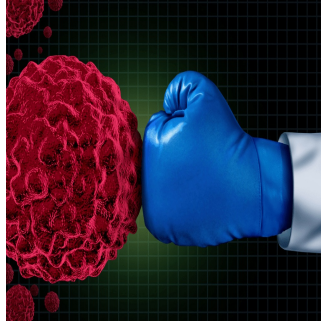

Digital Solutions for Cancer Care: The Role of AI in Precision Medicine



The field of cancer care is evolving rapidly, driven by advancements in artificial intelligence (AI) and digital technologies. These innovations enable healthcare systems to bridge gaps in cancer screening, improve clinical trial recruitment, and streamline care delivery. Geisinger Health System and Texas Oncology are prime examples of organisations leveraging AI and machine learning to optimise patient care in colorectal cancer screening and precision oncology. This article explores how digital solutions are transforming cancer care and the future possibilities they offer in the fight against cancer.

AI in Cancer Screening

Geisinger Health System's Colorectal Cancer Initiative Artificial intelligence is revolutionising cancer screening, particularly in colorectal cancer, where early detection is critical to improving survival rates. Geisinger Health System has taken a proactive approach, using AI and machine learning technologies to identify high-risk patients needing colonoscopy screenings. By analysing extensive data and predictive models, Geisinger has been able to flag patients most likely to benefit from early interventions. This targeted approach has led to a significant increase in completed screenings, with almost 30% of flagged patients undergoing life-saving colonoscopies.

AI-driven precision medicine improves efficiency and reduces the burden on healthcare personnel. By automating time-consuming tasks such as data analysis and patient identification, AI empowers clinicians to focus on patient care. Geisinger's success demonstrates how digital tools can positively impact clinical outcomes, showcasing the potential of AI in addressing gaps in cancer screening and ultimately saving lives through early detection.

Texas Oncology: Precision Medicine for All, Anywhere

Texas Oncology is breaking down geographical barriers to cancer care by integrating digital tools into its precision medicine programme. With a patient population spread across a vast state, Texas Oncology recognised the need to bring cutting-edge care directly to patients, regardless of their location. By using molecular databases and electronic medical records (EMRs), the organisation can identify patients' genetic profiles and match them to clinical trials, ensuring that even those in remote areas can access advanced treatment options.

One of the major hurdles in precision oncology is low participation in clinical trials, particularly in community settings. Texas Oncology's digital solutions have addressed this issue by streamlining trial recruitment and expanding access to patients in underserved regions. The introduction of virtual tumour boards, where specialists can collaborate remotely, has further enhanced patient care by allowing multidisciplinary teams to review cases and make informed treatment decisions. These digital innovations are not only increasing clinical trial participation but also improving patient outcomes by ensuring that precision medicine is available to everyone, no matter where they live.

The Future of Precision Medicine: Collaboration and Shared Knowledge

Digital technologies do more than streamline processes; they foster collaboration across healthcare organisations. At Texas Oncology, digital platforms have made it easier for multidisciplinary teams to work together, regardless of location. Virtual tumour boards have eliminated the logistical challenges of coordinating in-person meetings, allowing for real-time collaboration between radiologists, surgeons, and oncologists. This level of teamwork is critical in developing personalised treatment plans tailored to each patient's unique cancer profile.

Additionally, digital solutions are facilitating knowledge-sharing across the Texas Oncology network. The organisation can share best practices and lessons learned with its medical team by documenting and analysing treatment outcomes based on genetic profiles. This continuous learning approach ensures that patients benefit from the collective expertise of hundreds of physicians, enhancing the overall quality of care. The ability to

disseminate and integrate knowledge into daily practice is a key factor in advancing precision oncology and improving long-term patient outcomes.

Unlocking the Potential of AI in Cancer Care

Integrating artificial intelligence and digital solutions into cancer care transforms how healthcare organisations approach precision medicine. As demonstrated by Geisinger Health System and Texas Oncology, AI can significantly enhance cancer screening, clinical trial recruitment, and collaborative care. These technologies not only streamline workflows but also improve clinical decision-making, leading to better outcomes for patients. By embracing these innovations, healthcare providers can deliver personalised, cutting-edge care to patients, regardless of location, and unlock new possibilities in the fight against cancer. The future of cancer care is digital, and with continued advancements in AI, precision oncology will continue to evolve, offering hope to patients worldwide.

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