ROLE OF CTG IN IMPROVING PREGNANCY OUTCOME

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INTRODUCTION

Assessment of Fetal Being

- Maternal assessment of fetal activity
- U/S Transabdominal , Transvaginal US
- Doppler Blood Flow Studies
- Nonstress Test
- Biophysical Profile
- Modified Biophysical Profile
- Contraction Stress Test

INTRODUCTION

- nearly 150 years later, continuous fetal heart rate (FHR) monitoring became a reality .
- By 1998, electronic fetal monitoring was used in 84% of all U.S. births, regardless of whether the primary caregiver was a physician or a midwife.

- With the advent of these technologies, fetal monitoring is implemented in nearly all pregnancies, either in the antepartum or intrapartum period.
- The goal is to prevent fetal and neonatal morbidity and especially mortality.

Types Of Monitoring

- **Antepartum** fetal monitoring has the goal of identifying the fetus at risk,

allowing sufficient time to intervene before permanent injury or death occur.

- **Intrapartum** fetal monitoring should be able to identify three groups of fetuses ;

Why Perform Fetal Monitoring?

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 and is in no immediate danger .

3- The fetus that is negatively affected and lacks the reserve to compensate, thus is in danger for morbidity/mortality.

It is the third group that would most benefit from intervention.

- **The FHR may be evaluated by** auscultation or by electronic monitoring.
- Well-controlled studies have shown the equivalence of intermittent auscultation to continuous fetal heart monitoring when

auscultation was performed at specific intervals with a 1:1 nurse-to-patient ratio .

What Can We Monitor?

Fetal Heart Rate Interpretation ;

- Baseline Fetal Heart Rate
- Fetal Heart Rate Variability
- Accelerations
- Decelerations

Baseline Fetal Heart Rate

- Baseline Fetal Heart Rate
- The normal FHR baseline ranges from 120 to 160 beats per minute.
- Early in pregnancy, it is closer to 160 beats per minute,
- declining as gestational age advances.

Bradycardia

- Bradycardia is defined as an abnormally low baseline FHR (<120 beats per minute) and
- bradycardia may be seen in association with maternal blocker therapy, hypothermia, hypoglycemia, hypothyroidism, or
- fetal cardiac conduction defects (congenital atrioventricular block).

Tachycardia

- Fetal tachycardia has many possible etiologies.
- Most often, it is the result of decreased vagal or increased sympathetic outflow,

  Fetal case ;
- associated, fetal anemia, or fetal hypoxia. fetal tachyarrhythmias .

  Maternal case ;
- maternal hyperthyroidism , fever, infection,
- medications including sympathomimetics (e.g., ritodrine, terbutaline) and parasympatholytics (e.g., atropine,).

Sinusoidal Pattern

- The sinusoidal FHR pattern is an uncommon FHR baseline abnormality.
- It has the appearance of a smooth sine wave with an amplitude of 5 to 15 beats per minute and a frequency of 2 to 5 cycles per minute.
- There is little beat-to-beat variability, and accelerations are absent .

Sinusoidal Pattern

- is associated with hypoxia and severe fetal anemia.
- Additionally, it has been reported in association with fetomaternal hemorrhage, chorioamnionitis, fetal sepsis, and administration of narcotic analgesics .

Fetal Heart Rate Variability

- Variability in the FHR results from constant interplay between the sympathetic and parasympathetic arms of the fetal autonomic nervous system .
- FHR variability is considered normal or average when both short-term and long-term variability are present, and the difference between the peaks and troughs of the long-term fluctuations is 6 to 25 beats per minute

Fetal Heart Rate Variability

- Persistently decreased variability, however, may signal fetal acidosis.
- Decreased (three to five beats per minute) or absent (zero to two beats per minute) FHR variability reflects diminished fetal CNS activity, usually attributable to fetal sleep cycles or
- to medications administered to the mother (e.g., analgesics, magnesium sulfate, benzodiazepines, phenothiazines, atropine).

Accelerations

- Accelerations in the FHR occur with 90% of fetal movements as early as the second trimester, probably as a result of increased catecholamine release and decreased vagal stimulation of the heart .
- By 32 weeks gestation, nearly all normal fetuses will have 15 to 40 spontaneous accelerations per hour, reflecting normal oxygenation of the CNS cardiac axis .

Decelerations

- Decelerations in the FHR are most commonly encountered during the intrapartum period.
- **They are divided into three categories**: early, variable, and late decelerations . Classification is based on the characteristic appearance of the deceleration and its temporal relationship to the onset of a uterine contraction.

Early Decelerations

- Early Decelerations beginning at the onset of the contraction and ending when the contraction ends.
- They are thought to result from fetal head compression**, transient elevation of intracranial pressure**,

Variable Decelerations

- Variable Decelerations and Prolonged Decelerations .

Variable decelerations result from umbilical cord compression.

compression of the umbilical cord leads to **occlusion of the umbilical arteries** .

Late Decelerations

- Late decelerations reflect inadequate uteroplacental transfer of oxygen during contractions.
- Typically, that begin after the onset of a contraction and end after the contraction stops.
- During uterine contractions, decreased maternal perfusion of the uteroplacental unit causes a decline in fetal Po2 .

Late Decelerations

- Late decelerations may be caused by any factor that
- (a) reduces the normal placental transfer of oxygen or
- (b) increases the fetal oxygen demand beyond the available supply. Such factors include uterine hypertonus or tachysystole oxytocin, prostaglandins, uterine rupture, placental abruption .

Late Decelerations

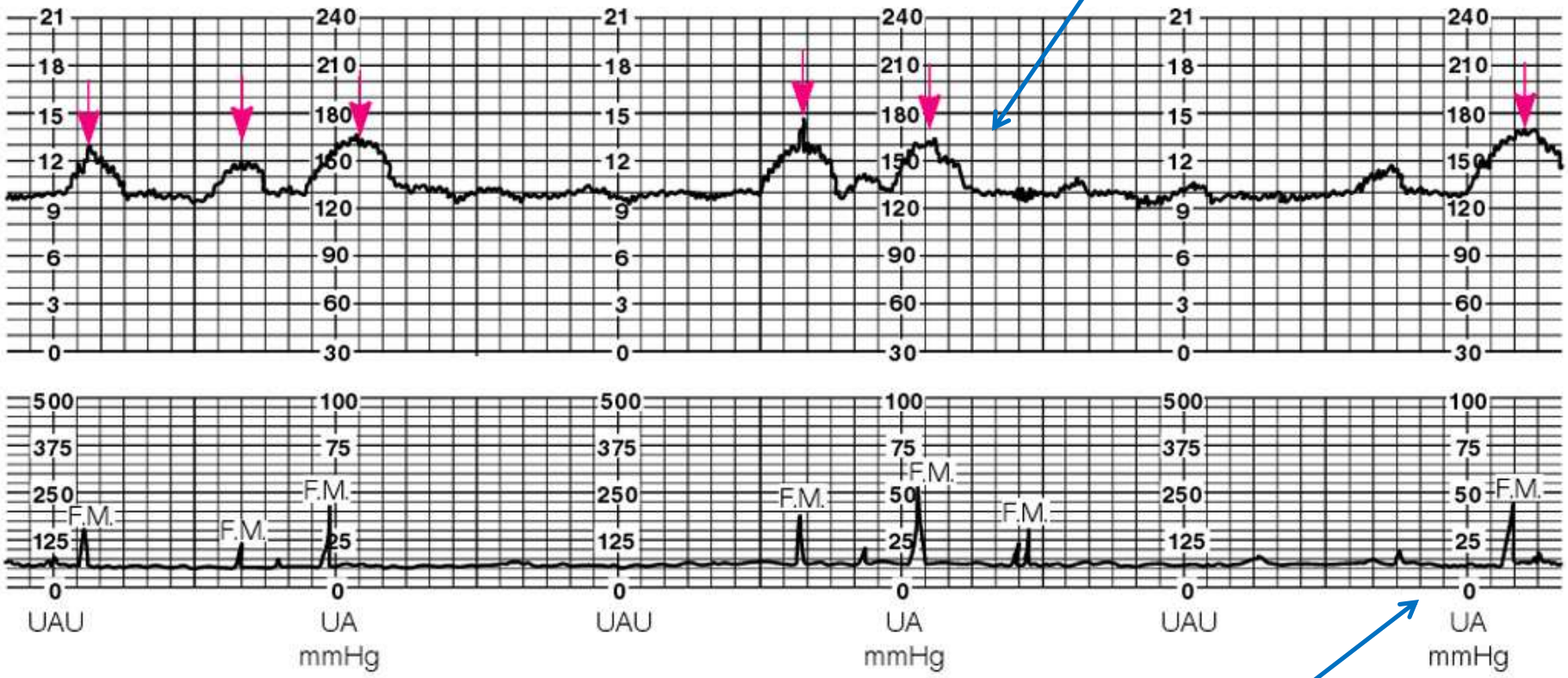
- maternal hypertension , preeclampsia, collagen vascular disease, renal disease, diabetes cardiac disease, hypovolemia, supine hypotension, sympathetic blockade from regional anesthesia, sepsis maternal hypoxia (apnea, cardiac disease, pulmonary disease) .

Nonstress Test

Can be done in Dr's office

- Evaluate fetal heart rate with fetal activity
- Reassuring if accelerations occur with fetal movement
- Interpretation
  - **Reactive** – 2 or more FHR accelerations of at least 15 bpm with a duration of at least 15 seconds in a 20 minute interval **(desired)**
  - **Nonreactive – reactive criteria not met within 30 minutes**
  - If decelerations are noted- phys notified- for further evalutaion

incr of about 15 bmp lasting 15 sec desired



Fetal Movement

Figure 14–5 Example of a reactive nonstress test (NST). Accelerations of 15 bpm lasting 15 seconds with each fetal movement (FM). Top of strip shows FHR; bottom of strip shows uterine activity tracing. Note that FHR increases (above the baseline) at least 15 beats and remains at that rate for at least 15 seconds before returning to the former baseline.

Ex: Nonreactive NST. Poss sleep or hypoglycemic. Poss treat w/ juice.

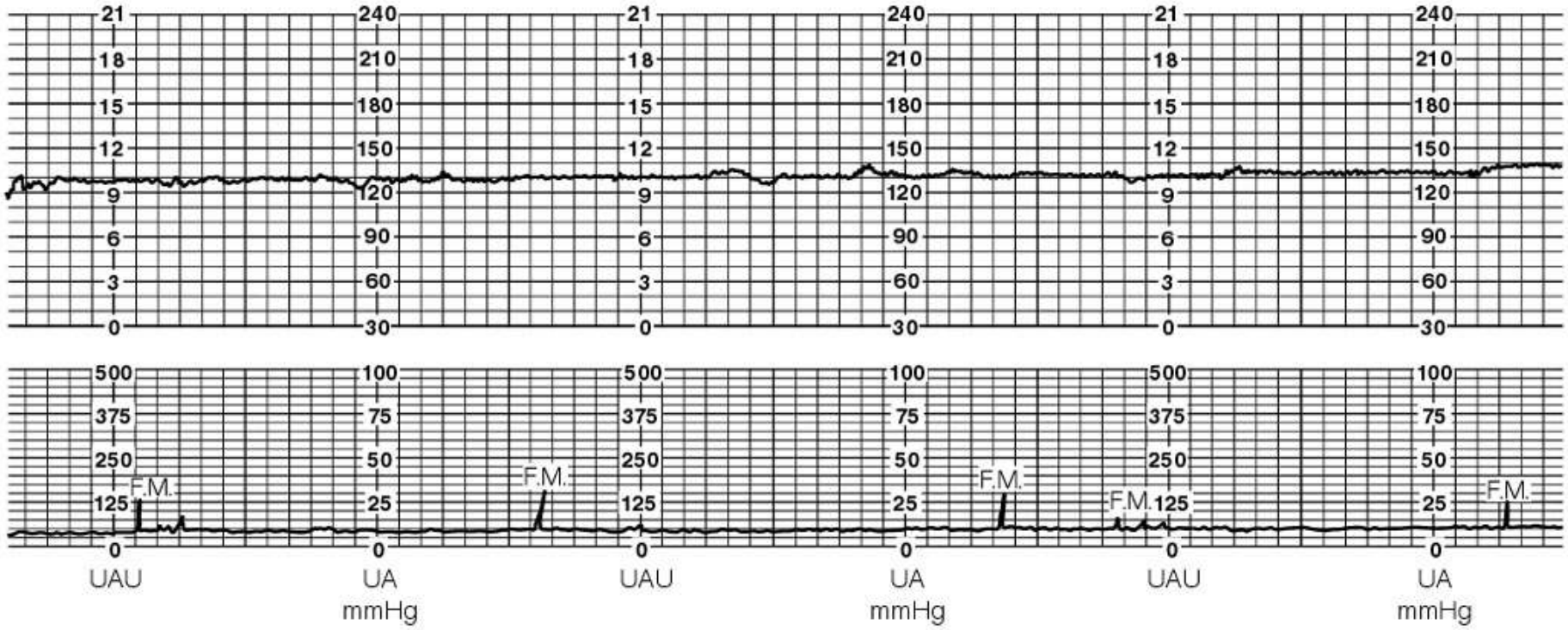


Figure 14–6 Example of a nonreactive NST. There are no accelerations of FHR with FM. Baseline FHR is 130 bpm. The tracing of uterine activity is on the bottom of the strip.

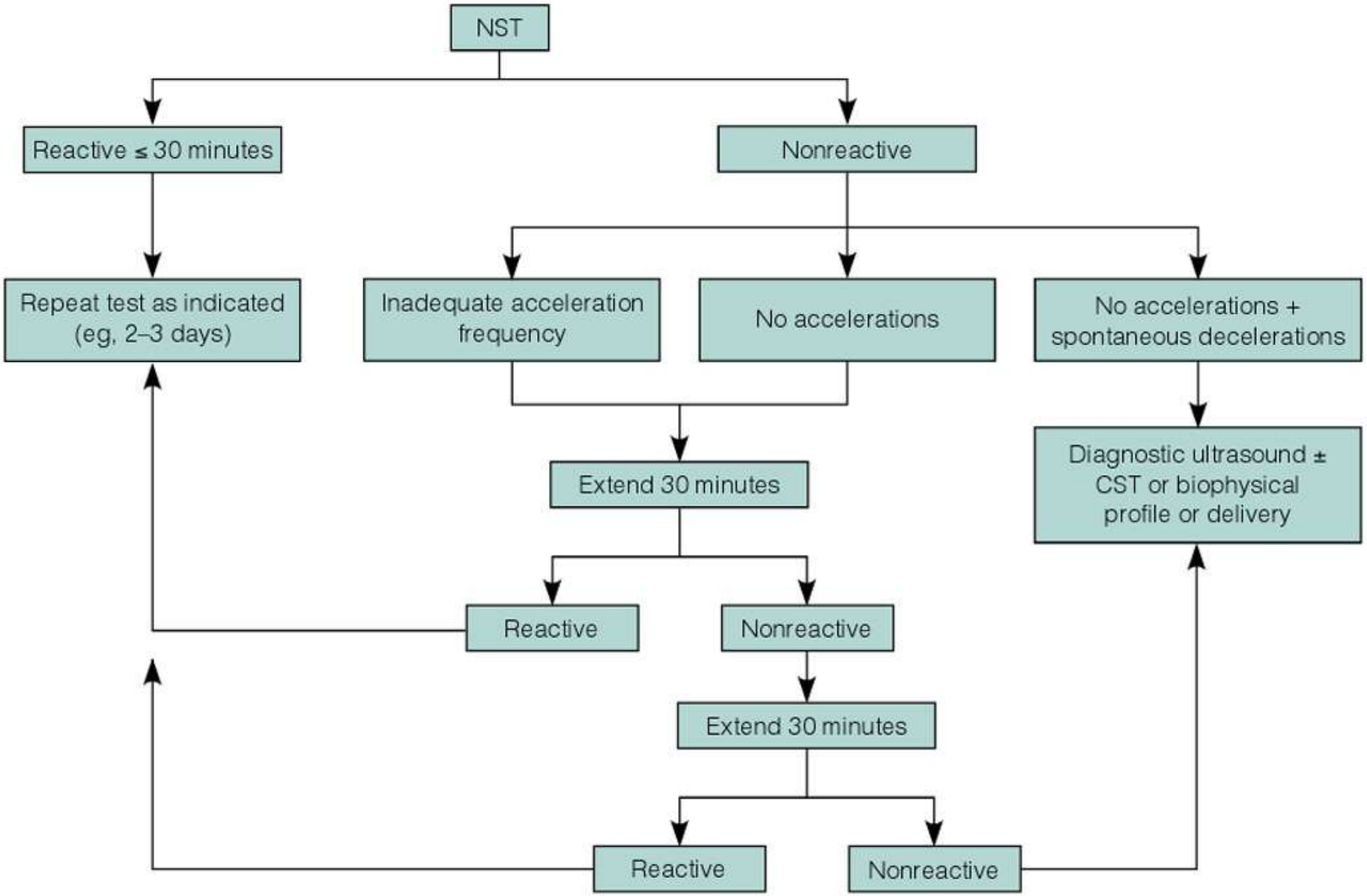


Figure 14–7 NST management scheme. *Source:* Devoe, L. D. (1989). Nonstress and contraction stress testing. In R. Depp, D. A. Eschenbach, & J. J. Sciarri (Eds.), *Gynecology and obstetrics* (Vol. 3, p. 9, Figure 5). Philadelphia: Lippincott.

Palli

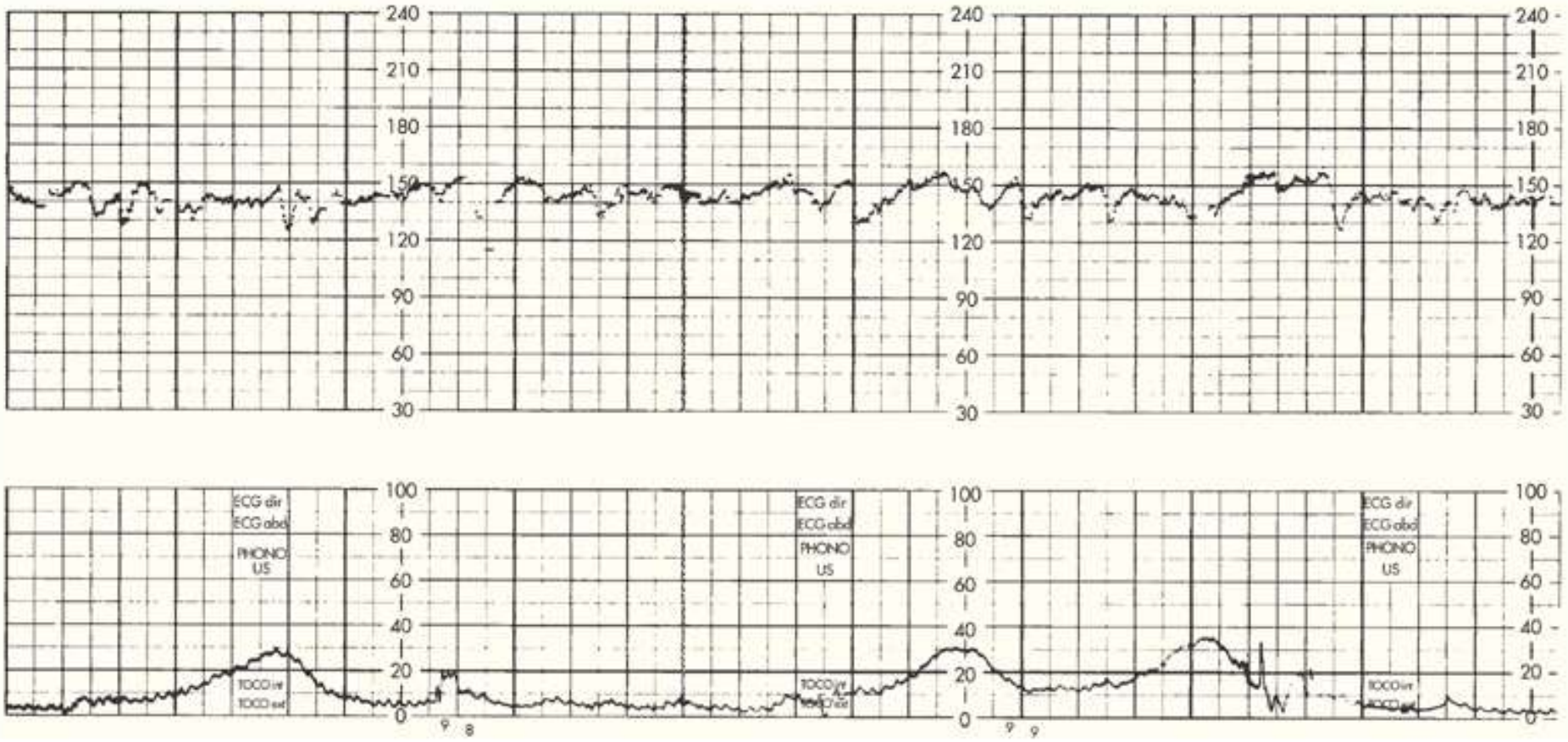
Contraction Stress Test

- **Evaluates the Respiratory function of the placenta**
  - Does it get O^2 to the baby? Test to check if the placenta has the reserves needed during contractions.
- **Records FHR response to stress of uterine contractions**
  - Compress arteries to placenta

- Uterine Contractions **induced by nipple stimulation** or Oxytocin (Caution: may cause pt to go into labor!)

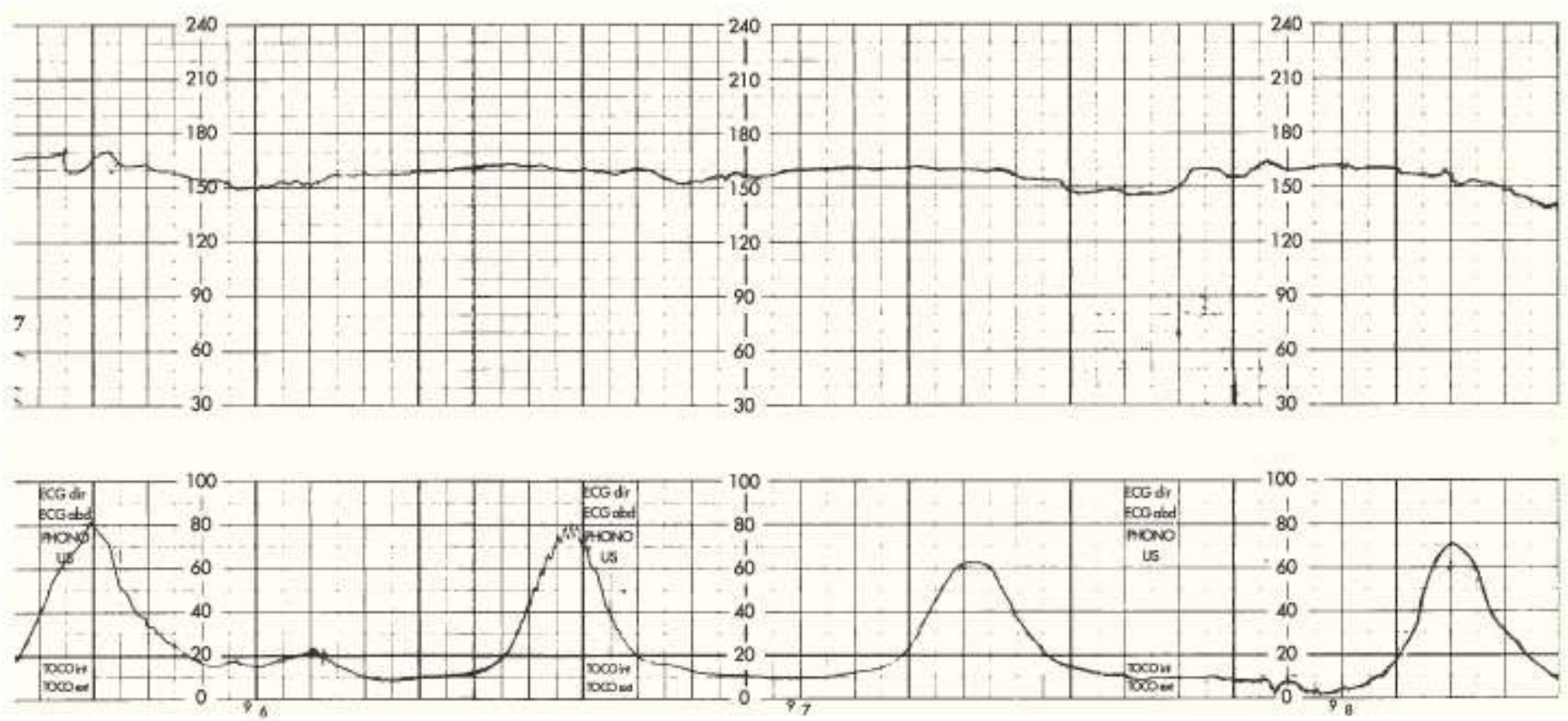
- **Interpretation**
  - **Negative** – 3 good contractions lasting 40 seconds in 10 minute interval with no late decelerations
  - **Positive – persistent late decelerations with more than 50% of the contractions** (NOT THE DESIRED RESULTS)

Ex: CST "Contraction Stress Test"



Negative CST.

Postive CST- baseline about 150, HR drops w/ contractions.



Positive CST, compromised fetus.

Another example of positive CST.

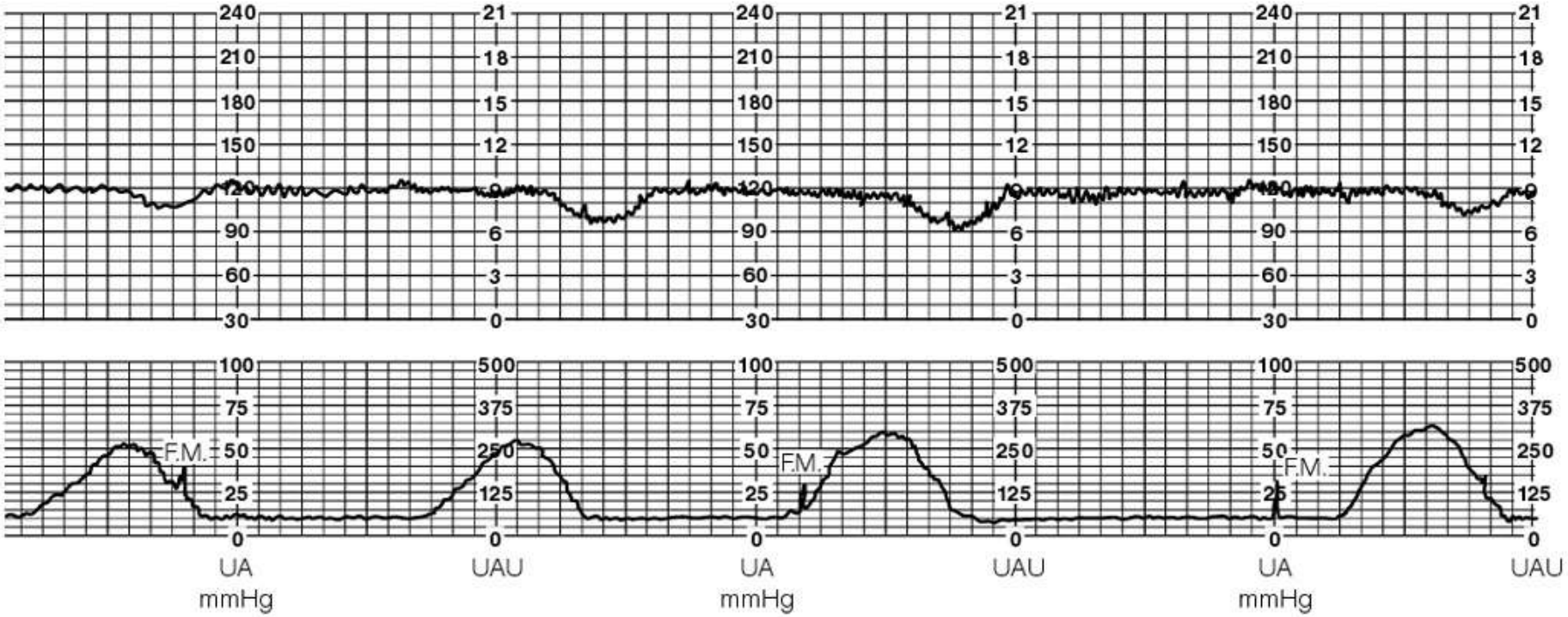


Figure 14–8 Example of a positive contraction stress test (CST). Repetitive late decelerations occur with each contraction. Note that there are no accelerations of FHR with three fetal movements (FM). The baseline FHR is 120 bpm. Uterine contractions (bottom half of strip) occurred four times in 12 minutes.

The goals of antepartum testing

- The goals of antepartum testing are
- (a) to identify fetuses in hazard so that permanent injury or death might be prevented and
- (b) to identify healthy fetuses so that unnecessary intervention might be avoided .

Conclusion

- The fetal wellbeing assessment is essential

In antepartum and during labor although the **CTG has false positive and very low percentage false negative CTG Still of great value in redaction neonatal morbidity and mortality .**


THANK YOU