Artificial intelligence and laboratory medicine: at the crossroads of value ethics and liability

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Laboratory medicine plays a pivotal role in healthcare and provides essential diagnostic information to guide clinical decision-making. Emerging technologies such as next-generation sequencing, liquid biopsies, and omics have transformed diagnostic testing on the way of a more personalized medicine. These technologies enable healthcare professionals to obtain more precise and accurate diagnostic information, which can lead to more targeted therapies. Artificial intelligence (AI) is also revolutionizing laboratory medicine with the potential to leverage value at different levels such as improving patient outcomes, clinical laboratories efficiencies and allocation of resources.

AI has the potential to transform laboratory medicine by enabling better decision-making, faster diagnosis, and more personalized treatment. AI can analyze and integrate vast amounts of data, identify patterns, and make predictions that can assist healthcare professionals in making accurate diagnoses. AI can also optimize laboratory workflows, reducing turnaround.

Time and improving patient outcomes. AI is also at the basis of a next generation of clinical decision support systems (CDSS) that can assist healthcare professionals in making clinical decisions. CDSS can integrate patient-specific data, imaging, and clinical guidelines to provide personalized treatment recommendations. However, CDSS must be carefully designed and evaluated to ensure that they are accurate and reliable and laboratory specialists are playing a fundamental role for that.

However, these advancements also raise ethical concerns and questions of liability. The use of emerging technologies and AI in laboratory medicine raises ethical concerns such as patient privacy, informed consent, and the potential for biases. AI algorithms must be transparent, explainable, and accountable to ensure that they are not perpetuating biases or making decisions that are not in the best interest of the patient. Patient privacy must also be protected when using AI, as patient data can be vulnerable to hacking and misuse.

Another important concern for the use of AI is liability. Who is responsible if an AI algorithm makes an incorrect diagnosis or recommendation? Is it the healthcare professional who uses the tool, the manufacturer of the tool, or the AI algorithm itself? Liability must be carefully considered and addressed to ensure that patients are protected, and healthcare professionals are not held responsible for errors that may be beyond their control.

Specialists in laboratory medicine are central players in the transition of emerging technologies as well as in the application of AI. They should be engaged, collectively and in multidisciplinary teams to achieve it. They must also carefully evaluate and implement these technologies to ensure that they are accurate, reliable, and ethical. It is crucial to strike a balance between the benefits and potential risks of using emerging technologies and AI in laboratory medicine to ensure the best possible outcomes for patients.

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