UNC SCHOOL OF MEDICINE

ANTENATAL TESTING: AMBULATORY SETTING

Guidelines prescribing antenatal testing rest on two major questions:

1. At what gestational age is a fetus at >1% risk of injury due to the maternal/fetal/placental disease to the best of our evidence to support our decision making?
2. At what gestational age would the patient and her care providers be willing to intervene with a delivery if the testing is abnormal?

Please note that these guidelines are for single-risk factor disorders only. If a patient has more than one risk factor for stillbirth, more intensive (earlier, more often) testing may be warranted.

Please consider recommending daily kick counts for all high risk patients.

ANTENATAL TESTING: AMBULATORY TESTING				
INITIATION of antenatal testing	**At diagnosis when intervention indicated**	**At 32-34 weeks**	**At 36 weeks**	**Growth**
FREQUENCY	**1x=Weekly 2x=Twice Weekly**			
DIAGNOSIS				
Age, maternal >40 at time of birth			1x	
Antiphospholipid Syndrome	Abnormal growth, use IUGR protocol	Normal Growth: 2x		EFW at 26-28 weeks and 32-34.
Cholestasis			1x	
Cyanotic maternal heart disease		1x		EFW at 26-28 and 32-34.
Diabetes				
A1DM				
A2DM		1x	2x	28-32wk
Pregestational		1x	2x	28-32wk
Decreased Fetal Movement	1x if condition resolves			

Fetal anomaly			1x (if risk of hydrops, may do earlier)	
Hemoglobinopathy,w/ anemia (Hct < 25%)			2x	
HIV CD4 count <200 or worsening disease				28wk
Hypertension				
No medication				
Controlled, medication		1x		28-32wk 34-36wk
Uncontrolled, medication		2x (amniotic fluid check weekly)		28-32wk 34-36wk
Preeclampsia, Mild	2x			Every 3 weeks from dx
Hyperthyroidism, abnormal 3rd trimester TSH		2x		
IUGR				
<5th percentile OR abnormal UAD OR oligohydramnios	2x			q3wk
<10th percentile, normal fluid and dopplers		1x		q3wk

Isoimmunization, moderate to severe	2x			
Lupus		1x		
Obesity Morbid BMI>40, with no co-morbidities		1x		
Post term (≥41 weeks)	2x (amniotic fluid check at least once/week)			
Polyhydramnios, MVP≥8 OR AFI≥26			1x	
Renal Disease, proteinuric		1x		
Smoking >1ppd				
Substance Abuse				
Stillbirth	From EGA at prior stillbirth; 1x			
Prior unexplained		1x		
Prior with oligo or IUGR		1x		
Thrombophilia requiring anticoagulation		1x		
Twins				
Mono-Mono	2x			
Mono-Di	q2wk US for Fluid	1x		
Di-Di			1x	
High Order Multiples		1x		
Vascular Disease, severe	2x			

RESOURCES

ACOG Practice Bulletin # 12, January 2000 Intrauterine Growth Restriction

ACOG Practice Bulletin #55, September 2004 Management of Postterm Pregnancy

ACOG Practice Bulletin # 9, October 1999 Antepartum Fetal Surveillance

Cochrane Database Systematic Reviews, Jan 21, 2009 Regimens of Fetal Surveillance for impaired fetal growth. Grivell, Wong, Bhatia

BMC Pregnancy and Childbirth. Reducing stillbirths: Screening and monitoring during pregnancy and labor. 2009 (supple 1):S5 Haws, Yakoob, Soomro, Menezes, Darmstadt, Bhutta

Annals of NY Academy of Sciences, 2009. Antenatal assessment for the detection of fetal asphyxia. An evidence-based approach using indication-specific testing. Anthony Vintzileos

American Journal of Perinatology 2008 ; 25:301-304. Stillbirth at term in women of advanced maternal age in the US: When could the antenatal testing be initiated? Bhatiyar, Funai, Rosenberg, Norwitz, Lipking, Buhimschi, Copel.

AJOG 2006 ;195:764-70. Maternal age and the risk of stillbirth throughout pregnancy in the US. Uma Reddy, Chia-wen Ko, Marian Willinger.

Obstetrics and Gynecology 2004(2); 219-24. Maternal morbid obesity and the risk of adverse pregnancy outcome. Cedergreen.

Seminars in Perinatology. 2008 32:281-287 Antenatal Fetal Assessment: Multifetal Gestation—An Overview. Larry Devoe

American Journal of Obstetrics and Gynecology (2005) 193, 1923–35; Etiology and prevention of stillbirth. Ruth C Fretts.

American Journal of Obstetrics and Gynecology 1997;177 (6);1385-1390. Electronic fetal heart monitoring; research guidelines for interpretation. NICHD Research Planning Workshop.

Obstetrics and Gynecology 2008:112:661-666. The 2008 NICHD Workshop Report on EFM Updated on Definitions, Interpretations and Research Guidelines. Macones et al.

BACKGROUND

Antepartum surveillance for fetal wellbeing is amongst one of the most common interventions done in developing world prenatal care for complicated pregnancies. Even so, the evidence supporting antepartum surveillance is weak with respect to the ideal type and frequency of testing or even whether such testing significantly alters outcome.

Clearly, no surveillance method can predict the sudden fetal death or injury as might occur with an abruption placenta, cord accident, prolapsed cord with unwitnessed membrane rupture, traumatic maternal injury or similarly abrupt occurrences.

The premise of antepartum surveillance for the complex obstetrical patient is to identify early signs of fetal compromise that might allow for an improvement in the uteroplacental fetal

circulation or to allow for a timely delivery before fetal injury occurs. In the worst case, it is meant to avoid stillbirth but additionally, our goal is to try to prevent avoidable injury. All of the tests have a better predictive value

for normal results; none of them are particularly accurate if they are abnormal. As such, when an abnormal result occurs remote from term, if there is any concern that the result may be a false positive, alternative testing may be in order in order to avoid iatrogenic prematurity with a healthy baby. Importantly, most of the tests are interchangeable—a normal result on a BPP does not require a CST or NST or vice versa.

This guideline is written in two parts: for the ambulatory patient and for the hospitalized patient. Additionally, the guidelines are written to relate to broad groups of high risk conditions rather than to try to indicate for each high risk condition what type of testing should be done. The individual clinician should make decisions for an individual patient as to timing, frequency and type of testing with the following issues in mind:

1. Financial cost
2. Resource utilization
3. Additional information that might be helpful if one test or another is used
    a. Example: for patients with risk factors for oligohydramnios, ultrasound-based antenatal testing at least occasionally may be helpful.
4. Actions to be taken if the antenatal test is abnormal
5. Patient convenience
6. Clinical convenience

The 1997 NICHD Definitions for Electronic Fetal Monitoring definitions and guidelines are used at UNC for interpretation. In pregnancies greater than 32 weeks gestation, an NST is considered reactive if there are 15 sec x 15 BPM accelerations in 20 minutes. With pregnancies less than 32 weeks gestation, accelerations need only be 10 sec x 10 BPM, twice in 20 minutes, to be considered reactive.

Protocol for High Risk Conditions in the Ambulatory Area

WHAT TEST TO DO?

For conditions with a high risk of oligohydramnios, the best fetal assessment test will include regular assessment of the amniotic fluid volume. The choice of BPP (modified to exclude the NST) or NST +AFI relies almost entirely on resource utilization in the testing unit. At UNC, the primary choice would be NST +AFI. If there is IUGR present, Doppler testing will be added, in which case for patient convenience, the primary modality should be US based, with BPP + Doppler.

For conditions with a low risk of oligohydramnios, NST is sufficient in most cases. If interval growth scans are to be done, on the weeks of the growth scans, BPP could be substituted for an NST.

For multiple gestations, ultrasound-based antenatal testing would be preferred at appropriate intervals to assess fetal growth and amniotic fluid. In situations in which it is uncertain that an NST is actually assessing different fetuses, then US based testing might be recommended.

For stable, single-factor high risk patients, testing should start at 32-34 weeks based on clinical judgment.

HOW OFTEN SHOULD TESTING BE DONE?

For stable, single-factor high risk patients, testing should be done weekly. If either the maternal or fetal status is worsening, then the testing frequency can be increased to twice weekly.

ANTENATAL SURVEILLANCE IN HOSPITALIZED PATIENTS

WHEN SHOULD TESTING START?

Antenatal testing should begin at the point the mother and her care team would be willing to intervene in the pregnancy.

HOW OFTEN SHOULD TESTING BE DONE?

Hospitalized high risk women should do daily self-fetal kick counts.

By definition, patients who are hospitalized antepartum are thought to be a high risk of poor outcome and in general, hospitalization occurs when patients are at or beyond the gestational age at which intervention is considered.

Patients with oligohydramnios from any reason or PPROM even with AFI> 5, daily NSTs are indicated with at least weekly BPP +/- Doppler examination.

Patients with active bleeding from abruption or previa, or unstable hypertensive disease should be tested daily.

Patients with other stable disorders can have twice weekly testing.

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Notification to Users

These algorithms are designed to assist the primary care provider in the clinical management of a variety of problems that occur during pregnancy. They should not be interpreted as a standard of care, but instead represent guidelines for management. Variation in practices should take into account such factors as characteristics of the individual patient, health resources, and regional experience with diagnostic and therapeutic modalities.