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New Trends, Applications, and IVD Industry Analysis

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Could the AHCA Slow Interest in Genetic Testing?

While it remains uncertain what the Senate will do with the American Health Care Act (AHCA), alarm is spreading about the legislation's implications for the estimated quarter of Americans under the age of 65 years (more than 50 million people) who have a preexisting condition. One of the more popular features of the Affordable Care Act (ACA) was its guarantee that insurance companies could not deny coverage to people with preexisting conditions. Prior to 2014, when the ACA took effect, private insurers evaluated the health status, health history, and risk factors of applicants for coverage and premium decisions.

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Genomic Testing May Be Currently Overhyped, Oncologists Say

Most oncologists believe genomic testing is a major advance, but that it is "significantly overpromoted," according to a survey conducted by Medscape and the Swedish Cancer Institute in Seattle.

The survey of 132 oncologists was conducted between Dec. 13, 2016 and Feb. 27, 2017. The respondents represented a wide range of practice settings including private practices (25 percent); hospital or hospital-owned group practice (47 percent); and military, research, academic or government institutions (16 percent).

Overall, 71 percent of oncologists believe genomic testing is "very" or "extremely" important to the practice of oncology. However, 55 percent believe it is "overpromoted" or "very overpromoted," with its value below expectations. One-third believes it is appropriately promoted and meets expectations. Yet, oncologists are hopeful about the future of testing. Among the roughly one-third of respondents that report genomic testing is not useful now, 89 percent believe it will be useful within 10 years.

Concerns with Genomic Testing

The survey assessed concerns among the oncologists. The biggest clinical concern is that too often genomic testing fails to provide clin-

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Could the AHCA Slow Interest in Genetic Testing?, *from page 1*

Concern is mounting over the AHCA's provision that allows states to apply for waivers that could allow insurers to charge those with preexisting substantially more, possibly pricing them out of the market to buy individual health insurance.

In just the last few years, genetic testing, including tests that assess hereditary cancer risk, has expanded dramatically. While this has been viewed as a positive development, empowering patients to proactively manage potential health conditions by personalizing screening strategies, the information now may be perceived as liability if the AHCA reverses the ban on preexisting conditions.

According to research from the Kaiser Family Foundation, the preexisting condition exclusion clauses varied state by state prior to the ACA.

- In 19 states, a health condition was considered preexisting only if the individual had actually received treatment or medical advice for the condition during defined period of time prior to the coverage effective date.
- In most states, a preexisting condition could also include one that had not been diagnosed, but that produced signs or symptoms that would prompt most people to seek medical advice or treatment.
- However, in 8 states and Washington, D.C., conditions that existed prior to the coverage effective date—including those that were undiagnosed and asymptomatic—could be considered preexisting and excludable from coverage under an individual market policy.

Previously declinable preexisting conditions in the individual market included: infectious diseases (AIDS/HIV, Hepatitis C virus), cancer, and many common diseases that researchers are examining for an underlying genetic cause (heart conditions, diabetes, Alzheimer's, Parkinson's disease, and mental disorders).

While it remains to be seen whether the ban on preexisting conditions will remain in place, and if not, whether undiagnosed, asymptomatic conditions will be considered preexisting, there is mounting speculation of how this provision of the AHCA will impact adoption of genetic testing. Presumably the nascent market of preemptive of wellness sequencing could be impacted, as could familial genetic testing and even direct-to-consumer genetic testing.

Takeaway: While it remains uncertain what final form AHCA legislation will take, there are increasing concerns over the definition of preexisting conditions in the era of genomic medicine.

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Potential Upcoming Shifts for Diabetes-Related Diagnostic Testing

New research suggests that potential shifts might occur in diabetes-related testing, including potential increased use of point-of-care- (POC-) based hemoglobin A1c (HbA_{1c}) testing for systematic screening and genetic testing in select patients diagnosed with diabetes.

"HbA_{1c} may be a superior screening method, due to effectively identifying individuals early on in the course of the disease, which accounts for this study's difference in identified hyperglycemia"

— Heather Whitley, Pharm.D.

Point-of-Care Testing Aids Identification of Prediabetes

Systematically screening patients with POC-based HbA_{1c} testing is more effective than standard screening practices at identifying patients with undiagnosed prediabetes, according to a study published in the March/April issue of the *Annals of Family Medicine*.

Given the American Diabetes Association's estimate that more than 8 million Americans may be living with undiagnosed diabetes, experts say there is a need to more quickly and easily identify and treat patients with hyperglycemia in order to improve outcomes. Standard practice uses fasting blood glucose tests in select patients. This test is known to be inconvenient and possibly delays care because of difficulty with patient follow-up.

The present study compared the number of diabetes screenings and test results between patients tested under standard practice and those systematically offered POC HbA_{1c} tests among patients aged 45 years or older being seen in a single-physician family medicine clinic. Patients with scheduled appointments on Tuesdays (active screening arm; offered a free POC HbA_{1c} test; n=164 screened and included in final analysis) were compared to those with a Wednesday appointment (standard practice arm; assessed for diabetes screenings under usual care; n=324 patients included in final analysis). Appointments occurred between April 2013 and March 2014. A clinical pharmacist evaluated patients in the office. Both groups were predominately obese.

Of the 164 participants that were systematically screened participants, 63 percent were diagnosed with previously unknown hyperglycemia. In total, 53 percent of the systematically screened had prediabetes (HbA_{1c} 5.7%-6.4%) and 10 percent had had diabetes (HbA_{1c} more than 6.5%). Among the 324 patients in the standard practice arm, 22 percent (n = 73) were screened, primarily by blood glucose (96 percent). Of those tested 8 percent had diabetes and 33 percent had prediabetes. The association between screening outcome and screening method, the researchers report, was statistically significant, in favor of HbA_{1c}.

"HbA_{1c} may be a superior screening method, due to effectively identifying individuals early on in the course of the disease, which accounts for this study's difference in identified hyperglycemia," writes lead author Heather Whitley, Pharm.D., from Auburn University in Alabama. "Identifying and treating chronic hyperglycemia early can result in clinically meaningful patient outcomes, which is most feasible by HbA_{1c} screenings and further facilitated by POC devices."

Genetic Causes of Diabetes Not Considered

Monogenic forms of diabetes remain misdiagnosed and often inappropriately treated, according to a presentation at the American College of Medical

Genetics and Genomics' (ACMGs') Annual Clinical Genetics Meeting (Phoenix; March 22-24).

These cases of diabetes, caused by a single gene defect, represent a heterogeneous group of disorders. While the actual prevalence of monogenic diabetes is not known, it is estimated to account for one to five percent of all diabetes cases. Experts say a majority of these cases go unrecognized or misdiagnosed as type 1 or type 2 diabetes and are often inappropriately treated.

The U.S Monogenic Diabetes Registry was created in 2008 at the University of Chicago to collect genetic, medical, and clinical information about monogenetic diabetes to further understanding of the disorder and raise awareness about the condition. As of December 2016, the registry enrolled 1,349 families, which were profiled in the ACMG presentation.

Genetic testing was initially performed via Sanger sequencing (for pathogenic variants in GCK, HNF1A, HNF4A, INS, and KCNJ11) and with a targeted, next-generation sequencing panel for those negative using Sanger sequencing. Pathogenic causes were identified in 429 families (674 individuals). For the three categories of monogenic diabetes common mutations were identified. For permanent neonatal diabetes, KCNJ11 (14.7 percent), INS (6.3 percent), and ABCC8 (5.4 percent) were the most common causes. For maturity onset diabetes of the young (MODY), mutations in GCK were most common (42 percent), followed by HNF1A (17.5 percent), and HNF4A (3.6 percent).

The majority of the registry participants were genetically diagnosed on a research basis. Although in many cases, there was a significant delay (more than 10 years) from initial diabetes diagnosis to confirmation of a monogenic cause.

"This delay in diagnosis can be primarily explained by two factors: 1) lack of physician awareness of the different subtypes of monogenic diabetes, how to clinically diagnose, and request genetic testing; 2) inadequate insurance coverage or refusal of insurance companies to cover genetic testing," says presenter May Sanyoura, Ph.D., from the University of Chicago (Illinois). "Monogenic diabetes should be considered in any diabetic patient who has features inconsistent with their current diagnosis or presents with additional features characteristic to a specific syndromic subtype of monogenic diabetes."

Of the MODY positive probands with the most common mutations, more than 27 percent were misdiagnosed at type 1 diabetes, 47.2 percent were misdiagnosed as type 2 diabetes, and more than 50 percent of them were inappropriately treated with either insulin or other glucose-lowering agents. For those diagnosed with the most common variants associated with neonatal diabetes, 45 percent of probands were misdiagnosed as having type 1 diabetes. An accurate diagnosis of monogenic forms of diabetes is "one of the most compelling clinical examples of personalized genetic medicine," Sanyoura says, as certain mutations are linked to more effective management with certain treatments.

Takeaway: New research highlights potential shifts in diabetes-related testing, including potential increased use of POC HbA_{1c} testing for systematic screening and genetic testing in select patients diagnosed with diabetes.

Testing Recommendations Expand as Zika Season Approaches

As warm weather sets in across the southern portion of the United States, public health officials are planning for the 2017 Zika season. This mosquito year experts have a better knowledge about the infection and its natural history, revised testing and laboratory guidance, and more available diagnostics. *DTET* conducted a comprehensive review of 2016 testing volumes, current clinical testing recommendations, remaining assay development challenges, and expectations for the upcoming season.

Zika Testing Volumes

There are no commercially available diagnostic tests cleared by U.S. Food and Drug Administration (FDA) for the detecting Zika virus. However, the FDA is working with Zika virus diagnostic developers to accelerate assay development programs. Over the past year there has been a significant increase in the number of Zika diagnostic products the FDA currently allows use of under emergency use authorization (EUA). Given the serious consequences of Zika, particularly during pregnancy, the FDA encourages laboratory developed test developers to submit a request for an EUA.

The first Zika diagnostics approved were developed by the U.S. Centers for Disease Control and Prevention (CDC)—the Immunoglobulin M (IgM) Antibody Capture Enzyme-Linked Immunosorbent Assay (MAC-ELISA; approved Feb. 26, 2016) and Trioplex real-time Reverse Transcription Polymerase Chain Reaction Assay (rtRT-PCR; approved March 17, 2016). While other tests from the private sector have received EUA, these initial two tests are still manufactured and distributed.

The CDC reported, as of January 2017 that it had received more than 165,000 samples for Zika testing across multiple laboratories, with the majority of samples tested using the MAC-ELISA assay.

Laboratory	#Specimens Received	# Specimens Tested by rtRT-PCR	# Tested by Zika IgM MAC-ELISA
CDC-Atlanta	5,023	3,464	2,827
CDC-Fort Collins	18,262	3,926	15,571
CDC-San Juan	81,667	45,136	48,015
Laboratory Response Network	60,788	25,439	35,349

(As of 1/2017; Source: https://www.cdc.gov/zika/pdfs/Laboratory-TF-Sustainment-Webinar-Slide-Deck-3-15-17.pdf)

AthenaResearch's analysis of data from its athenahealth network (more than 5,000 ordered tests; October 2016, the end of the 2016 mosquito season) shows that Zika testing was limited. As might have been expected the majority of testing was conducted in women (87 percent) and most testing occurred in

those aged 19 to 44 years (90 percent). Just over half of testing (52 percent) was initiated by obstetrician/gynecologists, while 23 percent of testing was ordered by primary care.

"Results of these [IgM] tests may not be able to determine whether women were infected before or after they became pregnant."

— CDC

Testing Recommendations

The U.S. Centers for Disease Control and Prevention (CDC) issued a Health Alert Notice on May 5 with updated guidance for testing women who live in or frequently travel to areas with a CDC Zika travel notice. The guidance includes an update on interpreting Zika virus IgM serological tests and a recommendation for nucleic acid test (NAT) testing at least once per trimester.

The CDC says its update reflects new data suggesting that Zika virus antibodies may stay in the body for months (beyond 12 weeks) in some infected individuals. Therefore, test results may not be able to determine how recently one was infected.

"Results of these [IgM] tests may not be able to determine whether women were infected before or after they became pregnant," the agency writes in the alert. "Although IgM persistence could affect IgM test interpretation for all infected people, it would have the greatest effect on clinical management of pregnant women."

To better determine infection timing, although possibly not conclusively, the CDC now recommends the following testing for pregnant women living in or frequently traveling to areas with Zika virus transmission or with a partner who tests positive for Zika virus infection:

- Test pregnant women promptly, using NAT, if they develop symptoms at any point during pregnancy or if their sexual partner tests positive for Zika virus infection.
- Consider Zika NAT testing at least once per trimester in asymptomatic women, in addition to IgM testing as previously recommended. The CDC warns, though, that a negative NAT test result does not rule out recent infection because viral ribonucleic acid (RNA) declines over time.
- NAT testing of amniocentesis specimens may provide additional information to help determine whether positive IgM test results suggest a recent infection.
- Consider IgM testing as part of pre-conception counseling to establish baseline IgM results before pregnancy.

Challenges to Diagnosis

Despite the revised testing guidance, diagnosis of Zika remains complicated for multiple reasons. First, clinically, most cases are mild infections with rather generic symptoms., which challenges identification of suspected cases.

From a laboratory perspective, cross-reactivity in assays between the Zika virus and other flaviviruses is common. Additionally, confirmation of Zika virus infection in patients presenting within one week of fever and consistent symptoms is based on detection of Zika virus RNA. However, experts say that during the acute phase of infection, Zika virus RNA levels in blood can be detected best between three and five days of symptom onset, but RNA concentrations are relatively low, with reported levels between 103 and 105 copies/mL.

Over the last year, researchers have looked at the effectiveness of other sample sources. Zika virus RNA was detectable in urine for up to 20 days after its clearance from blood, with RNA levels in urine as high as 106 copies/mL. Saliva may have some benefits for detecting active infections. But, experts say access to well-characterized clinical samples has been a major problem for manufacturers and has limited verification and validation studies of new assays.

Lingering concerns remain over viral persistence, assay specificity, turnaround time (CDC says theirs is seven to 10 days once samples are received), and the usefulness of plaque-reduction neutralization tests, which is the confirmatory test used due to its specificity in differentiating closely related viruses.

Ideally, experts say Zika assays would be multiplexed, allowing simultaneous detection of several pathogens (Zika, Chikungunya, and Dengue viruses) in a single sample. Additionally, a test that could simultaneously detect both Zika virus RNA and anti-Zika virus IgM could over the entire time period of acute Zika virus infection. Lastly, the ideal test would possess operational characteristics (in terms of storage, reagents, cost, etc.) could be used for public health in low- and middle- income countries.

The 2017 Zika Season

In 2016 Florida and Texas were the only continental U.S. states with local transmission, although California and New York experienced a large number of travel-related cases. May kicks off the 2017 transmission season. According to the Florida Department of Health, as of May 15, Florida had 44 Zika travel-related cases and four locally acquired Zika infections so far in 2017 (plus seven additional cases where transmission occurred in 2016, but testing happened in 2017). As of the week ending May 12, 2017, the Texas Department of State Health Services reported 12 Zika cases in the state, but with no breakdown of whether they were travel-related or locally transmitted cases. Additionally, Puerto Rico was especially hard hit in 2016 and has already seen 493 confirmed, symptomatic Zika virus cases (all locally transmitted), although there have been recent reports that the true number of cases in Puerto Rico may be under-reported.

To prepare, the CDC is maintaining surge planning for laboratory support. Additionally, the agency is planning to:

- Refine the performance of diagnostic assays, including assessing the value of whole blood and urine in molecular diagnostics

- Consider updates to the testing algorithm to allow increased flexibility and to simplify as appropriate
- Assist as needed in moving testing to commercial laboratories
- Conduct new research (e.g., developing a Zika virus multiplex bead assay, investigating more specific antibodies, developing rapid and specific IgM diagnostic test that uses mass spectrometry, and refining recombinant antigens in testing platforms to eliminate the need for inactivation of live virus)

Despite preparations, a report from the Public Broadcasting Service says that at an April meeting at the CDC, federal officials warned state health departments that Zika funding initially envisioned to last five years will likely run out this summer. The $1.1 billion that was approved in September 2016 was a one-time earmark to fight Zika and is now nearly depleted.

Takeaway: Experts hope that preparations for expanded laboratory capacity and an increasing number of EUA assays will help efforts to track and combat Zika virus this upcoming mosquito season. However, researchers remain engaged to improve upon current assays' ability to determine timing of infection.

FDA-Granted EUA for Commercial Clinical Diagnostics

There are 13 authorized NATs and three authorized IgM tests.

Company	Test	Test Type	Date of Authorization
DiaSorin	LIAISON® XL Zika Capture IgM Assay	Qualitative detection of Zika virus IgM antibodies in human sera	4/5/2017
Nanobiosym Diagnostics	Gene-RADAR® Zika Virus Test	Qualitative detection of RNA from Zika virus in human serum	3/20/2017
ELITechGroup Molecular Diagnostics	Zika ELITe MGB® Kit	Qualitative detection of RNA from Zika virus in human serum and EDTA plasma	12/9/2016
Abbott Molecular	RealTime Zika assay	Qualitative detection of RNA from Zika virus in human serum, EDTA plasma, and urine (collected alongside a patient-matched serum or plasma specimen) Added EDTA whole blood as an authorized specimen type	11/21/2016 1/6/2017
ARUP Laboratories (Salt Lake City, Utah)	Zika Virus Detection by RT-PCR test	Qualitative detection of RNA from Zika virus in human serum, EDTA plasma, and urine (collected alongside a patient-matched serum or EDTA plasma specimen)	9/28/2016
Vela Diagnostics	Sentosa® SA ZIKV RT-PCR Test	Qualitative detection of RNA from Zika virus in human serum, EDTA plasma, and urine (collected alongside a patient-matched serum or plasma specimen)	9/23/2016
InBios International	ZIKV Detect™ IgM Capture ELISA	Presumptive detection of Zika virus IgM antibodies in human sera	8/17/2016
Luminex (Austin, Texas)	xMAP® MultiFLEX™ Zika RNA Assay	Qualitative detection of RNA from Zika virus in human serum, plasma, and urine (collected alongside a patient-matched serum or plasma specimen)	8/4/2016

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Company	Test	Test Type	Date of Authorization
Siemens Healthcare Diagnostics	VERSANT® Zika RNA 1.0 Assay (kPCR) Kit	Qualitative detection of RNA from Zika virus in human serum, EDTA plasma, and urine (collected alongside a patient-matched serum or plasma specimen)	7/29/2016
Viracor Eurofins	Zika Virus Real-time RT-PCR test	Qualitative detection of RNA from Zika virus in human serum, plasma, or urine (collected alongside a patient-matched serum or plasma specimen)	7/19/2016
Hologic	Aptima® Zika Virus assay	Qualitative detection of RNA from Zika virus in human serum and plasma specimens Added processed urine (collected alongside a patient-matched serum or plasma specimen) as an authorized specimen	6/17/2016 9/2/2016
altona Diagnostics	RealStar® Zika Virus RT-PCR Kit	Qualitative detection of RNA from Zika virus in serum or urine (collected alongside a patient-matched serum specimen)	5/13/2016
Quest Diagnostics	Zika Virus RNA Qualitative Real-Time RT-PCR	Qualitative detection of RNA from Zika virus in human serum specimens Added urine as an authorized specimen type (when collected alongside a patient-matched serum specimen) type	4/28/2016 10/7/2016
CDC	Trioplex Real-time RT-PCR Assay	For the qualitative detection and differentiation of RNA from Zika virus, dengue virus, and chikungunya virus in human sera or cerebrospinal fluid (CSF; collected alongside a patient-matched serum specimen) and for the qualitative detection of Zika virus RNA in urine and amniotic fluid (each collected alongside a patient-matched serum specimen)	3/17/2016
CDC	Zika Immunoglobulin M (IgM) Antibody Capture Enzyme-Linked Immunosorbent Assay	For the presumptive detection of Zika virus-specific IgM in human sera or CSF (collected alongside a patient-matched serum specimen)	2/26/2016

Source: U.S. Food and Drug Administration.
Accessed May 14, 2017 at https://www.fda.gov/medicaldevices/safety/emergencysituations/ucm161496.htm#zika

FDA Speeding Approval Process, Continued User Fees Needed

The U.S. Food and Drug Administration (FDA) is plagued with chronic understaffing, scrutiny over the length of time for approvals, and an expanding workload, while also facing potential budget cuts proposed by the Trump administration. Yet, several recent reports are indicating improvements in the time to approval across drug and device types, which is welcome news to the life sciences industry.

Drug Approvals

For new therapeutic agents that were approved between 2011 and 2015, the regulatory reviews by the FDA were, on average, 60 days shorter than those by the European Medicines Agency (EMA), according to a correspondence published April 6 in the *New England Journal of Medicine*.

The authors say the speed of the U.S. regulatory review process will likely face scrutiny again, as Congress debates reauthorization of the Prescription Drug User Fee Act, which is set to expire this October. To inform this debate, the authors, led by Nicholas S. Downing, M.D., from Brigham and Women's

"The FDA—like many other regulatory authorities—has become much more strict about clinical evidence and testing requirements, thus lengthening the overall path to clearance."

— Emergo

Hospital in Boston, assessed all new therapeutic agents that had been approved by the FDA or the EMA between 2011 and 2015 and compared the median total review times between the agencies.

The researchers found that the FDA approved 170 new therapeutic agents over the four years, while the EMA approved 144. The FDA's median total review time was significantly shorter than the EMA's (306 days versus 383 days, respectively). Among the 142 therapeutic agents that were approved by agencies (with at least one of the approvals occurring during the study period), results were similar with median total review times of 303 days and 369 days, respectively.

Device Approvals

Regulatory consultancy firm Emergo (Austin, Texas) recently released its 2017 report reviewing medical device applications submitted to the FDA from 2012 to 2016. While not exclusive to diagnostic products, the report offers some insights for the diagnostics industry.

In 2016, the number of devices that received 510(k) clearance fell to 2,957, the lowest number since 2010. The company says this decline in clearances is "entirely attributable" to fewer American companies submitting devices to the FDA. For products cleared by FDA internal review, it took, on average, 177 calendar days from submission to clearance in 2016.

"The FDA—like many other regulatory authorities—has become much more strict about clinical evidence and testing requirements, thus lengthening the overall path to clearance," Emergo writes in the report. "Most companies can plan on waiting about six months to get the green light from FDA, although that varies by device."

The report found that 58 percent of devices cleared in 2016 were cleared within six months of submission.

The results from both of these reports echo the FDA's own analysis. In recent testimony to the House Committee on Energy and Commerce regarding reauthorization of the Medical Device User Fee Amendments, Jeff Shuren, M.D., FDA's director of the Center for Devices and Radiological Health, credited the user fee program for reducing FDA decision times. He testified that the FDA has made "substantial progress" and said that in 2015 it took on average 133 days to reach a decision on a 510(k), an 11 percent decrease in five years.

Shuren also said that the FDA's workload continues to increase about 10 percent every year, in part because of the increasing complexity of innovative medical devices and because of the need to use real-world evidence in post-market surveillance. As a result of this increasing workload, even if the Trump administration's proposed cuts to regulation and staffing are made, the agency still needs the medical device user fees to continue to speed the review process.

Takeaway: Recent analyses shows the FDA is making progress to speed the regulatory review process across product types and the agency plans on continued need of user fees for continued improvements in review speed.

Genomic Testing May Be Currently Overhyped, Oncologists Say, *from page 1*

ically actionable information that would change patient management (31 percent). Sixty-one percent of oncologists say that less than one-quarter of their patients would benefit from genomic testing.

Yet, despite these concerns over clinical utility, 66 percent of those who have ordered genomic testing did so in order to guide treatment decisions.

Despite more than two-thirds of respondents reporting using genomic testing within the last month, 86 percent felt that more physician education is needed before genomic testing could be widely used.

— Medscape

Financial considerations loomed large in responses with 84 percent saying insurance coverage is too poorly defined and 73 percent saying that getting approval for an unapproved indication is "too great a hurdle." Seventy-three percent also have concerns over the cost effectiveness of multiplex genomic testing. Yet, despite these concerns, 78 percent of oncologists say insurers should pay for genomic testing and 73 percent don't believe patients are willing to pay out-of-pocket for the testing. In practice the oncologists report that 85 percent of testing is paid for by patients' private health insurance, 35 percent by research funds, and 29 percent by self-pay.

Additional practical concerns ranked lower among the expressed concerns, with 18 percent saying there is not enough tissue to perform testing and 17 percent saying turnaround time is too long.

Despite more than two-thirds of respondents reporting using genomic testing within the last month, 86 percent felt that more physician education is needed before genomic testing could be widely used. This may be reflected in oncologists self-reported lack of confidence in counseling patients on the significance of identified genetic mutations. More than half (53 percent) reported a four or lower on a 7-point scale ("no" to "moderate" confidence). In terms of ordering guidance, National Comprehensive Cancer Network guidelines were most used (44 percent) followed by 32 percent who use published studies. Only eight percent said that their institution's guidance or practice pathways were their primary source for ordering information.

Nearly half (49 percent) said that genomic testing should be restricted to research settings currently. Twenty-seven percent of those who ordered testing did so to guide patients to clinical trials or in support of clinical research. However, of those that ordered a test to guide patients to a trial, fewer than a quarter of oncologists actually had a patient enroll a trial.

Testing is Ordered Inappropriately

The Medscape survey's revelations of oncologists' lack of comfort regarding genomic testing parallels a new study that shows genetic tests are often misordered.

One of every three genetic tests examined by a team of researchers shouldn't have been prescribed, according to an oral presentation at the 2017 annual clinical and scientific meeting for the American College of Obstetricians and Gynecologists (San Diego; May 6-9). The findings, the authors say, adds to a growing body of evidence suggesting that genetic tests are routinely overused and often misinterpreted.

Researchers from the Naval Medical Center San Diego in California, reviewed 114 charts associated with the genetic test billing codes for common genetic tests sent through LabCorp (cystic fibrosis, BRCA, factor V Leiden, prothrombin, alpha-thalassemia, hemochromatosis, and cell free DNA). The charts were examined for compliance with published clinical practice guidelines identified on Gene Reviews.

"As these tests are a small fraction of all genetic tests at our institution, future studies should broaden the scope of testing evaluated to understand the magnitude of this problem and potential cost savings," writes author Kathleen Ruzzo, M.D., in the abstract. "Genetic counselor review and/or involvement in genetic test ordering can decrease inappropriate healthcare expenditures and improve patient care."

Over the 3-month period 39 percent of tests (n=44) were misordered based on published clinical practice guidelines. Misorders were classified as not indicated (21 percent), false reassurance (7 percent), and 11 percent inadequate. Costs of ordered testing were compared to recommended testing. Had guidelines been adhered to, nearly $21,000 of cost savings could have been achieved.

Takeaway: The majority of oncologists report that genomic testing is not currently living up to expectations and that they feel ill-equipped to order and report the results. This discomfort may be reflected in a separate study's findings that one-third of genetic tests are misordered.