

Appendix to ThinPrep Imager article in BMJ

More histological high-grade cervical disease is detected by the ThinPrep Imager than by conventional cytology: a prospective study

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Appendix. http://www.health.usyd.edu.au/step/publications/imager_appendix.pdf

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Appendix

Comparison of nomenclature for cytology See **Table A**

Flow Diagram showing derivation of discordant slide pairs and comparison of PTR histology results See **Diagram**

Histology rates from discordant cytology

The numbers of discordant pairs for which results were available, and numbers of histology results of CIN2 or more severe, were calculated according to cytological diagnosis. The distribution of these is shown in **Table B**. For example, for the 15 cytology pairs with a TPI report of Inconclusive, high grade to be excluded, and a CC report of CIN1, 10 (66.7%) had PTR histology reports and 5 (33.3%) were reported as CIN2 or more severe. Therefore, 5 of the 10 (50.0%) PTR histology records available for these cytology pairs reported high-grade histology.

Analysis of biopsy rates for discordant cytology

Logistic modeling was undertaken to examine whether the availability of PTR histology was associated with the direction of discordancy for slides with discordant cytology results and where at least one test was CIN1 or more severe. A categorical variable was created to cover possible discordancies (Normal vs CIN1, Normal vs Inconclusive high grade to be excluded, Normal vs CIN2+, atypia without HPV vs CIN1, etc) giving rise to 11 categories. A second binary variable was used to identify which test (TPI or CC) gave the higher result. Both variables were included in the model to assess whether the odds of having histology available was associated with TPI (or CC) having the higher grade. A second model was also fitted to test for interaction between the two explanatory variables to assess whether the relative odds of histology for TPI vs CC varied according to category of discordancy.

Of 1758 discordant pairs of slides, PTR histology results were available for 909 (51.71%). Logistic modeling showed no evidence that the proportions of discordant slides (with at least one result of CIN1 or more severe) that were verified were associated with which test (TPI or CC) gave the more severe result ($\chi^2=0.34$, 1df, P=0.56). A test for interaction showed no evidence that the relative odds of verification varied across categories of discordancy ($\chi^2=3.7$, 10df, P=0.96). The analysis was repeated for the three discordant categories where one result

was normal. Again, there was no evidence that the proportion verified was associated with which test gave the more severe result ($\chi^2=0.16, 1df, P=0.69$) and the test for interaction was also not statistically significant ($\chi^2=1.96, 2df, P=0.38$). Hence, there was no evidence that knowledge of which test gave the abnormal result was associated with the odds of verification.

Table A

Comparison of nomenclature for cytology

Australian Modified Bethesda 1994	Bethesda 2001	British Nomenclature
Low Grade Epithelial Abnormality		
Squamous atypia	ASCUS	Borderline
Squamous atypia with HPV	LSIL	Mild dyskaryosis
CIN 1	LSIL	Mild dyskaryosis
High grade epithelial abnormality		
Inconclusive high grade to be excluded	ASC – H	Borderline
CIN2	HSIL	Moderate dyskaryosis
CIN 3	HSIL	Severe dyskaryosis

Diagram

Flow diagram: Accuracy of squamous cytology using PTR histology as reference standard

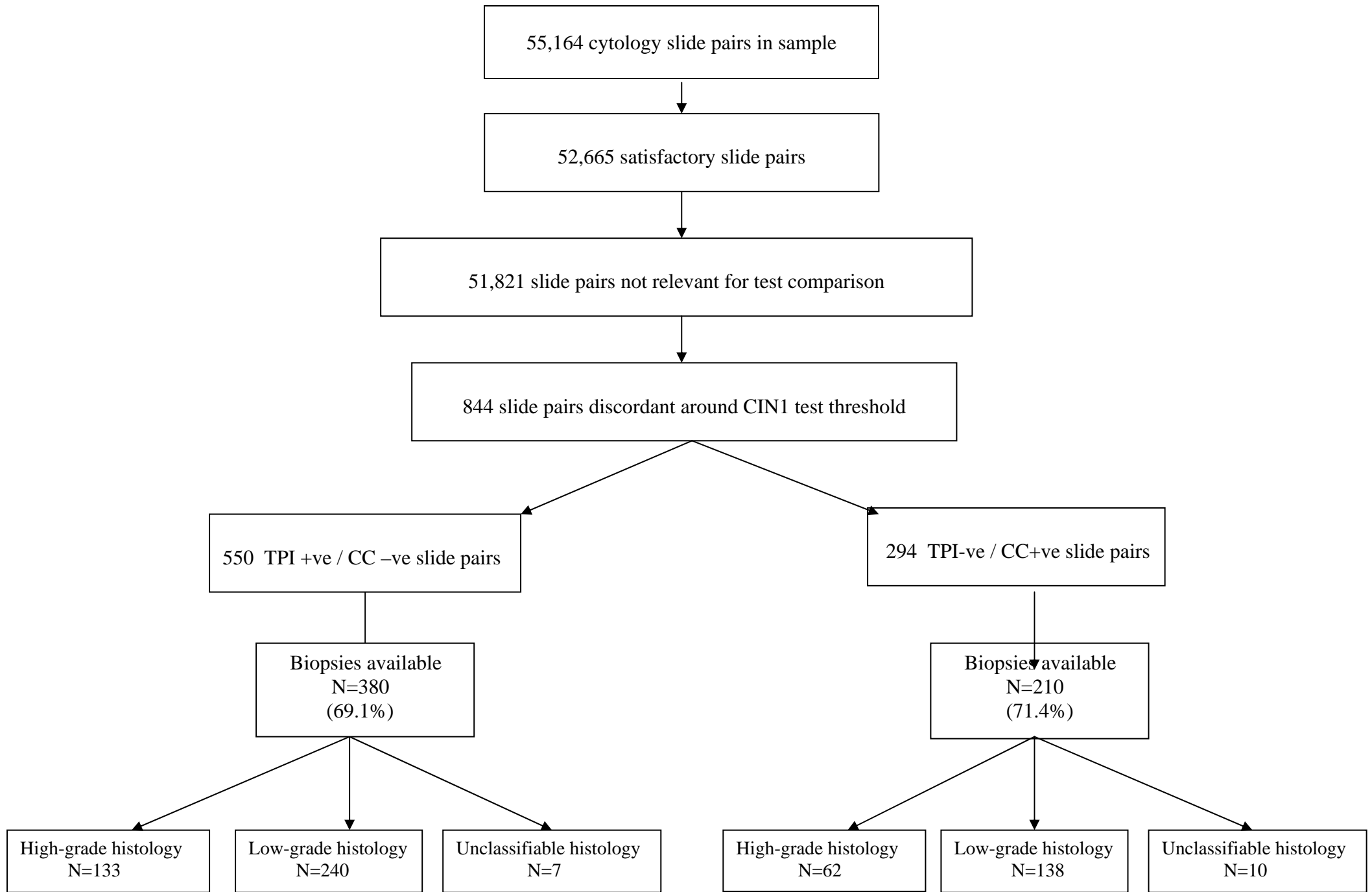


Table B Distribution of discordant cytology, PTR histology and cases of histology \geq CIN2

Key

Discordant cytology		
PTR histology	% of cytology	
Histology \geq CIN2	% of cytology	% of histology

Conventional cytology

	Normal	Atypia No HPV	Atypia HPV effect	CIN 1	Inconclusive high grade	CIN 2	CIN 3 +	Total
Normal			88 19 21.6% 3 3.4% 15.8%	47 33 70.2% 3 6.4% 9.1%	111 71 64.0% 14 12.6% 19.7%	2 1 50.0% 1 50.0% 100.0%	14 13 92.9% 5 35.7% 38.5%	262 137 52.3% 26 9.9% 19.0%
Atypia No HPV			59 12 20.3% 1 1.7% 8.3%	44 31 70.4% 9 20.5% 29.0%	33 21 63.6% 10 30.3% 47.6%	15 14 93.3% 5 33.3% 35.7%	6 6 100.0% 4 66.7% 66.7%	157 84 53.5% 29 18.5% 34.5%
Atypia HPV effect	376 43 11.4% 5 1.3% 11.6%	133 25 18.8% 5 3.8% 20.0%			12 10 83.3% 3 25.0% 30.0%	4 4 100.0% 2 50.0% 50.0%	6 6 100.0% 6 100.0% 100.0%	531 88 16.6% 21 4.0% 23.9%
CIN 1	179 109 60.9% 14 7.8% 12.8%	117 76 65.0% 22 18.8% 28.9%			27 20 74.1% 13 48.1% 65.0%	58 50 86.2% 29 50.0% 58.0%	6 5 83.3% 4 66.7% 80.0%	387 260 67.2% 82 21.2% 31.5%
Inconclusive high grade	98 67 68.4% 21 21.4% 31.3%	29 20 69.0% 10 34.5% 50.0%	2 2 100.0% 0 0.0% 0.0%	15 10 66.7% 5 33.3% 50.0%		6 5 83.3% 2 33.3% 40.0%	27 24 88.9% 19 70.4% 79.2%	177 128 72.3% 57 32.2% 44.5%
CIN 2	37 29 78.4% 14 37.8% 48.3%	26 22 84.6% 14 53.8% 63.6%	15 12 80.0% 7 46.7% 58.3%	53 48 90.6% 32 60.4% 66.7%	18 17 94.4% 15 83.3% 88.2%			149 128 85.9% 82 55.0% 64.1%
CIN 3 +	30 26 86.7% 17 56.7% 65.4%	12 12 100.0% 10 83.3% 83.3%	5 5 100.0% 4 80.0% 80.0%	11 9 81.8% 7 63.6% 77.8%	37 32 86.5% 27 73.0% 84.4%			95 84 72.3% 65 68.4% 77.4%
Total	720 274 38.1% 71 9.9% 25.9%	317 155 48.9% 61 19.2% 39.4%	169 50 29.6% 15 8.9% 30.0%	170 131 77.1% 56 32.9% 42.7%	238 171 71.8% 82 34.5% 48.0%	85 74 87.1% 39 45.9% 52.7%	59 54 91.5% 38 64.4% 70.4%	1758 909 51.7% 362 20.6% 39.8%

TPI