

CENTOGENE
THE RARE DISEASE COMPANY

CentoScreen[®]

THE EARLIEST STEP TO
RESPONSIBLE FAMILY PLANNING





The American College of Obstetricians and Gynecology recommends offering carrier screening to all pregnant women or couples considering pregnancy.¹

What is carrier screening?

Carrier screening is a genetic test used to determine if a healthy person is a carrier of a recessive genetic disease. The goal of carrier screening is to help individuals understand their risks of having a child with a genetic disorder and review the range of options available to guide pregnancy and family planning.

Previous studies have demonstrated that:

- An individual is a carrier of ~2.8 pathogenic variants on average²
- Approximately 1 in 4 (24%) individuals were carriers for at least 1 disorder and 1 in 20 (5.2%) were carriers for multiple disorders (of ~24000 individuals screened for 108 disorders)³
- 1 in 20 (5%) individuals (of 12,000 individuals screened for 3 disorders) were carriers, 88% had no previous family history and 1 in 240 were carrier couples with increased risk of having a child with a disorder⁴

Recent Committee Opinions from the American College of Obstetricians and Gynecology recommend carrier screening to be offered to all pregnant women or couples considering pregnancy. They also recommend pan-ethnic and expanded carrier screening in addition to just ethnicity-based carrier screening^{1,5}.

What is carrier screening at CENTOGENE?

CENTOGENE offers CentoScreen®, the most complete carrier screening test, with 332 genes, to help couples understand their risk of having a child with a recessive genetic disorder.

The 332 disorders were selected based on the following criteria:

1. a high carrier frequency
2. a well-defined phenotype
3. an early onset of disease
4. a highly severe phenotype
5. a severe effect on quality of life
6. the availability of surgical or medical intervention

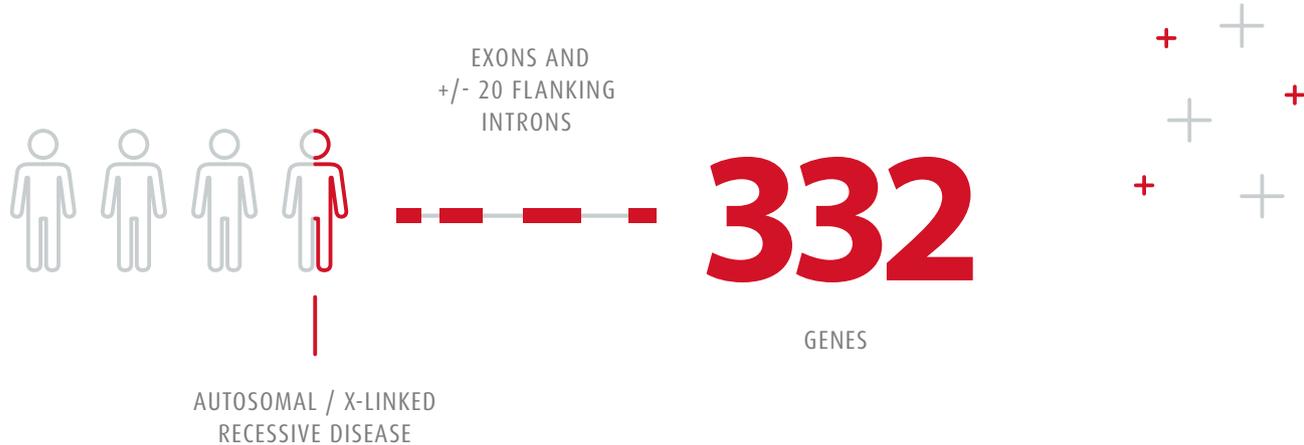
Who can be offered carrier screening with CentoScreen®?

CentoScreen® can be offered to individuals considering pregnancy or during early pregnancy. It is appropriate for:

- Couples without any family history of genetic disease to understand their genetic risks
- Couples with a family history of or previous child with genetic disease
- Couples from regions with high consanguinity
- Couples from ethnicities with high incidence of certain genetic diseases

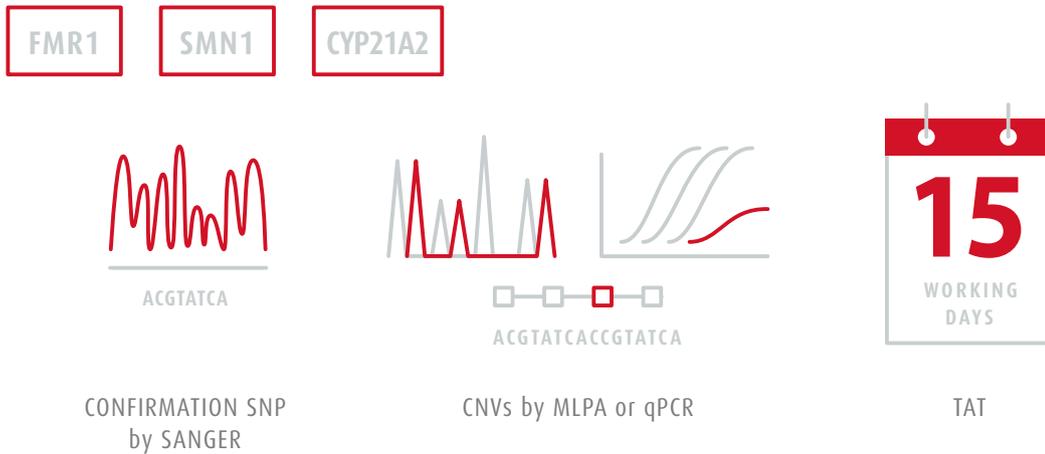
Carrier screening performed before pregnancy will allow you to provide your patients with a broader range of options consistent with their values and offer them more time to make an informed decision.

For the complete, up-to-date list of genes and genetic diseases covered by CentoScreen® refer to:



Why choose CentoScreen® for your patients?

- Comprehensive carrier screening panel targeting most relevant autosomal and X-linked recessive diseases
- Full gene sequencing of coding regions +/- 20 flanking intronic bases of 332 genes
- Integrated copy number variation (CNV) reporting for 34 genes where high frequency of structural variants have been reported
- Covers most relevant disease-causing variants from HGMD®, including deep intronic variants, and proprietary CentoMD® variants

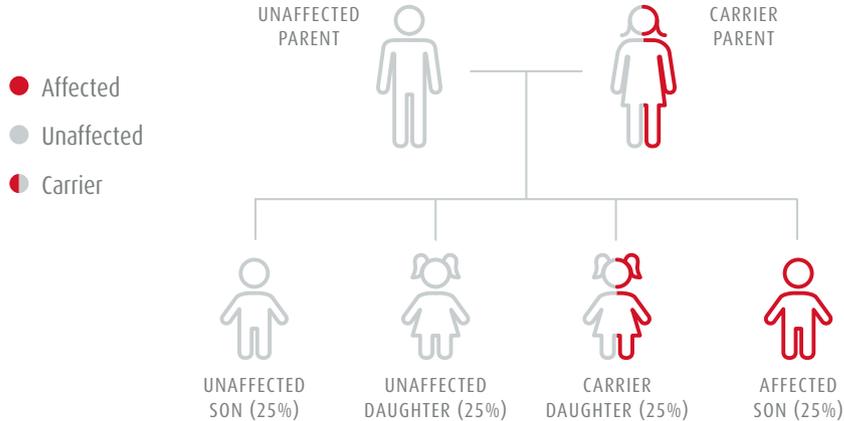


- Additional analyses for fragile X syndrome, spinal muscular atrophy, and congenital adrenal hyperplasia (FMR1, SMN1 and CYP21A2 genes respectively)
- $\geq 99\%$ of targeted genes covered at $\geq 20x$ sequenced by next generation sequencing
- Low quality single nucleotide variants (SNVs) and all relevant deletion/insertion variants are confirmed by sanger sequencing or MLPA/qPCR prior to reporting
- Turnaround time: 15 working days
- Sample required: 1ml EDTA blood or 1 CentoCard® (10 drops of blood)

Risk counseling for couples/patients who test positive

X-LINKED RECESSIVE DISORDER

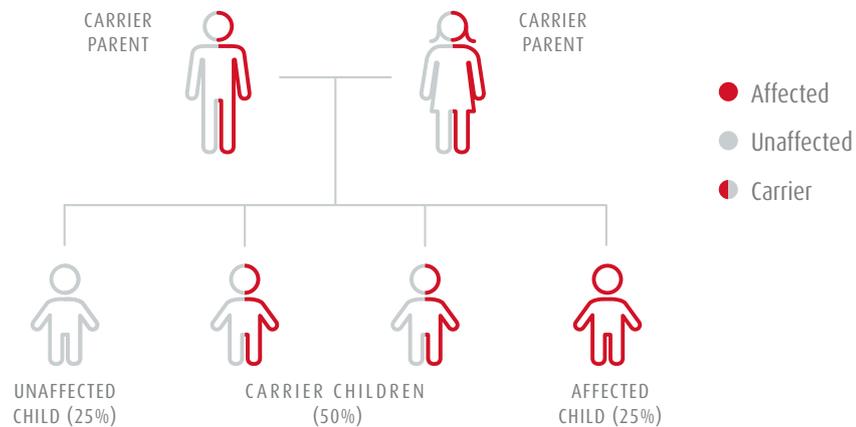
In an X-linked recessive disorder, if the mother is a carrier, there is a 25% chance that she will have an affected male child in each pregnancy:



- There is a 1/2 (50%) chance that the child is a male or female who is healthy with a normal copy of a particular gene
- There is a 1/4 (25%) chance that it is a healthy carrier female child or a mildly affected female child
- There is a 1/4 (25%) chance that it is an affected male with only one mutated copy of the gene

AUTOSOMAL RECESSIVE DISORDER

In an autosomal disorder, if both parents are carriers for the same genetic disease, there is a 25% chance of having an affected child (irrespective of gender) in each pregnancy:



- There is 1/4 (25%) chance that the child will be born with an autosomal recessive disorder. The child will have inherited two changed mutated genes, one from each parent
- There is 1/2 (50%) chance that the child will be a carrier like the parents, but will not have any symptoms. The child will have inherited one normal gene and one mutated gene
- There is a 1/2 (50%) chance that the child will not inherit the defected gene with a change (mutation) from either parent. This child will not be a carrier and will not be affected by the disorder

How do I order CentoScreen® and receive the results?

Depending on your patients' needs, different CentoScreen® ordering options are available.

	CENTOGENE products	DESCRIPTION
INITIAL ANALYSIS	CentoScreen® SOLO	Complete Panel Evaluation for 1 Patient
	CentoScreen® Paired PACK	Complete Panel Evaluation + risk gene analysis partner
	CentoScreen® DUO	Complete Panel Evaluation for 2 Patients



1.

Download request form to order CentoScreen®



2.

Draw and ship blood sample or or spot blood on our easy-to-use CentoCard®



3.

Sample arrives at the lab and DNA is extracted and analyzed



4.

Test report is created and shared as a download via CentoPortal®

If you are already ordering our non-invasive prenatal testing CentoNIPT® for your patients, carrier screening via our CentoScreen® test may also be relevant to your patients.

What types of results are reported?

Genetic counseling, both before and after CentoScreen®, is essential to help couples understand the results of the test, its implications and the options available. CENTOGENE will report pathogenic (class 1) and likely pathogenic (class 2) variants with strong evidence supporting pathogenicity.

If your patient is identified as a carrier of one or more genetic diseases, then testing is recommended for the partner. If the partner is also identified as a carrier for the same genetic disease, then this couple is at risk to have a child with the disease and will need genetic counseling about the disease and their options.

If the couple opts for prenatal testing in the future for the particular genetic disease, this can be performed at CENTOGENE with a short turnaround time of 10 business days. This will help you and your patients plan further steps together for the management of the pregnancy.

It is important to note that couples can be carriers for diseases other than those tested by CentoScreen® as the list of genes and diseases tested is not exhaustive.

This test may also inform you and your patients of a genetic condition they have and may require medical follow-up. This includes testing of late-onset autosomal dominant inherited conditions.

Reference

- ¹ Committee Opinion No. 690. American College of Obstetricians and Gynecologists. (2017) *Obstet Gynecol.*129:e35–40
- ² Bell CJ, et al. (2011) *Sci Transl Med.*3(65):65ra4
- ³ Lazarin et al. (2013) *Genet Med.*15(3):178-86
- ⁴ Archibald et al. (2017) *Genet Med.* doi:10.1038/gim.2017.134
- ⁵ Committee Opinion No. 691. American College of Obstetricians and Gynecologists. (2017) *Obstet Gynecol.*129:e41–55

Your partner of choice

For further information and support, please contact our closest representative or our customer support team, easily accessible by phone or email.

www.centogene.com

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Following GLP and GMP guidelines.

