



In The Name Of God

a

asphyxia

*Transient & repetitive episodes of
hypoxia & hypoxemia:*

Is extremely common during normal
labor.

Is generally well tolerated by the
fetus ...

Progressive ↓ in baseline fetal O₂ & PH (intrapartum)



Virtually universal

Levels of acidemia ⇒ Common in normal newborns



ominous in infants or adults

hypoxia _ _ _ _ ➤ metabolic acidemia → at risk of

long – term neurologic impairment

Hypoxemia = ↓ O₂ in blood

Hypoxia = ↓ O₂ in tissue

Acidemia = ↑ “H” ions in blood

Acidosis = ↑ “H” ions in tissue

Asphyxia = Hypoxia with metabolic acidosis

Uterine Blood flow $\Rightarrow$ O₂ delivery

Contractions

Maternal position

Conduction anesthesia

Complications (ap, preeclampsia, chorioamnionitis)

Umbilical cord (prolapse – compression common)

Susceptible fetuses (FGR – preterm)

GOALS:

To prevent fetal & neonatal Mb.

To prevent fetal & neonatal Mt.

CP: { prenatal
intrapartum: birth asphyxia 9%
post partum

Criteria to define an acute intra partum event sufficient to cause cerebral palsy: (all 4 should be present)

1. Metabolic acidosis in fetal UCa: $\text{PH} < 7$, base deficit $> 12 \text{ mmol/L}$
2. Early onset of severe or moderate encephalopathy in infants born at $\geq 34^{\text{w}}$.
3. Spastic quadriplegic or dyskinetic CP.
4. R/O of other etiologies: trauma, coagulation, infection, genetic.

- o Profound & prolonged asphyxia → cell death (death of organism)
- o Severe asphyxial brain injury → long term neurologic deficit.

{ CP: Major disorder of neurodevelopment
{ CP: Chronic disability → aberrant control of movement & posture appearing early in life

No recognized progressive disease

MR: 41%, seizures 23%, cortical visual impairment.

The goal of Ante partum fetal monitoring:

“to identify the fetus at risk”

DD between 3 groups:

- 1- The fetus that is not affected by labor
- 2- The fetus that is negatively affected by labor but has enough reserve to compensate fully: no immediate danger.
- 3- The fetus that is negatively affected by labor with no reserve to compensate → Mb/ Mt



Who should be monitored:

Fetal monitoring is offered to patients at increased risk of fetal or neonatal Mb/Mt.

- * Mat. medical complications: GDM, SLE
- * Fetal conditions: FGR, arrhythmia.
- * Pregnancy complications: Preeclampsia, PTL, PROM, Oligo & Polyhydramnios

What we can monitor:

- *FHR

- *Uterine activity (direct, indirect)

- *Fetal state (tone, movement, breathing)

- *AF

FHR monitoring

- Auscultation
- Electronic monitoring (Ext, Int)
- Intermittent
- Continuous

Fetal Heart Tracing

1- Baseline FHR (120 – 160bpm)

2- BTB – V

3- Periodic patterns

(accelerations, decelerations)

200 — US1 $\Delta \uparrow 160/60s$ $\downarrow 70/60s$

180

160

140

120

100

80

60

200

180

160

140

120

100

80

60

|||

00:24 04.04.44 2cm/min

FMP
 $\uparrow$ FMP

00

100

80

60

40

20

12

10

8

6

4

2

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Bradycardia

Basal FHR <120 bpm

Not common

DD :with deceleration (abrupt changes)

Rarely with: mat: β blocker Tx

Hypothermia

↓ glu

Hypothyroidism

Fetal AV block: structural heart disease

Viral CMV

Ro – La Ab.



FIGURE 6.36 Fetal bradycardia.

Tachycardia

Basal FHR >160 bpm

Mostly: ($\downarrow$ PS, $\uparrow$ S) $\rightarrow$ fever, infection anemia, fetal hypoxia

Other: Mat. hyperthyroidism, fetal tachyarrhythmias, medications.

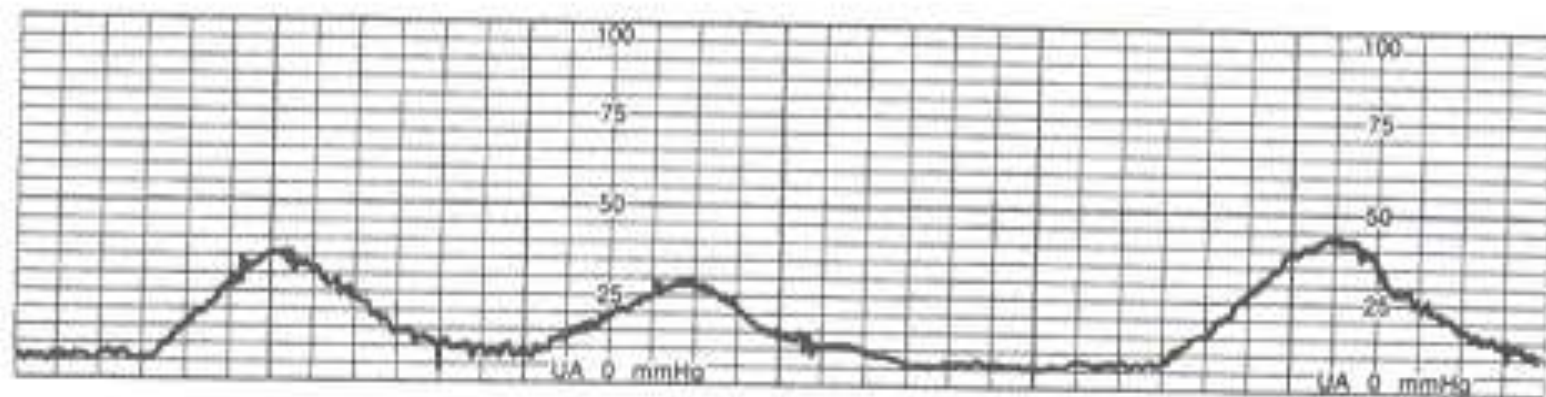
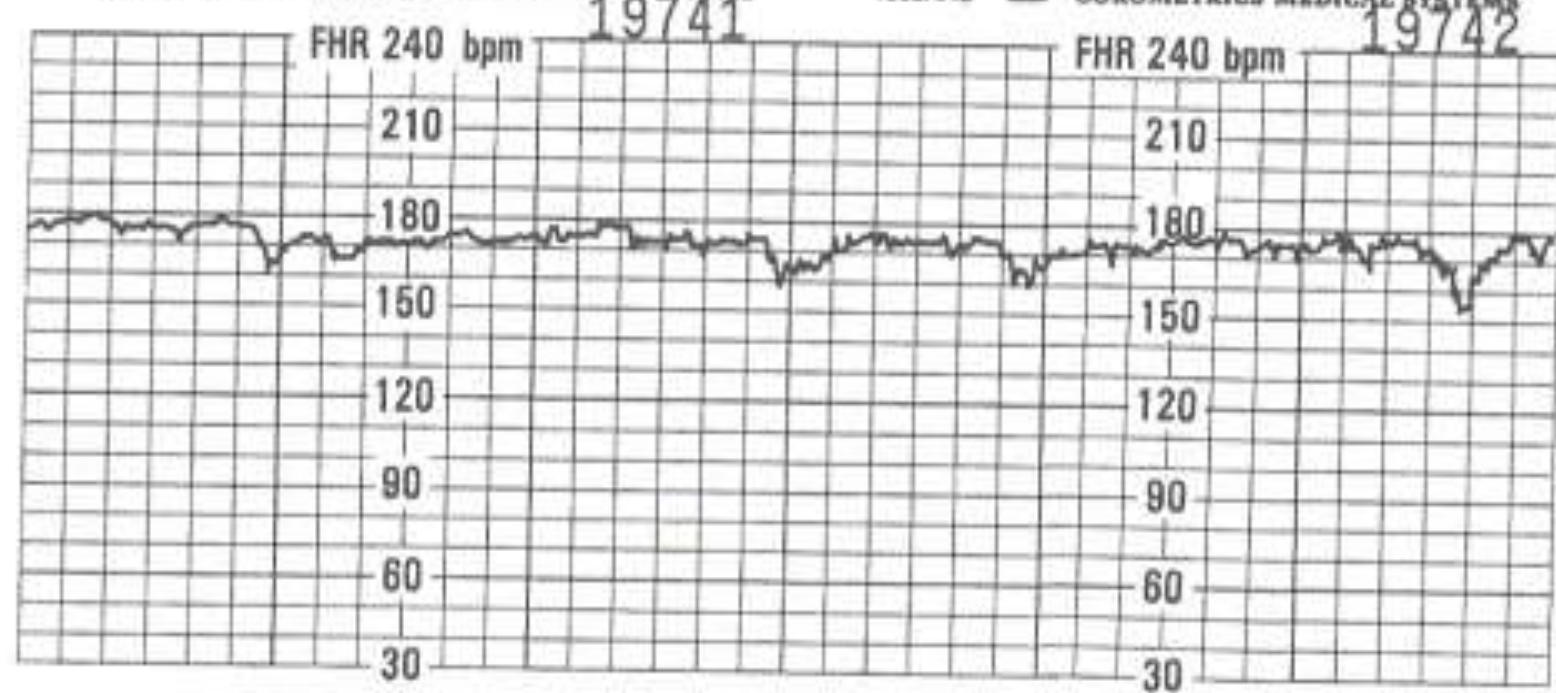


FIGURE 6.35 Fetal tachycardia.

Sinusoidal Pattern

- Uncommon
- Smooth sine line, 5 – 15bpm, 2 – 5 cycle/min
little BTB -v, no acceleration
- Associated with hypoxia, severe fetal anemia,
feto maternal hemorrhage,
chorioamnionitis, fetal sepsis, narcotic
analgesics.
- Needs immediate evaluation

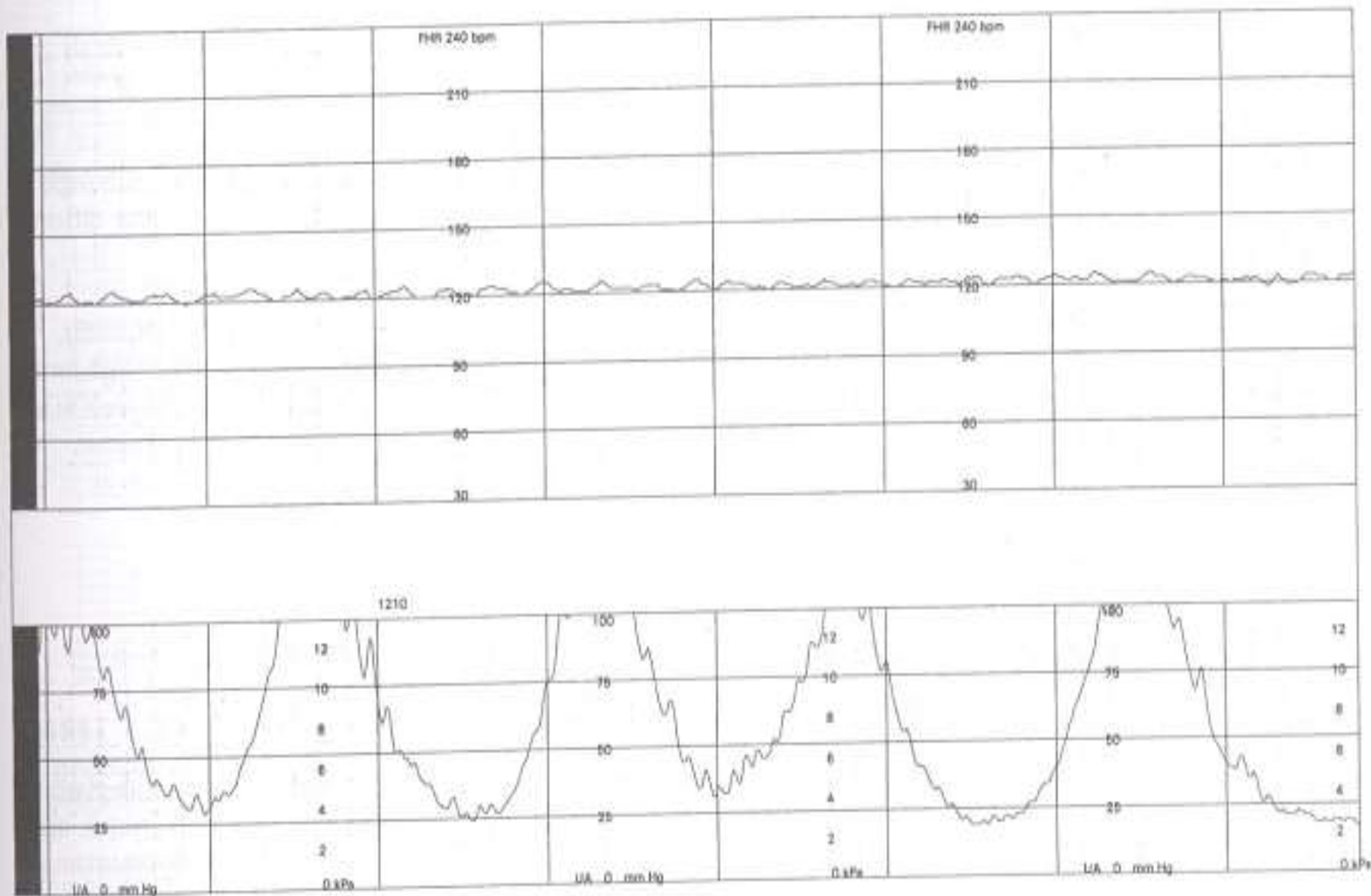


FIGURE 6.37 Sinusoidal pattern seen in a laboring patient with a partial placental abruption. Note uniform long-term variability and absent short-term variability.



Fetal Heart Rate variability

- Results from constant interplay between S & PS
- Short term (beat – to beat)
- Long term – broader cyclical fluctuations 3 – 5 cycle / min
- Normal: short & long are present (6 – 25bpm)
- Average variability: non acidotic vagal connection between the fetal CNS & cardiac conduction system
- ↓ BTB – V → ↓ fetal CNS activity: fetal sleep, Mat medications
(Mg, analgesia, phenothiazines, atropine)
- Persistent ↓ BTB – V → acidosis + FHR suggestive of hypoxia
 - Tac
 - Loss of reactivity
 - Repetitive dec.

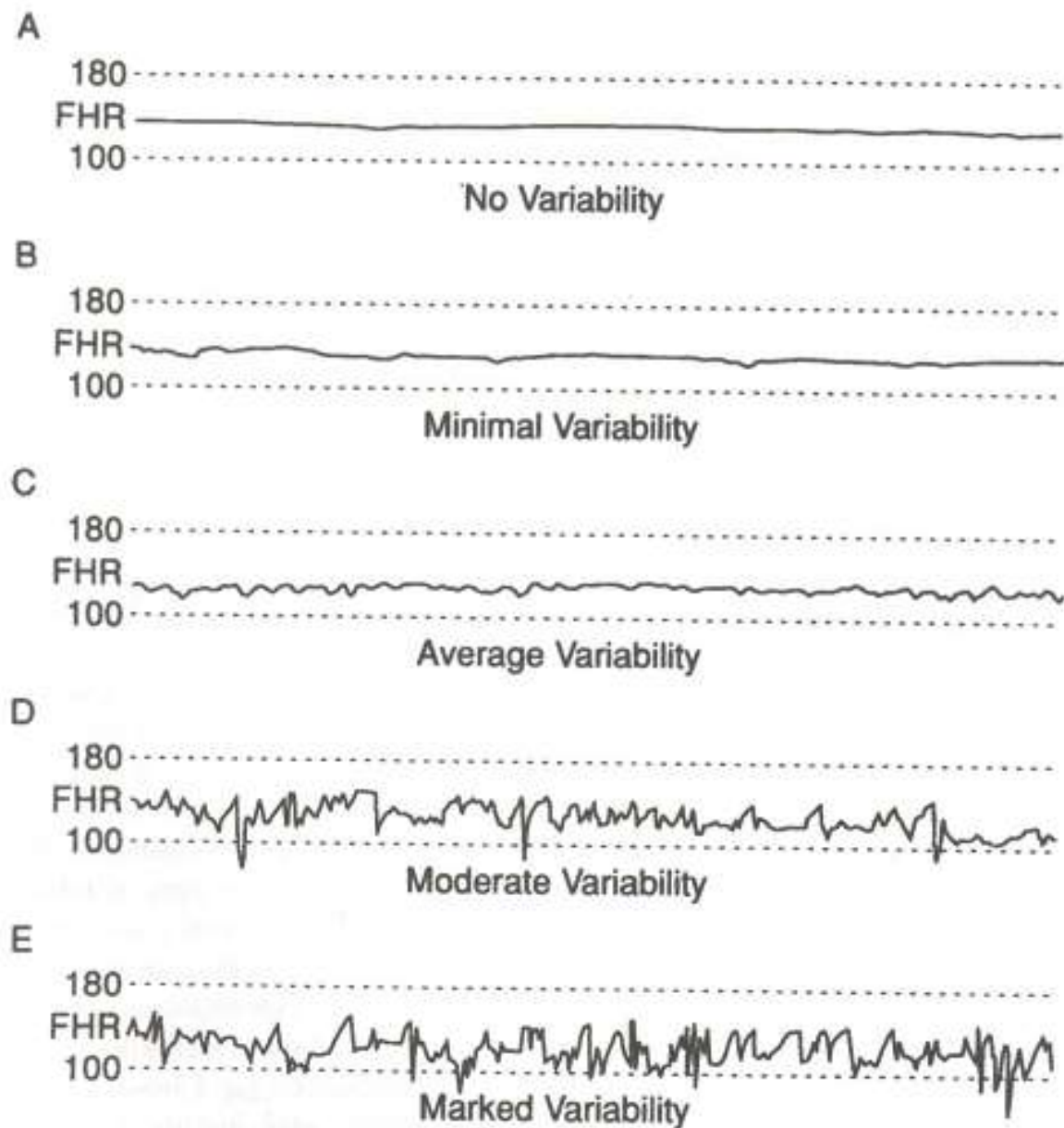


Figure 14-11. Examples of baseline fetal heart rate variability. Panels A and B indicate decreased variability (5 beats/min or less), whereas average or acceptable variability is shown in panels C through D, and increased or marked variability in panel E. (Redrawn from Paul and co-workers, 1975, with permission.)

Accelerations:

- Occur with 90% of fetal movements (FM)
- As a result of ↑S & ↓PS
- ↓ Acc: fetal sleep, medications, prematurity, acidosis
- ↑ Acc: fetal scalp, or vibro acoustic stimulation
↓
failure to induce Acc → suspicion of hypoxia.

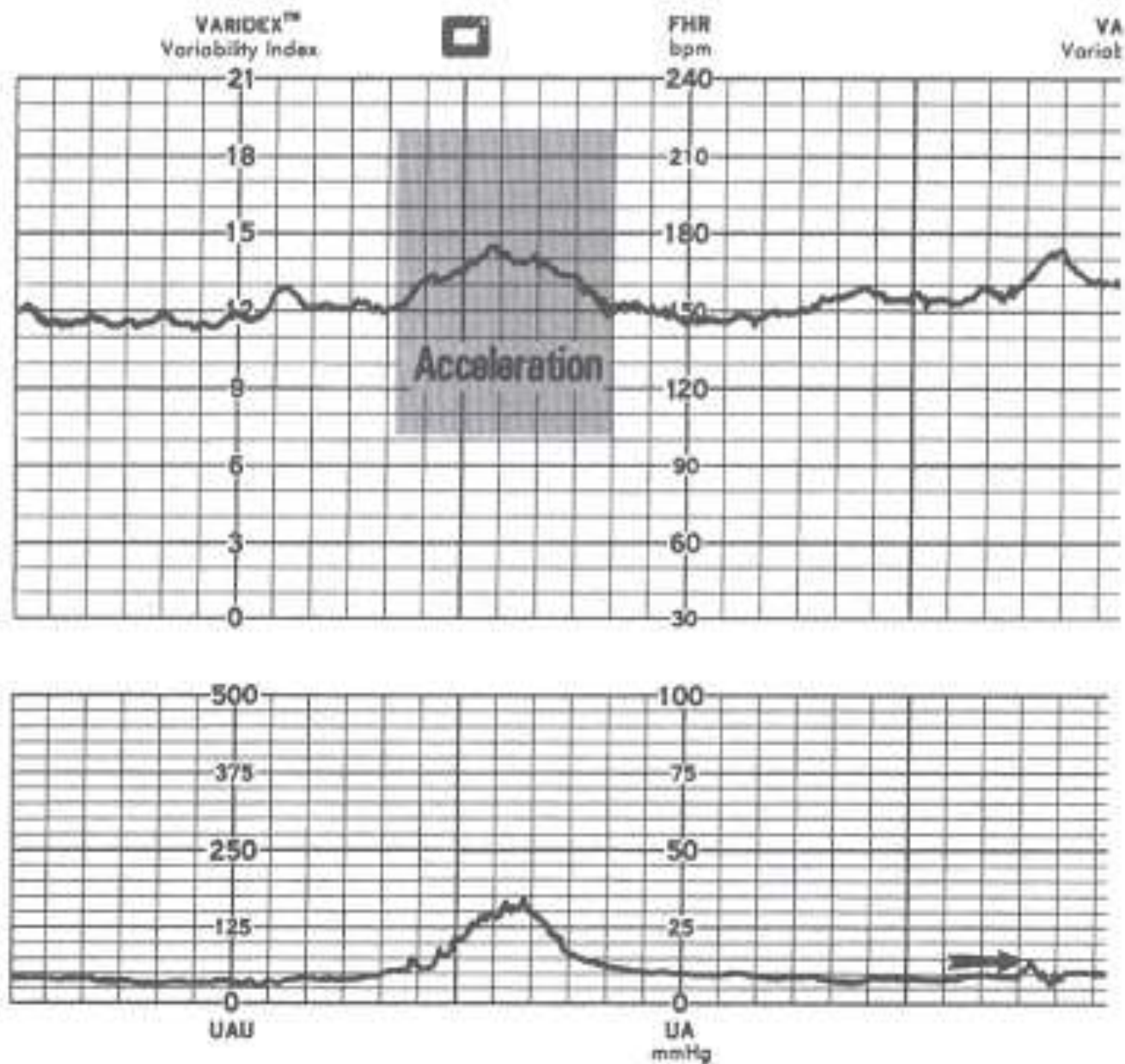


FIGURE 6.43 Fetal heart rate accelerations.

Decelerations:

- Most commonly: during intrapartum period
- early, late, variable

Early Decelerations:

- uniform, shallow dips, rarely <100 bpm
- Mirror uterine contractions.
- Results from head compression, transient  ICP, reflex augmentation of vagal tone.
- Cervical dilation 4 – 6cm, clinically benign.

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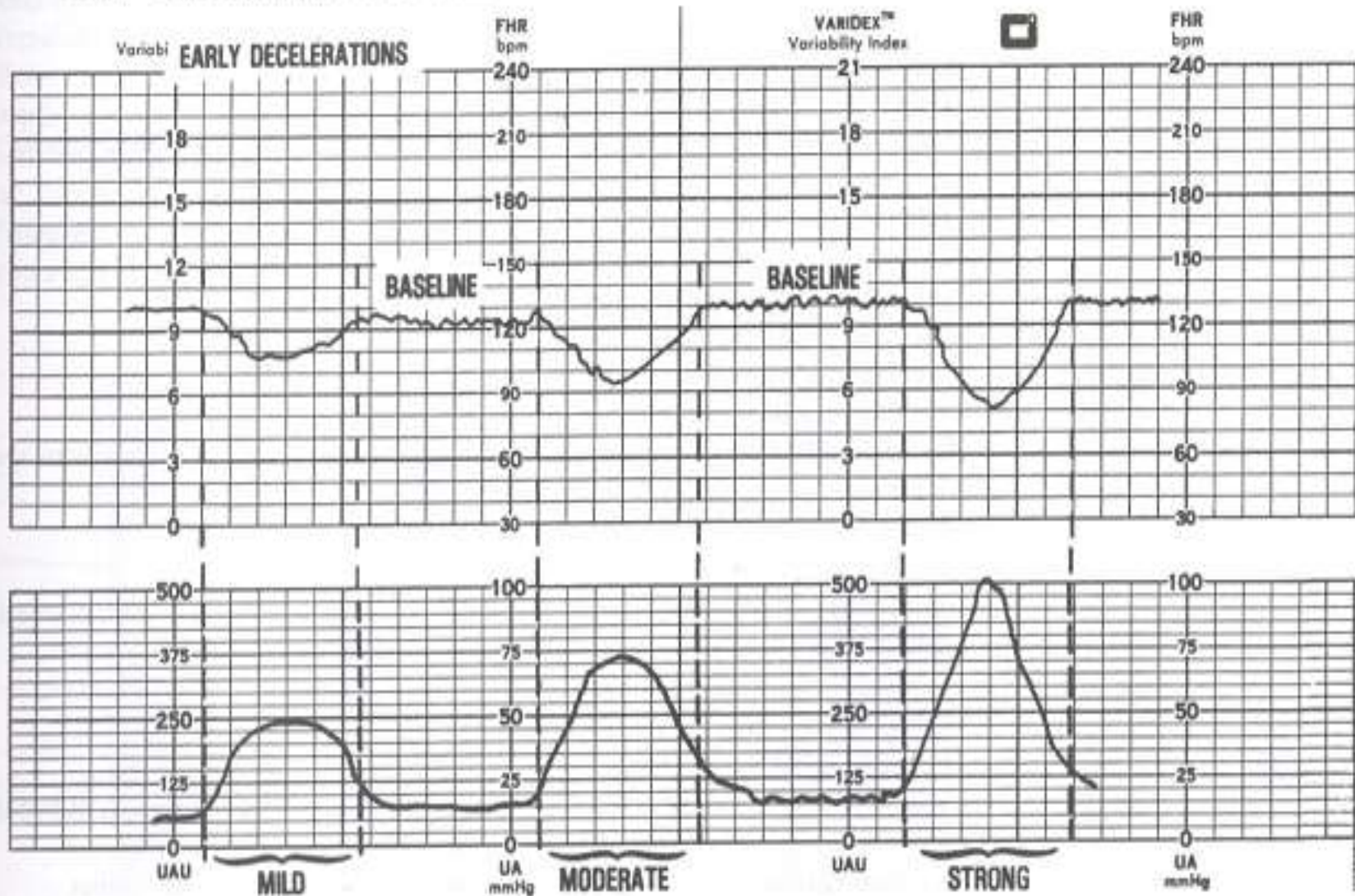


FIGURE 6.47 Early decelerations. Notice that as the intensity of the contraction improves, the depth of the early deceleration increases.

Variable Decelerations:

- Abrupt angular dips.
- No relation to uterine contractions.
- Results from umbilical cord compression.
- Non reassuring: >60sec, depth <70bpm.
- Isolated & infrequent: little clinical significance.
- Repetitive, severe → hypoxemia (R/O cord prolapse).
- Repetitive, severe: Other causes: nuchal cord, true knot, uterine rupture, ap, uterine hypertonus.
- Failure to return to baseline → prolonged decelerations.

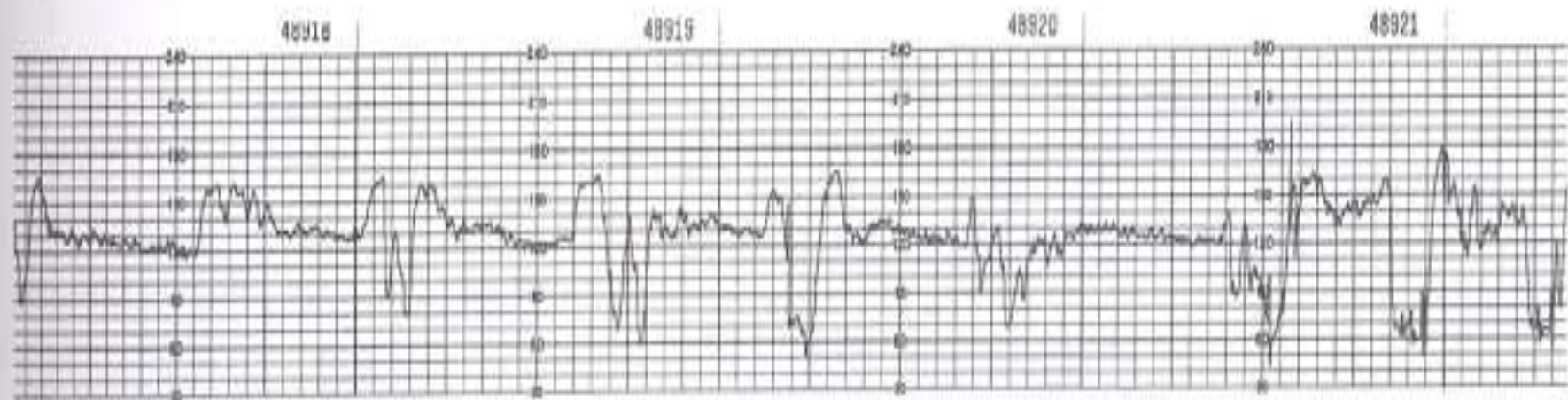


FIGURE 6.53 Reassuring variable decelerations. (Reprinted with permission from Freeman, R. K., Garite, T. J., & Nageotte, M. P. [1991]. *Fetal heart rate monitoring* [2nd ed., p. 116]. Baltimore: Williams & Wilkins.)



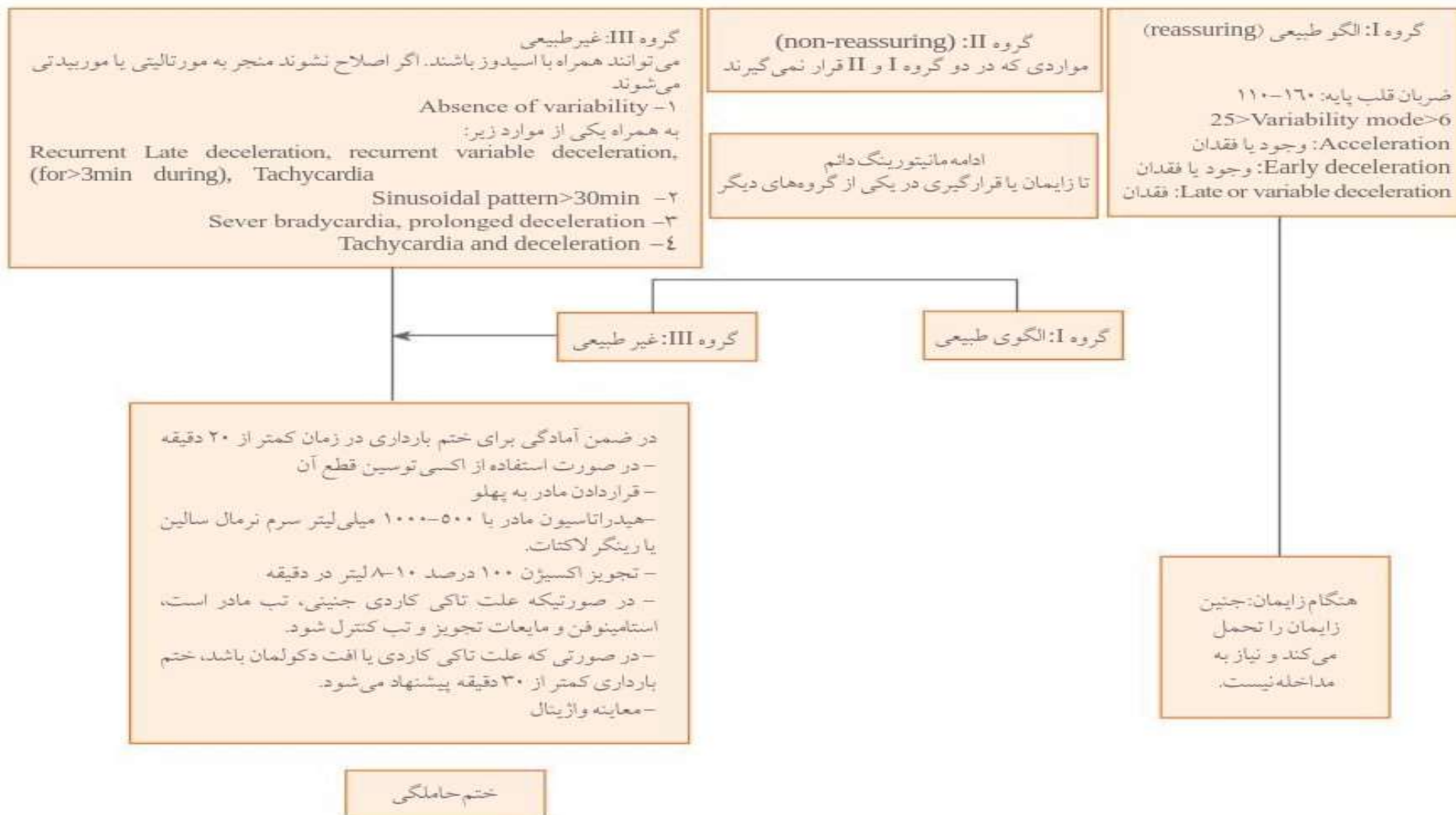
Acceleration	An abrupt increase in the FHR. Before 32 weeks of gestation, accelerations should last ≥ 10 sec and peak ≥ 10 bpm above baseline. As of 32 weeks gestation, accelerations should last ≥ 15 sec and peak ≥ 15 bpm above baseline. A prolonged acceleration is ≥ 2 minutes but less than 10 minutes. An acceleration of 10 minutes or more is considered a change in baseline.
Late deceleration	A gradual ² decrease and return to baseline of the FHR associated with a uterine contraction. The deceleration is delayed in timing, with the nadir of the deceleration occurring after the peak of the contraction. The onset, nadir, and recovery usually occur after the onset, peak, and termination of a contraction.
Early deceleration	A gradual decrease and return to baseline of the FHR associated with a uterine contraction. The nadir of the FHR and the peak of the contraction occur at the same time. The deceleration's onset, nadir, and termination are usually coincident with the onset, peak, and termination of the contraction.
Variable deceleration	An abrupt decrease in FHR below the baseline. The decrease is ≥ 15 bpm, lasting ≥ 15 seconds and < 2 minutes from onset to return to baseline. The onset, depth, and duration of variable decelerations commonly vary with successive uterine contractions.
Prolonged deceleration	A decrease in FHR below the baseline of 15 bpm or more, lasting at least 2 minutes but < 10 minutes from onset to return to baseline. A prolonged deceleration of 10 minutes or more is considered a change in baseline.

-1 Defined as taking ≤ 30 second from the onset of deceleration/acceleration to its nadir/peak.

-2 Defined as taking ≥ 30 second from the onset of deceleration/acceleration to its nadir/peak.

طبقه بندی و تفسیر الگوهای ضربان قلب جنین (NICHD)

NICHD یک سیستم سه بخشی را برای طبقه بندی الگوی ضربان قلب جنین پیشنهاد داده است (الگوریتم پیوست). از نظر تشخیصی مهم است که الگوی تراسه FHR تنها اطلاعات مربوط به وضعیت اسید-باز جنین را فراهم کند. طبقه بندی تراسه FHR، وضعیت جنین را در همان لحظه از زمان ارزیابی می کند و این طبقه بندی ممکن است بر اساس وضعیت بالینی و استراتژی های درمانی تغییر کند.



هیپراستیمولیشن، پرولاپس بند ناف، دکلمان جفت، پارگی رحم توجه شود.

در صورت تاکی سیستول انقباضات رحم جهت آماده کردن مادر از آمپول سولفات منیزوم ۴ گرم در ۱۰۰ سی سی سرم وریدی می توان استفاده کرد.

تأثير داروها بر ضربان قلب جنين

THE INFLUENCE OF MEDICATIONS ON FETAL HEART RATE

Medication	Change in Fetal Heartrate
Narcotics	Decrease in Variability, decrease in frequency of accelerations
Butorphanol	Transient sinusoidal fetal heart rate pattern, slight increase in baseline rate
Cocaine	Decrease in FHR variability
Corticosteriods	Decrease in FHR variability with betamethasone, but not dexamethasone
Magnesium sulfate	Decrease in FHR variability, clinically insignificant decrease in baseline rate, inhibition of increasing accelerations as gestational age advances
Terbutaline	Increase in baseline rate
Zidovidine	No change

Late Decelerations:

- Smooth, uniform decelerations
- During & after contractions
- Results from inadequate uteroplacental transfer of O_2
- Occurs when: ↓ placental O_2 transfer or ↑ fetal O_2 demand
- Uterine hypertonus (drugs, ap), hypertension, ↓ Mat. CO, Mat. hypoxia, anemia & fever

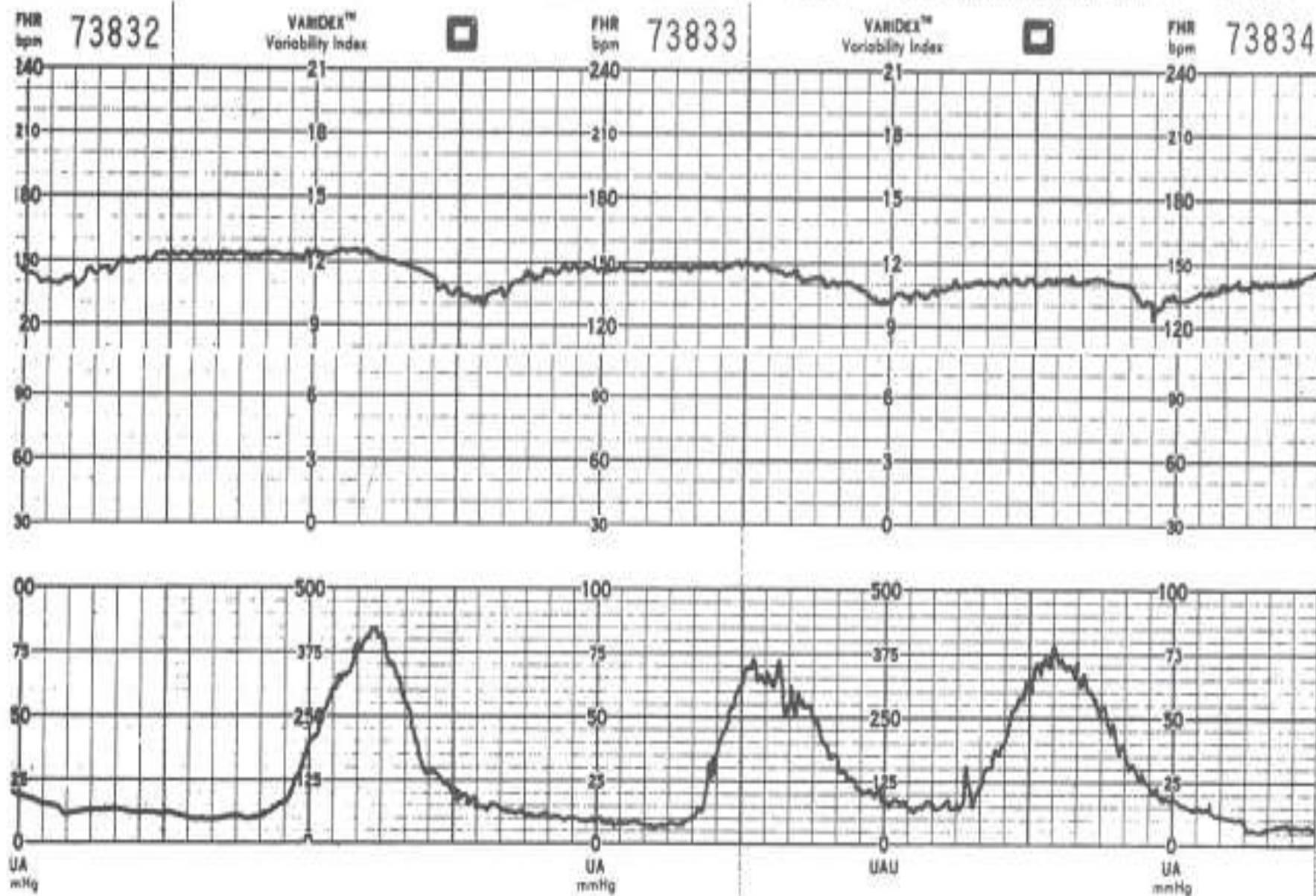


FIGURE 6.49 Late decelerations.



Types of Antepartum Fetal Assessment

- A. Fetal Movement Counts (Fetal Kick Counts)
- B. Non-Stress Test
- C. Contraction Stress Test
- D. Biophysical Profile
- E. Doppler Studies

Accuracy OF Testing

A. Tests with high sensitivity and specificity

1. Biophysical Profile (BPP)

B. Tests with high sensitivity (but high false positives)

1. Nonstress Test (NST)

2. Contraction Stress Test (CST or OCT)

Types of Intrapartum Fetal Assessment

- A. Continuous Electronic fetal Monitoring (CEFM)
- B. Structured Intermittent Auscultation (SIA)
- C. Fetal Scalp PH Sampling
- D. Fetal Acoustic Stimulation
- E. Manual Fetal Scalp Stimulation

Fetal Movement Counts

Epidemiology

Test sensitive for fetal well-being after 28 weeks

Physiology of normal third trimester fetal movement

- A. Fetus spends 10% of its time making gross movements
 - 1. Active fetal periods last 40 minutes
 - 2. Inactive fetal periods last 20 minutes (<75 minutes)
- B. Fetal activity peaks with maternal Hypoglycemia
 - 1. Usually Occurs between 9 pm and 1 am
 - 2. Activity (FMC) increased after meals or glucose load

Technique

A. Patient self monitors kick counts daily at home

B. Count performed at same time every day

1. Choose a time of day that fetus is most active

2. Consider performing after stimulating activity

- a. After walking or Exercise

C. Lie on left side in comfortable location

D. Count fetal movements to a count of 10 in one hour

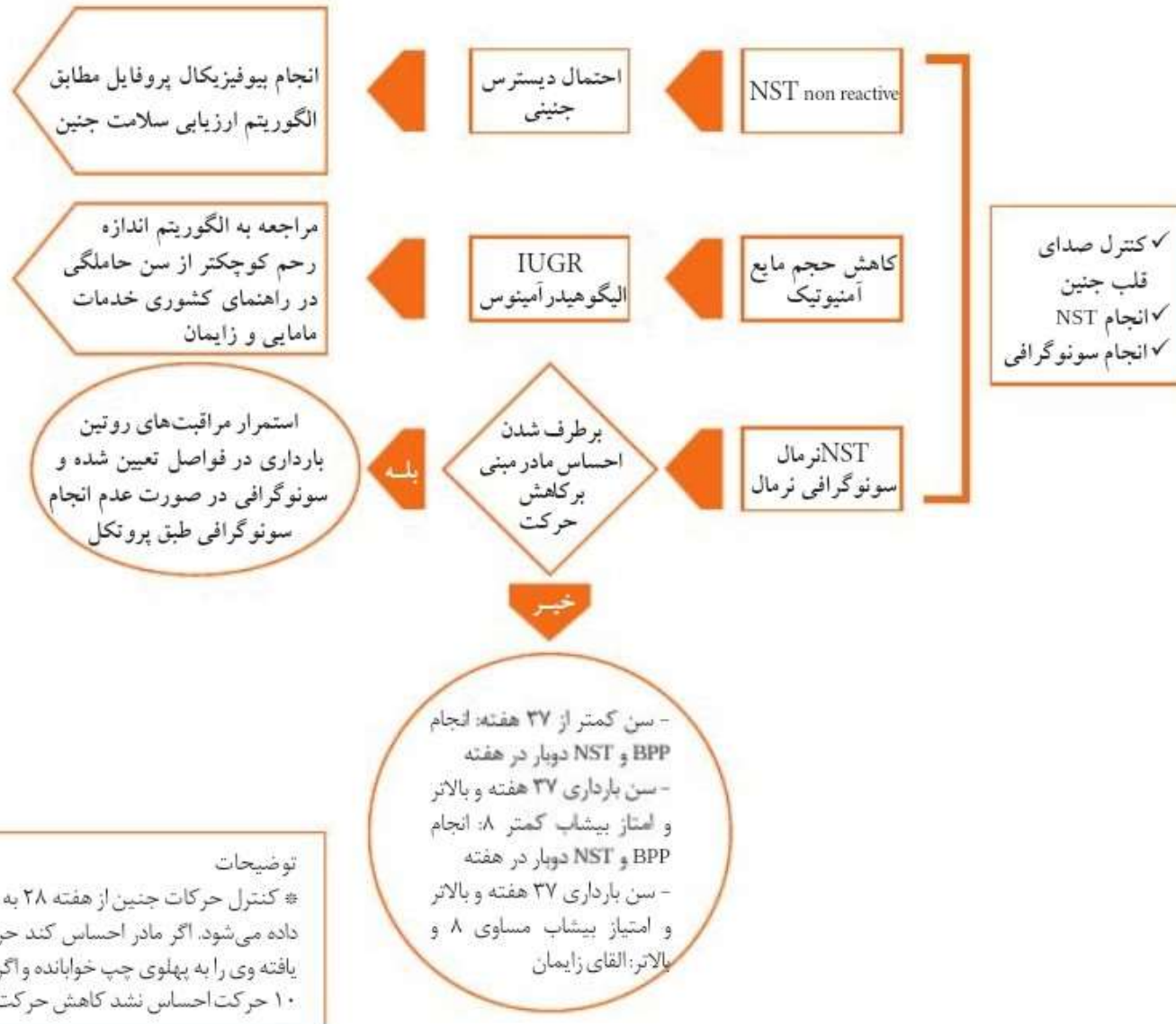
Management Of Inadequate Kick Count

<10 kick /2h or <4 kick /30 min

A. Fetal Assessment (Nonstress Test) needed immediately



کاهش حرکات جنین در جنین دارای قابلیت حیات



Non-Stress test

Interpretation

A. Reactive (Normal)

1. Two or more Fetal Heart Rate increases in 20 minutes
2. Accelerations increase by 15 beats for 15 seconds
3. Related to fetal movement

B. Non-reactive

1. Monitoring for two 20 minute periods
2. Neither period yields adequate accelerations
3. Adjuncts to assist fetal activity fail
 - a. Acoustic stimulation
 - b. Manual stimulation
 - c. Glucose drink

200 — US1 $\Delta \uparrow 160/60s$ $\downarrow 70/60s$

180

160

140

120

100

80

60

200

180

160

140

120

100

80

60

|||

00:24 04.04.44 2cm/min

FMP
 $\uparrow$ FMP

00

100

80

60

40

20

12

10

8

6

4

2

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Management

A. Reactive Nonstress test

1. Reassuring for fetal well being for 3-4 days
2. Follow daily Fetal Kick Counts

B. Non-Reactive Nonstress test

1. Perform Oxytocin Challenge Test (OCT)
2. Perform Biophysical Profile

NST

FNR: 1.9/1000 women tested weekly_(freeman 1982)

6.4/1000₍₁₉₈₃₎

FPR: 50%, **PROBLEM**

Low cost, easy use & interpretation ,needs little time

Biophysical Profile

BPP

Criteria(2 points for each)

A. Fetal Breathing

1. Thirty seconds sustained breathing in 30 minutes

B. Fetal Tone

1. One episode extremity extension and flexion

C. Body movement

1. Three episodes body movement over 30 minutes

D. Amniotic Fluid Volume

1. More than 1 pocket amniotic fluid >2 cm in depth

E. Non-Stress test

1. Reactive

Interpretation

A. Biophysical Profile: 8-10

1. Low risk or Normal result
2. Repeat Biophysical Profile Weekly
3. Indications to repeat Biophysical Profile twice-weekly
 - a. Gestational Diabetes
 - b. Gestational age >42 weeks

B. Biophysical Profile: 8

1. Delivery Indications : Oligohydramnios

C. Biophysical profile :6

1. Suspect asphyxia
2. Repeat Biophysical Profile in 24 hours
3. Delivery Indications
 - a. Repeat Biophysical Profile ≤ 6

D. Biophysical Profile: 4

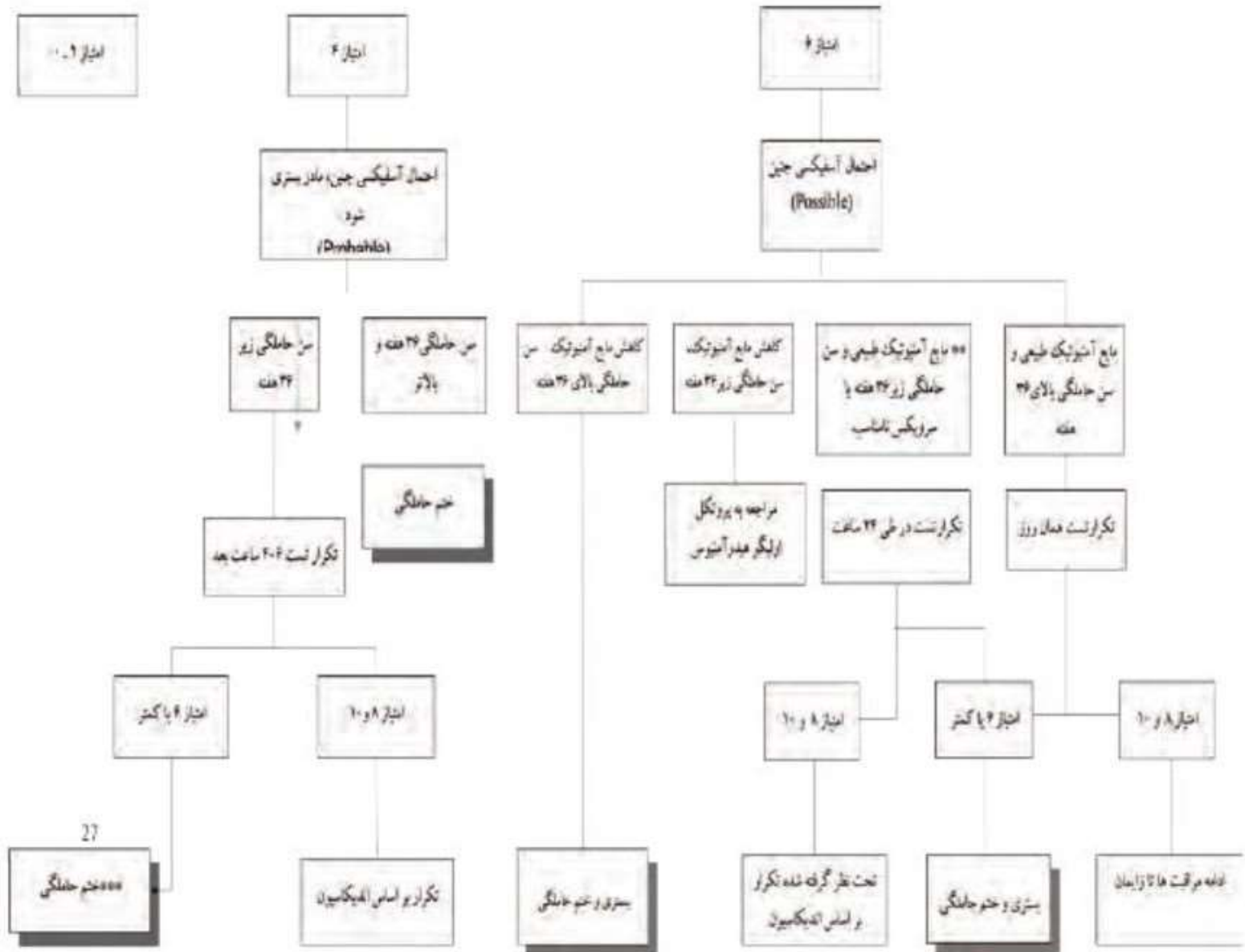
1. Suspect asphyxia
2. Delivery Indications
 - a. Gestational AGE >36 Weeks
 - b. Lung Maturity Tests Positive (L/S ratio > 2)

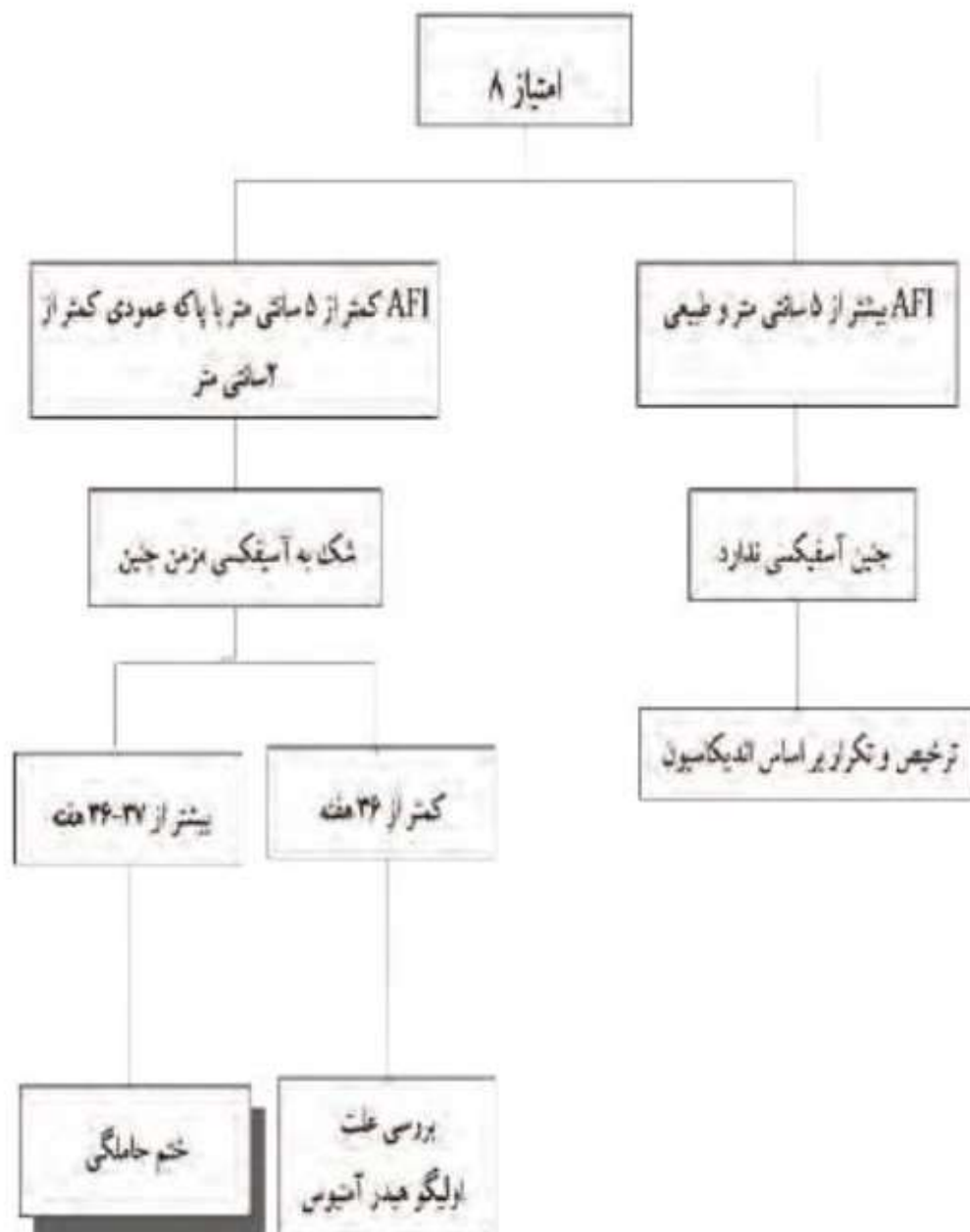
E. Biophysical Profile :0-2

1. Likely asphyxia
2. Continue Monitoring for 2 hours
3. Delivery Indications
 - a. Biophysical Profile < 4



اقدامات لازم بر اساس امتیاز بیوفیزیkal پروفایل





BPP Management

Result	Asphyxia (%)	Fetal death	
10/10	0	0/565	Expectant
AF ↔ 8/10	0	0/565	Expectant
AF ↓ 8/10	5-10	20-30	≥37 ^w → Del <37 → 2 ^w
AF ↔ 6/10	0	50	≥32 ^w → Del Immat → repeat with in 24hr < 6/10 → Del
AF ↓ 6/10	>10	>50	≥32 ^w → Del <32 ^w → daily BPP
AF ↔ 4/10	36	115	≥32 ^w → Del <32 ^w → daily BPP
AF ↓ 4/10	>36	>115	≥26 ^w → Del
AF ↔ 2/10	73	220	≥26 ^w → Del

BPP

FNR: 0.7/1000 (abruption – cord accidents – Feto
maternal – hemorrhage)

FPR: $6_{/10} \rightarrow 75\%$

$0_{/10} \rightarrow <20\%$

Weekly test, low FNR, excellent sensitivity

Limitation: needs trained personnel in U/S

Modified BPP

NST+ AF volume: increased sensitivity

decreased FNR

FNR: 0.8/1000, FPR: 80%

FNR for MBPP= BPP or CST

Limitations: needs backup testing in 10-50%

increased FPR

Contraction Stress Test

Technique

A. Oxytocin (Pitocin)

1. Start: 0.5 to 1.5 mU per minute
2. Titrate : increase 1 mU every 20 minutes
3. Goal : 3 contractions every 10 minutes

B. Nipple Stimulation

Contraindications

A. Absolute

1. Placenta Previa
2. Preterm Prolonged Rupture of Membranes (PPROM)
3. Cerclage
4. Incompetent cervix

B. Relative

1. Multiple Gestation
2. History of classic cesarean section

نتیجه OCT

Unsatisfactory

Equivocal

OCT مثبت

OCT منفی

تکرار تست ۲۴ ساعت بعد و یا انجام روش های دیگر ارزیابی جنین

مبارت تست های ارزیابی
سلامت جنین (BPP)

تکرار هفتگی

Interpretation

Interpretation

A. Negative (normal)

1. Adequate contractions:

- a. Three contractions in 10 minutes
- b. Each contraction lasts 40 seconds

2. No Late Decelerations

B. Positive

1.

- 1. Repetitive persistent Late Decelerations
- 2. Decelerations with more than half of contractions
- 3. Not due to uterine hyperstimulation

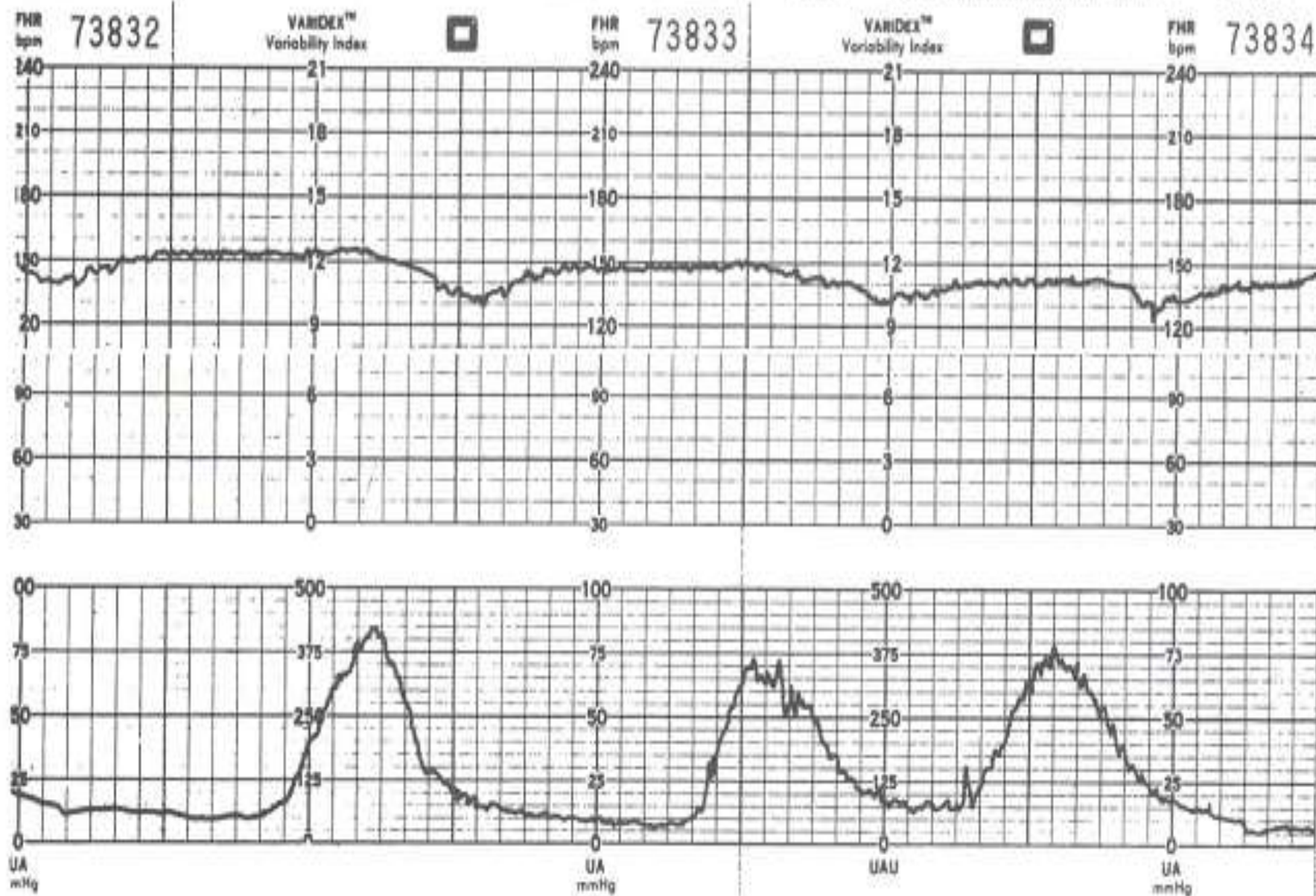


FIGURE 6.49 Late decelerations.

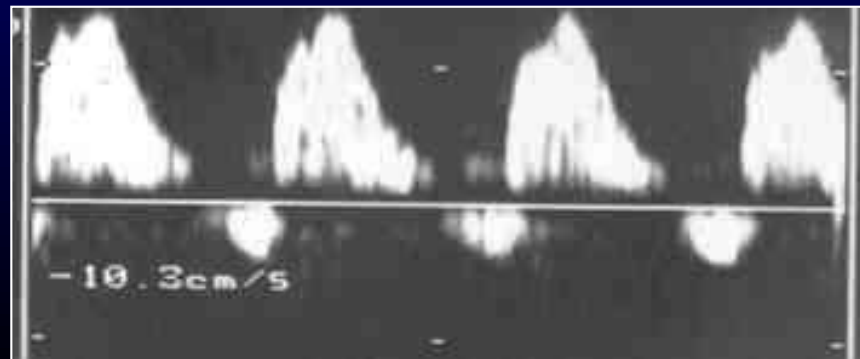
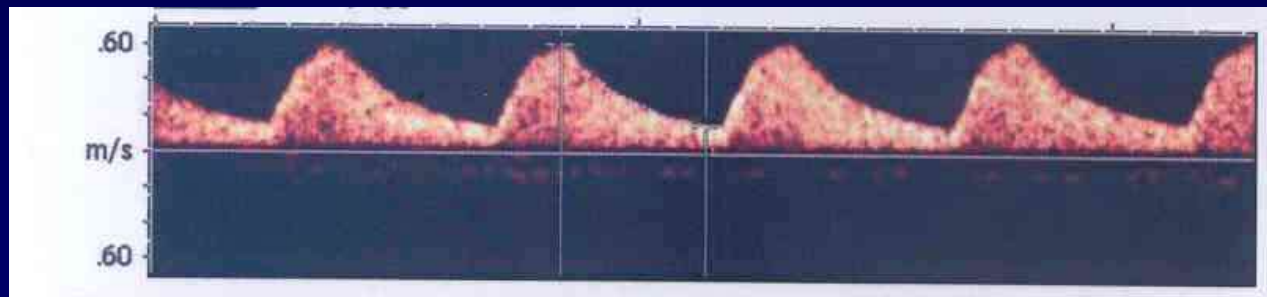
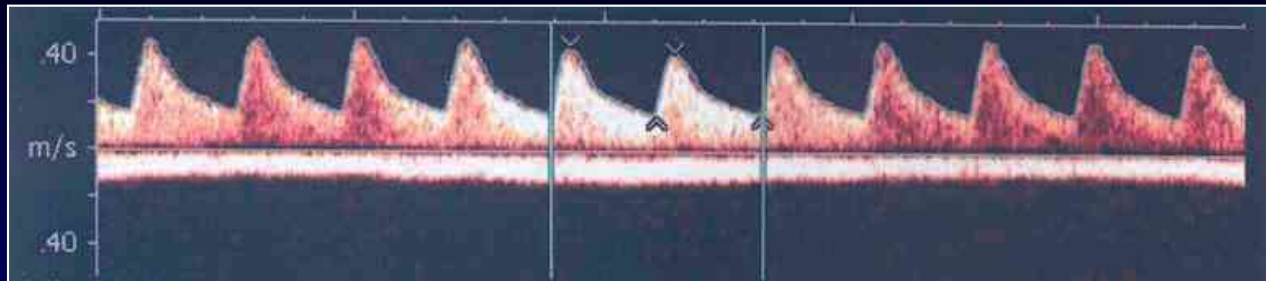
Uterine Activity

- Baseline tonus between contractions: 10mmHg
- Frequency: q 2 – 3min or 5-7/15 min ,
 >6/10 min: tachysystole
- Duration: 40 – 60 sec.

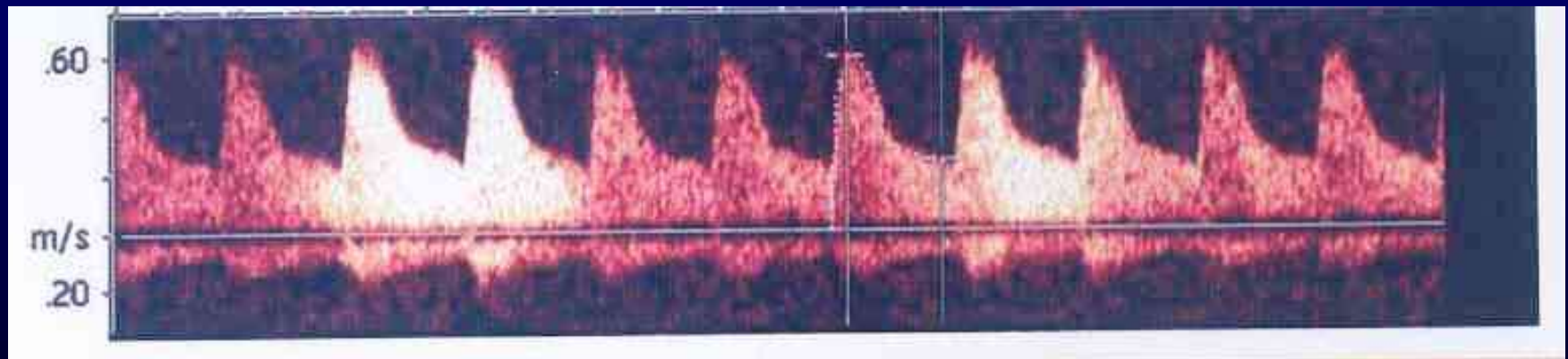
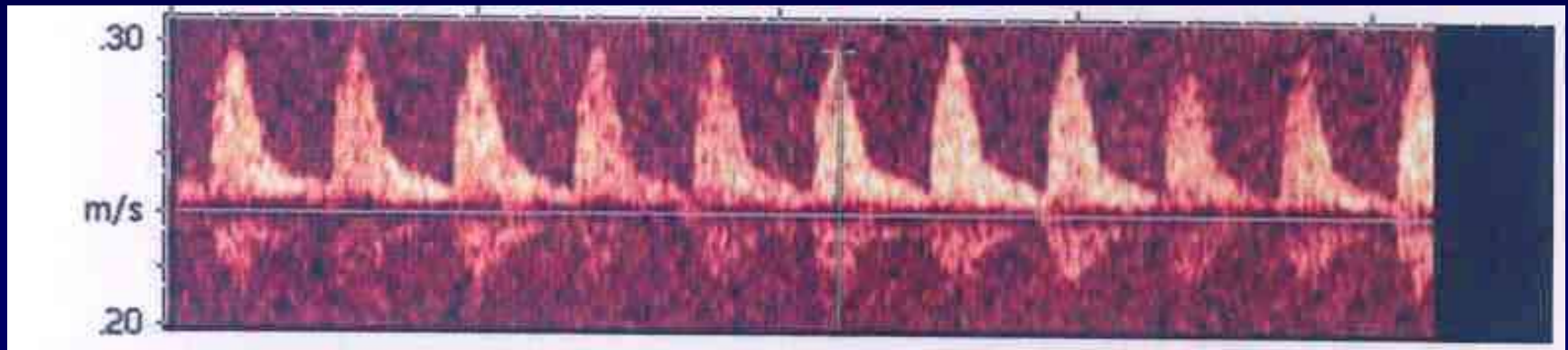
Prolonged: hyperstimulation, ap or rupture.

- Strength: 30 – 80mmHg

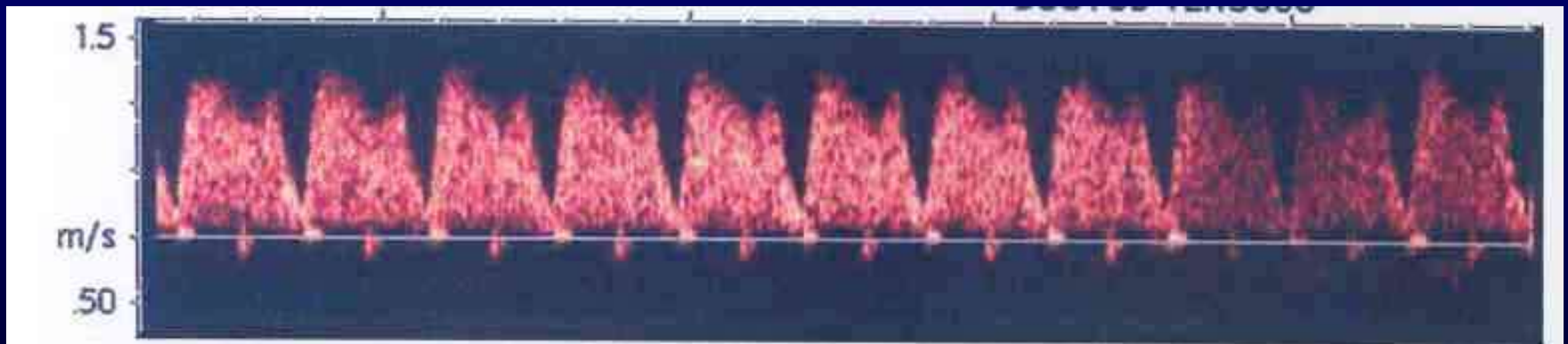
U/A Doppler



MCA - Doppler



Ductus Venosus



۱- در بارداری های بدون عارضه و کم خطر

در این بیماران مانیتورینگ مداوم الکترونیکی و یا سمع متناوب هر دو قابل قبول است؛ اما به منظور ممانعت از محدودیت تحرک بیمار و دستشویی رفتن روش معمول نظارت جنین در بارداری کم خطر، مانیتورینگ متناوب است. بررسی FHR در فاز فعال مرحله اول لیبر حداقل هر ۳۰ دقیقه و در مرحله دوم حداقل هر ۱۵ دقیقه توصیه می شود. در بارداری های کم خطر اگر به دلیل سمع ضربان قلب غیرعادی جنین در سمع متناوب، از مانیتورینگ مداوم استفاده شد، در صورتیکه طی مدت ۲۰ دقیقه سمع مداوم طبیعی باشد، می توان مانیتورینگ مداوم را متوقف و به سمع متناوب بازگشت. در بارداری های کم خطر، سمع متناوب قلب جنین (حداقل به مدت ۶۰ ثانیه)، بلافاصله پس از انقباض، با رعایت قانون یک به یک برای زایمان و قانون دو به یک در حین لیبر (یک ماما به ازای دو مادر) قویاً توصیه می شود و بایستی تفسیر آن در پرونده مادر ثبت گردد.

۲- در بارداری های پرخطر

بررسی و ثبت صدای قلب جنین، در مرحله اول زایمان هر ۱۵ دقیقه و در مرحله دوم زایمان هر ۵ دقیقه قبل، حین و پس از انقباض انجام می گردد. در مانیتورینگ مداوم بایستی هر ۲۰-۱۵ دقیقه نوار توسط ماما و یا پزشک ارزیابی شده، نتیجه بر روی نوار درج شده و هر یک ساعت در پرونده مادر ثبت گردد. رعایت قانون یک به یک در بارداری های پرخطر قویاً توصیه می شود. در صورتی که احتمال آسفیکسی جنین وجود داشته باشد؛ بایستی در مانیتورینگ مداوم مجهز به دستگاه ثبت، تراسه مربوطه بر روی سی دی ذخیره و بایگانی شود و در صورتی که از جنین نوار گرفته شده است؛ کپی آن نوار تهیه گردد. اسکن نوار به همراه سایر مدارک، توسط واحد مدارک پزشکی الزامی است.

در موارد مشکوک و یا پاتولوژیک (۲،۳ category) می توان از تحریک سرجنین جهت بررسی هیپوکسی استفاده کرد. تحریک سر جنین نباید در طی افت قلب جنین انجام شود. تحریک با فشار انگشت معاینه کننده و مالش اسکالپ به مدت ۱۵ ثانیه انجام می شود. اگر با این اقدام، افزایش ضربان (acceleration) صورت گیرد؛ بدین معنی است که جنین اسیدوتیک نمی باشد. توصیه می شود در موارد مشکوک، نوارها توسط دو نفر تفسیر شود.

استفاده از اکسیژن با ماسک صورت برای احیا داخل رحمی جنین توصیه نمی شود زیرا می تواند سبب صدمه به جنین شود؛ ولی در مواردی که اندیکاسیون های مادر یا مثلاً هیپوکسی یا قبل از سهواً می تواند مفید باشد. بدین منظور اکسیژن به میزان ۸ تا ۱۰ لیتر در دقیقه



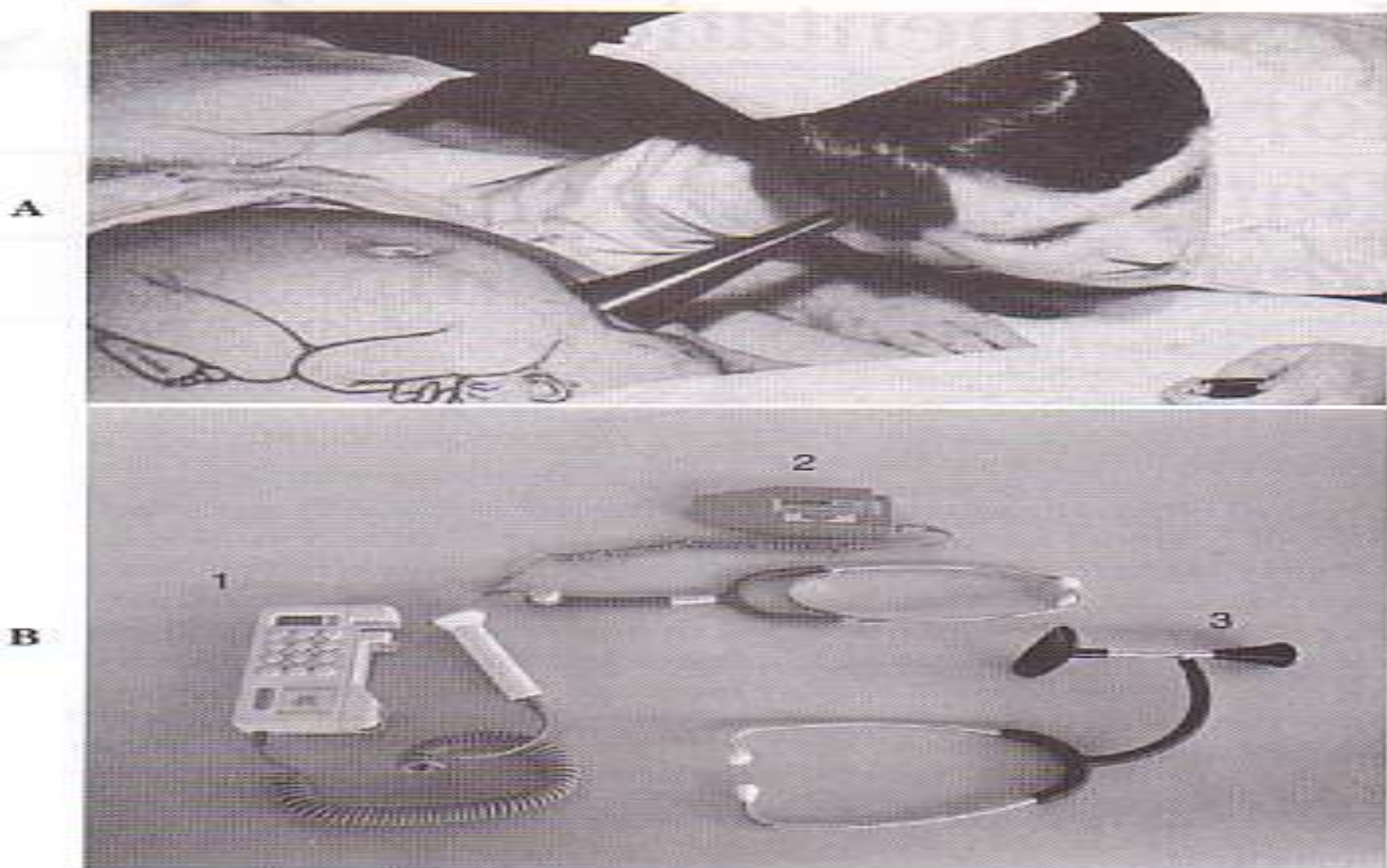
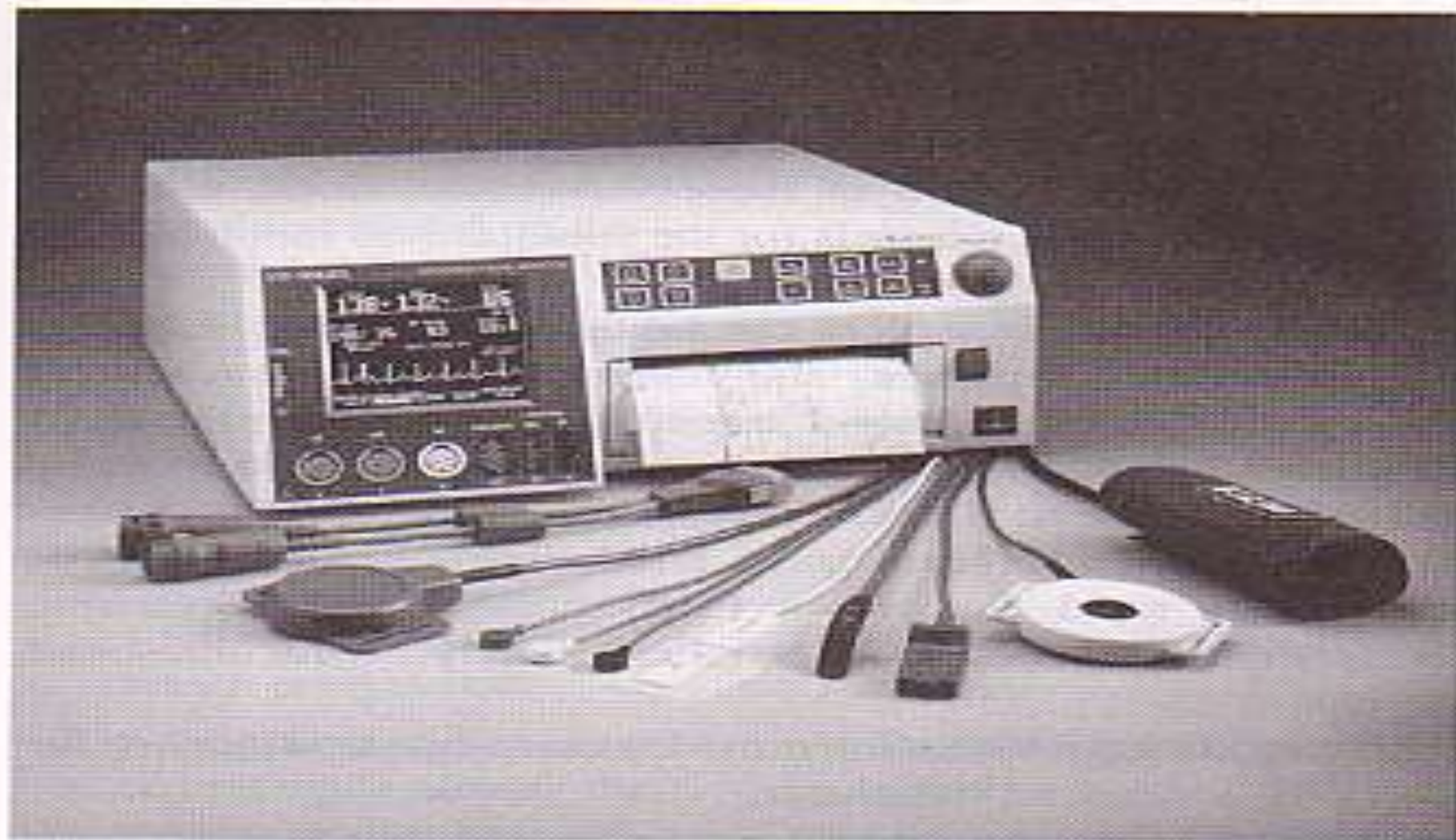


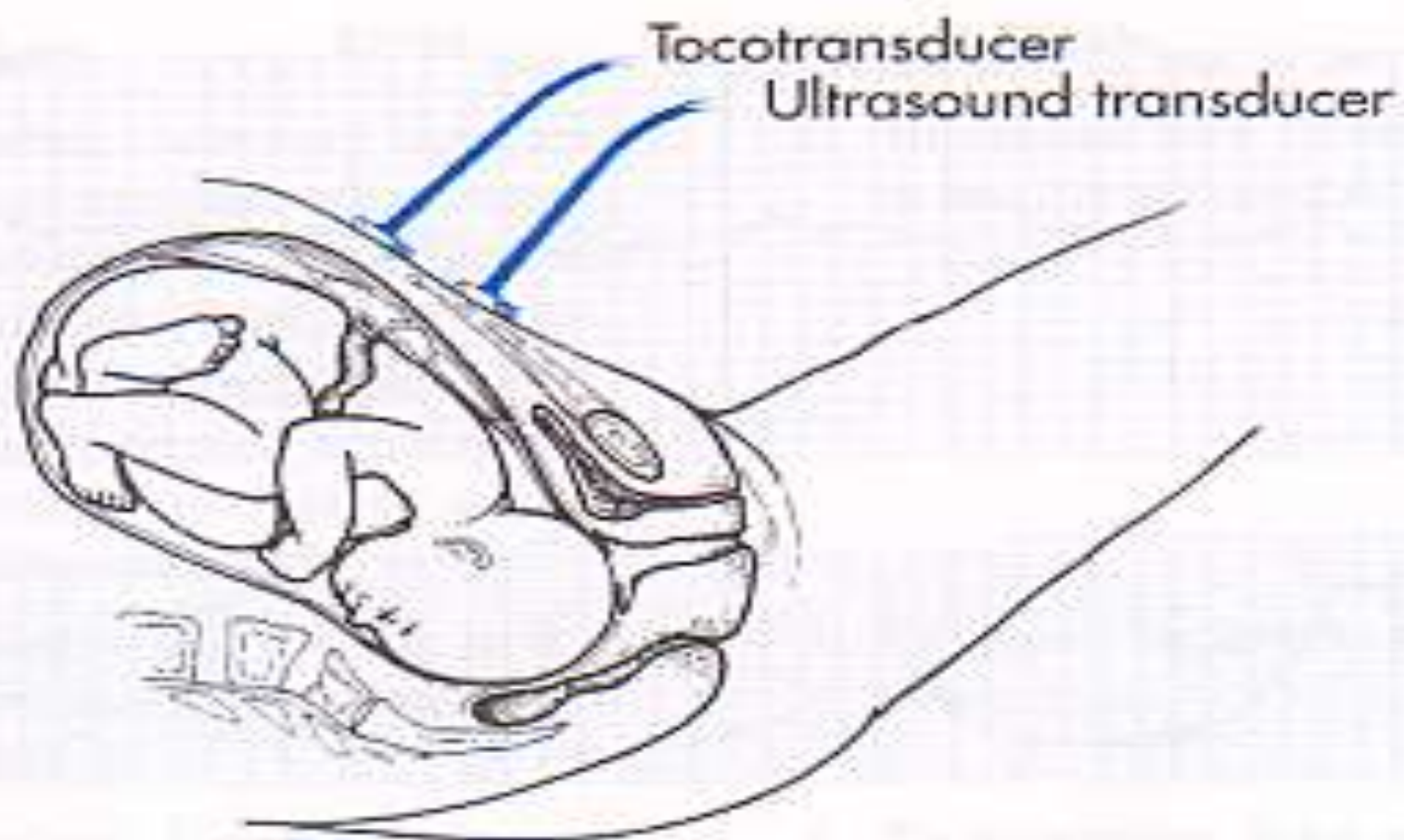
Figure 3-1

A, Auscultation of FHR with a Pinard stethoscope. Vertex left occipitoanterior. **B**, 1, Ultrasound fetoscope. 2, Ultrasound stethoscope. 3, DeLee-Hillis fetoscope.

(A from Bennett VR, Brown LK, eds: *Myles textbook for midwives*, ed 13. London, Churchill Livingstone. B, Courtesy Michael S. Clement, MD, Mesa,







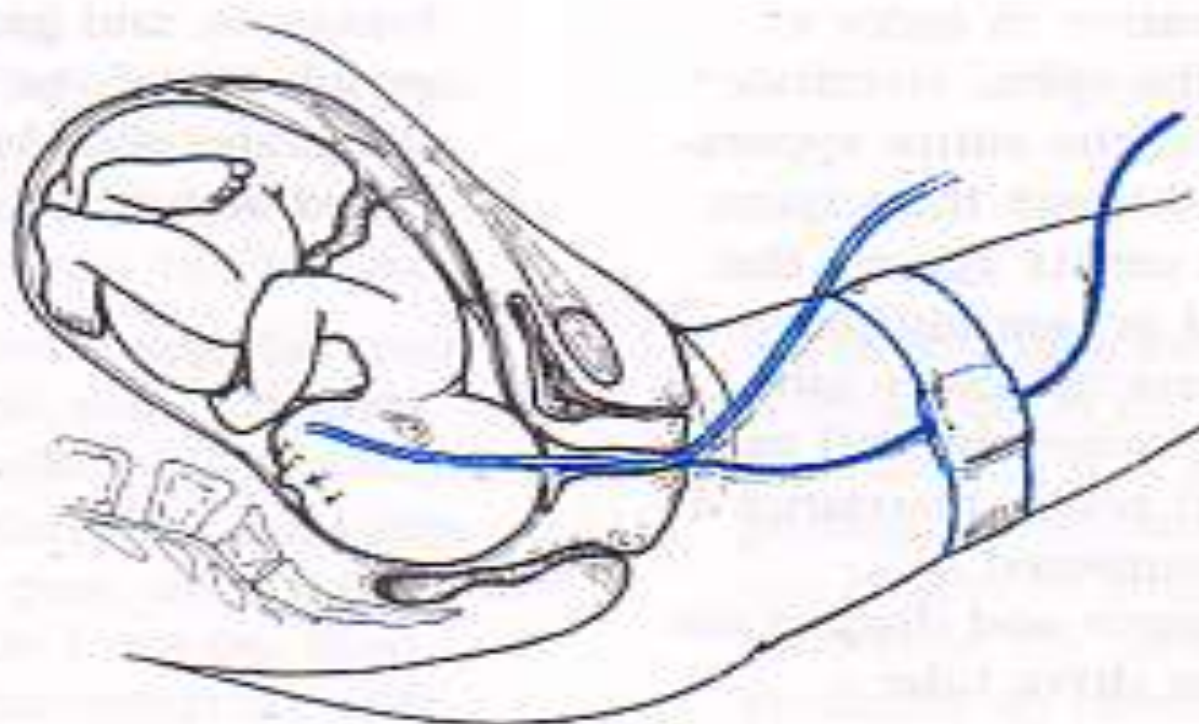


Figure 3-6

Diagrammatic representation of internal mode of monitoring with intrauterine catheter and spiral electrode in place.

TABLE 71-3

Indications for Continuous Electronic Fetal Monitoring

Labor Abnormalities

- Induced labor
- Augmented labor
- Prolonged labor
- Prolonged membrane rupture
- Regional analgesia
- Previous cesarean delivery
- Abnormal uterine activity

Suspected Fetal Distress in Labor

- Meconium staining of the amniotic fluid
- Suspicious fetal heart rate on auscultation
- Abnormal fetal heart rate on admission cardiotocography
- Vaginal bleeding during labor
- Intrauterine infection

Fetal Problems

- Multiple pregnancies (all fetuses)
- Small fetus
- Preterm fetus
- Breech presentation
- Oligohydramnios
- Post-term pregnancy
- Rhesus isoimmunization

Maternal Medical Disease

- Hypertension
- Diabetes
- Cardiac disease (especially cyanotic)
- Hemoglobinopathy
- Severe anemia
- Hyperthyroidism
- Collagen disease
- Renal disease

شرایط القا و یا تحریک زایمان

در صورتی که به دلایل مادری و یا جنینی، لازم است زایمان تسریع گردد بایستی خطرات جنینی و سلامت مادر دو ارزیابی شود. این ارزیابی شامل:

- درجه اورژانسی بودن
 - یافته‌های بالینی در شکم و یا در معاینه واژینال
 - روش زایمان (آیا اندیکاسیون استفاده از فورسپس و یا واکتوز وجود دارد)
 - پیش بینی درجاتی از دشواری زایمان (زایمان سخت)
 - محل ارائه خدمت
 - امکان دریافت مراقبت‌های پرخطر وجود داشته باشد
 - نیاز به انجام بی‌دردی اضافی و یا بیهوشی
 - خواست و ترجیح مادر
 - با مادر و تیم درمانی در مورد علت نیاز به تسریع در زایمان و گزینه‌های مورد نظر صحبت شود
 - زمان تصمیم‌گیری جهت تسریع زایمان ثبت گردد (۲۰۱۴)
- تکنیک نمونه‌گیری از عروق ناف و تفسیر نتایج آن در فصل‌های بعد به تفصیل بیان خواهد شد.

Goals: Ante partum testing

- 1- Dx of fetus in jeopardy
- 2- Dx of healthy fetus: no intervention
 - FNR: 0.4 – 0.9/1000 (incidence of fetal death/1^w)
 - FPR: 30 – 90%
 - GA to begin: 32 – 34^w
 - In fetuses of increased risk for hypoxia or asphyxia

Newborn Notes:

What is the APGAR Score?

www.babysilver.com

THE 5 SIGNS:

1. COLOR

- a. Pale or blue = 0
- b. Normal color body, but blue extremities
(arms and/or legs) = 1
- c. Normal color = 2 – completely pink



2. RESPIRATORY EFFORT

Respiration:

- a. Not breathing = 0
- b. Weak cry, irregular breathing = 1
- c. Strong cry = 2

- 2 points for a strong cry
- 1 point for a slow or weak cry
- 0 points for no cry at all



3. HEART RATE

Heart Rate:

- a. Absent heartbeat = 0
 - b. Slow heartbeat (less than 100 beats/minute) = 1
 - c. Adequate heartbeat (more than 100 beats/minute) = 2
-
- 2 = good strong heartbeat
 - 1 = slow but steady heartbeat
 - 0 = little or no heartbeat

4. MUSCLE TONE

Muscle Tone:

- a. Limp, flaccid = 0
 - b. Some flexing or bending = 1
 - c. Active motion = 2
-
- 2 points for vigorous motion
 - 1 point for small flexing
 - 0 points for no movement



5. REFLEXES

Response to Stimulation (also called Reflex Irritability):

- a. No response = 0
 - b. Grimace (facial expression) = 1
 - c. Vigorous cry or withdrawal = 2
-
- 2 points if the baby cries
 - 1 point if the baby grimaces (facial expression)
 - 0 points for no movement or sound

RESULTS

- 10 out of 10 is a perfect score
- The higher the score, the better the condition
- A score over 7 indicates good condition
- A score of 10 is unusual
- A score less than 7 may indicate some medical assistance

LIMITATIONS

- Quick assessment
- Does not necessarily indicate a baby's long-term behavior





Thank you for attention