



PERSPECTIVES IN PATHOLOGY

Digital Pathology: A New Look

By Dirk Soenksen

Digital pathology—a digital environment for slide-based diagnosis—represents what's new and exciting in pathology. Digital pathology enables the delivery of consistent and accurate results faster than traditional methods. In practice, digital pathology is a context-based approach that seeks to provide a pathologist with all of the information necessary to make a decision in one integrated environment. In the world of digital pathology, gross images, case histories, digital slides, algorithmic analyses and pathology reports are all tightly linked and at the pathologist's fingertips.

Diverse Needs

Clinical, research and education markets all need digital pathology, but the needs and issues for each are very different. The education market, for instance, has embraced digital pathology as an alternative to providing medical students with glass slide sets. Digital slides (digital images representing the entire slide) can be annotated and reviewed in synchronous or asynchronous interactions between students, and between students and instructors, obviating the need for maintaining glass slide teaching sets and for providing students with access to conventional microscopes.

In cancer research and toxicologic pathology, both areas of the research market, the focus is on handling and analyzing large volumes of slides, or in the case of tissue microarrays, large volumes of imagery data. For chief researchers or pharma companies faced with reviewing thousands of slides in a pre-clinical study, pathologists become the bottleneck in a

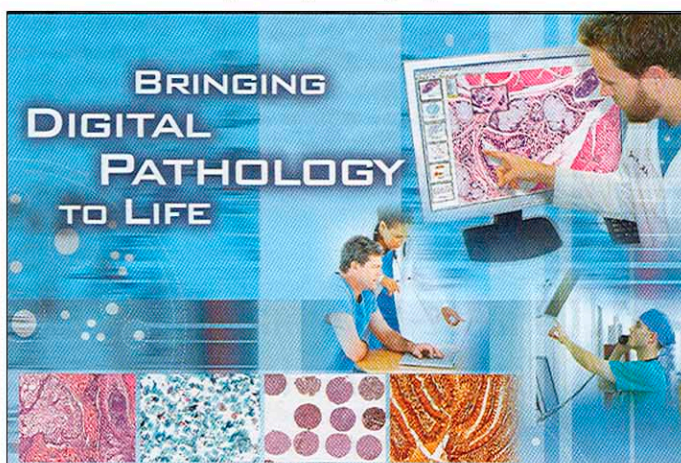
potentially long and costly process. Digital pathology is a way to automate time-consuming and tedious processes, to provide instant and intelligent access to otherwise unmanageable amounts of histopathologic data and ultimately speed the discovery process. Digital pathology also eliminates the need to move glass slides around for peer review.

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In the clinical market, the adoption of digital pathology is driven by the need for capabilities in telepathology, image analysis and interoperability with PACS (picture archiving and communication system), with some institutions self-certifying their digital pathology solutions in advance of regulatory certification. A driving factor in the adoption of digital pathology for clinical decision making is the dispersed nature of case information. Gross images are captured and stored in one place, glass slides are prepared in another location, case history in a third location, etc. Pathologists are provided on a daily basis with what amounts to an incomplete set of pieces to a puzzle, which makes for inefficient work and marginalizes their contribution to patient care. Digital pathology puts everything needed to make an interpretation or decision at their fingertips.

Key to PACS

Central to the vision for digital pathology is establishing pathology as a modality in a modern PACS—which is to say pathology imagery will be accessible from within the current healthcare IT infrastructure for managing imagery from X-ray, MRI, ultrasound and related modalities in digital format. Establishing pathology's role in PACS is also essential to enable the enterprise-wide PACS that is a funda-



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