Can AI Speed Expert-level Detection of Acute Brain Hemorrhage?

On May 14 2015, Dr. Derek Shepherd (a.k.a McDreamy), the neurosurgeon from Gray's Anatomy, saved four individuals injured in a car accident. He was pulling back onto the road and that's when a semi-truck slammed him. Derek was rushed to the nearest hospital, which was woefully incapable of saving his life.
When his ambulance showed up at the hospital, the on-call doctor didn't want to admit him. He kept saying that it was not a trauma center and was not equipped to deal with four car accident victims alongside Derek. Although they admitted him, they didn't take a head CT and were unaware of Derek's brain injury.
Besides being heartbroken, many of you like me must be wondering: Would Derek have survived had he underwent a CT scan and his injury was addressed as soon as he was brought to the hospital? The answer is – possibly yes.

From screen to practice

McDreamy's scenario is a reality at a majority of hospitals across the world. In reality, most of these institutions have easy access to CT scanning, but the burden encountered by the personnel working in radiology departments from the ever-increasing workload and imaging complexities is a clear indication that timely and accurate diagnosis of cases like intracranial hemorrhage (ICH) may suffer. Hospitals lacking on-demand radiology services are likely to rely on a resident to report the scan, where the potential to miss a finding is greater.
Intracranial hemorrhage (ICH) is a devastating sub-type stroke, accounting for 10-20% of all strokes worldwide. The mortality rate of ICH in a month is approximately 40%, which hasn't changed over at least the past 20 years. If patients survive the ictus, then the resulting hematoma present within brain parenchyma starts triggering adverse events, resulting in long-term neurological deficits. Symptoms tend to appear without warning, as in the case of Derek, but they develop gradually. And according to research conducted by Havard Medical School, symptoms worsen over a period of 30 to 90 minutes.

Deep into the Brain: Artificial Intelligence in Stroke Imaging

Like McDreamy, team HaiLTH also believes – "Every day is a beautiful day to save lives." Our products leverage the latest technology for a second layer of

analysis, expediting the clinical team's detection and response time for acute cases.

HaiLTH's unique AI based solution is capable of automatically identifying and alerting physicians of suspected internal brain bleeds from common non-contrast head CTs. HaiLTH's 1 pager emergency Teleradiology report can provide an early indication of people at high risk of brain bleeding, enabling rapid reviewing and management by the concerned team.

The unique algorithm of our AI-powered automated diagnostic solution based on deep learning models is trained on over approximately quarter a million head CTs. It comprises a unique tailor-made neural network architecture aimed at identifying intracranial hemorrhage while handling challenges like relatively small bleed size and high variance within a patient's brain.

AI to Change Radiology but Not Replace Radiologists

Coming back to the case of McDreamy's road traffic accident, our AI algorithm would have identified a bleed from a head CT. And adequate treatment on the basis of findings could possibly have saved his life. And as we continue to advance our head CT solution, we will identify more head CT findings that will augment radiologists' day-to-day practices and ensuring that patients receive the ultimate care, driven by HaiLTH solutions.

Recent advances in AI have led to speculation that the technology might replace human radiologists. But for the most part, though, the most advanced systems are currently on par with human performance. It is still imperative for a clinician to be involved in interpreting these ultrasound results read by AI, even if the technology, ideally, were to supplant the need for a human eye. The decision-making must be defined within the context of the individual clinical scenario, accounting for the patient preference, demographics and comorbid conditions.