

# Lower GTI & STDs

Topic- based Uworld Questions

Block 1, 2, 7, 8



A 23-year-old woman comes to the office due to 3 days of fever and dysuria. The patient also has had a pruritic, erythematous vulvar rash that is particularly painful during urination. She is sexually active with one partner, and they use condoms inconsistently. Temperature is 38.7 C (101.7 F), blood pressure is 120/80 mm Hg, and pulse is 84/min. There is suprapubic fullness on abdominal examination. Pelvic examination shows several tender, ulcerated lesions with circular borders on the inside of the left labia minora. Speculum examination shows no cervical friability or mucopurulent discharge. The left inguinal lymph nodes are enlarged and tender. Urethral catheterization is performed due to difficulty with spontaneous voiding. Urinalysis results are as follows:

Leukocyte esterase	positive
Nitrites	negative
Bacteria	none
White blood cells	15/hpf

Urine pregnancy test is negative. Which of the following tests would most likely establish this patient's diagnosis?

- A. Gram stain and culture of lesion for *Haemophilus ducreyi*
- B. KOH wet mount microscopy for *Candida albicans*
- C. Nucleic acid amplification testing for *Chlamydia trachomatis*
- D. Rapid plasma reagin testing for *Treponema pallidum*
- E. Viral culture of lesion for herpes simplex virus

Submit

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Leukocyte esterase	positive
Nitrites	negative
Bacteria	none
White blood cells	15/hpf

Urine pregnancy test is negative. Which of the following tests would most likely establish this patient's diagnosis?

- A. Gram stain and culture of lesion for *Haemophilus ducreyi* (30%)
- B. KOH wet mount microscopy for *Candida albicans* (0%)
- C. Nucleic acid amplification testing for *Chlamydia trachomatis* (7%)
- D. Rapid plasma reagin testing for *Treponema pallidum* (2%)
- E. Viral culture of lesion for herpes simplex virus (58%)

Omitted

Correct answer



58%

Answered correctly



01 sec

Time Spent



03/16/2020

Last Updated



Explanation

Infectious genital ulcers		
Painful	Herpes simplex virus	<ul style="list-style-type: none"> <li>• Small vesicles or ulcers on erythematous base</li> <li>• Mild lymphadenopathy</li> </ul>
	<i>Haemophilus ducreyi</i> (chancroid)	<ul style="list-style-type: none"> <li>• Larger, deep ulcers with gray/yellow exudate</li> <li>• Well-demarcated borders &amp; soft, friable base</li> <li>• Severe lymphadenopathy that may suppurate</li> </ul>
Painless	<i>Treponema pallidum</i> (syphilis)	<ul style="list-style-type: none"> <li>• Single ulcer (chancre)</li> <li>• Regular borders &amp; hard base</li> </ul>
	<i>Chlamydia trachomatis</i> serovars L1-L3 (lymphogranuloma venereum)	<ul style="list-style-type: none"> <li>• Small, shallow ulcers (often missed)</li> <li>• Can progress to painful, fluctuant adenitis (buboes)</li> </ul>

This patient's **multiple, painful genital ulcers** are consistent with a genital **herpes simplex virus (HSV)** infection. Patients with a primary infection often have systemic symptoms (eg, fever) and develop a **tender inguinal lymphadenopathy**. HSV evolves from vesicles to open ulcers; patients with ulcers often have associated dysuria and **sterile pyuria** (eg, white blood cells [WBCs] but no bacteria on urinalysis) due to urethral and vulvar inflammation and passage of urine over the open lesion. In addition, some patients may develop **acute urinary retention** (eg, suprapubic fullness) due to either reluctance to urinate or from a lumbosacral neuropathy that can complicate the infection.

The appearance of genital **HSV lesions** can vary and mimic other disease processes as the lesions change from vesicles to ulcers. Therefore, a suspected clinical diagnosis of genital HSV requires laboratory confirmation via **viral culture** or **PCR** testing. Viral culture is most effective in patients with active HSV lesions (such as this patient) but has decreasing sensitivity as lesions heal.

**(Choice A)** *Haemophilus ducreyi* is a sexually transmitted infection that causes chancroid, which can cause multiple painful ulcers and tender inguinal lymphadenopathy (less common in women). However, the ulcers have a gray/yellow exudate and a friable base, and the lymph nodes classically undergo supuration (eg, pus). Diagnosis is via bacterial culture; Gram stain typically show gram-negative rods.



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**(Choice B)** KOH wet mount microscopy is used to diagnose vulvovaginal candidiasis, which can present with a pruritic, erythematous vulvar rash and dysuria; however, there are no associated genital ulcers.

**(Choice C)** *Chlamydia trachomatis* can cause dysuria and sterile pyuria (ie, WBCs but no bacteria) due to urethritis, but patients typically have concomitant acute cervicitis (eg, cervical friability, mucopurulent discharge). Lymphogranuloma venereum is caused by *C trachomatis* serovars L1-L3 and presents with small, painless ulcers followed by painful, suppurative inguinal lymphadenopathy (buboes).

**(Choice D)** Nontreponemal serologic testing (ie, rapid plasma reagin) is used for evaluation of syphilis; primary syphilis typically presents with a single painless ulcer (ie, chancre) and bilateral, nontender lymphadenopathy.

#### Educational objective:

Genital herpes simplex virus infection can present with painful, pruritic, vesicular or ulcerative lesions; dysuria; and inguinal lymphadenopathy. Clinical diagnosis requires confirmation with laboratory testing via a viral culture or PCR.

#### References

- [Diagnosis of genital herpes simplex virus infection in the clinical laboratory.](#)

suprapubic fullness) due to either reluctance to urinate or from a lumbosacral neuropathy that can complicate the infection.

## Exhibit Display



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An 8-year-old girl is brought to the office after her mother noticed bloody spotting in the girl's underwear. The patient has no chronic medical conditions and is up to date on her vaccinations. She plays soccer with her elementary school team, and her parents are divorced. Vital signs are normal. Height and weight are at the 40th percentile. Physical examination reveals sexual maturity rating (Tanner) stage 1 breast development and no acne or axillary hair. Pelvic examination shows multiple 2-mm, raised, fleshy papules on the vulva and anus that bleed on contact with a cotton swab. Which of the following is the best next step in evaluation of this patient's lesions?

- A. Administer scotch tape test
- B. Ask about vulvar hygiene
- C. Measure hemoglobin A1c
- D. Perform wet mount microscopy
- E. Question about sexual abuse
- F. Review family history for malignancy

**Submit**

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- A. Administer scotch tape test (2%)
- B. Ask about vulvar hygiene (12%)
- C. Measure hemoglobin A1c (0%)
- D. Perform wet mount microscopy (1%)
- E. Question about sexual abuse (77%)
- F. Review family history for malignancy (5%)

Omitted

Correct answer

E



77%

Answered correctly



01 sec

Time Spent



02/03/2020

Last Updated

Explanation

**Anogenital warts (condyloma acuminata) in children****Etiology**

- Human papillomavirus infection



### Anogenital warts (condyloma acuminata) in children

<b>Etiology</b>	<ul style="list-style-type: none"> <li>Human papillomavirus infection</li> </ul>
<b>Transmission</b>	<ul style="list-style-type: none"> <li>Sexual abuse</li> <li>Autoinoculation from other sites</li> <li>Prenatal or perinatal</li> </ul>
<b>Clinical features</b>	<ul style="list-style-type: none"> <li>Pink/flesh-colored, verrucous papules &amp; plaques</li> <li>Asymptomatic (most common)</li> <li>Pruritic, friable lesions</li> </ul>
<b>Management</b>	<ul style="list-style-type: none"> <li>Sexual abuse assessment, especially age <math>\geq 4</math></li> </ul>

This patient's multiple, flesh-colored, raised papules along the vulva and anus are consistent with **condyloma acuminata** (ie, anogenital warts). Most lesions are asymptomatic, but they can become pruritic and friable, which can cause bloody spotting in patients' underwear. Condyloma acuminata are due to infection with low-risk **human papillomavirus** (HPV) types 6 and 11, which are typically transmitted via direct contact.

HPV can be transmitted via nonsexual contact such as vertical transmission during delivery, autoinfection from other areas of the body, or heteroinoculation from a caregiver (eg, diaper changes). However, because of the association with transmission via **direct genital contact**, an assessment for **sexual abuse** is required in all children, particularly those age  $\geq 4$ .

Anogenital warts in children are often self-resolving; therefore, asymptomatic patients typically require only observation. For those with symptomatic or unresolved disease, management options include topical treatments (eg, podophyllotoxin) and surgical removal.

**(Choice A)** The scotch tape test is used to diagnose pinworms (*Enterobius vermicularis*), which can cause anal pruritus and bloody spotting (secondary to scratching); however, pinworms do not cause skin lesions.

**(Choice B)** Poor vulvar hygiene is a risk factor for nonspecific vulvovaginitis (particularly in prepubertal girls), which can present with vulvovaginal pruritus, erythema, and bleeding. Poor vulvar hygiene does not cause raised vulvar lesions.

**(Choices C and D)** The poor glycemic control and immunosuppression associated with diabetes mellitus (ie, elevated hemoglobin A1c) can

**Management** • Sexual abuse assessment, especially age  $\geq 4$ 

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**(Choice B)** Poor vulvar hygiene is a risk factor for nonspecific vulvovaginitis (particularly in prepubertal girls), which can present with vulvovaginal pruritus, erythema, and bleeding. Poor vulvar hygiene does not cause raised vulvar lesions.

**(Choices C and D)** The poor glycemic control and immunosuppression associated with diabetes mellitus (ie, elevated hemoglobin A1c) can cause recurrent vulvovaginal candidiasis and candidal intertrigo. Patients typically have vulvovaginal pruritus and a thick, white vaginal discharge (vulvovaginal candidiasis) or a bright-red lesion over skinfolds (intertrigo). There are no associated multiple, raised, fleshy papules.

**(Choice F)** Vulvar cancer is also caused by HPV infection but is rare in children. It typically presents as a single vulvar mass rather than multiple masses. Because it is associated with infection, family history does not help with the diagnosis.

**Educational objective:**

Condyloma acuminata (anogenital warts) occur due to infection with human papillomavirus and can present as friable, raised papules. Although many cases in children are due to nonsexual contact (eg, autoinoculation), the association with disease transmission via direct genital contact requires assessment for sexual abuse.

**References**

A 22-year-old primigravid woman at 8 weeks gestation comes to the office for her initial prenatal visit. She has no symptoms except mild nausea. She smoked a pack of cigarettes a day and drank 7-8 beers each week but quit after learning she was pregnant. The patient has a history of an allergic reaction to penicillin; she developed a generalized rash with intense itching that responded to antihistamines and corticosteroid cream. Vital signs are within normal limits. Physical examination shows no abnormalities. The screening VDRL test is positive, as is the confirmatory fluorescent treponemal antibody absorption test. Her HIV test is negative. Which of the following is the best next step in management of this patient?

- A. Azithromycin
- B. Ciprofloxacin
- C. Doxycycline
- D. Erythromycin
- E. No treatment until delivery
- F. Skin testing and penicillin desensitization

Submit

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- A. Azithromycin (5%)
- B. Ciprofloxacin (1%)
- C. Doxycycline (3%)
- D. Erythromycin (2%)
- E. No treatment until delivery (0%)
- F. Skin testing and penicillin desensitization (86%)

Omitted

Correct answer

F



86%

Answered correctly



02 secs

Time Spent

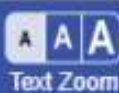


05/20/2020

Last Updated

Explanation

*Treponema pallidum* readily crosses the placenta and is associated with many **adverse fetal outcomes**, including intrauterine growth restriction, fetal death, and congenital infection. All pregnant women should be screened for syphilis at their **first prenatal visit** as treatment effectively



Explanation

*Treponema pallidum* readily crosses the placenta and is associated with many **adverse fetal outcomes**, including intrauterine growth restriction, fetal death, and congenital infection. All pregnant women should be screened for syphilis at their **first prenatal visit** as treatment effectively reduces fetal risk. Screening may be done with either a nontreponemal test (eg, VDRL) or treponemal-specific test (eg, fluorescent treponemal antibody absorption), but a positive test result requires confirmation (with the other test type) as the rate of false positives is high.

Pregnant patients with syphilis require treatment with **penicillin** as alternate antibiotic choices are ineffective, contraindicated, or have limited data in pregnancy. Patients with **penicillin allergy** should have a penicillin skin test to evaluate for the presence of an IgE-mediated response. If the test is positive, patients are **desensitized** to penicillin prior to receiving treatment with intramuscular penicillin G benzathine.

**(Choices A and D)** Azithromycin and erythromycin do not reliably cure maternal or fetal infection as *T pallidum* is often macrolide-resistant.

**(Choice B)** Ciprofloxacin is not an effective antibiotic for the treatment of syphilis.

**(Choice C)** Nonpregnant patients with penicillin allergy are typically given doxycycline to treat early syphilis. However, doxycycline is contraindicated in pregnancy due to issues with fetal bone growth.

**(Choice E)** Syphilis infection puts both the mother and fetus at great risk of complications. Delaying treatment is inadvisable.

**Educational objective:**

Treatment with penicillin is required for all pregnant patients with syphilis to prevent fetal complications. Patients with penicillin allergy should receive skin testing to confirm an IgE-mediated reaction. If the test is positive, patients are desensitized to penicillin prior to receiving treatment with intramuscular penicillin G benzathine.

Obstetrics & Gynecology  
Subject

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Syphilis  
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Previous



Next



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Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom

The following vignette applies to the next 2 items. The items in the set must be answered in sequential order. Once you click **Proceed to Next Item**, you will not be able to add or change an answer.

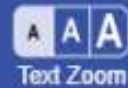
A 26-year-old woman comes to the office due to a vulvar lesion that she noticed 2 days ago. The lesion began as a papule, but this morning the patient noticed a small ulcer in the center. No pain or discharge is present. She has mild burning with urination but no fever, other skin lesions, or oral ulcers. The patient is sexually active and has had 5 male partners over the past 5 years. She uses oral contraceptives to prevent pregnancy. The patient regularly uses tobacco, alcohol, and illicit drugs. Vital signs are within normal limits. Vulvar examination shows a 2-cm ulcer with a nonexudative base and a raised, indurated margin. There is no tenderness with palpation. Moderate, painless bilateral inguinal lymphadenopathy is present.

#### Item 1 of 2

Which of the following is the most likely diagnosis in this patient?

- A. Behçet syndrome
- B. Chancroid
- C. Granuloma inguinale
- D. Herpes genitalis
- E. Syphilis
- F. Vulvar carcinoma

Submit



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#### Item 1 of 2

Which of the following is the most likely diagnosis in this patient?

- A. Behçet syndrome (0%)
- B. Chancroid (8%)
- C. Granuloma inguinale (12%)
- D. Herpes genitalis (4%)
- E. Syphilis (72%)
- F. Vulvar carcinoma (1%)

Omitted

Correct answer



72%

Answered correctly



02 secs

Time Spent



01/20/2020

Last Updated

### Characteristics of ulcerative sexually transmitted diseases

Disease	Causative agent	Features of primary lesion	Initial lesion painful?
Chancroid	<i>Haemophilus ducreyi</i>	<ul style="list-style-type: none"> <li>• Multiple &amp; deep ulcers</li> <li>• Base may have gray to yellow exudate</li> <li>• Organisms often clump in long parallel strands ("school of fish")</li> </ul>	Yes
Genital herpes	Herpes simplex virus 1 & 2	<ul style="list-style-type: none"> <li>• <b>Multiple</b>, small, grouped ulcers</li> <li>• Shallow with erythematous base</li> <li>• Multinucleated giant cells &amp; intranuclear inclusions (Cowdry type A)</li> </ul>	Yes
Granuloma inguinale (donovanosis)	<i>Klebsiella granulomatis</i>	<ul style="list-style-type: none"> <li>• Extensive &amp; progressive ulcerative lesions without lymphadenopathy</li> <li>• Base may have granulation-like tissue</li> </ul>	No



		intranuclear inclusions (Cowdry type A)	
Granuloma inguinale (donovanosis)	<i>Klebsiella granulomatis</i>	<ul style="list-style-type: none"> <li>• Extensive &amp; progressive ulcerative lesions without lymphadenopathy</li> <li>• Base may have granulation-like tissue</li> <li>• Deeply staining gram-negative intracytoplasmic cysts (Donovan bodies)</li> </ul>	No
Syphilis	<i>Treponema pallidum</i>	<ul style="list-style-type: none"> <li>• Single, indurated, well-circumscribed ulcer</li> <li>• Clean base</li> <li>• Thin, delicate, corkscrew-shaped organisms on dark-field microscopy</li> </ul>	No
Lymphogranuloma venereum	<i>Chlamydia trachomatis</i>	<ul style="list-style-type: none"> <li>• Small &amp; shallow ulcers</li> <li>• Large, painful, coalesced inguinal lymph nodes ("buboes")</li> <li>• Intracytoplasmic chlamydial inclusion bodies in epithelial cells &amp; leukocytes</li> </ul>	No

## cells &amp; leukocytes

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Patients with multiple sexual partners and substance abuse are at high risk for sexually transmitted infections. This patient has classic symptoms of **primary syphilis** - bilateral inguinal lymphadenopathy and a painless genital chancre. Syphilitic chancres form at the site of direct inoculation with *Treponema pallidum*. After exposure (3-60 days), patients develop a **single papule** that turns into a shallow, painless, **nonexudative ulcer** with indurated edges. Chancres are exceedingly **infectious**, with rates of *T pallidum* transmission as high as 30%. Most chancres resolve spontaneously in 6-8 weeks (if untreated), but the systemic spread of *T pallidum* results in continued infection.

**(Choices A, B, and D)** Behçet syndrome, chancroid, and herpes genitalis are usually characterized by multiple, painful genital lesions (not a single, painless lesion). Chancroid, caused by *Haemophilus ducreyi*, is most commonly found in developing regions but is rare in the United States. Behçet syndrome is thought to be a vasculitis and is marked by recurrent oral aphthous ulcers, often with significant systemic manifestations (including genital ulcers).

**(Choice C)** Granuloma inguinale is caused by *Klebsiella granulomatis* and is marked by the formation of extensive, progressive, and painless genital ulcers, usually without lymphadenopathy. Granuloma inguinale is seen primarily in India, Guyana, and New Guinea. In the United States, <100 infections occur annually, most in patients who have traveled to these countries.

**(Choice F)** Vulvar carcinoma usually presents with a vulvar plaque, ulcer, or mass, often with significant pruritus. Vulvar cancer would evolve over weeks or months (not 2 days).

**Educational objective:**

Primary syphilis is marked by the formation of a painless chancre that begins as a papule and converts into a nonexudative ulcer with indurated borders. Mild to moderate bilateral lymphadenopathy is often present.

Obstetrics & Gynecology  
Subject

Female Reproductive System & Breast  
System

Syphilis  
Topic



## Item 2 of 2

Serum rapid plasma reagin and herpes simplex virus polymerase chain reaction testing are negative. Which of the following is the best next step in management of this patient?

- A. Biopsy and culture of the ulcer
- B. Empiric acyclovir
- C. Empiric ceftriaxone and azithromycin
- D. Empiric penicillin
- E. Follow-up in 2 weeks to ensure resolution

Submit

Item 2 of 2

Serum rapid plasma reagin and herpes simplex virus polymerase chain reaction testing are negative. Which of the following is the best next step in management of this patient?

- A. Biopsy and culture of the ulcer (28%)
- B. Empiric acyclovir (0%)
- C. Empiric ceftriaxone and azithromycin (8%)
- D. Empiric penicillin (60%)
- E. Follow-up in 2 weeks to ensure resolution (1%)

Omitted  
Correct answer  
D

60%  
Answered correctly

02 secs  
Time Spent

01/20/2020  
Last Updated

Explanation

Syphilis - diagnostic serology	
<b>Nontreponemal</b> (RPR, VDRL)	<ul style="list-style-type: none"><li>• Antibody to cardiolipin-cholesterol-lecithin antigen</li><li>• Quantitative (<b>titers</b>)</li><li>• <b>Possible negative result in early infection</b></li></ul>

Syphilis - diagnostic serology	
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<b>Treponemal</b> (FTA-ABS, TP-EIA)	<ul style="list-style-type: none"><li>• Antibody to treponemal antigens</li><li>• Qualitative (<b>reactive/nonreactive</b>)</li><li>• <b>Greater sensitivity in early infection</b></li><li>• Positive even after treatment</li></ul>

FTA-ABS = fluorescent treponemal antibody absorption; RPR = rapid plasma reagin;  
TP-EIA = *Treponema pallidum* enzyme immunoassay.

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This patient with a **painless genital ulcer** and bilateral inguinal lymphadenopathy almost certainly has **primary syphilis**. However, initial syphilis screening serology with **rapid plasma reagin (RPR)** was **negative**. Two types of serologic tests are used in **combination** to diagnose syphilis:

- Nontreponemal (eg, RPR, VDRL)
- Treponemal (eg, fluorescent treponemal antibody absorption)

Although either type may be used to screen for syphilis, nontreponemal tests may have higher false-negative rates (20%-30%) in patients with primary syphilis.

Patients with negative screening serology and strong clinical evidence of primary syphilis (eg, chancre) should be treated **empirically** with **intramuscular benzathine penicillin G** as this reduces the risk of transmission. In these patients, **repeat nontreponemal serology** should be done in 2-4 weeks to establish baseline titers; a 4-fold titer decrease at 6-12 months would confirm adequate treatment.

(Choice A) *Treponema pallidum* cannot be cultured, so biopsy is unhelpful. Awaiting biopsy results also delays treatment.



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**(Choice A)** *Treponema pallidum* cannot be cultured, so biopsy is unhelpful. Awaiting biopsy results also delays treatment.

**(Choice B)** Acyclovir is used to treat genital herpes simplex virus (HSV) outbreaks. HSV lesions tend to be multiple, vesicular, and painful; this patient has a single, painless lesion with negative HSV polymerase chain reaction results.

**(Choice C)** A single dose of ceftriaxone plus azithromycin is used in the treatment of gonorrheal urethritis. *Neisseria gonorrhoeae* usually causes dysuria and a purulent urethral discharge, not a single, painless ulcer.

**(Choice E)** Treatment should not be delayed as the risk of transmission with syphilitic chancres is as high as 30% and patients may not return for treatment (as chancres spontaneously resolve).

**Educational objective:**

Syphilis is diagnosed with a combination of nontreponemal (eg, rapid plasma reagin) and treponemal serology. False-negative nontreponemal serology is common in primary syphilis. Patients with negative initial serologies and strong clinical evidence of primary syphilis (eg, chancre) should be treated empirically with intramuscular benzathine penicillin G.

A 19-year-old nulligravid woman comes to the emergency department due to abnormal vaginal discharge for the last 2 weeks. The patient has douched twice with no change in the discharge. She had an episode of postcoital vaginal bleeding a few days ago, followed by return of the abnormal yellow discharge. Her last menstrual period was 3 weeks ago. The patient is sexually active and has had the same partner for 6 months; they use the withdrawal method for contraception. Physical examination shows yellow cervical discharge. The cervix is friable and bleeds easily on cotton tip manipulation. Urine pregnancy test is negative. Nucleic acid amplification testing is not available. A sample of the discharge is obtained for microscopic examination. Which of the following is the most likely microscopic finding in this patient?

- A. Clue cells
- B. Hyphae
- C. No organisms
- D. Spirochetes
- E. Trichomonads

Submit

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- A. Clue cells (4%)
- B. Hyphae (0%)
- C. No organisms (55%)
- D. Spirochetes (9%)
- E. Trichomonads (29%)

Omitted  
Correct answer  
C

55%  
Answered correctly

02 secs  
Time Spent

03/07/2020  
Last Updated

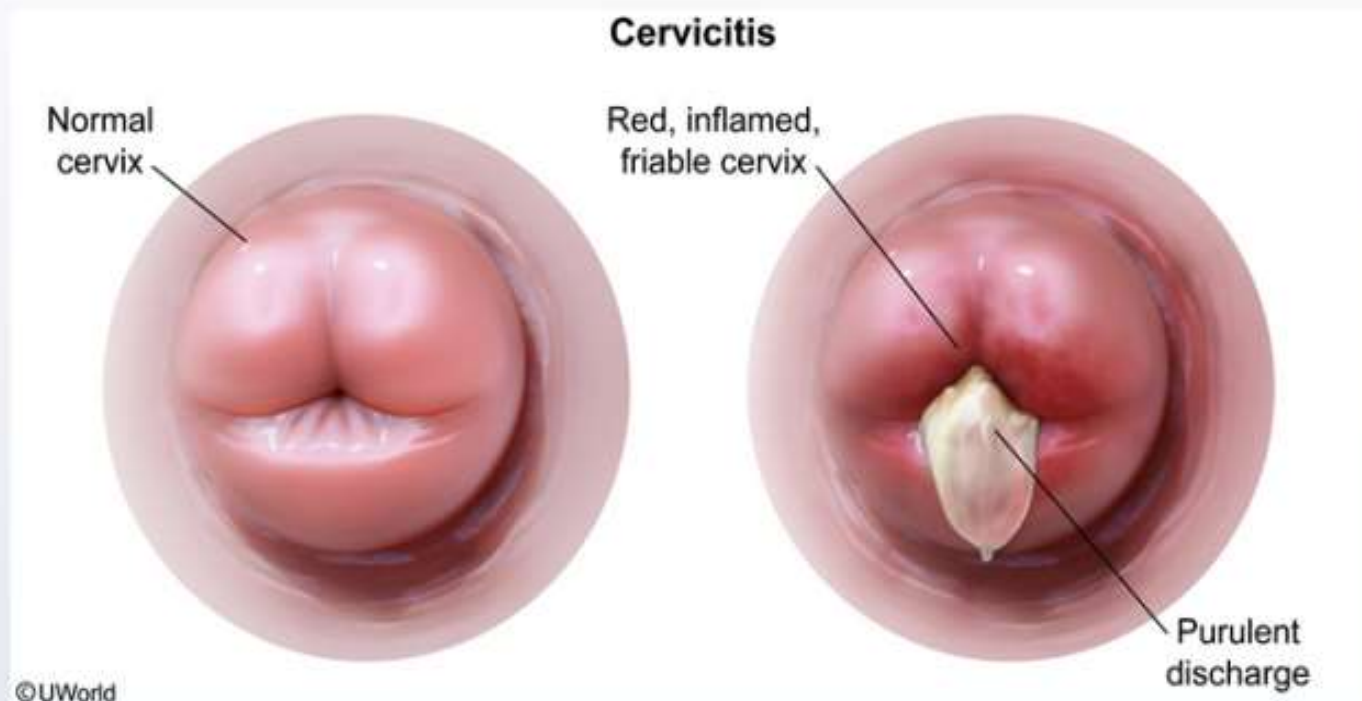
Explanation

### Cervicitis

Normal  
cervix

Red, inflamed,  
friable cervix

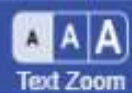




This patient has **acute cervicitis**, which is most commonly caused by *Chlamydia trachomatis* and *Neisseria gonorrhoeae*. Inflammation of the cervix can result in abnormal vaginal discharge and postcoital bleeding due to contact irritation of the cervix. Classic findings include **mucopurulent cervical discharge** and an edematous, **friable cervix** that bleeds with manipulation.

The **gold standard** diagnostic test for acute cervicitis is nucleic acid amplification testing (NAAT). **NAAT** has high sensitivity and specificity for *C trachomatis* and *N gonorrhoeae* detection and has replaced older, less sensitive techniques (eg, culture, microscopy). Light **microscopy** is not helpful in the diagnosis of acute cervicitis as *C trachomatis* is an obligate intracellular pathogen and, therefore, **no organisms** are visualized. In addition, microscopy also has low sensitivity in identifying the gram-negative intracellular diplococci of *N gonorrhoeae* on endocervical smears, especially in asymptomatic patients.

**(Choice A)** Clue cells are vaginal epithelial cells coated by bacteria characteristic of bacterial vaginosis. Douching is a risk factor for bacterial vaginosis, which presents with malodorous, thin, watery discharge and no cervical inflammation.



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**(Choice A)** Clue cells are vaginal epithelial cells coated by bacteria characteristic of bacterial vaginosis. Douching is a risk factor for bacterial vaginosis, which presents with malodorous, thin, watery discharge and no cervical inflammation.

**(Choice B)** Hyphae seen on potassium hydroxide (KOH) microscopy are diagnostic for *Candida* vaginitis. Patients with *Candida* infections typically present with vulvovaginal pruritus and thick, clumpy, white discharge.

**(Choice D)** Spirochetes, the agents of syphilis, cannot be seen by light microscopy, and direct visualization requires dark-field microscopy. Patients with syphilis present with a painless chancre and lymphadenopathy, not cervical discharge.

**(Choice E)** Trichomonads, flagellated protozoans, are a less common cause of acute cervicitis. Patients with trichomoniasis may have an erythematous cervix with punctate lesions (eg, strawberry cervix) and a frothy, green discharge.

#### Educational objective:

Microscopy is not used in the diagnosis of acute cervicitis due to its low sensitivity and inability to detect the most common pathogens, *Chlamydia trachomatis* and *Neisseria gonorrhoeae*. Nucleic acid amplification testing is the gold standard for diagnosis.

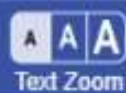
#### References

- [The utility of wet prep in predicting Neisseria gonorrhoeae and Chlamydia trachomatis.](#)

A 20-year-old woman comes to the office for a refill of oral contraceptives. She is in a monogamous relationship that began 6 months ago and uses condoms as back-up contraception. The patient became sexually active at age 14 and has had 5 lifetime partners. Her last menstrual period was 2 weeks ago. She has regular menses lasting 4-5 days every 28 days. The patient has not received the human papillomavirus (HPV) vaccination series and has never had a Pap test. Three months ago, she had negative screening for sexually transmitted infection. The patient has no chronic medical conditions and has had no prior surgery. She smokes cigarettes socially but does not use alcohol or illicit drugs. Vital signs are normal. Physical examination shows normal external genitalia without any lesions. Which of the following is recommended for this patient?

- A. HPV testing and, if negative, HPV vaccination
- B. HPV vaccination alone
- C. Pap testing alone
- D. Pap with HPV testing
- E. Reassurance and follow-up in 1 year

**Submit**



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- A. HPV testing and, if negative, HPV vaccination (8%)
- B. HPV vaccination alone (64%)
- C. Pap testing alone (5%)
- D. Pap with HPV testing (10%)
- E. Reassurance and follow-up in 1 year (10%)

Omitted

Correct answer  
B



64%  
Answered correctly



03 secs  
Time Spent



04/06/2020  
Last Updated

Explanation

Human papillomavirus

Human papillomavirus	
<b>Disease associations</b>	<ul style="list-style-type: none"> <li>• Cervical cancer</li> <li>• Vulvar &amp; vaginal cancers</li> <li>• Anal cancer</li> <li>• Penile cancer</li> <li>• Oropharyngeal cancer</li> <li>• Anogenital warts</li> <li>• Recurrent respiratory papillomatosis</li> </ul>
<b>Vaccine indications</b>	<ul style="list-style-type: none"> <li>• All female and male patients* age 11-26 (but may be given to those age 9-45)</li> <li>• <b>NOT</b> indicated in pregnant women</li> </ul>

\*Including those with a history of genital warts, abnormal Pap cytology, or positive human papillomavirus DNA test.

**Human papillomavirus (HPV)** is the most common sexually transmitted infection and has been linked to multiple diseases, including condylomata acuminata (ie, anogenital warts) as well as vulvar, vaginal, anal, oropharyngeal, and **cervical cancer**. Persistent HPV infection (particularly with types 16 and 18) results in **cellular dysplasia** because the incorporation of viral DNA increases prooncogenic protein expression and inhibits normal cellular regulation.

The **HPV vaccination** induces an antibody response that decreases the risk of both HPV infection and subsequent related diseases. Routine administration of the vaccine series is indicated for **female and male patients age 11 to 26**, but vaccination may be given from age 9 to 45. Catch-up vaccination should be offered for patients who are either unvaccinated or did not complete the series (**Choice E**).

**(Choice A)** Previous or current HPV infection is not a contraindication to HPV vaccination because vaccination provides protection against other HPV types that the patient may encounter with future sexual activity.

**(Choices C and D)** Pap testing begins at age 21 in immunocompetent patients regardless of age of onset of sexual activity or number of sexual partners. Although most young (age <30) women become infected with HPV shortly after the onset of sexual activity, the infection typically clears and does not progress to cervical dysplasia or cancer. Therefore, routine HPV testing is not indicated in this population because it would increase

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#### Educational objective:

Human papillomavirus (HPV) vaccination is recommended to prevent HPV-related disease; it is typically administered to those age 11-26 but can be given from age 9 to 45. Cervical cancer screening with Pap testing begins at age 21 in immunocompetent patients regardless of age of onset of sexual activity.

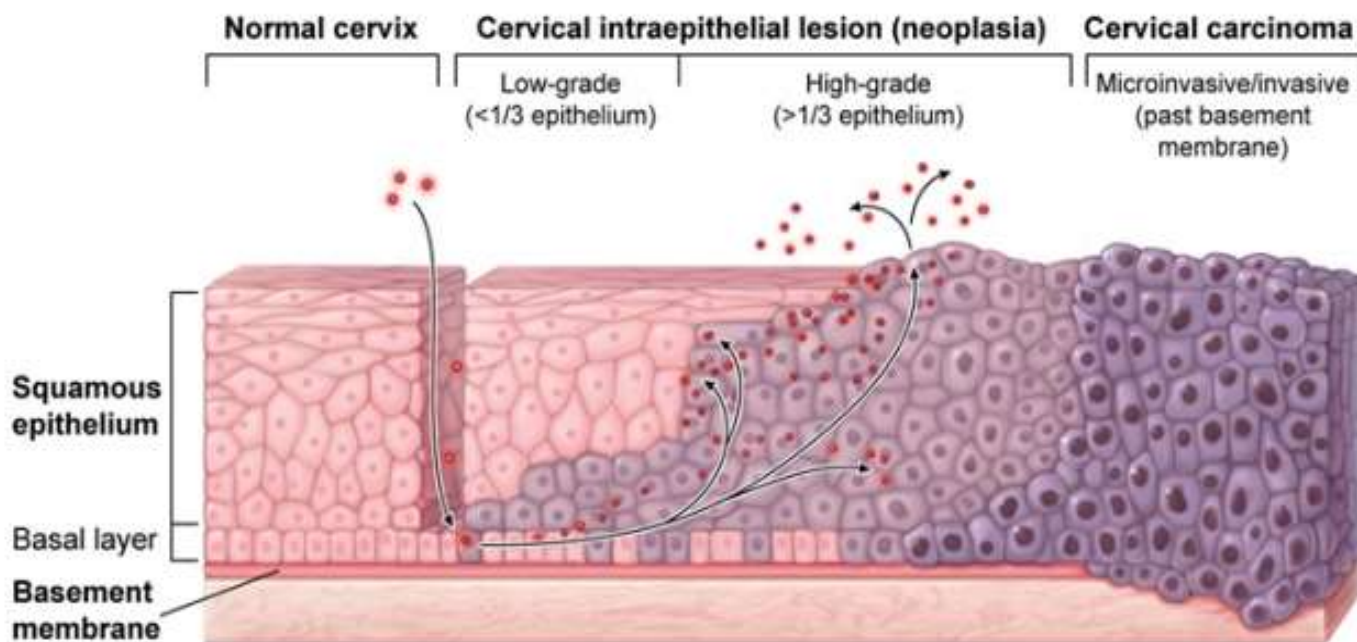
#### References

- [Human papillomavirus vaccination for adults: updated recommendations of the Advisory Committee on Immunization Practices.](#)
- [Population-level impact and herd effects following the introduction of human papillomavirus vaccination programmes: updated systematic review and meta-analysis.](#)

\*Including those with a history of genital warts, abnormal Pap cytology, or positive human papillomavirus DNA test.

Exhibit Display

### HPV infection & progression to cervical cancer



HPV = human papillomavirus.

CUWorld