NCPTS

The Bethesda System for reporting Cervical Cytology

Unsatisfactory samples

Benign/reactive changes

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THE BETHESDA SYSTEM
Principles

- must communicate clinically relevant information to the patient's health-care provider
- should be uniform and reasonably reproducible between pathologists and laboratories
- must reflect the most current understanding of cervical neoplasia

Bethesda 2001 is currently in use in New Zealand

- Used to report all cervical/vaginal cytology since 1 July 2005
- Standard report text is used by all laboratories
- Free comments can be added to the report but do not go to the NCSP-Register
- Bethesda 2014 is likely to be introduced in 2018

The Bethesda System

Specimen Adequacy

Interpretation/Result

Recommendation

ADEQUACY: Satisfactory

The specimen is satisfactory for evaluation.

The specimen is satisfactory for evaluation. No endocervical/transformation zone component is present.*

* At least 10 well-preserved endocervical or squamous metaplastic cells either singly or in clusters, constitutes an adequate transformation zone component.

Comments

- The presence or absence of a transformation zone component provides a useful quality indicator for sample takers but is not associated with increased detection rates of squamous lesions.

- The specimen is satisfactory if atypical or abnormal cells are identified, by definition.

- If the smear is unsatisfactory as a cervical screening test, the presence of organisms or benign endometrial cells in a woman 40+ years, are still reported.

ADEQUACY: Unsatisfactory

The specimen is unsatisfactory for evaluation because….

of insufficient squamous cells.

of poor fixation/preservation.

foreign material obscures the cells.

inflammation obscures the cells.

blood obscures the cells.

of cytolysis/autolysis.

INTERPRETATION/RESULT

- All reports are categorised by the result to assist sample takers to process reports
- The category is given as a heading at the top of the report

Negative for Intraepithelial Lesion or Malignancy

Epithelial Cell Abnormality

Other

Negative for Intraepithelial Lesion or Malignancy

Normal findings

Organisms

Other non-neoplastic findings

- Reactive changes (optional to report) e.g. associated with inflammation, previous radiation, an IUCD etc.
- Normal endometrial cells in women 40+ yrs (NZ)
- Atrophy (optional to report)

Organisms

There are organisms consistent with *Trichomonas vaginalis*

There are fungal organisms morphologically consistent with *Candida* species

There is a shift in microbiological flora suggestive of bacterial vaginosis

There are bacteria morphologically consistent with *Actinomyces* species

There are cellular changes consistent with *Herpes simplex virus*

Reactive/non-neoplastic changes

There are reactive cellular changes present.

There are endometrial cells present in a woman over the age of 40 years.*

There are atrophic cellular changes present.

**The presence of endometrial cells in a woman over the age of 40 years can be a normal finding, or seen in association with hormone replacement therapy , or rarely, associated with endometrial pathology including hyperplasia or neoplasia. Please correlate this finding with any symptomatology of uterine pathology, for example abnormal uterine bleeding and refer/investigate appropriately.*

Epithelial cell abnormalities

Squamous

Atypical Squamous Cells (ASC)

- of undetermined significance (ASC-US)
- cannot exclude HSIL (ASC-H)

LSIL: Low-grade Squamous Intraepithelial Lesion

HSIL: High-grade Squamous Intraepithelial Lesion

-with features suspicious for invasion

Squamous Cell Carcinoma

Glandular

Atypical Glandular/Endocervical/Endometrial Cells (AGC)

Atypical glandular/endocervical cells, favour neoplastic

Endocervical Adenocarcinoma in Situ (AIS)

Adenocarcinoma: endocervical/endometrial/extrauterine/NOS

Other

Other Malignant Neoplasms

There are abnormal cells consistent with a malignant neoplasm.

(sarcoma/lymphoma/melanoma)

RECOMMENDATION

The next smear should be taken in three years, based on the smear history held on the NCSP-Register.

……..*other report recommendations depending on the report, clinical and NCSP history*

In view of the abnormal clinical history provided, urgent referral for assessment is recommended regardless of the cytological findings.

The Bethesda System
References

- The 2001 Bethesda System. Terminology for Reporting Results of Cervical Cytology. Solomon D. et al

  JAMA April 24 2002 Vol 287 No.16 pp 2114-9

- The Pap Test and Bethesda 2014. Nayar R, Wilbur DC.

  Cancer Cytopathol 2015;123:271-281

- The Bethesda System for Reporting Cervical Cytology.

  Nayar and Wilbur 3rd Edition 2015 Springer

- www.cytopathology.org/NIH

  (Website atlas of images)

UNSATISFACTORY SMEARS

A. Rejected specimens – LBC vial leaking, unlabeled.
B. Specimen examined but unsatisfactory for evaluation

The specimen is unsatisfactory for evaluation because….

- of insufficient squamous cells.
- of poor fixation/preservation.
- foreign material obscures the cells.
- inflammation obscures the cells.
- blood obscures the cells.
- of cytolysis/autolysis.

Bethesda Criteria for adequate cellularity

Squamous cells

well-visualised and well-preserved

Liquid-based samples: at least 5,000 cells

- a minimum of 10 fields counted randomly along a diameter that includes the centre of the preparation

- minimum numbers of cells needed:

SurePath: 9 cells per 40X in each of 10 fields

ThinPrep: 4 cells per 40X in each of 10 fields

Ref: The Bethesda System for Reporting Cervical Cytology 3rd Edition. Nayar and Wilbur (eds). Springer.

What degree of cellularity is satisfactory?

- Bethesda criteria is not based on a lot of objective research
- No absolute minimum cellularity: at the low end, need to balance gains in sensitivity with the disadvantages of increases in unsatisfactory rates
- Are conflicting studies: some suggest that the optimal minimum threshold may be higher: 5,000 – 20,000 range
- NZ currently uses the 5,000 Bethesda threshold

Inadequate rates UK

Health Technology Assessment 2015 (Kitchener et al)

http://www.journalslibrary.nihr.ac.uk/hta/volume-19/issue22#abstract.

Conclusion: SurePath slides: 15,000 minimum

ThinPrep slides: 5,000 minimum

2013-14 Inadequate rate across UK = 2.4%

Reference:

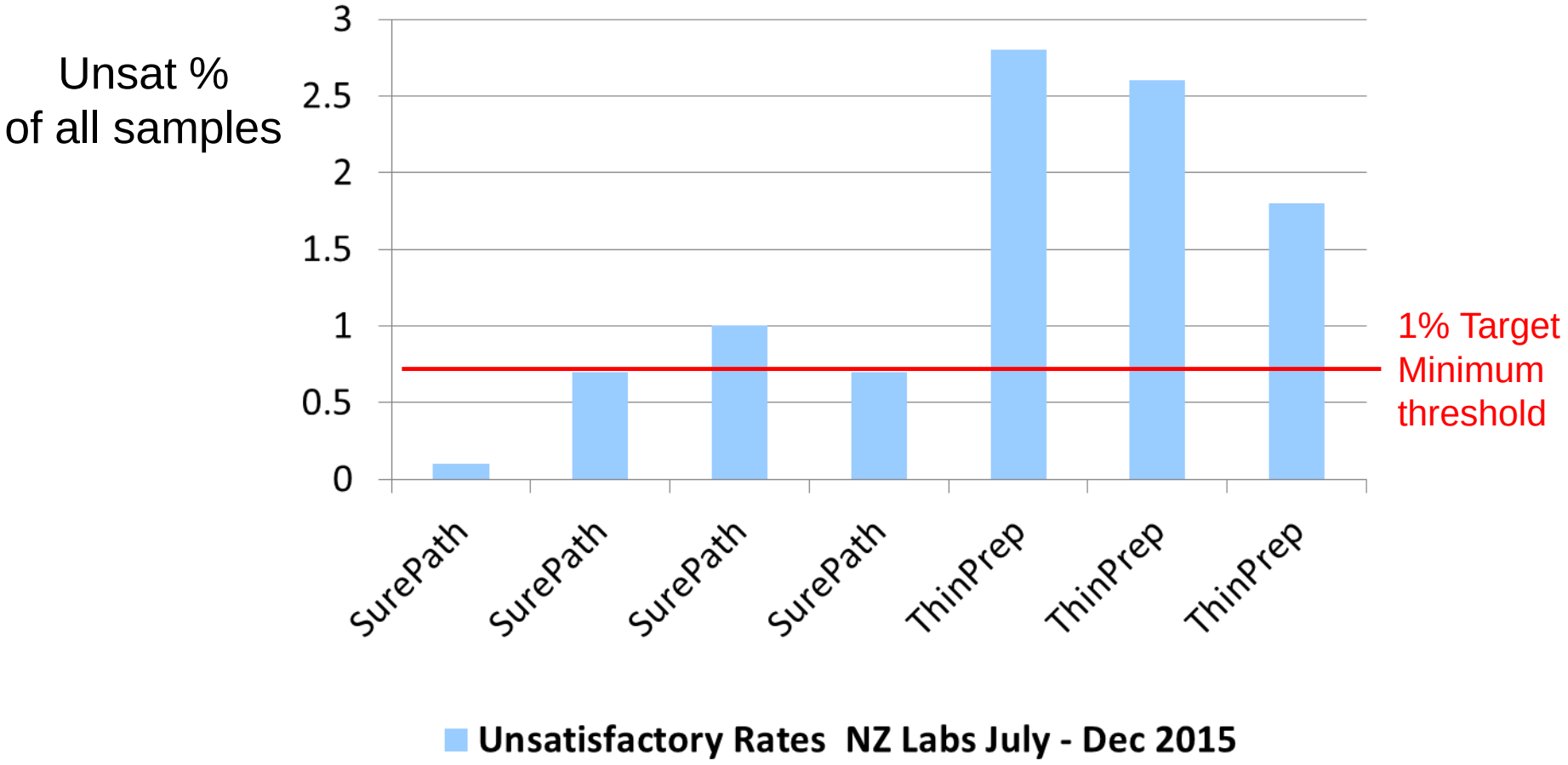
ABC3 and LBC – Adequate or not?

Duval E. (editorial) *Cytopathology* 2013, **24**, 211-5

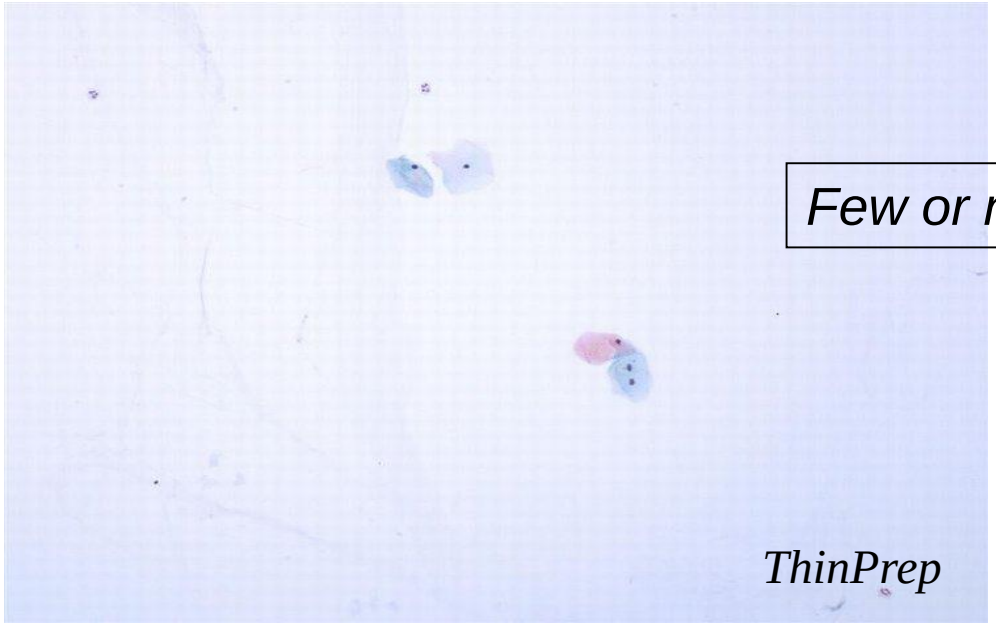
Unsatisfactory rates in New Zealand

Total for NZ samples July - Dec 2015: 1.3%

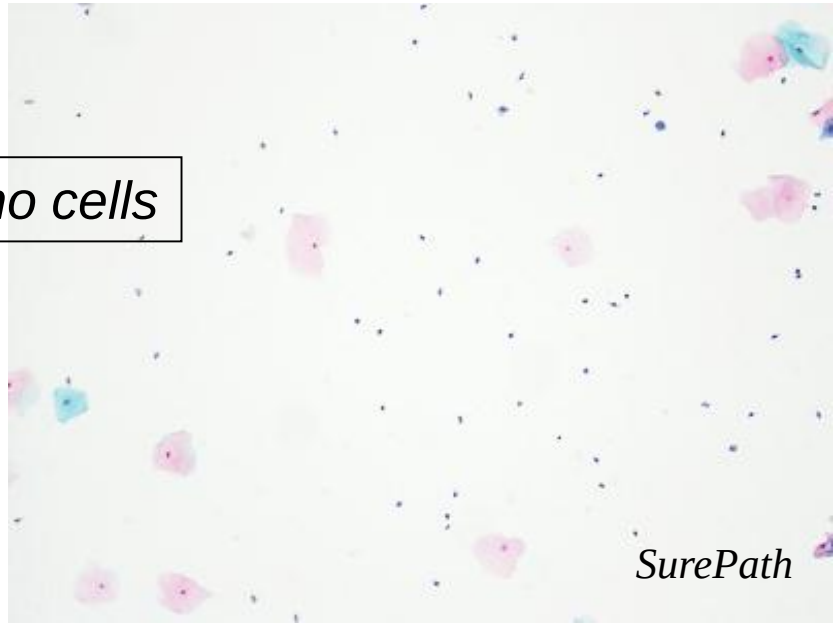
Target: 1-5% of all LBC samples reported as unsatisfactory

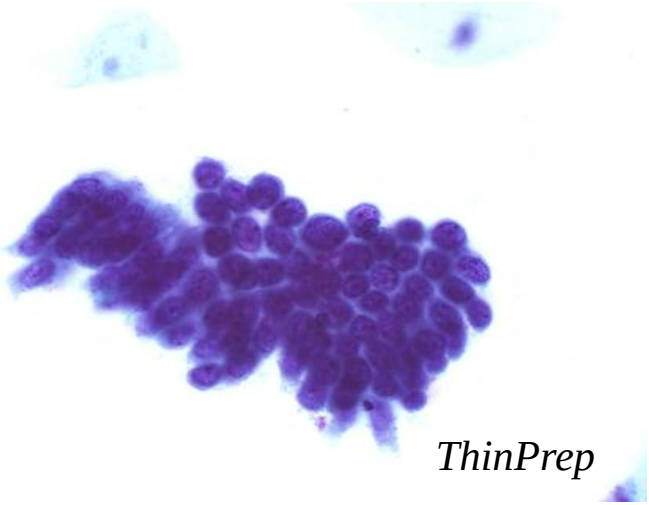


The specimen is unsatisfactory for evaluation because of insufficient squamous cells.



Few or no cells

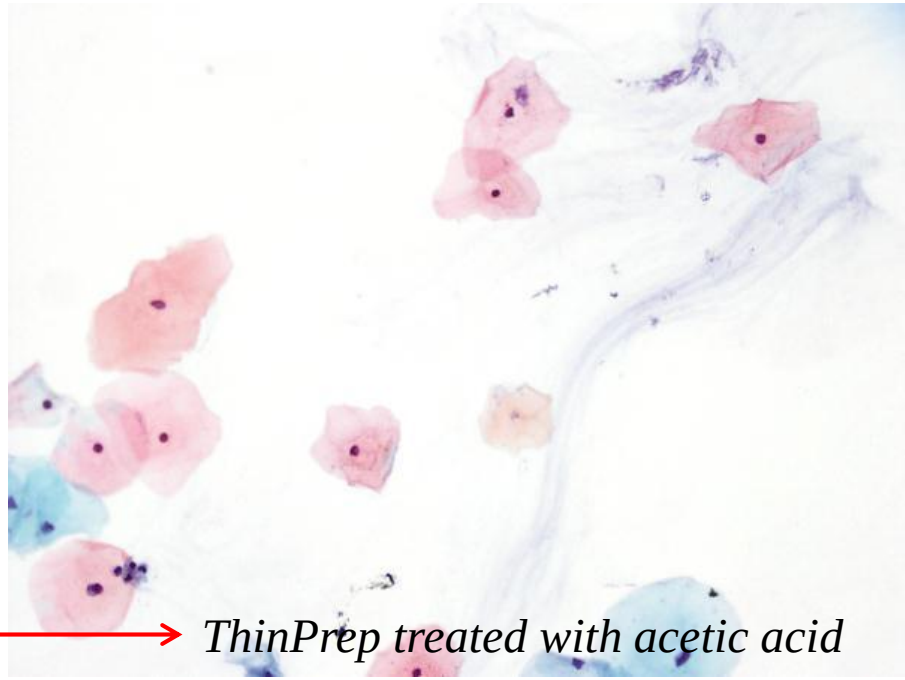




Mainly endocervical cells

The specimen is unsatisfactory for evaluation because of obscuring foreign material.

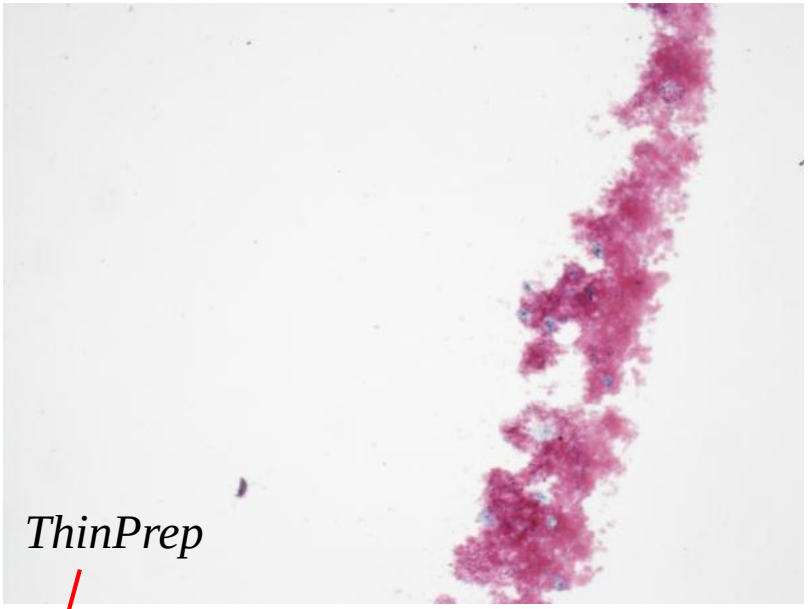
ThinPrep



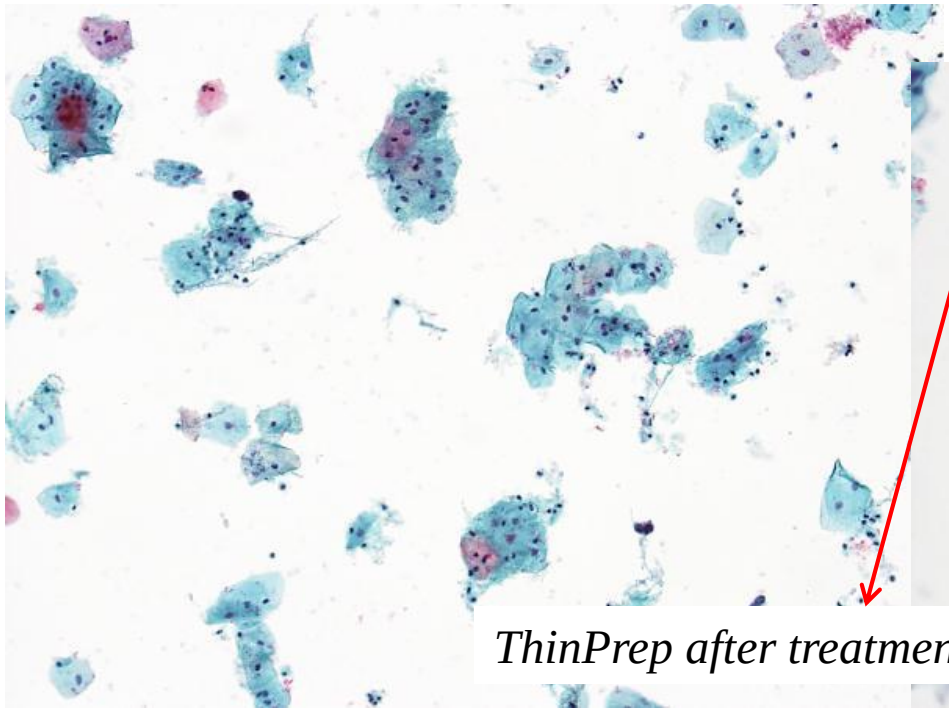
ThinPrep treated with acetic acid

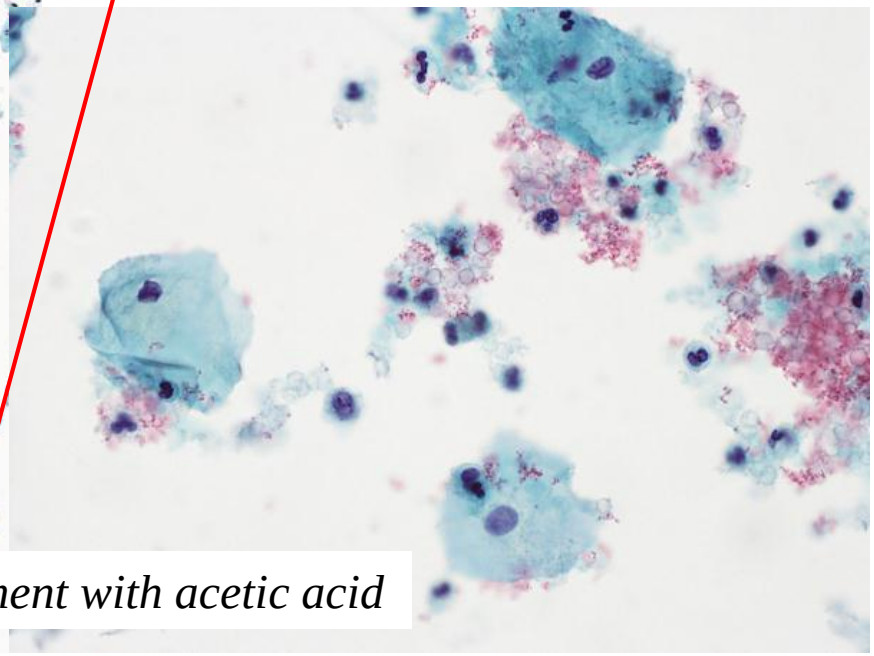
Excess mucus: treat with acetic acid and reprocess

The specimen is unsatisfactory for evaluation because blood obscures the cells.

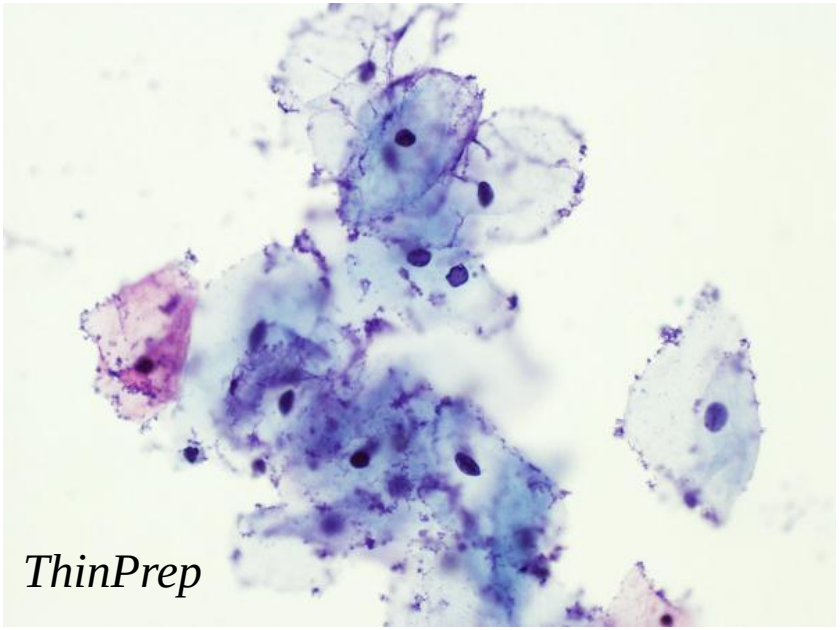


ThinPrep



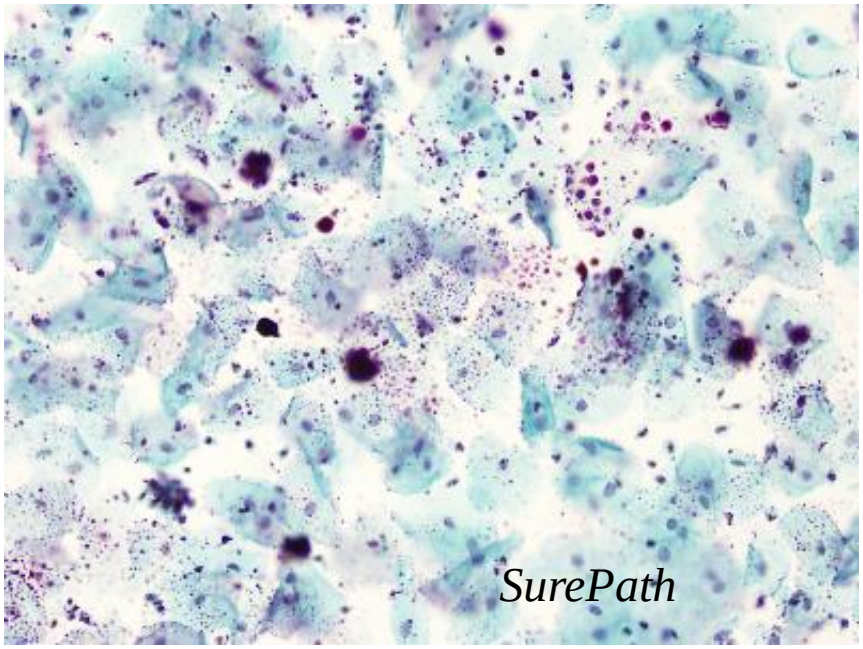


ThinPrep after treatment with acetic acid



Lubricant

The specimen is unsatisfactory for evaluation because foreign material obscures the cells.



Stain deposit

Organisms

There are organisms consistent with *Trichomonas vaginalis*

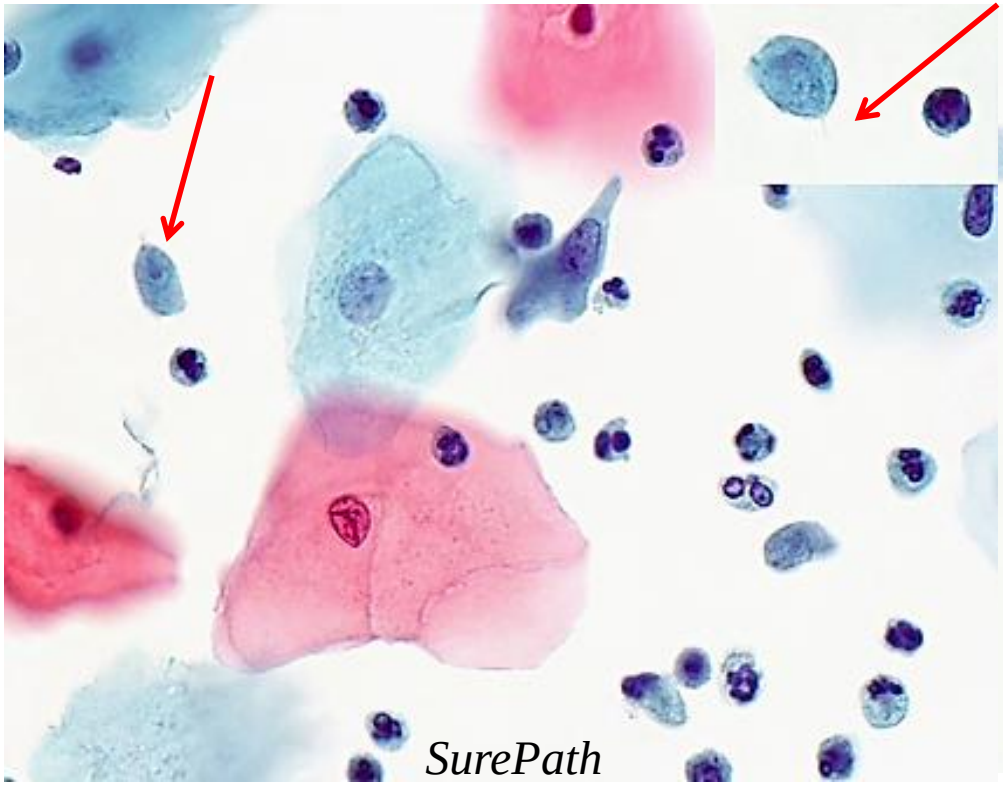
There are fungal organisms morphologically consistent with *Candida* species

There is a shift in microbiological flora suggestive of bacterial vaginosis

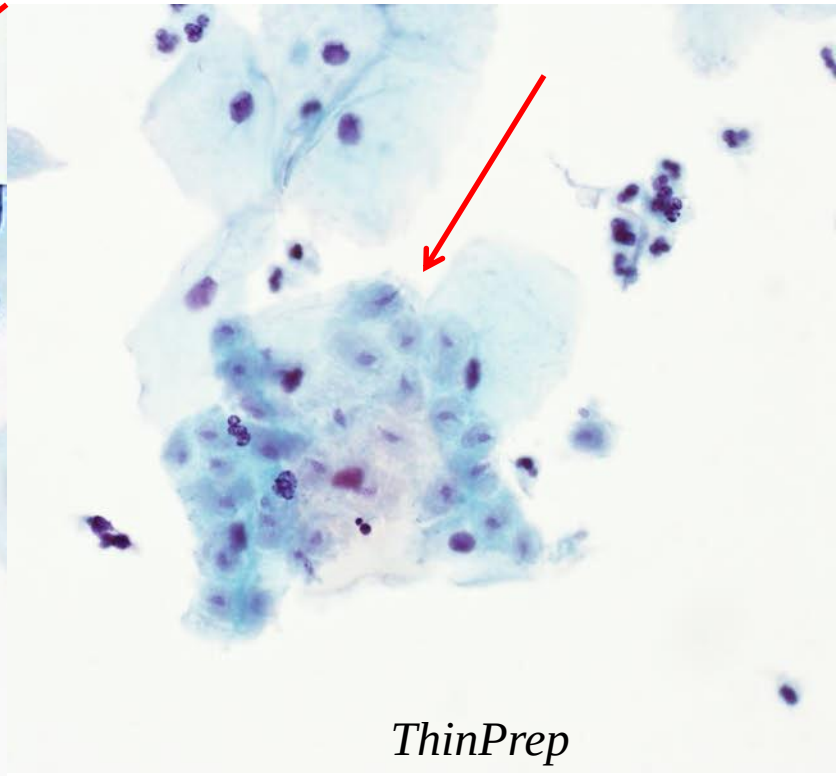
There are bacteria morphologically consistent with *Actinomyces* species

There are cellular changes consistent with *Herpes simplex* virus

Trichomonas vaginalis



Single trichomonads
insert: flagellum

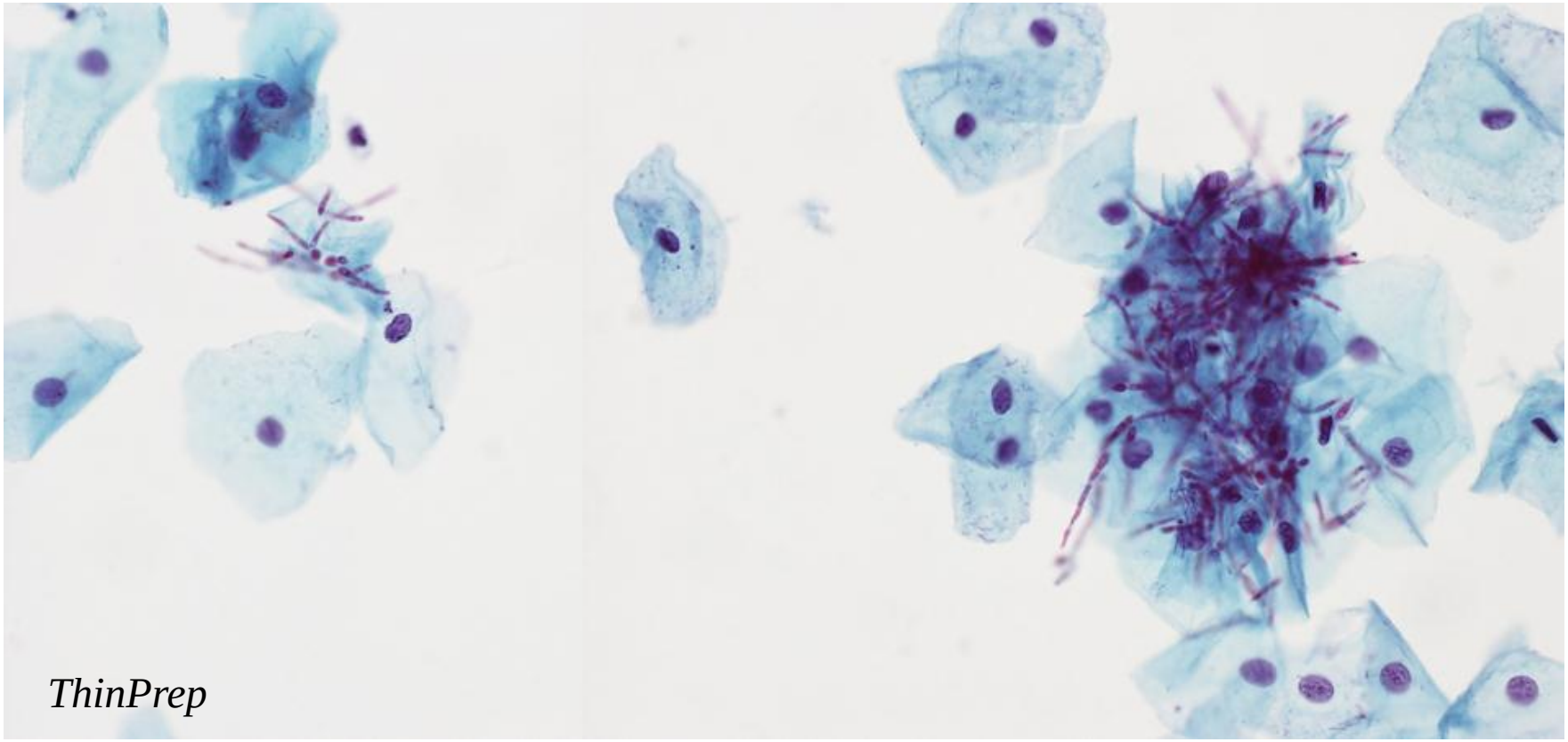


Large cluster of
trichomonads

What can trip you up about *Trichomonas*?

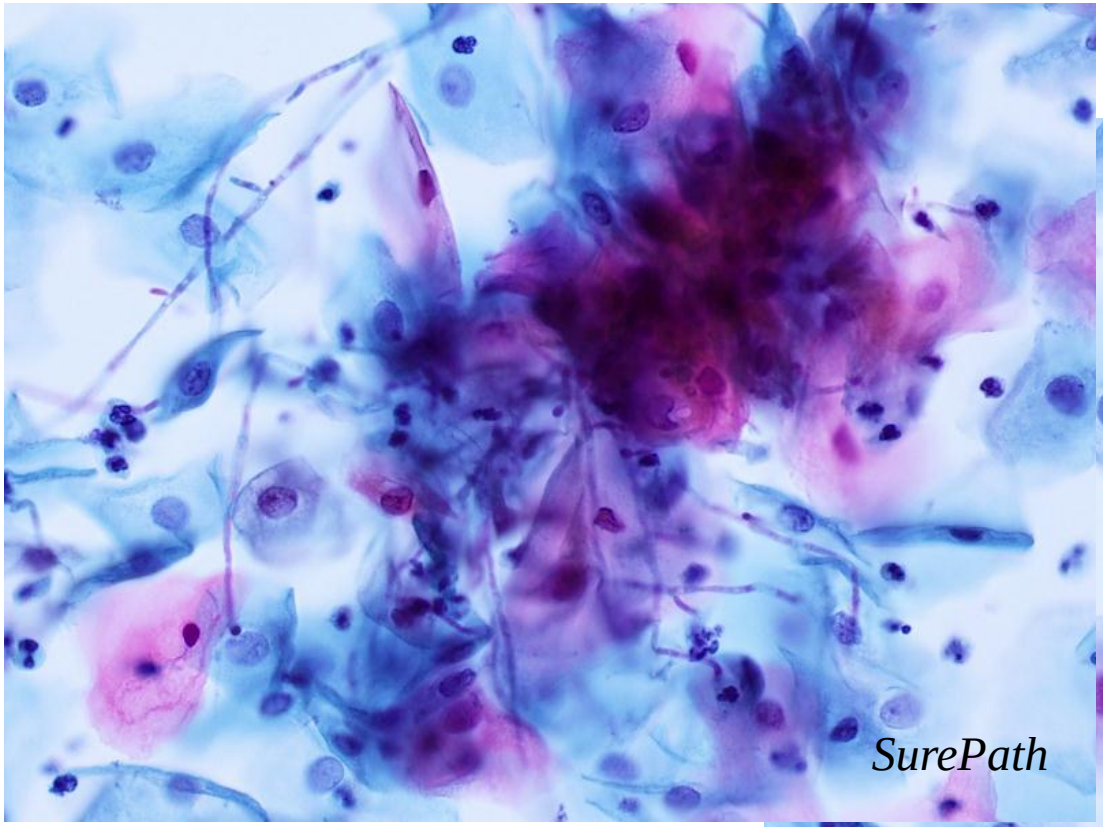
1. Missing them! *Leptothrix* can be associated.
2. Overdiagnosis: confusion with degenerate epithelial cells
3. DD: Invasive Squamous cell carcinoma

- Marked reactive change and inflammation can be overdiagnosed as SCC, particularly where the organisms are missed
- SCC can be missed where it co-exists with *Trichomonas*

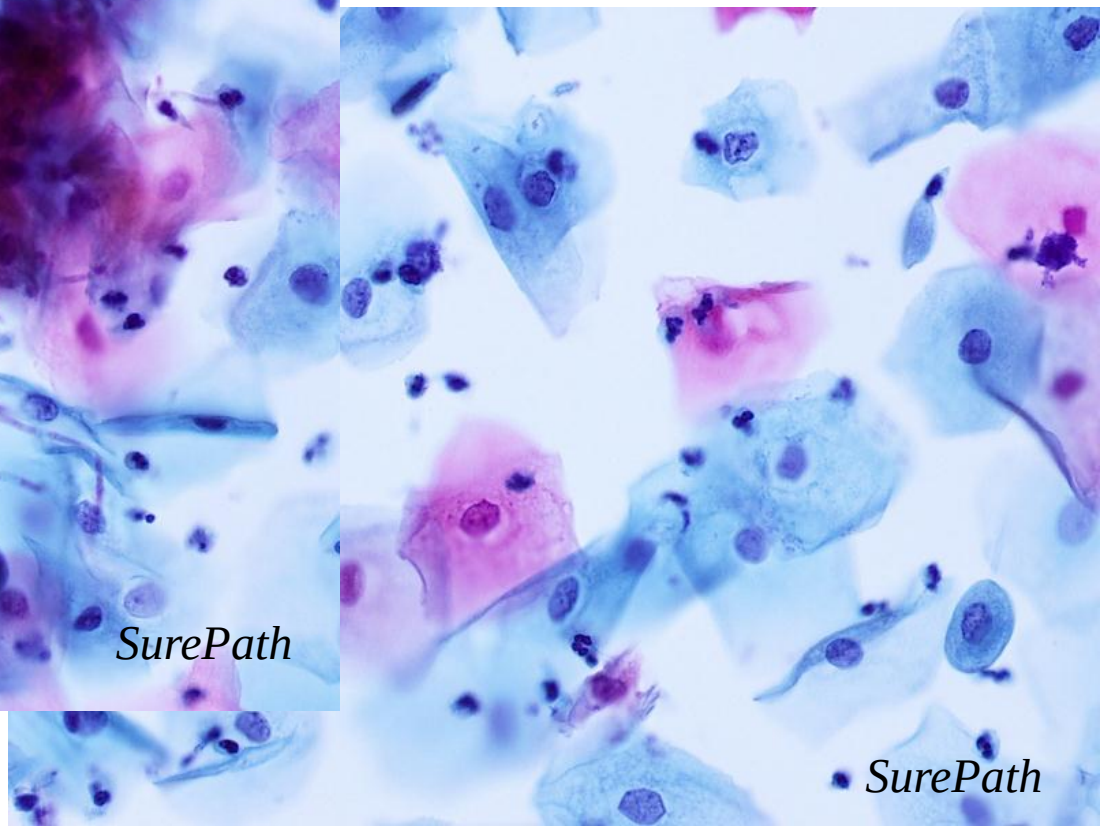


Fungal organisms consistent with *Candida* species

Fungal organisms consistent with *Candida* species



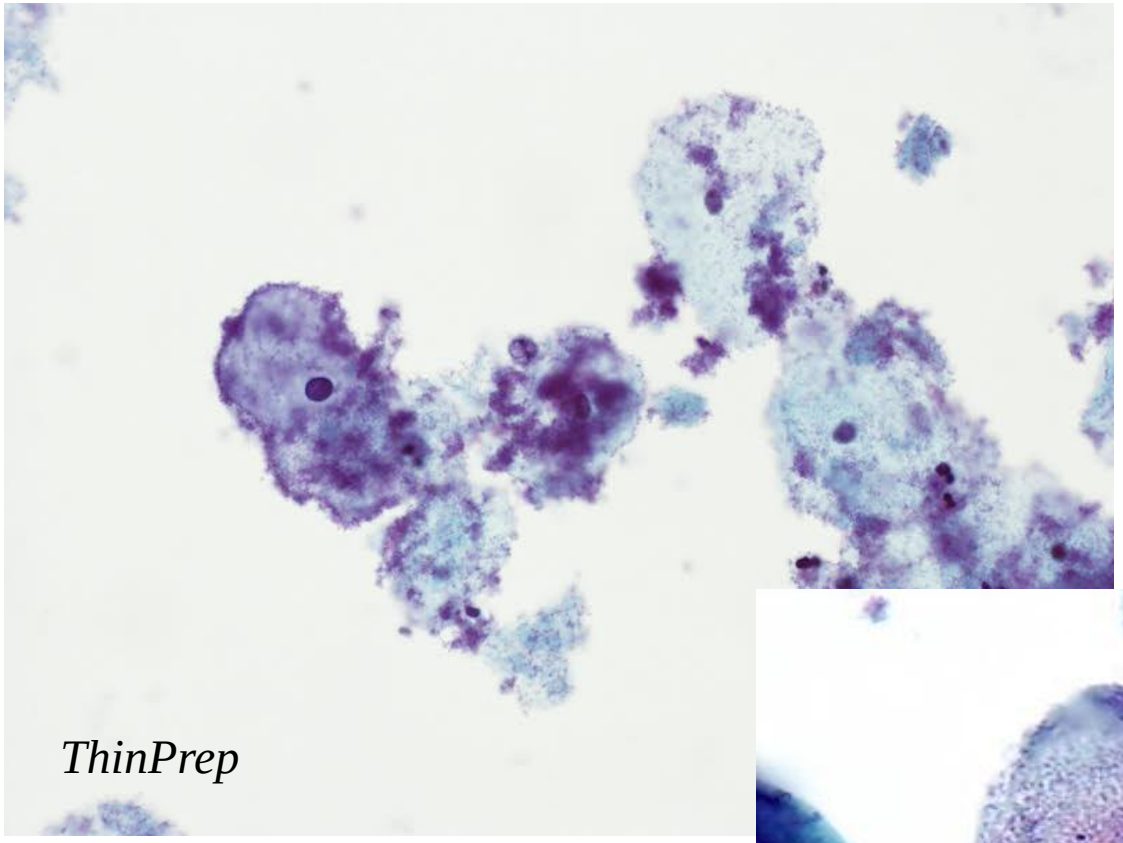
Pseudohyphae,
Shish Kebab effect

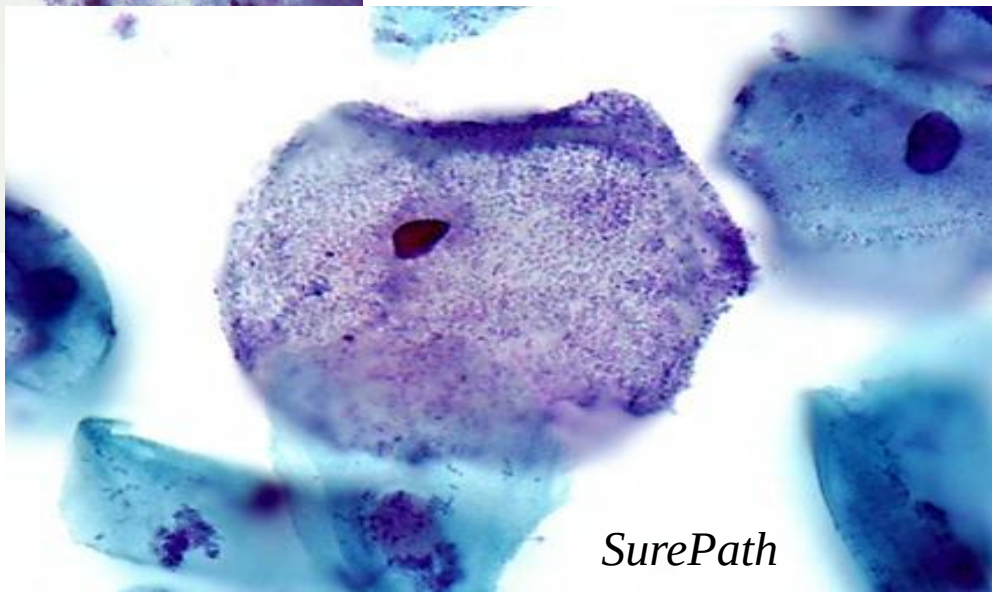


Small perinuclear halos, eosinophilia
moth-eaten cytoplasm

What can confuse you about *Candida*?

- Other contaminant fungi or strands of debris
- DD: LSIL
  - Overdiagnosis of LSIL because the reactive cell changes can mimic LSIL
  - LSIL and *Candida* can co-exist



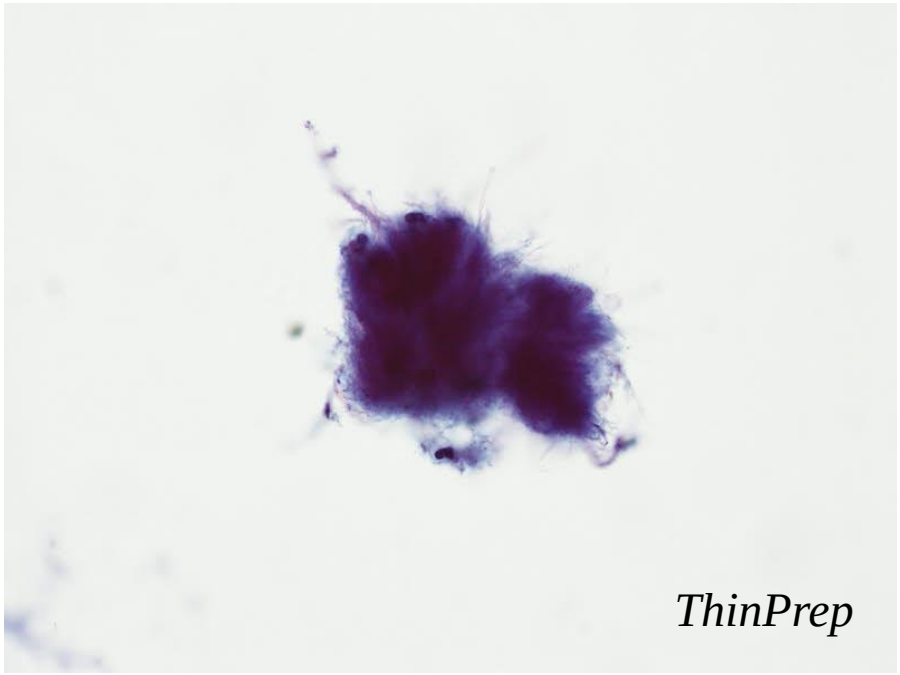


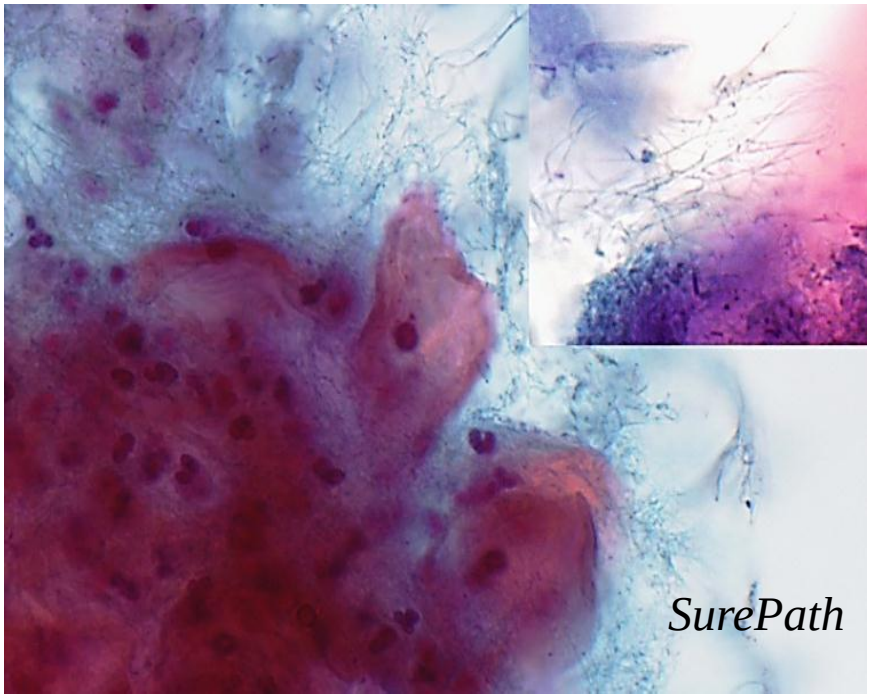
Shift in bacterial flora suggesting bacterial vaginosis

What can baffle you about bacterial vaginosis?

- When should you report it?
  - There are no criteria for how many clue cells you need to see before you report this with LBC
  - Mixed infection – cocci and lactobacilli
- Other “granular” debris
  - Atrophic vaginitis
  - Treated blood (post acetic-acid)
  - Lubricant

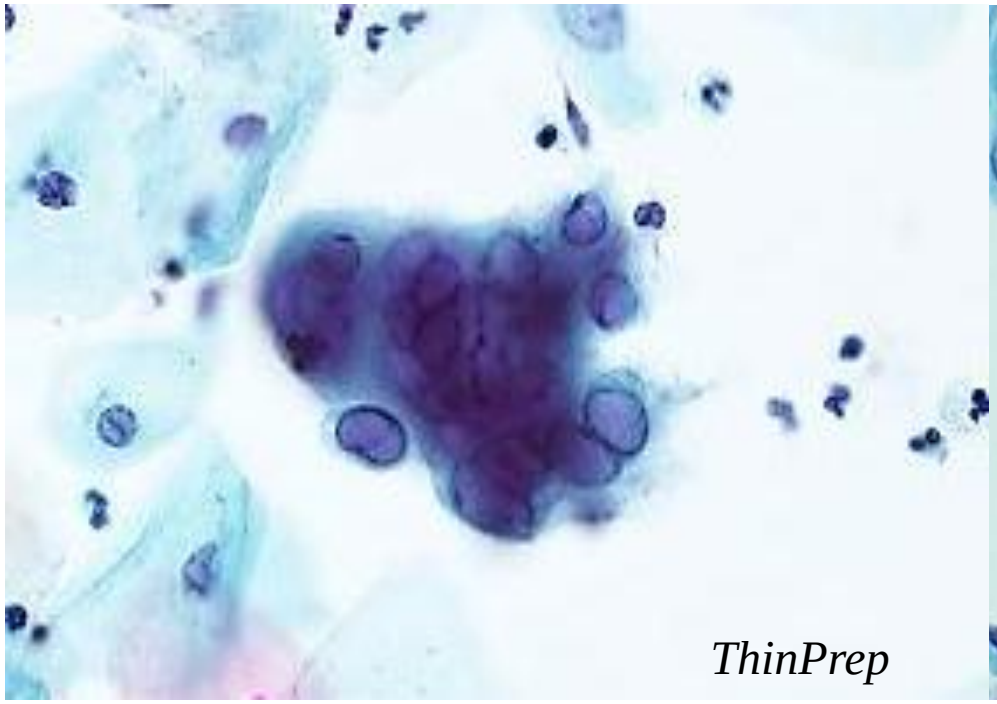
Bacteria consistent with *Actinomyces*

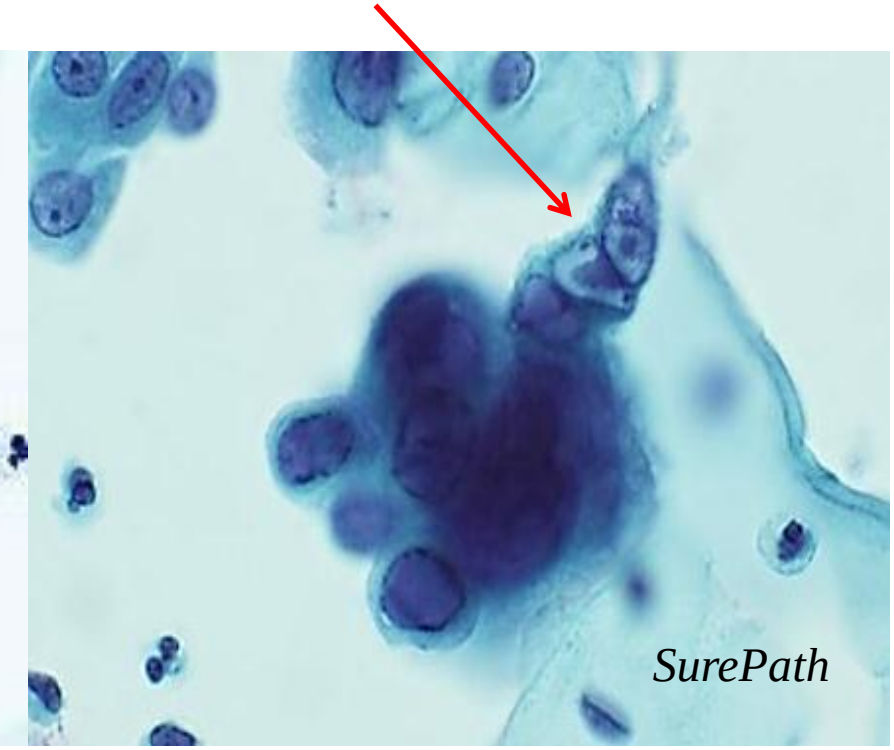




What can annoy you about *Actinomyces*?

- "Looks like *actinomyces*" but can't see filaments
- Filaments vary in thickness – often encrusted with neutrophils or granular debris
- Confusion with
  - masses of neutrophils
  - tangled clumps of *leptothrix*
- No history of an IUCD





Moulding, multinucleation and margination of chromatin

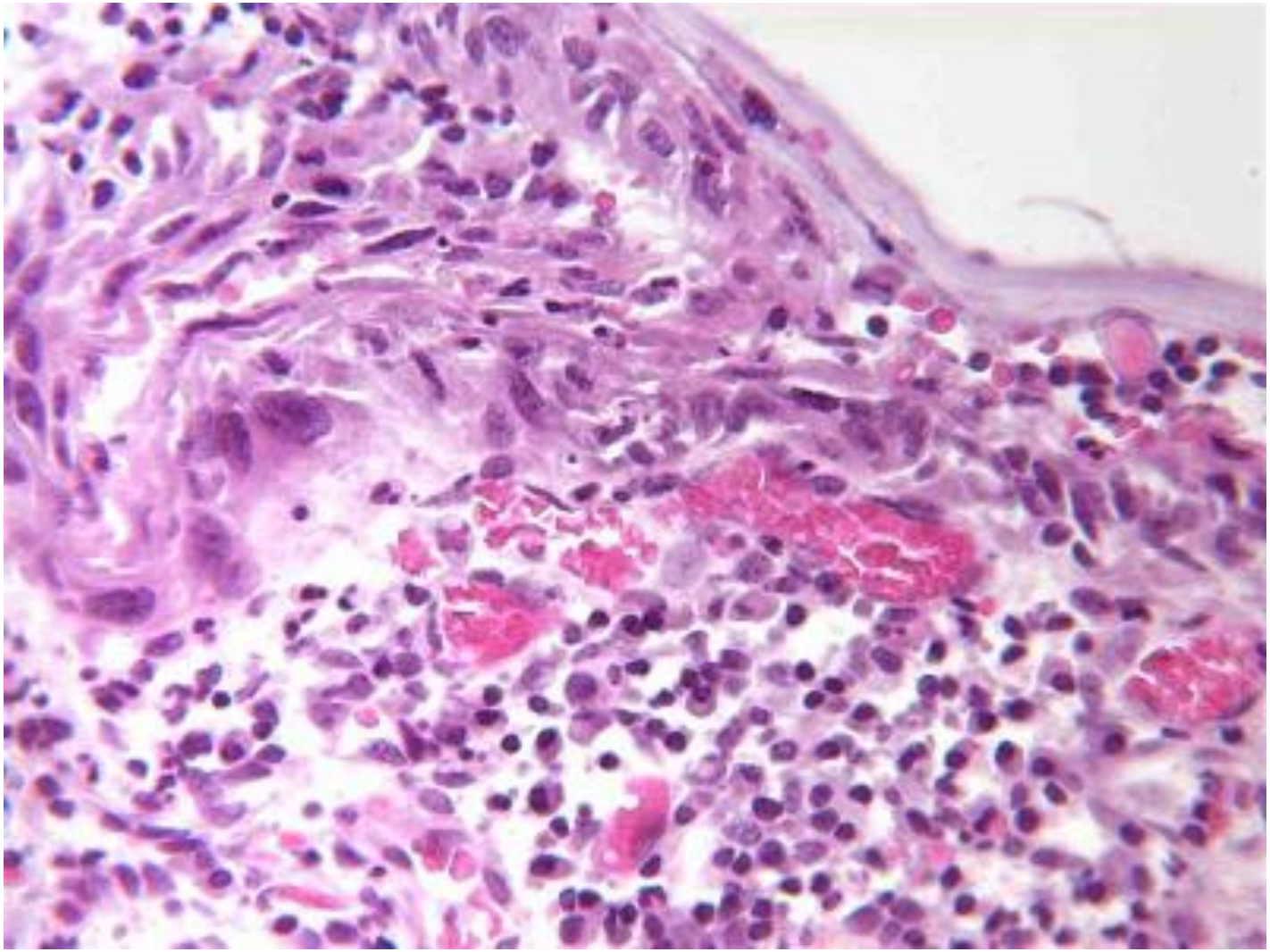
Intranuclear viral inclusions

Cell changes consistent with *Herpes simplex* virus

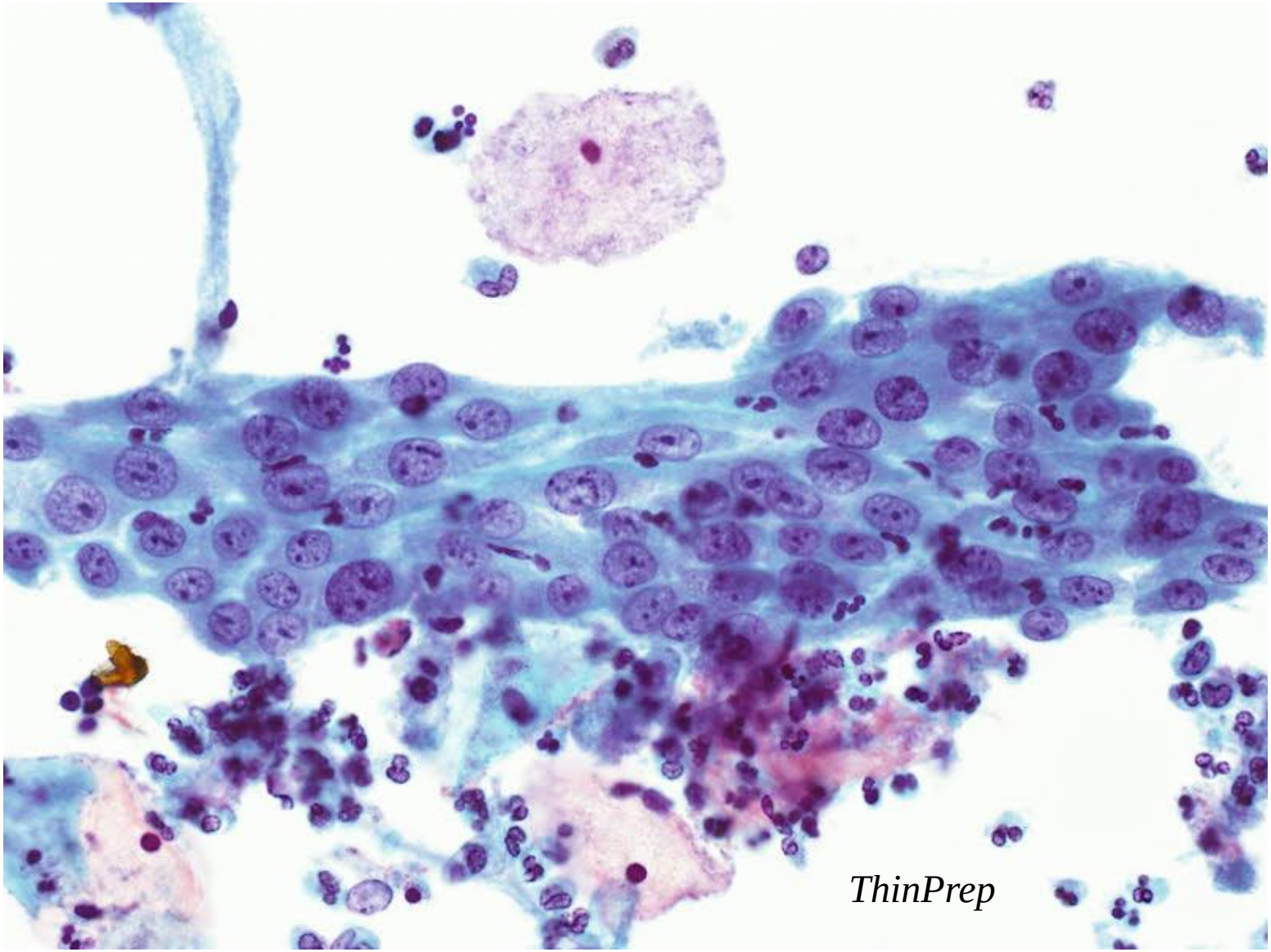
What is hazardous about Herpes?

- Confusion with degenerate endocervical cells

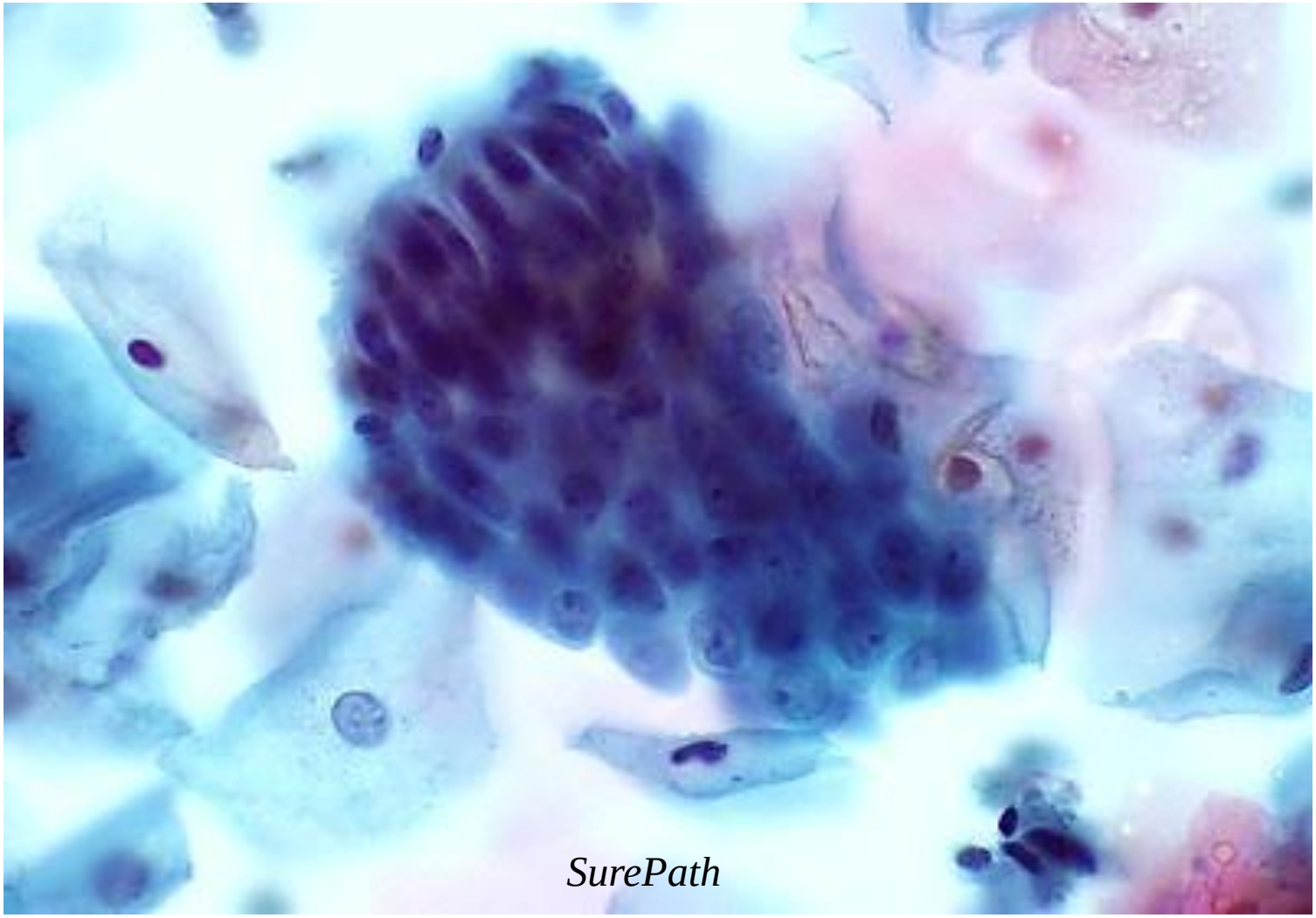
Reactive changes

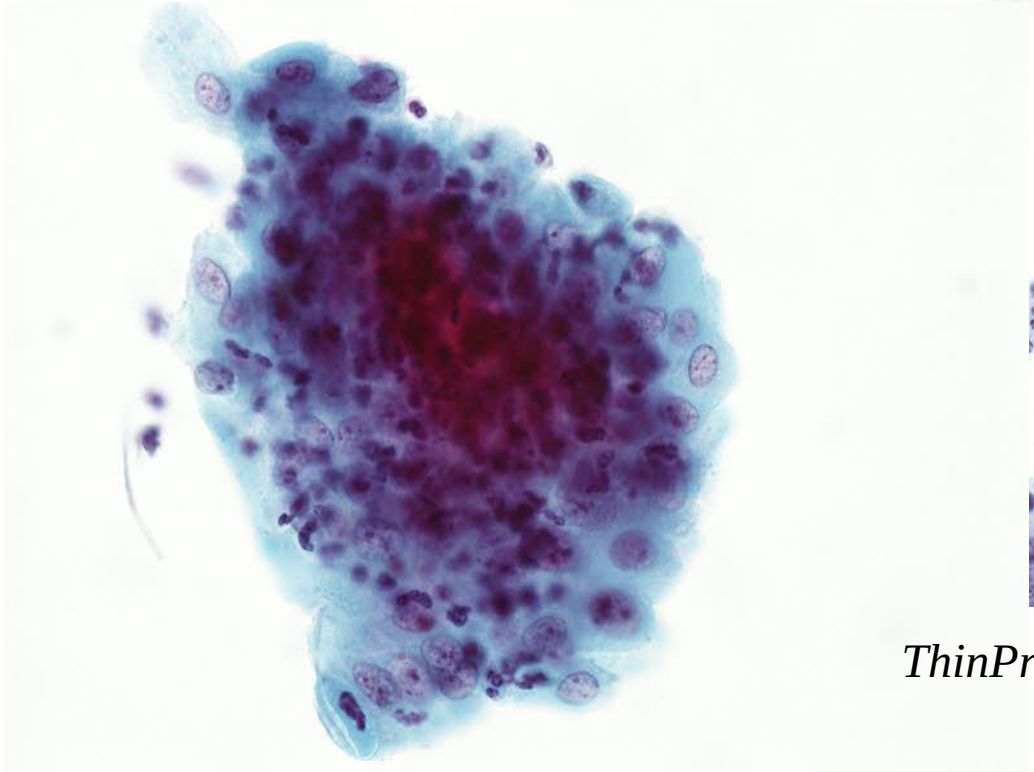


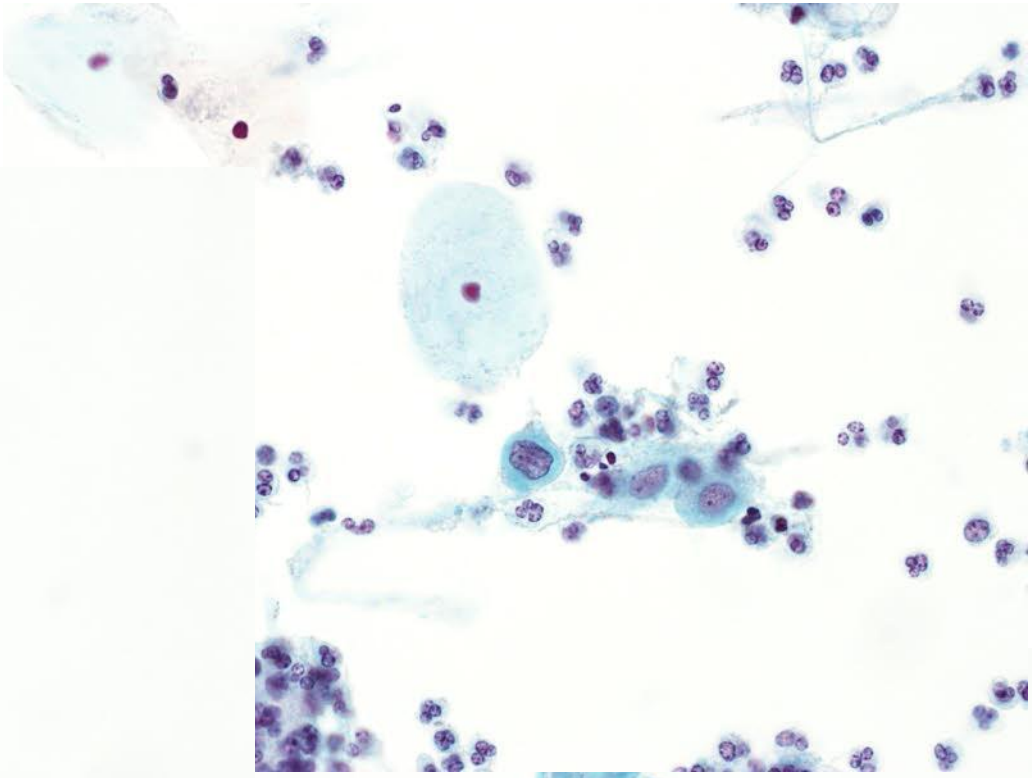
Reactive squamous cells



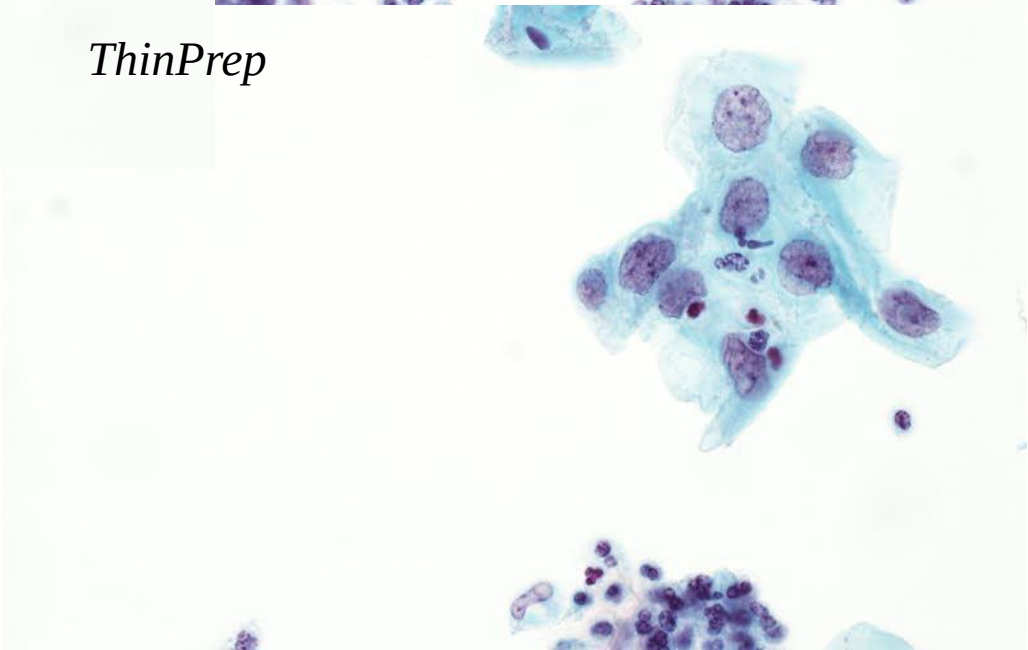
Reactive endocervical cells





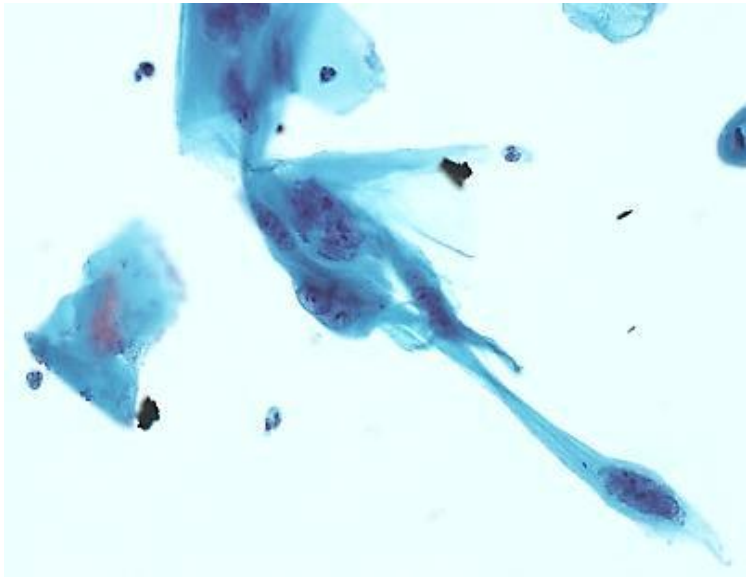


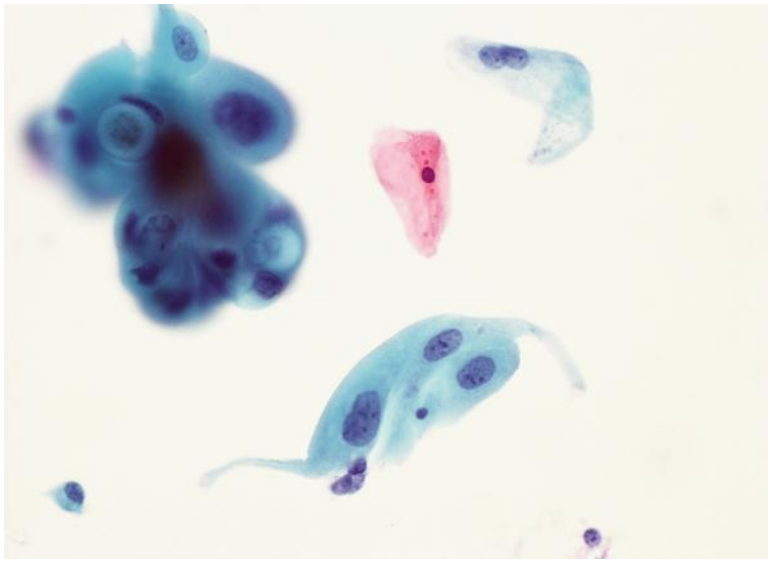
ThinPrep

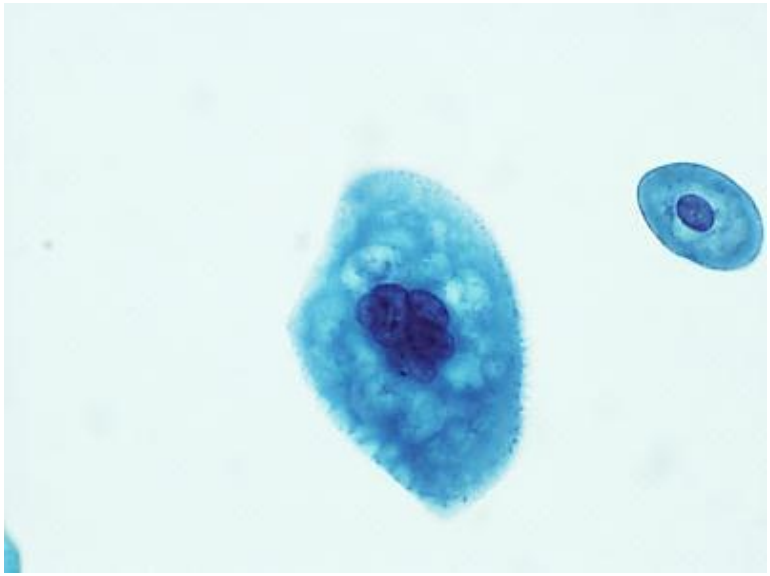


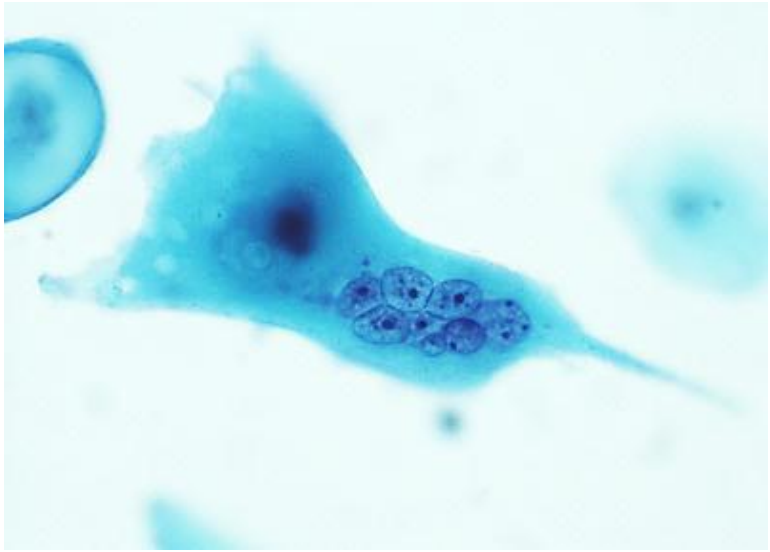
Atypical Squamous Cells, possible high-grade
Could be an active cervicitis, high-grade not excluded

Radiation change



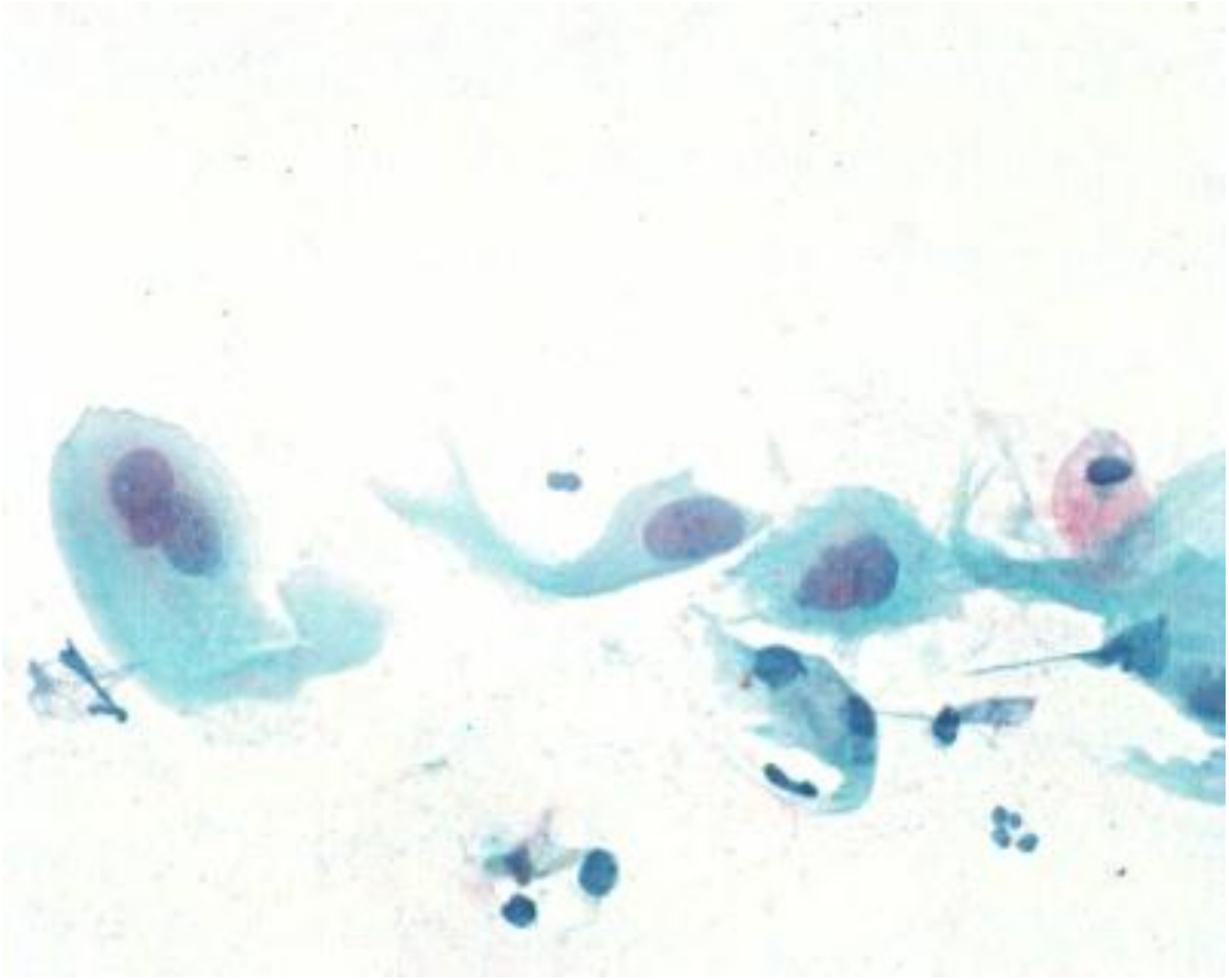






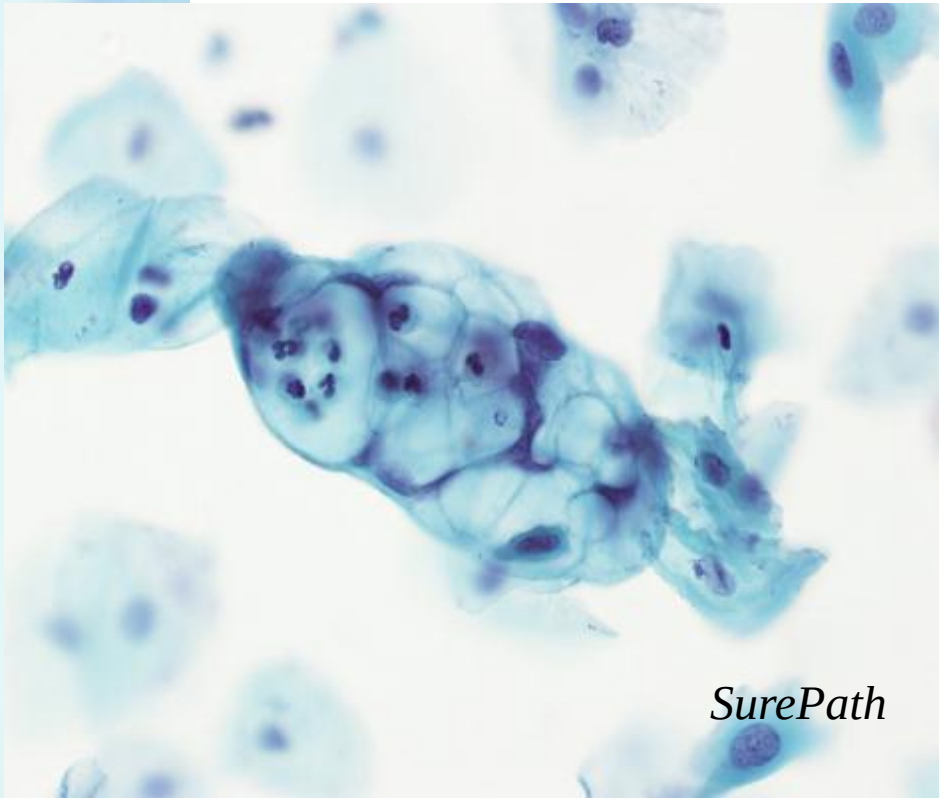
SurePath

Chemotherapy effect



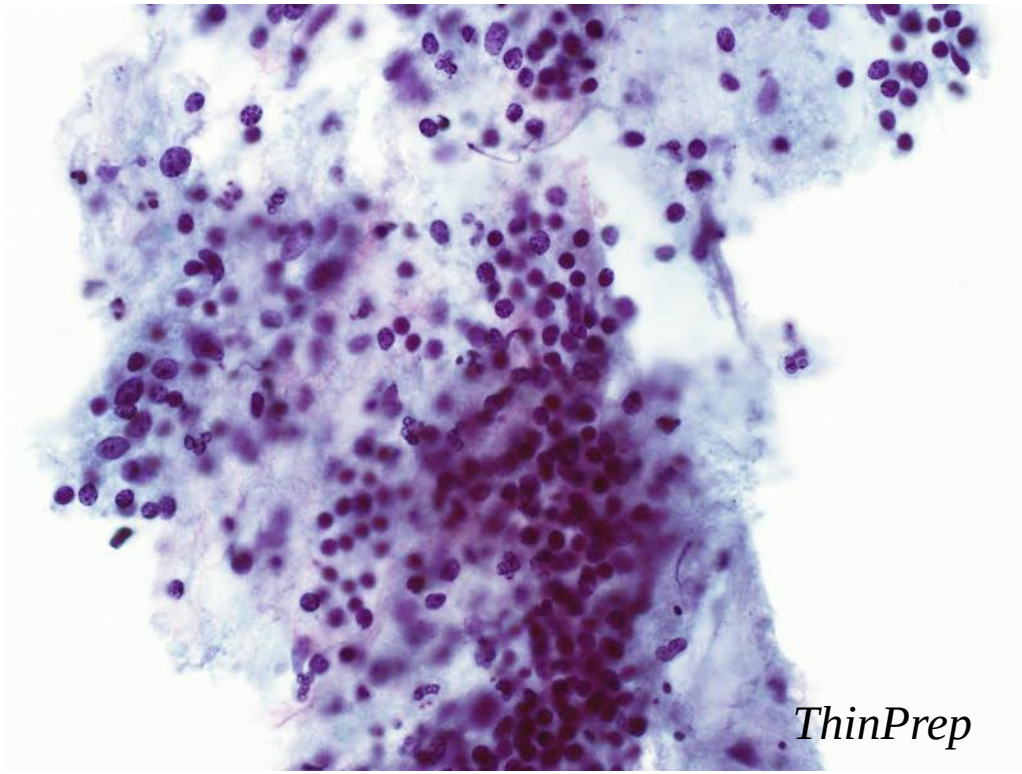
IUCD cells

ThinPrep

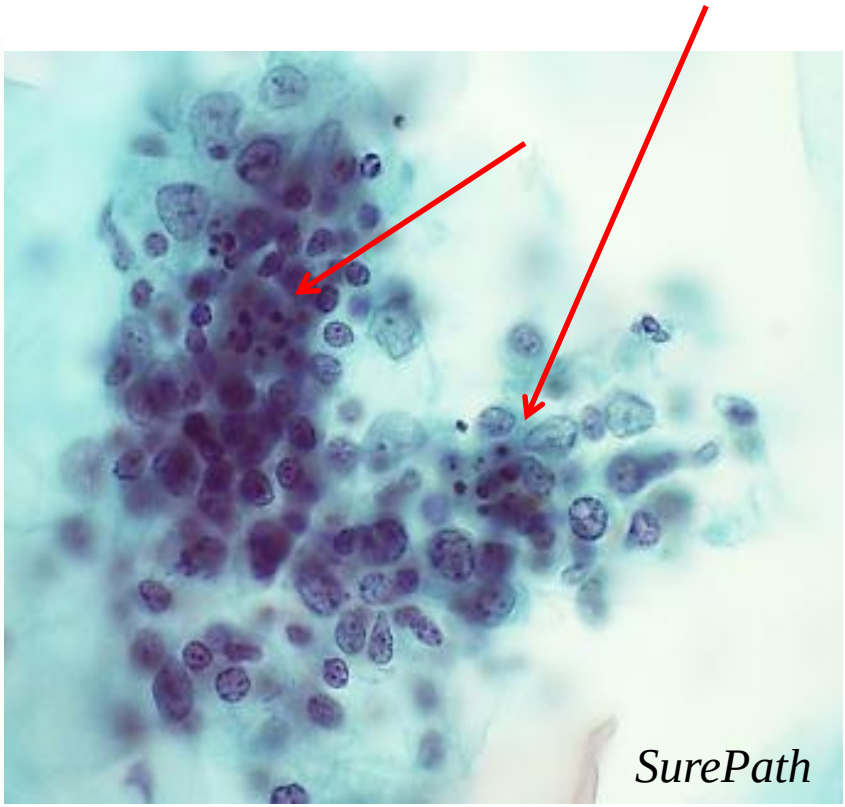


SurePath

Lymphocytic cervicitis

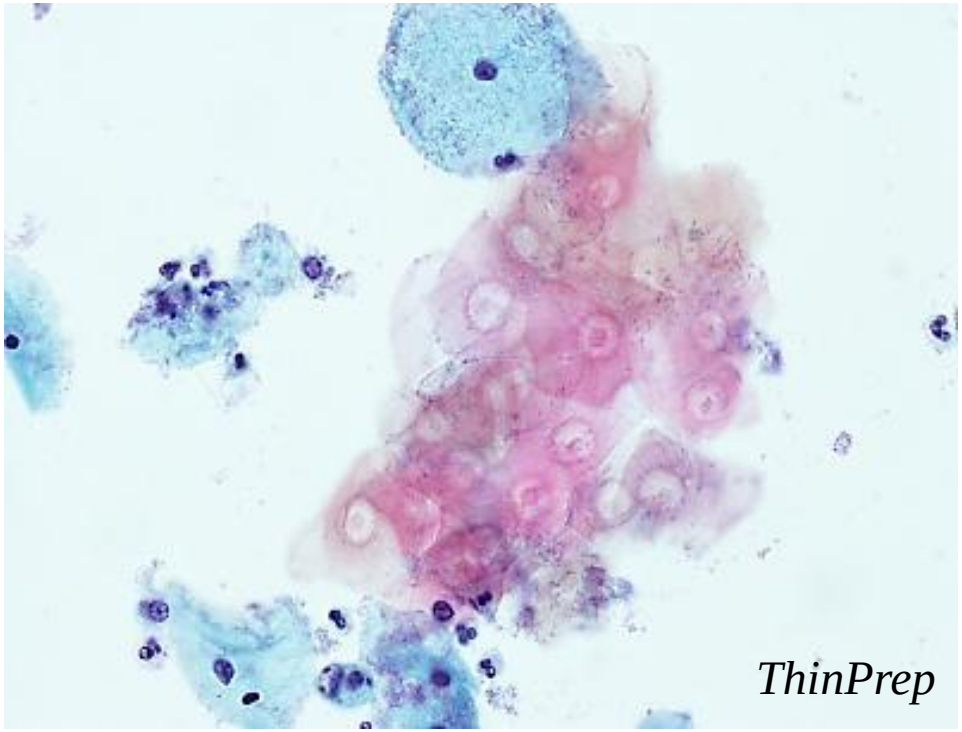


Loose cluster of lymphocytes

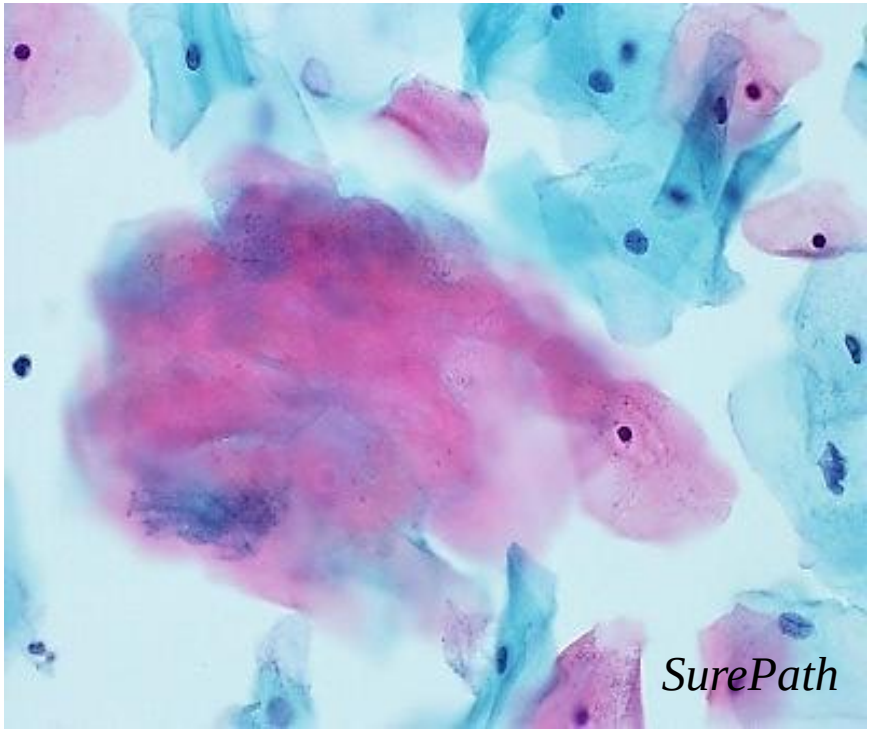


Tingible body macrophages

Hyperkeratosis

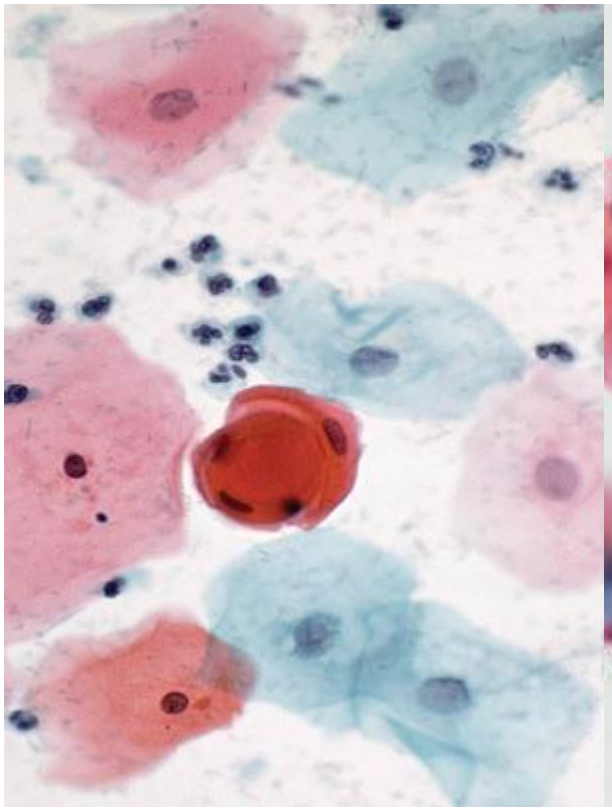


Ghost nuclear outlines

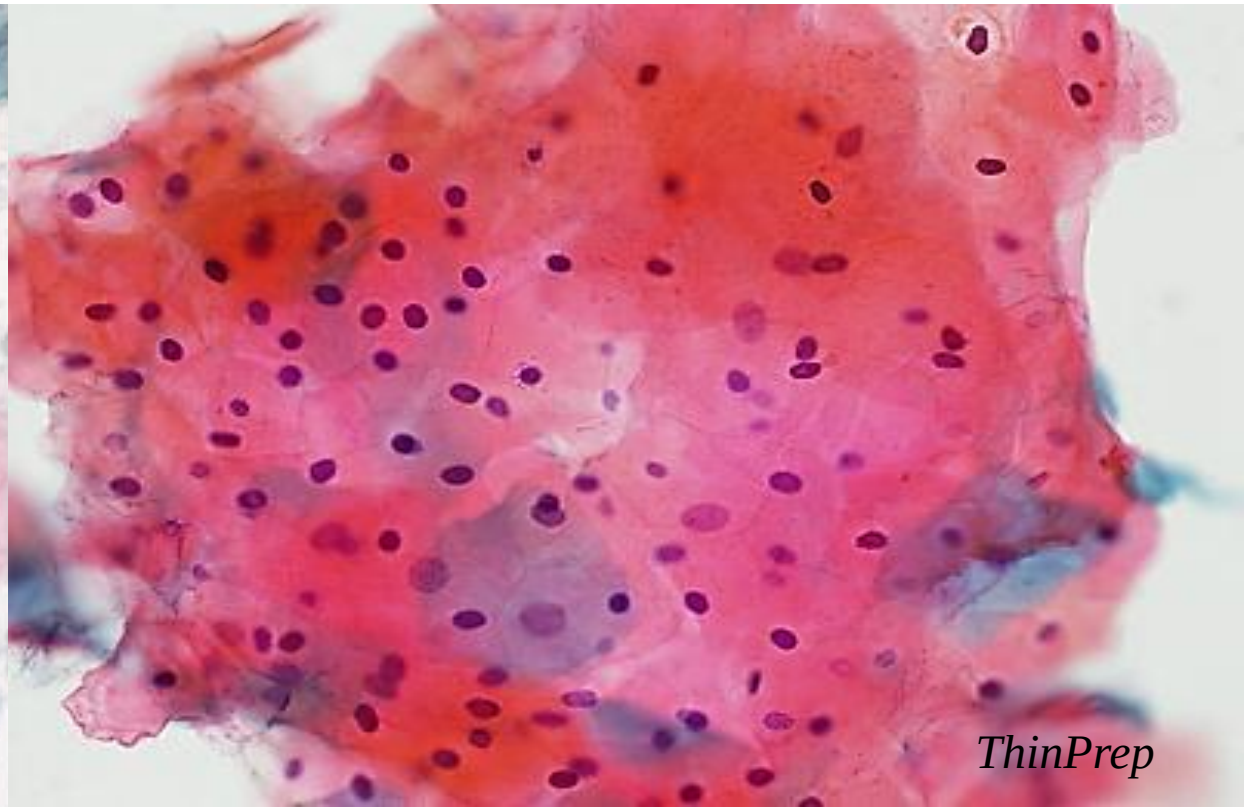


Amorphous eosinophilic debris

Parakeratosis

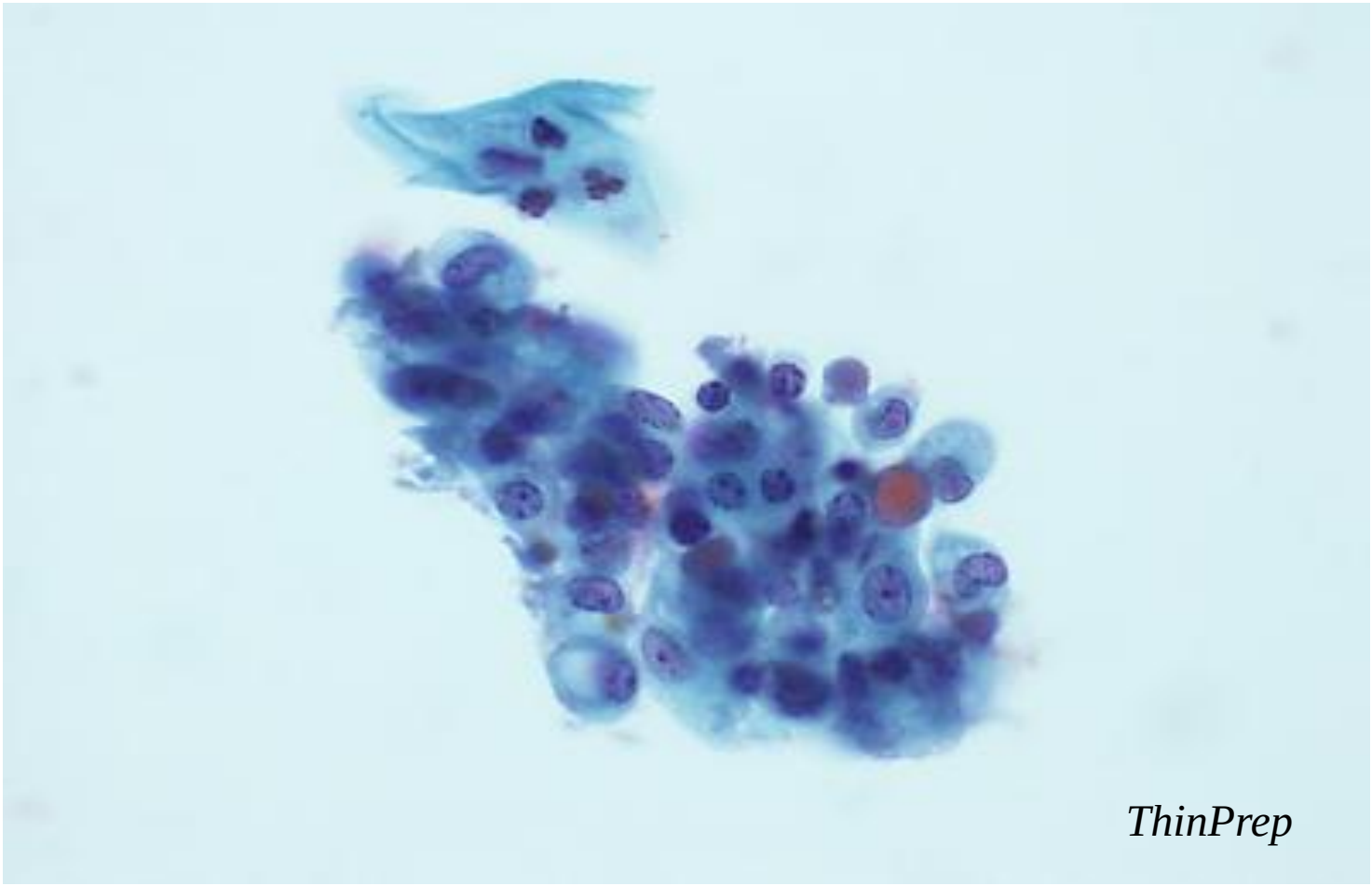


Squamous pearl



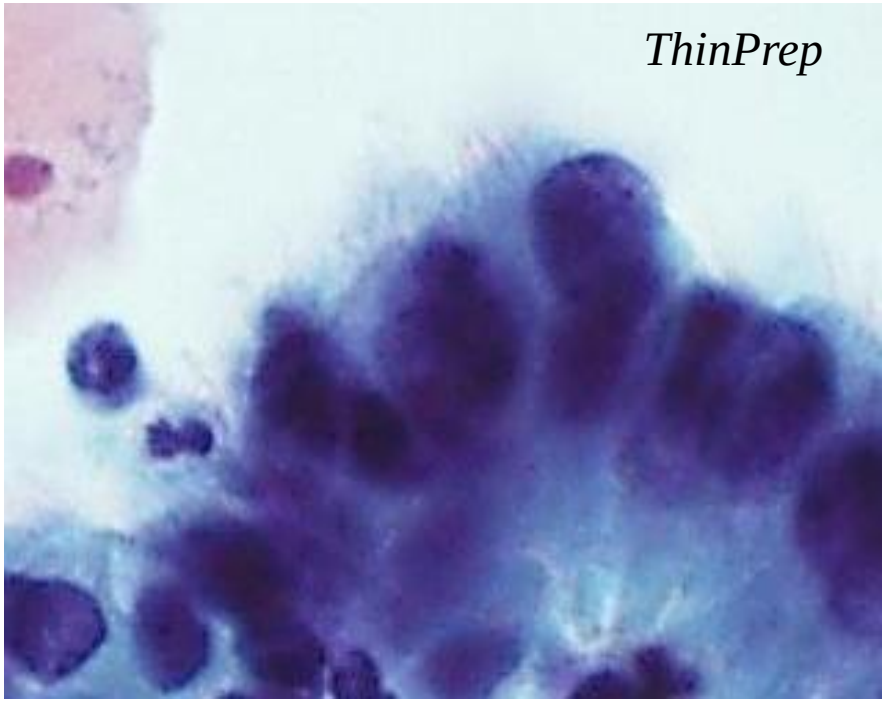
Parakeratotic group showing smaller darker nuclei

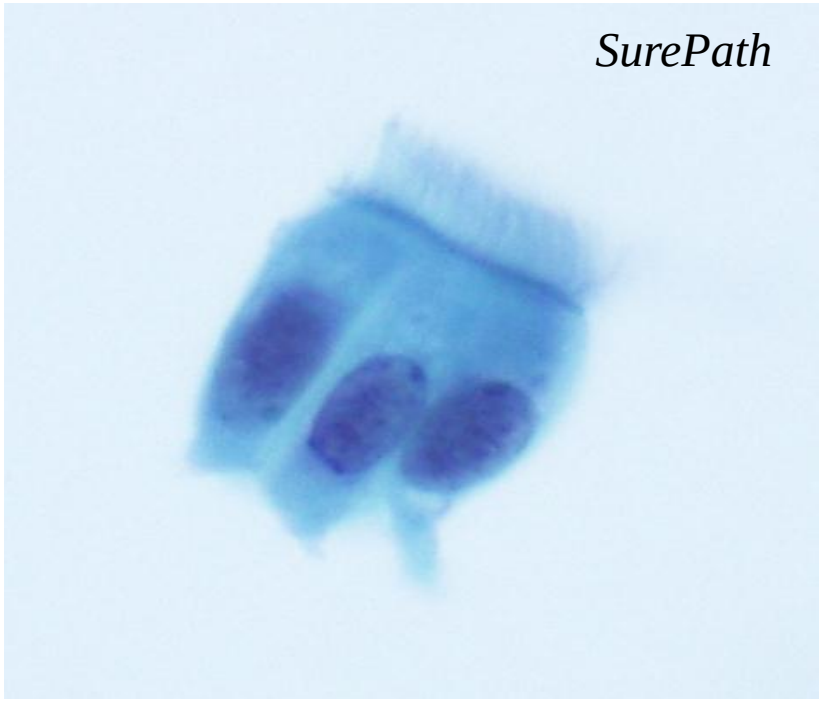
Cervical endometriosis



Endometrial cells, histiocytes and blood

Tubal metaplasia





Columnar endocervical cells with cilia and terminal bars

Transitional metaplasia

Characteristic longitudinal nuclear grooves

Concluding Comments

- Effective reporting systems are a communication tool to convey precise useful information.
- Reporting samples as unsatisfactory is important
- Organisms are reported when we see them: doesn't always imply infection
- Many benign/reactive conditions are no longer reported as they are not of clinical relevance
  - Familiarity with benign/reactive patterns is important so these entities can be distinguished from significant disease