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Commentary

Artificial Intelligence in Oncology and its Clinical Data

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DESCRIPTION

The field of Artificial Intelligence (AI) in oncology has grown exponentially in recent years. AI solutions have been developed to address a variety of cancer-related challenges. Healthcare institutions, hospital systems, and technology companies aim to support clinical decision making, improve access to cancer treatments, and improve clinical efficiency while providing safe and quality tumor treatments for developing AI tools. However, the acceptance of AI instruments is not widespread, and the impact of AI on patient outcomes remains uncertain. The major obstacles to AI implementation in oncology are biased heterogeneous data, data management and collection burdens, lack of standardized work reports, inadequate clinical validation, workflow and user design challenges, outdated regulation and law. Includes workflow, dynamic knowledge and data and specific actions that key stakeholders can take to overcome barriers to the implementation of AI in oncology include training and education of oncology staff in AI. Data standardization, model validation methods, legislation and safety regulations, funding and conducting future work. Artificial Intelligence (AI) is a branch of computer science that studies algorithms that perform tasks normally associated with human cognition. AI has been applied to medical problems for many years, but its adoption is now accelerating due to the dramatic growth of large machine-accessible health data, powerful computing systems, and innovative software technologies. AI embraces different methods and processes different formats of data to generate insights that inform healthcare and its delivery. Like humans, AI can use existing knowledge and experience to recognize patterns in data. However, unlike humans, AI can quickly synthesize large amounts of complex, diverse data without feeling tired.

AI algorithms have the potential to transform health and healthcare delivery by helping solve complex problems such as improving quality of life, prolong survival, maximize safety and increase value. AI algorithms are developed using AI methods and consist of rules or processes that are applied to specific scenarios to analyze data, learn from data, and make informed decisions. They can be developed using a rule-based approach that requires human input (ie, monitored) or a statistical approach that does not require human input (that Common healthcare applications include conditions, events, and risks to support clinical decision making, enable population health management, reduce administrative burden, increase efficiency, and facilitate discovery.

Due to the complexity of oncology, the opportunities for AI to influence oncology-related problems are enormous. However, so far, few AI tools have had a significant and widespread impact on oncology. The goal of this manuscript is to identify current and future AI-based solutions to oncology problems. Discuss barriers to implementing effective cancer-focused AI solutions. We propose steps to help facilitate the development and use of AI tools in routine clinical practice. Due to some features of oncology, AI can make a big impact. First, the social burden of cancer is great. In the United States, more than 1.8 million people are diagnosed each year and about 600,000 die of cancer. Second, cancer treatments are very expensive and costs are rising rapidly, with estimated annual cancer spending in the United States study $ 173 at $ 140 billion. Third, optimal treatment planning requires the interpretation and integration of large amounts of complex data from a variety of sources, including pathology, laboratories, radiology, and advanced molecular diagnostics. While these properties make oncology suitable for the application of AI solutions, they also pose significant obstacles to their development.

To date, some of the most promising studies on AI in oncology have been done in the areas of cancer appearance, especially digital pathology, x-ray copy, and clinical photography. In digital pathology, AI is applied to both low-level and high-level appearance processing and classification tasks (eg, tumor detection and segmentation, and appearance pattern-based disease diagnosis and treatment response prediction) and is time-consuming. In radiology, multiple assessments have been revealed that AI tools can distinguish between high-risk and low-risk lesions with a variety of diagnostic methods. Integration of radiographic descriptions for risk stratification of lesions detected in descriptions with other data sources (such as clinical features and genetic/biochemical markers) already exists and will become more common in the future. AI is also used to improvethe diagnostic accuracy of dermatological and gastrointestinal malignancies in clinical data and reduce diagnostic uncertainty.

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