



A New Diagnostic for MWDs: Static Cytology Maximizes Readiness, Accelerates Treatment, and Trains Military Officers



Elise E. B. LaDouceur, DVM, DACVP

Veterinary Pathology Service, Joint Pathology Center, Silver Spring, MD

Introduction

Static cytology, where digital slide images are captured and emailed to a pathologist, is faster and more accessible than mailing whole cytology slides to a diagnostic laboratory. However, its accuracy and utility have not been studied when images are captured by clinical veterinarians under realistic conditions. This study aimed to assess diagnostic concordance between static cytology and whole slide analysis and survey Veterinary Corps Officers (VCOs) on the benefits of static cytology.

Methods

- Static cytology cases:** The Joint Pathology Center (JPC) implemented a diagnostic static cytology service for Veterinary Treatment Facilities (VTFs). Static cytology cases submitted were reviewed by a single, board certified veterinary clinical pathologist, who rendered all interpretations. Cases submitted over the first 17 months were collated.
- Whole slide comparison:** If whole cytology slides were subsequently submitted, an intra-observer, blinded comparison between static and whole slide interpretations was performed and categorized as full agreement, minor disagreement, major disagreement, or diagnosis established on slide review (DESR).
- Statistics:** Sensitivity (TP/[TP+FN]) and specificity (TN/[TN+FP]) of static cytology compared to whole slide analysis were determined. Spearman’s rank correlation analysis was used to determine how strongly the number of images submitted correlated to the level of agreement.
- Contributor survey:** A survey was also sent to participating veterinarians to collect data on submission time and reasons for service use.

Results

- Static cytology cases:** Images of cytology slides from 274 lesions were submitted to JPC by 75 Veterinary Corps Officers (CONUS [n=62] and OCONUS [n=13]) in the first 17 months of implementing this service.
- Whole slide comparison:** Whole slides were submitted for evaluation following static cytology for 94 out of the 274 lesions (**Table 1**).

Table 1. Diagnostic Concordance between Static Cytology and Whole Slide Review

Diagnostic Concordance	Percentage of cases	Key Details
Full Agreement	78%	22% had increased diagnostic confidence on whole glass slide review
Diagnosis Established on Slide Review (DESR)	17%	The pathologist requested full slide review because the static cytology was non-diagnostic/descriptive, and the follow-on whole slide review established a diagnosis
Minor Disagreement	3%	The diagnostic process was the same (one case each of proliferative, neoplastic, and inflammation), but the whole slide diagnosis was more specific
Major Disagreement	1%	The static cytology diagnosis was inflammation, and the whole slide diagnosis was neoplastic (i.e., keratin-producing cyst or neoplasm with inflammation)

- Statistics:**
 - Specificity of static cytology = 87%
 - Sensitivity of static cytology = 74%
 - Spearman’s rank correlation between number of images submitted and level of agreement = 0.1011 (p=0.38), indicating a lack of significance
- Contributor survey:** Questionnaires were sent to 75 contributors, 23 of which responded (30.7% response rate). Clinicians indicated static cytologies and whole slide submissions required on average 0.4 hours and 5.9 hours, respectively, to prepare and submit. Clinicians also indicated reasons for using the static cytology service (**Table 2**).

Table 2. Why Clinicians Submit Static Cytology

Reason for submitting static cytology (select all that apply)?	%
Faster diagnosis	57%
Improve cytology skills	76%
Make treatment decisions	71%
Other	10%

Discussion

By significantly reducing the time burden associated with full slide submissions, static cytology creates a more efficient workflow, allows for faster treatment decisions, and improved patient care, which is especially pivotal to improving medical readiness for Military Working Dogs (MWDs). As essential "force multipliers," MWDs directly impact combat capabilities, security, and detection of dangerous substances; therefore, maximizing their working time is vital to mission readiness. Static cytology allows for rapid, often same-day results, facilitating prompt clinical decisions and reduced downtime. This is especially relevant for MWDs stationed in remote locations with inconsistent mail access. Most VCOs use this service to improve their cytology skills through direct access to a board-certified clinical pathologist, who helps them verify interpretations and hone critical skills like image acquisition and microscope handling. This study also validated static cytology as an accurate diagnostic tool, even when images are captured by non-pathologists (i.e., veterinarians in a clinical setting).



Select References

- Blanchet *et al.* Evaluation of region of interest digital cytology compared to light microscopy for veterinary medicine. *Vet Pathol.* 2019;56(5):725-731.
- Fish *et al.* Digital Cytopathology Quality Guidelines. *Vet Clin Pathol.* 2025;54(4):318–337
- Pantanowitz L. Digital images and the future of digital pathology. *J Pathol Inform.* 2010;1:15.
- Piccione *et al.* Digital pathology in veterinary clinical pathology: a review. *Vet Pathol.* 2025;62(5):631-645.