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Gynecologic Complaints in the Adolescent Female

The adolescent patient presenting to the emergency department with gynecologic-related complaints deserves special considerations compared to the adult female patient with similar problems. The majority of patients will have straightforward presentations, but recognition of a gynecologic problem or patient with an atypical presentation is critical. This article reviews the most common gynecologic complaints the adolescent may have.

— Ann M. Dietrich, MD, Editor

Introduction

Adolescent girls may not be straightforward about gynecologic issues, and the emergency practitioner should specifically and in a sensitive manner ask about the patient's gynecologic history. Young women in this age group are the most likely to have irregular menstrual cycles, with abnormal vaginal bleeding being a very common emergency department complaint. The adolescent patient is also at greater risk than an adult for sexually transmitted infections, which must be diagnosed and treated by emergency physicians. Another vital topic is emergency contraception that may be requested by the adolescent female patient. The goal of this article is to address these and other related issues in an effort to improve the emergency physician's recognition and management of gynecologic complaints in the adolescent.

General Approach to the Adolescent Female Patient

Taking an Adolescent History. The teenage patient may not be forthcoming about her true chief complaint. She may feel embarrassed, be afraid of disapproval, or require confirmation of confidentiality prior to discussion. Vague abdominal complaints or nonspecific chief complaints may be the adolescent's attempt to seek care for genitourinary complaints.

The provider should focus on the adolescent as the patient and address her directly. After the emergency practitioner has elicited past medical and family history and the parents' chief complaint, consideration should be given to having the parents excused from the room to allow the adolescent the opportunity to discuss concerns and complete the examination in private. Using a non-judgmental tone of voice and explicitly telling the patient that she has the right to confidential reproductive health care will encourage disclosure. Seeing the patient without her parent/guardian also provides an important opportunity to ask the patient whether she is sexually experienced, using drugs, or being pressured into these or any other high-risk activities. Drug and alcohol abuse have been associated with higher-risk sexual behaviors, including earlier sexual debut, multiple partners, and inconsistent use of contraception.¹ Answers to the questions in Table 1 will allow the emergency provider to gauge the patient's risk for abusive relationships, pregnancy, and sexually transmitted infections. The provider can choose which questions are the most applicable for a given patient.

Executive Summary

- By law, parents are not allowed to force an adolescent to undergo a pregnancy test nor tests for drugs of abuse.
- In the adolescent patient, vaginal bleeding is most commonly due to dysfunctional uterine bleeding with anovulation (95%) and, much less frequently, due to pathologies such as bleeding dyscrasias, endocrine disorders, or malignancy.
- During the first two years after menarche, 55-80% of cycles are anovulatory; by year four or five of menstruation, only 20% of cycles are anovulatory.
- The major findings in the CDC's 2002-2007 data included a rise in the prevalence of HIV in adolescents as well as in rates of syphilis.

This history should not take more than a few minutes for a busy practitioner to complete. Furthermore, this interaction provides a unique opportunity for the emergency medicine practitioner to provide education and anticipatory guidance to the patient. Although traditionally preventative medicine has been considered outside the scope of emergency medicine, emergency physicians have become a source of primary care for patients who have barriers to regular care. About 75% of adolescents utilize the health care system each year, and many of these visits are in the emergency department or urgent care facility. If the emergency physician does not provide education to the high-risk adolescent, that patient may be at preventable risk for sexually transmitted infections, abuse, or unplanned pregnancy.^{3,4}

The Adolescent Gynecologic Exam

Frequently, young female patients in the emergency department have not had a prior pelvic exam. If the current complaint necessitates a gynecologic exam, consent must be obtained from the adolescent. Reassurance and answering all questions prior to the exam should reduce patient and parental stress. Again, the parents should be excused from the room if the adolescent prefers, and a chaperone should accompany the provider. After the patient dons a gown, removes her undergarments, and is provided with a sheet to cover her lap, describe each step of the exam before you start the exam and again as you perform the exam. Use appropriately

sized specula to minimize discomfort. First, an external exam should be performed, looking for infectious lesions, signs of vaginitis, and also any signs of abuse (note that in the majority of exams, even if there is abuse, there are no signs). Second, a speculum exam is performed to inspect the cervix and vaginal vault for bleeding, discharge from the cervical os, cervical lesions, or other abnormalities. Finally, a bimanual exam should be performed to detect any adnexal tenderness, masses, or cervical motion tenderness.

Updates on Issues of Confidentiality

Confidentiality is paramount in this age group. A teenage patient will want to know that certain services can be provided confidentially (i.e., without parental consent or notification), including the diagnosis and treatment of sexually transmitted infections or pregnancy. By law, parents are not allowed to force an adolescent to undergo a pregnancy test nor tests for drugs of abuse. However, confidentiality has limits that should be explained to the adolescent patient. Specifically, sexual and physical abuse are not protected under minor consent laws, and they require parental notification for the safety of the minor unless the parent is the one suspected of abusing the patient.

Vaginal Bleeding

Overview. Vaginal bleeding is a common complaint in the emergency department. In adults, the differential diagnosis of vaginal bleeding in the non-pregnant patient includes

fibroids, polyps, or malignancy. However, in the adolescent patient, this complaint is most commonly due to dysfunctional uterine bleeding with anovulation (95%) and, much less frequently, due to pathologies such as bleeding dyscrasias, endocrine disorders, or malignancy.⁵⁻⁷ Although it is outside the scope of this review, it is also important to consider complications of pregnancy, such as spontaneous abortion or ectopic pregnancy, in the differential diagnosis of irregular vaginal bleeding in the adolescent patient. A negative pregnancy test is critical prior to consideration of other etiologies of vaginal bleeding.

Pathophysiology and Differential Diagnosis of Vaginal Bleeding. Dysfunctional uterine bleeding (DUB), the most common cause of abnormal vaginal bleeding in the adolescent, is defined as irregular uterine bleeding not due to structural lesions or systemic diseases. In adolescents, anovulatory cycles are responsible for the majority of DUB. Anovulation is caused by the relative immaturity of the hypothalamic-pituitary-ovarian axis in this age group. During the first two years after menarche, 55-80% of cycles are anovulatory; by year four or five of menstruation, only 20% of cycles are anovulatory.^{4,7}

Polycystic ovarian syndrome (PCOS) is the most common endocrine cause of anovulatory cycles and resulting DUB. The syndrome is diagnosed clinically by symptoms including hirsutism and irregular menstrual cycles. PCOS is associated with insulin resistance and obesity, although 10% of PCOS patients are

Table 1. Key Components of the Adolescent History

1. "Have you ever had oral, vaginal, or anal sex?" Oral/vaginal/anal sex may need to be defined for the adolescent patient. Avoid slang terms, but ask specifics to determine risk.
2. "How many partners have you had in your lifetime?" Follow this by distinguishing male/female partners. "Have you had sexual relationships with males, females, or both?" Avoid presumptive terms like "boyfriend."
3. "Have you ever been exposed to sexually transmitted infections?" (Remind the patient of risk factors, including IV drug use, high-risk sexual partners, multiple partners, unprotected sex.)¹
4. "Have you ever been treated for, diagnosed with, or tested for a sexually transmitted infection such as gonorrhea, chlamydia, syphilis, trichomonas, or warts?"
5. "What methods are you using to protect yourself against a sexually transmitted infection? Do you have any questions about how to protect yourself against sexually transmitted infections?"
6. Similarly, "What methods are you using to protect yourself against pregnancy? Do you have any questions about how to prevent pregnancy?"
7. "Are you and/or your partner using any substances or devices while having sex?" This may identify risk factors for vaginal infections/irritations, dyspareunia, as well as abuse or nonconsensual sex acts.² This question should be followed with a screen for inter-partner violence: "Has anyone touched you sexually in a way you didn't want?" "Has anyone hit you or hurt you?"

normal or under weight. The finding of polycystic ovaries on a transvaginal ultrasound supports the diagnosis, although it is not required for the clinical diagnosis of PCOS. The suspicion of this syndrome warrants referral to gynecology, adolescent medicine, or a family practitioner for further workup.^{7,8}

In the differential of adolescent abnormal uterine bleeding, another etiology for the emergency physician to consider, though much less common, is a bleeding dyscrasia. The emergency provider may be the first physician to encounter patients with an underlying bleeding disorder, as heavy menstrual bleeding is the most commonly experienced sequela. In a series of studies, patients requiring hospitalization for menstrual bleeding had a 5-28% prevalence of bleeding disorders. Many of these patients will enter the hospital through the emergency department.^{9,10} While it is not crucial that the emergency provider make the final diagnosis

of the particular bleeding disorder, it is imperative to include a bleeding disorder in the differential, especially in those patients with a positive family history, patients with heavy bleeding at menarche, or those requiring transfusion and admission. Also, once hormonal treatments are started, it is much more difficult to make a diagnosis of a blood dyscrasia.

Clinical Features and History of Vaginal Bleeding. The evaluation of vaginal bleeding should start with an assessment of the patient's hemodynamic stability. Unstable or potentially unstable patients should have two large-bore IVs established and volume replacement with isotonic saline and packed red blood cells, if indicated.

The initial history of this complaint should include the onset and timing of the bleeding, including timing in relation to the last normal menstrual cycle and duration of bleeding. Inquire about regularity

and duration of cycles and the age of menarche. The patient should try to quantify the bleeding, which may be difficult; ask specifically how frequently she is changing pads/tampons. Also ask specifically if she saw any clots with the bleeding.

In addition to the above general historical questions, further questions may help narrow the differential diagnosis of vaginal bleeding. For example, ovulatory cycle bleeding should be preceded by premenstrual symptoms (breast tenderness, bloating, mood swings, or cramping). Heavy, irregular bleeding without these preceding complaints is often triggered by an anovulatory cycle.^{5,8} Ask about a history of excessive bleeding (such as after dental procedures or prolonged nosebleeds) to screen for bleeding disorders, and similarly ask about family history of bleeding disorders and gynecologic issues.¹¹ As always with the complaint of vaginal bleeding, ask about the potential of pregnancy, while keeping in consideration that patients are not always truthful about their sexual history and that a pregnancy test should be performed regardless.

Diagnostic Studies. Emergency department laboratory investigation for vaginal bleeding should always include a pregnancy test and a complete blood count. In patients requiring transfusion, with suspected bleeding disorder, or being considered for admission, order a coagulation panel and type and cross. In the pregnant patient, a pelvic ultrasound should be obtained to evaluate for possible ectopic pregnancy and for viability of the pregnancy. It would be helpful to draw LH, FSH, and TSH levels and a von Willebrand's panel (VWP) because initiation of hormone therapy (to blunt bleeding) will invalidate LH and FSH results, while blood transfusion will alter the accuracy of the VWP test.

Treatment. The treatment choice for dysfunctional uterine bleeding will be guided by the volume of bleeding and by the results of the lab work obtained. Mild bleeding may be followed expectantly, for example, while moderate bleeding

Table 2. Management of Dysfunctional Uterine Bleeding^{6,9,21}

Categories of Bleeding	Treatment Guidelines
Mild (duration of bleeding < 3 months, normal hemoglobin)	<ul style="list-style-type: none">• Watch and wait• Track cycle with menstrual calendar• NSAIDs for cramps and to decrease blood flow
Moderate (heavy menses or increased frequency of cycle, mild anemia with hemoglobin 8-10 g/dL)	<ul style="list-style-type: none">• If not bleeding now: Start cyclic OCP, medroxyprogesterone acetate, or norethindrone acetate• If bleeding now: Start taper method of monophasic OCPs (30 µg ethinyl estradiol/0.3 mg norgestrel)<ul style="list-style-type: none">– One pill Q6h for 2 days, then– One pill Q8h for 2 days, then– One pill Q12h for 2 days, then– One pill daily for 3 days to complete the 21-pill pack– Then start new 21-day pack and take one per day, continue OCPs for 3-6 months, skipping any placebos– Make sure to prescribe anti-emetic to prevent nausea associated with higher estrogen doses– If contraindication to estrogen:<ul style="list-style-type: none">– Norethindrone acetate 5-10 mg daily
Severe (hemoglobin < 7 g/dL, hemoglobin < 10 g/dL in patient with heavy bleeding or who is orthostatic)	<p>Should admit and send extended workup. Start treatment with either OCPs (30-50 µg ethinyl estradiol/0.3 mg norgestrel)</p> <ul style="list-style-type: none">• One pill Q4h until bleeding stops, then• One pill Q6h for 2 days, then• One pill Q8h for 2 days, then• One pill Q12h for 2 days, then• One pill daily for 3 days to complete the 21-pill pack• Then start new 21-day pack and take one per day, continue OCPs for 3-6 months, skipping any placebos <p>OR Premarin 25 mg IV Q4h until bleeding stops and then start OCPs 1 pill PO QD to provide progesterone to stabilize the endometrium.</p> <ul style="list-style-type: none">• Also prescribe: iron supplementation, nausea prophylaxis
Special Considerations	<ul style="list-style-type: none">• For patients who cannot tolerate oral medicines, use Premarin 25 mg IV Q4h until bleeding stops, then prescribe OCPs• In patients where estrogen contraindicated, use norethindrone acetate 5-10 mg Q4h, followed by taper
<p>Adapted from Hettler J. Pediatric and Adolescent Gynecology. <i>Textbook of Pediatric Emergency Medicine</i>. Lippincott Williams & Wilkins; 2010, and Emans SJ, et al. Delayed puberty and menstrual irregularities. <i>Pediatric and Adolescent Gynecology</i> Lippincott Williams & Wilkins; 2005.</p>	

may prompt the emergency physician to start medication to slow bleeding. The patient should always be instructed to follow up with her primary care physician in case long-term OCPs are required to control bleeding, or in case further workup is needed to discover the etiology. In Table 2, the specifics of treatment plans and the levels of bleeding or

anemia for which they are indicated are outlined in detail.

Sexually Transmitted Infections

Scope of Problem: The Rise of Sexually Transmitted Infections in Adolescents. Sexually transmitted infections (STIs) are an important emergency department complaint,

and recent data show a rise in prevalence of many of these infections in adolescents. The CDC's Division of Reproductive Health tracks the nationwide trends in sexually transmitted infections. The major findings in the 2002-2007 data included a rise in the prevalence of HIV in adolescents as well as in rates of syphilis. From 1996 to 2006, the rate of HIV

in males aged 15-19 years nearly doubled. Many EDs are now using rapid HIV testing and some are even piloting universal testing in high prevalence areas such as Washington, DC.^{13,14} Similarly, the incidence of syphilis, which had been steadily declining between 1997-2005, has risen again, affecting 2.2 individuals per 100,000 in 2006, versus only 1.5 per 100,000 in 2004. Gonorrhea infection rates have plateaued in recent years after a decline for more than 20 years.¹³⁻¹⁵

Risk Factors for Sexually Transmitted Infections (STIs) in Adolescents. Multiple factors place this age group at risk for higher rates of all STIs. It is important, even in the often hectic environment of the emergency department, to screen higher-risk adolescents, including those with early sexual debut, multiple partners, inconsistent use of condoms, limited health care access, drug use, and men having sex with men. Remember that minors have the right in all states to confidential care for sexually transmitted infections.

Some physiologic features place the teenage patient at higher risk for contraction of STIs. The adolescent-aged host frequently has a more naïve immune system to sexually transmitted infections. Other anatomic differences in this age group place the patient at higher risk. Adolescent women have a larger cervical ectropion than adults, thus increasing the STI risk because these cells have greater susceptibility to infection than other types of cervical cells.

History Taking for Patients with Suspected Sexually Transmitted Infection. The complaints that bring an adolescent patient to the emergency department for an STI may include vaginal discharge, pruritis, dysuria, dyspareunia, abdominal pain, or even just a request for STI testing with fears of an exposure. Gonorrhea produces symptoms an average of 10 days after exposure, and may include urinary discomfort, vaginal discharge, dyspareunia, and also pelvic pain — remember to

consider pelvic inflammatory disease and related sequelae, including tubovarian abscesses. Another manifestation of this STI may be Bartholin's gland abscesses, so when treating a gland abscess, screen for STI risk factors and consider empiric treatment. On the other hand, chlamydia is frequently asymptomatic. Up to 42% of patients affected by gonorrhea have a concomitant infection with chlamydia, necessitating testing and treatment for both, as addressed in Table 3.¹⁵

Treatment and Follow-up for Suspected Sexually Transmitted Infections. Because the adolescent patient may be difficult to contact for follow-up culture results, empiric treatment is indicated if the suspicion of disease is high. Remember that given confidentiality laws, the minor herself, rather than the parents, must be contacted with follow-up cultures. It may be useful to send test results to the primary care physician in order to ensure the results are delivered confidentially and in a setting in which that provider can initiate treatment and counseling.

Other Considerations in Gonorrhea and Chlamydia Testing: New Testing Modalities and Follow-up Testing. Gonorrhea and chlamydia can be tested for routinely in the emergency department with endocervical or self- or physician-administered vaginal swabs. These infections can also be tested by urine testing, but require a first void or "dirty" urine sample, while another common test collected during workup for abdominal complaints, a urinalysis for bacterial infection, is done mid-stream. However, mid-stream urine testing for chlamydia has been shown to be sensitive, making simultaneous collection for both STIs and urinary tract infections in the emergency department much simpler.¹⁸

All patients with gonorrhea or chlamydia require retesting in 3 months to ensure clearance of the disease, given its potential for long-term harm, including infertility and pelvic inflammatory disease. If the infection is present at this follow-up,

it is more likely to be due to re-infection rather than resistant infection. Proper education to the adolescent patient is imperative, including notification of all partners from the 60 days prior to diagnosis and instructions to abstain from sexual activity until 7 days after initiation of treatment of both partners. Patients should be advised to follow up with their primary care provider to initiate partner treatment/notification if tests come back positive.^{15,21}

The presence of one sexually transmitted infection portends the risk for other concomitant infections, including human immunodeficiency virus (HIV). The emergency physician evaluating a patient for gonorrhea and chlamydia should consider ordering testing for syphilis and HIV to do a complete STI workup. Alternatively, if the emergency physician can ensure reliable follow-up, these additional screening tests may be performed by the primary care provider.²²

Alternative Treatment Options in Gonorrhea/Chlamydia.

Treatment regimens for gonorrhea and chlamydia are found in Table 3. If the adolescent patient refuses an intramuscular injection, there are oral-only regimens, although these are not recommended as first line because of quinolone resistance by *Neisseria gonorrhoeae*. However, if local gonorrhea resistance is low and the patient is also at low risk, the provider could alternatively prescribe:

- single dose cefixime 400 mg PO; or
- levofloxacin 500 mg PO daily for 7 days; or
- ofloxacin 300 mg PO BID for 7 days; or
- erythromycin base 500 mg PO QID for 7 days.

This should be prescribed in addition to the single dose of azithromycin 1 g PO, or doxycycline 100 mg PO BID for 7 days, to prevent resistance.²¹

The Possibility of Resistant *Neisseria Gonorrhoeae*. There has been growing concern about cephalosporin-resistant *Neisseria*

Table 3. Diagnosis and Management of Common Gynecologic Infections¹⁶⁻¹⁹

Disease	Symptoms	Signs	Testing	Treatment**	Clinical Considerations
Bacterial Vaginosis (BV)*	Thin, gray discharge with fishy odor, especially after sex	Gray discharge coating vaginal walls	<ul style="list-style-type: none"> • Positive whiff amine test • Vaginal pH > 4.5 • Clue cells > 20% 	<ul style="list-style-type: none"> • Oral (500 mg BID for 7 days) OR vaginal metronidazole • Oral OR vaginal clindamycin 	Risk factor for STI infection/transmission
Genital HSV	<ul style="list-style-type: none"> • Primary: Painful genital lesions, dysuria, fever, malaise • Recurrent: Less severe, genital lesions only 	Multiple shallow, erythematous, painful ulcers	<ul style="list-style-type: none"> • Viral culture and PCR (most sensitive) from base of ruptured ulcer • Serology, less useful in acute period 	<ul style="list-style-type: none"> • Treat all primary infections due to severity of symptoms and to shorten duration of primary infection • CDC's 2010 recommendations, all 10-day courses: <ul style="list-style-type: none"> — Acyclovir 400 mg PO TID — Famciclovir 250 mg PO TID — Valacyclovir 1000 mg PO BID 	<ul style="list-style-type: none"> • To treat or not treat recurrence left to patient/doctor discretion Recurrent: <ul style="list-style-type: none"> • CDC's 2010 recommendations: <ul style="list-style-type: none"> — Acyclovir 800 mg PO TID x 2 days OR 800 mg PO BID x 5 days — Famciclovir 1000 mg PO BID x 1 day OR 125 mg PO BID x 5 days — Valacyclovir 500 mg PO BID x 3 days OR 1 g once daily x 5 days
Yeast Infection*	"Cottage cheese" discharge, vaginal pruritis, dysuria	Vulvar and vaginal erythema, edema	<ul style="list-style-type: none"> • KOH with budding yeast and hyphae • pH 4-4.5 (BV has pH > 4.5) • Amine test negative (versus BV) 	<ul style="list-style-type: none"> • Topical azoles available • Single dose oral fluconazole 150 mg often more desirable 	<ul style="list-style-type: none"> • Complicated infections (pregnant, immunocompromised, diabetes) require 2 fluconazole 150 mg doses, taken 3 days apart. • LFT testing not required for either single or two-dose regimens
Trichomonas	<ul style="list-style-type: none"> • Classic (in 10-30%) green-yellow frothy discharge, pruritus, dysuria • Common: Purulent, thin discharge • Dyspareunia, post-coital bleeding 	<ul style="list-style-type: none"> • Green-yellow frothy discharge • Punctate hemorrhages of vagina and cervix ("strawberry cervix" seen only in 20% of patients) 	<ul style="list-style-type: none"> • Motile trichomonads on wet mount (only in 50-70%) • If not seen, culture or rapid nucleic acid tests 	Single-dose oral metronidazole 2000 mg	<ul style="list-style-type: none"> • Treat sexual partner

*Bacterial vaginosis is not clearly established as sexually transmitted, but rather an imbalance in vaginal flora common in females of child-bearing age. Yeast infections are also not sexually transmitted. Risk factors include pregnancy, diabetes, and antibiotic use.²⁰

**For all regimens, please check safety and specialized dosing for treatment in the pregnant patient.

gonorrhoeae. The 2010 CDC recommendations continue to support the regimen of ceftriaxone 250 mg IM once *plus* azithromycin 1 g orally once or doxycycline 100 mg PO BID for 7 days.²¹ Laboratories are

identifying small, although notable rates of resistance in both gonorrhea and chlamydia cultures. However, there is insufficient prevalence of resistant strains to warrant significant changes to the current treatment

recommendations. The recommendation is ceftriaxone plus azithromycin for dual coverage against gonorrhea to prevent further resistance.^{17,23}

The emergency practitioner should watch for any future updates

Table 3. Diagnosis and Management of Common Gynecologic Infections¹⁶⁻¹⁹ (continued)

Disease	Symptoms	Signs	Testing	Treatment**	Clinical Considerations
Chlamydia	<ul style="list-style-type: none"> • 50% asymptomatic • Vaginal discharge, dysuria, bleeding • Symptoms of PID: Low abdominal pain or RUQ pain + lower GU symptoms 	<ul style="list-style-type: none"> • Mucopurulent cervical discharge • Friable, edematous cervix 	<ul style="list-style-type: none"> • Urine, vaginal, or cervical nucleic acid amplification (becoming gold standard) • Cervical culture • Rapid immunoassays (available soon) • Imaging if indicated in PID 	<ul style="list-style-type: none"> • Single dose oral azithromycin 1000 mg OR 7 days oral doxycycline 100 mg twice daily • PID may necessitate admit for IV antibiotics 	<ul style="list-style-type: none"> • Untreated cervicitis can lead to PID, causing infertility or future ectopic pregnancies • Consider partner testing and expedited partner treatment
Gonorrhea	<ul style="list-style-type: none"> • 50% asymptomatic • Similar to chlamydia with discharge, pruritis, or, if PID, abdominal pain 	<ul style="list-style-type: none"> • Mucopurulent cervical discharge • Friable, edematous cervix 	<ul style="list-style-type: none"> • Urine or vaginal nucleic acid amplification most sensitive and specific • Culture is the test of choice in suspected extragenital infection, plus gives antibiotic sensitivity 	<ul style="list-style-type: none"> • CDC recommendation: Single IM dose ceftriaxone 250 mg • AND single dose oral azithromycin 1 g or 7 days of oral doxycycline 100 mg twice daily 	<ul style="list-style-type: none"> • PID, infertility, ectopic pregnancy • Disseminated gonococcal infection • Pharyngeal infections • Consider partner testing and treatment
Syphilis	<ul style="list-style-type: none"> • Primary: Painless papule then chancre • Secondary: Constitutional symptoms, rash of palms/soles, alopecia, CNS infection • Latent: CNS, cardiovascular 	<ul style="list-style-type: none"> • Primary: Raised ulceration, inguinal lymphadenopathy • Secondary: Rash is discrete reddish-brown, scaly lesions, or condyloma lata. Lymph nodes, hard and rubbery, especially epitrochlear 	<ul style="list-style-type: none"> • Initial (sensitive) serology testing for ED: VDRL, RPR • Follow-up testing if above positive, more specific treponemal serology testing such as FTA-ABS 	<ul style="list-style-type: none"> • Primary, secondary, or early latent: benzathine penicillin G • Latent: 3 weekly doses benzathine penicillin G 	<ul style="list-style-type: none"> • Infection raises risk of HIV acquisition and transmission • Treatment may provoke Jarisch-Herxheimer reaction • Consider partner testing and treatment
HIV	<ul style="list-style-type: none"> • Consider acute infection in the differential for flu or mononucleosis-like illness 	<ul style="list-style-type: none"> • Rash • Lymph nodes • Mucocutaneous ulcers 	<ul style="list-style-type: none"> • HIV rapid antibody test BUT may be initially negative • Also send RNA viral load, as acute HIV associated with high levels of viremia (even with negative antibody test) 	<ul style="list-style-type: none"> • Urgent referral for workup and initiation of HAART treatment 	<ul style="list-style-type: none"> • Partner notification, testing • Key is level of suspicion; opportunity to catch the HIV infection in the acute phase

**For all regimens, please check safety and specialized dosing in the treatment in the pregnant patient.

Table 4. Indications for Emergency Contraception

- Unprotected sex
- Sexual assault
- Failure of a contraceptive (i.e., contraceptive vaginal ring in place for more than 5 weeks, contraceptive vaginal ring out for more than 3 hours, broken condom, missed doses of oral/vaginal/injection contraceptives)

in CDC recommendations as concerns for resistance grow.

Emergency Contraception

Background and Epidemiology.

Teen pregnancy in the United States had been decreasing annually during 1991-2005, but subsequently increased again from 2005-2007, at a rate now of approximately 42.5 affected young women per 1,000.^{15,24} The emergency provider's role in prevention of unplanned pregnancy is limited to the provision of emergency contraception. Any patient presenting to the emergency department for a pregnancy test who has had unprotected vaginal sex or contraceptive failure in the past 120 hours is a candidate for emergency contraception.

Indications for Emergency Contraception. The main indications to prescribe this class of medications are: unprotected sex, sexual assault, or failure of a contraceptive. Failures of prescribed contraceptives may include: a contraceptive vaginal ring in place for more than 5 weeks, contraceptive vaginal ring out for more than 3 hours, broken condoms, or missed doses of oral/vaginal/injection contraceptives. (See Table 4.)

Treatment Regimens in Emergency Contraception.

Originally, two main categories of emergency contraception existed: combination pills, sometimes referred to as the Yuzpe regimen, and progesterone-only pills.^{25,26} The Yuzpe regimen's use is limited by severe nausea and vomiting as side

effects and lower efficacy compared to other emergency contraception options. Only 57% of pregnancies are prevented by Yuzpe method versus 85% with levonorgestrel-only pills. Many brands of regular oral contraceptive pills can be used, in combinations unique to each brand, to provide emergency contraception. (See Table 5.) A complete list of approved pills is available at the Emergency Contraception website: <http://ec.princeton.edu/questions/dose.html>.

Levonorgestrel (trade name Plan B/Next Choice) is approved for use within 72 hours of unprotected sex, although the World Health Organization has shown efficacy up to 120 hours.

In 2010, the FDA approved ulipristal acetate (UPA, trade name ella), a progesterone receptor modulator. Its efficacy is proven up to 120 hours after unprotected sex, taken in a single 30-mg dose. In fact, if taken within 72 hours, UPA had a 42% lower pregnancy rate than levonorgestrel. If taken within 24 hours, UPA had a 65% lower pregnancy rate compared to levonorgestrel.^{11,27} However, the provider must keep in mind that UPA is not yet widely available in U.S. pharmacies.

Finally, another option, although it requires training for placement or immediate referral to a gynecologist/family practitioner, is the copper intrauterine device. If the patient has guaranteed follow-up with a provider who can place a copper IUD, this device may prevent up to 99.9% of pregnancies if it can be inserted within 5 days of unprotected sex.

In summary, the emergency provider's options include (in increasing order of efficacy): traditional OCP packs in regimens particular to each brand; levonorgestrel only (trade names Plan B or Next Choice); a new medication called ulipristal acetate (trade name ella); or the patient may be referred for emergency copper IUD.

It is imperative to counsel the patient on the following issues: close follow-up, the possibility of emergency contraception failure, and future contraceptive plans. Teens may ask the provider if emergency contraception will terminate an existing pregnancy. They should be educated that emergency contraception is not an abortive agent. Levonorgestrel works by delaying ovulation, and UPA may prevent ovulation, thus neither will disrupt an already fertilized and implanted pregnancy.¹¹ Possible side effects to be communicated to the patient can include nausea/vomiting, headaches, and menstrual-like cramping. All patients should have a negative pregnancy test in the emergency department before UPA is prescribed.

Contraindications to Use of Emergency Contraception. For both the Yuzpe method and levonorgestrel emergency contraceptives, the only contraindications to use are allergy to the drugs or current pregnancy (only due to fact that emergency contraception will not be effective in case of confirmed pregnancy).

Legal and Confidentiality Considerations for Emergency Contraception. A physician can prescribe and also provide the so-called "morning-after pill" to the adolescent patient without parental consent or notification.^{19,28} In addition, legislation is now expanding to cover this aspect of women's health. In 17 states, it is now law that health care facilities must offer emergency contraception to sexual assault patients.²⁶ As of 2009, levonorgestrel-only emergency contraception pills are available "behind the counter," with a form of

Table 5. Oral Contraceptives that Can Be Used for Emergency Contraception in the United States*

Brand	Company	First Dose**	Second Dose (12 hours later)**	Ulipristal acetate per dose (mg)	Ethinyl estradiol per dose (µg)	Levonorgestrel per dose (mg)***
<i>Ulipristal Acetate Pills</i>						
ella	Watson	1 white pill	None**	30	—	—
<i>Progestin-only Pills</i>						
Levonorgestrel tablets	Perrigo	2 white pills	None**	—	—	1.5
Next Choice	Watson	2 peach pills	None**	—	—	1.5
Next Choice One Dose	Watson	1 peach pill	None	—	—	1.5
Plan B One-Step	Teva	1 white pill	None	—	—	1.5
<i>Combination Progestin and Estrogen Pills</i>						
Altavera	Sandoz	4 peach pills	4 peach pills	—	120	0.60
Amethia	Watson	4 white pills	4 white pills	—	120	0.60
Amethia Lo	Watson	5 white pills	5 white pills	—	100	0.50
Amethyst	Watson	6 white pills	6 white pills	—	120	0.54
Lessina	Teva	5 pink pills	5 pink pills	—	100	0.50
Levora	Watson	4 white pills	4 white pills	—	120	0.60
Lo/Ovral	Akrimax	4 white pills	4 white pills	—	120	0.60
Low-Ogestrel	Watson	4 white pills	4 white pills	—	120	0.60
Nordette	Teva	4 light orange pills	4 light orange pills	—	120	0.60
Ogestrel	Watson	2 white pills	2 white pills	—	100	0.50
Seasonale	Teva	4 pink pills	4 pink pills	—	120	0.60
Seasonique	Teva	4 light blue-green pills	4 light blue-green pills	—	120	0.60

Adapted from <http://ec.princeton.edu/questions/dose.html>. A complete list can be found at the web site.

* ella, Plan B One-Step, Next Choice One Dose, Next Choice, and levonorgestrel tablets are the only dedicated products specifically marketed for emergency contraception. The regular oral contraceptives listed above have been declared safe and effective for use as ECPs by the United States Food and Drug Administration. Outside the United States, about 100 emergency contraceptive products are specifically packaged, labeled, and marketed. Levonorgestrel-only ECPs are available either over-the-counter or from a pharmacist without having to see a clinician in 60 countries. In the U.S., Plan B One-Step, Next Choice One Dose, Next Choice, and levonorgestrel pills are available over-the counter to women and men aged 17 and older. Younger patients can purchase these pills with a prescription. ella is available by prescription only.

** The labels for Next Choice and levonorgestrel tablets say to take one pill within 72 hours after unprotected intercourse, and another pill 12 hours later. However, recent research has found that both pills can be taken at the same time. All of the brands listed here may be effective when used within 120 hours after unprotected sex, but should be taken as soon as possible.

*** The progestin in Lo/Ovral, Low-Ogestrel, and Ogestrel is norgestrel, which contains two isomers, only one of which (levonorgestrel) is bioactive; the amount of norgestrel in each tablet is twice the amount of levonorgestrel.

identification, for men and women aged 17 years and older in all 50 states. Patients 16 years of age and younger require a prescription from the physician, except in nine states where laws have been passed to allow pharmacists to dispense emergency contraception pills without a prescription. These pharmacists must work in collaboration with a physician or have undergone specialized training to female patients of any age.^{11,19,28}

Conclusion

In this review, the important considerations for the adolescent patient with a gynecologic complaint and subjects that are unique to this age group have been discussed. The emergency provider must obtain a complete and confidential history and physical exam. Many chief complaints warrant a consideration of the genitourinary system, as teenage patients are not always forthcoming with gynecologic complaints. The text has reviewed the common etiologies, workup, and treatment for abnormal uterine bleeding, one of the most common adolescent emergency department complaints. Emergency physicians must understand the current testing and treatment recommendations for sexually transmitted infections; patterns of resistance may change first-line recommendations in the future. The frequency of co-infection with multiple sexually transmitted infections should be considered. The report also reviewed the current treatment options and legality issues in the use of emergency contraception. This is meant as an overview of the unique issues in treating the adolescent female patient in the emergency department and as an update to the provider on the current topics in the gynecologic health of this population.

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Physician CME Questions

- What is the most likely cause of recurrent symptoms of chlamydia 3 months after treatment?
 - re-infection
 - resistant strain of *Chlamydia*
 - misdiagnosis at first presentation
 - insufficient duration of therapy
- What is the recommended treatment in the non-pregnant teenager with green-yellow discharge and motile pathogens on wet mount?
 - 7 days of oral metronidazole twice daily
 - oral fluconazole single dose
 - IM ceftriaxone single dose
 - oral metronidazole single dose
- The most common cause for dysfunctional uterine bleeding in the adolescent patient is anovulatory cycles. Of the endocrine causes for these, the most common cause is:
 - pituitary adenoma
 - hypothyroidism
 - PCOS
 - congenital adrenal hyperplasia
- The FDA-approved time frame from unprotected sex to use of levonorgestrel-only emergency contraception is ___ hours, while WHO has shown efficacy up to ___ hours.
 - 48, 72
 - 72, 96
 - 120, 148
 - 72, 120
- A 26-year-old woman is seen in your emergency department complaining of vaginal pruritis and thick white discharge. Her exam shows vulvar edema and erythema. Microscopy shows hyphae and vaginal pH is 4.0. The treatment of choice for this patient is:
 - azithromycin 2 g PO single dose
 - fluconazole 150 mg PO single dose
 - metronidazole 2000 mg PO single dose
 - ceftriaxone 250 mg IM single dose
- By years 4-5 after menarche, what percentage of menstrual cycles are still anovulatory?
 - 55%
 - 75%
 - 5%
 - 20%
- What would be an acceptable treatment of uncomplicated gonorrhea/chlamydia according to current recommendations by the CDC?
 - single IM ceftriaxone dose
 - single IM ceftriaxone dose + single oral azithromycin dose
 - IV cefepime for resistant pathogen
 - oral doxycycline 7-day course
- Which of the following is the most effective method of emergency contraception?
 - Yuzpe method (estrogen/progesterone)
 - levonorgestrel 1.5 mg PO ASAP
 - ulipristal acetate (UPA) 30 mg PO ASAP after negative pregnancy test
 - copper IUD
- Which of the following is a major drawback to Yuzpe regimen of emergency contraception versus progesterone-only regimens?
 - abdominal cramping
 - infertility
 - higher rate of treatment failure
 - vaginal bleeding
- Which patient likely warrants initiation of OCPs in the ED for irregular vaginal bleeding and outpatient follow-up only?
 - a patient with a heavier period this month, hemoglobin 7 mg/dL
 - a patient with hemoglobin 9 mg/dL, orthostatic symptoms
 - a patient with hemoglobin 11 mg/dL, heavier bleeding for the past 4 periods in a row, with normal vital signs
 - a patient with a spotting episode in between two normal periods

Pediatric Emergency Medicine Reports

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Upon completion of this educational activity, participants should be able to:

- recognize specific conditions in pediatric patients presenting to the emergency department;
- describe the epidemiology, etiology, pathophysiology, historical and examination findings associated with conditions in pediatric patients presenting to the emergency department;
- formulate a differential diagnosis and perform necessary diagnostic tests;
- apply up-to-date therapeutic techniques to address conditions discussed in the publication;
- discuss any discharge or follow-up instructions with patients.

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- Pass the online tests with a score of 100%; you will be allowed to answer the questions as many times as needed to achieve a score of 100%.
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Management of Dysfunctional Uterine Bleeding

Categories of Bleeding	Treatment Guidelines
Mild (duration of bleeding < 3 months, normal hemoglobin)	<ul style="list-style-type: none"> • Watch and wait • Track cycle with menstrual calendar • NSAIDs for cramps and to decrease blood flow
Moderate (heavy menses or increased frequency of cycle, mild anemia with hemoglobin 8-10 g/dL)	<ul style="list-style-type: none"> • If not bleeding now: Start cyclic OCP, medroxyprogesterone acetate, or norethindrone acetate • If bleeding now: Start taper method of monophasic OCPs (30 µg ethinyl estradiol/0.3 mg norgestrel) <ul style="list-style-type: none"> – One pill Q6h for 2 days, then – One pill Q8h for 2 days, then – One pill Q12h for 2 days, then – One pill daily for 3 days to complete the 21-pill pack – Then start new 21-day pack and take one per day, continue OCPs for 3-6 months, skipping any placebos – Make sure to prescribe anti-emetic to prevent nausea associated with higher estrogen doses – If contraindication to estrogen: <ul style="list-style-type: none"> – Norethindrone acetate 5-10 mg daily
Severe (hemoglobin < 7 g/dL, hemoglobin < 10 g/dL in patient with heavy bleeding or who is orthostatic)	<p>Should admit and send extended workup. Start treatment with either OCPs (30-50 µg ethinyl estradiol/0.3 mg norgestrel)</p> <ul style="list-style-type: none"> • One pill Q4h until bleeding stops, then • One pill Q6h for 2 days, then • One pill Q8h for 2 days, then • One pill Q12h for 2 days, then • One pill daily for 3 days to complete the 21-pill pack • Then start new 21-day pack and take one per day, continue OCPs for 3-6 months, skipping any placebos <p>OR Premarin 25 mg IV Q4h until bleeding stops and then start OCPs 1 pill PO QD to provide progesterone to stabilize the endometrium.</p> <ul style="list-style-type: none"> • Also prescribe: iron supplementation, nausea prophylaxis
Special Considerations	<ul style="list-style-type: none"> • For patients who cannot tolerate oral medicines, use Premarin 25 mg IV Q4h until bleeding stops, then prescribe OCPs • In patients where estrogen contraindicated, use norethindrone acetate 5-10 mg Q4h, followed by taper

Adapted from Hettler J. Pediatric and Adolescent Gynecology. *Textbook of Pediatric Emergency Medicine*. Lippincott Williams & Wilkins; 2010, and Emans SJ, et al. Delayed puberty and menstrual irregularities. *Pediatric and Adolescent Gynecology* Lippincott Williams & Wilkins; 2005.

Key Components of the Adolescent History

1. "Have you ever had oral, vaginal, or anal sex?" Oral/vaginal/anal sex may need to be defined for the adolescent patient. Avoid slang terms, but ask specifics to determine risk.
2. "How many partners have you had in your lifetime?" Follow this by distinguishing male/female partners. "Have you had sexual relationships with males, females, or both?" Avoid presumptive terms like "boyfriend."
3. "Have you ever been exposed to sexually transmitted infections?" (Remind the patient of risk factors, including IV drug use, high-risk sexual partners, multiple partners, unprotected sex.)¹
4. "Have you ever been treated for, diagnosed with, or tested for a sexually transmitted infection such as gonorrhea, chlamydia, syphilis, trichomonas, or warts?"
5. "What methods are you using to protect yourself against a sexually transmitted infection? Do you have any questions about how to protect yourself against sexually transmitted infections?"
6. Similarly, "What methods are you using to protect yourself against pregnancy? Do you have any questions about how to prevent pregnancy?"
7. "Are you and/or your partner using any substances or devices while having sex?" This may identify risk factors for vaginal infections/irritations, dyspareunia, as well as abuse or nonconsensual sex acts.² This question should be followed with a screen for inter-partner violence: "Has anyone touched you sexually in a way you didn't want?" "Has anyone hit you or hurt you?"

Indications for Emergency Contraception

- Unprotected sex
- Sexual assault
- Failure of a contraceptive (i.e., contraceptive vaginal ring in place for more than 5 weeks, contraceptive vaginal ring out for more than 3 hours, broken condom, missed doses of oral/vaginal/injection contraceptives)

Diagnosis and Management of Common Gynecologic Infections

Disease	Symptoms	Signs	Testing	Treatment**	Clinical Considerations
Bacterial Vaginosis (BV)*	Thin, gray discharge with fishy odor, especially after sex	Gray discharge coating vaginal walls	<ul style="list-style-type: none"> Positive whiff amine test Vaginal pH > 4.5 Clue cells > 20% 	<ul style="list-style-type: none"> Oral (500 mg BID for 7 days) OR vaginal metronidazole Oral OR vaginal clindamycin 	Risk factor for STI infection/transmission
Genital HSV	<ul style="list-style-type: none"> Primary: Painful genital lesions, dysuria, fever, malaise Recurrent: Less severe, genital lesions only 	Multiple shallow, erythematous, painful ulcers	<ul style="list-style-type: none"> Viral culture and PCR (most sensitive) from base of ruptured ulcer Serology, less useful in acute period 	<ul style="list-style-type: none"> Treat all primary infections due to severity of symptoms and to shorten duration of primary infection CDC's 2010 recommendations, all 10-day courses: <ul style="list-style-type: none"> Acyclovir 400 mg PO TID Famciclovir 250 mg PO TID Valacyclovir 1000 mg PO BID 	<ul style="list-style-type: none"> To treat or not treat recurrence left to patient/doctor discretion Recurrent: CDC's 2010 recommendations: <ul style="list-style-type: none"> Acyclovir 800 mg PO TID x 2 days OR 800 mg PO BID x 5 days Famciclovir 1000 mg PO BID x 1 day OR 125 mg PO BID x 5 days Valacyclovir 500 mg PO BID x 3 days OR 1 g once daily x 5 days
Yeast Infection*	"Cottage cheese" discharge, vaginal pruritus, dysuria	Vulvar and vaginal erythema, edema	<ul style="list-style-type: none"> KOH with budding yeast and hyphae pH 4-4.5 (BV has pH > 4.5) Amine test negative (versus BV) 	<ul style="list-style-type: none"> Topical azoles available Single dose oral fluconazole 150 mg often more desirable 	<ul style="list-style-type: none"> Complicated infections (pregnant, immunocompromised, diabetes) require 2 fluconazole 150 mg doses, taken 3 days apart. LFT testing not required for either single or two-dose regimens
Trichomonas	<ul style="list-style-type: none"> Classic (in 10-30%) green-yellow frothy discharge, pruritus, dysuria Common: Purulent, thin discharge Dyspareunia, post-coital bleeding 	<ul style="list-style-type: none"> Green-yellow frothy discharge Punctate hemorrhages of vagina and cervix ("strawberry cervix" seen only in 20% of patients) 	<ul style="list-style-type: none"> Motile trichomonads on wet mount (only in 50-70%) If not seen, culture or rapid nucleic acid tests 	Single-dose oral metronidazole 2000 mg	<ul style="list-style-type: none"> Treat sexual partner

*Bacterial vaginosis is not clearly established as sexually transmitted, but rather an imbalance in vaginal flora common in females of child-bearing age. Yeast infections are also not sexually transmitted. Risk factors include pregnancy, diabetes, and antibiotic use.²⁰

**For all regimens, please check safety and specialized dosing for treatment in the pregnant patient.

Disease	Symptoms	Signs	Testing	Treatment**	Clinical Considerations
Chlamydia	<ul style="list-style-type: none"> 50% asymptomatic Vaginal discharge, dysuria, bleeding Symptoms of PID: Low abdominal pain or RUQ pain + lower GU symptoms 	<ul style="list-style-type: none"> Mucopurulent cervical discharge Friable, edematous cervix 	<ul style="list-style-type: none"> Urine, vaginal, or cervical nucleic acid amplification (becoming gold standard) Cervical culture Rapid immunoassays (available soon) Imaging if indicated in PID 	<ul style="list-style-type: none"> Single dose oral azithromycin 1000 mg OR 7 days oral doxycycline 100 mg twice daily PID may necessitate admit for IV antibiotics 	<ul style="list-style-type: none"> Untreated cervicitis can lead to PID, causing infertility or future ectopic pregnancies Consider partner testing and expedited partner treatment
Gonorrhea	<ul style="list-style-type: none"> 50% asymptomatic Similar to chlamydia with discharge, pruritus, or, if PID, abdominal pain 	<ul style="list-style-type: none"> Mucopurulent cervical discharge Friable, edematous cervix 	<ul style="list-style-type: none"> Urine or vaginal nucleic acid amplification most sensitive and specific Culture is the test of choice in suspected extragenital infection, plus gives antibiotic sensitivity 	<ul style="list-style-type: none"> CDC recommendation: Single IM dose ceftriaxone 250 mg AND single dose oral azithromycin 1 g or 7 days of oral doxycycline 100 mg twice daily 	<ul style="list-style-type: none"> PID, infertility, ectopic pregnancy Disseminated gonococcal infection Pharyngeal infections Consider partner testing and treatment
Syphilis	<ul style="list-style-type: none"> Primary: Painless papule then chancre Secondary: Constitutional symptoms, rash of palms/soles, alopecia, CNS infection Latent: CNS, cardiovascular 	<ul style="list-style-type: none"> Primary: Raised ulceration, inguinal lymphadenopathy Secondary: Rash is discrete reddish-brown, scaly lesions, or condyloma lata. Lymph nodes, hard and rubbery, especially epitrochlear 	<ul style="list-style-type: none"> Initial (sensitive) serology testing for ED: VDRL, RPR Follow-up testing if above positive, more specific treponemal serology testing such as FTA-ABS 	<ul style="list-style-type: none"> Primary, secondary, or early latent: benzathine penicillin G Latent: 3 weekly doses benzathine penicillin G 	<ul style="list-style-type: none"> Infection raises risk of HIV acquisition and transmission Treatment may provoke Jarisch-Herxheimer reaction Consider partner testing and treatment
HIV	<ul style="list-style-type: none"> Consider acute infection in the differential for flu or mononucleosis-like illness 	<ul style="list-style-type: none"> Rash Lymph nodes Mucocutaneous ulcers 	<ul style="list-style-type: none"> HIV rapid antibody test BUT may be initially negative Also send RNA viral load, as acute HIV associated with high levels of viremia (even with negative antibody test) 	<ul style="list-style-type: none"> Urgent referral for workup and initiation of HAART treatment 	<ul style="list-style-type: none"> Partner notification, testing Key is level of suspicion; opportunity to catch the HIV infection in the acute phase

**For all regimens, please check safety and specialized dosing in the treatment in the pregnant patient.

Supplement to *Pediatric Emergency Medicine Reports*, February 2013: "Gynecologic Complaints in the Adolescent Female." Authors: **Brianne Jo Steele, MD**, Stanford Kaiser Emergency Medicine Residency; **Sophia Yen, MD, MPH**, Assistant Professor, Division of Adolescent Medicine, Department of Pediatrics, Lucile Packard Children's Hospital/Stanford University Medical School; and **N. Ewen Wang, MD**, Associate Director of Pediatric Emergency Medicine, Division of Emergency Medicine, Department of Surgery, Stanford University Medical School.

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