



Proceedings

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CHOOSING AND IMPLEMENTING THE CORRECT WHOLE SLIDE IMAGING SYSTEM

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Introduction/ Background

The whole slide imaging (WSI) market has developed enormously in the recent years. This evolution has made the selection and the implementation of digital pathology more complicated. Based on a validation process, we developed recommendations that need to be taken into account when implementing whole slide imaging. In addition to selecting the right hardware, one should also focus on laboratory organization, integration, training and handling.

Aims

The aim is to integrate WSI as efficiently as possible in a standardized process. This should lead to a user friendly workflow for pathologists and must ensure the quality of the diagnosis.

Methods

We organized on-site demonstrations to test several available WSI systems with a fixed set of histology slides. We evaluated scanning quality, measured the scanning time, the amount of data produced and made a simulation of a routine workflow. We developed a to-be workflow beginning with the scanning process until the final diagnosis of the pathologist. The workflow focused on the integration of the system into the laboratory information system. We standardized the technical laboratory processes to increase the quality of the slides and the efficiency of WSI. The standardization included good labeling, adequate quality, standardized location and correct number of sections on the slide. We introduced a continuous workflow to reduce batch size and to decrease the turn-around-time. The pathologists were only allowed to work with WSI after training in order to manipulate the images as efficiently as possible. Finally we validated the system according to CAP guidelines for WSI for diagnostic purpose in pathology.

Results

It is very important to determine what the purpose of WSI implementation in the lab is. The different systems show large variations between them and not every set up will fit in the specific workflow of each lab. The workflow simulation gave us an idea of the scanning turn-around-time and made it possible to estimate the amount of scanners that would be necessary in daily routine. Another focus point is the total integration of WSI to find a synergy between the hardware, workflow and the way the system can be integrated into the IT infrastructure of the lab. Beside the bidirectional communication with the laboratory information system, data storage organization and its influence on the lab's productivity is also very important. Organizing the laboratory with a standardized continuous workflow will reduce the amount of data, increase speed and lower the amount of rescans. To prevent that WSI is used inefficiently, it is crucial to train the pathologists before they start using it. A lack of training will lead to a dislike of WSI due to poor knowledge of the available applications. The pathologists are indicating that it's crucial to have the correct hardware to manipulate the image in order to ensure diagnostic speed and to lower the threshold towards WSI. We may conclude that choosing and implementing the correct WSI solution needs a systematic approach to succeed on the long term. Defining and optimizing the workflow before implementing whole slide imaging is crucial. Hardware, workflow and IT infrastructure should match to ensure productivity. Training of the pathologists is decisive in



order to ensure efficient use.