

Digitally-Driven Real Time Diagnostics

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In the near future, physicians will be able to focus more explicitly on the individual patient's life journey rather than reacting to illnesses and ailments as they arise. Advances in digital technology are transforming how health is sustained and how real time diagnostics are performed.

Real Time Diagnostics in Focus

At the [Jahrestagung "House of Pharma"](#) in Frankfurt on September 3, 2019, Dr. Stefan Weiss, Zühlke's business innovation consultant for Pharma and Medtech, discusses the rapid evolution of digitally-powered real time diagnostics and what such changes imply for existing pharmaceutical business models – followed by a discussion with Prof. Dr. Jochen Maas (General manager R&D Germany at Sanofi-Aventis).

Health monitoring via mobile devices, wearable technologies, and lifestyle apps has already begun to transform diagnostic analysis and thereby expand the physician's care provision toolkit. Digital tools, ranging from informative apps for drug users from pharmaceutical companies to wearables and digital implants that record health data, perform internal measurements, and control nerves to alleviate pain (electroceuticals).

Real world patient and genomic data can also help confirming drug efficacy and raising the significantly decreasing productivity of today's R&D departments. Rather than relying trial and error, real time diagnostics, therapy, and outcome data can help physicians more quickly and accurately determine appropriate treatments. With only one in ten compounds reaching the market due to poor patient monitoring during trials, real time diagnostics may reduce development costs, which can currently top \$2 billion for a single drug.

Digital Developments in Diagnostics

New digital technologies hold the potential to make the delivery of medicine more accurate, more personalized, and more timely. Indeed, change can be seen in the way health monitoring tools and wearable technologies have facilitated real time diagnostics. The patients' experience is increasingly one of autonomy and mobility, thanks to an emerging suite of services powered by the digital transformation that even includes implants like continuous glucose monitoring (CGM) devices.

Further, improvements in image recognition and unstructured machine learning have accelerated the diagnosis process. Striking developments in three-dimensional imaging and

augmented reality, e.g. for the correct usage of drug delivery systems, provide practical lessons for how businesses can fully leverage the benefits of new technologies across the pharmaceutical sector.

Within a few years, innovation in digital technologies are likely to empower physicians to deliver highly personalized care. They will be able to precisely identify and track biomarkers and supplement them with digital makers including movement and voice patterns.



New digital technologies hold the potential to make the delivery of medicine more accurate. (Image: Getty)

Digitally Managing Incurable Disease

Similar benefits can be achieved in the handling of incurable and hereditary diseases. As in the case of diabetes, digital health monitoring, wearable technologies, and lifestyle apps can be deployed to keep track of critical biomarkers like glucose levels in real time. Diagnostic work that once required the extraction of biological samples, a visit to a clinic or a primary care provider, and time spent waiting for results from a full-service laboratory, can now be completed quickly and independently.

Substantial improvements in the convenience and accuracy of medical delivery are now possible through the disruptive application of digital technologies. Blood glucose test strips

are now routinely used by patients to monitor and manage diabetes from one minute to the next.

Other persistent conditions like chronic obstructive pulmonary disease (COPD), cardiovascular disease, and various forms of cancer are increasingly able to be monitored using digitally-driven mobile diagnostics technologies. As with diabetes, approaching such diseases in this way will improve both patient comfort and long-run outcomes.

Updated Business Models and Regulatory Considerations

To benefit from digitalization, pharmaceutical business models must account for the true potential of wearable technologies and apps in bolstering the value of related data. Devices and sensors are a major physical communication element connecting actors—allowing patients to access, collect, and transmit biological data to medical tech and pharmaceutical actors in real time.

Digitally-driven disease prediction can enable the development of new business models that center on disease prevention and management rather than traditional treatment-centered approaches. With relatively light regulatory intervention by national and subnational governments, digitally-enhanced disease prediction and prevention techniques may enjoy further advantages over conventional approaches.

No wonder the pharmaceutical industry is increasingly interfacing with and exploiting many of the same digital technologies that are powering the progress of preventative medicine. With these advantages in mind, interested stakeholders should still take heed and proactively help to frame reasonable policies moving forward.

Digital Ethics, Efficacy and Efficiency

Multi-parametric diagnostics enable the collection of more and more data points, requiring the maintenance of larger personal data sets. Such new technologies inevitably raise important ethical questions regarding patient data that should be engaged proactively. These questions include:

- How are large data sets collected, secured, and used?
- Who owns that data, who can analyze it, and how?
- What type of data are usable given the intricacies of at-home collection and the absence of physicians from the collection process?
- What are the sensitivities surrounding the deployment of telemedicine tools, chatbots, and voice-controlled technologies in the diagnostic process?

Beyond providing diagnostics information, wearable and mobile digital technologies can also be harnessed to combat the sense of isolation often felt by patients with chronic diseases.

For instance, take the smartphone app mySugr, which connects diabetes patients and caregivers worldwide. Acquired by Roche two years ago, mySugr powers community-building, data-sharing, and coaching services aimed at improving quality of care and the patient experience.

When combined with revised business models and an active understanding of policy and ethical considerations, the digital turn in real-time diagnostics holds powerful implications for reducing costs and streamlining care delivery in the coming months and years.