

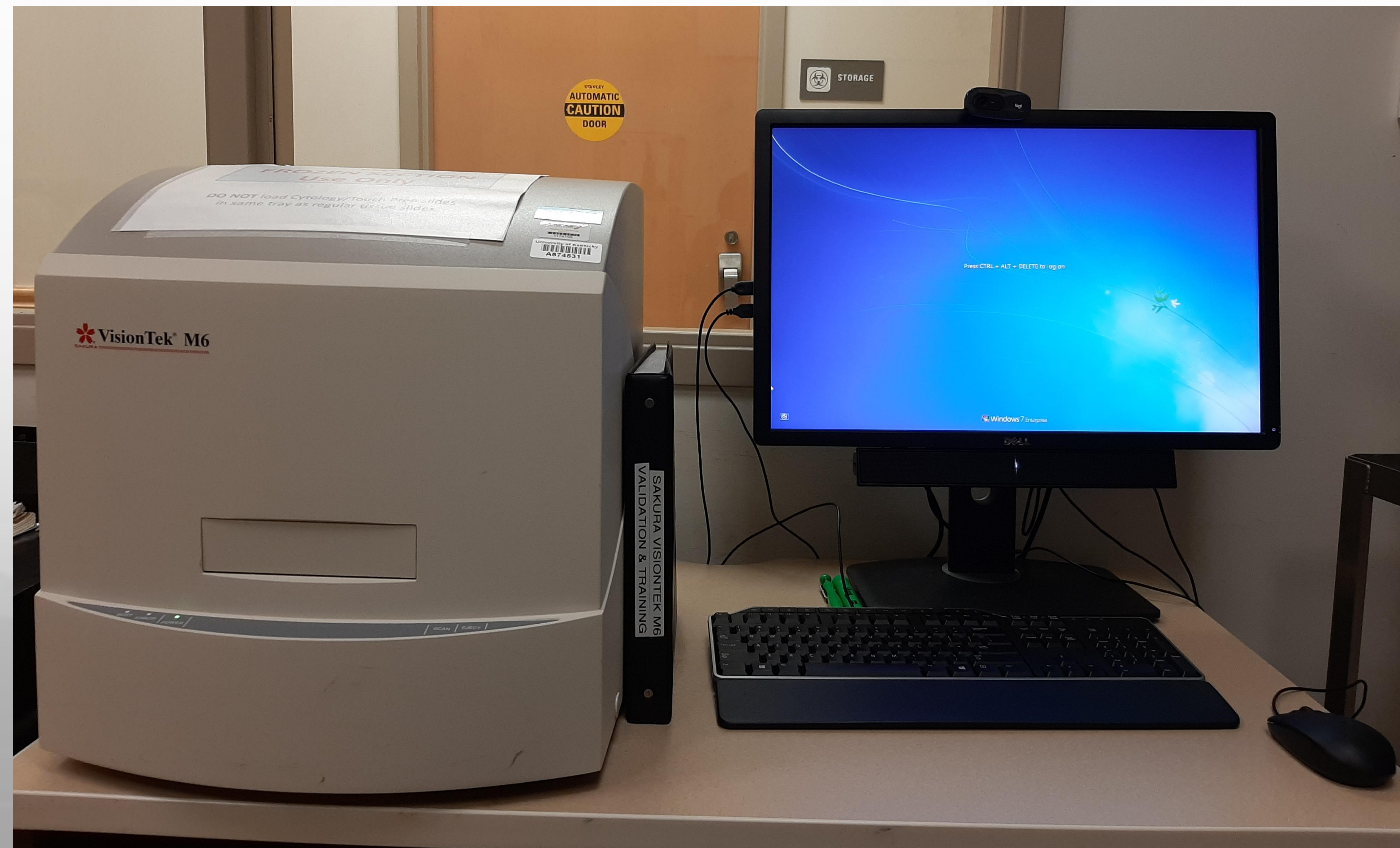


## CONTEXT

- The Department of Pathology at University of Kentucky Chandler Hospital has installed a slide scanning microscope for remote interpretation of frozen sections. This project is a summary of the processes and challenges of the experiment. We also demonstrate concordance of diagnoses between the digital and classic mediums of frozen section analysis.

## DESIGN

- A validation study set of 40 frozen section cases were digitalized using a Sakura Visiontek M6 digital microscope robotic imaging system.
- The cases were selected to represent a variety of organ systems. All frozen slides were scanned at 20x magnification, apart from touch preparations, which were scanned at a magnification of 40x.
- Eight surgical pathologists reviewed the scans, independently, and their interpretations were compared to the final diagnosis rendered on glass slides.
- Major discrepancies were defined at the level of benign versus malignant, while minor discrepancies were defined as inaccurate classification of the lesion which does not affect management (e.g. aneurysmal bone cyst versus non-ossifying fibroma). Deferrals were used when insufficient information was provided to guide further management (e.g. spindle cell tumor).



## RESULTS

Pathologist	Concordant	Major Discrepancy	Minor Discrepancy	Defer	Experience Level (years)
1	33 (82.5%)	1 (2.5%)	3 (7.5%)	3 (7.5%)	1
2	37 (92.5%)	0	0	3 (7.5%)	10+
3	33 (82.5%)	1 (2.5%)	2 (5%)	4 (10%)	2
4	35 (87.5%)	1 (2.5%)	2 (5%)	2 (5%)	10
5	34 (85%)	1 (2.5%)	3 (7.5%)	2 (5%)	1
6	34 (85%)	2 (5%)	2 (5%)	2 (5%)	6
7	37 (92.5%)	1 (2.5%)	1 (2.5%)	1 (2.5%)	10+
8	35 (87.5%)	0	2 (5%)	3 (7.5%)	10

- The rates of major discrepancies ranged from 0-2.5% (average of 2.2%), minor discrepancies ranged from 0-7.5% (average of 4.7%), and deferrals from 2.5-7.5% (average of 6.3%).
- Two cases accounted for the majority of major discrepancies; one salivary gland tumor and one bone tumor.
- Gynecological pathology and liver pathology were the most prevalent minor discrepancies (47% and 20%, respectively).
- The level of experience did not seem to positively or negatively affect the rate of discrepancies or deferrals.

## CONCLUSION

- A digital slide system appears to perform relatively well, but inferior to conventional slides.
- Validation of a frozen scanner is challenging and time consuming. Using scanned frozen slides is a practical alternative but it may not capture the whole analytical experience.
- There are some limitations to the design of this study which may affect the overall concordance.

