Current Guidelines For Evaluating And Managing Symptomatic Early Pregnancy In The Emergency Department

Abdominal pain and/or vaginal bleeding are common presenting complaints among patients in the first trimester of pregnancy. In evaluation of this group, the primary concern is to identify ectopic pregnancy. The prevalence of ectopic pregnancy in symptomatic emergency department (ED) patients can be > 10%, significantly higher than the prevalence in the general population. As ultrasonography has become increasingly available in the ED setting, it has taken on a primary role in the evaluation of these patients. Bedside ultrasound by the emergency physician is primarily used to document the presence or absence of an intrauterine pregnancy, the presence of which is generally accepted as ruling out an ectopic pregnancy. The absence of an intrauterine pregnancy may represent either an intrauterine pregnancy that is too early to visualize by ultrasound or an ectopic pregnancy. Historically, quantitative beta-hCG levels and the concept of the “discriminatory threshold” have been used to determine who should get an ultrasound, and help discriminate early intrauterine pregnancy from ectopic pregnancy when an intrauterine pregnancy is not identified; however, a review of the evidence reveals that a low quantitative beta-hCG should not be used as the reason to defer an ultrasound, nor should it be used to exclude ectopic pregnancy in patients with an indeterminate ultrasound.

Practice Guideline Impact

- Quantitative beta-hCG measurements generally should not be used to determine who does or does not need an ultrasound in the ED.
- Quantitative beta-hCG measurements should not be relied upon to exclude an ectopic pregnancy in cases where the ultrasound is indeterminate.
- Strongly consider ruptured ectopic pregnancy in the differential diagnosis of patients who have received methotrexate and present with concerning signs or symptoms.
This document was developed by a committee organized by the American College of Emergency Physicians (ACEP). The policy targets physicians working in emergency departments. ACEP was the funding source, and there were no relevant industry relationships disclosed by the subcommittee members.

The group identified 3 critical questions and utilized an explicit strategy for their literature search and review. Evidence was evaluated for quality according to predefined criteria and was sorted into 4 classes: I, II, III, or X-fatally flawed. Recommendations were based on the strength of evidence for each question: A, high degree of clinical certainty; B, moderate degree of clinical certainty; and C, based on Class III studies or panel consensus. The guideline applies to stable patients in the first trimester of pregnancy who present to the ED with abdominal pain and/or vaginal bleeding without a previously confirmed intrauterine pregnancy.

Critical Question 1: Should the emergency physician obtain a pelvic ultrasound in a clinically stable pregnant patient who presents to the ED with abdominal pain and/or vaginal bleeding and a beta-hCG level below a discriminatory threshold?

Patient Management Recommendations
- Level A recommendations. None specified.
- Level B recommendations. None specified.
- Level C recommendations. Perform or obtain a pelvic ultrasound for symptomatic pregnant patients with a beta-hCG level below any discriminatory threshold.

Critical Question 2: In patients who have an indeterminate transvaginal ultrasound, what is the diagnostic utility of beta-hCG for predicting possible ectopic pregnancy?

Patient Management Recommendations
- Level A recommendations. None specified.
- Level B recommendations. Do not use the beta-hCG value to exclude the diagnosis of ectopic pregnancy in patients who have an indeterminate ultrasound.
- Level C recommendations. Obtain specialty consultation or arrange close outpatient follow-up for all patients with an indeterminate pelvic ultrasound.

Critical Question 3: In patients receiving methotrexate for confirmed or suspected ectopic pregnancy, what are the implications for ED management?

Patient Management Recommendations
- Level A recommendations. None specified.
- Level B recommendations. (1) Arrange outpatient followup for patients who receive methotrexate therapy in the ED for a confirmed or suspected ectopic pregnancy. 2) Strongly consider ruptured ectopic pregnancy in the differential diagnosis of patients who have received methotrexate and present with concerning signs or symptoms.
- Level C recommendations. None specified.
Editorial Comment

Emergency clinicians frequently evaluate and manage stable patients with abdominal pain and/or vaginal bleeding during the first trimester of pregnancy. Although a variety of pathologies may cause these symptoms, the emergency clinician’s primary goal is to identify patients with an ectopic pregnancy. It is important to remember that the prevalence of ectopic pregnancy in symptomatic ED patients is as high as 13% in some studies, which is much higher than the rate in the general population.2,3

The Role Of Quantitative Beta-hCG: In recent years, the use of bedside pelvic ultrasound has become more common, but approaches to evaluating complication of early pregnancy still vary considerably because of differing availability of ultrasound among departments or at different times of day. Diagnostic algorithms often incorporate a quantitative beta-hCG level and apply the principle of the “discriminatory threshold,” generally defined as the level at which the sensitivity of ultrasound approaches 100% for the detection of intrauterine pregnancy. Traditionally, the presumptive diagnosis of ectopic pregnancy is made if an intrauterine pregnancy is not visualized when the serum beta-hCG is above this threshold, usually between 1000 and 2000 mIU/mL. (Some diagnostic algorithms do not mandate an ultrasound if the beta-hCG is below this threshold.) This practice likely arose when ultrasound was a more limited resource, as an attempt to triage its use, based on the assumption that when the patient had a beta-hCG below this threshold, that (1) the ultrasound was unlikely to be diagnostic, (2) an ectopic pregnancy was less likely to be present, or that (3) an ectopic pregnancy was less likely to rupture. After reviewing the evidence, this ACEP clinical policy concluded that having a beta-hCG “below any discriminatory threshold” should not be considered a reason to defer an ultrasound. In fact, evidence has emerged challenging the applicability of the discriminatory threshold at all in ED practice.

The Indeterminate Ultrasound: The management of symptomatic early pregnancy is particularly difficult when the ultrasound—whether bedside or performed by radiology—is indeterminate. This occurs approximately 20% to 30% of the time.3-8 Ultrasounds may be indeterminate for a number of reasons, including the clinical setting, patient population, ultrasound machine and operator, and the criteria used for diagnosis. An ultrasound may also be nondiagnostic simply because the patient presents early, before an intrauterine pregnancy or an extrauterine pregnancy can be definitively identified. Unfortunately, in patients with an indeterminate ultrasound, the clinician cannot accurately predict who has an ectopic pregnancy based on whether the beta-hCG is above or below a discriminatory threshold, and the policy recommends against using the beta-hCG to exclude the diagnosis of ectopic pregnancy. In patients with an indeterminate ultrasound, management and disposition need to be based on the patient’s risk factors and clinical status, taking into account their likelihood for outpatient follow-up, since consultation or close follow-up is recommended.

The Implications Of Methotrexate And Anti-D Immunoglobulin: This ACEP clinical policy also explores the implications of patients receiving methotrexate for confirmed or suspected ectopic pregnancy. Finally, another question that often arises in the management of these patients is whether to administer anti-D immunoglobulin to patients who are Rh-negative. Because no new quality evidence on this topic was identified during the literature search, the patient management recommendations from 20039 remain unchanged and are not discussed further in the 2012 clinical policy.

Summary: The definitive diagnosis of ectopic pregnancy in the first trimester remains a clinical challenge. There is growing evidence that a discriminatory threshold cannot be relied upon to identify the patients who need an ultrasound and that a beta-hCG cannot be relied upon to predict which patients with an indeterminate ultrasound have an ectopic pregnancy. Despite the emergency clinician’s best efforts,
a significant minority of patients will not have a definitive diagnosis after their ED work-up, and the management and disposition will need to take into account the patient’s clinical picture as well as other contributing factors.

According to the ACEP policy statement, Emergency Ultrasound Imaging Criteria Compendium, the primary indication for bedside ultrasound of the pelvis is to evaluate for the presence of an intrauterine pregnancy, minimizing the likelihood of an ectopic pregnancy when modifying factors such as infertility treatment (putting patients at risk of heterotopic pregnancy) are not present. It is important to note that this guideline excluded patients who were at higher risk of heterotopic pregnancy.

References


7. Tayal VS, Cohen H, Norton HJ. Outcome of patients with an indeterminate emergency department first-trimester pelvic ultrasound to rule out ectopic pregnancy. Acad Emerg Med. 2004;11(9):912-917. (Prospective observational study; 300 patients)


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1. A stable patient has complaints of vaginal spotting and she has a quantitative beta-hCG level of 500 mIU/mL. The decision to obtain a pelvic ultrasound is best described by which statement?
   a. Pelvic ultrasound should be deferred, as the serum beta-hCG level is below any traditionally defined "discriminatory threshold."
   b. Pelvic ultrasound should be obtained if adnexal tenderness is present on pelvic examination, despite the low serum beta-hCG level.
   c. Pelvic ultrasound is recommended despite the low quantitative beta-HCG.

2. A well-appearing pregnant patient with vaginal spotting, no complaints of pain, and a normal pelvic examination is sent for pelvic ultrasound, which is resulted as indeterminate. In the interim, the patient’s serum beta-hCG level returns at 500 mIU/mL. Which of the following is the most appropriate next clinical action?
   a. Discharge with plan for follow-up with her obstetrician/gynecologist in 5 to 7 days or to return to the ED if symptoms worsen, as she likely has an early pregnancy.
   b. Obtain obstetrician/gynecologist consultation in the ED or arrange for outpatient follow-up within 48 hours, as ectopic pregnancy is not excluded by the low serum beta-hCG level.
   c. Given the serum beta-hCG level, advise the patient to return in 1 week (sooner if symptoms worsen) for repeat pelvic ultrasound, since at that point, an intrauterine pregnancy should be visible.

3. A patient was given methotrexate 2 days ago by her gynecologist for treatment of an ectopic pregnancy. She presents to the ED with complaints of worsening pain and vaginal bleeding. Which of the following statements is most accurate?
   a. Any increase in pelvic pain is concerning for ruptured ectopic pregnancy and should be evaluated as such.
   b. A period of increased pelvic pain and bleeding, which represents expulsion of the products of conception from the uterine cavity, is to be expected after methotrexate therapy.
   c. The primary concern after methotrexate therapy is uncontrolled vaginal bleeding. If the patient’s hematocrit is stable, she can be safely discharged to follow up with her gynecologist.
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