

# General information about positive NIPT results

**My patient's NIPT is positive for XXY syndrome (Klinefelter syndrome). What does this mean?** Your patient's NIPT result suggests the presence of an extra copy of the X chromosome. NIPT is a screening test; false positives can occur. The actual chance for the pregnancy to have XXY syndrome depends on many factors, including the patient's clinical and family history.

**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."<sup>1</sup> Confirmation prior to birth can also help with pregnancy and neonatal management.

Please see below for more information about XXY syndrome and additional resources.

**What is XXY syndrome?** XXY syndrome is a condition that is caused by a male having an extra copy of the X sex chromosome (two copies of the X chromosome and one copy of the Y chromosome rather than the usual one copy of each).

**What are the features of XXY syndrome?** XXY syndrome is likely to result in livebirth. Males with XXY syndrome have variable phenotypes. Some of the common features of XXY syndrome include learning disabilities, delayed speech and language development, taller stature, hypogonadism, and risk of infertility.

**What is the prevalence of this condition?** Approximately 1 in 600 males are born with XXY syndrome. This condition usually happens by chance and can be associated with advanced maternal age.

## What testing could be considered?

- Specialized genetic tests such as karyotyping, fluorescence in situ hybridization (FISH), qPCR and microarray are available to confirm the presence of XXY syndrome.
- 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.
- Ultrasound evaluation is not expected to be useful in aiding with a prenatal diagnosis of XXY syndrome, as ultrasound is usually normal. A normal ultrasound cannot exclude this condition.

## Resources for XXY syndrome

Genetics Home Reference -

<http://ghr.nlm.nih.gov/condition/klinefelter-syndrome>

National Organization for Rare Disorders -

<https://rarediseases.org/rare-diseases/klinefelter-syndrome/>

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.

### Reference:

- American College of Obstetricians and Gynecologists. Screening for fetal aneuploidy. Practice Bulletin No. 163. *Obstet Gynecol.* 2016;127:e123-e137.

### Additional Sources:

Gardner RJM, Sutherland GR, Schaffer LG. *Chromosome Abnormalities and Genetic Counseling*. 4th ed. New York, NY: Oxford University Press; 2012.

Jones KL. *Smith's Recognizable Patterns of Human Malformation*. 5th ed. Philadelphia, PA: W.B. Saunders Company; 1997.