WOMEN'S HEALTH

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Prenatal Screening for Multifetal Pregnancies: Recent Publications Support Updated ACOG/SMFM Guidelines

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Historically, twin gestations have posed unique challenges to aneuploidy detection during pregnancy

In 2018 alone, around 127,000 twin and higher-order multifetal births occurred in the United States according to the Centers for Disease Control and Prevention (CDC).[1] Until recently, aneuploidy screening options for multifetal pregnancies have been limited. The American College of Obstetricians and Gynecologists (ACOG) and the Society for Maternal Fetal Medicine (SMFM) recommended the use of maternal serum screening and diagnostic testing for twin and multifetal pregnancies, citing a lack of published data to extend a recommendation to cell-free DNA (cfDNA) or non-invasive prenatal testing (NIPT).[2]

However, some providers have been utilizing cfDNA (NIPT) options for screening in twin and multifetal pregnancies since 2012. Over time, data have become available demonstrating the efficacy of cfDNA screening in multifetal pregnancies. Recent publications have shown that cfDNA screening in twin pregnancies outperforms traditional screening modalities.[3,4]

ACOG/SMFM have now updated their prenatal screening guidelines in the recently released Practice Bulletin 226, and state that cfDNA screening is suitable for all pregnancies regardless of age or risk, and can be used in twin pregnancies.[5] Screening options should be discussed with all patients early in pregnancy, along with diagnostic testing and genetic counseling should be provided as part of this discussion.[5]

Recent published data on cfDNA screening for twin and multi-fetal pregnancies

Since the original validation study was published in 2012,[6] several peer-reviewed publications have documented the successful application of cfDNA in multifetal pregnancies.

- Screening for trisomies by cfDNA testing of maternal blood in twin pregnancy: update of The Fetal Medicine Foundation results and meta-analysis.[4]
- A new era in aneuploidy screening: cfDNA testing in >30,000 multifetal gestations: Experience at one clinical laboratory.[7]
- Cell-free DNA screening in twin pregnancies: A more accurate and reliable screening tool.[3]

In general, these studies demonstrate that cfDNA screening is superior to traditional serum screening tests for twins, and that cfDNA screening performs similarly in twin and singleton gestations.

HEALTH AWARENESS CALENDAR

JANUARY

- Cervical Health Awareness Month
- National Birth Defects Prevention Month

An in-depth look at the most recent published data on cfDNA in twin pregnancies

Cell-free DNA screening in twin pregnancies: A more accurate and reliable screening tool.[3]

The study analyzes the performance of cfDNA screening in twin gestations by matching cfDNA results with cytogenetic and/or microarray outcomes from patients pursuing both cfDNA screening and diagnostic testing during the same pregnancy performed at a single commercial laboratory.[3] The data from over 400 cfDNA twin cases with diagnostic outcomes suggests that a commonly used cell-free DNA screening test performs similarly in twin and singleton gestations, and offers higher sensitivities and positive predictive values for aneuploidy screening compared to traditional serum biochemical screening in twins.[3]

Study results

- High combined sensitivity for trisomies 21, 18, and 13 of 98.7%[3]
  - Similar to combined detection rate in singleton validation studies of 98.9%[8]
  - Only 1 false negative case, with confirmed mosaicism for trisomy 21 on CVS[3]
- High negative predictive value (99.6%) for the core trisomies[3]
- Positive predictive values (PPVs) in this study population, which is enriched for aneuploidy, were 78.7%, 84.6%, and 66.7% for trisomy 21, 18, and 13, respectively[3]

High specificity (>96%) for individual trisomy, despite the proportionally small number of negative (euploid) cases, which limits calculations of specificity and false positive rates.[3]

	Trisomy 21	Trisomy 18	Trisomy 13
Screening test for twins	**Detection rate**	**Detection rate**	**Detection rate**
First trimester screening with nuchal translucency (NT)[9]	75-85%	66.7%	N/A
Second trimester serum screening[9]	63%	N/A	N/A
cfDNA (NIPT) from LabCorp/Integrated Genetics[3]	98.0%	>99.9%	>99.9%

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SUMMARY

The use of cfDNA screening in multifetal pregnancies has increased dramatically since its introduction in 2012. Over the past eight years, several peer-reviewed publications have demonstrated that this testing outperforms traditional aneuploidy screening methodologies for twin gestations. The relevance of this data is endorsed by ACOG/SMFM in the recent statement that cfDNA screening is the most sensitive and specific screening tool for common aneuploidies, and can be used in twin pregnancies. With test utilization among providers likely to increase, it is expected that further data will emerge regarding this technology, to support clinicians in making evidence-based decisions for these high risk pregnancies.

CLICK HERE to learn more about our NIPT offerings and how we align with the ACOG guidelines.

Reference

1. Centers for Disease Control and Prevention. National Center for Health Statistics. Multiple Births. https://www.cdc.gov/nchs/fastats/multiple.htm. Accessed September 30, 2020.
2. ACOG Practice Bulletin 163: Screening for fetal aneuploidy. *Obstet Gynecol.* 2016;127:e123–e37.
3. Chibuk J, Rafalko J, Boomer T, McCullough R, McLennan G, Wyatt P et al. Cell-free DNA screening in twin pregnancies: A more accurate and reliable screening tool. *Prenatal Diagnosis*. 2020.
4. Gil M, Galeva S, Jani J, Konstantinidou L, Akolekar R, Plana M et al. Screening for trisomies by cfDNA testing of maternal blood in twin pregnancy: update of The Fetal Medicine Foundation results and meta-analysis. *Ultrasound in Obstetrics & Gynecology.* 2019.
5. ACOG Practice Bulletin 226. *Obstet Gynecol.* 2020 Oct;136(4):e1-e22.
6. Canick J et al. DNA sequencing of maternal plasma to identify Down syndrome and other trisomies in multiple gestations. *Prenat Diagn.* 2012 Aug;32(8):730-4. https://doi: 10.1002/pd.3892.
7. Dyr B, Boomer T, Almasri EA, Wardrop JL, Rafalko J, Chibuk J, et al. (2019) A new era in aneuploidy screening: cfDNA testing in >30,000 multifetal gestations: Experience at one clinical laboratory. PLoS ONE 14(8): e0220979. https://doi. org/10.1371/journal.pone.0220979
8. Palomaki G, Deciu C, Kloza E, et al. DNA sequencing of maternal plasma reliably identifies trisomy 18 and trisomy 13 as well as Down syndrome: an international collaborative study. *Genet Med.* 2012;14(3):296-305.
9. ACOG Practice Bulletin 169. Twin, triplet, and higher-order multifetal pregnancies. *Obstet Gynecol.* 2016;128(4):e131-e146.

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