General information about positive NIPT results

My patient's NIPT is positive for multiple aneuploidies. What does this mean? Your patient's NIPT result suggests the presence of aneuploidy of more than one chromosome. The presences of multiple aneuploidies in a pregnancy is very rare, but can occur. However, NIPT is a screening test and false positives can occur. In addition, there may be other underlying biological explanations for a NIPT result suggesting multiple aneuploidies.

Next steps to consider: You should discuss the results and the potential clinical implications with your patient. The American College of Obstetricians and Gynecologists and the Society for Maternal-Fetal Medicine state, "All women with a positive cell-free DNA test result should have further detailed counseling and testing and should have a diagnostic procedure before any irreversible action is taken."[1] Confirmation prior to birth can also help with pregnancy and neonatal management.

Please see below for more information about multiple aneuploidy results.

What is multiple aneuploidy? Multiple aneuploidy refers to the presence of an extra or missing copy of multiple chromosomes.

What are the features of multiple aneuploidy? Most pregnancies with multiple aneuploidies will result in spontaneous miscarriage.[2,3] However, an estimated 0.16% of trisomy 21 cases involve a double aneuploidy with a sex chromosome (XXX, XXY, XYY, or monosomy X).[4] The associated features are dependent upon the exact chromosomes involved.

What is the prevalence of this condition? Unknown, but very rare. For this reason, positive predictive value (PPV) cannot be calculated.

What testing could be considered?

- Several biological explanations may underlie a multiple aneuploidy result on NIPT. These include, but are not limited to:
  - Multiple aneuploidy in the pregnancy
  - Single aneuploidy in the pregnancy
  - Maternal benign or malignant tumor
  - Maternal aneuploidy or other chromosomal change
- Specialized genetic tests such as karyotyping, fluorescence in situ hybridization (FISH), qPCR and microarray are available to confirm the presence of multiple aneuploidies.
- These confirmatory tests are generally performed on cells from chorionic villus sampling (CVS) or amniocentesis during pregnancy, on cord blood or peripheral blood sample after the baby is born, or on products of conception (POC) in case of a miscarriage. Sometimes, maternal chromosome testing may be needed to confirm maternal aneuploidy or chromosomal change.
- NIPT results of multiple aneuploidies have been linked to occult maternal benign and malignant tumors.[5-9]
- Ultrasound evaluation may be useful in aiding with a prenatal diagnosis of multiple aneuploidies, but a normal ultrasound can not exclude this condition.

The information provided in this sheet is based on literature search performed on 11/28/16. This Information Sheet is intended to provide some general overview of the key issues relating to its subject matter. This sheet is not intended to be an exhaustive discussion of the subject covered by the sheet nor should it be used to substitute for the exercise of a Clinical Laboratory or a Healthcare Provider's legal or professional duties relative to interpreting the test results to which this Information Sheet relates. This sheet is also not intended to serve as a recommendation of management. This sheet is not intended to be a substitute for genetic counseling.

References:

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Additional Source:

Snyder H, Curnow KJ, Bhatt S, Bianchi DW. Follow-up of multiple aneuploidies and single monosomies detected by noninvasive prenatal testing: implications for management and counseling. *Prenat Diagn.* 2016;36:203-209.