



Chapter 7

THE NON-STRESS TEST

Despite widespread use there is poor evidence that antenatal non-stress testing (NST) can reduce perinatal morbidity or mortality.

If it is to be used, it should be used in women with risk factors for adverse perinatal outcome. There is no good evidence on which to base a recommendation for frequency of non-stress testing. In most cases a normal NST is predictive of good perinatal outcome for one week (providing the maternal – fetal condition remains stable), except in women with insulin dependent diabetes or with a post dates pregnancy, in which case NST's are recommended twice weekly.

Non-stress tests are performed to assist with the assessment of fetal well being during the antenatal period. Accelerations, along with other characteristics of the fetal heart rate; for example baseline, variability, presence or absence of spontaneously occurring decelerations are used, as a means of assessing fetal well-being, particularly in the fetus at risk. Fetal heart rate acceleration in association with fetal movements are indicators of fetal health. Spontaneously occurring fetal heart rate decelerations require clarification and may need active management.

Indications

- absence of, or diminished fetal movements as perceived by the mother
- abnormal maternal serum screening in absence of confirmed anomaly
- morbid obesity
- advanced maternal age
- Conditions where there is concern regarding utero-placental insufficiency eg. post term, IUGR, previous stillbirth, antepartum hemorrhage, Pre-pregnancy diabetes, gestational diabetes requiring insulin, gestational hypertension, and pre-eclampsia
- Monitoring health of an at-risk infant eg. Rh sensitization, multiple gestation
- Trauma eg. MVA, assault, falls
- Preterm labour
- Post-dates fetal health assessment

Methods

1. Explain the procedure to the woman
2. Offer the woman an opportunity to empty her bladder
3. Ask the woman if she has taken medications/drugs/used any substances within the two hours prior to arrival for the NST
4. Ask the woman if she is a smoker and how recently she has smoked a cigarette
5. The woman is placed in semi-fowler or left lateral position to avoid maternal hypotension and its effect on the fetus
6. External monitor
 - abdominal palpation to assess presentation and position (Leopolds)
 - using contact gel, place the transducer on the abdomen where the fetal heart is best heard
 - apply the tocotransducer to maternal fundus to monitor any uterine activity
 - provide a fetal movement marker and instruct the woman to record fetal movements by pushing on the button to record the fetal movement on the graph paper
 - record the NST for at least 20 minutes.
 - If criteria is not met in first 20 minutes leave NST on for another full 20 minutes
7. Record relevant information such as: B.P., temperature, contractions, or bleeding as well as any medication the mother may be taking and recent smoking in the health care record to assist in interpretation
8. Identify graph - using woman's name, date of birth, and physician or attach addressograph label on the reactive portion. After physician evaluation, place on the chart as permanent record. The tracing is to be kept as a permanent record with the chart.
9. Nurses and physicians skilled in the interpretation of the NST may classify the tracing as normal atypical or abnormal. The interpretation should be documented in the health care record. When findings are inconclusive consultation with another health care provider should be done.

Interpretation

- based on presence or absence of accelerations of fetal heart rate.
- Interpretation of the NST is dependent on gestational age. At <32 weeks accelerations of 10bpm lasting 10 seconds are used.

Normal

- Baseline 110 - 160/min.
- variability 6 - 25 beats per minute (moderate)

- no decelerations or occasional variable < 30 sec
- 2 or more accelerations of at least 15 beats per minute above baseline lasting 15 seconds at the base in less than 40 min of testing in a term fetus.
- 2 or more accelerations of at least 10 beats per minute above baseline lasting 10 seconds in less than 40 minutes of testing in a preterm fetus. (with or without fetal movement discernible by the women)

Before the woman is discharged, if she is an outpatient, the timing of the next NST/physician visit, etc. should be determined, based on the indications for the NST.

Atypical

- Baseline 100-110
- > 160 bpm < 30 min
- Rising baseline
- Variability \leq 5 bpm (absent or minimal) for 40-80 min
- Variable decelerations, 30-60 sec duration
- Accelerations in term fetus \leq 2 accelerations with the acme of \geq 15 bpm, lasting 15 sec in 40-80 min
- if the NST is atypical after 20 minutes, continue monitoring for up to 80 minutes
- if still not normal there needs to be an immediate consultation for further assessment of the clinical circumstances

Abnormal

- Baseline Bradycardia < 100 bpm
 - Tachycardia > 160 for > 30 min
 - Erratic baseline
 - Variability \leq 5 bpm for \geq 80 min
 - \geq 25 bpm for > 10 min
 - Sinusoidal
 - Decelerations variable decelerations > 60 sec duration
 - Late decelerations
 - Accelerations in term fetus \leq 2 accelerations with acme of \geq 15 bpm, lasting 15 sec in > 80 min
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- The NST is classified as Abnormal requires urgent action. An overall assessment of the situation and further investigation with ultrasound or BPP

is required. Some situations will require immediate actions to facilitate delivery.

NOTE: There is **no evidence** that food or drink ingested by the mother will cause the test to be normal. Indeed, the woman should not be given anything by mouth until the plan of management is determined, as a Caesarean Section may be needed, and a full stomach would place the woman at risk of aspiration.

Suggested Reading

Brown, R., Patrick, J., The Non Stress Test: How Long is Enough? Am J Obstet Gynecol.,141:646,1981.

References:

The Canadian Perinatal Programs Coalition: Fundamentals of Fetal Health Surveillance: A Self Learning Manual; Fourth Edition 2009

SOGC Guidelines on Fetal Health Surveillance JOGC September 2007