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# Digital Pathology Could Improve Accuracy, Timeliness of Cancer Diagnosis

*Ohio State among first to implement a system-wide digital pathology service for cancer diagnostics, including primary diagnosis and second opinions*

COLUMBUS, Ohio – An accurate, timely diagnosis is the critical first step in every cancer patient's treatment. Traditional pathology services, however – where tumor cells are placed on glass slides for examination under a microscope – make it more difficult to share the cases for second review and rely on more subjective methods of grading and quantitating cancer.

In April 2017, the U.S. Food and Drug Administration (FDA) approved digital pathology for use in primary cancer diagnosis, opening the door for clinical pathology services to undergo important changes that will make it easier to share cases for expert review and utilize sophisticated quantitative algorithms to accurately stage and grade cancer. This will enable patients to start potentially life-saving therapies sooner.

Also known as "whole-slide imaging," digital pathology is the process of scanning conventional glass slides and then digitally knitting consecutive digital images into a single, whole image that replicates the information on the glass slide. This virtual image is paired with associated clinical information to give pathologists an integrated picture of the person's unique cancer. Pathologists can then perform additional diagnostics, including image analysis tests that are not possible on traditional glass slides.

Unlike conventional glass slides, these enhanced images can be viewed, manipulated and interpreted on a computer with the combined benefit of the pathologist's trained eye and predictive algorithms.

“These algorithms can separate certain features above and beyond what the human eye can see because the important features may actually be a combination of characteristics that indicates a specific diagnosis,” says Anil Parwani, MD, PhD, director of digital pathology and vice chair/director of anatomic pathology at The Ohio State University College of Medicine Department of Pathology. “Taken together, these features act almost like an image signature to help us make a prediction about a patient’s cancer. We can also use algorithms to do risk assessment.”

The Ohio State University Comprehensive Cancer Center – Arthur G. James Cancer Hospital and Richard J. Solove Research Institute (OSUCCC – James) is implementing a long-term digital pathology workflow solution for the cancer program as well as the overall health system. All new patient pathology slides will be digitized along with the past five years of pathology slides processed at the Columbus, Ohio-based hospital.

“Cancer pathologic diagnosis is needed at all hours of the day and in every community across the globe. This technology will allow us to take that subspecialized consultation and diagnosis to patients – regardless of where they live,” adds Parwani.

In addition to improving pathology workflow and patient care implications, the OSUCCC – James effort will create a robust digital archive of pathology cases with associated clinical data for future research based on subsets of cancer. Funds raised by Pelotonia, a grassroots cycling event that supports cancer research initiatives at the OSUCCC-James, will be used to help create this research archive and make it available to all cancer investigators.

“Leveraging this type of de-identified big data for research collaboration is critical as we move forward in an era of predictive precision cancer medicine – finding ways to match the right patient with the right drug at the right time is absolutely critical, and this is taking another step toward that goal,” adds Michael Caligiuri, MD, director of the Ohio State University Comprehensive Cancer Center and CEO of The James Cancer Hospital and Solove Research Institute.

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**About the OSUCCC – James**

The Ohio State University Comprehensive Cancer Center – Arthur G. James Cancer Hospital and Richard J. Solove Research Institute strives to create a cancer-free world by integrating scientific research with excellence in education and patient-centered care, a strategy that leads to better methods of prevention, detection and treatment. Ohio State is one of only 47 National Cancer Institute (NCI)-designated

Comprehensive Cancer Centers and one of only a few centers funded by the NCI to conduct both phase I and phase II clinical trials on novel anticancer drugs sponsored by the NCI. As the cancer program's 308-bed adult patient-care component, The James is one of the top cancer hospitals in the nation as ranked by *U.S. News & World Report* and has achieved Magnet designation, the highest honor an organization can receive for quality patient care and professional nursing practice. At 21 floors and with more than 1.1 million square feet, The James is a transformational facility that fosters collaboration and integration of cancer research and clinical cancer care. Learn more at cancer.osu.edu.