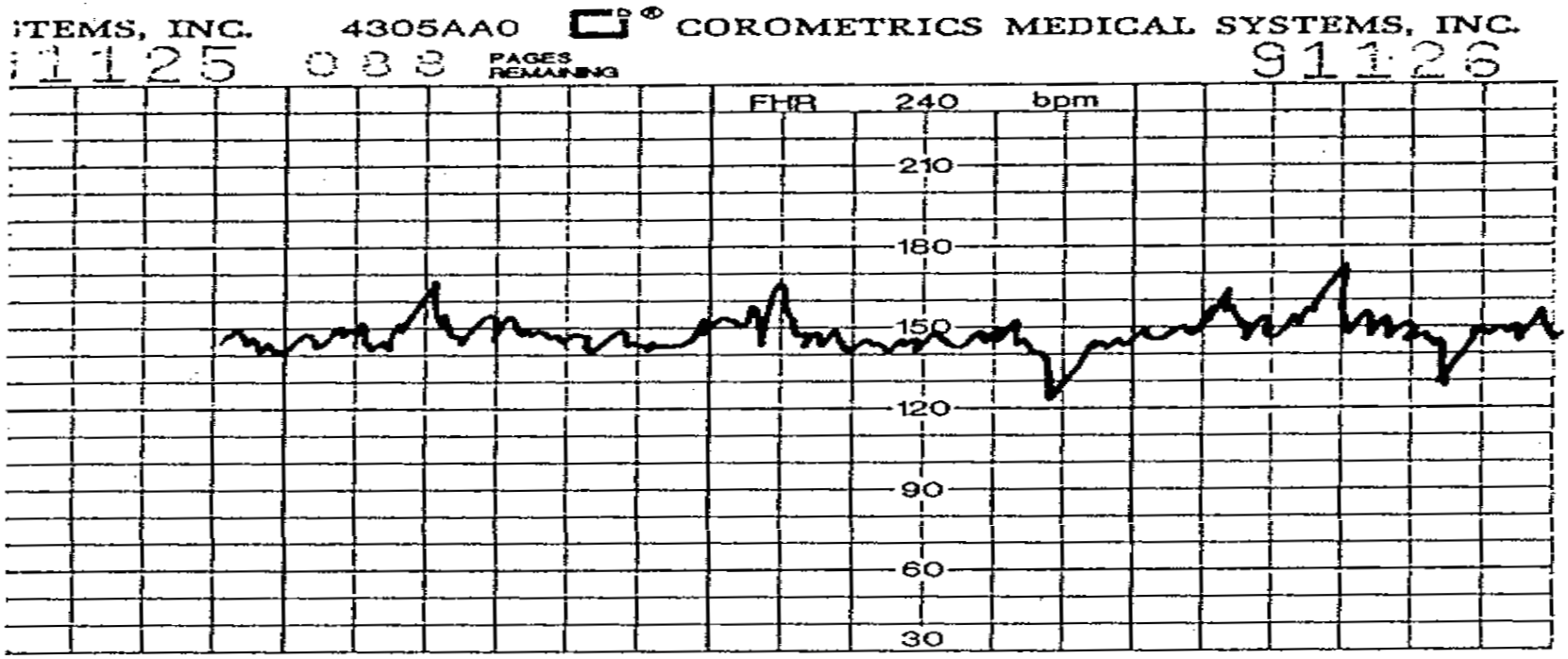
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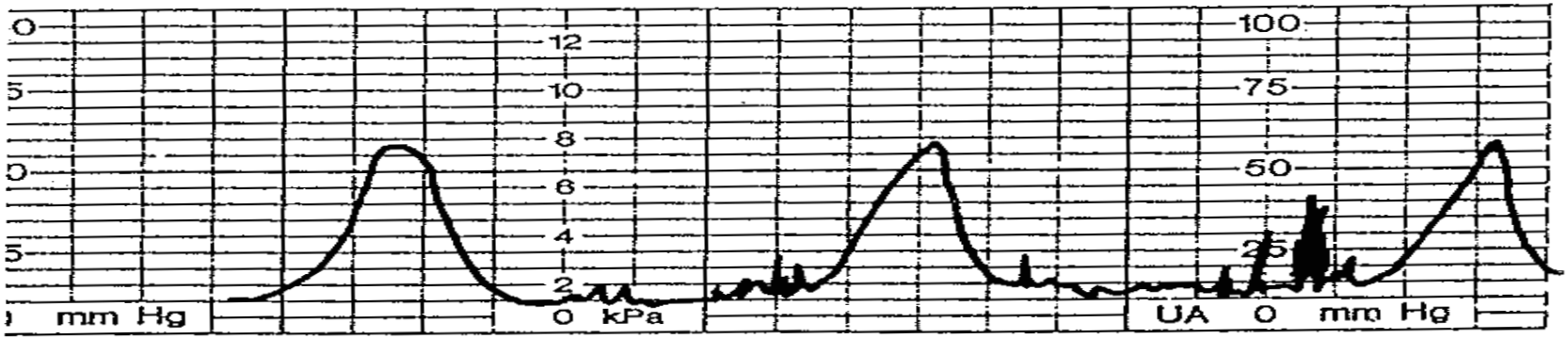
FIG. 10.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