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PRACTICE QUESTIONS

CSMLS - The Canadian Society For Medical Laboratory Science / La Société canadienne de science de laboratoire médical

CY

Diagnostic Cytology

EDITION	QUESTIONS	FORMAT
Demo	9	Limited Edition PDF

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Before you begin

What this is

9 practice questions for CSMLS - The Canadian Society For Medical Laboratory Science / La Société canadienne de science de laboratoire médical `CY`, each with its answer key and an explanation. Answer a question before you read its key — the explanation is worth more once you have committed.

If something looks wrong

Send us three things and we will check it:

- the exam code, `CY`
- the question number
- the email address on your order

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QUESTION 1 SINGLE CHOICE

According to the Bethesda System for Reporting Cervical Cytology, which of the following best describes a low-grade squamous intraepithelial lesion (LSIL)?

A Cellular changes consistent with a high-risk HPV infection showing koilocytosis and immature metaplastic cells with mild nuclear enlargement

B **Koilocytic atypia, mild nuclear enlargement, and hyperchromasia in mature superficial or intermediate squamous cells, typically associated with HPV cytopathic effect**

C Sheets of small, uniform basal-like cells with high nuclear-to-cytoplasmic ratios and prominent nucleoli consistent with invasive carcinoma

D Dyskeratotic cells, parakeratosis, and pearl formation without koilocytosis, indicating atrophy with degeneration

ANSWER **B**

WHY LSIL, as defined by the Bethesda System, is characterized by cellular changes associated with HPV cytopathic effect, including koilocytosis (perinuclear halos with peripheral condensation of cytoplasm), mild nuclear enlargement (approximately three times the area of a normal intermediate nucleus), mild hyperchromasia, and irregular nuclear contours. These changes are typically seen in mature superficial or intermediate squamous cells. Option A describes HSIL changes more than LSIL, option C describes invasive squamous cell carcinoma, and option D describes atrophic or degenerative changes, not LSIL.

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QUESTION 2 SINGLE CHOICE

On a Pap test, a cluster of cells with markedly enlarged, hyperchromatic, irregular nuclei; high nuclear-to-cytoplasmic ratios; coarse chromatin; and conspicuous nucleoli is most consistent with which diagnosis under the Bethesda System?

A Atypical squamous cells of undetermined significance (ASC-US)

B Low-grade squamous intraepithelial lesion (LSIL)

C **High-grade squamous intraepithelial lesion (HSIL)**

D Squamous cell carcinoma

ANSWER C

WHY The described features—markedly enlarged, hyperchromatic, irregular nuclei with high nuclear-to-cytoplasmic ratios and coarse chromatin in cells smaller than typical LSIL—are the defining criteria for HSIL. HSIL encompasses lesions formerly classified as CIN 2 and CIN 3. ASC-US is reserved for cells that do not meet LSIL criteria. Squamous cell carcinoma would additionally show tumor diathesis, marked pleomorphism, macronucleoli, and irregular cytoplasmic keratinization.

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QUESTION 3 SINGLE CHOICE

In pleural fluid cytology, which cytomorphologic feature most reliably supports a diagnosis of malignant mesothelioma over metastatic adenocarcinoma?

A Three-dimensional cell balls with smooth community borders

B Single large cells with prominent nucleoli and a thick, refractile cytoplasmic ring

C Stromal fragments and psammoma bodies

D **Cellular groups with 'windows' between adjacent nuclei, and cytoplasmic vacuoles with a fuzzy, lacy border**

ANSWER D

WHY Mesothelioma characteristically shows intercellular 'windows' between cells, lacy/fuzzy cytoplasmic borders, and dense cytoplasm with peripheral vacuolation rather than the crisp, sharply punched-out vacuoles typical of adenocarcinoma. Three-dimensional cell balls with smooth community borders and psammoma bodies favor adenocarcinoma (e.g., ovarian or lung primary). Large cells with prominent nucleoli and refractile rings describe malignant giant cells, which is not specific for mesothelioma.

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QUESTION 4 MULTIPLE CHOICE

Which of the following are appropriate quality assurance practices for a gynecologic cytology laboratory? (Choose two.)

A Rescreening a randomly selected 10% of negative cervicovaginal cases by a senior cytotechnologist

B Discontinuing the use of control slides for Papanicolaou staining once the laboratory passes an initial proficiency test

C **Retaining all negative Pap slides for a minimum of five years and rescreening all HSIL and carcinoma cases for diagnostic confirmation**

D **Documenting the lot numbers of fixatives and stains used for each specimen to enable batch-level traceability**

ANSWER **C · D**

WHY Established cytology QA practices require retention of negative Pap slides for at least five years for retrospective review, along with confirmation of all HSIL/cancer cases, and lot-level documentation of reagents to enable traceability in case of staining or fixation problems. Option A misstates the recommended rescreening percentage—the commonly cited QA target is to rescreen at least 10% of negatives (or a statistically valid sample), not a randomly chosen figure. Option B is incorrect because daily or per-run control slides are an ongoing requirement, not a one-time measure.

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QUESTION 5 SINGLE CHOICE

Which cytologic feature in a sputum specimen is most characteristic of pulmonary adenocarcinoma?

A Corkscrew-shaped fibers with dense orangeophilic cytoplasm on Papanicolaou stain

B **Three-dimensional cell clusters with acinar or papillary architecture and eccentric nuclei containing prominent nucleoli**

C Multinucleated giant cells with both intranuclear and cytoplasmic inclusions

D Squamous pearls with keratinization and necrotic tumor diathesis

ANSWER **B**

WHY Pulmonary adenocarcinoma on sputum cytology typically presents as three-dimensional, cohesive clusters with glandular (acinar, papillary, or lepidic) architecture, eccentric nuclei, finely vacuolated cytoplasm, and prominent nucleoli. Option A describes squamous cell carcinoma cytomorphology, particularly the elongated 'corkscrew' or fiber cell with dense keratinized cytoplasm. Option C describes viral cytopathic effect (e.g., measles or HSV). Option D describes keratinizing squamous cell carcinoma.

QUESTION 6 SINGLE CHOICE

Atypical endocervical cells reported as 'atypical glandular cells, favor neoplastic' on a Pap test are most commonly associated with which underlying lesion?

A Squamous intraepithelial lesion of the cervix

B **Endocervical adenocarcinoma in situ (AIS) or invasive endocervical adenocarcinoma**

C Endometrial polyps without atypia

D Tubal metaplasia of the endocervix

ANSWER **B**

WHY The Bethesda category 'atypical glandular cells, favor neoplastic' indicates findings that are quantitatively or qualitatively concerning but fall short of a definitive adenocarcinoma diagnosis. The most common clinically significant association is with endocervical adenocarcinoma in situ (AIS) or invasive endocervical adenocarcinoma, although endometrial pathology may also produce this pattern. SIL is a squamous lesion and would not be reported as a glandular abnormality. Tubal metaplasia and benign endometrial polyps typically do not produce cytology interpreted as 'favor neoplastic.'

QUESTION 7 MULTIPLE CHOICE

Which of the following factors can render a cervicovaginal Pap specimen unsatisfactory (unsatisfactory for evaluation)? (Choose two.)

A **Squamous epithelial cells obscuring more than 75% of the slide, making epithelial cell evaluation impossible**

B Presence of endometrial cells in a woman over 45 years of age, regardless of sampling context

C **Obscuring blood, inflammation, or lubricant artifact that prevents evaluation of at least 75% of the squamous component**

D Absence of any transformation zone component (endocervical or metaplastic cells) in a conventional smear from a woman of any age

ANSWER **A · C**

WHY Per the Bethesda System, a specimen is unsatisfactory when squamous cells are obscured by inflammation, blood, or other material such that more than 75% of epithelial cells cannot be evaluated, or when the cellularity is below the minimum threshold (~5,000 well-visualized squamous cells for liquid-based preparations). The presence or absence of an endocervical/transformation zone component no longer renders a specimen unsatisfactory in the current Bethesda System, although it should be noted in the report. Endometrial cells in women ≥45 years of age do not automatically make a specimen unsatisfactory; they are reported as an 'other' finding.

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QUESTION 8 SINGLE CHOICE

Which staining problem is most likely indicated when Papanicolaou-stained Pap smears show pale, poorly defined nuclei and cytoplasm with poor cytoplasmic differentiation (orangeophilic, green, and blue components all weak)?

A **Inadequate hematoxylin staining, often from expired or oxidized hematoxylin, or insufficient staining time**

B Overlong differentiation time in acid alcohol following hematoxylin

C Inadequate dehydration with residual water interfering with eosin and light green

D Contaminated xylene causing cytoplasmic color washout

ANSWER **A**

WHY Pale nuclei together with weak cytoplasmic polychromasia (poor orange G/EA differentiation) most often reflect weak hematoxylin function caused by oxidation, contamination, or insufficient staining time. Overlong acid-alcohol differentiation would specifically remove nuclear staining while leaving cytoplasmic colors more intact. Inadequate dehydration primarily affects cytoplasmic crispness and contrast but not nuclear staining. Contaminated xylene would clear the slide poorly but not specifically wash out nuclear stain.

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QUESTION 9 SINGLE CHOICE

Which fine needle aspiration (FNA) cytologic feature is most characteristic of papillary thyroid carcinoma?

- **A** **Orphan Annie eye nuclei, nuclear grooves, and intranuclear cytoplasmic pseudoinclusions**
- **B** Enlarged cells with abundant granular cytoplasm and intracytoplasmic colloid droplets
- **C** Plasmacytoid cells with eccentric nuclei and dense perinuclear hof arranged in a Z-balling pattern
- **D** Sheets of bland follicular cells with uniform, round nuclei and abundant background colloid

ANSWER **A**

WHY The pathognomonic nuclear features of papillary thyroid carcinoma on FNA include enlarged, optically clear ('Orphan Annie eye') nuclei, longitudinal nuclear grooves, and intranuclear cytoplasmic pseudoinclusions, often accompanied by papillary architecture, multinucleated giant cells, and psammoma bodies. Option B suggests Hurthle cell neoplasm. Option C describes medullary thyroid carcinoma. Option D describes a benign colloid nodule.

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