AVALON HEALTHCARE SOLUTIONS

June 13, 2021

AVALON'S COVID-19 TESTING AND LAB BENEFIT MANAGEMENT BRIEF

from Avalon Healthcare Solutions

CONTENTS

- GENETICS: A (R)EVOLUTION IN TESTING 2
- INVITATION TO JOIN JUNE 15 WEBINAR..... 3
- EXCERPT FROM THE 2021 AVALON LAB TREND REPORT 4
- AVALON LABORATORY NETWORK COVID-19 CAPACITY & TURNAROUND TIME REPORT 5

Avalon is an expert in lab management with a foundation in science. Clinically-driven lab strategies are transforming lab testing into actionable intelligence for value-driven care. Avalon's core program includes a full delegation of Routine Testing Management, Genetic Testing Management, Independent Laboratory Network Management, and Medical Specialty Rx Management. You can learn more about our impact here and the latest news here.

FOR MORE INFORMATION, PLEASE CONTACT US:

Kerri Fritsch, Chief Client Officer
813-751-3832 | Kerri.Fritsch@avalonhcs.com

Michelle DeCarlo, Regional Director
813-579-1673 Michelle.Decarlo@avalonhcs.com

Joy Harris, Associate Vice President
813-751-3814 | Joydana.Harris@avalonhcs.com

Neill Legg, Regional Director
910-527-5000 | Neill.Legg@avalonhcs.com

Jennifer Lynch, Regional Director
813-751-3893 | Jennifer.Lynch@avalonhcs.com

Sandy Smith, Regional Director
813-733-4799 | Sandra.Smith@avalonhcs.com

Mike Snyder, EVP, Provider Networks
813-751-3834 | Mike.Snyder@avalonhcs.com

GENETICS: A (R)EVOLUTION IN TESTING

On May 26th, V.M. Pratt, Ph.D., the Director of Molecular Genetics and Pharmacogenomics Laboratories at Indiana University, presented recent advances in genetic testing. She discussed innovations, differentiation in gene coverage, and the future of the field.

The Plethora of Genetic Testing Options

Genetic testing can identify changes in genes or chromosomes. These biomarkers are important indications of certain diseases. When a provider suspects gene testing would help narrow down their diagnosis, they order a test. But which genetic test is right for the patient? This is the question providers face as they confront dozens of choices in the form of single-gene tests and multi-gene panels. Another dilemma is the number of genetic tests to order per patient. As Dr. V.M. Pratt explains, on average, providers order two different genetic tests per patient.

Testing (R)evolution

Historically, when laboratories offered genetic testing for inherited and somatic diseases, it was primarily accomplished one gene at a time, known as single-gene testing or Sanger Sequencing. For example, single genes related to cystic fibrosis and the *BRCA1* and *BRCA2* genes for breast cancer could be analyzed for indications of disease.

For many years, much of the consensus for evidence-based genetic testing was in the form of these high-risk, targeted tests. Evidence and guidelines presented the strongest support for targeted gene analyses. Why was this the case? When it came to broader panels, different labs offered high variability in their panels – in other words, there was a lack of standardization among laboratories – and minimal consensus. For panels with dozens of genes offered as proprietary solutions, there were questions on what should be ordered at a minimum, ideal composition, and whether a broad gene testing approach was a value-add. As testing has evolved, the type of testing has accelerated, and companies have offered expanded test options.

Now, cancer tests have evolved to offer hot-spot tumor-specific panels that analyze tumor samples for aberrations. These tests are moving toward whole exome (WES) and whole transcriptome testing, along with whole genome (WGS) testing, the latter of which gives a personalized, clinical account of your entire DNA.

While whole genome testing is not yet considered routine or standard of care, the (r)evolution in testing continues.

The Most Commonly Ordered Genetic Tests & Evidence-Based Guidelines

What are the most ordered genetic tests today? Both hereditary cancer (*BRCA1* and *2*) and neoplasms (genomic tests for staging) are the most frequently ordered genetic tests. For these tests and others, the Clinical Advisory Board (CAB) at Avalon Healthcare Solutions takes a balanced approach to genetic testing, implementing the current evidence-based research and guidelines.

When considering what genes should be included for clinical indications, the CAB begins with three organizations at the forefront of genetic testing guidelines: the National Comprehensive Cancer Network (somatic and tumor testing guidelines), Clinical Pharmacogenetics Implementation Consortium (pharmacogenetics testing guidelines), and GeneReviews® (specific genetic disorders and genes). These guidelines inform decision making and offer the most up-to-date information on patient standard of care.

What percentage of ordered genetic tests do not meet the coverage criteria?

The complexity of genetic testing technologies is further complicated by providers' education on insurance coverage. Many ordered tests do not meet the coverage criteria. For instance, a little over half (56%) of genetic tests ordered by providers do not meet the coverage criteria, Dr. Pratt notes.

Next-Generation Sequencing (NGS)

You may have heard the term "Next-Generation Sequencing" (NGS) when genetic testing is mentioned.

NGS or "massively parallel sequencing" allows us to look at hundreds of molecules at a time or lots of fragments of

DNA in parallel. The wide application of NGS has helped to identify infrequent gene alterations that are a part of cancer diagnosis. Both whole exome sequencing and whole genome sequencing, discussed earlier, fall under the broader umbrella of NGS. Both are commonly done in research settings and are becoming more broadly available in the laboratory testing space.

Hours Spent in Analysis and Interpretation of Molecular Tests for Oncology

But what about the time it takes to "read" or analyze genetic tests? Dr. Pratt says that larger gene sets can take a significantly longer time to analyze, according to recently released research by the Association for Molecular Pathology. A single gene can take an hour to analyze; multiplex PCR can take 2.5 hours, NGS takes approximately 3 hours, and a gene panel of 50+ next-generation sequenced genes can take over five hours to analyze. This illustrates the time-intensive nature of some of these larger panel tests, adding another layer of complexity.

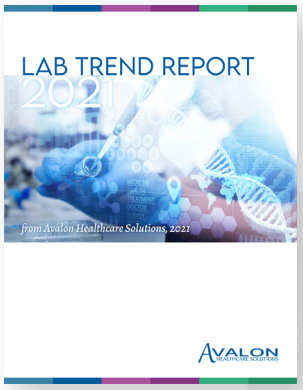
Liquid Biopsy Technologies

One of the other hot-topic areas in genetic research is the liquid biopsy test. With certain types of cancer, cancer cells may slough off DNA into the bloodstream; using liquid biopsy technologies, geneticists can take a sample of blood, isolate it, and perform diagnostic testing to help providers reach a diagnosis. This is an evolving area, and some FDA-cleared tests are available.

The Future: Polygenic Risk Scores and DNA Methylation

Geneticists know that multiple genes at a time can be involved in disease processes, but how do multiple genes in concert cause one disease? Part of the answer is found in DNA methylation. Methylation is the process by which gene expression is controlled through methyl groups being added to the DNA molecule. Along with multiple gene interactions, scientists are researching DNA methylation as it pertains to studying when genes are turned on and off. Dr. Pratt notes that there are a few single-gene tests that consider methylation, but not necessarily the whole methylome (DNA methylation or "on-off profile" of all genes). This area is a current topic of research.

Dr. Pratt concludes by emphasizing the revolutionary aspect of the field of genetic testing today. Genetic testing is a rapidly evolving field. Resources are available to help us understand available gene panels and how they serve as a resource in diagnosis for patients; it is an exciting time to be in healthcare, and in the laboratory benefits space.



EXCERPT FROM THE 2021 AVALON LAB TREND REPORT

MOLECULAR DIAGNOSTICS (MDX) AND GENETIC TESTING

Although they only accounted for 11% of Medicare laboratory testing expenditures in 2015, as a consequence of the substantial financial pressure placed upon CDLTs, the recent goldrush for laboratories has been in the molecular diagnostics (MDx) space.[1] National spending on molecular oncology testing increased from $708 million in 2010 to over $3 billion ($3,037 million, for comparison) in 2017—a compound annual growth rate of 23%.[2] Likewise, Medicare spending on genetic testing has nearly tripled from 2017 to 2019, going from $473 million to $1.36 billion during that span.[3] According to total 2017 allowed charges, the top three defined molecular pathology tests were Cologuard (CPT 81528), Oncotype (CPT 81519), and BRCA 1 & 2 full sequence analysis (CPT 81162). The top three molecular pathology tests in 2020 among Avalon's clients were fetal chromosomal aneuploidy (81420), Cologuard, and cystic fibrosis carrier screening (81220).

As many of the molecular oncology tests that labs bill to Medicare do not have dedicated current procedural terminology (CPT) codes, the molecular oncology CPT code with the second highest allowed charges in 2017 ($116 million) was "unlisted molecular pathology procedure" (81479)—a CPT code that accounted for a mere $4M in allowed charges in 2013.[4] Since this single CPT code could describe hundreds of different tests, there are high administrative costs associated with processing it, which health plans must absorb. As these tests are expensive, complex, and increasingly common, there is a need for an automated approach to pre-certifying them.

Molecular diagnostics are growing at a 23% compounded annual growth rate.

1 Klipp J. U.S. Clinical Laboratory Industry: Forecast & Trends 2018-2020. Laboratory Economics. 2018:8.
2 Klipp J. The US Anatomic Pathology Market: Forecast & Trends 2019–2021. Poughkeepsie NY: Laboratory Economics. 2019:31.
3 Despite Savings on Many Lab Tests in 2019, Total Medicare Spending Increased Slightly Because of Increased Utilization for Certain High-Priced Tests. U.S. Department of Health and Human Services Office of the Inspector General. 2020. https://oig.hhs.gov/oei/reports/OEI-09-20-00450.asp
4 Klipp J. The US Anatomic Pathology Market: Forecast & Trends 2019–2021. Poughkeepsie NY: Laboratory Economics. 2019:32.

WWW.AVALONHCS.COM

AVAILABLE NOW:
INDUSTRY'S FIRST LAB TREND REPORT. CLICK HERE TO REQUEST YOUR COPY.

AVALON LABORATORY NETWORK
COVID-19 CAPACITY & TURNAROUND TIME REPORT

LAB	RT-PCR Y/N	MULTIPLE PLATFORMS	CAPACITY (PER DAY)	TAT
Quest	Y	Y	320,000	1-2 days
LabCorp	Y	Y	275,000	1-2 days
Aegis	Y	Y	110,000	1-2 days
BioReference	Y	Y	100,000	1 day
Premier Medical Lab	Y	Y	100,000	1-2 days
Eurofins-Diatherix	Y	N	60,000	1-3 days
Mako Medical Lab	Y	Y	50,000	1-2 days
GenetWorx	Y	Y	40,000	2 days
AIT (American Institute of Tox)	Y	Y	20,000	1-2 days
PathGroup	Y	Y	20,000	1-2 days
Sonic-CPL	Y	Y	20,000	1-3 days
Genesis DX	Y	Y	16,000	1-2 days
MDL (Medical Diagnostic Lab)	Y	N	12,000	1 day
AccuReference	Y	N	10,000	2 days
LabTech	Y	Y	10,000	2 days
Inform Diagnostics	Y	N	5,000	1-2 days
Luxor	Y	Y	5,000	1 day
Neogenomics	Y	Y	5,000	1-4 days
Transplant Genomics	Y	N	5,000	1-2 days
Precision Genetics	Y	N	4,000	1-2 days
BAKO	Y	N	2,500	1-2 days
Radeas	Y	Y	2,400	1-2 days
NephronPharm	Y	Y	2,000	2-3 days
Wake Medical Lab Consultants	Y	Y	1,500	1 day
Andor Labs	Y	N	500	1-2 days
SMA	Y	Y	500	1-2 days

WANT TO LEARN MORE? **CLICK HERE** **TO CONNECT WITH AVALON**