impractical. Most patients with acute PID have lower abdominal pain of <3 weeks' duration, pelvic tenderness on bimanual pelvic examination, and evidence of lower genital tract infection (e.g., MPC). Approximately 60% of such patients have salpingitis at laparoscopy, and perhaps 10–20% have endometritis alone. Among the patients with these findings, a rectal temperature >38°C, a palpable adnexal mass, and elevation of the ESR to >15 mm/h also raise the probability of salpingitis, which has been found at laparoscopy in 68% of patients with one of these additional findings, 90% of patients with two, and 96% of patients with three. However, only 17% of all patients with laparoscopy-confirmed salpingitis have had all three additional findings.

In a woman with pelvic pain and tenderness, increased numbers of PMNs (30 per 1000× microscopic field in strands of cervical mucus) or leukocytes outnumbering epithelial cells in vaginal fluid (in the absence of trichomonal vaginitis, which also produces PMNs in vaginal discharge) increase the predictive value of a clinical diagnosis of acute PID, as do onset with menses, history of recent abnormal menstrual bleeding, presence of an IUD, history of salpingitis, and sexual exposure to a male with urethritis. Appendicitis or another disorder of the gut is favored by the early onset of anorexia, nausea, or vomiting; the onset of pain later than day 14 of the menstrual cycle; or unilateral pain limited to the right or left lower quadrant. Whenever the diagnosis of PID is being considered, serum assays for human β-chorionic gonadotropin should be performed; these tests are usually positive with ectopic pregnancy. Ultrasonography and magnetic resonance imaging (MRI) can be useful for the identification of tuboovarian or pelvic abscess. MRI of the tubes can also show increased tubal diameter, intratubal fluid, or tubal wall thickening in cases of salpingitis.

The primary and uncontested value of laparoscopy in women with lower abdominal pain is for the exclusion of other surgical problems. Some of the most common or serious problems that may be confused with salpingitis (e.g., acute appendicitis, ectopic pregnancy, corpus luteum bleeding, ovarian tumor) are unilateral. Unilateral pain or pelvic mass, although not incompatible with PID, is a strong indication for laparoscopy unless the clinical picture warrants laparotomy instead. Atypical clinical findings such as the absence of lower genital tract infection, a missed menstrual period, a positive pregnancy test, or failure to respond to appropriate therapy are other common indications for laparoscopy. Endometrial biopsy is relatively sensitive and specific for the diagnosis of endometritis, which correlates well with the presence of salpingitis.

Vaginal or endocervical swab specimens should be examined by NAATs for *N. gonorrhoeae* and *C. trachomatis*. At a minimum, vaginal fluid should be evaluated for the presence of PMNs, and endocervical secretions ideally should be assessed by Gram's staining for PMNs and gram-negative diplococci, which indicate gonococcal infection. The clinical diagnosis of PID made by expert gynecologists is confirmed by laparoscopy or endometrial biopsy in ~90% of women who also have cultures positive for *N. gonorrhoeae* or *C. trachomatis*. Even among women with no symptoms suggestive of acute PID who were attending an STD clinic or a gynecology clinic in Pittsburgh, endometritis was significantly associated with endocervical gonorrhea or chlamydial infection or with bacterial vaginosis, being detected in 26%, 27%, and 15% of women with these conditions, respectively.

TREATMENT PELVIC INFLAMMATORY DISEASE

Recommended combination regimens for ambulatory or parenteral management of PID are presented in **Table 163-6**. Women managed as outpatients should receive a combined regimen with broad activity, such as ceftriaxone (to cover possible gonococcal infection) followed by doxycycline (to cover possible chlamydial infection). Metronidazole can be added, if tolerated, to enhance activity against anaerobes; this addition should be strongly considered if bacterial vaginosis is documented. Although few methodologically sound clinical trials (especially with prolonged follow-up) have been conducted, one meta-analysis suggested a benefit of providing good coverage against anaerobes.

TABLE 163-6 COMBINATION ANTIMICROBIAL REGIMENS RECOMMENDED FOR OUTPATIENT TREATMENT OR FOR PARENTERAL TREATMENT OF PELVIC INFLAMMATORY DISEASE

Outpatient Regimens[a]	Parenteral Regimens
Ceftriaxone (250 mg IM once) ***plus*** Doxycycline (100 mg PO bid for 14 days) ***plus***[b] Metronidazole (500 mg PO bid for 14 days)	Initiate parenteral therapy with either of the following regimens; continue parenteral therapy until 48 h after clinical improvement; then change to outpatient therapy, as described in the text **Regimen A** Cefotetan (2 g IV q12h) *or* cefoxitin (2 g IV q6h) ***plus*** Doxycycline (100 mg IV or PO q12h) **Regimen B** Clindamycin (900 mg IV q8h) ***plus*** Gentamicin (loading dose of 2 mg/kg IV or IM, then maintenance dose of 1.5 mg/kg q8h)

[a]See text for discussion of options in the patient who is intolerant of cephalosporins. [b]The addition of metronidazole is recommended by some experts, particularly if bacterial vaginosis is present.

Source: Adapted from Centers for Disease Control and Prevention: MMWR Recomm Rep 59(RR-12):1, 2010.

The CDC STD treatment guidelines recommend initiation of empirical treatment for PID in sexually active young women and other women at risk for PID if they are experiencing pelvic or lower abdominal pain, if no other cause for the pain can be identified, and if pelvic examination reveals one or more of the following criteria for PID: cervical motion tenderness, uterine tenderness, or adnexal tenderness. Women with suspected PID can be treated as either outpatients or inpatients. In the multicenter Pelvic Inflammatory Disease Evaluation and Clinical Health (PEACH) trial, 831 women with mild to moderately severe symptoms and signs of PID were randomized to receive either inpatient treatment with IV cefoxitin and doxycycline or outpatient treatment with a single IM dose of cefoxitin plus oral doxycycline. Short-term clinical and microbiologic outcomes and long-term outcomes were equivalent in the two groups. Nonetheless, hospitalization should be considered when (1) the diagnosis is uncertain and surgical emergencies such as appendicitis and ectopic pregnancy cannot be excluded, (2) the patient is pregnant, (3) pelvic abscess is suspected, (4) severe illness or nausea and vomiting preclude outpatient management, (5) the patient has HIV infection, (6) the patient is assessed as unable to follow or tolerate an outpatient regimen, or (7) the patient has failed to respond to outpatient therapy. Some experts also prefer to hospitalize adolescents with PID for initial therapy, although younger women do as well as older women on outpatient therapy.

Currently, oral cephalosporins, doxycycline, and the fluoroquinolones do not provide reliable coverage for gonococcal infection. Thus, adequate oral treatment of women with serious intolerance to cephalosporins is a challenge. If penicillins are an option, amoxicillin/clavulanic acid combined with doxycycline has elicited a short-term clinical response in one trial. If fluoroquinolones are the only option and if the community prevalence and individual risk of gonorrhea are known to be low, oral levofloxacin (500 mg once daily) or ofloxacin (400 mg twice daily) for 14 days, with or without metronidazole, may be considered; moreover, clinical trials performed outside the United States support the effectiveness of oral moxifloxacin. In this case, it is imperative to perform a sensitive diagnostic test for gonorrhea (ideally, culture to test for antimicrobial susceptibility) before initiation of therapy. For women whose PID involves quinolone-resistant *N. gonorrhoeae*, treatment is uncertain but could include parenteral