

Artificial intelligence is the real thing for pharma and medtech



[Madeleine Armstrong](#)



Advances in computing power and machine learning could drastically change the way drugs are developed and paid for.

Artificial intelligence might seem more the preserve of computer nerds and tech giants than pharma companies. But according to Boehringer Ingelheim's global chief data scientist, Philipp Diesinger, "the entire industry is looking at data science and AI".

This increased focus on data could drastically change the way drugs are developed and paid for. For example, AI will be vital if outcomes-based healthcare is to be successfully implemented, pointed out Philips' chief innovation & strategy officer, Jeroen Tas, who also stressed that AI really signalled a new way of handling data.

He described AI as "the way you interpret data. You constantly stream the data and add that data to the body of knowledge," he told *EP Vantage* during the AI Summit in London in May. "That's not the case today, because it's all in the head of the doctor."

Boehringer's Mr Diesinger believes that what is new is the "combination of AI, big data and new perceptions of these deep analytical methods", as well as an increasing capacity for data storage and processing.

While some might question whether this marks a real change from existing approaches, Mr Diesinger believes that "there is a perception now for data-driven decision making in businesses, and that has not been around before". He pointed out how AI has transformed the financial industry "using theoretical physicists and mathematicians to optimise trading. We're doing the same now with regards to decision-making within [Boehringer]."

The German company has been active in AI for around two years, and is using data to reduce the cost of drug development and enable earlier go/no-go decisions on pipeline candidates. According to Mr Diesinger, the group wants to evolve from a pharma to a holistic healthcare company, with the help of AI.

Meanwhile, Philips has been narrowing its focus from technology in general to medtech alone - and has gone big on connected devices and data processing.

Improving cancer care

Oncology is one area where pharma companies are already employing AI. Notably, Novartis, which has also been involved in AI for two or three years, [recently signed a deal](#) with IBM Watson to explore the technology's

use in breast cancer care.

The collaboration's aims include identifying better treatment sequences or predictors of response, Pascal Touchon, Novartis's global head of oncology strategy, told *EP Vantage*.

The project will analyse data from existing electronic health records using Watson's AI expertise. So what does Novartis bring to the table? "We understand what the key questions are and what to do with the answers," Mr Touchon replied.

The scope is not limited to patients receiving Novartis drugs as the company is interested in breast cancer generally. Mr Touchon expects initial findings in less than a year and, if it is successful, "we believe this collaboration could then be applied to other cancers".

Another application for AI that both Novartis and Watson are exploring is clinical trial matching. [A study](#) presented at the recent Asco meeting found that using the technology reduced the time required to screen patients for eligibility by 78%.

"If you're better at scanning patients, this could lead to faster trial enrolment [and] faster development of innovation," Mr Touchon said.

At a stroke

As for Boehringer, Mr Diesinger would only give one example of its AI projects: the Angels Initiative, a joint venture with the European Stroke Organisation that gathers anonymous time stamp data from hospitals to reveal patterns in stroke care and identify potential pinch points. This could lead to improvements aimed at speeding up stroke treatment, ultimately resulting in better outcomes for patients.

One change in practice involves identifying stroke patients in the ambulance and carrying out simple tests, so the stroke team is waiting at the hospital entrance. "That saves something like 10 minutes right away," Mr Diesinger said.

Also looking for patterns is London-based BenevolentAI, which hopes its machine-based learning approach to processing academic research, clinical studies and other health-related data will help identify correlations in data that could lead to new drugs and significantly speed up the process of drug development.

The company has already signed a deal worth up to \$800m to develop two Alzheimer's drugs for an undisclosed US pharma group. This is good progress, but Jackie Hunter, BenevolentAI's chief executive, believes most big pharma companies, if they are doing anything in AI, are dabbling. "We need critical mass," she said.

Ms Hunter also believes that if big pharma continues to sit on the sidelines and not integrate AI into their mainstream activities it could find itself overtaken by other industries. Speaking at the Prism Series conference in London earlier this month Ms Hunter said: "It would not surprise me if one of the top 10 companies in healthcare in 10 years will be [Alphabet's] Google or Vodafone."

Hurdles

AI could come into its own in outcomes-based pricing, an increasing focus for cost-conscious healthcare systems. While several outcomes-based deals have been announced, the approach still faces barriers.

"You might ask, why is it not happening? One reason is that's not the way care is being reimbursed today," said Philips's Mr Tas.

Current practice involves paying for discrete events: "Consultation, procedure, medication". In contrast, outcomes-based strategies rely on continuous care. "You continuously monitor and you intervene at the moment it's needed, so you need another way to reimburse it."

Mr Tas concluded that outcomes-based pricing was "not going to happen overnight because it's such a big shift. But it's happening, and we see it everywhere."

With plenty of other companies clamouring to get into healthcare, including tech giants like IBM Watson and Alphabet, how will medtech and pharma groups compete in the AI space?

"We're at the point of care," Mr Tas said. "It's not only that we have the devices; it's that we're on the floor. We're working with clinicians on the ground, and they get the insight into what's needed, which perhaps someone who's set back from that is not going to be able to gain."

Boehringer's Mr Diesinger agreed: "IBM Watson has some nice cases where it is diagnosing patients better than doctors, but to make it to a highly regulated traditional market there's a long way to go. We're not a technology company obviously, but we already have all this regulatory burden and access to healthcare figured out."

There are still issues to be ironed out, including cybersecurity dangers, illustrated by the ransomware attack in May that hit the UK's NHS as well as a [recent report](#) by the US Health Care Industry Cybersecurity Task Force highlighting the challenges the industry faces.

In AI we trust?

Even if cybersecurity is assured, others in the industry believe that one of the biggest hurdles AI in healthcare will have to overcome is patient trust.

Josh Sutton of Sapientrazorfish, a digital and AI consultancy group, says the big problem for health-based AI is that patients often want the answers about their health explained.

"In certain industries, like advertising for example, people don't care how you came up with an answer. In healthcare people are passionately obsessed, justifiably so, with how a decision was made to diagnose someone with cancer or recommend they have heart surgery."

This desire for transparency around diagnosis could require AI companies to give details of the algorithms used in their technology, something they might be reluctant to consider - or even enabling the technology to provide direct explanations to patients.

Mr Sutton believes that this will become more of a focus as AI becomes more prevalent in the industry and could be a limiting step for the global adoption of the approach as a standalone outside of the human-plus-machine construct many see for the industry in the short term.

"The full automation of work that is done in the industry today will take a significantly longer time than [in] other industries simply because of how critical it is we get it right, and our need, correctly in my opinion, to understand how the decisions get made and why they get made," he said.

Mr Diesinger of Boehringer agrees that overall, the pharma sector is a "couple of years behind other industries" in terms of using AI. But he feels that that could soon begin to change, particularly if healthcare spending comes under more pressure, forcing the sector to become more streamlined.

He said: "Managers are now much more interested in these new technologies and much more open to trying new things."

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