

Table. Likelihood Ratios for Important Pelvic Inflammatory Disease Clinical Findings.

	Positive LR (95% CI)	Negative LR (95% CI)
Abdominal pain	1.12 (0.90–1.40)	0.85 (0.63–1.17)
Pelvic pain	0.91 (0.71–1.16)	1.12 (0.85–1.47)
Abdominal tenderness	0.78 (0.55–1.09)	1.18 (0.96–1.44)
Cervical motion tenderness	0.91 (0.51–1.61)	1.02 (0.91–1.15)
Uterine tenderness	1.13 (0.45–2.85)	0.99 (0.92–1.07)
Adnexal tenderness	1.04 (0.54–1.99)	0.99 (0.90–1.10)

LR, Likelihood ratio; CI, confidence interval.

both involve laboratory tests for sexually transmitted infections. The resulting likelihood ratios for important pelvic inflammatory disease clinical findings in regard to the composite outcomes are shown in the Table below.

From the perspective of the composite outcome, neither a history of abdominal or pelvic pain nor examination findings of pelvic tenderness appear to have any relation to pelvic inflammatory disease. Yet these findings are the hallmarks of pelvic inflammatory disease, and according to the CDC guideline, pelvic inflammatory disease cannot be diagnosed without tenderness on pelvic examination.² Concluding that pelvic pain and tenderness have no relation to pelvic inflammatory disease is akin to concluding that runny nose and sore throat have no relation to upper respiratory illness. These bizarre results are merely an artifact of combining clinically heterogeneous conditions into a single composite outcome. Similarly, if streptococcal pharyngitis and dental abscess were combined into a composite “oropharyngeal infection,” then tooth tenderness might have no relation to the composite; but this would not indicate that it has no relation to dental abscess.

Second, the authors define their composite outcome as a positive laboratory test result for sexually transmitted infection, and then, because they conclude that no examination criteria are predictive of the composite outcome, they argue that the current CDC pelvic examination criteria for pelvic inflammatory disease should be abandoned. This conclusion is unjustified. As the CDC guideline explains, pelvic inflammatory disease is a polymicrobial infection, and thus not all cases have positive sexually transmitted infection test results nor necessarily involve gonorrhea, chlamydia, or trichomonas. Therefore, abandoning the current examination criteria will miss cases of pelvic inflammatory disease. Arguing that the miss rate is acceptable requires some evidence of the number of

missed pelvic inflammatory disease cases that will progress to tubo-ovarian abscess, chronic pelvic pain, infertility, or ectopic pregnancy. Considering that two thirds of the women with a positive pelvic examination result in this study had negative sexually transmitted infection test results (82 of 122), the potential harm of abandoning the pelvic examination criteria for pelvic inflammatory disease is vast, and the authors fail to address this issue. Without quantification of the harm, the potential benefits of the authors’ recommendation do not justify the risks of missed pelvic inflammatory disease.

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1. Farrukh S, Sivitz AB, Onogul B, et al. The additive value of pelvic examinations to history in predicting sexually transmitted infections for young female patients with suspected cervicitis or pelvic inflammatory disease. *Ann Emerg Med.* 2018;72:703-712.e1.
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In reply:



We appreciate Dr. Swartz’s careful review of our article,¹ but are unpersuaded by his argument.

For our study, we used a composite score for cervicitis and pelvic inflammatory disease because we think the distinction between the former and early pelvic inflammatory disease is subtle. There were no patients in the study who received parenteral treatment, and in general hospitalization does not occur frequently for adolescents with pelvic inflammatory disease at our site. Our study suggests that the pelvic examination components of cervical motion tenderness, uterine tenderness, and adnexal tenderness are subjective, and although they might be present in pelvic inflammatory disease, they also might be present in cervicitis and in any patient who is anxious during the examination or has a lower pain threshold or intolerance for the examination. Conversely, some women

with infection may be more stoic or familiar with the examination process, and pain will be less obvious on examination. There are other studies that also suggest that findings such as cervical, uterine, and adnexal tenderness are insensitive and nonspecific, and vary when different clinicians perform the examination.²⁻⁵

In the “Limitations” section of the study, we acknowledged that pelvic inflammatory disease can be attributed to other organisms such as *Mycoplasma genitalium*, herpes, and normal flora overgrowth. However, the antibiotic regimens that the Centers for Disease Control and Prevention suggests are targeted toward chlamydia, gonorrhea, and trichomonas. Visualization or palpation provided by the pelvic examination does not clarify which organism is involved or which antibiotic is needed.

We agree with the concern for patients with negative test results for sexually transmitted infections and positive results for pelvic examinations, and the related risk of chronic complications because of untreated cases. In the article, we discuss a stepwise approach that begins with urine point-of-care testing for chlamydia, gonorrhea,⁶ trichomonas, candida, and clue cells. For patients with negative urine testing results, we suggested the pelvic examination can be considered to aid diagnosis.

Surveillance data show that rates of sexually transmitted infections and their subsequent complications are increasing every year, as is antibiotic resistance to gonorrhea. The current approach, which relies heavily on the pelvic examination, is proving unsuccessful at combating this epidemic. Empiric treatment of all patients with positive pelvic examination results, as Dr. Swartz points out, means that almost 60% of women are being treated with antibiotics that do not truly target the cause of their infection. This approach does not necessarily resolve the patient’s problem and creates resistance. The use of point-of-care sexually transmitted infection results and development of additional sensitive tests for other causes of cervicitis and pelvic inflammatory disease will aid in making a correct diagnosis. New treatment guidelines are imperative, and we encourage physicians who work in high-risk areas to repeat our study for external validity and assess whether it pertains primarily to cervicitis and not pelvic inflammatory disease.

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Hypothermic Cardiac Arrest Patients’ Selection Criteria for Extracorporeal Life Support Rewarming in Extreme Cases



To the Editor:

We read with great interest the recent case report by Forti et al.¹ We appreciate the professionalism and dedication of the rescue and medical teams and applaud their success. They pushed the limit of human potential for survival, proving once again that “no one is dead until warm and dead.”

We would like to add some additional comments in regard to patient selection criteria for extracorporeal life support rewarming in accidental hypothermia, and notably in regard to such extreme cases.

Although to our knowledge no cutoff for the duration of cardiopulmonary resuscitation (CPR) has been defined