



Advances and Limitations of Artificial Intelligence in Healthcare: Oncology Perspective

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Artificial intelligence and IOT (internet of things) being the latest hype in our everyday applications of technology started to shape multiple sectors around us. From transportation to finance, education and social media, it is indeed growing by the day and torpedoed by the massive investment capabilities of tech firms and their insatiable appetite to explore new fields.

AI in healthcare in general and oncology in particular hold multiple strong cards; the colossal computing power offered by AI is a prime asset for data indexing and information compounding pivotal for clinical trials and data analysis rendering results of utmost accuracy in a timely and cost-effective manner. Oncologists' access to information is also optimized, enabling swift and precise engagement with latest findings and studies. AI has promising benefits in alleviating administrative barriers from oncology practice increasing doctors' time in supporting patients directly.

Molecular and precision oncology is an area where AI has proved paramount benefits. The use of computational power enhanced greatly the screening and diagnostic process through comparing thousands even millions of molecular, genetic, and cellular data. AI succeeded in promoting higher accuracy in early detection, diagnosis, and monitoring of solid tumors helping to tailor and improve overall treatment.

With that in mind, multiple barriers delay AI's incorporation in oncology today. Being a computational black box, one cannot rely on it to give a dissected and rational decision in general. In oncology, transparency is of great importance to all parties involved:

patients, caregivers, hospitals and insurance companies. This black box effect combined with the automated learning of generative AI present a regulatory nightmare that holds back its use in clinical hospital settings. In addition, ethical dilemmas present another layer of complications since liability and accountability in AI are practically non-existent.

The quality of data presented to the algorithm play a huge role in the outcome of any decision taking. Bad, incomplete or simply mis-interpreted data results in false decision outcomes; what even makes this problem more serious is that AI itself does not recognize this difference between reliable and inaccurate consequences.

Biases are an important factor in limitations of AI in oncology too. Machines are more prone to algorithmic biases thus social or economic variables are very hard to incorporate on programming levels.

To sum up, AI can present a super weapon in the armory of practicing oncologists worldwide. A symbiotic approach where doctors and researchers utilize AI as a helping tool to optimize their practice and research should be the cornerstone of incorporating it more to the field.

However, empathy, human touch, and well-rounded multifaceted decisions taken by oncologists themselves will remain the gold standard for an ideal clinical practice, optimized by machines assistance, to reach their desired outcomes with significant efficiency within societal and medical regulatory norms.