MATERNAL FETAL MEDICINE FOUNDATION IS NOW THE PERINATAL QUALITY FOUNDATION

The Maternal Fetal Medicine Foundation (MFMF) was formed in 2005 and in turn instituted the Nuchal Translucency Quality Review (NTQR). Effective January 1, 2012 the MFMF became the Perinatal Quality Foundation (perinatalquality.org). The NTQR program (ntqr.org) will not change and will be joined by other initiatives. The Examiner will continue to focus on first trimester risk assessment and the NTQR program but will also include items of interest related to new developments in obstetrical care. The mission of the Perinatal Quality Foundation is to improve the quality of Maternal Fetal Medicine medical services by providing state of the art educational programs, and evidence-based, statistically valid monitoring systems to evaluate current practices and facilitate the transition of emerging technologies into clinical care.

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The Nuchal Translucency Quality Review Program is pleased to announce the 5,000th NTQR NT credentialed NT provider. The 5,000th person to pass the course, exam, and image review is Pamela Rhodes, RDMS who works at Inner Vision Women’s Ultrasound under Dr. Philippe Jeanty in Nashville, Tennessee.

OBESITY and NT MEASURES

Loralei L. Thornburg, MD
University of Rochester
Rochester, New York

Obesity has become one of the most prevalent medical problems in the United States; over 60% of women are overweight with a body mass index (BMI) over 25 kg/m².1 Obesity and its associated medical problems increases the risks in pregnancy, and therefore, practitioners everywhere are struggling with how to provide care to this increasing growing segment of our population.2 Obesity is also associated with increasing maternal age, and therefore, accurate and early aneuploidy screening is especially important for many of these women.3 It is well established that BMI limits the ability to visualize fetal structures in the second trimester; and therefore limits ultrasound based risk screening in this population.4 - 6

1. Obesity and NT measures
2. Obesity and NT measures
3. Obesity and NT measures
4. Obesity and NT measures
5. Obesity and NT measures
6. Obesity and NT measures
Maternal habitus affects ultrasound penetration and visualization in the first trimester as well. Early screening with nuchal translucency (NT) measurements only provides appropriate assessments of aneuploidy risk when measured accurately. Therefore, a discussion of the ability to perform NT measurement in the obese patient is important.

Studies have found that NT screening is less likely to be completed in obese women, with higher failure rates than reported in the general population. It is important to remember that even in non-obese women, there is a failure rate for these measurements. Although the overall failure rate of the FaSTER trial was only 7.1%, other studies have shown higher failure rates outside of the study setting. Wax et al reported that only 80% of women presenting at eligible gestational ages had usable NT measurements obtained, although this improved to 86.6% after repeated attempts, (a 13.4% failure rate), which is similar to other studies. However, the majority of papers do not specifically discuss the reason for the failure- citing only “failed NT” or “fetal position or maternal obesity”.

In the largest study to date specifically addressing NT measurement in the general population of obese women, the overall failure rate for those attempted at appropriate gestational ages was 9.7% (vs. 2.2% in non-obese patients), and correlated strongly with the degree of obesity. Failure rates ranged from 5.4% in Class I obesity (BMI 30-34.9), to 8.8% in Class II (BMI 35-39.9), and to as high as 22.7% in Class III (BMI >40) obese patients. Each completion rate improved after repeated attempts, but remained higher than non-obese women with an overall failure rate of 6.6% (vs. 1.6% in non-obese patients). The failure rates were again correlated with obesity, and were highest in the most obese group of patients (3.9% Class I, 6.7% Class II and 13.5% Class III). This means that although the majority of patients who desire nuchal translucency screening will be able to be screened, there is a still a higher rate of screen failure in obese women.

Additionally, Thornburg et al showed that the obese patients required additional time, and additional ultrasound attempts for success over their non-obese counterparts. In the study by Wax et al, even when study visits were expanded to 30-40 minutes, failure rates remained high. Therefore, visit times may need be adjusted to reflect the challenges in the obese patient, and even with this, not all women will achieve NT screening. Patients should be made aware prior to their ultrasound that additional time will likely be required and ultrasound units may wish to allot extra time for those patients with morbid obesity.

Obese women also represent a physical challenge to sonographer, as literature suggests that scanning these patients contributes to injury. Maximizing the physical plant, such as higher stools for sonographers, motorized patient beds with high rated hydraulics and obesity specific ultrasound settings can all be utilized to accommodate obese patients more comfortably and quickly, and may help to avoid injury to the sonographer performing the scan. Additional strategies used for challenging fetal positions such as transvaginal or combined transvaginal/transabdominal approach, upright scanning, and having the patient or family aid in retraction of the pannus may be of particular value in the obese gravida.

Although it is clear that there are limitations to completion of the NT measurement in the obese gravida, the majority of patients will be able to have NT screening if desired. However, this may require additional time, strategies, and visits, and even with these the completion rate declines as maternal obesity increases.

What is Wrong with These Images:
A. Not magnified enough
B. Fetus not in midsagittal
C. NT line not crisp and clear
D. Amnion not seen
E. Head flexed or over-extended
F. Calipers not placed properly
G. Calipers not oriented perpendicular to the long axis of the fetus
H. + calipers not used
I. Calipers not measuring widest spot
J. Good image, nothing wrong

5. Tsai L, Ho M, Pressman EK, Thornburg LL. Rates of completion of ‘soft marker’ aneuploidy screening in obese gravidas. Prenatal Diagnosis. 30(9), 2010. 821-826. PMID: 20575150
Talking Points for Explaining First Trimester Screening to Ob Patients

First trimester screening is an option I offer to all of my pregnant patients.

First trimester screening involves an ultrasound examination to measure the pocket at the back of the fetus’ neck called the nuchal translucency. It also includes a blood draw from the patient to measure the levels of two substances call PAPP-A and HCG that are normally present in the bloodstream of a woman during the first trimester of pregnancy.

The NT tends to be larger in fetuses with an abnormal number of chromosomes, for example those with Down syndrome. The levels of HCG tend to be increased in pregnancies with Down syndrome and the PAPP-A is often lower in pregnancies known to have Down syndrome.

The NT is also larger in fetuses with trisomy 18 than in those with the usual number of chromosomes. The PAPP-A and HCG are lower in pregnancies known to have trisomy 18.

The screening test will provide a numerical estimate of the risk of Down syndrome and trisomy 18. Put another way, the screening test will tell you the chance for Down syndrome and for trisomy 18 in this pregnancy.

Talking Points for Explaining First Trimester Screen Results Screen Positive for Down Syndrome

Based on a combination of your age, the ultrasound measurement of the nuchal translucency and the levels of PAPP-A and HCG in your bloodstream, the chance for trisomy 18 in this pregnancy is 1 in X. This places your pregnancy in the low risk group for Trisomy 18.

The chance for Down syndrome is estimated to be 1 in X. Put another way, the chance for Down syndrome in this pregnancy is approximately X%. There is a (100-X)% chance that the fetus does not have Down syndrome.

The chance for Down syndrome is greater than the screening cut-off of 1 in X.

Having a result that is greater than the screening cut-off means that the chance for Down syndrome is increased, but we do not know for certain if the fetus has it or not.

Further testing is necessary to determine whether the fetus actually has Down syndrome or not.

The only tests that can make the diagnosis of Down syndrome during pregnancy are chorionic villi sampling (CVS) and amniocentesis.

CVS is a procedure done between 10 and 13 weeks
However, a screening test cannot tell for certain if a fetus has Down syndrome or trisomy 18. The results simply estimate the chance for each of these conditions in the fetus.

The results of testing separates women into two groups. In one group the chances for Down syndrome and trisomy 18 are less than the screening cut-offs established for each condition; the women in this group are considered at low-risk for Down syndrome or trisomy 18. The other group has a risk that exceeds the cut-off; this smaller group is considered to be at higher risk for Down syndrome or trisomy 18.

Having a test result that exceeds the screening cut-off does not mean that a fetus has a chromosome abnormality. It simply means the chance is increased and further testing, chorionic villi sampling or amniocentesis, is needed to determine if the fetus is affected or not.

Since the result is only a risk estimate, most women in the high-risk range will have healthy babies.

Some women know that they want a definitive test to know for sure that the fetus has the normal number of chromosomes. These women can benefit from chorionic villus sampling or amniocentesis instead of first trimester screening. Other women may choose to forego screening because they know that they would not have a chorionic villus sampling or amniocentesis procedure under any circumstance and would prefer to wait until birth to learn if their baby has Down syndrome or trisomy 18.

Many women are undecided about invasive testing like chorionic villus sampling and amniocentesis because these tests have a small risk for complications. First trimester screening is most helpful to this group of women because they can use the information gained from their screening test to help guide their decisions.

Talking Points for Explaining First Trimester Screen Results

Screen Positive for Trisomy 18

Based on a combination of your age, the ultrasound measurement of the nuchal translucency and the levels of PAPP-A and HCG in your bloodstream, the chance of Down syndrome in this pregnancy is 1 in X. This result is below the screening cut-off and places your pregnancy in a low risk group for Down syndrome.

The risk for a more rare chromosome condition called trisomy 18 is estimated to be 1 in X. Put another way the chance for trisomy 18 is approximately X%. There is a (100-X)% chance that the fetus does not have trisomy 18.

In amniocentesis, which is typically performed after 16 weeks of pregnancy, a thin needle is inserted through the woman’s abdomen to draw a sample of fluid, called amniotic fluid, from the sac around the baby.

Both CVS and amniotic fluid samples contain cells that are used for chromosome analysis and the results can tell whether or not a fetus has Down syndrome with 99.9% accuracy.

However, there is a chance for miscarriage associated with these procedures. The chance to have a miscarriage after a CVS or an amniocentesis is estimated to be 1 in 300 to 1 in 500 (0.33% to 0.2%).

If you are still not sure whether you want to have a CVS or an amniocentesis, you can consider having a detailed ultrasound examination at 18-20 weeks of pregnancy to see if there are any findings known to occur more frequently in fetuses that have Down syndrome than in fetuses that do not.

Like first trimester screening, the results of the ultrasound cannot tell you whether or not the baby has Down syndrome, but they can provide you with more information to use in making a decision about whether to have an amniocentesis.

I’d like to refer you for genetic counseling for a more detailed discussion of your first trimester screen results and testing options available to you.
The chance for trisomy 18 is greater than the screening cut-off of 1 in X.

Having a result that is greater than the screening cut-off means that the chance for trisomy 18 is increased, but we do not know for certain if the fetus has it or not.

Further testing is necessary to determine whether the fetus actually has trisomy 18 or not.

Features of trisomy 18 include an increased likelihood for birth defects, especially heart defects, abnormalities in the position of the hands and feet, poor growth, and changes in facial appearance including a small chin. Babies born with trisomy 18 have severe medical problems and developmental disabilities. Unfortunately, even with the best medical care, most babies with trisomy 18 pass away from medical complications within one year.

The only tests that can make the diagnosis of trisomy 18 during pregnancy are chorionic villi sampling (CVS) and amniocentesis.

CVS is a procedure done between 10 and 13 weeks of pregnancy in which a small sample of tissue is taken from the edge of the placenta either by inserting a needle through the woman’s abdomen or by inserting a thin, flexible tube through the woman’s cervix via the vagina.

In amniocentesis, which is typically performed after 16 weeks of pregnancy, a thin needle is inserted through the woman’s abdomen to draw a sample of fluid, called amniotic fluid, from the sac around the baby.

Both CVS and amniotic fluid samples contain cells that are used for chromosome analysis and the results can tell whether or not a fetus has trisomy 18 with 99.9% accuracy.

However, there is a chance for miscarriage associated with these procedures. The chance to have a miscarriage after a CVS or an amniocentesis is estimated to be 1 in 300 to 1 in 500 (0.33% to 0.2%).

If you are still not sure whether you want to have a CVS or an amniocentesis, you can consider having a detailed ultrasound examination at 18-20 weeks of pregnancy. Most fetuses with trisomy 18 have ultrasound abnormalities, but ultrasound alone cannot make the diagnosis, nor can the diagnosis be ruled-out by ultrasound.

Like first trimester screening, the results of the ultrasound cannot tell you whether or not the baby has trisomy 18, but they can provide you with more information to use in making a decision about whether to have an amniocentesis.

I’d like to refer you for genetic counseling for a more detailed discussion of your first trimester screen results and testing options available to you.

Poor Crown-Rump Length Measurements: CRL’s should be measured in a neutral mid-sagittal plane. Both pictures show the fetus in an incorrect plane for measurement. The picture on the left shows the calipers extended too far.
Prenatal Detection of Down Syndrome using Massively Parallel Sequencing (MPS): a rapid response position statement from a committee on behalf of the Board of the International Society for Prenatal Diagnosis, 24 October 2011

Background

The International Society for Prenatal Diagnosis (ISPD) has provided recommendations for best practices in prenatal screening for aneuploidy (Benn et al., 2011). The development of non-invasive tests based on the presence of cell-free fetal nucleic acids in maternal plasma offer substantial new opportunities to improve prenatal screening. Recent studies have shown that in high-risk populations, massively parallel sequencing (MPS) can detect a large proportion of Down syndrome affected pregnancies with a low false-positive rate (Chiu et al., 2011; Ehrich et al., 2011; Sehnert et al., 2011; Palomaki et al., 2011; and others presented at international scientific meetings). However, this test is not fully diagnostic and therefore constitutes an advanced screening test. Accordingly, confirmation of MPS positive results through invasive testing would still be required. It is also important to recognize that for women who are screen-positive using current screening protocols, Down syndrome represents only about half of the fetal chromosomal abnormalities identified through amniocentesis and CVS.

MPS in prenatal population screening

Before routine MPS-based population screening for fetal Down syndrome is introduced additional trials are needed. These need to provide evidence that:

(a) There is efficacy in low risk populations
(b) The test is suitable for the diverse sub-populations such as twins and IVF donor pregnancies
(c) The test can be provided in a cost-effective, timely, and equitable manner
(d) If used in conjunction with other screening tests, the MPS result can be combined to provide a composite risk estimate.

MPS for individual patients

Commercial MPS-based testing for prenatal detection of Down syndrome has recently been introduced in the United States and it has been advocated for women who have been determined to be at high risk based on other conventional screening tests (Palomaki et al., 2011). Commercial testing is also available in China and will soon be launched in Europe.
ISPD accepts that with suitable genetic counseling (see below) MPS can be helpful for women who may have been determined to be high risk by one of the previously recommended screening strategies (Benn et al., 2011).

ISPD does not endorse the ad-hoc use of MPS testing in women at lower risk, outside a formal protocol that considers the overall best combination of tests, their impact on screening performance and patient acceptability. In general, the components that are incorporated in multi-test prenatal screening protocol should be defined by the population that will most benefit, the gestational age that each test can be offered, impact on invasive testing, economics, and other practical considerations such as the availability or need for genetic counseling.

**Genetic counseling**

At this time, individual women who might be considering the MPS test need to receive detailed genetic counseling that explains the benefits and limitations of the test. Testing should only be provided after an informed consent. Information that must be provided to the patient includes:

1. The test currently available in the USA is only for fetal Down syndrome which constitutes only about half of the fetal aneuploidy that would be identified through amniocentesis or CVS. In China the available test also detects Edwards syndrome.
2. The test does not detect all cases of fetal Down syndrome.
3. There are also occasional false-positive results and therefore women with positive MPS results need to receive confirmatory testing through an amniocentesis or CVS.
4. Patients with positive MPS results are at very high risk of Down syndrome and for some women the extended period awaiting confirmatory invasive testing results is likely to be highly stressful.
5. For some patients a MPS test result may not be informative.
6. For those women who are at increased risk of a child with a prenatally diagnosable disorder with Mendelian pattern of inheritance, microdeletion syndrome, and some other conditions, amniocentesis or CVS would still be indicated.

**References**


Committee

**Peter Benn**¹ *, Antoni Borrell², Howard Cuckle³, Lorraine Dugoff⁴, Susan Gross⁵, Jo-Ann Johnson⁶, Ron Maymon⁷, Anthony Odibo⁸, Peter Schielen⁹, Kevin Spencer¹⁰, Dave Wright¹¹ and Yuval Yaron¹²

¹Department of Genetics and Developmental Biology, University of Connecticut Health Center, Farmington, CT, USA
²Prenatal Diagnosis Unit, Institute of Gynecology, Obstetrics and Neonatology, Hospital Clinic, Maternitat Campus, University of Barcelona Medical School, Catalonia, Spain
³Department of Obstetrics and Gynecology, Columbia University Medical Center, New York, NY, USA
⁴Department of Obstetrics and Gynecology, University of Pennsylvania, Philadelphia, PA, USA
⁵Department of Obstetrics and Gynecology, Albert Einstein College of Medicine, New York, NY, USA
⁶Department of Obstetrics and Gynecology, University of Calgary, Calgary, AB, Canada
⁷Department of Obstetrics and Gynecology, Assaf Harofe Medical Center, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel
⁸Department of Obstetrics and Gynecology, Washington University in St Louis, St Louis, MO, USA
⁹Laboratory for Infectious Diseases and Perinatal Screening, National Institute for Public Health and the Environment (RIVM), Bilthoven, The Netherlands
¹⁰Prenatal Screening Unit, Clinical Biochemistry Department, Barking Havering & Redbridge University Hospitals, King George Hospital, Goodmayes, UK
¹¹Department of Mathematics and Statistics, University of Plymouth, Plymouth, UK
¹²Prenatal Diagnosis Unit, Genetic Institute, Sourasky Medical Center, Tel Aviv, Israel

*Chair

E-mail: benn@nso1.uchc.edu
Required Quality Maintenance (RQM):

Between April 2010 and October 2011 the NTQR Quality Review Program assigned to RQM 745 participants whose monitoring reports were out of expected range two consecutive reporting periods. The Quality Assessment (QA) committee has looked at changes in NT median MOM and SD after completion of the RQM and a preliminary report will be presented at the SMFM meeting in Dallas in February. In addition the NTQR Quality Assessment committee and image review committees have looked at factors that may predict out of range monitoring results and assignment to RQM. This data will be presented at AIUM.

The percentage of participants out of range has decreased each reporting period in 2011. The differences are small but the direction is right.

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Epidemiologic Report Schedule 2012:

First Quarterly Reports:
- Reporting Period 2/1/2011 - 1/31/2012
  - Report Issue Date 3/7/2012

Second Quarterly Reports:
- Reporting Period 5/1/2011- 4/30/2012
  - Report Issue Date 6/7/2012

Third Quarterly Report:
- Reporting Period 8/1/2011 - 7/31/2012
  - Report Issue Date 9/7/2012

Fourth Quarterly Report:
- Reporting Period 11/1/2011 - 10/31/2012
  - Report Issue Date 12/7/2012

Answers to the Image Review Questions:

1. C,D,F
2. F
3. D, F
4. C,D, I

Editor-in-Chief: Letters and Other Inquiries:

Send letters to the editor and all other inquiries to:
Karin M. Fuchs, MD
ntqrsupport@ntqr.org
kmf2121@columbia.edu
The Examiner
Nuchal Translucency Quality Review
12316 A North May Avenue #272
Oklahoma City, OK 73120