MediBuddy

Into The Depths of Diagnostic Testing

Figuring out the cause of an ailment isn't child's play. It requires a qualified doctor's diagnosis. To confirm the diagnosis, certain tests are conducted. The results of these tests help pinpoint the ailment. In fact, over **60% of the decisions** taken in patient care can be accredited to the findings of laboratory tests.[1]

Even if a person is completely healthy, a diagnostic test can help detect diseases that silently lurk without showing any symptoms in the body. Once the disease has been identified, the next step is to monitor the ailment. This is especially true in the case of chronic ailments like diabetes.

To put it concisely, Diagnostic tests are approaches used in clinical practice to identify with high accuracy the disease of a particular patient and thus to provide early and proper treatment.[2]

Diagnostic tests are used for:

- **Detecting** ailments
- **Screening** the patient for undetected ailments
- **Monitoring** chronic conditions

DID YOU KNOW?

A simple blood test like **Complete Blood Count** can detect blood cells, haemoglobin concentration and haematocrit. It also tracks vitamin B12 and vitamin D. This test could help in detecting blood cancer and can indicate whether one has thalassaemia.[5]

A TICKING CLOCK:
Importance of Turn Around Time (TAT)

Have you ever questioned the amount of time it takes to receive the results of a blood test or a biopsy? The process involved is complex, especially when a sample requires testing not once, but up to four times. The amount of time taken to complete a process or fulfill this request is called turn around time (TAT). Accuracy, precision, timeliness, and authenticity are the four pillars of efficient laboratory services. [3] A long TAT, i.e, waiting on a test result, can hamper the process of detecting ailments in case there are no visible symptoms or when deciding the line of treatment for a patient. There are different ways of defining TAT. Clinicians consider TAT from the time the test is ordered to results reporting, whereas laboratory professionals usually use the time of receiving the specimen to the time of reporting of results as the TAT. [3]

A Key Factor For Physician Satisfaction and Patient Safety

In a study of 300 U.S. hospital physicians, a survey was conducted to explore the value of in vitro diagnostic testing to patients, providers, and the healthcare system as a whole.[4] **Nearly three-quarters** of emergency medicine physicians, hospital lab directors, and internists agreed that improving TAT is directly linked with satisfaction and safety.[4] Additionally, Chicago-based Swedish Covenant Hospital reported that due to investment in its lab, patient and physician satisfaction improved and the hospital attracted more patients.[4]

Turn Around Time (TAT) as a benchmark of Laboratory Performance

In a 2010 Indian study at a super speciality center in Delhi about TAT as a benchmark for Laboratory performance, it was found that delays in TAT were not due to the testing itself but in the pre and post analytical phases. Pre analytical phase includes specimen handling issues that occur even prior to the time the specimen is received in the laboratory. Post analytical phase refers to the phase of forwarding the final laboratory results to the hospital or department. [12]
Here are the TATs[3]:

4.5-5.5 HOURS	30 MINUTES	1 HOUR
Biochemistry Samples	**Prothrombin time Samples**	**Electrolyte Samples**
1 HOUR	1 DAY	
Emergency Samples	**OPD Samples**	

In the case of the above TATs, the only delays were caused due to manual delivery of samples or reports. The TAT for OPD samples was one day since the reports are dispatched the next day. There were also cases where patients receive the reports as and when they turn up for subsequent health check ups, which can lead to delay in treatment.

DID YOU KNOW?

About five years ago, TB culture test used to take 6-8 weeks. Today, one can get the diagnosis done in a day.[5]

INDUSTRY DEVELOPMENT
in Medical Diagnostics

Medical diagnostics has gone through tremendous changes in the past decade. The credit for this majorly belongs to technological advancements. Here are some of the noteworthy developments in this field:

DNA blood tests for prenatal screening

Prenatal screening is an important process that ascertains the health status of an unborn baby. Non Invasive Prenatal Testing (NIPT)[6] is a prenatal screening that helps identify if the mother is at increased risk of giving birth to a child with a genetic disorder. This test looks at the DNA from your baby's placenta in a sample of your blood to identify the risk level.

DNA blood tests for cancer screening

A new cancer test called DELFI screens for seven types of cancer in a novel way. Currently, pathologists diagnose cancer by examining tumor tissue under a microscope. However, this is a time-consuming process. In comparison, DELFI finds the abnormal DNA packaging at the molecular level through a noninvasive blood test. In a study of 208 patients with various stages of breast, colorectal, lung, ovarian, pancreatic or gastric cancer and 215 healthy individuals, this test accurately detected cancers 98% of the time. [7]

Smartphone-based medical testing

From Urine testing with the help of a cell phone[8] to tracking your heart rate, smartphone based medical testing is having far-reaching impacts. Since mobiles are always on a person, they seem to be helpful “wearable trackers”.

Gene-based test

Another field that has far-reaching impacts in healthcare is gene-based testing. There is research being done on estimating the risk of Heart Disease, Breast Cancer and other diseases based on genetics.[9]

Point-of-Care Testing

Diagnostic testing is being organized around the patient rather than the provider. It has moved out of laboratories and into the patient homes, doctor’s offices or even ambulances with Point-of-Care-Testing (POCT). Some examples of POCT include a home test for glucose, a home pregnancy test, HbA1c measurement at a doctor’s clinic, rapid 20 minute test for HIV.[9]

Evolution of Medical Equipment

Equipment for diagnostic testing is evolving thanks to rapid technological changes. This has helped to come up with minimally invasive solutions. Even the now common CT technology is actually an amazing medical advancement as it helps in evaluation of trauma victims, acute abdominal pain, appendicitis and complex abdominal pathology. [13] The advent of touchscreen technologies in diagnostics has helped save time by accelerating test setup procedures and analysis of measurement results. When it comes to infusion pump, which are medical devices that deliver fluids, such as nutrients and medications, the newer devices provide better precision and speed.[14]

Conclusion

Medical diagnostics is taking the world by storm. Increasing the use of appropriate diagnostic testing can lead to cost savings. Case in point, in the US, earlier detection of certain cancers could save around US$26 billion per year.[10] With tests becoming faster and more efficient, better health outcomes and higher patient satisfaction is expected.

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