HOW AI WILL MAKE YOU RETHINK HEALTHCARE TODAY!

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Say hi to Mario! Mario, the robot-nurse, will soon start helping out in the distribution of medicines to patients at Mater Dei Hospital. Announced by the Health Minister, Hon. Chris Fearne, the new system is to be fully rolled out by 2021. Welcome to the age of Artificial Intelligence!

Up until a few years ago, the mention of Artificial Intelligence immediately brought to mind images of technology synonymous with science fiction movies. Fast-forward a couple of years, and now everybody knows what Artificial Intelligence is, or has at least come across the term "AI". We are now starting to truly appreciate the benefits AI is affording us across several application areas. One of these areas is the area of healthcare.

An important application is that of early disease detection. Hospitals generate an incredible amount of data that has for years, been left unused. But what if the key to help detect early signs of illnesses in patients is hidden somewhere in that data? When a patient is admitted to a clinic, the first thing a physician does is record the signs and symptoms. The case is then followed by noting down any treatment given and any interventions done, and finally, the outcome of the treatment. This is obviously repeated hundreds of times daily by different doctors. The application of AI has given us the capability to analyse all this data and learn any patterns and correlations in medical data to improve rapid decision-making. What we mean by early disease detection is that if a patient comes into a clinic and states his symptoms, then by using AI, the physician can be presented with an accurate list of causes, and more importantly with an effective treatment plan that has been formulated by taking into consideration what worked well in previous interventions.

Linking to the application of early disease detection is the application of AI in medical imaging. Once again, the enormous amounts of data that a hospital generates, this time in the form of medical images, can be applied to excellent use. In 2016, the American technology company NVIDIA announced an affiliation with the Massachusetts General Hospital Clinical Data Science Centre who aims to serve as a hub for AI applications in healthcare for detection, diagnosis, treatment, and management of diseases. The result of this affiliation was a supercomputer that has been trained to detect anomalies in medical images and can reach accurate conclusions, having previously studied 10 billion already-taken medical images. The number of captured medical images is overgrowing, and the process of analysing these images in time becomes unmanageable for any human, leading to the possibility of mistakes being made. AI offers the opportunity of improving this process by analysing the images faster and detecting any anomalies in a more accurate way.

While perhaps these two applications have become the applications most synonymous with AI in healthcare, we have now started exploring other applications that also focus on the patient who is already receiving some form of treatment as opposed to only prevention or early detection. Particular interest in this area has been shown in the application of Virtual Reality systems that help alleviate some of the pain patients go through during chemotherapy sessions, for example. Such systems are based on the workings of distraction therapy. During a treatment procedure, a patient is immersed in a specially designed virtual world that ensures a patient remains focused on what is happening in the world he is seeing rather than focusing on the pain symptoms. I refer you to the work being done by a US-based company KindVR, who is collaborating with clinics across the US to trial non-invasive systems to help children cope with pain.[1,2] Similar research is also being carried out locally by the Department of AI at the University of Malta in collaboration with the Sir Anthony Mamo Oncology Centre.

Another aspect is clinical bed management which is perhaps one of the major challenges in managing hospitals and this arises from the difficulty to forecast patient flow. It is practically impossible for any human to accurately plan ahead taking into consideration all the variables that can change instantly and which affect the whole scenario. An AI platform can easily analyse enormous chunks of relevant data going back years, and make informed decisions about the future through an analysis of common trends. This means that if the data at hand showed that emergency respiratory admissions peaked on particularly cold winters, then an AI system can be programmed to immediately identify such peaks at a very early stage and issue projections.

AI will never completely replace the human element in healthcare, but its adoption ensures that human activities are genuinely enhanced. AI is here and, more importantly, AI is real … now is the right opportunity to start adopting it!

REFERENCES

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