TWOD: Revolutionizing Digital Pathology

Pathology labs face constant pressure to deliver accurate results faster while managing increasing workloads and stringent time constraints. Traditional histopathology workflows present several challenges that hinder improving efficiency and precision. These include labor-intensive manual processes, disorganized case management, delays in obtaining second opinions, and lengthy wait times for diagnoses. These challenges highlight the need for more efficient and streamlined workflows to improve patient care outcomes.

Inefficient histopathology workflows can also lead to significant diagnostic errors, adversely affecting patient care. A recent survey revealed that approximately 95% of pathologists and laboratory directors believe that most errors occur in the pathology lab. The study found that 38% of errors happen at the initial labeling and identification stages, including mix-ups of patient names or tissue locations. Problems with tissue sampling, such as lost or damaged samples, account for 10% of errors. Nearly half of the errors occur during the preparation of the final pathology report, including missing information or incorrect report delivery. These findings underscore the critical need for implementing more efficient and error-resistant systems in histopathology labs.1,2

The TWOD Advantage

If you're seeking to streamline your pathology lab's operations to manage growing workloads and minimize errors, it's time to consider a comprehensive workflow optimization solution. Our Tissue Workflow Optimization for Digital (TWOD) system enhances the entire pathology process. From specimen collection to final diagnosis, TWOD streamlines operations for faster, more accurate output. By integrating a proprietary cassette system with advanced digital pathology tools, TWOD optimizes tissue handling, processing, and analysis of biopsy specimens.

Let’s explore five key advantages the TWOD platform has over traditional pathology workflows:

Advantage 1: Proprietary Cassettes Preserve Specimen Integrity and Accelerate Biopsy Workflows

A persistent challenge in tissue biopsy handling has been maintaining specimen integrity. Traditional processing methods require transferring biopsies from cassettes to formalin jars, often resulting in lost, broken, or damaged specimens, leading to delays and potential errors such as misdiagnoses. TWOD minimizes tissue biopsy handling issues with its patent-pending cassette that accommodates three biopsy cores in one unit. Unlike traditional methods, specimens can remain in the cassette from lab arrival through fixation, grossing, and embedding processes. This innovation eliminates excess tissue manipulation, dramatically reducing the risk of lost, broken, or damaged specimens. This translates to fewer delays, lower risk of misdiagnosis, and no need for repeat procedures.

The benefits of the TWOD cassette go beyond sample preservation. By consolidating three cores into one cassette, it slashes reagent use, cuts down on staining, processing, imaging, and slide review time, and minimizes physical storage needs. For pathology labs, this means significant time and cost savings, coupled with improved accuracy.

Advantage 2: Tracking and Identity Retention for Unparalleled Accuracy

TWOD cassettes feature a unique color-coding and barcoding system that tracks specimens from the sampling site to the histology lab to the pathologist’s computer. Each tissue in a single block is stained with a distinct colored dye to ensure accurate tracking. Barcodes are seamlessly integrated with our Laboratory Information System and Image Management System, providing centralized management of the entire process. The result is drastically improved diagnostic accuracy and reduced errors. In an era of rising demands on pathology labs, TWOD ensures that each specimen is handled with the utmost care and accountability.

Advantage 3: AI-powered Analysis for Enhanced Diagnoses

The TWOD system automates and standardizes gross biopsy measurements. AI-powered technology,

developed in-house by the DigitCells software team, aids in biopsy core measurements using machine learning algorithms to automatically detect and measure cores. These algorithms accurately account for core curvature, ensuring that the camera does not mistakenly detect the edges of the cassette or unwanted artifacts as part of the tissue. This provides consistent, objective measurements of tissue biopsies, all while the tissues remain securely within the TWOD cassette. Measurements are auto-populated into the Laboratory Information System, reducing hands-on time and minimizing the risk of data entry errors.

Advantage 4: Digitized Slides Expedite the Diagnostic Process

TWOD transforms the way pathologists work by allowing them to view slides digitally on their computer screens, eliminating the need to spend hours at a microscope. Digitized slides also facilitate access to historical data, making it easier to track disease progression and improve patient treatment outcomes. Moreover, with just a few clicks, pathologists can effortlessly share digital slides with colleagues, enhancing the accessibility and speed of obtaining second opinions, further ensuring diagnostic accuracy.

Advantage 5: Seamless Integration with Current Workflows

Digitizing your workflow might seem daunting – will you need to overhaul well-established protocols? TWOD has you covered. Our system allows you to digitize your workflow without major changes to existing tissue processing protocols. TWOD integrates seamlessly with your current lab processes, minimizing manual steps and reducing delays. This means you can harness the power of digital pathology without disrupting your established procedures.

Make the Leap to Digital with TWOD

By incorporating the best of traditional histopathology and digital pathology tools and methods, TWOD can improve efficiency and accuracy. By addressing common challenges in workflow optimization, specimen integrity, and tracking, you won't just make processes easier at the bench – you'll be helping improve patient outcomes.

To learn more about how TWOD can transform your pathology workflow, or to schedule a demonstration, contact our team at DigitCells.

1. Santana MF, Ferreira LC de L, Santana MF, Ferreira LC de L. Errors in Surgical Pathology Laboratory. In: Quality Control in Laboratory. IntechOpen; 2018. doi:10.5772/intechopen.72919

2. Zarbo RJ, Meier FA, Raab SS. Error detection in anatomic pathology. Arch Pathol Lab Med. 2005;129(10):1237-1245. doi:10.5858/2005-129-1237-EDIAP