Advanced diagnostic tests are the foundation for personalized medicine

Innovative diagnostic tests precisely measure biological signs called biomarkers. Biomarkers indicate if processes in the human body are functioning normally or if an abnormal condition or disease exists, allowing doctors to better understand how this affects their patient. By combining the data from molecular and other diagnostic tests with an individual’s medical history and current clinical symptoms, healthcare providers can develop targeted management and/or prevention plans. Tailoring treatments to the needs of an individual rather than applying standard treatments determined by broader populations has been shown to improve patient quality of life and outcomes. Such therapy reduces cost from overtreatment with ineffective therapies and avoidance of adverse events.

Advanced Diagnostics Allow Doctors to Deliver

**The right treatment:** Molecular and other tests, including companion diagnostics, help improve outcomes by allowing doctors to make a precise diagnosis and tailored treatment decisions to avoid ineffective therapies.

**To the right patient:** Genetic profiling tests allow doctors to assess a patient’s potential responsiveness to available treatment options, including identifying appropriate clinical trials.

**In the right dose:** Pharmacogenomic testing helps us understand how a patient’s genetic variations can influence their responses to medications and help pinpoint optimal dosing.

**At the right time:** Diagnostic tests enable doctors to make safer and more effective patient management and treatment decisions at a faster pace.
Example: Diagnostics have enabled breakthroughs in immunotherapy for certain cancer patients

Genetic profiling tests can detect whether there is a high amount of instability in a patient's tumor, commonly referred to as microsatellite instability-high or MSI-H. Patients with MSI-H solid tumors are more likely to benefit from drugs developed for cancer immunotherapy (medicines that work with a patient's immune system). This discovery led to a groundbreaking FDA approval for a “pan-tumor” immunotherapy based on a common biomarker across different types of tumors—marking a shift toward treating cancers based on their tumor genetics rather than their site of origin in the body1.

Endnotes


Breast Cancer

12% of women in the U.S. will be diagnosed with breast cancer over the course of their lifetime—with over 250,000 new cases diagnosed in 2017. Diagnostic tests utilize varying technologies to identify which of the major subtypes of breast cancer a patient has and enables doctors to design optimal treatment strategies for each individual patient leading to improved outcomes.

Metastatic Colorectal Cancer

Routine testing of patients with metastatic colorectal cancer for the KRAS mutation before initiating treatment with epidermal growth-factor receptor (EGFR) inhibitors would save patients from having to undergo ineffective therapy—and result in $604 million in annual health care cost savings.

Stroke

If genetic testing were performed for every patient before starting treatment with Warfarin, a commonly prescribed anticoagulant, it is estimated that 17,000 strokes could be prevented while avoiding 85,000 serious bleeding events annually—saving over $1 billion in healthcare spending.

Metastatic Melanoma

Metastatic Melanoma is an aggressive cancer with a 5-year survival rate of 15-20%. Advanced genetic testing led to the discovery that 40% of patients have a mutation in the BRAF gene and 20% have a mutation in their NRAS gene. Targeted treatment of these specific genetic alterations has shown high response rates and impressive survival benefits over conventional chemotherapies.

Lung Cancer

Multiple studies have demonstrated that the majority (60–70%) of lung cancers possess genetic biomarkers that could be treated with targeted therapies. Patients matched to targeted therapies based on molecular diagnostic testing had better survival than those who were not matched.

HIV/AIDS

Abacavir is a medication used to treat HIV/AIDS. While well-tolerated in most patients, it can cause serious hypersensitivity reactions in others. A strong link was discovered between hypersensitivity to Abacavir and a rare form of the HLA-B gene. Using genetic tests to screen patients for this HLA-B gene allows doctors to use a personalized medicine approach, selecting the safest treatment for each patient.
About AdvaMedDx

AdvaMedDx, a division of the Advanced Medical Technology Association (AdvaMed), represents *in vitro* diagnostics (IVD) companies. Our member companies produce advanced IVD tests and technologies that allow early detection of disease, facilitate evidence-based medicine, improve patient health and healthcare, and enable personalized medicine. Further, leveraging innovative IVDs can lower overall healthcare costs. AdvaMedDx is the only advocacy organization exclusively addressing policy issues facing diagnostic manufacturers in the United States and abroad.