UW researchers using AI to hone brain cancer care, diagnosis

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Researchers with the UW Carbone Cancer Center are developing AI techniques to improve personalized treatments and avoid unnecessary biopsies and surgeries.

Pallavi Tiwari is co-director of imaging and radiation science at the Madison-based cancer center and an associate professor of radiology and biomedical engineering at the UW School of Medicine and Public Health. Her team is gathering MRI scans from clinical sites around the world to train artificial intelligence models to predict how patients will respond to treatment.

"We want to personalize treatment for every patient based on the kind of tumor that they have," she said in remarks provided by UW Health

One promising application of this technology aims to help patients with an aggressive form of brain cancer called glioblastoma, Tiwari said. After treatment, these patients have to return for follow-up care due to the high risk of recurrence. With currently available tools, specialists are unable to tell the difference between a benign noncancerous lesion caused by the radiation treatment and new tumor growth.

But with the new AI tools being developed, "we have over 90 percent accuracy in distinguishing patients who have a benign radiation side effect from patients who have tumor recurrence," she said. For patients with noncancerous lesions, that means they don't have to undergo invasive, unnecessary biopsies or surgeries.

"We are continuing to move forward, and we are actually planning a clinical trial on this where we can prospectively demonstrate the value of these models in conjunction with the radiologist," she said.

Tiwari also explained chemotherapy radiation treatment will fail in 40 percent of brain cancer patients within six months of treatment. She says the AI tools in development could help predict which patients will see a positive response, guiding selections for clinical trials and improving the likelihood of treatment success.

Meanwhile, researchers also want to use machine learning tools to help neurosurgeons identify prime locations for biopsy sampling.

"That's, in our mind, sort of a low-hanging fruit," she said. "These patients right now, when they undergo biopsy, very often neurosurgeons go in in a blinded way, because they don't know where to take the biopsy from."

See more:
https://www.wisbusiness.com/2023/uw-carbone-cancer-center-improving-brain-cancer-diagnostics-and-treatment-with-ai/