Patients Tap Physicians And Community Hospitals To Access Genetic Testing:

*Demand Soars As Consumers Want To Know*

Trisha Brown, MS, CGC  
Vice President, Clinical Affairs  
DNA Direct  
April 29, 2010

**Agenda**

- Consumer Interest in Genetic Testing  
  - What is driving it?  
  - Barriers for consumers and physicians

- Integrating Genomic Medicine  
  - DNA Direct’s Solutions
DNA Direct Overview

Our Mission:

To bring the power of personalized medicine to patients, providers, and payors – reducing health risks, preventing disease, and better targeting therapies

Disclosure: Employee of DNA Direct, DNA Direct’s products reviewed.

Consumer Interest in Genetic Testing
Consumer Interest in Genetic Testing

- The majority of Americans are interested in genetic testing

<table>
<thead>
<tr>
<th>Why Test?</th>
<th>Approval Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Find new cures or drugs</td>
<td>93%</td>
</tr>
<tr>
<td>Prevent adverse drug reactions</td>
<td>93%</td>
</tr>
<tr>
<td>Identify risk of disease</td>
<td>91%</td>
</tr>
<tr>
<td>Identify risk in offspring</td>
<td>86%</td>
</tr>
<tr>
<td>Identify risk of disease, even if there is no treatment</td>
<td>79%</td>
</tr>
<tr>
<td>For employers to make hiring decisions</td>
<td>19%</td>
</tr>
<tr>
<td>For insurers to decide who to cover</td>
<td>15%</td>
</tr>
</tbody>
</table>


Steps in Genetic Testing

**THE RIGHT PERSON**

*WHY IT MATTERS:* Finding the right people to benefit from genomic medicine can improve disease management and lower healthcare costs.

**THE RIGHT TEST**

*WHY IT MATTERS:* Getting the wrong test can misinform medical decisions and increase healthcare costs.

**THE RIGHT INTERPRETATION**

*WHY IT MATTERS:* Delivers the full value of genetic information and enables physicians to make appropriate management decisions.
Barriers to Genetic Testing

• Lack of healthcare provider knowledge
  • 90% of MDs surveyed want to use genetics, but only 40% are comfortable ordering a genetic test, and 63% have limited or no access to experts

• Lack of Experts
  • Genetic Counselors: MS, certified professionals who assess risk and educate, <2,400
  • Clinical Genetics: MDs, provide genetic diagnostic and therapeutic management, <500

There are only a little over 500 geneticists and 2400 genetic counselors who see patients in the U.S.

Ratio of geneticists to population by state

As a result, genetics is pushed to the PCP, who is often not prepared for genetics
Barriers to Genetic Testing

- No evidence yet that genetic testing has a significant impact on preventing or treating common, chronic disease
  - Chronic disease affects >50% of the US population, and accounts for ~75% of the total healthcare spend

- Adoption of standards into clinical practice can lag by over a decade
  - In one study, only 32% of eligible women had her2 neu testing
  - Across studies, only 30-55% of eligible patients are prescribed warfarin

Balas & Boren, (2000) Yearbook of Medical Informatics pp 65-70

Barriers to Genetic Testing

- Patient non-compliance
  - Only 20-30% of people recommended to have colon cancer screening do it

  - 30% of people with adenomatous polyps do not return for follow up colonoscopy

  - By 6 months of therapy initiation, up to 55% of people stop taking their cholesterol medications

Integrating Genetic Testing

- In order for personalized medicine to progress as many US researchers want it to, it will require a more focused commitment from better informed federal agencies, smarter collaborations across public and private sectors, bigger studies and bolder science, and intelligent changes in the healthcare system overall”

- Francis Collins, January 2009
DNA Direct Solutions

Proprietary Technology Architecture Unique to Genetics + National Call Center of Genetic Experts

Access to Experts

Genetic Expert Call Center
Delivering Genetic Expertise at Every Step

Key Specialties:
- Cardiology
- Gastroenterology
- Obstetrics
- Oncology
- Pharmacogenomics
- Psychiatry
- Neurology

Centralized Call Center Management Aims:
- Custom business rules
- Clinical protocol management
- Caller & record metrics
- Performance analytics
Physician Education

Provider Portal Concept

Secure portal to access comprehensive tools and resources

Preauthorization wizard

Latest news and updates on tests and technology

CME sessions and forum for physicians

DNAdirect

Patient Education

Patient Portal Concept

Genomics 101 developed for consumer audience

Clinical Decision support tools to help understand test appropriateness

Multimedia videos and testimonials as a learning tool

Immediate access to genetic experts

DNAdirect
Patient Decision Support

Customizes content based on family and medical history

Integrates video to share patient stories and perspectives

Enables exploration of various decision options

Explains possible next steps based on test results

Testing Options for Hereditary Breast & Ovarian Cancer

Getting Started

This is an educational tool to help you decide if your personal and family history meets the criteria for genetic testing for inherited breast and ovarian cancer caused by the BRCA 1 and 2 genes. If you meet the criteria for testing, the tool will walk you through the pros and cons of testing to help you determine if this is the right time for you to seek testing, and help you understand the best test to consider.

Begin Step 1

Other Companies

Get genetic testing and counseling from a trusted source. Learn More.
Analysts and Consultants Recommending Community Hospital Model as Differentiator
Implementations

Virtual Medical Genetics Center

Strategizing the Division of Labor
Hospital Positioned as a “Virtual Shepherd of Services”

- DNA Direct
  - Provides web-enabled educational resources, decision support to physicians, helps physicians select appropriate tests
  - Connects patients with board-certified genetic counselors through a national call center
  - Educates patients about genomic medicine, genetic conditions

- Genomic Medicine Institute
  - No Conflict of Interest
  - GWAS and cancer genetics research
  - Physician training in genomics

- Laboratory
  - Hospital-directs patients to contract directly with labs to undergo testing
  - Offers genetic testing in eight specialties, including: cardiology, gastroenterology, psychiatry, oncology, genomics and obstetrics; additional applications to be added across the year

Source: DNA Direct: Strategies of Success
Bridging the gaps between Physician and Patient

Genomic Evaluation Leads to Health Management Plan
Linking Hospital Physicians with DNA Direct’s Genetic Counseling Services

- Physician clicks “Refer a Patient for Counseling” link on [El Camino website]
- Genetic counselor from DNA Direct calls patient within 24 hours to schedule session
- Genetic counselors available in various specialties
- Phone-based genetic counseling sessions conducted
- Testing ordered through physician if appropriate

Additional Services
- El Camino website provides case studies and reimbursement information for each test
- El Camino physicians have unique “1-800” number into DNA Direct’s call center to consult genetic counselors
- Each patient has unique number into DNA Direct’s call center for consultations
- Personalized report, clinical summary provided online
- Separate reports for patient, physician explain test results, provide decision support

Genomic Medicine Institute
Physicians

Refer patients to genetic counseling
Web-based clinical decision support and tools
Key specialty area overviews and guidance for testing
CME education and training

DNAdirect
Genomic Medicine Institute

**Physicians**

- Test Appropriateness Questionnaire
- Test background and use
- Clinical guidelines and evidence
- Controversies and references

Genomic Medicine Institute

**Patients**

- Easy-to-understand result interpretation
- Next steps and actions
- Personalized message from physician
- Letter for family and support physicians

---

**DNAdirect**

---

**Test Summary**

<table>
<thead>
<tr>
<th>Patient</th>
<th>Type</th>
<th>Mutation Analysis</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient 1</td>
<td>Anonymous</td>
<td>Patient 2</td>
<td>01/01/2023</td>
</tr>
<tr>
<td>Patient 2</td>
<td>Test Name</td>
<td>Cystic Fibrosis Mutation Analysis</td>
<td>02/02/2023</td>
</tr>
</tbody>
</table>

Your Cystic Fibrosis Test Results

You have tested for the presence of the most common mutations in the gene for cystic fibrosis (CF). CF is an inherited condition that causes a range of medical complications, mostly involving breathing and digestion. The severity of CF depends on many factors, including which genetic mutations a person has, other genes, and environmental factors.

Your CF genetic test found that you have a single CF mutation called delta F508.

This result means that you are a carrier of cystic fibrosis. Genes come in pairs. This test found that you have a change in only one of your CF genes. In order to have CF, a person must have a change in both copies of the CF gene. CF carriers are healthy people who don’t have symptoms of CF and aren’t at risk to get CF. However, if two CF carriers have children together, each pregnancy has a 25% chance to inherit two CF mutations and have CF. If you are pregnant or planning pregnancy, your partner may want to consider CF carrier screening. Genetic counseling may be considered to discuss these results further.

You reportedly have a family member who either has CF or is a carrier of CF. Based on your family history, you were already at increased risk to be a carrier of CF. Now that you have your test result, you know that this specific mutation is in your family.

Knowing the name of the mutation that you carry will be valuable information for any of your family members who would also like to have CF testing.

**A Message From Your Physician**

Physicians can enter a message for their patients during report creation. If the physician enters this optional message, it will appear here.
Access to DNA Perspectives

Warfarin Response Testing

Comprehensive content to inform the lay person

Call to action: contact physician or learn about genetic counseling

DNAdirect
Over 600 users in a small pilot in 40 practices, patients and physicians very satisfied.

Testimonials

"Just wanted to let you know that I really enjoyed this great experience in learning about such breakthrough technology, and was amazed how it can help human beings’ fundamental but also complex health issues be answered"

-El Camino Hospital Patient

"Instead of referring my patient to another center and making them wait weeks to get in, I can get the information I need and refer patients to DNA Direct for immediate help."

-El Camino Hospital Physician
Medco and DNA Direct
Acquisition - February 2, 2010

Medco

- Rules engines
- Extensive existing customer base
- Pharmacogenomics
- DUR with warnings on over 50 drug-gene interactions
- Personalized Medicine Research Institute
- TRC Pharmacists

DNA Direct

- High touch service model
- URAC-accredited UM programs
- National network of Genetic Counselors
- Patient and physician counseling on test results
- Tools/technology around genomic services

Committed to Personalized Medicine

THANK YOU!

trish@dnadirect.com