WOMEN'S HEALTH AND GENETICS

Inheritest® Carrier Screen

Comprehensive insights for every reproductive journey

labcorp

Advancing patient care through a comprehensive continuum of testing, workflow solutions and expert support

More than ever, carrier screening is about early awareness, empowerment and access for all in order to prepare for the future. With continuing advancements in treatment options, comprehensive knowledge can significantly enhance family planning and neonatal care.

Inheritest Carrier Screen is part of a comprehensive offering for preconception to prenatal and from screening to diagnosis. Whether it's clinical testing or complex genetics, Labcorp can fully support your practice to save time and optimize patient care.

The case for broad, ethnic-neutral carrier screening

- "Carrier screening paradigms should be ethnic and population neutral and more inclusive of diverse populations..."[1]–American College of Medical Genetics and Genomics (ACMG)
- Carrier screening for spinal muscular atrophy, in addition to cystic fibrosis "should be offered to all women who are considering pregnancy or are currently pregnant."[2]–American College of Obstetricians and Gynecologists (ACOG)
- Approximately 1% to 2% of all couples are at risk for having a child affected with a severe recessive genetic disorder[3]

Beyond ethnicity and family history

The absence of family history for genetic disease is not an indicator of decreased risk for having an affected child. For example, more than 80% of infants with CF are born to families with no prior family history.[4]

People may not know their family history or ethnic background[5]

Everyone carries 3 to 5 variants, which, if passed along in a pregnancy, could lead to a genetic disorder[6]

Comprehensive options for provider-patient shared decision making

With multiple ethnic-neutral and multi-ethnic panel options, Inheritest Carrier Screen reflects the evolving needs of providers, patients, and the latest society recommendations.

Panel	Gene Count
Inheritest CF/SMA Panel–Screens for cystic fibrosis and spinal muscular atrophy, two of the more common genetic disorders recommended for general population carrier screening by medical societies[2]	2
Inheritest Core Panel–Screens for cystic fibrosis, spinal muscular atrophy and fragile X syndrome, some of the more common genetic disorders	3
Inheritest 14-gene Panel–Includes disorders associated with ethnicity listed in the ACOG recommendations	14
Inheritest High Frequency Panel–110 of the genes included in the ACMG Tier 3 category (≥ 1/200 carrier frequency)	110
Inheritest 100 PLUS Panel–Includes analysis of more than 100 clinically relevant genetic disorders	143
Inheritest 300 PLUS Panel–Covers more than 300 clinically relevant genetic disorders, including all the genes in the 14-Gene and 100 PLUS Panels as well as additional genes in the American College of Medical Genetics and Genomics (ACMG) Tier 3 category, focusing on high-frequency disorders	350
Inheritest 500 PLUS Panel–Coverage of more than 500 clinically relevant genetic disorders	578

Visit **womenshealth.labcorp.com/providers/carrier-screening/customize-carrier-screening-panel** to learn more about our panel customization options and process. NOTE: Establishing and maintaining a custom panel is in Labcorp's sole discretion.

Clinically relevant gene coverage

More than 500 disorders covered by Inheritest were thoughtfully selected by our clinical and scientific team, taking into consideration:

- ACOG and ACMG society guidance and practice resources
- Inclusion of known recessive and X-linked genes causing each disorder
- Disorders that can affect quality of life, require medical management, decrease life expectancy
- Disorders that may be severe and of early onset, degenerative and progressive, cause intellectual disability, loss of vision/eye problems, deafness/hearing loss
- Metabolic disorders that may benefit from early medical intervention

Cutting-edge science and methodology

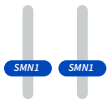
Advanced sequencing technology and appropriate confirmations for greater accuracy

- Full-gene sequencing with greater than 99% detection rates for most genes, and deletion/duplication analysis (copy number variant (CNV) calling)
- Positive results are confirmed with an orthogonal technology consistent with ACMG guidelines to deliver optimal sensitivity and specificity

Enhanced SNP analysis to identify patients at risk to be silent (2+0) SMA carriers

- Potential identification of more couples at risk for having a child with SMA[7]
- Enhanced residual risk estimates to inform genetic counseling and support patient education[7]
- Improved prenatal and neonatal management, including early diagnosis and early referral for new therapies

***SMN1* Gene in Normal and Carrier States**



Non-Carrier

2 copies of *SMN1*, each on a different chromosome

SMA Carrier

1 copy of *SMN1* on one chromosome and 0 copies of *SMN1* on other chromosome

SMA Silent Carrier

2 copies of *SMN1* on the same chromosome

One fast result for fragile X risk assessment

Fast turnaround time for a complete and final fragile X result with both CGG and AGG repeats reported

Inheritest Carrier Screen lab report including a final CGG/AGG fragile X result (when appropriate)

2-3 weeks

Continuity of care and streamlined workflows

Comprehensive partner testing– GeneSeq PLUS

If your patient's result is positive, a comprehensive analysis of a requested gene can be performed for the partner.

- This analysis, recommended by ACMG,[1] helps identify more carriers and a greater number of potentially at-risk pregnancies compared to panel testing
- Available for most genes in the Inheritest panels*‡
- Reports variants including pathogenic, likely pathogenic, variants of uncertain significance (VUS), and deletions and duplications, contributing to high detection rates
- Screening in the presence of family history
- Can be ordered with or without VUS based on provider and patient preference

Multiple reporting options

Includes partner reflex to GeneSeq PLUS**. We will hold partner's specimen until patient's result is available

Prenatal diagnosis

End-to-end continuum of patient care saves time and reduces anxety. Once an at-risk pregnancy is identified, prenatal diagnostic testing is available for any of the disorders in the Inheritest panels, to deliver insights regarding the baby's condition.

* Available for all disorders on Inheritest except SMA. Please order Spinal Muscular Atrophy (SMA) for follow-up partner testing.

‡ Full-gene sequencing for alpha thalassemia (HBA1/HBA2) and congenital adrenal hyperplasia (CYP21A2) is not currently available. Gene-specific sequencing can be ordered and the analysis will be targeted to specific pathogenic variants.

** Reflex to GeneSeq (Test No. 482595) has to be ordered for the partner via a separate TRF/EMR order. The partner's name and date of birth (DOB) need to be provided to the lab on both the patient's and partner's order.

Supporting your practice

Physician services and ease-of-use solutions help to streamline your workflow, saving valuable time so you can focus on your patients.

Connectivity solutions–Interfaces with over 600 EMR/LIS solutions to help your practice with test ordering and results delivery.

Results reporting–14-21 day turnaround time (from date of sample pickup).

Labcorp Link™–View, share, manage and analyze lab results—anytime, anywhere.

Diagnostic Assistant–Provides the most complete view of a patient's lab results history while delivering actionable, evidence-based guidelines and lab-based clinical insights to facilitate informed clinical decision-making and improved patient care.

Supporting your patients

Patients can benefit from our network of genetic counseling services, broad managed care coverage, and convenience options for sample collection as well as educational resources and out-of-pocket cost transparency.

More than 2,000 patient service centers–for convenient access to specimen collection sites including select Walgreens locations. Convenient home diagnostic test collection service in collaboration with Getlabs.

Extensive in-network coverage–Labcorp is in network with most major health plans, helping your patients maximize their benefits and save on out-of-pocket costs. Based on our internal billing data, most patients pay $0.

Genetic counseling–a national network of over 100 board-certified and state-licensed genetic counselors dedicated to patient care. Visit our online scheduler at womenshealth.labcorp.com or call 855-422-2557.

iGeniE–our innovative digital assistant is designed to help simplify your process for pre-test education and delivering Inheritest carrier screening results to your patients.

Patient Engagement Program–individualized support to help patients understand their insurance and out-of-pocket costs. We have flexible programs to meet individual patient needs because we believe our tests should be accessible for all. Send your patients to womenshealth.labcorp.com/estimatemycost or have them call us toll-free (within the U.S.) 844-799-3243. We will take it from there.

For over 25 years, we have been supporting patient needs through genetic counseling.

Genetic counseling is an integral part of the services we provide. With our national network of board-certified and state-licensed genetic counselors and medical geneticists, we provide accessibility to genetics expertise and a broad range of services tailored to your practice and your patients.

Your time with patients is precious. We can help by supporting your patients' educational and counseling needs with access to our genetic counselors, patient education videos on genetics and telegenetic counseling services. To learn more, call **855-GC-CALLS (855-422-2557)**.

Inheritest Panel List

Inheritest CF/SMA Panel (2 Genes)
Cystic fibrosis (CFTR)
Spinal muscular atrophy (SMN1)

Inheritest Core Panel (3 Genes)
Cystic fibrosis (CFTR)
Fragile X syndrome (FMR1)
Spinal muscular atrophy (SMN1)

Inheritest 14-gene Panel (14 Genes)
Alpha-thalassemia (HBA1, HBA2)
Beta-hemoglobinopathies, includes sickle cell disease and beta-thalassemias (HBB)
Bloom syndrome (BLM)
Canavan disease (ASPA)
Cystic fibrosis (CFTR)
Familial dysautonomia (ELP1)
Fanconi anemia (FANCC)
Fragile X syndrome (FMR1)
Gaucher disease (GBA)
Mucolipidosis type IV (MCOLN1)
Niemann-Pick disease types A and B (SMPD1)
Spinal muscular atrophy (SMN1)
Tay-Sachs disease (HEXA)

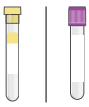
Inheritest High Frequency Panel (110 Genes)	
3-Methylcrotonyl-CoA carboxylase deficiency (MCCC2)	Cerebrotendinous xanthomatosis (CYP27A1)
Achromatopsia (CNGB3)	Ciliopathies (CEP290)
Adrenoleukodystrophy, X-linked (ABCD1)	Congenital adrenal hyperplasia (CYP11A1, CYP21A2)
Aicardi-Goutières syndrome (RNASEH2B)	Congenital adrenal hypoplasia, X-linked (NR0B1)
Alpha-thalassemia (HBA1, HBA2)	Congenital disorders of glycosylation (PMM2)
Argininosuccinic aciduria (ASL)	Congenital hydrocephalus 1 (CCDC88C)
Aspartylglucosaminuria (AGA)	Congenital myasthenic syndrome (CHRNE)
Atransferrinemia (TF)	Cystic fibrosis (CFTR)
Autoimmune polyglandular syndrome type 1 (AIRE)	Deafness and hearing loss, nonsyndromic (GJB2)
Bardet-Biedl syndrome (BBS1, BBS2)	Developmental and epileptic encephalopathy (ARX)
Basal ganglia disease, biotin-thiamine-responsive (SLC19A3)	Dihydrolipoamide dehydrogenase deficiency (DLD)
Beta-hemoglobinopathies, includes sickle cell disease and beta-thalassemias (HBB)	Donnai-Barrow syndrome (LRP2)
Beta-ketothiolase deficiency (ACAT1)	Dystrophic epidermolysis bullosa (COL7A1)
Biotinidase deficiency, profound and partial (BTD)	Dystrophinopathies, including Duchenne and Becker muscular dystrophy and X-linked cardiomyopathy (DMD)
Bloom syndrome (BLM)	Ehlers–Danlos-like syndrome (TNXB)
Canavan disease (ASPA)	Ellis-van Creveld syndrome (EVC2)
Carnitine palmitoyltransferase II deficiency (CPT2)	Fabry disease (GLA)
Cerebral creatine deficiency syndromes (SLC6A8)	Factor IX deficiency (hemophilia B) (F9)

Inheritest High Frequency Panel (110 Genes) *(Continued)*	
Familial dysautonomia (ELP1)	Niemann-Pick disease types A and B (SMPD1)
Familial hemophagocytic lymphohistiocytosis (PRF1)	Oculocutaneous albinism (OCA2, TYR)
Familial hyperinsulinism (ABCC8)	Opitz G/BBB syndrome (MID1)
Fanconi anemia (FANCC)	Ornithine transcarbamylase deficiency (OTC)
Fragile X syndrome (FMR1)	Pelizaeus-Merzbacher disease (PLP1)
Fraser syndrome (GRIP1)	Pendred syndrome (SLC26A4)
Galactosemia (GALT)	Phenylalanine hydroxylase deficiency, includes phenylketonuria (PKU) (PAH)
Gaucher disease (GBA)	POLG-related disorders (POLG)
Glycogen storage disease type I (G6PC1, SLC37A4)	Polycystic kidney disease, autosomal recessive (PKHD1)
Glycogen storage disease type IV (GBE1)	Pompe disease (GAA)
Hereditary fructose Intolerance (ALDOB)	Pontocerebellar hypoplasia (RARS2)
Hermansky-Pudlak syndrome (HPS1, HPS3)	Primary hyperoxaluria (AGXT)
Homocystinuria (CBS)	Primary microcephaly (MCPH1)
Hypophosphatasia (ALPL)	Pulmonary surfactant metabolism dysfunction (ABCA3)
Joubert syndrome and related disorders, including Meckel-Gruber syndrome (AHI1, CC2D2A, TMEM216)	Retinitis pigmentosa (DHDDS, RPGR)
Juvenile retinoschisis, X-linked (RS1)	Schindler disease (NAGA)
L1 syndrome (L1CAM)	Short-rib thoracic dysplasia (DYNC2H1)
Limb-girdle muscular dystrophy (FKRP)	Smith-Lemli-Opitz syndrome (DHCR7)
Maple syrup urine disease (BCKDHB)	Spinal muscular atrophy (SMN1)
Medium-chain acyl-CoA dehydrogenase (MCAD) deficiency (ACADM)	Spinocerebellar ataxia 10 (ANO10)
Megalencephalic leukoencephalopathy with subcortical cysts type 1 (MLC1)	Sulfate transporter-related osteochondrodysplasias, includes achondrogenesis type 1B, atelosteogenesis type 2, diastrophic dysplasia, and recessive multiple epiphyseal dysplasia (SLC26A2)
Metachromatic leukodystrophy (ARSA)	Tay-Sachs disease (HEXA)
Methylmalonic acidemia (MMUT)	Trimethylaminuria (FMO3)
Methylmalonic acidemia with homocystinuria (MMACHC)	Tyrosinemia type I (FAH)
Mevalonate kinase deficiency (MVK)	Usher syndrome (hearing loss and retinitis pigmentosa) (CLRN1, PCDH15, USH2A)
Mitochondrial complex deficiency (SCO2)	Very long-chain acyl-CoA dehydrogenase (VLCAD) deficiency (ACADVL)
Mucolipidosis type II and III (GNPTAB)	Vitamin D-dependent rickets (CYP27B1)
Mucolipidosis type IV (MCOLN1)	Walker-Warburg syndrome and other FKTN related dystrophies (FKTN)
Mucopolysaccharidosis type I (IDUA)	Wilson disease (ATP7B)
Myotonia congenita (CLCN1)	Xeroderma pigmentosum (ERCC2, XPC)
Nemaline myopathy (NEB)	
Nephrotic syndrome (NPHS1)	

To view all available panels and disorders included in Inheritest Carrier Screen, please visit **womenshealth.labcorp.com/providers/carrier-screening/inheritest-panels**

Test/Panel Name	Test No.
Inheritest® CF/SMA Panel	**481758**
Inheritest® Core Panel	**481776**
Inheritest® 14-gene Panel	**481797**
Inheritest® High Frequency Panel	**481816**
Inheritest® 100 PLUS Panel	**481855**
Inheritest® 300 PLUS Panel	**481874**
Inheritest® 500 PLUS Panel	**481893**
GeneSeq® PLUS	**482370**
GeneSeq® PLUS, Fetal Analysis	**482389**
Targeted Variant Analysis	**482552**
Targeted Variant, Fetal Analysis	**482534**
Partner Reflex to GeneSeq®	**482595**
GeneSeq® PLUS, *ATP7B (Wilson disease)*	**482424**
GeneSeq® PLUS, *CFTR (Cystic fibrosis)*	**482449**
GeneSeq® PLUS, *DMD (Dystrophinopathies)*	**482466**
GeneSeq® PLUS, *GALT (Galactosemia)*	**482483**
GeneSeq® PLUS, *MEFV (Familial Mediterranean fever)*	**482500**
GeneSeq® PLUS, *HEXA (Tay-Sachs disease)*	**482884**

Specimen requirements:



- **Blood**: 8.5 mL whole blood in a yellow-top (ACD-A) tube (preferred) or lavender-top (EDTA) tube; yellow-top (ACD-B) tube is not acceptable. Applies to all tests listed above except Fetal Analysis.

- **Saliva**: Saliva specimens are accepted in Oragene®•Dx saliva collection kits. To order saliva kits, please contact your sales representative or Client Services at 800-848-4436.

- **Buccal swab**: Specimens collected using buccal swab kits are accepted. To order buccal swab kits, please contact your sales representative or Client Services at 800-848-4436.

References

1. Gregg AR, Aarabi M, Klugman S, et al. Screening for autosomal recessive and X-linked conditions during pregnancy and preconception: a practice resource of the American College of Medical Genetics and Genomics (ACMG). *Genet Med*. 2021;23(10):1793-1806. doi:10.1038/s41436-021-01203-z.
2. Carrier Screening for Genetic Conditions. Committee Opinion No. 691. American College of Obstetricians and Gynecologists. *Obstet Gynecol*. 2017;129:e41–55.
3. Ropers HH. On the future of genetic risk assessment. *J Community Genet*. 2012;3(3):229-236. doi:10.1007/s12687-012-0092-2.
4. Wildhagen MF, ten Kate LP, Habbema JD. Screening for cystic fibrosis and its evaluation. *Br Med Bull*. 1998;54(4):857-875. doi:10.1093/oxfordjournals.bmb.a011734.
5. Lazarin GA, Haque IS, Nazareth S, et al. An empirical estimate of carrier frequencies for 400+ causal Mendelian variants: results from an ethnically diverse clinical sample of 23,453 individuals. *Genet Med*. 2013;15(3):178-186. doi:10.1038/gim.2012.114.
6. Chong JX, Ouwenga R, Anderson RL, Waggoner DJ, Ober C. A population-based study of autosomal-recessive disease-causing mutations in a founder population. *Am J Hum Genet*. 2012;91(4):608-620. doi:10.1016/j.ajhg.2012.08.007.
7. Luo M, Liu L, Peter I, et al. An Ashkenazi Jewish SMN1 haplotype specific to duplication alleles improves pan-ethnic carrier screening for spinal muscular atrophy. *Genet Med*. 2014;16(2):149-156. doi:10.1038/gim.2013.84.

Continuity of care, pioneering science, professional service

Inheritest is available through Labcorp, which delivers continuity of care for your patients, from carrier screening to noninvasive prenatal screening (NIPS) to prenatal and pediatric diagnostic testing.

We provide the scientific expertise you need and the customer experience patients want.

Call Us
Toll-free (within the US): 800-848-4436

For clinical questions, please contact:
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