

Pelvic inflammatory disease - Management

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How should I diagnose pelvic inflammatory disease?

- **A diagnosis of pelvic inflammatory disease (PID) should be made on clinical grounds.**
 - Negative swab results do not rule out a diagnosis of PID.
 - Do not delay making a diagnosis and initiating treatment whilst waiting for the results of laboratory tests.
- **Ectopic pregnancy should be ruled out.**
- **Suspect PID if any of the following symptoms are present:**
 - Pelvic or lower abdominal pain (usually bilateral).
 - Deep dyspareunia particularly of recent onset.
 - Abnormal vaginal bleeding (intermenstrual, postcoital, or 'breakthrough') which may be secondary to associated cervicitis and endometritis.
 - Abnormal vaginal or cervical discharge as a result of associated cervicitis, endometritis, or bacterial vaginosis. This is often very slight and may be transient, especially with chlamydial infection.
 - Right upper quadrant pain due to peri-hepatitis (Fitz–Hugh–Curtis syndrome).
 - Peri-hepatitis occurs in 10–20% of women with PID.
 - It is characterized by the development of adhesions between the liver and the peritoneum, causing right upper quadrant pain.
- **On examination** look for:
 - Lower abdominal tenderness — usually bilateral.
 - Adnexal tenderness (with or without a palpable mass), cervical motion tenderness, uterine tenderness (on bimanual vaginal examination).

- Abnormal cervical or vaginal mucopurulent discharge (on speculum examination).
- A fever of greater than 38°C, although the temperature is often normal.
 - **Take endocervical swabs for gonorrhoea and chlamydia and a high vaginal swab.** Consider taking blood for a white cell count, erythrocyte sedimentation rate (ESR), and C-reactive protein.
- For more information see [Investigations](#).

Basis for recommendation

Making a diagnosis of PID on history and examination alone

- These recommendation are based on expert opinion in guidelines on the management of acute pelvic inflammatory disease (PID) from the Royal College of Obstetricians and Gynaecologists [[RCOG, 2009](#)], the British Association for Sexual Health and HIV [[BASHH, 2005a](#)], and guidelines from the Department of Health and Human Services Centres for Disease Control and Prevention [[CDC, 2006](#)].
- Making an accurate clinical diagnosis of PID from the symptoms and signs has been described as 'little better than tossing a coin' [[Ross, 2002](#)] and clinicians should have a low threshold for initiating treatment.
- Symptoms and signs for suspected PID lack sensitivity and specificity [[RCOG, 2009](#)]. The positive predictive value of making a clinical diagnosis of PID compared with a laparoscopic diagnosis (using laparoscopic diagnosis as the gold standard) is 65–90% [[RCOG, 2009](#)]. However, although used as the gold standard, laparoscopy may have a low sensitivity, as 15–30% of women with suspected PID have no signs of acute infection on laparoscopy even when organisms have been found in their fallopian tubes [[RCOG, 2009](#)].
- The positive predictive value of a clinical diagnosis of PID also depends on epidemiological factors, including [[CDC, 2006](#)]:
 - The age of the woman (PID is more common in adolescents).
 - Whether the woman is attending a genito-urinary medicine clinic.

- Whether the woman is in a setting where the rates of chlamydia, gonorrhoea, and bacterial vaginosis are high [[BASHH, 2005a](#)].
- There is [evidence](#) from a large cross-sectional analysis that:
- Adnexal tenderness has a high sensitivity for PID.
- The finding most strongly associated with endometritis was a positive test result for *Chlamydia trachomatis* or *Neisseria gonorrhoeae*.

Endocervical and high vaginal swabs

- The recommendation that all women with suspected PID should be tested for *C. trachomatis* and *N. gonorrhoeae* (in general by taking endocervical swabs) is based on expert opinion in guidelines from the Royal College of Obstetricians and Gynaecologists [[RCOG, 2009](#)], the British Association for Sexual Health and HIV [[BASHH, 2005a](#)], the *European guideline for the management of pelvic inflammatory disease* [[Ross et al, 2008](#)], and guidelines from the Department of Health and Human Services Centres for Disease Control and Prevention [[CDC, 2006](#)]. These are the most common sexually transmitted organisms detected in PID.
- CKS recommends taking a high vaginal swab to look for other vaginal infections such as bacterial vaginosis and candidiasis.

Erythrocyte sedimentation rate (ESR), C-reactive protein, and leucocyte count

- Increased ESR, C-reactive protein, and leucocyte count supports the diagnosis of PID and can provide useful measures of disease severity [[RCOG, 2009](#)].
- However, the ESR or C-reactive protein and white cell count may be normal in mild or moderate PID [[Ross et al, 2008](#)].

Who is at risk of developing pelvic inflammatory disease?

- **Risk factors for developing pelvic inflammatory disease** include:
 - **Factors related to sexual behaviour:**
 - Young age (less than 25 years).
 - Early age of first coitus.

- Multiple sexual partners.
- Recent new partner (within the previous 3 months).
- History of sexually transmitted infection in the woman or her partner.
- **Recent instrumentation of the uterus or interruption of the cervical barrier:**
- Termination of pregnancy.
- Insertion of an intrauterine device (within the past 6 weeks).
- Hysterosalpingography.
- In vitro fertilization and intrauterine insemination.

Basis for recommendation

These recommendations are based on expert opinion in guidelines from the Royal College of Obstetricians and Gynaecologists [[RCOG, 2009](#)], the British Association for Sexual Health and HIV [[BASHH, 2005a](#)], the *European guideline for the management of pelvic inflammatory disease* [[Ross et al, 2008](#)], and a non-systematic review [[Barrett and Taylor, 2005](#)].

What else might it be?

- Lower abdominal pain in a young woman may also be due to:
 - An ectopic pregnancy.
 - Threatened abortion.
 - Ruptured corpus luteal cyst.
 - Acute appendicitis:
 - Nausea and vomiting occur in most women with appendicitis, but in only 50% of women with pelvic inflammatory disease.
 - Cervical motion pain occurs in about 25% of women with acute appendicitis.
 - Endometriosis.

- Gastrointestinal disorders (most commonly irritable bowel syndrome).
- Complications of an ovarian cyst, such as rupture, torsion, or haemorrhage.
- Urinary tract infection.
- Functional pain (that is of unknown physical origin). There may be longstanding symptoms.
- Mittelschmerz pain.

Basis for recommendation

These recommendations are based on expert opinion in guidelines from the Royal College of Obstetricians and Gynaecologists [[RCOG, 2009](#)], the British Association for Sexual Health and HIV [[BASHH, 2005a](#)], the *European guideline for the management of pelvic inflammatory disease* [[Ross et al, 2008](#)], and a guideline that was adapted for use in the Department of Pediatrics at the University of Texas — Houston Health Science Center [[Eissa and Cromwell, 2003](#)].

What investigations should I do?

- Do a pregnancy test if pregnancy is a possibility.
- **Take endocervical swabs for *Chlamydia trachomatis* and *Neisseria gonorrhoeae*.**
 - If uncertain, confirm with the local laboratory which testing methods are available, the samples required, and how soon these should reach the laboratory.
 - In general, chlamydia should be tested for by taking endocervical samples, using nucleic acid amplification tests (NAATs). First-catch urine samples or vulvovaginal swabs may be accepted for NAAT testing by some laboratories.
 - Endocervical swabs for *N. gonorrhoeae* should be sent in transport medium to arrive at the laboratory for culture within 24 hours. NAATs may be used, but a positive NAAT should be confirmed using a second NAAT test with a different primer sequence, or with culture.

- Adequate sample collection is important. When taking an endocervical swab, the swab should be inserted inside the cervical os and firmly rotated against the endocervix. Swabbing a collection of discharge will result in an inadequate specimen, so it is generally recommended that excess cervical secretions are cleaned away prior to taking the swab.

- There is no need to take a urethral swab unless local guidelines suggest this.

- **If possible, look for endocervical or vaginal pus cells under a microscope on a wet-mount vaginal smear:**

- If absent, a diagnosis of pelvic inflammatory disease (PID) is unlikely.

- Excess leucocytes are associated with PID but they are also found in women with lower genital tract infection.

- **Consider performing the following tests. If elevated they support the diagnosis of PID but are non-specific:**

- Erythrocyte sedimentation rate (ESR).

- C-reactive protein.

- Leucocyte count.

Basis for recommendation

Taking swabs for *Chlamydia trachomatis* and *Neisseria gonorrhoeae*

- The recommendation that all women with suspected PID should be tested for *C. trachomatis* and *N. gonorrhoeae* is based on expert opinion in guidelines from the Royal College of Obstetricians and Gynaecologists [[RCOG, 2009](#)], the British Association for Sexual Health and HIV [[BASHH, 2005a](#)], the *European guideline for the management of pelvic inflammatory disease* [[Ross et al, 2008](#)], and guidelines from the Department of Health and Human Services — Centres for Disease Control and Prevention [[CDC, 2006](#)].

- A positive result supports a diagnosis of PID and reinforces the need to treat sexual partners.

o However, a negative result does not exclude PID [[BASHH, 2005a](#)].

Interpreting the results of a wet-mount smear

- The absence of endocervical or vaginal pus cells suggests that the diagnosis is not PID. The negative predictive value for a diagnosis of PID is 95% (that is, 19/20 people who have a negative test result will not have the disease) [[BASHH, 2005a](#); [RCOG, 2009](#)].
- The presence of pus cells is a non-specific finding. The positive predictive value is low (that is, the proportion of people who have a positive test result and who have PID is only 17%) [[BASHH, 2005a](#); [RCOG, 2009](#)].

Erythrocyte sedimentation rate (ESR), C-reactive protein, and leucocyte count

- Increased ESR or C-reactive protein, and leucocytosis, all support the diagnosis of PID and can provide a useful measure of disease severity [[RCOG, 2009](#)].
- However, the ESR, C-reactive protein, or white cell count may be normal in mild or moderate PID [[Ross et al, 2008](#)].

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How should I manage someone with suspected PID?

- **Women with suspected mild or moderate pelvic inflammatory disease (PID) may be treated in primary care if an ectopic pregnancy can be ruled out.**
- **Test for other sexually transmitted infections and other genital infections.**
- o Refer the woman and her [sexual partner\(s\)](#) to a genito-urinary medicine or sexual health clinic to facilitate screening for infections (and contact tracing). Ideally the woman should be screened for other sexually transmitted diseases before commencing antibiotics so that a diagnosis can be made and

is not compromised. However starting antibiotics is a priority if PID is suspected and should not be delayed whilst awaiting an appointment.

▪ **Provide pain relief with ibuprofen or paracetamol.** If the response to either drug is insufficient consider:

- Combining/alternating paracetamol *and* ibuprofen, *or*
- Adding codeine to paracetamol or ibuprofen.

▪ **Start empirical antibiotics as soon as a presumptive diagnosis of PID is made clinically.** Do not wait for swab results.

◦ **If the risk of gonococcal infection is low** prescribe any of the following:

◦ Ofloxacin 400 mg orally twice daily *plus* oral metronidazole 400 mg twice daily, both for 14 days.

◦ Ceftriaxone 250 mg as a single intramuscular dose, *plus* oral doxycycline 100 mg twice daily *and* oral metronidazole 400 mg twice daily, both for 14 days.

◦ Ceftriaxone 250 mg as a single intramuscular dose, followed by oral azithromycin 1 g per week for 2 weeks (but there is less evidence to support this regimen).

◦ Oral cefixime 400 mg as a single dose (off-label use) can be used as an alternative to ceftriaxone 250 mg in the above regimens.

◦ **If the risk of gonococcal infection is high** (the woman's partner has gonorrhoea, her symptoms and signs are clinically severe, or she has had sexual contact whilst abroad) prescribe either of the following:

◦ Ceftriaxone 250 mg as a single intramuscular dose, *plus* oral doxycycline 100 mg twice daily *and* oral metronidazole 400 mg twice daily, both for 14 days.

◦ Cefixime 400 mg as a single oral dose (off-label use), *plus* oral doxycycline 100 mg twice daily *and* oral metronidazole 400 mg twice daily, both for 14 days.

- Regimens containing ofloxacin or azithromycin are not recommended.
- **A regimen of metronidazole and doxycycline (without intramuscular ceftriaxone) is not recommended.**
- See [Prescribing information](#).
- **If there is a risk of a very early pregnancy** (too early for a pregnancy test to be positive):
 - Offer paracetamol first line for analgesia. Ibuprofen is an alternative if paracetamol is ineffective but should only be used before 30 weeks gestation.
 - The risk of giving any of the recommended antibiotic regimens at this stage of pregnancy is low. If drug toxicity did occur at this stage of pregnancy, it would result in failed implantation. For a more detailed discussion of potential risks, see [Basis for recommendation](#).
 - Admit women with a positive pregnancy test urgently.
 - Treat women who are infected with HIV the same treatment as women who are not infected. PID should be managed in conjunction with their HIV physician.

Basis for recommendation

Women with mild or moderate PID can be treated in primary care

- There is [evidence](#) from a large randomized trial that women with mild-to-moderate PID can be safely treated at home. Outpatient and inpatient treatments are equally effective for women with clinically mild-to-moderate PID, and there is evidence that long-term reproductive outcomes are also similar.

Importance of excluding pregnancy

- National guidance from the Royal College of Obstetrics and Gynaecology stresses the importance of excluding an ectopic pregnancy in all women suspected of having PID [[RCOG, 2009](#)].

Referral for contact tracing and screening

- These recommendations are based on guidance from the Royal College of Obstetricians and Gynaecologists [[RCOG, 2009](#)] and the British Association for Sexual Health and HIV [[BASHH, 2005](#)].

Analgesia

- This recommendation is based on expert advice in the *European guideline for the management of pelvic inflammatory disease* [[Ross et al, 2008](#)] and the British Association for Sexual Health and HIV [[BASHH, 2005](#)].

Importance of prompt treatment

- It is likely that delaying treatment increases the risk of the PID becoming worse, and increases the risk of complications such as ectopic pregnancy, subfertility, or chronic pelvic pain occurring in the future [[BASHH, 2005](#); [CDC, 2006](#); [Ross, 2008](#); [RCOG, 2009](#)].
 - A low threshold for commencing an empirical antibiotic (that is, before the results of tests are available) is recommended because of the risk of serious complications if treatment is delayed. This is particularly important in women younger than 25 years of age because there is a higher incidence of PID in this age group.
 - Negative swabs do not exclude PID and should not necessarily influence the decision to treat.
 - There is limited [evidence](#) from a case-controlled study that fertility may be impaired and ectopic pregnancy may be more likely if treatment for acute pelvic inflammatory disease is delayed for 3 days or more after the onset of symptoms.

Recommended antibiotic regimens

- The antibiotic regimens included are those which are practical for use in primary care (that is, they do not require intravenous antibiotics) and are recommended in guidelines produced by the Royal College of Obstetricians and Gynaecologists and the British Association for Sexual Health and HIV [[BASHH, 2005](#); [RCOG, 2009](#)].
 - These guidelines recognize that there is uncertainty about the optimum treatment regimen [[RCOG, 2009](#)] due to limited [evidence](#) from clinical trials.

However, the recommended regimens are likely to be effective against the most likely pathogens involved (*Chlamydia trachomatis*, *Neisseria gonorrhoeae*, anaerobes).

- There is a better evidence base for the use of cefoxitin than ceftriaxone but, as it is not easily available in the UK, intramuscular ceftriaxone is recommended in its place [[RCOG, 2009](#)].

- Metronidazole is included in the intramuscular ceftriaxone plus oral doxycycline regimen to improve coverage for anaerobic bacteria.

- Ofloxacin and azithromycin should be avoided in women at high risk of gonorrhoea because of increasing resistance in the UK [[BASHH, 2005](#); [BASHH, 2005](#)].

- Although PID presenting in primary care may be less severe than in other settings, there is no published evidence to support the use of less intensive regimens.

- Recent guidance from the Royal College of Obstetricians and Gynaecologists recommends the combination of intramuscular ceftriaxone and oral azithromycin but states that clinical trial evidence for this regimen is less strong [[RCOG, 2009](#)]. There is limited [evidence](#) from two randomized controlled trials that azithromycin used alone or in combination with ceftriaxone is effective in the treatment of PID.

- Oral cefixime as a single dose (off-label use) is recommended as an alternative to the intramuscular ceftriaxone component of the regimens by the Health Protection Agency, for practical issues of administration in primary care [[HPA and Association of Medical Microbiologists, 2010](#)].

- Ceftriaxone is included in the regimen primarily to cover gonorrhoea. A single dose of oral cefixime 400 mg is an alternative treatment option recommended for gonorrhoea by British Association for Sexual Health and HIV (BASHH) [[BASHH, 2005](#)], a primary care guideline [[RCGP and BASHH, 2006](#)], and a European guideline [[Bignell, 2009](#)].

Antibiotic regimens *not* recommended

- A combination of metronidazole and doxycycline (without intramuscular ceftriaxone). Although this regimen has been recommended in the past and is still used in primary care it is not recommended in the guidelines produced by the British Association for Sexual Health and HIV or the Royal College of Obstetricians and Gynaecologists [[BASHH, 2005](#); [RCOG, 2009](#)]. Guidelines from the Royal College of Obstetricians and Gynaecologists state that there are no clinical trials adequately assessing the effectiveness of this regimen, and its use in isolation (that is, without intramuscular ceftriaxone) is not recommended [[RCOG, 2009](#)]. There is [evidence](#) from a retrospective study and a systematic review that metronidazole combined with doxycycline is not suitable for the treatment of acute PID in the UK. The addition of intramuscular ceftriaxone as an initial dose significantly improved the clinical cure rate in the one retrospective study [[Piyadigamage and Wilson, 2005](#)].
- Azithromycin used alone (that is, without intramuscular ceftriaxone). Data supporting its use alone are limited and it is not recommended [[RCOG, 2009](#)].
- Moxifloxacin alone. There is [evidence](#) from one high quality randomized controlled trial that moxifloxacin has similar efficacy to a combination of ofloxacin and metronidazole. CKS does not recommend its use as it is a black triangle drug (under intensive surveillance by the Medicines and Healthcare products Regulatory Agency [MHRA]), and there are concerns that it may have similar issues with gonococcal resistance to ofloxacin. In addition, although moxifloxacin is now licensed for the treatment of PID, the Medicines and Healthcare products Regulatory Agency (MHRA) has restricted its indications to second-line use to when other medicines cannot be prescribed or have failed. This is because of an increased risk of life-threatening liver reactions and other serious risks associated with its use [[MHRA, 2008](#); [MHRA, 2011](#)].

Drug choice during very early pregnancy (before a positive pregnancy test)

- Experience suggests that paracetamol can be used at any time during pregnancy or breastfeeding [[NTIS, 2004](#); [Schaefer et al, 2007](#)].
- The UK Teratology Information Service (UKTIS, formerly the National Teratology Information Service [NTIS]), reviewed safety data of NSAIDs from published research and postmarketing surveillance systems. They concluded that 'the available data do not indicate that exposure to ibuprofen before 30 weeks of pregnancy is associated with an increased risk of congenital defects or spontaneous abortions' [[NTIS, 2004](#)].

- The Royal College of Obstetricians and Gynaecologists recommends that the risk of giving any of their recommended antibiotic regimens in very early pregnancy (before a positive pregnancy test) is low, since significant drug toxicity results in failed implantation [[RCOG, 2009](#)].
- Ceftriaxone has not specifically been studied during pregnancy. However, the risk associated with use of cephalosporins during pregnancy is thought to be low and, although data are limited for individual agents such as ceftriaxone, the cephalosporins as a class are considered to be an appropriate choice during pregnancy [[NTIS, 2008](#)]. Although ceftriaxone crosses the placental barrier, it has not been associated with adverse events on fetal development in laboratory animals [[ABPI Medicines Compendium, 2009](#)].
- Doxycycline is contraindicated beyond the 15th week of gestation because, from the 16th week of pregnancy it causes tooth and bone discolouration and inhibits bone growth. However, it can be used in the first trimester. Inadvertent first-trimester use of tetracyclines occurs frequently and has not been associated with an increased risk of congenital malformations [[Schaefer et al, 2007](#)].
- Metronidazole has been in clinical use for a long time, and experience suggests that it is not teratogenic in humans [[Schaefer et al, 2007](#)]. A recent prospective controlled study in 228 women exposed to metronidazole in pregnancy, 86% of whom had first trimester exposure, confirms these findings [[Schaefer et al, 2007](#)].
- Ofloxacin has only limited pregnancy-exposure data. Quinolones have caused arthropathy in animal studies. However, a recent study (most of the data are on ciprofloxacin and norfloxacin, but some are on ofloxacin) did not find that quinolone use in the first trimester of pregnancy was associated with an increased risk of malformations or other adverse effects on pregnancy outcome [[Schaefer et al, 2007](#)].
- There are fewer published data on the use of azithromycin rather than erythromycin during pregnancy and breastfeeding. The limited published data and follow-up data collected by the UK Teratology Information Service (UKTIS, formerly the National Teratology Information Service [NTIS]), do

not demonstrate an increased risk of congenital malformations following exposure to azithromycin in human pregnancy [[NTIS, 2008](#)].

Management of women with HIV

▪ Women with HIV may experience more severe symptoms of PID, but will usually respond to the standard antibiotic regimens. No change in treatment from that recommended for women without HIV infection is required [[BASHH, 2005](#)]. There is no evidence to suggest that HIV-positive women benefit from hospitalization or parenteral treatment [[Sweet, 2009](#)].

When should I seek specialist advice or admit urgently?

▪ **Admit urgently** if:

- Ectopic pregnancy cannot be ruled out.
- Symptoms and signs are severe (such as nausea, vomiting, and a fever greater than 38°C).
- There are signs of pelvic peritonitis.
- A surgical emergency such as acute appendicitis cannot be ruled out.
- The woman is pregnant.
- A tubo-ovarian abscess is suspected.
- The woman is unwell and there is diagnostic doubt.
- The woman is unable to follow or tolerate an outpatient regimen.

▪ **Consider seeking specialist advice:**

- If the woman is immunocompromised (such as HIV, taking immunosuppressants).
- Admission is required for women who have HIV only if they have clinically severe pelvic inflammatory disease (PID).
- Discussion with a genito-urinary specialist or gynaecologist is advised if there is doubt regarding whether admission is necessary.

- If peri-hepatitis (Fitz–Hugh–Curtis syndrome) is suspected.

Basis for recommendation

Urgent admission

- These recommendations are based on expert opinion in guidelines from the Royal College of Obstetricians and Gynaecologists [[RCOG, 2009](#)], the British Association for Sexual Health and HIV [[BASHH, 2005a](#)], the *European guideline for the management of pelvic inflammatory disease* [[Ross et al, 2008](#)], and guidelines from the Department of Health and Human Services Centres for Disease Control and Prevention [[CDC, 2006](#)].

Pregnant women

- If the pregnancy is intrauterine, then pelvic inflammatory disease (PID) is rare except in the case of septic abortion [[RCOG, 2009](#)].
- The recommendation that pregnant women with PID should be admitted to hospital under the care of an obstetrician is based on expert opinion, as intravenous antibiotics are required because of the increased risk of maternal and fetal morbidity and pre-term delivery [[BASHH, 2005a](#); [CDC, 2006](#); [Ross et al, 2008](#); [RCOG, 2009](#)].
- Neonatal complications can occur as a result of perinatal transmission of infection, such as ophthalmia neonatorum (due to *Chlamydia trachomatis* or *Neisseria gonorrhoeae* infection) and chlamydial pneumonitis [[Brocklehurst and Rooney, 1998](#)].

Women with HIV

- Women with HIV may experience more severe symptoms of PID. Expert opinion in guidelines from the Royal College of Obstetricians and Gynaecologists and the British Association for Sexual Health and HIV [[BASHH, 2005a](#); [RCOG, 2009](#)] recommend that only women with severe disease should be admitted.

Suspected peri-hepatitis

- Guidelines from the Royal College of Obstetricians and Gynaecologists and the British Association for Sexual Health and HIV [[BASHH, 2005a](#); [RCOG, 2009](#)] state that although laparoscopic division of adhesions is sometimes performed, there is insufficient trial evidence to

make any recommendations other than giving the usual treatment for PID. CKS therefore recommends seeking specialist advice if peri-hepatitis is suspected.

What advice should I give?

- Explain:
 - The importance of completing the course of antibiotics (even if swabs are negative) in order to reduce the risk of long-term complications such as infertility, ectopic pregnancy, and chronic pelvic pain.
 - The exception to this is if the woman has mild or moderate pelvic inflammatory disease (PID) and is unable to tolerate metronidazole. She may stop taking the metronidazole but must continue with the other antibiotics in the regimen.
 - The importance of screening for sexually transmitted infections.
 - The need for contact tracing, and screening and treatment of sexual partners to prevent reinfection.
 - The need to avoid unprotected intercourse until both the woman and her partner(s) have completed treatment.
 - That fertility is usually not affected in mild PID if it is treated promptly, but repeated episodes of PID are associated with an exponential increase in the risk of infertility.

Basis for recommendation

These recommendations are based on expert advice in guidelines from the Royal College of Obstetricians and Gynaecologists, the British Association for Sexual Health and HIV [[BASHH, 2005a](#)], and the *European guideline for the management of pelvic inflammatory disease* [[Ross et al, 2008](#)].

Complications of pelvic inflammatory disease (PID)

- Tubal infertility:

o There is [evidence](#) from prospective cohort studies that the risk of infertility is related to the number of episodes of pelvic inflammatory disease (PID) and their severity: 0.6% of women had tubal-factor infertility after an episode of mild PID, and 21.4% of women had tubal-factor infertility after an episode of severe PID.

- The risk of ectopic pregnancy is increased ten-fold after one episode of PID [[Oakeshott, 2003](#)].
- Estimates vary but chronic pelvic or abdominal pain (lasting for more than 6 months) develops in 18% of women who have had PID [[Drife and Magowan, 2004](#)]. There is evidence from a large randomized trial of 831 women who have had an episode of mild-to-moderate PID that chronic pelvic pain may be present in 34% of women at a mean follow up of 35 months [[Ness et al, 2002](#)].
- About a third of women have repeated infections [[Drife and Magowan, 2004](#)].

Discontinuation of metronidazole if it is not tolerated

- Although anaerobes may have a role in the pathogenesis of PID, they are probably of more importance in women who have severe PID. Expert opinion in guidelines from the Royal College of Obstetricians and Gynaecologists [[RCOG, 2009](#)], the British Association for Sexual Health and HIV [[BASHH, 2005a](#)], and the *European guideline for the management of pelvic inflammatory disease* [[Ross et al, 2008](#)], based on studies which have not included metronidazole but have had good outcomes, is that if the PID is not severe and metronidazole is not tolerated then it may be stopped.

Referral for contact tracing and screening

- These recommendations are based on expert opinion in guidelines from the Royal College of Obstetricians and Gynaecologists [[RCOG, 2009](#)] and the British Association for Sexual Health and HIV [[BASHH, 2005a](#)].

Avoiding unprotected sexual intercourse

- These recommendations are based on expert opinion in guidelines from the Royal College of Obstetricians and Gynaecologists [[RCOG, 2009](#)] and the British Association for Sexual Health and HIV [[BASHH, 2005a](#)].

How should I manage sexual partners?

- Ideally, current partners and recent partners (within the last 6 months) should be seen in a genito-urinary medicine (GUM) clinic, or primary care facility with equivalent expertise for screening, treatment, and contact tracing.
- Partners may need to be managed in primary care if they refuse or are unable to attend a GUM clinic, or if there is likely to be an unacceptable delay in accessing specialist services.
- Test for chlamydia, and offer empirical treatment as available tests have variable sensitivity. For more information, see the CKS topic on [Chlamydia - uncomplicated genital](#).
- Test for gonorrhoea. Only offer treatment for gonorrhoea if either the woman's swabs or her partner's swabs are positive for gonorrhoea. For more information, see the CKS topic on [Gonorrhoea](#).
- If it is not possible to adequately screen the partner for chlamydia and gonorrhoea, empirical treatment for chlamydia *and* gonorrhoea should be given.
- **Advise sexual abstinence until both the woman with pelvic inflammatory disease and her partner have completed the course of treatment.** Use a barrier method if sexual intercourse cannot be avoided.

Basis for recommendation

- These recommendations are based on expert opinion in guidelines from the Royal College of Obstetricians and Gynaecologists [[RCOG, 2009](#)] and the British Association for Sexual Health and HIV [[BASHH, 2005a](#)].

What follow up should I arrange?

- **Review within 72 hours.**
- There should be demonstrable clinical improvement (such as a reduction in abdominal tenderness, and a reduction in uterine, adnexal, and cervical motion tenderness).

- If there has been little or no improvement, consider admitting to hospital or review the diagnosis.
- Check the antibiotic sensitivities from swab results. Even if swabs are negative, treatment should be continued.
- If metronidazole is not tolerated it may be discontinued in women with mild or moderate pelvic inflammatory disease (PID) as it has uncertain efficacy in this group.
- **Consider further review at about 4 weeks** in order to:
 - Check compliance with, and response to, treatment.
 - Confirm that sexual contacts have been screened and treated.
 - Discuss the potential sequelae of PID.
- **Tests of cure** are only necessary if:
 - Symptoms persist after treatment.
 - Antibiotic resistance is likely (particularly in cases of gonorrhoea).
 - Poor compliance with treatment is suspected, or the treatment has not been tolerated.
 - There is a possibility of reinfection (that is, further contact with untreated partners).
 - Sensitivity testing has not been undertaken or has indicated resistance.

Basis for recommendation

These recommendations are based on expert opinion in guidelines from the Royal College of Obstetricians and Gynaecologists [[RCOG, 2009](#)], the British Association for Sexual Health and HIV [[BASHH, 2005a](#)], and the Department of Health and Human Services — Centres for Disease Control and Prevention [[CDC, 2006](#)].

Admission, if the woman is failing to improve

- Failure to improve substantially after 72 hours suggests a need for further investigation, intravenous therapy, or surgical intervention [[BASHH, 2005a](#)].

Discontinuation of metronidazole if it is not tolerated

- Although anaerobes may have a role in the pathogenesis of pelvic inflammatory disease (PID), they are probably of more importance in women who have severe PID. Expert opinion in guidelines from the Royal College of Obstetricians and Gynaecologists [[RCOG, 2009](#)], the British Association for Sexual Health and HIV [[BASHH, 2005a](#)], and the *European guideline for the management of pelvic inflammatory disease* [[Ross et al, 2008](#)], based on studies which have not included metronidazole but have had good outcomes, suggests that if the PID is not severe and metronidazole is not tolerated then it may be stopped.

How should I manage a woman who has an intrauterine device in situ?

- **Consider removing any contraceptive intrauterine device (IUD) in women presenting with pelvic inflammatory disease (PID), after discussion with the woman.**

- Experts agree that the device should be removed if the woman wishes removal or if symptoms have not resolved within 72 hours.

- Evidence is limited and expert opinion is divided over whether it is necessary to remove the IUD at the initial presentation.

- If a decision is made to remove the IUD, ask if the woman has had sexual intercourse within the last 7 days and consider offering emergency hormonal contraception. For more information see the CKS topic on [Contraception - emergency](#).

- **If the woman develops pelvic pain and has had actinomyces-like organisms (ALOs) identified on a smear in the past:**

- Take endocervical swabs, *and*

- Urgently seek specialist advice regarding treatment.

- Consider removal of the IUD.

Basis for recommendation

Removal of an intrauterine device (IUD)

- [Evidence](#) on whether or not to remove an intrauterine device in a woman who has pelvic inflammatory disease is limited and conflicting. There are no long term data on the effects on fertility.
- Expert opinion differs regarding women with pelvic inflammatory disease (PID) who have an IUD:
 - Expert advice in the Faculty of Sexual and Reproductive Healthcare clinical guideline on intrauterine contraception does not routinely recommend the removal of an IUD. The Faculty's Clinical Effectiveness Unit supports the continued use of intrauterine contraception and appropriate antibiotic treatment if PID is suspected; there is no need to remove the IUD unless symptoms fail to resolve within 72 hours or the woman wants it removed [[FFPRHC, 2006](#); [FSRH, 2007](#)].
 - Expert opinion in guidelines on the management of acute PID from the Royal College of Obstetricians and Gynaecologists [[RCOG, 2009](#)] advises that consideration be given to removing the IUD especially if symptoms have not resolved within 72 hours.
 - The British Association for Sexual Health and HIV recommend considering removing the IUD if the woman develops PID. They advise balancing the decision to remove the IUD against the risk of pregnancy if the woman has had sexual intercourse in the preceding 7 days [[BASHH, 2005a](#)].
 - Selected practice recommendations for contraceptive use from the World Health Organization state that [[WHO, 2004](#)]:
 - There is no need for removal of the IUD if the woman wishes to continue its use.
 - If the woman wishes removal, remove it after antibiotic treatment has been started.
 - If the infection does not improve then generally the course would be to remove the IUD and continue antibiotics. If the IUD is not removed then the antibiotic should be continued and the woman should be monitored closely.

Presence of actinomyces-like organisms (ALOs)

- Expert opinion in guidelines from the Faculty of Sexual and Reproductive Healthcare is that [\[FSRH, 2007\]](#):

- The role of ALOs in infection in women using intrauterine contraception is unclear. *Actinomyces israelii* is a commensal organism in the female genital tract *and* although these organisms may be found on cervical smears or swabs, their presence is not diagnostic or predictive of disease. Therefore, there is no need to remove an IUD if the woman does not have symptoms.

- If PID is suspected in a woman who has a history of ALOs on a cervical smear, it is important to consider that the infection may be due to other organisms.

- It may be appropriate to remove the IUD.

What contraceptive advice should I give?

- **Women who have a history of, or currently have, pelvic inflammatory disease (PID) may use the following contraceptive methods** (UK Medical Eligibility Criteria [UKMEC] category 1, that is, a condition for which there is no restriction for the use of the contraceptive method):

- Combined oral contraceptive (COC) pill.

- Progestogen-only pill.

- Depot progestogen injection.

- Progesterone-only contraceptive implant.

- **For women with a history of PID who wish to have an intrauterine device (IUD) fitted:**

- Explain that the relative risk of PID is increased six-fold in the 20 days following insertion, but that the absolute risk remains low (approximately 1%). After this time, the risk is the same as the population without an IUD and remains low unless there is exposure to sexually transmitted infection (STI).

- If the woman has had a subsequent pregnancy, there are no restrictions on the use of both the copper IUD and the levonorgestrel intrauterine system (LNG-IUS) (UKMEC category 1).
- If the woman has *not* had a subsequent pregnancy, the benefit of using either the copper IUD or the LNG-IUS generally outweighs the theoretical or proven risks (UKMEC category 2, that is, a condition where the advantages of using the method generally outweigh the theoretical or proven risks).
- Test for the following infections a few days before IUD insertion to allow infection to be treated before or at the time of insertion:
 - *Chlamydia trachomatis* in women at risk of STIs.
 - *Neisseria gonorrhoeae* in women at risk of STIs from areas where gonorrhoea is prevalent.
 - All STIs, if this is requested by the woman.
 - Consider taking a high vaginal swab to test for other vaginal infections.
 - Give prophylactic antibiotics before IUD insertion if testing for STIs is not possible or has not been completed.
 - There is no consensus about which antibiotic regimen to use. Choose a regimen (seeking specialist advice where appropriate) that will treat chlamydia infection and that will also treat gonorrhoea if local prevalence is high.
- **If the woman currently has PID, an IUD should not be inserted** as there is an unacceptable health risk (UKMEC category 4, that is, a condition which represents an unacceptable health risk if the contraceptive method is used).
- **If the woman requires sterilization:**
 - A pelvic examination should be done to rule out recurrent or persistent PID and to determine the mobility of the uterus.
 - Provided there is no current PID, and if the woman has had a subsequent pregnancy, there are no medical reasons to deny sterilization.

- If the woman has not had a subsequent pregnancy or has current PID, provide an alternative form of contraception until she can be fully assessed. At operation, it may be difficult to localize the tubes due to pelvic adhesions.

- **Women should be advised to use a barrier method of contraception to protect against STIs.**

Basis for recommendation

Choice of contraception

- These recommendations are based on the UK Medical Eligibility Criteria (UKMEC) for contraceptive use [[FFPRHC, 2006](#)] and a guideline from the Faculty of Sexual and Reproductive Healthcare [[FSRH, 2007](#)].

Intrauterine device (IUD)

- A review of the World Health Organization's experience of pelvic inflammatory disease (PID) associated with IUD use from around the world included 12 randomized studies and one non-randomized study, and found that [[FSRH, 2007](#)]:

- Amongst 22,908 IUD insertions and during 51,399 woman-years of follow up, the overall rate of PID was 1.6 cases per 1000 years of use.

- The risk of PID was six-fold higher during the 20 days after IUD insertion than during later times.

Testing for bacterial vaginosis

- CKS recommends taking a high vaginal swab to look for other vaginal infections such as bacterial vaginosis.

Recommendation on antibiotic prophylaxis

- The recommendation to test for sexually transmitted infections (STIs), or prescribe prophylactic antibiotics if testing for STIs is not possible or has not been completed, before IUD insertion is based on expert opinion in guidelines from the National Institute for Health and Clinical Excellence [[NICE, 2005](#)] and the Faculty of Sexual and Reproductive Healthcare [[FSRH, 2007](#)] as the risk of PID following insertion of an IUD where infection is present is unknown.

- Both guidelines recommend testing for STIs and prescribing prophylactic antibiotics if testing for STIs is not possible or has not been completed before an IUD is inserted in women *at increased risk of STIs*. Women who have a history of PID are at increased risk of STIs.

- However, there is good [evidence](#) from a Cochrane systematic review that the use of doxycycline or azithromycin orally before IUD confers little benefit even in populations with a high prevalence of STIs.

Sterilization

- These recommendations are based on the UKMEC for contraceptive use [[FFPRHC, 2006](#)].

Protection against STIs

- Evidence supports the use of male or female condoms to reduce the risk of several sexually transmitted infections (STIs). For more information see the section on [Barrier methods in preventing STIs](#) in the CKS topic on [Contraception](#). However, even with consistent and correct use, infections may still (rarely) be transmitted [[FFPRHC, 2007a](#)].

What investigations and treatments are available in secondary care?

- In secondary care, investigations that might be considered to help make a diagnosis of pelvic inflammatory disease (PID) include:

- Transvaginal ultrasound scanning supported by power Doppler. This can identify inflamed and dilated tubes and tubo-ovarian masses, especially when there is diagnostic difficulty. However, similar changes may occur in endometriosis or early ectopic pregnancy.

- Magnetic resonance imaging and computerized tomography.

- Laparoscopy with direct visualization of the fallopian tubes. This is an invasive procedure and is not routinely used in clinical practice.

- Endometrial biopsy.

- Surgical management may include:

- Laparoscopy: division of adhesions and drainage of pelvic abscesses may help early resolution.
- Ultrasound-guided aspiration of pelvic fluid collections.
- Adhesiolysis if there is peri-hepatitis.

Basis for recommendation

Other investigations in secondary care

- Transvaginal ultrasound is most useful in detecting large tubal swellings or fluid collections which only occur in women with severe pelvic inflammatory disease (PID) in whom irreversible tubal damage may already have occurred [[Ross, 2003](#)]. Power Doppler ultrasound is able to detect changes in blood flow associated with the hyperaemia that occurs with tubal inflammation [[Ross, 2003](#)].
- The recommendation that transvaginal ultrasound scanning supported by power Doppler may be helpful is based on expert opinion in a guideline from the Royal College of Obstetricians and Gynaecologists who also commented that there is limited evidence that magnetic resonance imaging and computerized tomography can assist in making a diagnosis [[RCOG, 2009](#)].
- Laparoscopy may provide information on the severity of the condition. However there is potential difficulty in identifying mild intra-tubal inflammation or endometritis and there is diagnostic variability between clinicians [[Ross, 2003](#); [BASHH, 2005a](#); [RCOG, 2009](#)].
- Endometrial biopsy may be helpful, but there is insufficient evidence to support its routine use [[Ross et al, 2008](#)].

Surgical treatment

- These recommendations are based on expert opinion in guidelines from the Royal College of Obstetricians and Gynaecologists and the British Association for Sexual Health and HIV [[BASHH, 2005a](#); [RCOG, 2009](#)].
- The British Association for Sexual Health and HIV [[BASHH, 2005a](#)] comment that although it is possible to perform adhesiolysis in women with peri-hepatitis there is no evidence that this is superior to antibiotic treatment alone.

Prescriptions

For information on contraindications, cautions, drug interactions, and adverse effects, see the electronic Medicines Compendium (eMC) (<http://emc.medicines.org.uk>), or the British National Formulary (BNF) (www.bnf.org).

Antibiotics

Age from 13 years onwards

Multi-therapy: Ceftriaxone injection + doxycycline + metronidazole

Ceftriaxone injection: 250mg single dose

Ceftriaxone 250mg powder for solution for injection vials
Reconstitute and give a single dose of 250mg by intramuscular injection.
Supply 1 250mg vial.

Age: from 13 years onwards
NHS cost: £2.45
Licensed use: yes

Doxycycline capsules: 100mg twice a day for 14 days

Doxycycline 100mg capsules
Take one capsule twice a day for 14 days.
Supply 28 capsules.

Age: from 13 years onwards
NHS cost: £1.94
Licensed use: off-label duration

Metronidazole tablets: 400mg twice a day for 14 days

Metronidazole 400mg tablets
Take one tablet twice a day for 14 days.
Supply 28 tablets.

Age: from 13 years onwards
NHS cost: £1.63
Licensed use: yes

Multi-therapy: Cefixime + doxycycline + metronidazole

Cefixime tablets: 400mg single dose

Cefixime 200mg tablets
Take two tablets as a single dose.
Supply 2 tablets.

Age: from 13 years onwards
NHS cost: £3.78
Licensed use: no - off-label indication

Doxycycline capsules: 100mg twice a day for 14 days

Doxycycline 100mg capsules
Take one capsule twice a day for 14 days.

Supply 28 capsules.

Age: from 13 years onwards
NHS cost: £1.94
Licensed use: off-label duration

Metronidazole tablets: 400mg twice a day for 14 days

Metronidazole 400mg tablets
Take one tablet twice a day for 14 days.
Supply 28 tablets.

Age: from 13 years onwards
NHS cost: £1.63
Licensed use: yes

Multi-therapy: Ceftriaxone injection + azithromycin

Ceftriaxone injection: 250mg single dose

Ceftriaxone 250mg powder for solution for injection vials
Reconstitute and give a single dose of 250mg by intramuscular injection.
Supply 1 250mg vial.

Age: from 13 years onwards
NHS cost: £2.45
Licensed use: yes

Azithromycin tablets: 1g once a week for 2 weeks

Azithromycin 500mg tablets
Take two tablets as a single dose once a week for 2 weeks.
Supply 4 tablets.

Age: from 13 years onwards
NHS cost: £9.86
Licensed use: no - off-label dose

Multi-therapy: Cefixime + azithromycin

Cefixime tablets: 400mg single dose

Cefixime 200mg tablets
Take two tablets as a single dose.
Supply 2 tablets.

Age: from 13 years onwards
NHS cost: £3.78
Licensed use: no - off-label indication

Azithromycin tablets: 1g once a week for 2 weeks

Azithromycin 500mg tablets
Take two tablets as a single dose once a week for 2 weeks.
Supply 4 tablets.

Age: from 13 years onwards
NHS cost: £9.86
Licensed use: no - off-label dose

Age from 18 years onwards

Multi-therapy: Ofloxacin + metronidazole

Ofloxacin tablets: 400mg twice a day for 14 days

Ofloxacin 400mg tablets
Take one tablet twice a day for 14 days.
Supply 28 tablets.

Age: from 18 years onwards
NHS cost: £15.46
Licensed use: no - off-label dose

Metronidazole tablets: 400mg twice a day for 14 days

Metronidazole 400mg tablets
Take one tablet twice a day for 14 days.
Supply 28 tablets.

Age: from 18 years onwards
NHS cost: £1.63
Licensed use: yes

Analgesia: use when required

Age from 13 years onwards

Ibuprofen tablets: 200mg to 400mg three to four times a day

Ibuprofen 200mg tablets
Take one or two tablets 3 to 4 times a day when required for pain relief. Do not exceed the stated dose.
Supply 56 tablets.

Age: from 13 years onwards
NHS cost: £1.38
OTC cost: £2.38
Licensed use: yes

Paracetamol tablets: 500mg to 1g up to four times a day

Paracetamol 500mg tablets
Take one or two tablets every 4 to 6 hours when required for pain relief. Maximum of 8 tablets in 24 hours.
Supply 50 tablets.

Age: from 13 years onwards
NHS cost: £0.79
Licensed use: yes

Age from 18 years onwards

Codeine 30mg tablets: add on to paracetamol or NSAID if required

Codeine 30mg tablets
Take one or two tablets every 4 to 6 hours when required for pain relief. Maximum of 8 tablets in 24 hours.
Supply 28 tablets.

Age: from 18 years onwards
NHS cost: £1.22
Licensed use: yes