



Issues for application of virtual microscopy to cytoscreening, perspectives based on questionnaire to Japanese cytotechnologists

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Abstract

Introduction: To clarify the issues associated with the applications of virtual microscopy to the daily cytology slide screening, we conducted a survey at a slide conference of cytology.

Methods: The survey was conducted specifically to the Japanese cytology technologists who use microscopes on a routine basis. Virtual slides (VS) were prepared from cytology slides using NanoZoomer (Hamamatsu Photonics, Japan), which is capable of adjusting focus on any part of the slide [1, 2]. Total of ten layers were scanned from the same slides, with 2 micrometer intervals. To simulate the cytology slide screening, no marker points were created. The total data volume of six slides was approximately 25 Giga Bytes. The slides were stored on the Windows 2003 Server, and were made accessible on the web to the cytology technologists.

Results: Most cytotechnologists answered “Satisfied” or “Acceptable” to the VS resolution and drawing speed, and “Dissatisfied” to the operation speed. To the ten layered focus, an answer “insufficient” was slightly more frequent than the answer “sufficient”, while no one answered “fewer is acceptable” or “no need for depth”. As for the use of cytology slide screening, answers “usable, but requires effort” and “not usable” were about equal in number. In Japanese cytology meeting, unique VS system has been used in slide conferences with marking to the discussion point for years.

Conclusions: Therefore, Japanese cytotechnologists are a relatively well accustomed to the use of VS, and the survey results showed that they regarded VS more positively than we expected. Currently, VS has the acceptable resolution and drawing speed even on the web. Most cytotechnologists regard the focusing capability crucial for cytology slide screening, but the consequent enlargement of data size, longer scanning time, and slower drawing speed are the issues that are yet to be resolved.

Keywords: Virtual slide, Cytoscreening, Cytotechnologist, Focusing ability.