
Workshop for O& G trainees and paramedics

17 Dec 2011

Cytological Interpretation

May Yu

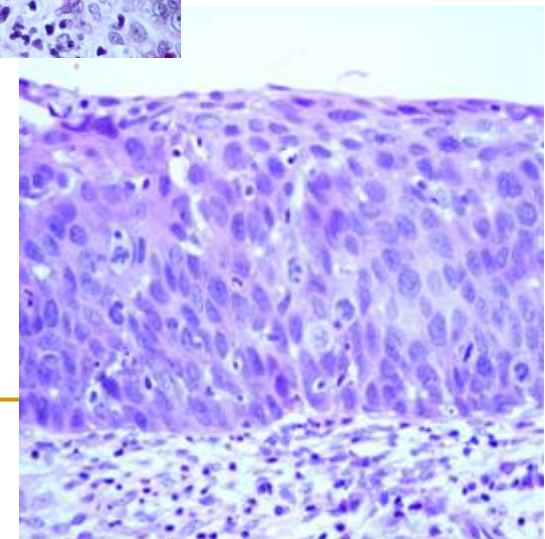
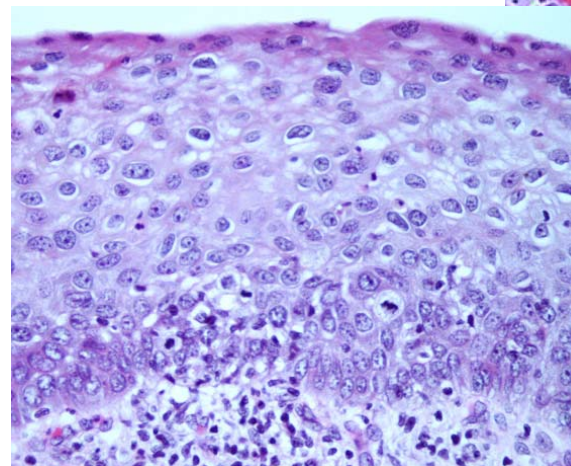
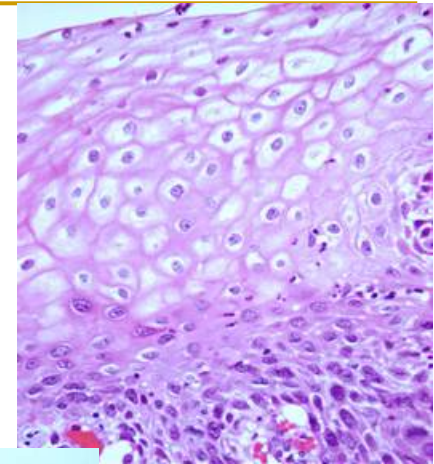
Director of Cytology Laboratory Service

Department of Anatomical & Cellular Pathology

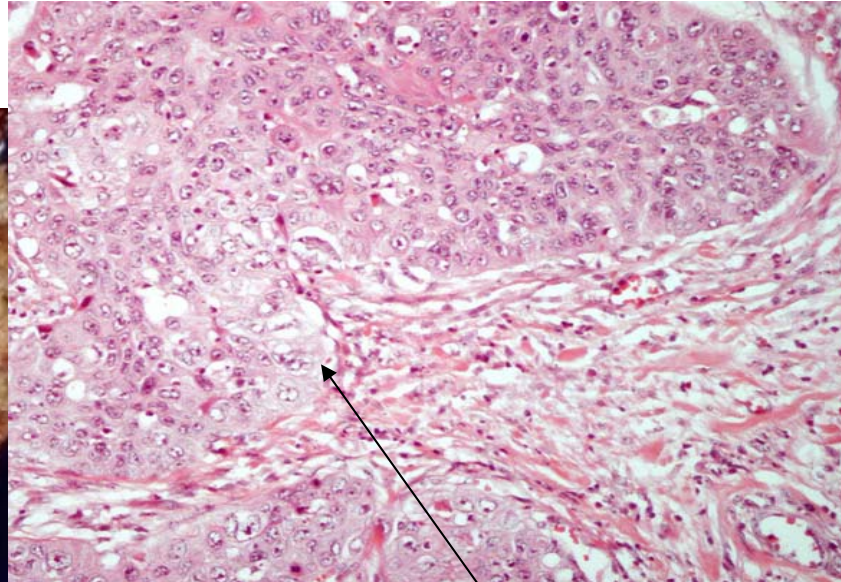
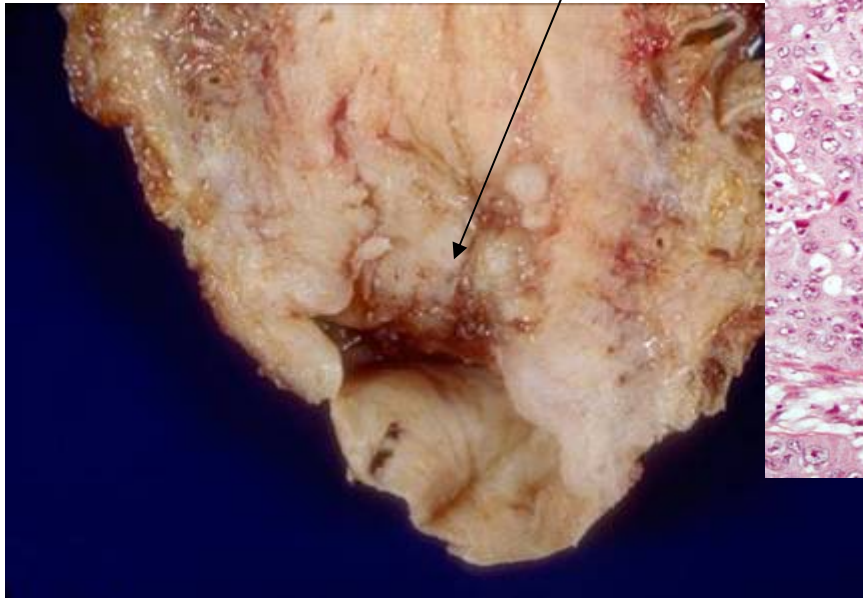
Prince of Wales Hospital

Cervical smear

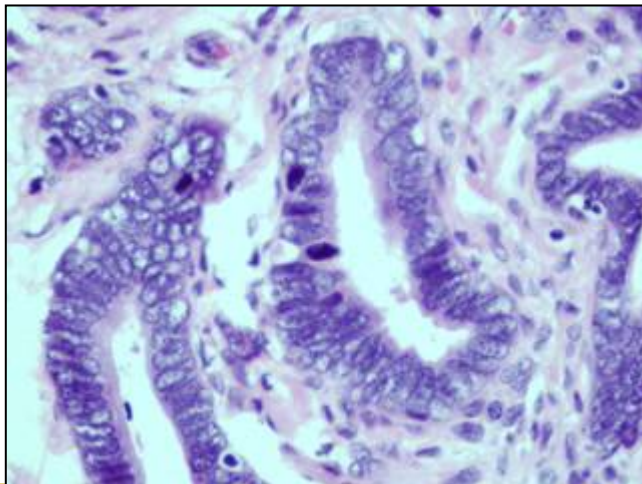
- Cervical smear screening can detect
 - ❑ LSIL : encompassing CIN I and HPV infections
 - ❑ HSIL: encompassing CIN II and III
 - ❑ Carcinomas (e.g. squamous cell carcinoma, adenocarcinoma, etc.)
 - ❑ Bethesda system is used as the standardized reporting system for cervical smears.



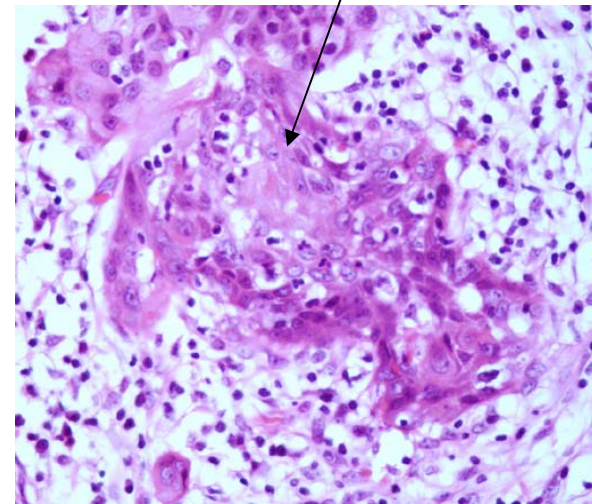
Cervical carcinoma



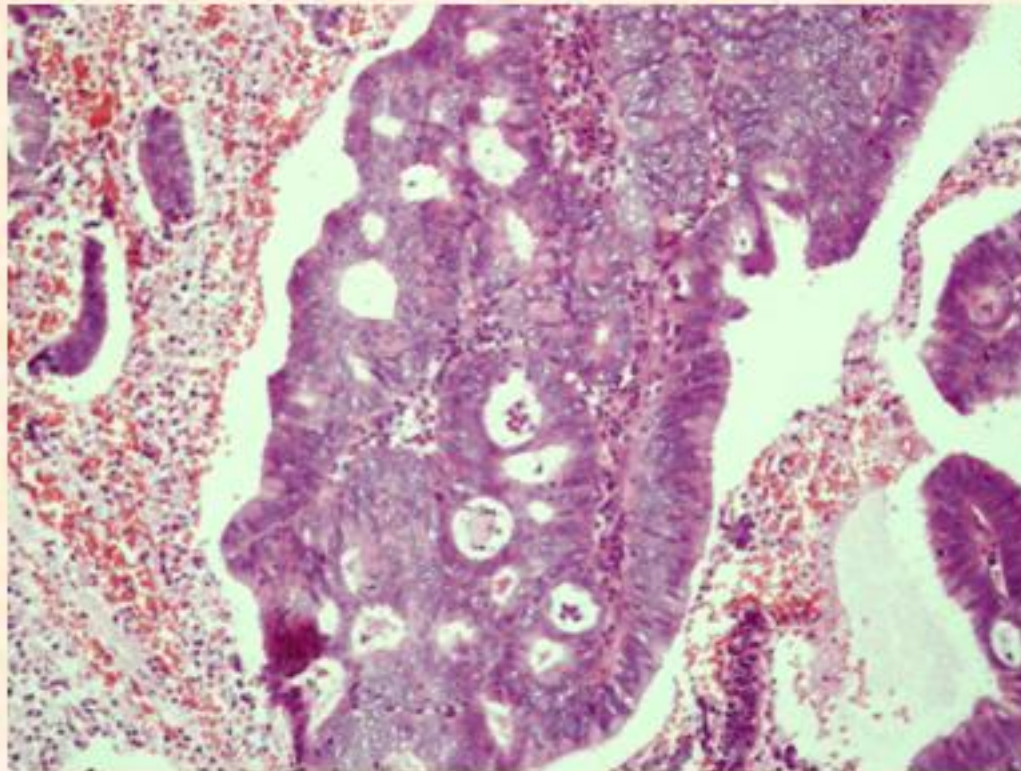
Squamous cell carcinoma



Adenocarcinoma



Endometrial adenocarcinoma



?Picture source: Robbins Pathological Basis of Diseases



Diane Solomon Ritu Nayar

EDITORS

The Bethesda System for Reporting Cervical Cytology

Definitions, Criteria, and
Explanatory Notes

Second Edition



Bethesda system (2001) for cervical smear reporting

- **SPECIMEN TYPE:** *Indicate conventional smear (Pap smear) vs. liquid based vs. other*
 - **SPECIMEN ADEQUACY**
 - **GENERAL CATEGORIZATION** (*optional*)
 - Negative
 - Epithelial Cell Abnormality (*specify 'squamous' or 'glandular' as appropriate*)
 - Other Malignant neoplasms
-

Bethesda system for cervical smear reporting

- **EPITHELIAL CELL ABNORMALITIES**

- **SQUAMOUS CELL**

- Atypical squamous cells
 - of undetermined significance (ASC-US)
 - cannot exclude HSIL (ASC-H)
- Low grade squamous intraepithelial lesion (LSIL)
encompassing: HPV/mild dysplasia/CIN 1
- High grade squamous intraepithelial lesion (HSIL)
encompassing: moderate and severe dysplasia, CIS/CIN 2 and CIN 3
 - with features suspicious for invasion (*if invasion is suspected*)
- Squamous cell carcinoma

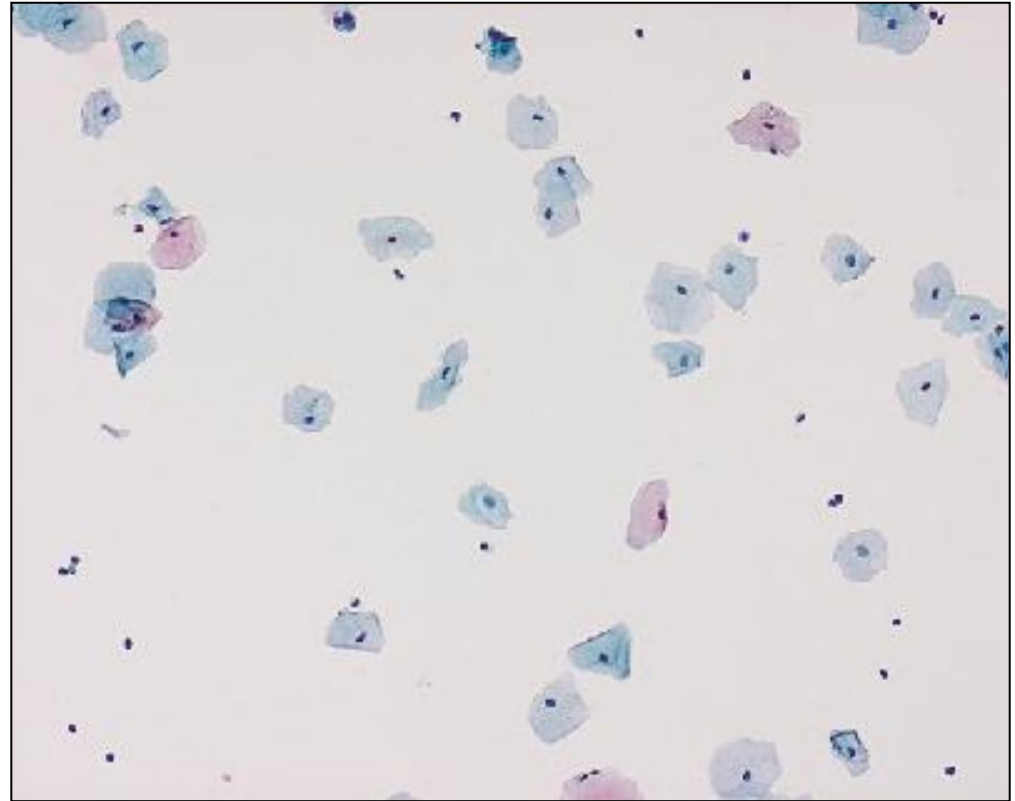
- **GLANDULAR CELL**

- Atypical
 - endocervical cells (NOS *or specify in comments*)
 - endometrial cells (NOS *or specify in comments*)
 - glandular cells (NOS *or specify in comments*)
- Atypical
 - endocervical cells, favor neoplastic
 - glandular cells, favor neoplastic
- Endocervical adenocarcinoma in situ
- Adenocarcinoma
 - endocervical
 - endometrial
 - extrauterine
 - not otherwise specified (NOS)

- **OTHER MALIGNANT NEOPLASMS: (*specify*)**

Borderline cellular adequacy

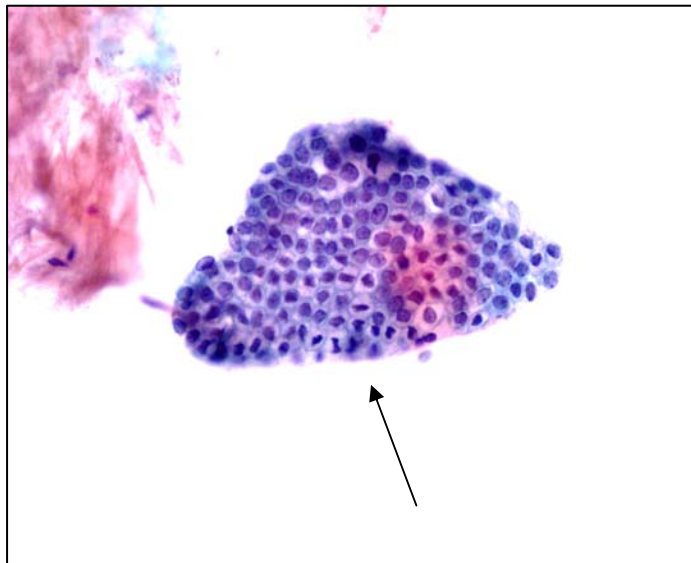
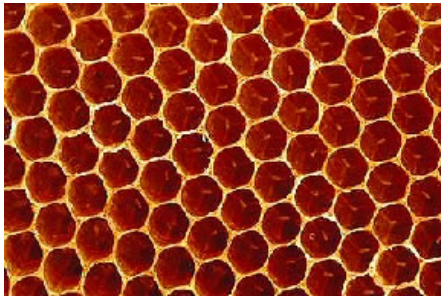
- X10 objective
- > 5000 cells/ liquid based slide
- > or =11 cells/ field
- Picture here is of borderline cellular adequacy



Slide from NCI Bethesda website

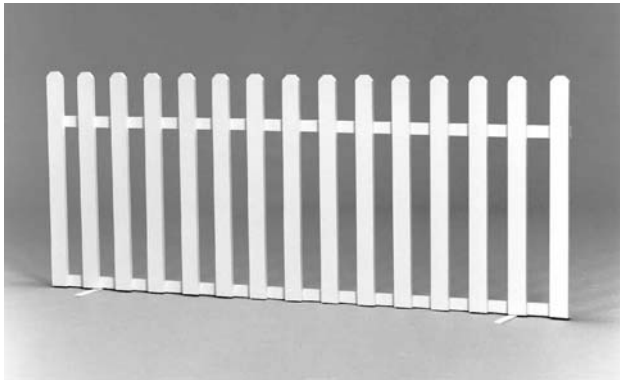
Benign endocervical cells

- Honey comb pattern

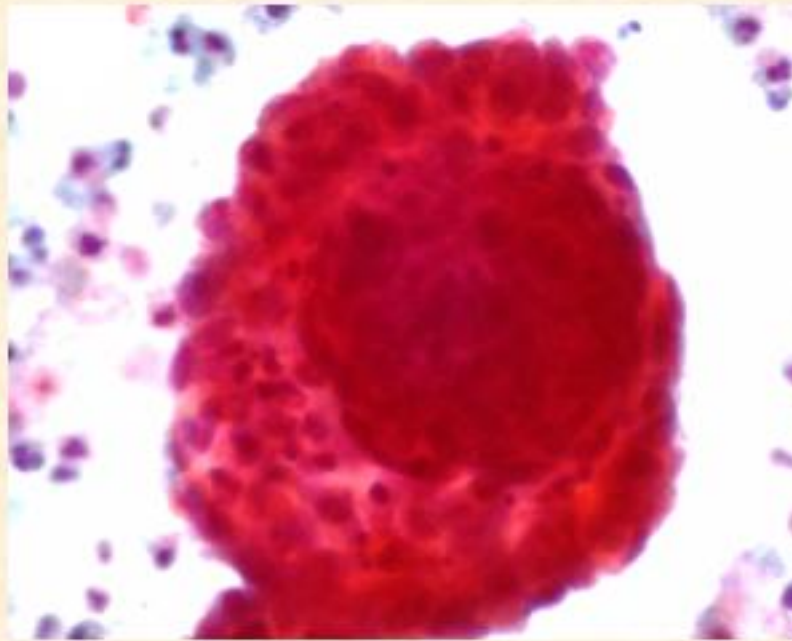


Benign endocervical cells

- Picket-fence pattern and honey comb pattern

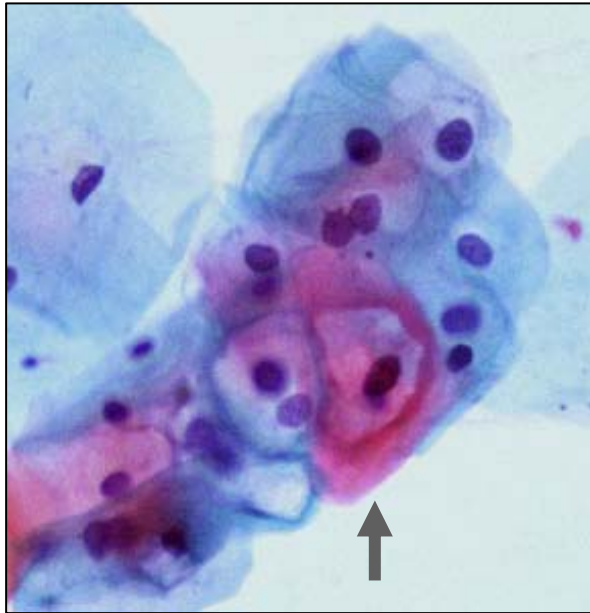


Endometrial cells

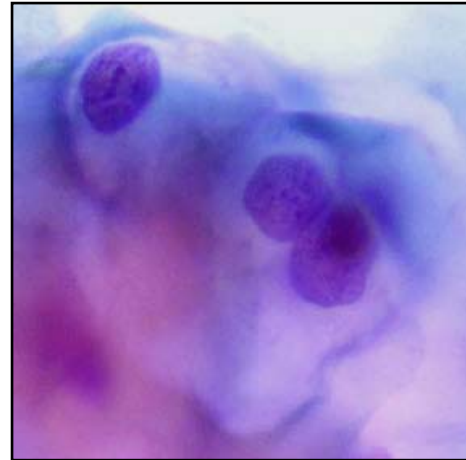


Normally shed endometrial cells: N.B. donut shape with outer endometrioid glandular cells and inner core of stromal cells. Usually appear out of tissue plane and degenerated

Cervical smear: low grade squamous intraepithelial lesion (LSIL)

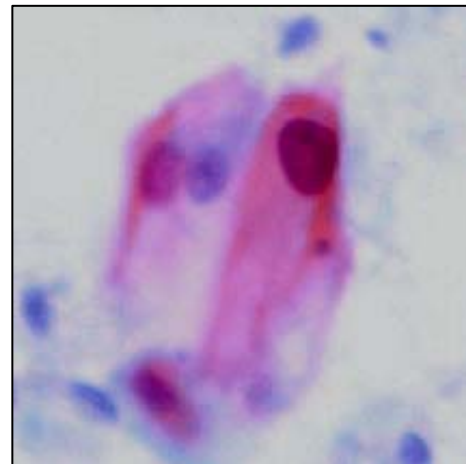


Koilocytes: Note the enlarged dark smudged nuclei, perinuclear cytoplasmic halo, and condensed cytoplasmic borders

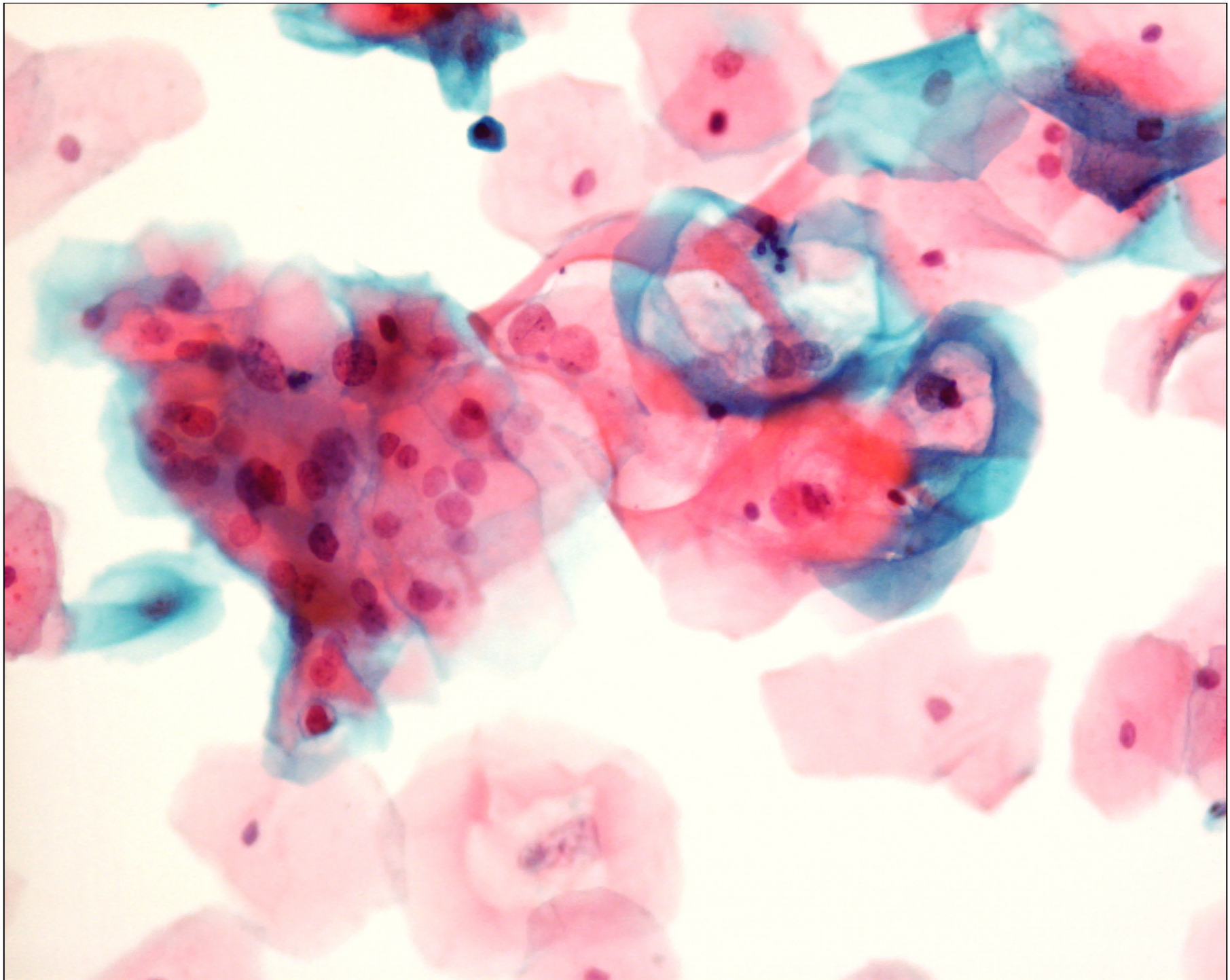


Koilocytes

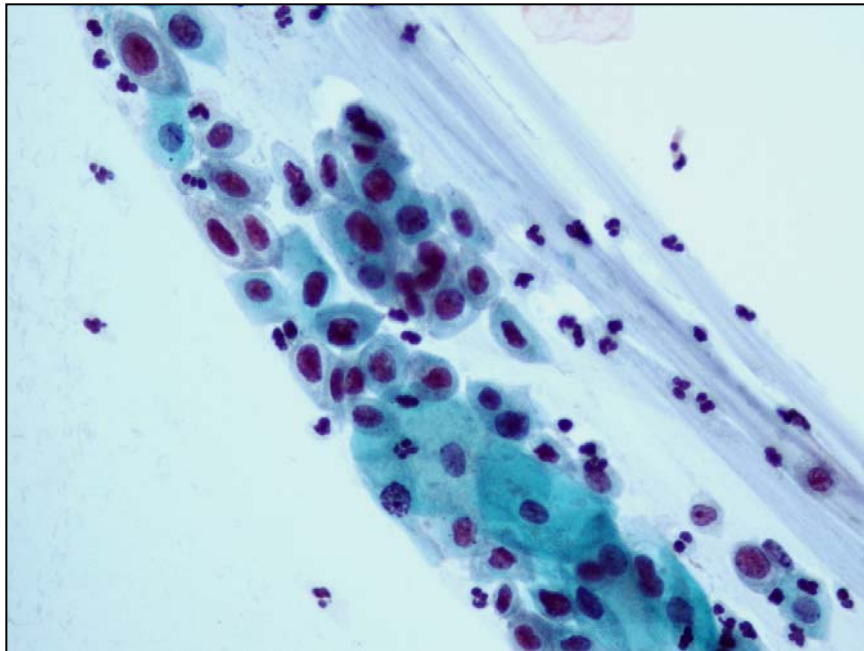
- Represent squamous cells with cytopathic changes, characteristically related to HPV effect



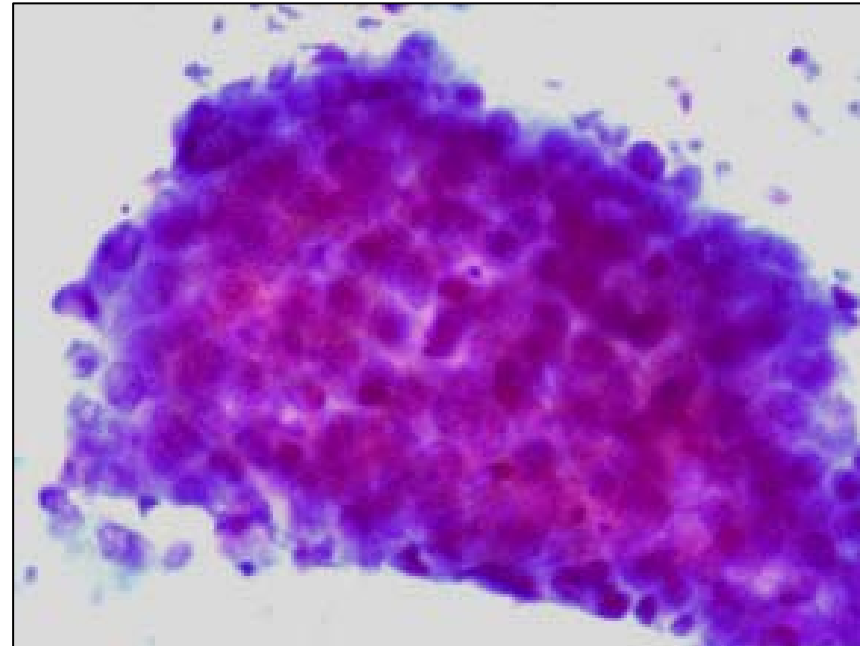
Mildly atypical squamous cells with enlarged hyperchromatic nuclei (CIN I)



Cervical smear: High grade squamous intraepithelial lesion (HSIL)

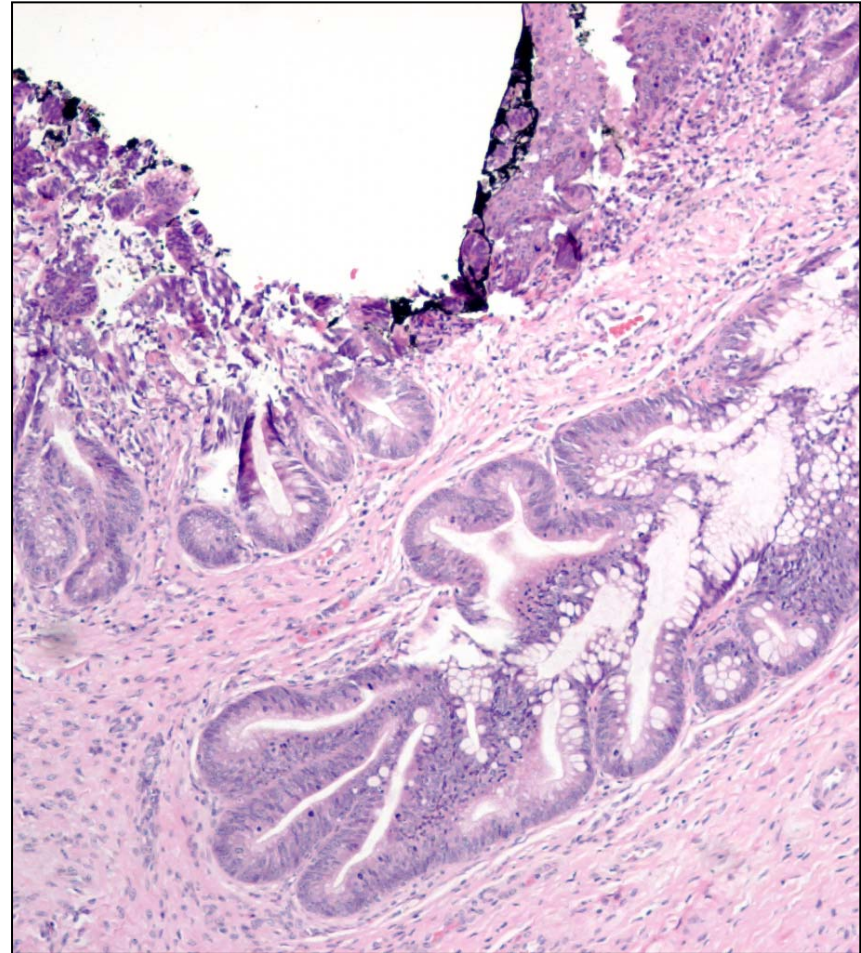
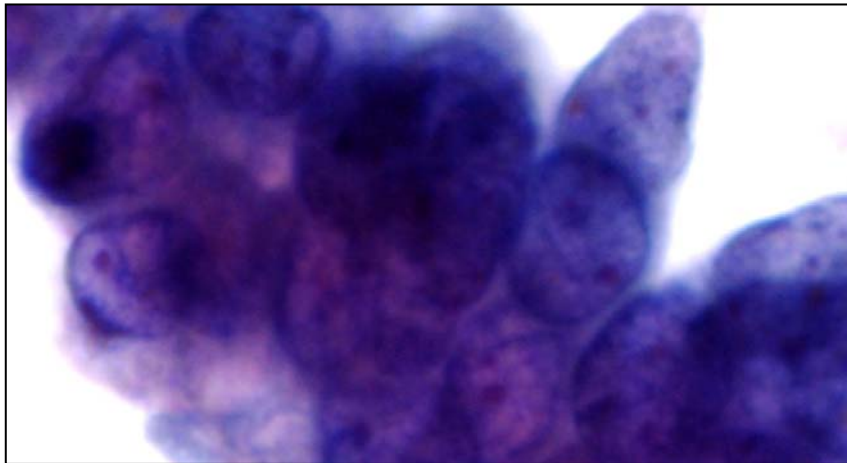
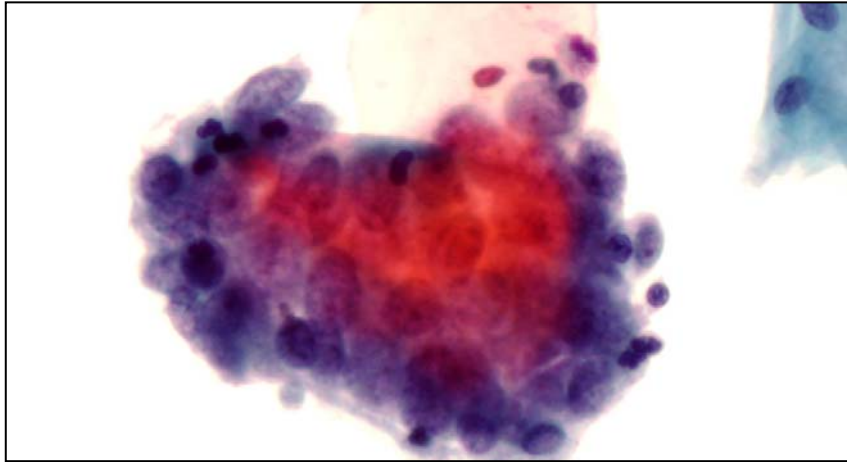


HSIL (CIN II)

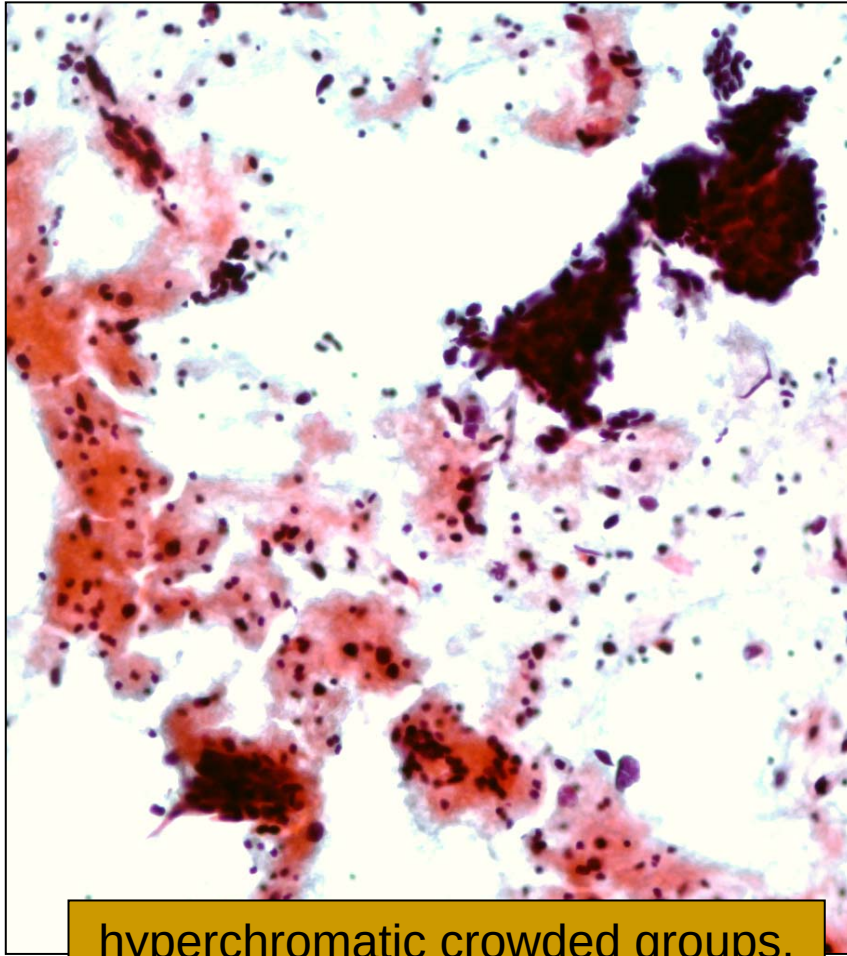


HSIL (CIN III)

Endocervical adenocarcinoma-in situ (AIS)



Squamous cell carcinoma

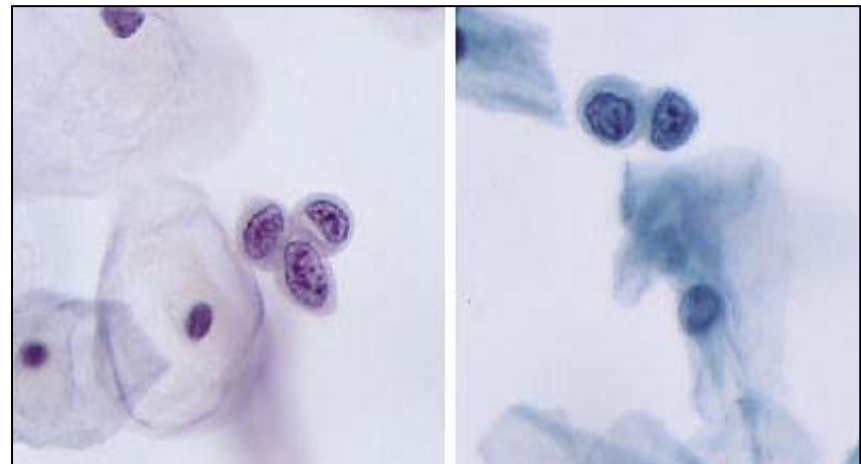
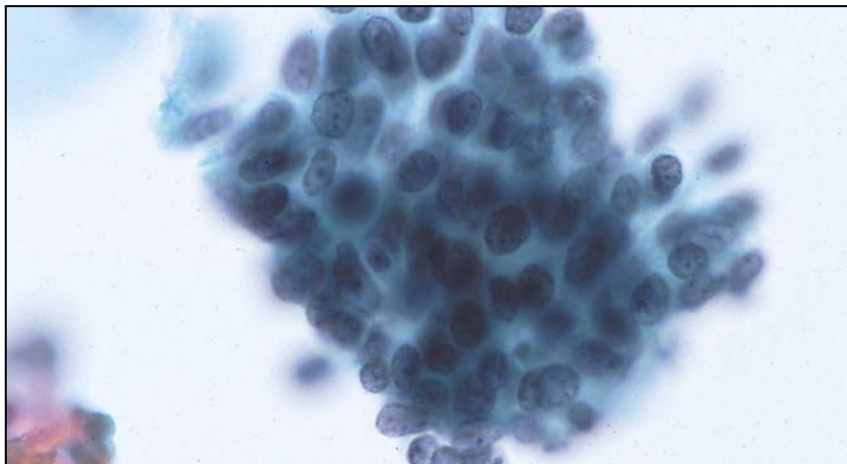
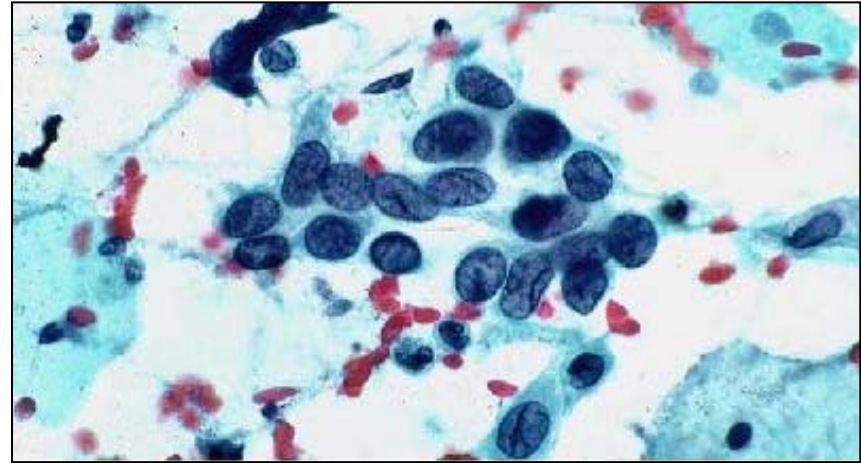
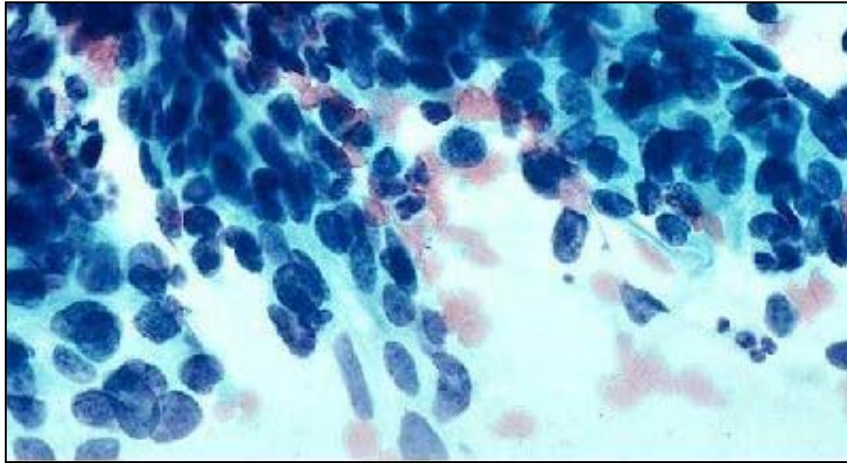


hyperchromatic crowded groups,
tumor diathesis (necrosis)



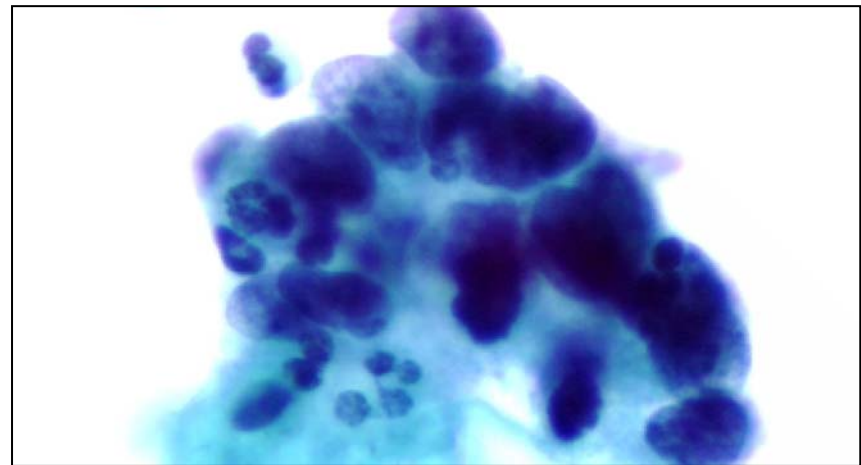
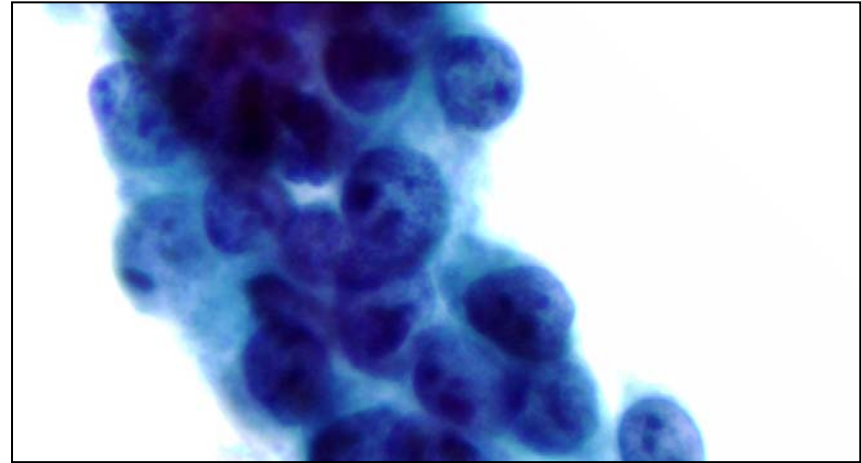
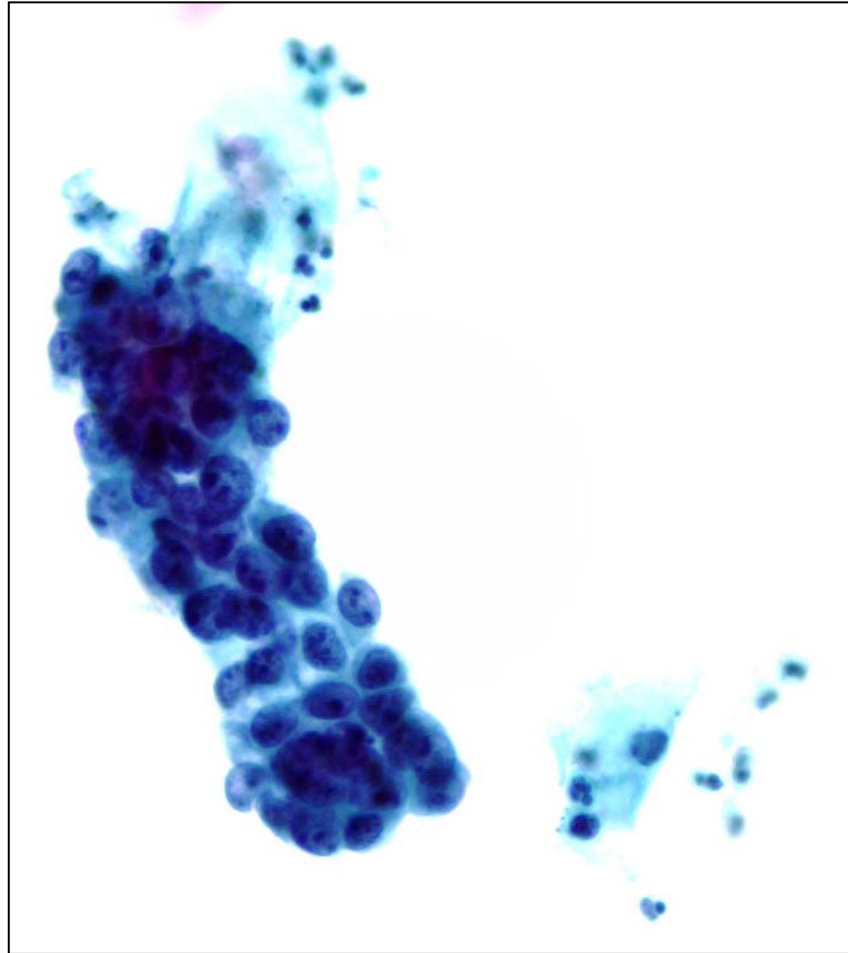
SCC with tadpole abnormal cells

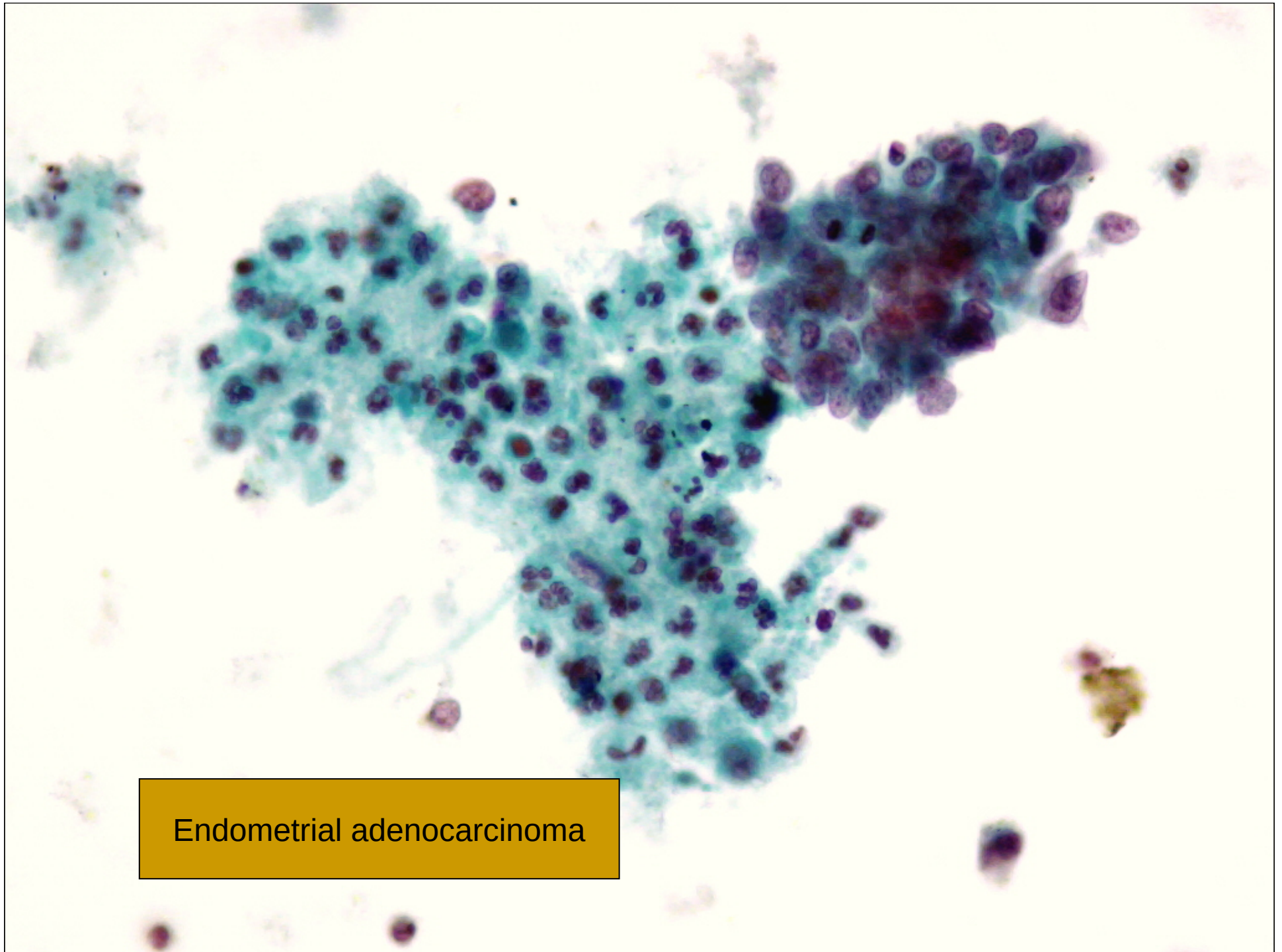
HSIL



NCI-Bethesda slides

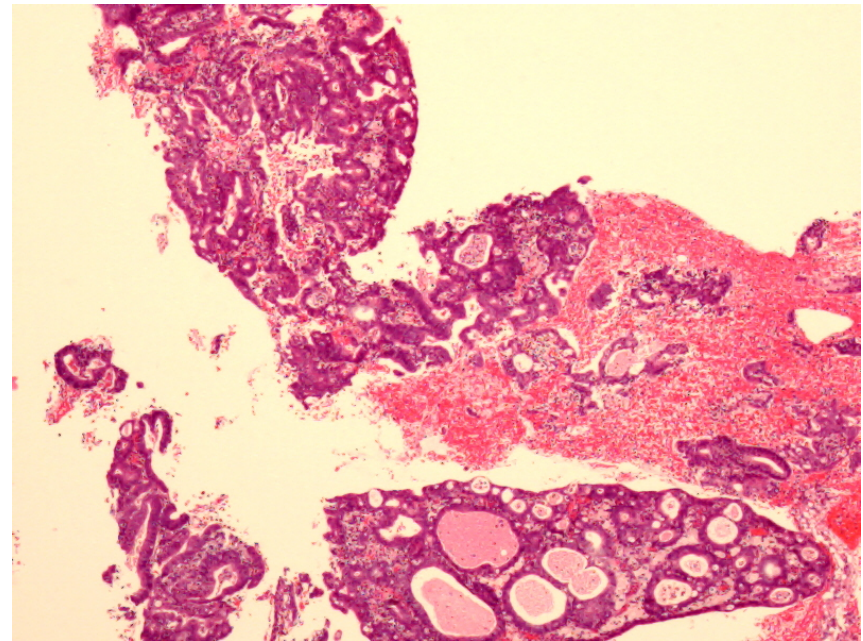
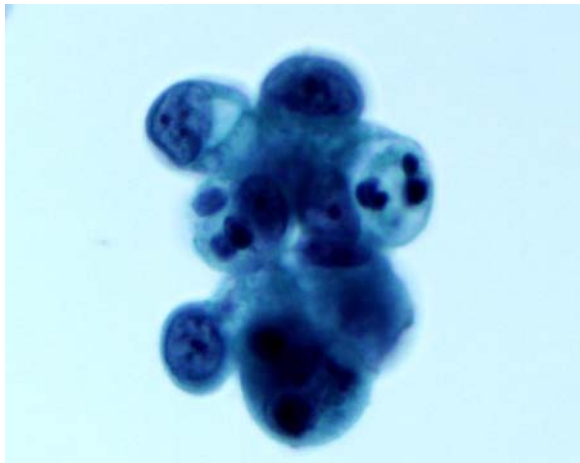
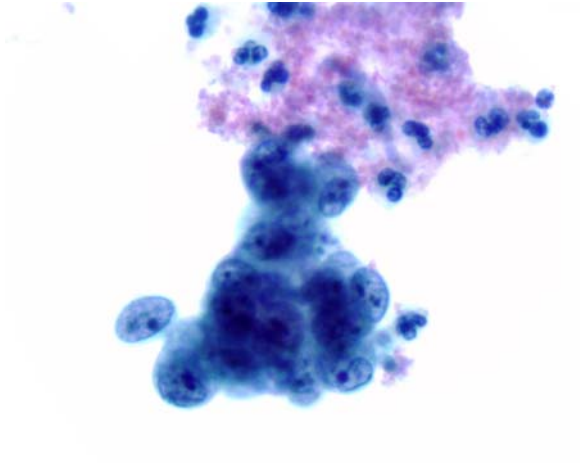
Endocervical adenocarcinoma

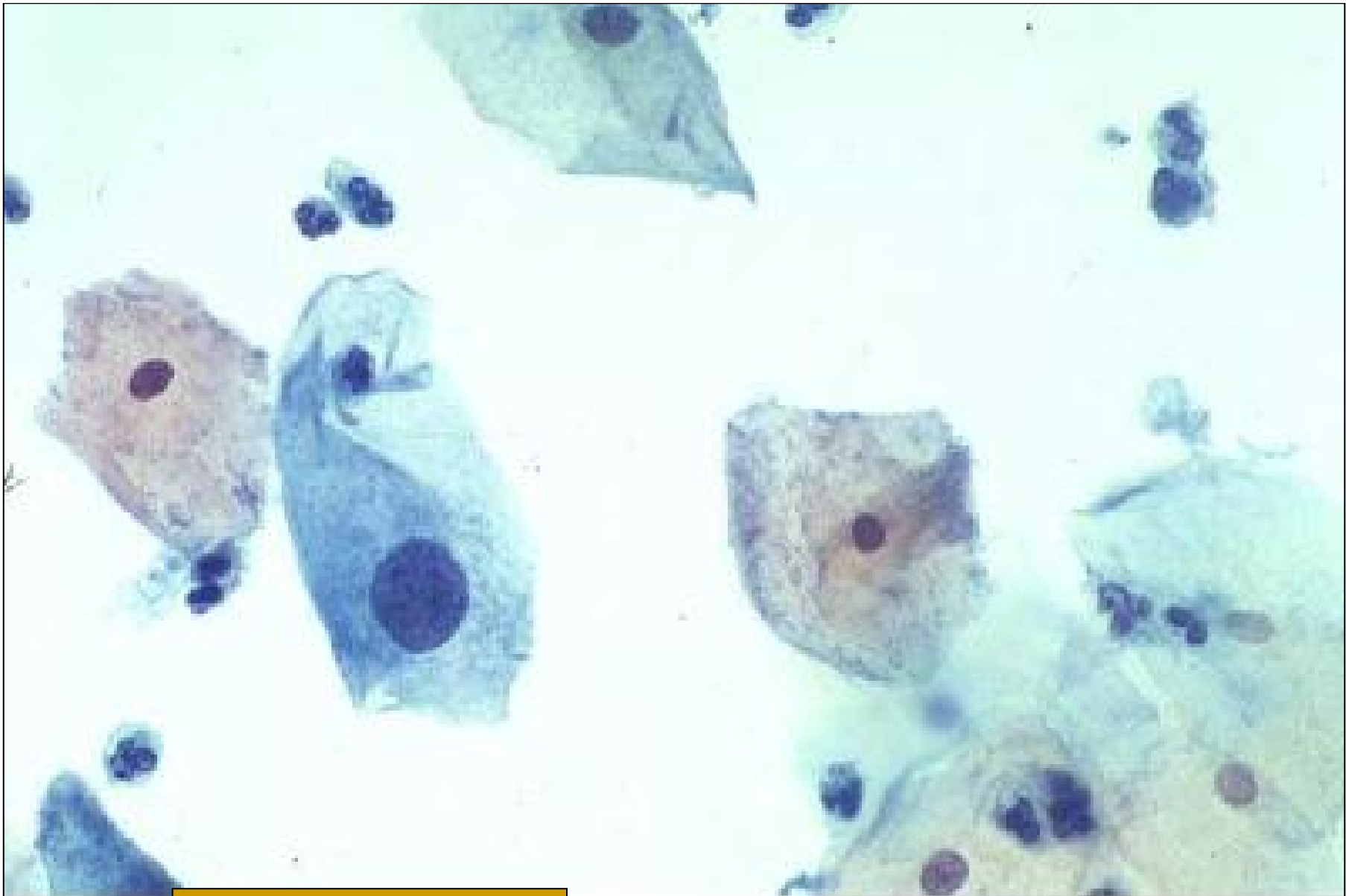




Endometrial adenocarcinoma

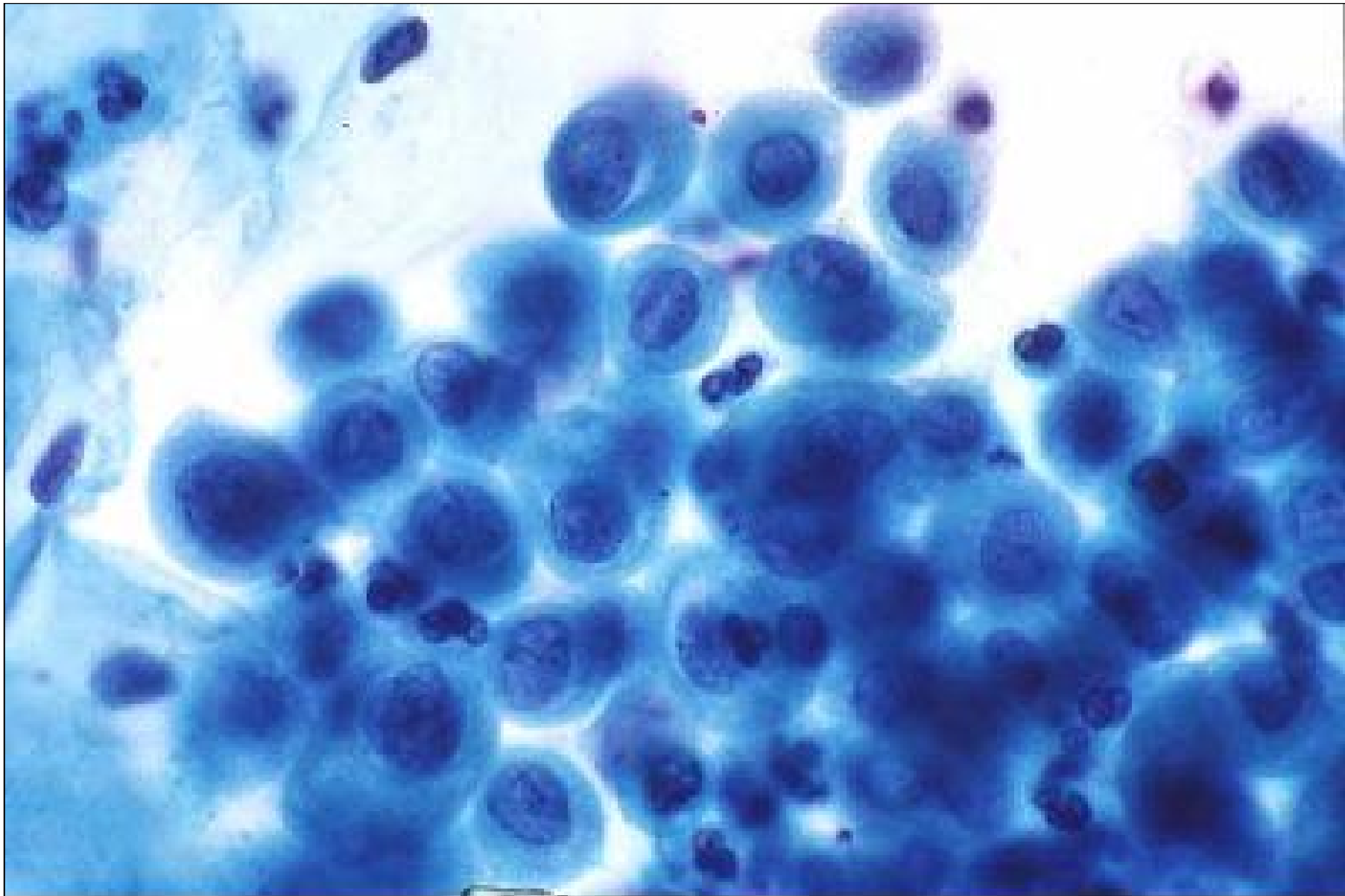
Endometrial adenocarcinoma





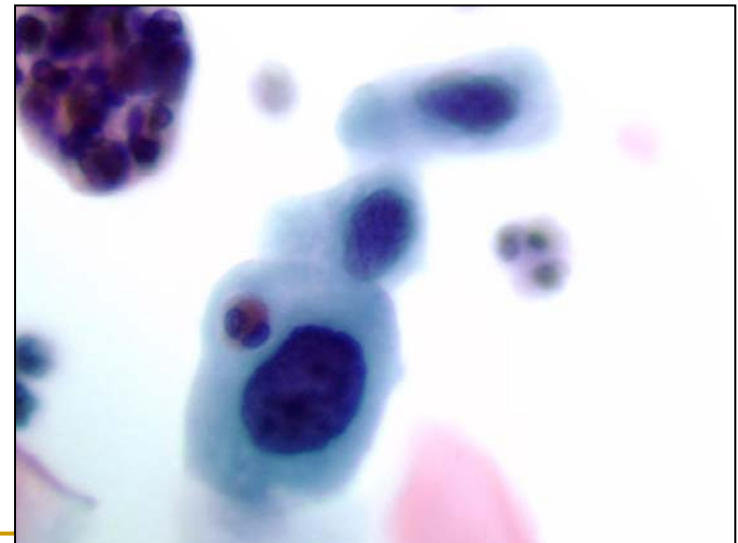
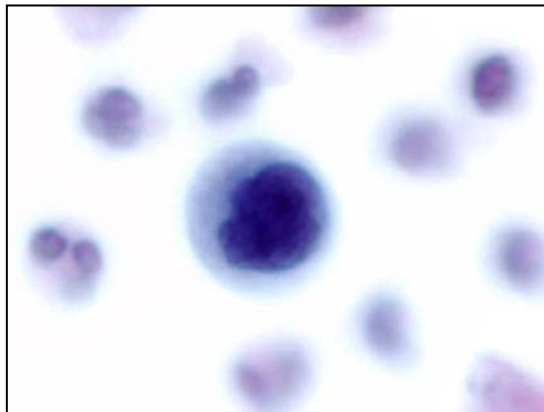
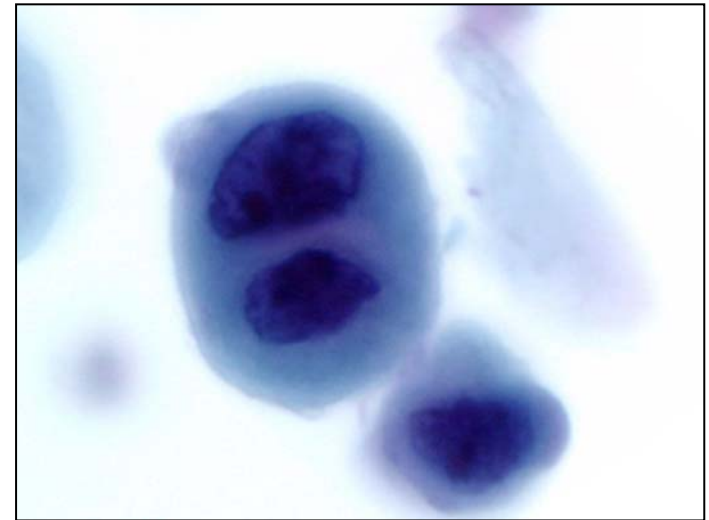
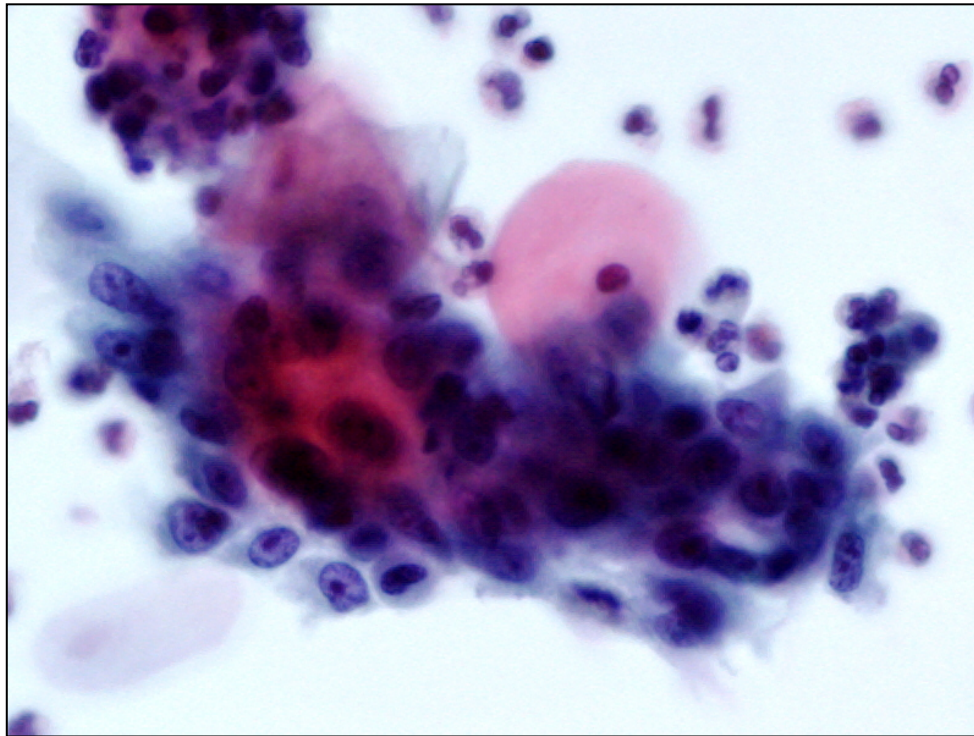
ASCUS

NCI-Bethesda slide



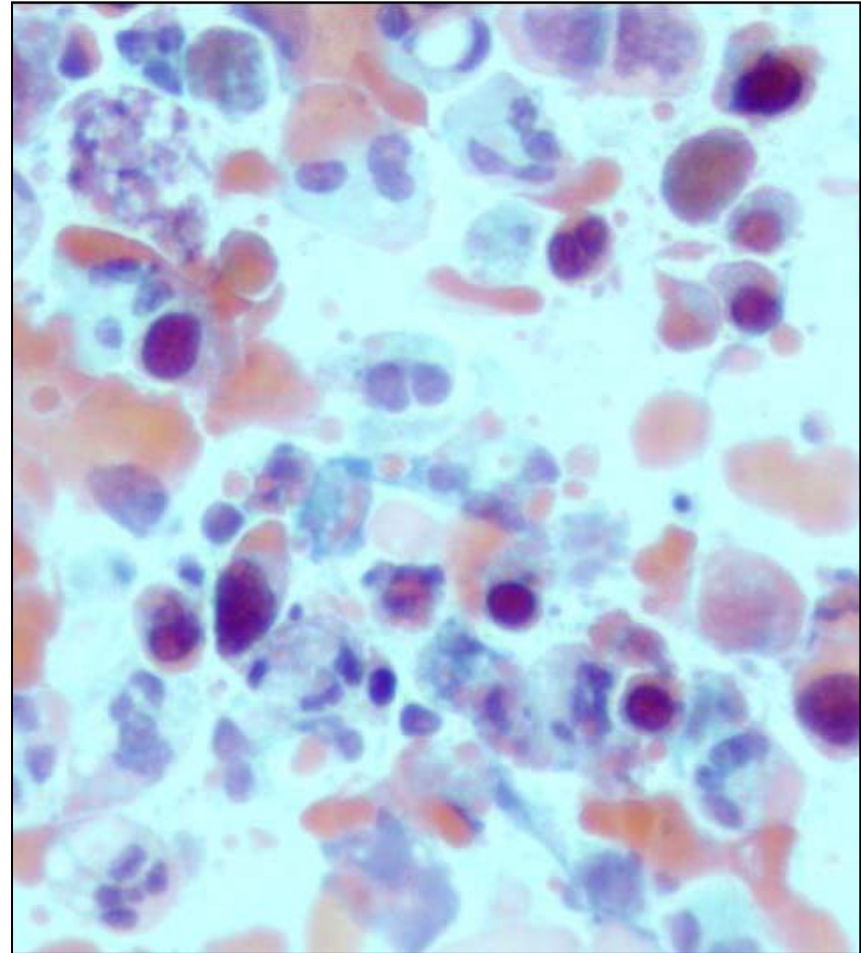
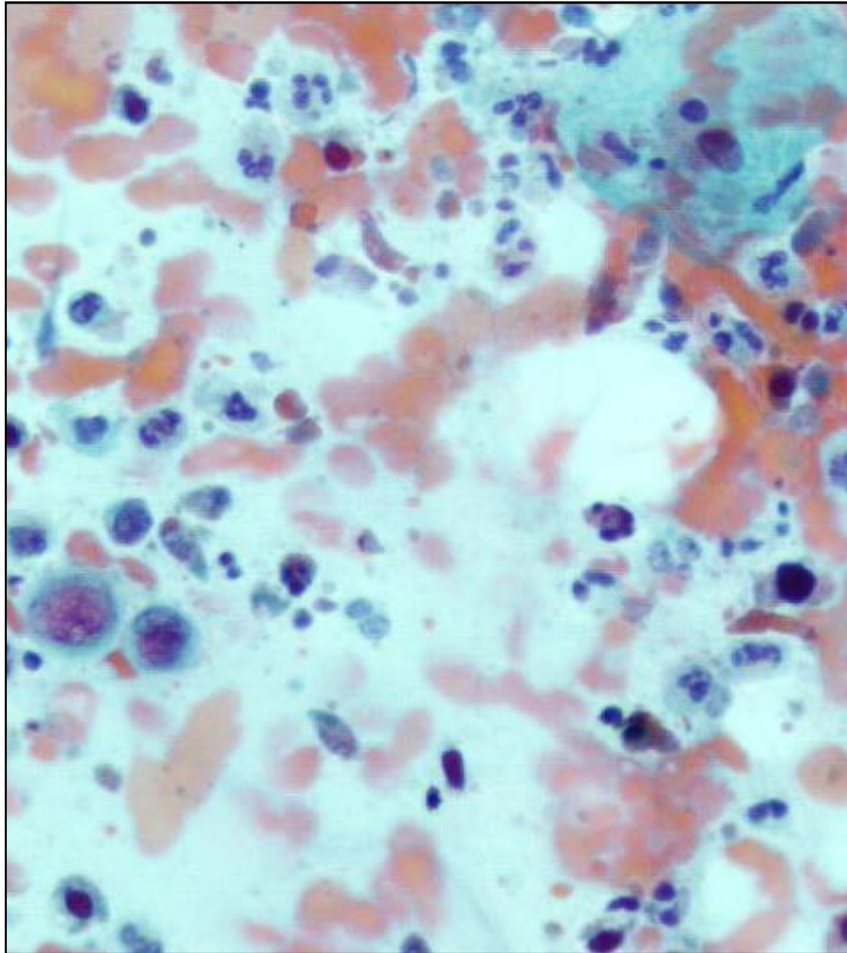
ASCH

Slide from NCI-Bethesda



ASC-H

Atypical glandular cells, favour neoplastic
(Suspicious of endometrial



AGC- mimicker

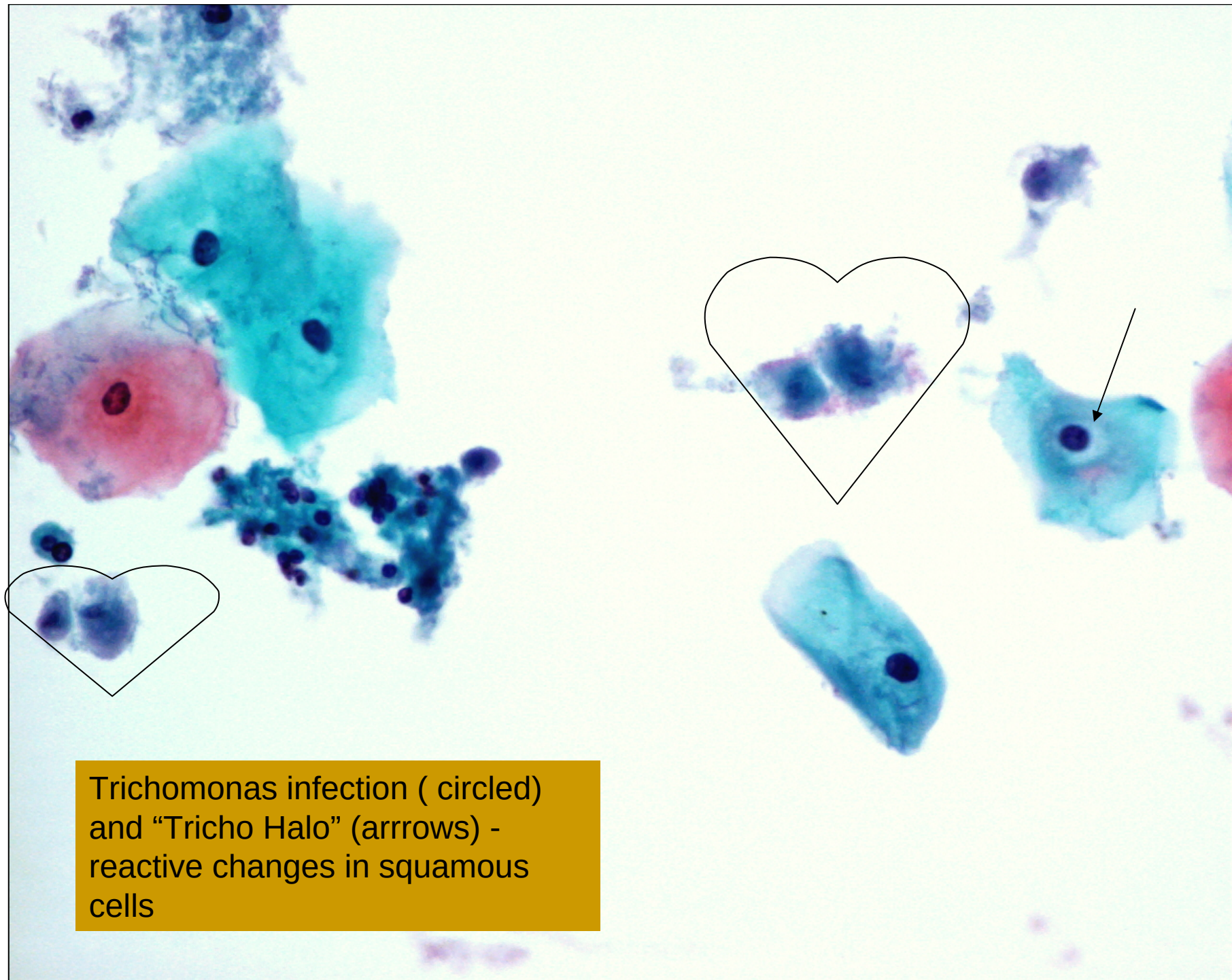
- Benign:
 - ❑ high endocervical cells
 - ❑ Tubal metaplastic cells
 - ❑ Brush artifacts
 - ❑ Reactive endocervical or endometrial cells
 - ❑ Direct endometrial scrapings
 - HSIL (e.g. involving glands)
-

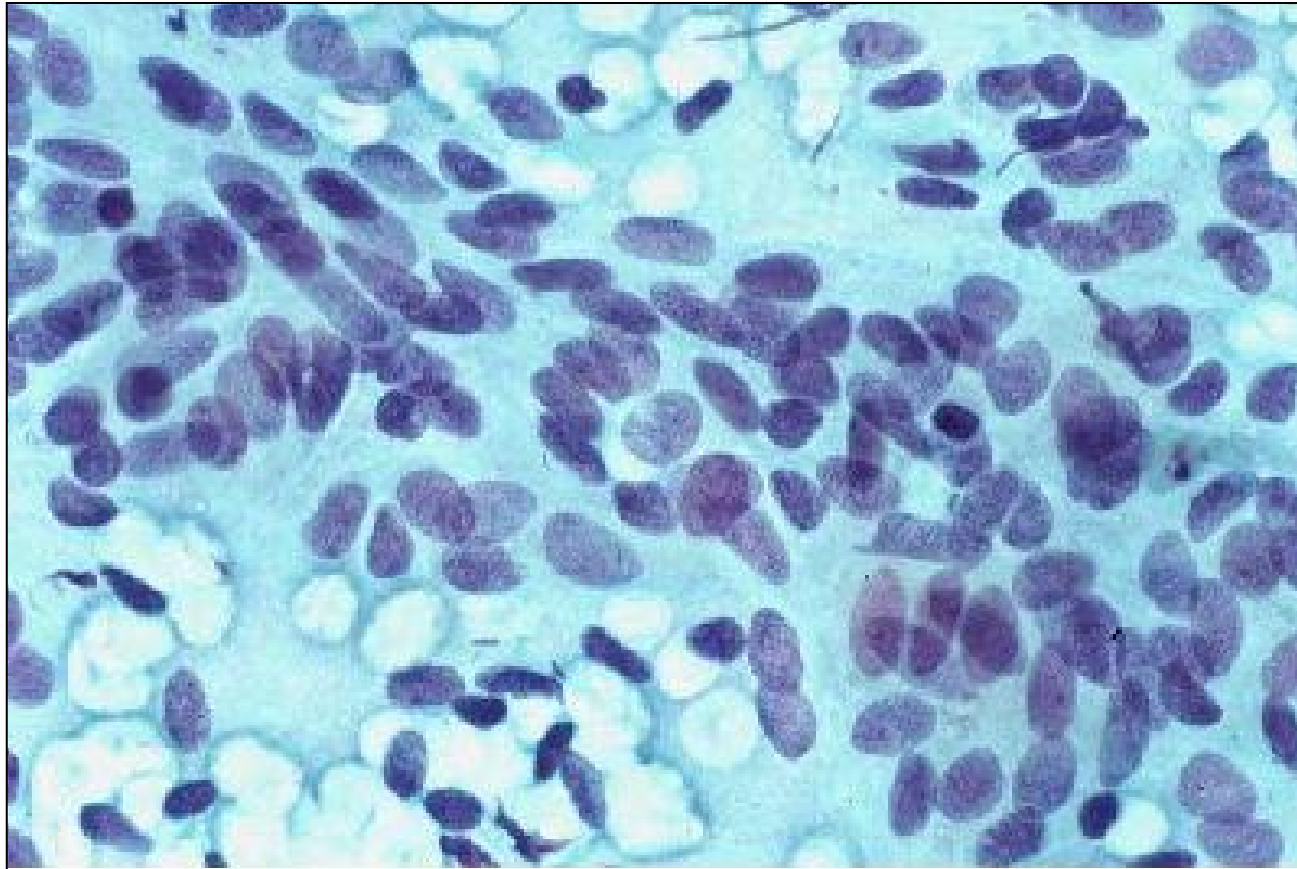
AGC

- A significant proportion may be associated with important diagnosis, e.g. HSIL, AIS or adenocarcinoma
 - Need colposcopy, further investigation
 - Try to be more specific if endocervical or endometrial, if one can tell, because this will guide further investigation directions
 - Try to avoid over-diagnosing AGC.
-

Potential diagnostic pitfalls

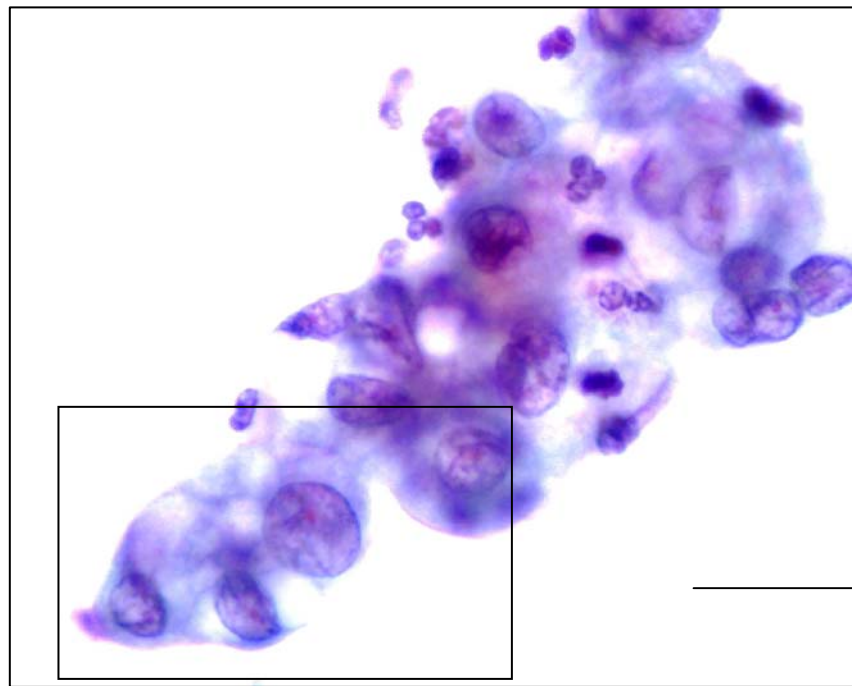
- Overdiagnosis
 - ❑ High sampling
 - ❑ Atrophic vaginitis
 - ❑ Florid reactive changes and infections (repair, IUCD, viral inclusions)
 - ❑ Radiation effect
 - ❑ Fail to recognize mimickers, e.g. Tubal metaplasia, brush artifacts, Arias Stella reaction of pregnancy, endometrial cells (menstrual shed or directly scraped)
 - Underdiagnosis
 - ❑ Too few squamous cells, T zone not sampled
 - ❑ Pale HSIL
 - ❑ Small HSIL – litigation cells
 - ❑ Obscured background: e.g. too bloody, thick mucus, dried smear
 - ❑ Very well differentiated adenocarcinoma (e.g. minimal deviation adenocarcinoma)
-



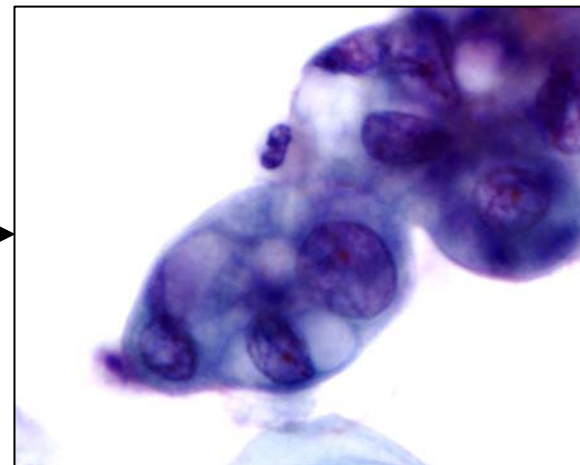
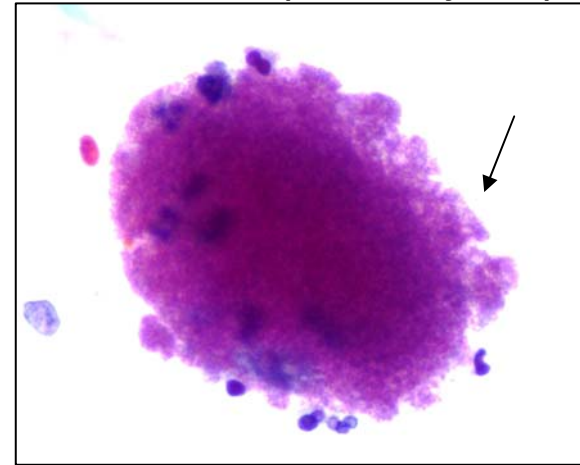


Atrophic changes : hyperchromatic naked nuclei
but preserved nuclear polarity and fine chromatin

Reactive endocervical cells – Intra-uterine contraceptive device use

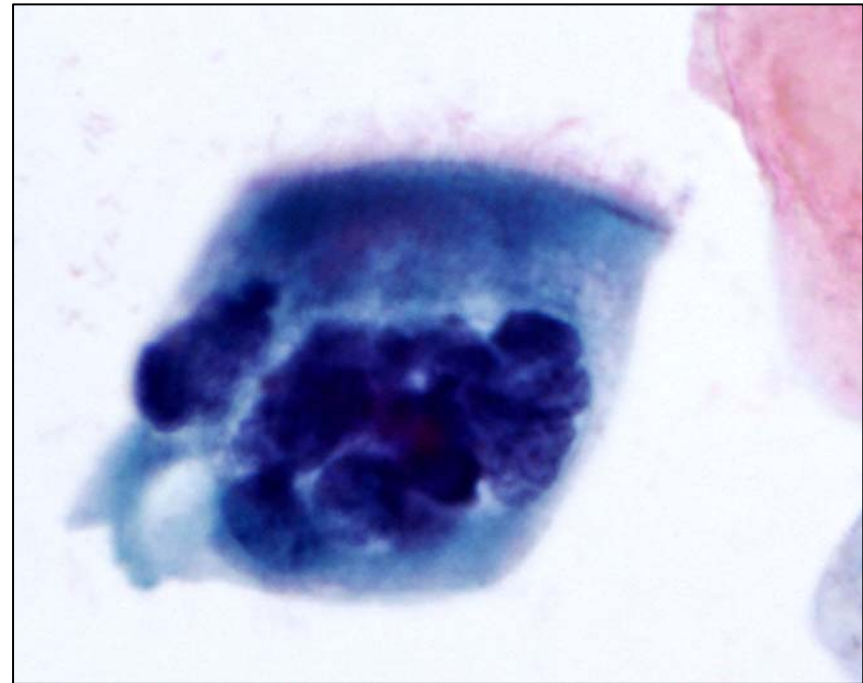


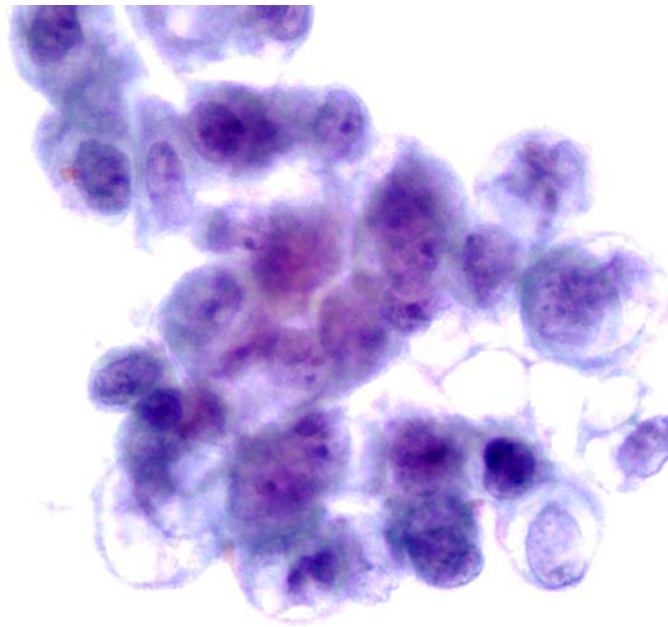
“Sulphur” granule
(Actinomyces)



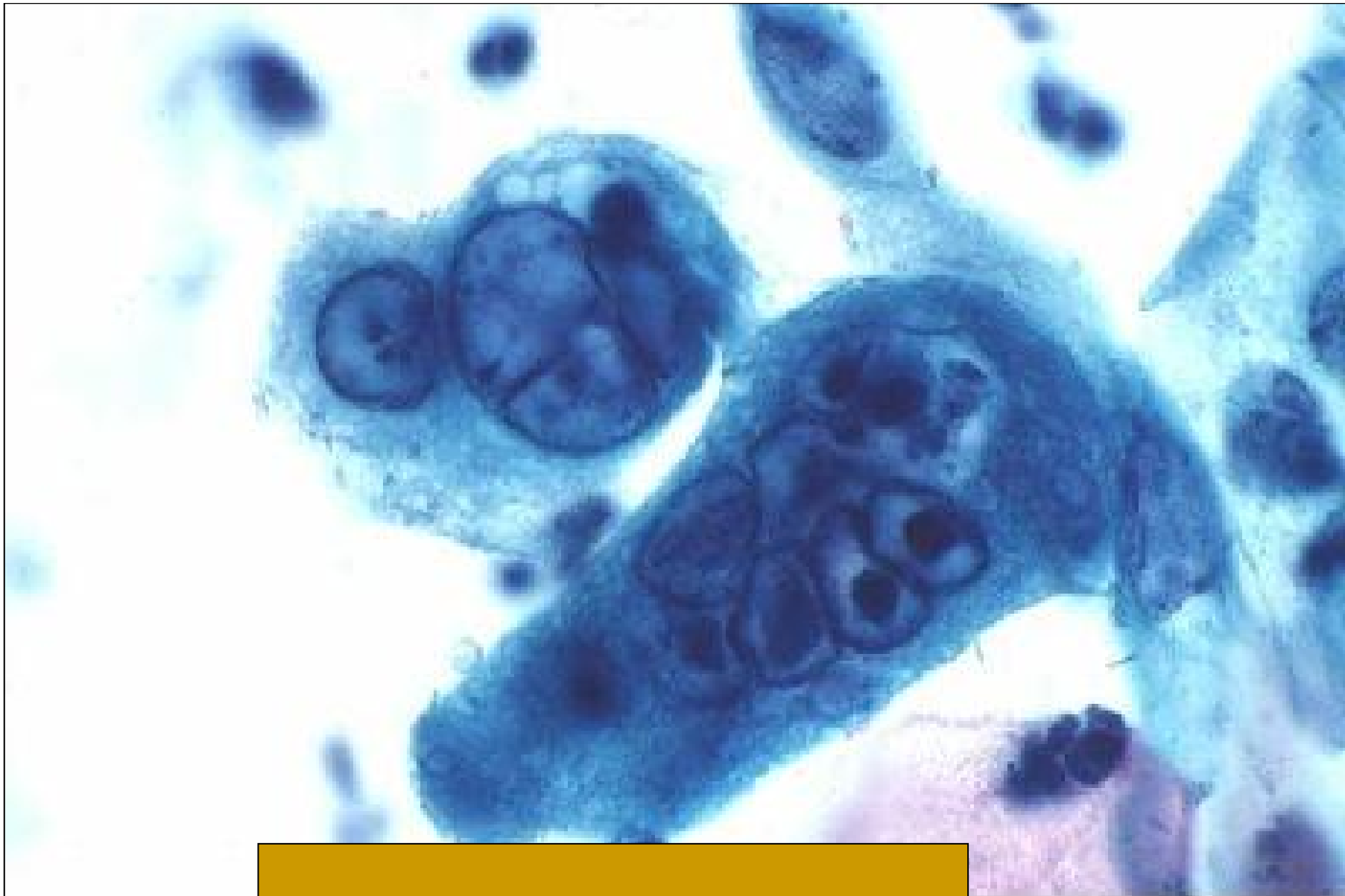
Tubal metaplasia

- Pseudostratified dark nuclei
- Recognize cilia but not always preserved
- Note the terminal bar



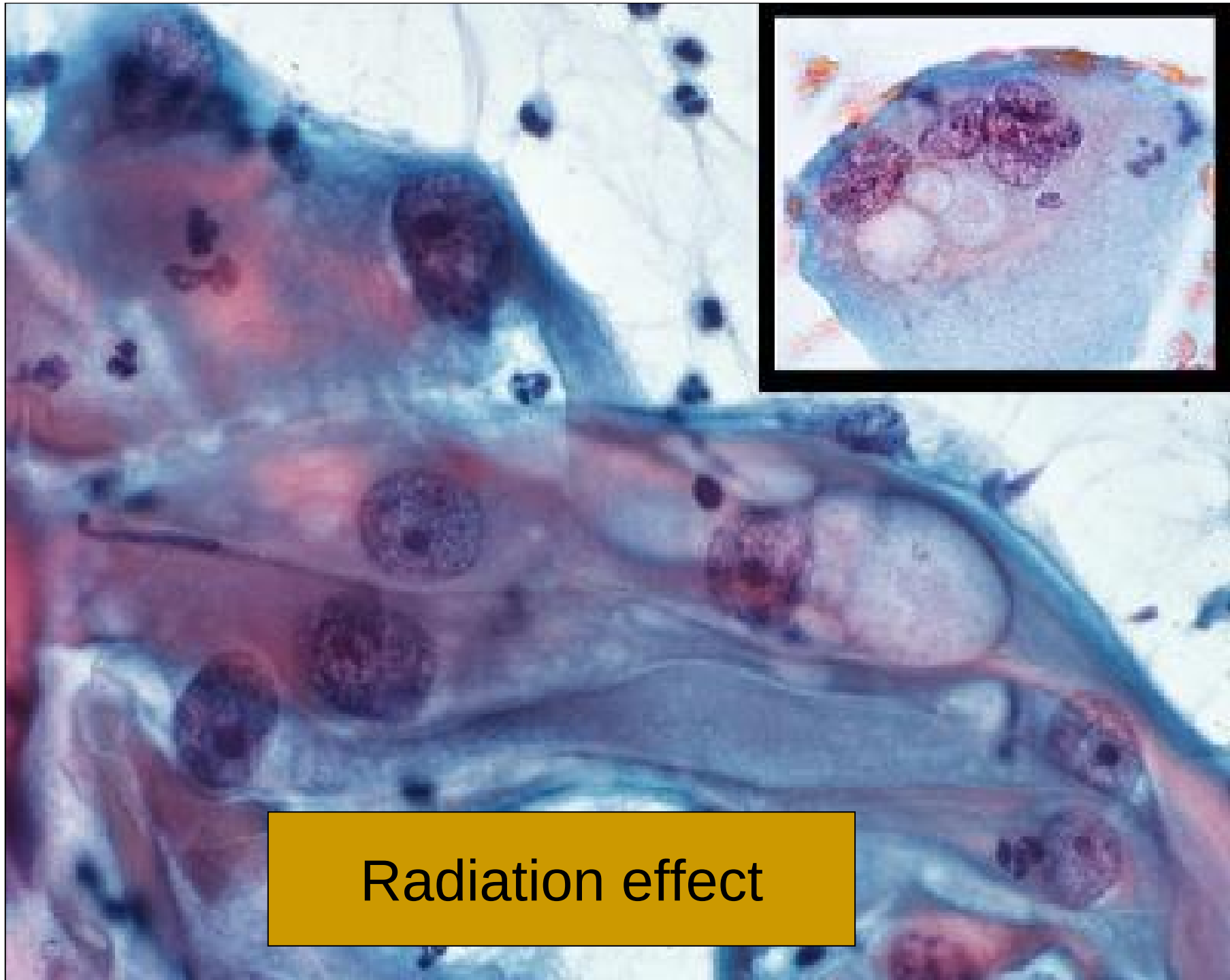


Reactive cells.



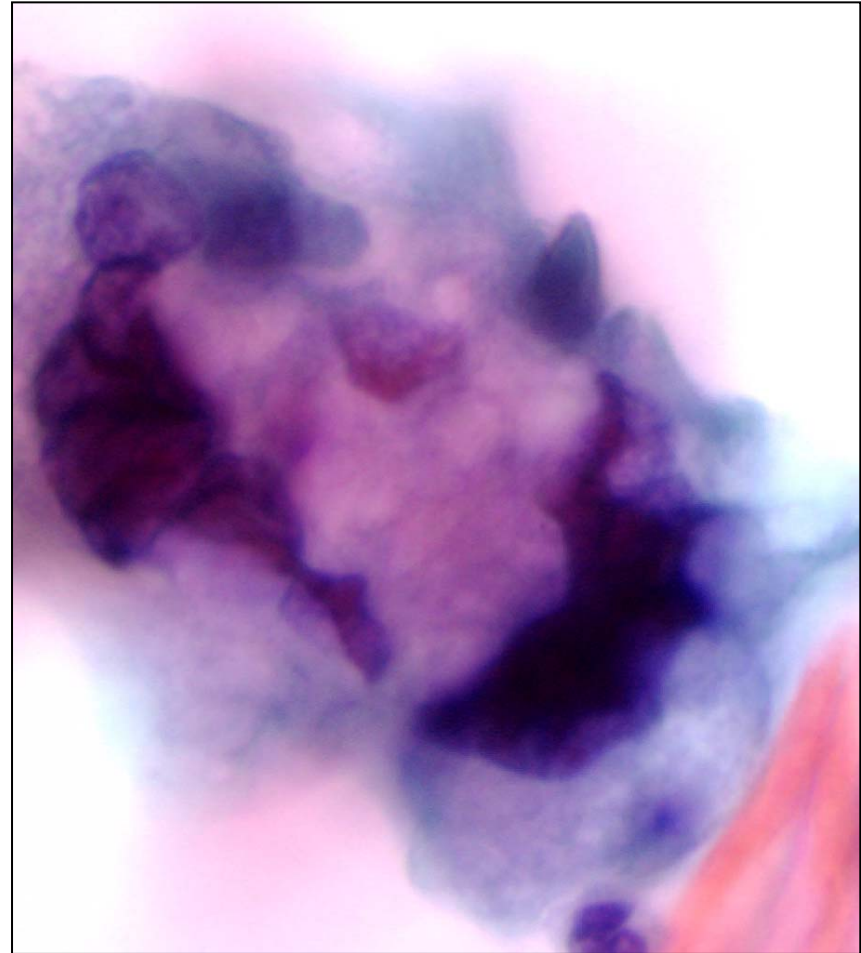
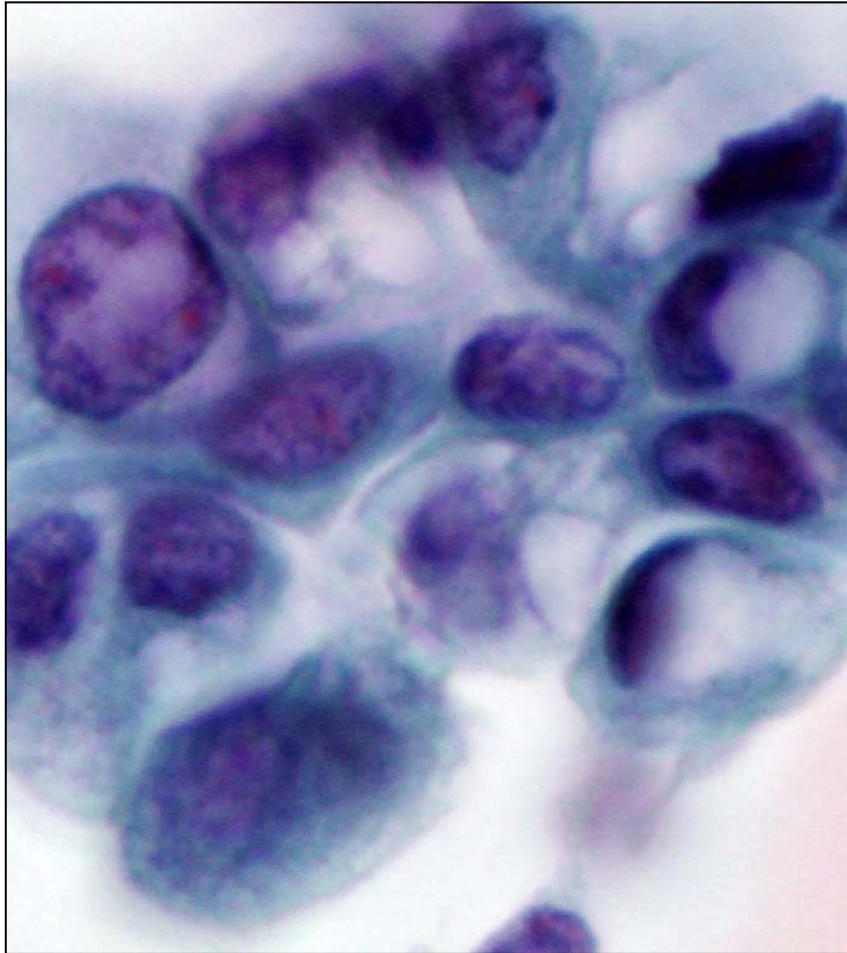
Herpes virus infection

Slide from
NCI Bethesda
website



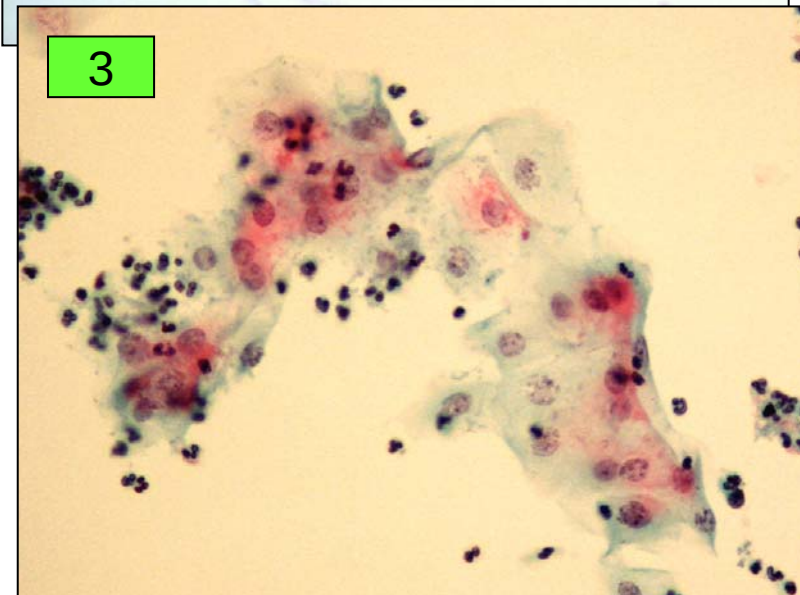
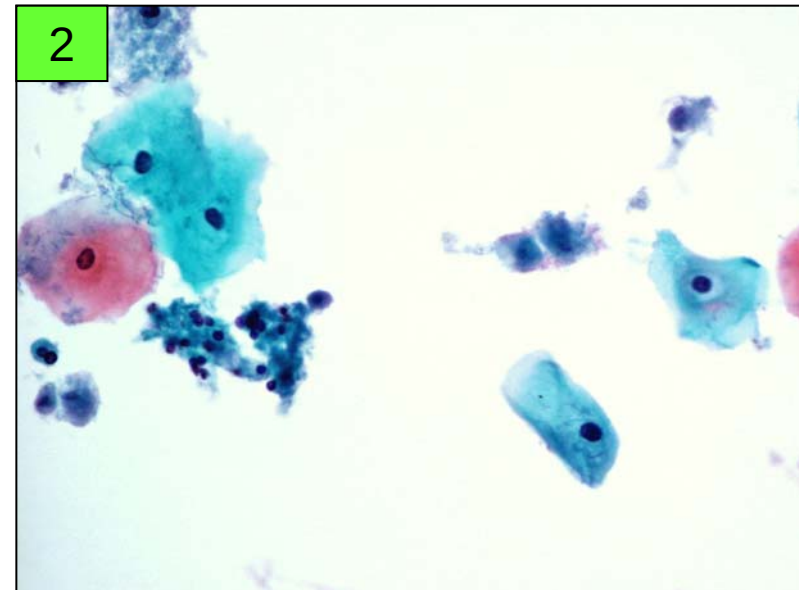
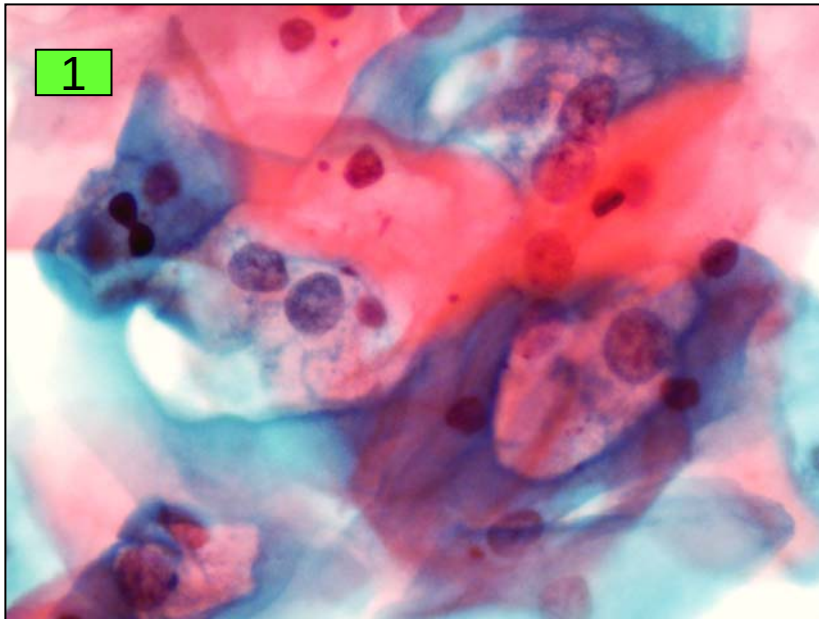
Radiation effect

Reactive endocervical cells



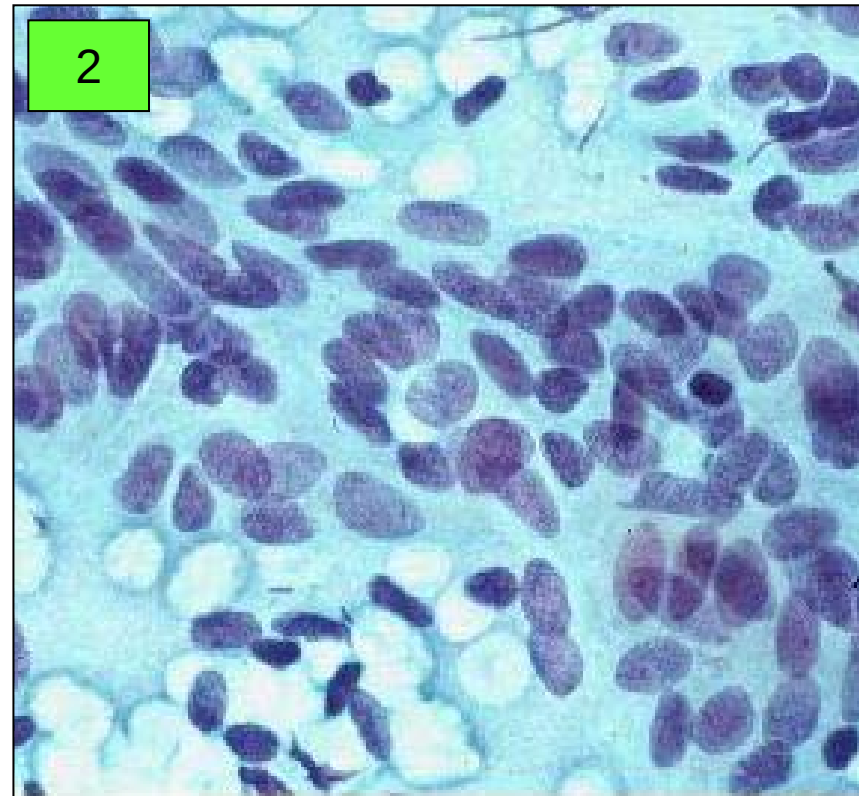
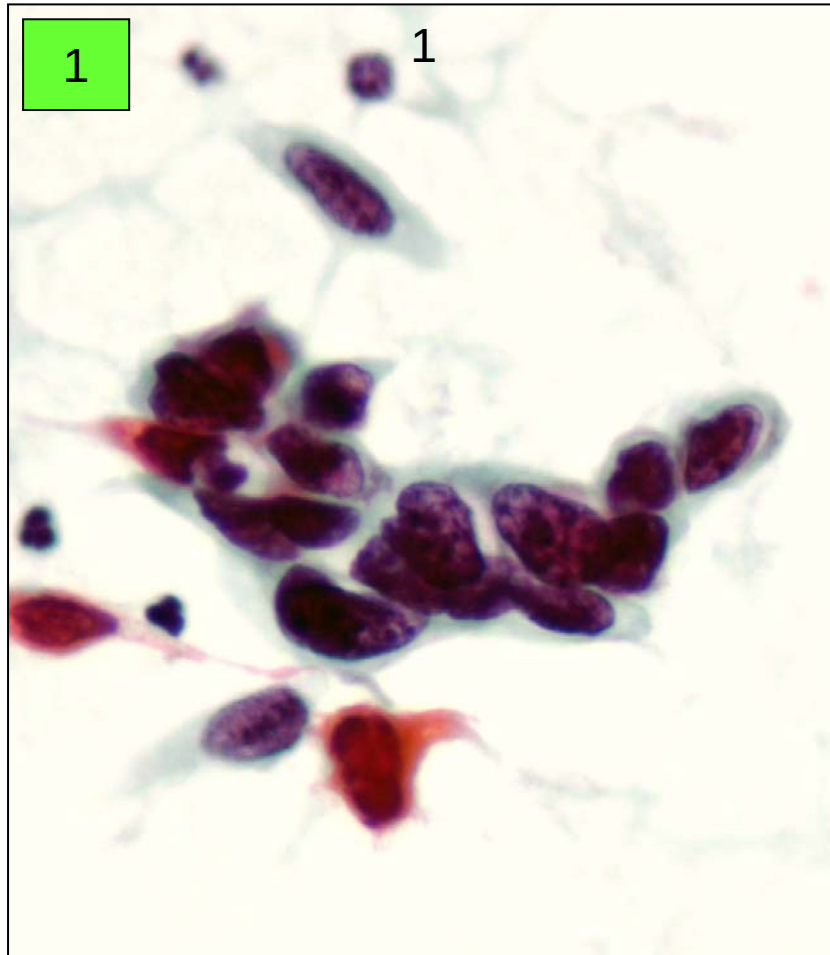
Quiz cases

Which one is LSIL



Ans:1

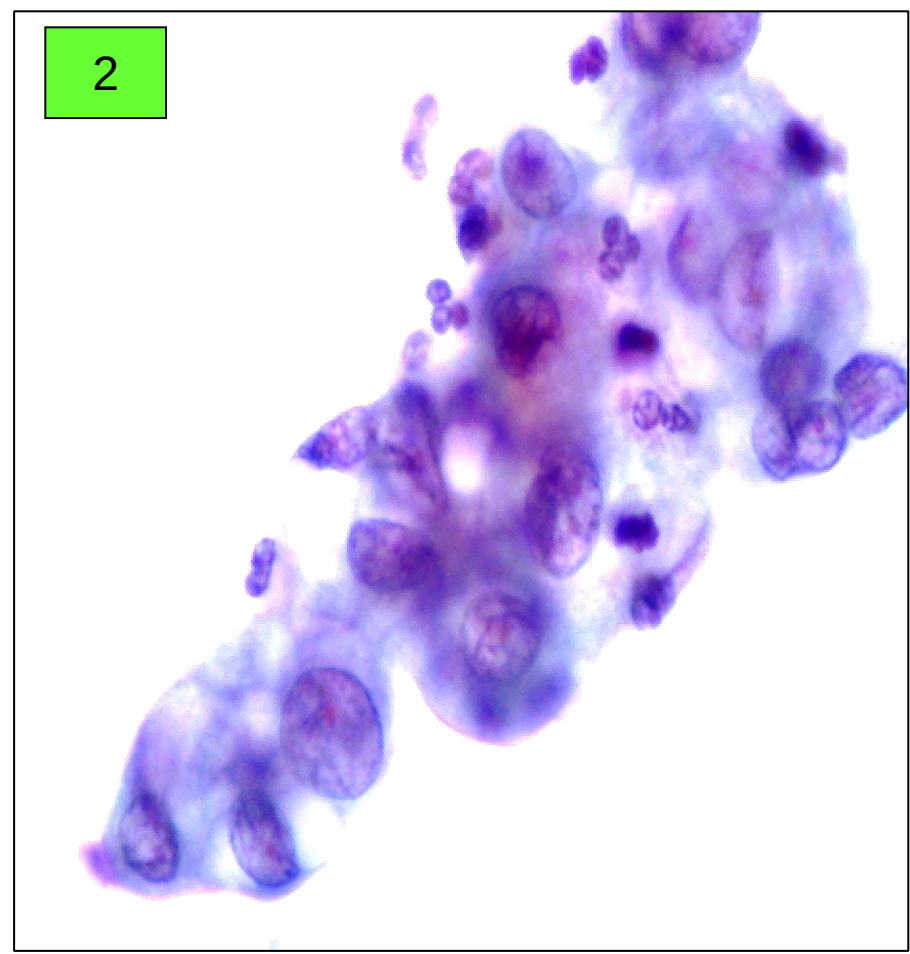
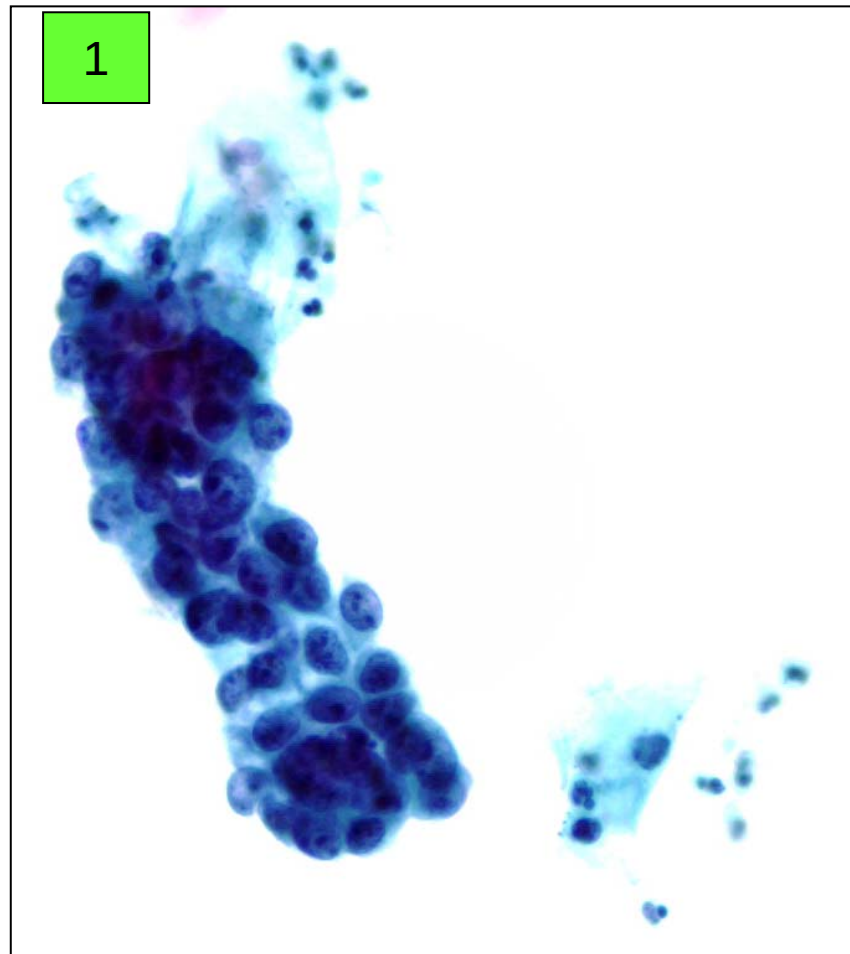
Which one is HSIL



Slide from NCI Bethesda website

Ans:1

Which is adenocarcinoma?



Ans:1

Quality assurance

- Specimen satisfactory rate
 - Ratio of atypical versus definitive positive cases
 - False positives and negatives – cytology-histology correlation
 - % of high grade lesions (HSIL, ASCH, AIS or >) with histology confirmed
 - % of histologically confirmed positive cases with false negative cytology diagnosis
-

Quality Assurance

- In-house PWH
 - Rescreen all high risk
 - > 10% negative rescreen
 - Periodic review cytotech-pathologist diagnosis discrepancy
 - Cyto-histological correlation
 - Prospective – on encounter
 - Retrospective – TBM, yearly retrieval of cases
 - External QAP – e.g., Hong Kong, Australasia, US
 - Training and continuing educational activities
 - Feedback from clinical colleagues – TBM, CPC
-

Cheers &
Thank you
