Genetic testing services and support, from preconception to prenatal
Carrier screening, once thought to be a test primarily for specific ethnic groups, is now often recommended for every patient. The American Congress of Obstetricians and Gynecologists (ACOG) recently updated its recommendations, stating that carrier screening for spinal muscular atrophy (SMA), in addition to cystic fibrosis (CF), "should be offered to all women who are considering pregnancy or are currently pregnant."¹

**COMPREHENSIVE, VERSATILE, COVERING WHAT MATTERS**

Inheritest® provides carrier screening for more than 110 severe disorders that can cause cognitive or physical impairment and/or require surgical or medical intervention. Selected to focus on severe disorders of childhood onset, and to meet ACOG and the American College of Medical Genetics and Genomics (ACMG) criteria, many of the disorders share a recommendation for early intervention.

Inheritest offers multiple panels to suit the diverse needs of your patients:

<table>
<thead>
<tr>
<th>Panel</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CORE PANEL</strong></td>
<td>Focuses on mutations for CF, SMA, and fragile X syndrome, with the following carrier risks:</td>
</tr>
<tr>
<td></td>
<td>CF: as high as 1 in 24² (varies by ethnicity)</td>
</tr>
<tr>
<td></td>
<td>SMA: as high as 1 in 47³ (varies by ethnicity)</td>
</tr>
<tr>
<td></td>
<td>Fragile X syndrome: approximately 1 in 259 females (all ethnicities)⁴</td>
</tr>
<tr>
<td><strong>SOCIETY GUIDED PANEL</strong></td>
<td>Includes mutations for more than a dozen disorders listed in ACOG and/or ACMG guidelines</td>
</tr>
<tr>
<td><strong>ASHKENAZI JEWISH PANEL</strong></td>
<td>Includes mutations for more than 39 disorders relevant to patients of Ashkenazi Jewish descent</td>
</tr>
<tr>
<td><strong>COMPREHENSIVE PANEL</strong></td>
<td>Includes mutations for more than 110 disorders across 141 different genes—includes all disorders in Core, Society Guided, and Ashkenazi Jewish panels</td>
</tr>
</tbody>
</table>
THE CASE FOR EXPANDED CARRIER SCREENING

While some providers may only screen for CF or select screening based on ethnicity, the case for more comprehensive screening is becoming clear. According to a bulletin from the World Health Organization, the global prevalence at birth of all single-gene disorders is about 10 per 1000.5

Our internal laboratory data also supports the case for more comprehensive screening. In screening over a thousand patients with the Comprehensive panel, our data showed that focusing only on disorders listed in ACOG/ACMG guidelines can result in a significant number of missed carriers6 (see figure 1).

Of the disorders a Comprehensive panel can identify:*  

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>113</td>
<td>can result in severe early onset, increased childhood mortality, or shortened lifespan</td>
</tr>
<tr>
<td>77</td>
<td>may cause intellectual disability</td>
</tr>
<tr>
<td>77</td>
<td>are metabolic disorders that may have treatment benefit with early medical intervention</td>
</tr>
<tr>
<td>62</td>
<td>may cause loss of vision/ eye problems in affected individuals—early identification could be beneficial</td>
</tr>
<tr>
<td>39</td>
<td>may cause deafness/ hearing loss—early identification could be beneficial</td>
</tr>
<tr>
<td>5</td>
<td>are X-linked, meaning only the mother has to be a carrier for the child to be at risk</td>
</tr>
</tbody>
</table>

Some disorders will have characteristics of multiple categories.

ANCESTRY AND FAMILY HISTORY CAN BE A MYSTERY

An absence of disorders in a patient’s family can be an insufficient guide for targeted screening. For example, more than 80% of infants with CF are born to families with no prior family history.7 In addition, early studies estimated that each person carries three to five mutations, which, if passed along in a pregnancy, could lead to a genetic disorder.8

BEYOND NGS TO DELIVER GREATER ACCURACY

Inheritest Carrier Screen uses next-generation sequencing (NGS)* to capture a broad spectrum of mutations, including rare variants, with Sanger sequencing run to confirm positive results and deliver optimal sensitivity and specificity.

FOCUSED PARTNER TESTING

If your patient’s result is positive, Integrated Genetics can offer her partner full gene sequencing for any autosomal recessive gene in the Inheritest panels (except SMA, for which we offer partners SMN1 copy number analysis).

Full gene sequencing detects disease-causing variants as well as variants of uncertain significance, to identify a greater number of at-risk pregnancies.

PRENATAL DIAGNOSIS

Additionally, once an at-risk pregnancy is identified, we can perform mutation-specific prenatal diagnostic testing—for any of the disorders in the Inheritest panels—to deliver insights regarding the baby’s condition.

Where some testing service providers are unable to offer single gene testing, VUS identification, or prenatal diagnosis—sometimes resulting in time-consuming retesting—Integrated Genetics offers a continuum of care for patients that can both save time and reduce anxiety.

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*Based on information on the relevant disorders compiled from Genetics Home Reference and GARD.5,10

*Next-generation sequencing is used for the Comprehensive, Ashkenazi Jewish, and Society Guided panels. For all panels, PCR with reflex to Southern blot is used for fragile X syndrome analysis, and quantitative PCR analysis is used for SMA analysis. While all panels include CF analysis, the Core panel uses a bead-based array that identifies 97 common CF mutations.
A continuity of care, pioneering science, professional service

Inheritest is available through Integrated Genetics, which delivers a continuity of care for your patients, from carrier screening to noninvasive prenatal testing (NIPT, also known as cfDNA testing) to diagnostic testing.

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

RAPID RESULTS

Samples have a typical turnaround time of 14 calendar days after a test arrives at our lab.

EXTENSIVE MANAGED CARE CONTRACTS

Help patients maximize their benefits.

CONVENIENT BLOOD DRAWS

We have a nationwide network of patient service centers, allowing for convenient access to sample collection. Visit www.LabCorp.com to find your nearest location.

GENETIC COUNSELING

Patients with a positive test result may be offered counseling, and Integrated Genetics offers the largest national commercial network of genetic counselors to help inform and support patients.

REFERENCES

6. Internal data from 2,501 specimens reported between 2/2/16 and 12/14/16.