

Pelvic Inflammatory Disease

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CME This clinical content conforms to AAFP criteria for continuing medical education (CME). See CME Quiz Questions on page 696.

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Jonathan Ross acts as an expert witness in civil cases relating to pelvic inflammatory disease. Jonathan Ross is the treasurer for the British Association for Sexual Health and HIV guidelines and an Editorial Board member for the European STI guidelines.

Pelvic inflammatory disease (PID) is caused by infection of the upper female genital tract, and is often asymptomatic.

- PID is the most common gynecologic reason for admission to the hospital in the United States, and is diagnosed in 1.1% of women 16 to 45 years of age consulting their primary care physician in England and Wales.

- Epithelial damage from infections such as *Chlamydia trachomatis* or *Neisseria gonorrhoeae* may allow opportunistic infection from many other bacteria.

- About 20% of women with PID become infertile, 40% develop chronic pain, and 1% of those who conceive have an ectopic pregnancy.

- Spontaneous resolution of symptoms may occur in some women.

- Empiric treatment is started as soon as the diagnosis of PID is suspected to minimize the risk of sequelae such as tubal obstruction and infertility.

- The positive predictive value of clinical diagnosis is 65% to 90% compared with laparoscopy, and observational studies suggest that delaying treatment by three days may impair fertility.

- The absence of infection from the lower genital tract does not exclude PID.

Oral antibiotics are likely to be beneficial and are associated with the resolution of symptoms and signs of pelvic infection, but we do not know which antibiotic regimen is best.

- Clinical and microbiological cure rates of 88% to 100% have been reported after oral antibiotic treatment.

- The risks of tubal occlusion and infertility depend on severity of infection before treatment. Clinical improvement following treatment may not necessarily translate into improved long-term fertility.

Oral antibiotics may be as effective as parenteral antibiotics in reducing symptoms and preserving fertility in women with mild to moderate PID, with fewer adverse effects. However, we do not know the optimal duration of treatment.

Women at high risk of PID include those with prior infection with *C. trachomatis* or *N. gonorrhoeae*, young age at onset of sexual activity, unprotected sexual intercourse with multiple partners, and history of PID. Risks of PID may be increased after instrumentation of the cervix, and testing for infection before such procedures is advisable. We do not know whether prophylactic antibiotics before insertion of an intrauterine device reduce these risks.

Definition

PID is inflammation and infection of the upper genital tract in women, typically involving the uterus and adnexa. Mild to moderate PID is defined as the absence of a tubo-ovarian abscess. Severe disease is defined as severe systemic symptoms or the presence of a tubo-ovarian abscess.

Incidence and Prevalence

The exact incidence of PID is unknown because the disease cannot be diagnosed reliably from clinical symptoms and signs. Direct visualization of the fallopian tubes by laparoscopy is the best single diagnostic test, but it is invasive, lacks sensitivity, and is not used routinely in clinical practice. PID is the most common gynecologic reason for admission to the hospital in the United States, accounting for 18 per 10,000 recorded hospital discharges. A diagnosis of PID is made in 1.1% of women 16 to 45 years of age consulting their primary care physician in England and Wales. However, because most PID is asymptomatic, this figure underestimates

the true prevalence. A crude marker of PID in resource-poor countries can be obtained from reported hospital admission rates, where it accounts for 17% to 40% of gynecologic admissions in sub-Saharan Africa, 15% to 37% in Southeast Asia, and 3% to 10% in India.

Etiology and Risk Factors

Factors associated with PID mirror those for sexually transmitted infections—young age, reduced socioeconomic circumstances, lower

educational attainment, and a recent new sex partner. Women considered at high risk of PID include those with prior chlamydia or gonorrhea, young age at onset of sexual activity, unprotected sexual intercourse with multiple partners, and history of PID. Infection ascends from the cervix, and initial epithelial damage caused by bacteria (especially *C. trachomatis* and *N. gonorrhoeae*) may allow the opportunistic entry of other organisms. Many different microbes, including *Mycoplasma genitalium* and anaerobes, may be isolated from the upper genital tract. The spread of infection to the upper genital tract can be increased by instrumentation of the cervix. It is reduced by barrier methods of contraception, levonorgestrel implants, and oral contraceptives, compared with other forms of contraception.

Prognosis

PID has a high morbidity; about 20% of affected women become infertile, 40% develop chronic pelvic pain, and 1% of those who conceive have an ectopic pregnancy. Uncontrolled observations suggest that clinical symptoms and signs resolve in a significant proportion of untreated women.

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Clinical Questions

How do different antimicrobial regimens compare when treating women with confirmed PID?

Likely to be beneficial	Antibiotics (for symptoms and microbiologic clearance in women with confirmed PID)
	Different durations of antibiotic treatment (no evidence as to which duration is best)
	Oral antibiotics (as effective as parenteral antibiotics for mild to moderate PID)

What are the effects of routine antibiotic prophylaxis to prevent PID before IUD insertion?

Unknown effectiveness	Routine antibiotic prophylaxis before IUD insertion in women at high risk
Unlikely to be beneficial	Routine antibiotic prophylaxis before IUD insertion in women at low risk

IUD = intrauterine device; PID = pelvic inflammatory disease.