Contraction Stress Tests (CST): Oxytocin Challenge Test (OCT) & Breast Stimulated Stress Test (BSST)

POLICY BC.06
BIRTH CENTER
Patient Care
Issued:
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I. PURPOSE

To guide the experienced obstetrical RN in conducting a contraction stress test (CST).

II. POLICY

An experienced obstetrical RN familiar with external fetal monitoring (EFM), intravenous oxytocin and/or nipple stimulation use may perform a CST per provider's order. A CNM or physician will interpret the test.

III. PROCEDURE

CRITICAL POINTS

Indications:

The CST is used to assess the fetal response to transient stress/reductions in oxygen associated with uterine contractions. The CST is one method of assessing the presumed adequacy of oxygen exchange between the maternal/fetal dyad. A CST may be used as a follow up test for a non-reactive or suspicious non-stress test (NST). The CST may be used before the application of prostaglandin agents to ascertain the safety of their use in certain situations; such as a fetus believed to be at risk for uteroplacental insufficiency (e.g. post-dates, severe IUGR, decreased amniotic fluid, Pre-E, or diabetes). CST results may also be helpful in determining the optimal timing and method of delivery.

Relative Contraindications:

A. Preterm PROM

B. Placenta previa/ Vasa Previa

C. Third trimester bleeding

D. Previous classical cesarean section or multiple uterine surgeries

E. Multiple gestation

F. Incompetent cervix

G. Polyhydramnios

H. Premature labor

Interpretation:

A. The CST is interpreted according to the presence or absence of late fetal heart rate (FHR) decelerations. A negative CST or absence of late decelerations is associated with fetal survival of 1 week in greater than 99% of the cases. The test is positive even if the contraction frequency is less than three in 10 minutes. A positive CST or presence of late decelerations requires further evaluation and/or consideration for delivery. See Appendix for full definitions.

B. A CST is performed during simultaneous monitoring of FHR and uterine activity.

1. If at least three spontaneous contractions of > 40 seconds in duration are present in a 10 minute period, no uterine stimulation is necessary.

2. If fewer than 3 contractions of > 40 seconds in duration occur in 10 minutes,

contractions are induced per provider order, with intravenous oxytocin infusion (OCT) or nipple stimulation (BSST). Both the FHR pattern and the uterine activity must be recorded in order to interpret the CST. If the contractions do not register on the monitor tracing, use a pen to mark the beginning and end of contractions as identified by palpation or patient report.

C. Instruct patient not to perform nipple stimulation at home.

PROCEDURE

A. Oxytocin Challenge Test (OCT)

1. Explain procedure to the patient.
2. Place patient in semi-fowler position or lateral tilt and take vital signs.
3. Apply FHR monitor and toco
4. Run a baseline fetal monitor tracing of at least 10 minutes duration. If 3 adequate contractions (lasting > 40 sec) are present in a 10 minute period, the test is complete.
5. If no uterine contractions are present, establish routine IV access with a main line of Lactated Ringers per IV pump.
6. Set up oxytocin line using buretrol tubing and IV pump.
7. Label all lines per IV labeling policy.
8. Connect the oxytocin infusion to the main line at a port close to the IV insertion site.
9. The initial dose should be 0.5 – 1 mU/min. At 15-20 minute intervals the dose may be doubled until there is an increase in uterine activity. Once a rate of 8 mU/min is achieved, the infusion *is generally* increased in increments of 2-4 mU/min until an adequate contraction pattern of 3 contractions lasting >40 secs in a 10 minute period is obtained. *Note the difference in titration of oxytocin between this protocol and the oxytocin induction/augmentation protocol.*
10. The FHR and uterine activity should be continuously monitored. Uterine tone (resting) and strength of contractions should be assessed by palpation.
11. Maternal blood pressure and pulse should be monitored and recorded before the procedure begins, q 15 min during the first hour of a CST, and then hourly to rule out hypotension as a factor in the interpretation.
12. In the event that contractions are consistently less than two minutes apart or last greater than 90 seconds in duration, or if FHR decelerations occur, the oxytocin infusion should be reduced or discontinued and the provider notified. Conservative measures (IV fluids, uterine displacement, and oxygen administration) may also be used. Also consider using terbutaline 0.25 mg SQ, to be given only with provider order.
13. When there are 3 contractions that meet criteria in a ten-minute period, discontinue the oxytocin infusion and consult with the provider. Continue EFM monitoring with mainline IV fluids infusing at TKO until uterine activity returns to baseline.

B. BSST-Nipple Stimulation

1. Prepare the following equipment:
   a. Washcloth
   b. Mineral Oil or Lanolin
2. Explain procedure to the patient.
3. Place patient in semi-fowler position or lateral tilt and take vital signs.
4. Apply FHR monitor and toco
5. Run a baseline FHR tracing of at least 10 minutes duration. If 3 adequate contractions (lasting > 40 sec) are present in a 10 minute period, the test is complete.
6. Maternal blood pressure and pulse should be monitored and recorded before the procedure begins, q 15 min during the first hour of BSST, and then hourly to rule out hypotension as a factor in the interpretation.
7. If no uterine contractions are present; have the patient place a warm washcloth or heat pack on breasts. Using another washcloth or mineral oil, the patient stimulates one nipple at a time by rolling or tugging gently under or through the washcloth continuously for 2 minutes, or until a contraction is felt. The purpose of nipple stimulation is to release endogenous oxytocin. Nipple stimulation should not be painful. The patient may alternate nipples every 2 minutes if one side becomes sore. Lanolin or mineral oil may be used on nipple to prevent soreness.
8. If the patient feels a contraction or one is noted on TOCO, stop nipple stimulation. Start to stimulate the nipple again after the contraction ends. Make sure the start and stop time of each nipple stimulation are being recorded on the tracing.
9. If unilateral nipple stimulation results in inadequate contractions after 20 minutes, let the patient rest for 5 minutes and then, have the patient stimulate both nipples with continuous stimulation until a contraction begins. Record the starting and stopping time of bilateral nipple stimulation. This should last another 20 minutes.
10. When there are 3 contractions lasting >40 sec in a 10 minute period have the patient stop the stimulation and consult with the provider. Continue EFM monitoring until uterine activity returns to baseline.
11. If uterine contractions last more than 90 seconds or are closer than two minutes apart:
    a. Stop nipple stimulation
    b. Observe uterine activity. Stimulation may be resumed if needed when uterine activity is < 90 seconds and > 2 minutes apart.
12. If there are inadequate or no contractions after the 20-minute bilateral nipple stimulation discontinue the nipple stimulation, consult with the provider and patient. Obtain provider order to begin an oxytocin challenge test. Record discontinuation of nipple stimulation and initiation of the OCT on the labor flowsheet

IV. RESPONSIBILITY

For questions regarding this policy contact the Birthing Center Clinical Nurse Specialist.

V. REFERENCES

ACOG (1999). Antepartum Fetal Surveillance. ACOG Practice Bulletin #9, ACOG 2004 Compendium of Selected Publications. Washington DC: American College of Obstetricians and Gynecologists.

ACOG (2014). Antepartum Fetal Surveillance. ACOG Practice Bulletin #145, ACOG 2014 Compendium of Selected Publications. Washington DC: American College of Obstetricians and Gynecologists.

Ellison, P., M. Foster, M., Sheridan-Pereira, M., MacDonald, D. (1991). Electronic Fetal Heart Monitoring, Auscultation and Neonatal Outcome. Am J. Obstet Gynecol, 164: 5, Part 1: 1281-1289

Parer, J.T.;(2000). Handbook of Fetal Heart Rate Monitoring, 2nd Ed. Philadelphia; W.B.Saunders,

Kavanagh, J., Kelly, A.J.,Thomas, J. (2005). Breast stimulation for cervical ripening and induction of labor. The Cochrane Database of Systematic Reviews. Issue 3

VI. HISTORY OF POLICY:

Author:
Issue Date:
Review/Revised: Mar 2014, M. Mullen RNC, M.P. Thiet MD, M. Killion RN CNS
Last Revision/Review: Dec 2017, N. Manke, RN Ben Li MD, M. Killion RN CNS

VII. APPENDIX

A. Criteria for Interpreting Contraction Stress Test

APPENDIX A
Criteria for Interpreting Contraction Stress Test

ACOG Practice Bulletin #145: Antepartum Fetal Surveillance (2014). ACOG

- **Negative**: no late or significant variable decelerations.
- **Positive**: late decelerations following 50% or more contractions (even if contraction frequency is fewer than three in 10 minutes).
- **Equivocal-suspicious**: intermittent late decelerations or significant variable decelerations.
- **Equivocal**: FHR decelerations that occur in the presence of contractions more frequent than every 2 minutes or lasting longer than 90 seconds.
- **Unsatisfactory**: fewer than three contractions in 10 minutes or uninterpretable tracing.

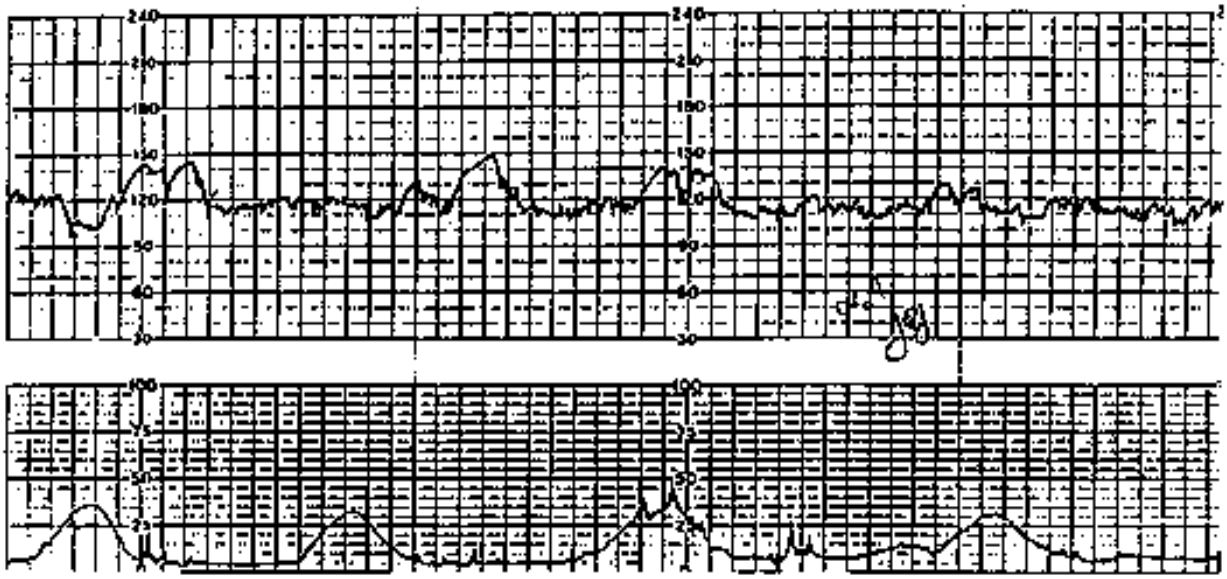

Figure 1. Negative CST. Moderate variability, no late decelerations, baseline fetal heart rate 110-160 bpm.

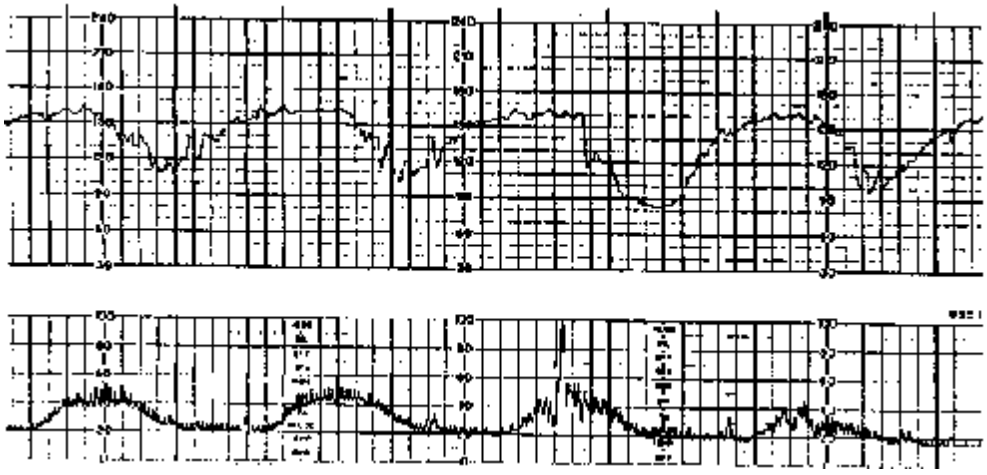

Figure 2. Positive CST: Recurrent late decelerations with an adequate contraction pattern. Recurrent late decelerations occur with >50% of uterine contractions in any time period.