Faculty of Family Planning and Reproductive Health Care Clinical Effectiveness Unit

A unit funded by the FFPRHC and supported by the University of Aberdeen and the Scottish Programme for Clinical Effectiveness in Reproductive Health (SPCERH) to provide guidance on evidence-based practice

FFPRHC and BASHH Guidance (January 2006)

The management of women of reproductive age attending non-genitourinary medicine settings complaining of vaginal discharge

Journal of Family Planning and Reproductive Health Care 2006; **32**(1): 33–42

This Guidance provides information for clinicians and women concerning management of vaginal discharge. A key to grades of recommendations, based on levels of evidence, is given at the end of this document. Details of the methods used by the Clinical Effectiveness Unit (CEU) in developing this Guidance and evidence tables summarising the research basis of the recommendations are available on the Faculty website (www.ffprhc.org.uk). Abbreviations (in alphabetical order) used include: BASHH, British Association for Sexual Health and HIV: BV, bacterial vaginosis; CEU, Clinical Effectiveness Unit; GUM, genitourinary medicine; HVS, high vaginal swab; RCT, randomised controlled trial; STI, sexually transmitted infection; TV, *Trichomonas vaginalis*; VVC, vulvovaginal candidiasis.

Introduction

This Guidance was developed by the Faculty of Family Planning and Reproductive Health Care (FFPRHC) Clinical Effectiveness Unit (CEU) in collaboration with the British Association for Sexual Health and HIV (BASHH).

Guidance on the management of infective causes of vaginal discharge has been published previously.[1–3] This present Guidance provides evidence-based recommendations and good practice points on the management of women of reproductive age complaining of vaginal discharge who attend non-genitourinary medicine (GUM) settings (where near-patient microscopy is unavailable).

This Guidance focuses on the commonest causes of vaginal discharge in women of reproductive age: physiological and infective (e.g. bacterial vaginosis, candida[4] and trichomoniasis) (Table 1). Infections with other organisms such as *Chlamydia trachomatis* and *Neisseria gonorrhoeae* may cause vaginal discharge due to cervicitis. Other causes of vaginal discharge are considered briefly (e.g. foreign bodies, cervical ectopy and genital tract malignancy).

In addition, recommendations are provided on the management of vaginal discharge in special circumstances: during pregnancy and postpartum, post-abortion and recurrent infections. The management of children and postmenopausal women is outside the scope of this Guidance.

Table 1 *Causes of vaginal discharge in women of reproductive age*

- **Physiological**
- **Infective (non-sexually transmitted)**
  - Bacterial vaginosis
  - Candida
- **Infective (sexually transmitted)**
  - *Trichomonas vaginalis*
  - *Chlamydia trachomatis*
  - *Neisseria gonorrhoeae*
- **Non-infective**
  - Foreign bodies (e.g. tampons, condoms)
  - Cervical polyps and ectopy
  - Genital tract malignancy
  - Fistulae
  - Allergic reactions

What are the commonest causes of vaginal discharge in women of reproductive age?

1 In women of reproductive age complaining of vaginal discharge the commonest cause is physiological, but infective and other causes (e.g. foreign body, cervical ectopy) should be excluded (Good Practice Point).

Physiological discharge

During the menstrual cycle, concentrations of oestrogen and progesterone vary. This variation alters the quantity and type of cervical mucus. Physiological cervical mucus is perceived by women as vaginal secretions or discharge. Prior to ovulation, oestrogen concentration increases, altering cervical mucus from non-fertile (thick and sticky) to fertile (clearer, wetter, stretchy and slippery). After ovulation, oestrogen concentration decreases and progesterone concentration increases; cervical mucus becomes thick and sticky and hostile to sperm.

From the time of puberty, the vagina is colonised by lactobacilli and other bacteria. Commensal lactobacilli metabolise glycogen in the vaginal epithelium to produce lactic acid, thus the vaginal environment is normally acidic (pH<4.5). Other commensal bacteria include anaerobic streptococci, diphtheroids, coagulase-negative staphylococci and α-haemolytic streptococci. Some commensal organisms can constitute infection if they 'overgrow': *Candida albicans, Staphylococcus aureus* and β-haemolytic streptococci including *Streptococcus agalactiae*.

Non-sexually transmitted infections

Bacterial vaginosis

Bacterial vaginosis (BV) is the commonest cause of infective vaginal discharge. Typical symptoms and signs

Table 2 *Summary of symptoms and signs (including point-of-care test for vaginal pH) associated with common infective causes of vaginal discharge in women of reproductive age*

	Bacterial vaginosis	Candida	Trichomoniasis
Symptoms	Thin discharge Offensive or fishy odour *Associated symptoms:* No itch	Thick white discharge Non-offensive *Associated symptoms:* Vulval itch or soreness Superficial dyspareunia External dysuria	Scanty to profuse or frothy yellow discharge Offensive *Associated symptoms:* Vulval itch Dysuria Low abdominal pain
Signs	Discharge coating vagina and vestibule No vulval inflammation	Normal findings *or* Vulval erythema, oedema, fissuring, satellite lesions	Vulvitis and vaginitis So-called strawberry cervix (uncommon 2%)
Point-of-care test: vaginal pH	≥4.5	<4.5	≥4.5

are summarised in Table 2. BV is characterised by an overgrowth of anaerobic organisms that replace normal lactobacilli, leading to an increase in vaginal pH (≥4.5). *Gardnerella vaginalis* is commonly found in women with BV, but the presence of *Gardnerella* alone is insufficient to constitute a diagnosis of BV. Other organisms associated with BV include *Prevotella* species, *Mycoplasma hominis* and *Mobiluncus* species. In clinical practice, BV is diagnosed using Amsel's or Nugent's criteria (Table 3).

BV can occur and remit spontaneously; it is associated with early age at first intercourse and higher number of sexual partners.[5] Nevertheless, BV is not considered to be a sexually transmitted infection (STI).

Candida

C. albicans is a vaginal commensal found in 10–20% of asymptomatic women. Acute vulvovaginal candidiasis (VVC) is caused by overgrowth within the vagina of yeasts [usually *C. albicans* (80–95% of cases) or *C. glabrata* (5%)]. Acute VVC is the second commonest cause of infective vaginal discharge. Typical symptoms and signs are summarised in Table 2.

Candidiasis occurs most commonly when the vagina is exposed to oestrogen, especially in women aged 20–30 years and in pregnancy. The lifetime incidence of VVC is 50–75%. Around 50% of women who have had an acute attack will have a further episode.

Antibiotics may precipitate VVC. There is no good evidence that hormonal contraception increases the risk of VVC,[6] nor is there evidence that tampons, sanitary towels or vaginal douching cause candidiasis. Candidiasis is not sexually transmitted.[2,7]

Sexually transmitted infections

Trichomonas vaginalis

Trichomonas vaginalis (TV) is a flagellated protozoan that causes vaginitis. Women with TV commonly complain of vaginal discharge and dysuria (due to urethral infection). Typical symptoms and signs are summarised in Table 2. TV is sexually transmitted.

Chlamydia trachomatis

C. trachomatis, the most common bacterial STI in the UK, is usually asymptomatic (in 80% of women). However, women may present with vaginal discharge (due to cervicitis), abnormal bleeding (postcoital or intermenstrual), lower abdominal pain, dyspareunia or dysuria. Risk factors for *C. trachomatis* are: age <25 years, a new sexual partner or more than one partner in the last year.

Neisseria gonorrhoeae

N. gonorrhoeae is the second commonest bacterial STI in the UK. Up to 50% of women with *N. gonorrhoeae* will complain of vaginal discharge.[8] The discharge is due to cervicitis rather than vaginitis. *N. gonorrhoeae* may co-exist with other genital tract pathogens such as TV, candida and *C. trachomatis*.[8]

Table 3 *Summary of laboratory processing of specimens from women complaining of vaginal discharge*

Specimen	Preparation of samples in the laboratory	Samples prepared to detect:
High vaginal swab (from lateral vaginal walls)	Microscopy and Gram stain	Bacterial vaginosis Amsel's criteria (3/4 present): ● White discharge ● pH>4.5 ● Fishy odour (with addition of 10% KOH to discharge) ● Clue cells (vaginal epithelial cells surrounded by bacteria) Nugent or Hay/Ison criteria: ● *Gardnerella* and/or *Mobiluncus* morphotypes predominant ● Score >6 *Candida* (spores and pseudohyphae)
	Saline wet microscopy	*Trichomonas vaginalis* (direct visualisation of flagellate protozoa)
	Culture	*Neisseria gonorrhoeae* (chocolate agar) *Candida* (Sabouraud's medium) if microscopy inconclusive
	Sensitivities	For appropriate treatment regimens
Endocervical swab	Culture Enzyme-linked immunosorbent assay and nucleic acid amplification tests	*Neisseria gonorrhoeae* *Chlamydia trachomatis*

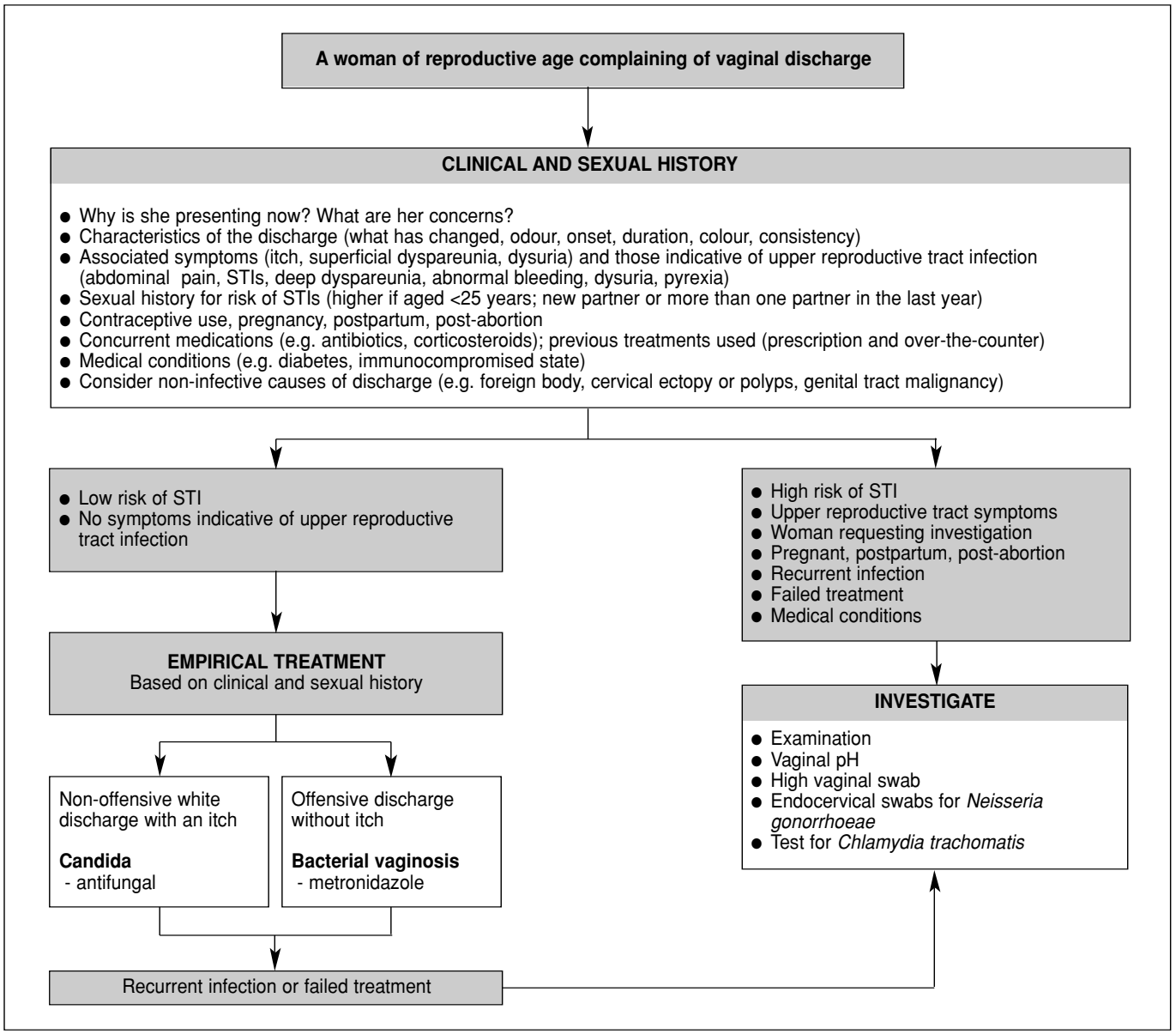

Figure 1 *Flow chart for the assessment of women attending non-genitourinary medicine settings complaining of vaginal discharge.*

Other causes of vaginal discharge

There are many other causes of vaginal discharge that should be considered (Table 1). These include: foreign bodies (e.g. retained tampons or condoms), cervical ectopy or polyps, genital tract malignancy, fistulae and allergic reactions. Exclusion of infective and other causes can help confirm that a vaginal discharge is physiological.

Why is it important to take a clinical history from a woman complaining of vaginal discharge?

2 A clinical history (to ascertain associated symptoms) and a sexual history (to assess STI risk) can guide a clinician in the further management of a woman with vaginal discharge (Grade B).

3 A clinician should ask a woman: how her discharge has changed; what she is concerned about; whether there is any odour or itch; whether there are any symptoms suggestive of upper reproductive tract infection (i.e. pain, dyspareunia, bleeding) and should assess risk of STIs (Good Practice Point).

4 Risk factors for STIs to be sought are: age <25 years; change in sexual partner in the last year; more than one partner in the last year (Grade B).

Symptoms associated with vaginal discharge can guide a clinician to the most likely cause. Some symptoms are more likely to be associated with certain infections than others (Table 2).

When a woman presents with a vaginal discharge that she deems to be different from her normal (physiological) discharge this should be assessed by first taking an appropriate clinical and sexual history. A woman may be concerned about specific underlying causes (infective, STIs, cancers) and these concerns should be addressed.

The presence of vaginal discharge, in itself, is a poor predictor of STI.[9] Nevertheless, a sexual history should be taken to assess the risk of STIs. Women are at *higher risk* of STIs if: aged <25 years, with a change in partner in the last year or with more than one sexual partner in the last year.[10,11]

The characteristics of the vaginal discharge should be determined:

- What has changed
- Any odour
- Onset
- Duration
- Cyclical in nature
- Colour
- Consistency
- Exacerbating factors (e.g. after intercourse).

The clinician should enquire about any associated symptoms:

- Itch
- Superficial dyspareunia
- Dysuria.

The clinician should elicit any symptoms indicative of upper reproductive tract infection:

- Deep dyspareunia
- Pelvic or abdominal pain
- Abnormal bleeding (intermenstrual or postcoital)
- Fever.

The clinician should determine if treatment has been used (prescription or over-the-counter) and if effective. Guidelines have been developed for over-the-counter treatment of presumed candida in pharmacies.[12,13] However, studies suggest that even women with a previously confirmed episode of candida are not good at self diagnosis.[14–16]

The clinician should determine if there have been any potential triggers: recent use of antibiotics, corticosteroid therapy or recent unprotected intercourse. Medical conditions that may increase risk of infection should be considered (e.g. diabetes, immunocompromised state). Contraceptive use should be determined. The assessment of a woman complaining of vaginal discharge is summarised in Figure 1.

When should a woman complaining of vaginal discharge be investigated?

5 A woman of reproductive age complaining of vaginal discharge should be investigated if: she requests investigation; she is deemed to be at higher risk of STIs; there are symptoms indicative of upper reproductive tract infection; previous treatment has failed; she is postnatal, post-miscarriage or post-abortion; or she is within 3 weeks of intrauterine contraceptive insertion (Grade C).

6 A woman of reproductive age presenting with vaginal discharge who is low risk for STIs and without symptoms indicative of upper reproductive tract infection may be given empirical treatment, based on symptoms, without taking swabs at first presentation (Grade C).

When a woman presents with a complaint of vaginal discharge, her clinician should consider if and when investigations are required. Investigation is indicated if:

- Requested by the woman
- She is deemed to be at *higher risk* of STIs
- There are symptoms indicative of upper reproductive tract infection (e.g. pain, abnormal bleeding, dyspareunia, fever)
- Previous treatment has failed
- She is postnatal, post-miscarriage, or post-abortion
- She is within 3 weeks of insertion of intrauterine contraception.

A combination of investigations [examination, point-of-care tests (e.g. vaginal pH), laboratory tests] is often required to allow accurate assessment.[4]

As for symptoms, the presence or absence of physical signs may guide a clinician towards the most likely diagnosis; but diagnostic accuracy varies (Table 2).

The Health Protection Agency suggests that most women with vaginal discharge thought to be due to BV or candida do not require investigation.[4] Empirical treatment can be given after taking a clinical and sexual history if:

- The woman is at *low risk* of STIs
- She has no symptoms indicative of upper reproductive tract infection
- She is happy to be treated without investigation
- She can return for follow-up if symptoms do not resolve.

Choice of empirical treatment (Table 4) can be based on history taking alone (Table 2 and Figure 1). The presence of itch makes candida the likeliest cause and an antifungal is appropriate. An offensive odour makes BV the likeliest cause and metronidazole is appropriate.

What point-of-care investigations can be performed in non-genitourinary medicine settings?

7 Together with symptoms and signs, assessment of vaginal pH aids the clinician in the management of a woman complaining of vaginal discharge (Grade C).

8 Vaginal pH can be measured on secretions obtained from the lateral vaginal walls using narrow range pH paper (Good Practice Point).

Examination

In addition to the clinical and sexual history, physical examination and vaginal pH provide supporting information for a clinician assessing a woman with vaginal discharge. Physical examination should include:

- Abdominal palpation (for pain or tenderness)
- Inspection of the vulva (for obvious discharge, vulvitis)
- Speculum examination (inspection of: vaginal walls, cervix; foreign bodies; amount, consistency and colour of discharge)
- Bimanual pelvic examination (adnexal and uterine tenderness, cervical motion tenderness).

Vaginal pH

Guidelines recommend checking vaginal pH [using narrow range paper (pH 4–7)] in the assessment of women with vaginal discharge.[1,2] Secretions should be collected from the lateral vaginal walls using a loop or swab. Vaginal pH≥4.5 is one of Amsel's criteria used in the diagnosis of BV (Table 3). A prospective observational study showed that vaginal pH was the most sensitive of Amsel's criteria, but that specificity was low.[17]

Vaginal pH is non-specific and can be altered by BV, TV, semen, blood, cervical secretions and lubricating jelly.[18] A cross-sectional study[19] found that using vaginal pH together with symptoms and signs improved the accuracy of diagnosis of BV. A retrospective study found that a raised vaginal pH was strongly associated with BV ($p<0.001$).[20] A study in a specialist clinic setting (family planning and GUM) showed that clinical history, examination and vaginal pH were useful in the assessment of women with symptomatic vaginal discharge at first presentation, but less useful than formal investigation.[21] Vaginal pH measurement can be used to assess the balance of probability of causes such as BV or TV (pH≥4.5) or candida (pH<4.5). (NB. Vaginal pH measurement cannot help distinguish between BV and TV.)

Table 4 *Medical treatments for common infective causes of vaginal discharge in women of reproductive age*

	Bacterial vaginosis	Candida	Trichomoniasis
Recommended regimens	**Oral regimens** (70–80% cure) *Metronidazole:* 400–500 mg twice daily for 5–7 days or single 2 g dose	**Vaginal regimens** (80–95% cure) *Clotrimazole pessary*: single 500 mg dose, 200 mg nightly for 3 days or 100 mg nightly for 6 days *Econazole pessary:* one 150 mg pessary or 150 mg nightly for 3 days *Feticonazole pessary:* single 600 mg pessary at night or 200 mg pessary nightly for 3 days *Miconazole intravaginal cream (2%)*: 5 g applicator nightly for 10–14 days or twice daily for 7 days. Can apply to anogenital area **Oral regimens** *Fluconazole capsule:* 150 mg single dose *Itraconazole capsule:* 200 mg twice daily for 1 day **Vaginal regimens** (70–90% cure) *Nystatin vaginal cream (100 000 units):* 4 g for 14 nights or *nystatin pessary (100 000 units):* 1–2 for 14 nights	**Oral regimens** (95% cure) *Metronidazole:* 400–500 mg twice daily for 5–7 days or single 2 g dose
Alternative regimens	**Vaginal regimens** (70–80% cure) *Metronidazole gel (0.75%):* 5 g applicator nightly for 5 days *Clindamycin cream (2%):* 5 g applicator nightly for 7 days *Oral clindamycin:* 300 mg twice daily for 7 days *Tinidazole* 2 g oral single dose	Antifungal creams can be applied to the vulval area	
Recurrent infection	**Suppressive therapy** *Oral metronidazole:* 400 mg twice daily for 3 days at the beginning and end of menstruation *Intravaginal metronidazole (0.75%):* 5 g applicator twice weekly for 4–6 months after an initial 10-day course (outside product licence) Avoid douching, and shampoo, gels and antiseptics in the bath	**Induction regimen** (as above for initial treatment) **Maintenance regimen** *Oral fluconazole:* 100 mg as a single dose weekly for 6 months *Clotrimazole pessary:* a single 500 mg pessary weekly for 6 months *Oral itraconazole:* 400 mg (two divided doses in 1 day) monthly for 6 months Avoid local irritants, perfumed products, tight-fitting synthetic clothing	**Treatment failure** Exclude vomiting with metronidazole and repeat standard regimen as above Check risk of re-infection, partner notification and treatment, and compliance If drug resistance is suspected seek specialist advice
Partner treatment	Routine screening and treatment of male sexual partners not recommended	Routine screening and treatment of male sexual partners not recommended	Partner notification and treatment is recommended. Screen for other STIs
Treatment in pregnancy	Symptomatic women should be treated as above	Treatment with topical azoles as above but longer duration of treatment (7 days) may be required Avoid oral regimens due to potential teratogenicity	Meta-analyses do not indicate teratogenicity of metronidazole even in the first trimester
Special notes	Avoid alcohol with metronidazole Avoid high-dose single regimens if breastfeeding, use intravaginal treatment Clindamycin intravaginal cream can damage latex condoms	Latex condoms, diaphragms and cervical caps may be damaged by vaginal preparations containing econazole, miconazole, isoconazole or clotrimazole	Spontaneous cure rate of 20–25% Avoid alcohol with metronidazole Avoid high-dose single regimens if breastfeeding

Readers are advised to refer to the current edition of the *British National Formulary (BNF)* for dosing regimens. Oral clindamycin and isoconazole vaginal tablets are not listed in the *BNF* Volume 49 and have been omitted from the table above.

What laboratory investigations can be performed on women complaining of vaginal discharge?

9 Clinicians should liaise with their local laboratory to find out how specimens are processed and what information they will be able to provide (Good Practice Point).

10 Clinicians should provide laboratory staff with appropriate clinical information when submitting specimens from women with vaginal discharge including: risk of STIs, suspicion of STIs and associated symptoms (Good Practice Point).

Laboratory investigations are the most useful way of diagnosing infective causes of vaginal discharge. Specimens should be taken from relevant sites, transferred into an appropriate medium, and stored appropriately if not transferred to the laboratory immediately. Standard operating procedures are available for microbiology laboratories, however practice varies nationally. Clinicians should liase with their local laboratory to find out how specimens are routinely processed. Relevant clinical information should be provided to laboratory staff to help in processing of samples:

- Patient's age
- Risk of STIs or suspicion of STIs
- Character of discharge
- Associated symptoms indicative of upper reproductive tract infection.

Clinicians should also liaise with the local laboratory to find out what information will be provided on result forms. Readers are referred to BASHH Guidance[1–3] for information on *C. trachomatis* and *N. gonorrhoeae*.[8,22]

High vaginal swab

A high vaginal swab (HVS) should be taken from the lateral vaginal walls and posterior fornix. The sample should be placed in transport medium, which does not need to contain charcoal. If the HVS is not transported immediately to the laboratory, it should be stored at 4°C for no longer than 48 hours. The laboratory can use a HVS to prepare a smear for microscopy, for wet microscopy and for direct plating.[23]

Endocervical and other swabs

N. gonorrhoeae infects the columnar cells of the endocervix. Therefore an endocervical swab should be sent if gonorrhoea is suspected (Table 3). Swabs from other sites may be appropriate based on clinical history (urethral, rectal, oropharyngeal).

C. trachomatis can be detected using samples taken from the endocervix and vulva or urine if a nucleic acid amplification technique (NAAT) is used. However, if a woman is being examined, an endocervical swab should be taken. The type of sample kit used may vary and manufacturers' instructions should be followed.

Facilities for direct plating of genital samples for the identification of *N. gonorrhoeae* will be unavailable in many primary care sites. However, use of transport medium also gives acceptable results.[8] If swabs are to be put in transport medium (with or without charcoal) they should be stored at 4°C and transferred within 48 hours.

Microscopy

In general, laboratories use a HVS to prepare a dry Gram stain slide for microscopy. A Gram stain slide can reveal candida (pseudohyphae) or BV (clue cells and proportions of lactobacilli and other organisms) (Table 3). Wet microscopy can be prepared in the laboratory by dipping a small amount of discharge (from a HVS) into saline on a microscope slide. This can be useful in identifying protozoa in TV and pseudohyphae in candida.

Culture

Culture in Sabouraud's medium can be used to detect candida if microscopy is inconclusive or if the identification of species type would be useful (recurrent infections).[2] Culture media are also available for TV. Culture is the method of choice in the UK for the detection of *N. gonorrhoeae* (Table 3).[8]

Nucleic acid amplification tests and nucleic acid hybridisation tests

Ideal diagnostic tests are those with sensitivity >90% and specificity >99%. NAATs approach this ideal. These tests can be used to identify organisms such as *C. trachmatis*. They are particularly useful for samples taken non-invasively (e.g. urine and self-taken vaginal swabs).[8,22]

Which treatments are appropriate for women complaining of vaginal discharge?

Treatment of non-sexually transmitted infections

Treatment of bacterial vaginosis

11 The recommended treatment for bacterial vaginosis is oral metronidazole (400–500 mg twice daily for 5–7 days, or a single 2 g dose) (Grade A).

12 Testing and treatment of the male sexual partner(s) is not indicated (Grade C).

13 Women using combined hormonal contraception should be advised to use additional contraceptive protection (e.g. condoms) during the antibiotic course and for 7 days afterwards (Grade C).

High initial cure rates (70–80%.) are achieved with medical treatment (Table 4).[1] Recommended treatment regimens include oral metronidazole (400–500 mg twice daily for 5–7 days or a single 2 g dose).[1] The single dose may improve compliance but may be less effective at 4 weeks follow-up. Alternative regimens include: intravaginal metronidazole gel (0.75%), 5 g application nightly for 5 days; intravaginal clindamycin cream (2%), 5 g application nightly for 7 days; oral clindamycin 300 mg twice daily for 7 days; or tinidazole 2 g oral single dose. Use of acidic vaginal gel as treatment has also been described.[24]

The relapse rate can be as high as 60% within 3 months. Routine testing and treatment of the sexual partner(s) is not recommended. Treating male partners does not reduce the relapse rate.[25]

Treatment of vulvovaginal candidiasis

14 Vaginal and oral antifungals (azoles) are equally effective in the treatment of vulvovaginal candidiasis (Grade A).

15 Vulval antifungals (in addition to oral or vaginal regimens) can be used if women have vulval symptoms (Good Practice Point).

16 There is no need for routine screening or treatment of male partner(s) (Grade C).

17 Women should be advised that latex condoms, diaphragms and cervical caps may be damaged by some vaginal/vulval antifungal treatments (Grade C).

Antifungal treatment can be given if VVC is suspected and there is *low risk* of STIs; antifungals were effective in a previous infective episode; or prior to awaiting results when swabs have been taken.[2]

Vaginal and oral azole treatments give cure rates of 80–95% (clinical and laboratory) for acute VVC.[2] The efficacy of treatment depends on the total dose given, rather than duration. A single high dose is as effective as a divided dose given over several days; and compliance may be improved. Vulval application of imidazoles can also be used as this is a common site of infection (Table 4).

Oral azoles (fluconazole and itraconazole) have been shown in randomised controlled trials (RCTs) to be effective in VVC.[7] They are as effective as vaginal imidazoles. Choice of treatment will depend on availability and patient preference.

Nystatin preparations give a 70–90% cure rate. Vaginal nystatin is more effective against *C. glabrata* (and other non-*albicans* species) but is not used routinely for VCC as it requires a 14-day course.[2,7] Some vaginal/vulval therapies may damage latex condoms, diaphragms and cervical caps (Table 4).

There is no evidence that routine treatment of the male sexual partner(s) is beneficial.[2]

Treatment failure (no resolution of symptoms within 7–14 days) is unusual in acute VVC.[7] Clinicians should assess the situation for likely causes:

- Poor compliance with treatment
- Continued presence of an irritant
- Misdiagnosis of the initial condition
- Organisms resistant to standard treatment
- Presence of mixed infection
- Recurrent infection
- Underlying condition (e.g. concurrent antibiotic use, diabetes or immunosuppression).

Use of lactobacillus

18 Women may use probiotics (live yoghurts) in the management of VVC or BV but evidence of effectiveness is poor (Good Practice Point).

There are some randomised trials investigating probiotics (*Lactobacillus acidophilus*) in the treatment and prevention of VVC and BV but they are limited by small sample size, high attrition rates and short follow-up.

A small trial of a 6-day course of intravaginal *L. acidophilus* and oestradiol for treatment of BV showed a cure rate (based on Amsel's criteria) of 88% at 4 weeks, compared to 22% with placebo.[26]

A small randomised crossover study of women with at least four documented episodes of VVC or BV in the previous year investigated the use of oral *L. acidophilus* (as enriched yoghurt).[27] The study was limited by small sample size and high attrition. There was no difference in VVC in women using enriched yoghurt versus pasteurised yoghurt, but the incidence of BV was decreased in both groups.

A small trial of women using oral antibiotics for non-gynaecological infections found that 23% developed VVC after treatment.[28] The use of oral or vaginal lactobacillus during and following antibiotic use conferred no benefit in preventing acute VVC.

Treatment of sexually transmitted infections

Treatment of Trichomonas vaginalis

19 The recommended treatment for *T. vaginalis* is oral metronidazole (a single 2 g oral dose or 400 mg twice daily for 5–7 days) (Grade A).

20 Women should be informed that *T. vaginalis* is an STI and partner notification and treatment is recommended for all partners in the last 6 months (Grade C).

There is a spontaneous cure rate of 20–25% for TV. A Cochrane Review identified two clinical trials which suggest that oral treatment is more effective than vaginal treatment.[29] Oral antimicrobial treatment is recommended because urethral and paraurethral gland infection often co-exists with vaginal infection.[29] Oral metronidazole can achieve a cure rate of 95% (Table 4).[3] Recommended regimens are: metronidazole single 2 g oral dose or 400 mg twice daily for 5–7 days. The single dose may improve compliance. A Cochrane Review showed that a cure can also be achieved with a single dose of nitroimidazole (Table 4).

Treatment of the male sexual partner(s) is recommended.[3]

Treatment of Chlamydia trachomatis and Neisseria gonorrhoeae

21 Women identified as having an STI should be treated according to national guidance. Local integrated care pathways should be in place for testing for other STIs and for partner notification (Good Practice Point).

Partner notification

22 Patient treatment and partner notification can take place in GUM clinics, general practice or family planning services if staff have the appropriate skills (Good Practice Point).

Patient treatment and partner notification are advised when any STI is identified. This can take place in GUM clinics, general practice or family planning services if health care providers have the appropriate skills. Service providers must ensure that appropriate clinical care networks are in place locally to facilitate this.

How should clinicians manage women with vaginal discharge in special circumstances?

Vaginal discharge in pregnancy

Bacterial vaginosis

23 Pregnant women with BV should be treated as for non-pregnant women (Grade A).

If BV is identified as a cause of vaginal discharge in pregnancy it should be treated. Treatment regimens include: oral metronidazole 400 mg twice daily for 5 days; metronidazole vaginal gel 5 g nightly for 5 nights; oral clindamycin 300 mg twice daily for 7 days; or clindamycin cream for 3 days (Table 4).

Although BV is associated with late miscarriage, preterm labour, premature rupture of membranes, low birth weight and postpartum endometritis,[1] routine screening for BV in pregnancy is not yet recommended. Current guidelines support screening for BV only for women with a previous preterm birth (prior to 28 weeks' gestation) or second-trimester miscarriage.[30]

Vulvovaginal candidiasis

24 Women with VVC in pregnancy should be given vaginal azole regimens but may require up to 7 days' treatment (Grade A).

25 Women with VVC in pregnancy should avoid oral antifungals because of potential teratogenicity (Grade C).

VVC is common in pregnancy. Treatment is the same as for non-pregnant women but may need to be of longer duration (i.e. 7 days) (Table 4). A Cochrane Review showed that, as for non-pregnant women, vaginal imidazole was more effective than nystatin.[31] Oral antifungals should be avoided in pregnancy because of potential teratogenicity.[2,7]

Trichomonas vaginalis

26 There is no indication for routine screening for TV in pregnancy. However, treatment is indicated if TV is diagnosed (oral metronidazole 400 mg twice daily for 7 days) (Grade A).

There is increasing evidence that TV may be associated with preterm delivery and low birth weight.[3,32,33] A Cochrane Review investigated the effects of different treatments for TV in pregnancy.[34] In two trials, over 90% of women were cleared of vaginal TV after treatment. Metronidazole as a single dose is likely to provide a cure for TV (Table 4) but it is not known if this regimen has any impact on pregnancy outcome.

Vaginal discharge following miscarriage, abortion or delivery

27 Women with vaginal discharge after miscarriage, abortion or delivery should be investigated at first presentation. Treatment for likely causal organisms may be appropriate while awaiting swab results (Good Practice Point).

BV is associated with endometritis and pelvic inflammatory disease following abortion.[1,25] Women presenting with vaginal discharge following abortion or miscarriage or in the puerperium should be fully investigated and treated for likely causal organisms while awaiting swab results. The possibility of retained products of conception should be considered. A heavy growth of coliforms may be associated with infection in the presence of retained products.[35]

Recurrent vaginal discharge

28 Consideration should be given to underlying causes in women presenting with recurrent vaginal discharge due to BV or candida (Grade C).

29 Clinicians should be aware of psychosexual problems and depression, which can occur in women with recurrent vaginal infections (Good Practice Point).

General advice is as for treatment of acute infections (Table 4). Potential underlying conditions (e.g. diabetes, immunosuppression, corticosteroid therapy or concurrent antibiotic use) should be investigated. VVC is more common in diabetic and immunocompromised women.[7] Psychosexual problems and depression may occur in women with recurrent VVC. Appropriate counselling may be indicated.

Recurrent bacterial vaginosis

30 For women with recurrent BV, suppressive regimens (outside the product licence) may be considered, but evidence to support their effectiveness is limited (Grade C).

31 Women can be advised to avoid use of douches, shower gels, antiseptic agents and shampoo in the bath (Grade C).

Despite high initial cure rates (70–80%) (Table 4), recurrence of BV occurs within 3 months of treatment in 15–30% of women. Most relapses occur in the first year[5] and are not thought to be due to drug resistance.

An RCT in 42 women with recurrent BV evaluated intravaginal lactate gel to reduce recurrence. Seventeen women used lactate gel for 3 days immediately after menstruation for 6 months. Intention-to-treat analysis suggested that 71% were clear of infection following use of lactate gel compared to 4.8% with placebo.[36]

A small study compared tinidazole 2 g stat followed by acidic vaginal gel for 3 weeks with clindamycin vaginal cream 5 g per night for 7 nights.[37] At 4 weeks the cure rate (clinically) was 94% for tinidazole + acidic gel versus 77% for clindamycin cream. The vaginal pH was reduced to <4.5 in 78% of women using acidic vaginal gel versus 38% with clindamycin cream.

Suppressive therapy could be considered: for example, 5 g metronidazole intravaginal gel (0.75%) twice weekly for 4–6 months after an initial 10-day treatment, or 400 mg metronidazole orally twice daily for 3 days at the start and end of menstruation.[30]

Women can be advised to avoid douching[38–40] and using shampoo, shower gel and antiseptics in the bath.[1]

Acidifying gel may reduce relapse rates and can maintain acidic vaginal pH at 1 month follow-up.[5,37]

Recurrent vulvovaginal candidiasis

32 For women with recurrent VVC (four or more episodes in 12 months) an 'induction and maintenance' regimen may be used for 6 months (Grade B).

33 Women can be advised to avoid douching, local irritants, perfumed products and tight-fitting synthetic clothing (Grade C).

It is unclear if recurrent VVC (defined as four or more episodes annually) is due to re-colonisation or new growth.[2,7] Recurrent VVC occurs in less than 5% of women.

The strongest evidence regarding treatment of recurrent VVC was obtained from an RCT of 387 women who had achieved clinical and microbiological remission following an induction regimen. Recurrent VVC was treated with weekly fluconazole or placebo for 6 months.[7,41,42] More women receiving fluconazole remained disease-free *during* the maintenance period (91% vs 36%, p<0.001) and remained disease-free 6 months *after* the maintenance period (43% vs 22%, $p<0.001$). Nevertheless, most women who received the maintenance regimen had a relapse within 1 year.

An induction regimen may be used followed by a maintenance regimen for 6 months.[2] Induction regimens involve daily use of vaginal imidazoles (usually clotrimazole) or oral fluconazole or itraconazole for 6–12 days (usual regimen). The maintenance regimen (half dose) should comprise weekly or monthly treatments for 6 months' duration[2] (oral fluconazole 100 mg weekly, clotrimazole pessary 500 mg weekly or oral itraconazole 400 mg). Relapse occurs in up to 50% of women after cessation of maintenance therapy.[2] Induction and maintenance treatment may need to be restarted and continued for a longer period (12 months).[7] The use of antifungals (oral fluconazole, clotrimazole pessary and oral itraconazole) for 6 months is within product licence. Patient preference for topical or oral treatment will determine the chosen regimen (Table 4).

General management includes avoidance of local irritants and tight-fitting synthetic clothing.[2]

Recurrent Trichomonas vaginalis

34 Recurrent TV is usually due to re-infection, but consideration should be given to the possibility of drug resistance (Grade C).

Recurrent TV is usually due to re-infection; treatment, education and partner notification are required. Recurrent infection can be due to drug resistance (Table 4).

References

1 Clinical Effectiveness Group (Association for Genitourinary Medicine and the Medical Society for the Study of Venereal Diseases). *2001 National Guideline for the Management of Bacterial Vaginosis*. http://www.bashh.org/guidelines/2002/bv_0601.pdf [Accessed 28 October 2005].

2 Clinical Effectiveness Group (Association for Genitourinary Medicine and the Medical Society for the Study of Venereal Diseases). *National Guideline on the Management of Vulvovaginal Candidiasis*. http://www.bashh.org/guidelines/2002/candida_0601.pdf [Accessed 28 October 2005].

3 Clinical Effectiveness Group (Association for Genitourinary Medicine and the Medical Society for the Study of Venereal Diseases). *2001 National Guideline on the Management of Trichomonas vaginalis*. http://www.bashh.org/guidelines/2002/tv_0601.pdf [Accessed 28 October 2005].

4 Health Protection Agency. Diagnosis of vaginal discharge/vaginitis. Guidelines – summarising clinical guidelines for primary care 25, 214. 2005. http://www.hpa.org.uk/infections/topics_az/hiv_and_sti/guidelines/vaginal_discharge_guide_020205.pdf [Accessed 28 October 2005].

5 Wilson J. Managing recurrent bacterial vaginosis. *Sex Transm Infect* 2005; **80**: 8–11.

6 Davidson F, Oates JK. The pill does not cause thrush. *Br J Obstet Gynaecol* 1985; **92**: 1265–1266.
7 Department of Health. *PRODIGY Guidance – Candida – female genital*. 2004. http://www.prodigy.nhs.uk/guidance.asp?gt=Candida%20-%20female%20genital [Accessed 28 October 2005].
8 Clinical Effectiveness Group (Association for Genitourinary Medicine and the Medical Society for the Study of Venereal Diseases). *2001 National Guideline on the Management of Gonorrhoea in Adults*. http://www.bashh.org/guidelines/2002/gc_0601.pdf [Accessed 28 October 2005].
9 Zhang J, Hatch M, Zhang D, Shulman J, Harville E, Thomas AG. Frequency of douching and risk of bacterial vaginosis in African-American women. *Am Coll Obstet Gynecol* 2004; **104**: 756–760.
10 Scottish Intercollegiate Guidelines Network (SIGN). *Management of Genital Chlamydia trachomatis Infection* (SIGN Publication No. 42). Edinburgh, UK: SIGN, 2002. http://www.sign.ac.uk/pdf/qrg42.pdf [Accessed 28 October 2005].
11 Faculty of Family Planning and Reproductive Health Care Clinical Effectiveness Unit. FFPRHC Guidance (January 2004). The copper intrauterine device as long-term contraception. *J Fam Plann Reprod Health Care* 2004; **30**: 29–42.
12 Bond C, Watson M; Grampian Evidence Based Community Pharmacy Guidelines Group. The development of evidence-based guidelines for over-the-counter treatment of vulvovaginal candidiasis. *Pharm World Sci* 2002; **25**: 177–181.
13 Watson MC, Bond CM; Grampian Evidence Based Community Pharmacy Guidelines Group. Evidence-based guidelines for non-prescription treatment of vulvovaginal candidiasis (VVC). *Pharm World Sci* 2003; **25**: 129–134.
14 Ferris DG, Nyirjesy P, Sobel JD, Soper D, Pavletic A, Litaker MS. Over-the-counter antifungal drug misuse associated with patient-diagnosed vulvovaginal candidiasis. *Am Coll Obstet Gynecol* 2002; **99**: 419–425.
15 Sihvo S, Ahonen R, Mikander H, Hemminki E. Self-medication with vaginal antifungal drugs: physicians' experiences and women's utilization patterns. *Fam Pract* 2000; **17**: 145–149.
16 Roy S, Caillouette JC, Faden JS, Roy T, Ramos DE. Improving appropriate use of antifungal medications: the role of an over the counter vaginal pH self-test device. *Infect Dis Obstet Gynaecol* 2003; **11**: 209–216.
17 Gutman RE, Peipert JF, Weitzen S, Blume J. Evaluation of clinical methods for diagnosing bacterial vaginosis. *Am Coll Obstet Gynecol* 2005; **105**: 551–557.
18 Hanna NF, Taylor-Robinson D, Kalodiki-Karamanoli M, Harris JRW, McFadyen IR. The relation between vaginal pH and the microbiological status in vaginitis. *Br J Obstet Gynaecol* 1985; **92**: 1267–1271.
19 Thinkhamrop J, Lumbiganon P, Thongkrajai P, Chongsomchai C, Pakarasang M. Vaginal fluid pH as a screening test for vaginitis. *Int J Gynaecol Obstet* 1999; **66**: 143–148.
20 Pavletic AJ, Hawes SE, Geske JA, Bringe K, Polack SH. Experience with routine vaginal pH testing in a family practice setting. *Infect Dis Obstet Gynecol* 2004; **12**: 63–68.
21 Melville C, Nandwani R, Bigrigg A, McMahon AD. A comparative study of the clinical management strategies for vaginal discharge in family planning and genitourinary medicine settings. *J Fam Plann Reprod Health Care* 2004; **31**: 26–30.
22 Clinical Effectiveness Group (Association for Genitourinary Medicine and the Medical Society for the Study of Venereal Diseases). *Clinical Effectiveness Guideline for the Management of Chlamydia trachomatis Genital Tract Infection*. http://www.bashh.org/guidelines/2002/c4a_0901c.pdf [Accessed 28 October 2005].
23 Crowley T, Berry J, Horner PJ, Gough KR, Turner A. Can a laboratory diagnosis of bacterial vaginosis be made from a transported high vaginal swab using anaerobic culture and microscopy of a wet preparation? *Sex Transm Infect* 1998; **74**: 228–229.
24 Fiorilli A, Molteni B, Milani M. Successful treatment of bacterial vaginosis with a policarbophil-carbopol acidic vaginal gel: results from a randomised double-blind, placebo-controlled trial. *Eur J Obstet Gynecol Reprod Biol* 2005; **120**: 202–205.
25 Department of Health. *PRODIGY Guidance – Bacterial Vaginosis*. 2004. http://www.prodigy.nhs.uk/guidance.asp?gt=bacterial%20vaginosis [Accessed 28 October 2005].
26 Parent D, Bossens M, Bayot D, Kirkpatrick C, Graf F, Wilknson FE, *et al*. Therapy of bacterial vaginosis using exogenously-applied *Lactobacilli acidophili* and a low dose of estriol: a placebo-controlled multicentric clinical trial. *Drug Res* 1996; **46**: 68–73.
27 Shalev E, Battino S, Weiner E, Colodner R, Keness Y. Ingestion of yogurt containing *Lactobacillus acidophilus* compared with pasteurized yogurt as prophylaxis for recurrent candidal vaginitis and bacterial vaginosis. *Arch Family Med* 1996; **5**: 593–596.
28 Pirotta M, Gunn J, Chondros P, Grover S, O'Malley P, Hurley S, *et al*. Effect of lactobacillus in preventing post-antibiotic vulvovaginal candidiasis: a randomised controlled trial. *BMJ* 2004; **329**(7465): 548.
29 Department of Health. *PRODIGY Guidance – Trichomoniasis*. 2002. http://www.prodigy.nhs.uk/guidance.asp?gt=Trichomoniasis [Accessed 28 October 2005].
30 Clinical Effectiveness Group (BASHH). *National Guideline for the Management of Bacterial Vaginosis* (update draft). 2005.
31 Young GL, Jewell D. Topical treatment for vaginal candidiasis (thrush) in pregnancy. *Cochrane Database Syst Rev* 2001; (4): CD000225.
32 Saurina GR, McCormack WM. Trichomoniasis in pregnancy. *Sex Transm Dis* 1997; **24**: 361–362.
33 Cotch MF, Pastorek JG, Nugent RP. *Trichomonas vaginalis* associated with low birth weight and preterm delivery. *Sex Transm Dis* 1997; **24**: 353–360.
34 Gülmezoglu AM. Interventions for trichomoniasis in pregnancy. *Cochrane Database Syst Rev* 2002; (3): CD000220.
35 Macsween KF Ridgway GL. The laboratory investigation of vaginal discharge. *J Clin Path* 1998; **51**: 564–567.
36 Andersch B, Lindell D, Dahlen L. Bacterial vaginosis and the effect of intermittent prophylactic treatment with acid lactate gel. *Gynecol Obstet Invest* 1990; **30**: 114–119.
37 Milani M, Barcellona E, Agnello A. Efficacy of the combination of 2 g oral tinidazole and acidic buffering vaginal gel in comparison with vaginal clindamycin alone in bacterial vaginosis: a randomized, investigator-blinded, controlled trial. *Eur J Obstet Gynaecol Reprod Biol* 2003; **109**: 67–71.
38 Ness R, Hillier SL, Ricther HE, Soper DE, Stamm C, McGregor J, *et al*. Douching in relation to bacterial vaginosis, lactobacilli, and facultative bacteria in the vagina. *Am Coll Obstet Gynecol* 2002; **100**: 765–772.
39 Martino JL, Vermund SH. Vaginal douching: evidence for risks or benefits to women's health. *Epidemiol Rev* 2002; **24**: 109–124.
40 Schwebke JR, Desmond RA, Oh MK. Predictors of bacterial vaginosis in adolescent women who douche. *Sex Transm Dis* 2004; **31**: 433–436.
41 Sobel JD, Kapernick PS, Zervos M, Reed BD, Hooton T, Soper D, *et al*. Treatment of complicated Candida vaginitis: comparison of single and sequential doses of fluconazole. *Am J Obstet Gynecol* 2001; **185**: 363–369.
42 Sobel JD, Wiesenfeld HC, Martens M, Danna P, Hooton TM, Rompalo A, *et al*. Maintenance fluconzole therapy for recurrent vulvovaginal candidiasis. *N Engl J Med* 2004; **351**: 876–883.

This Guidance was developed by the Clinical Effectiveness Unit (CEU) of the Faculty of Family Planning and Reproductive Health Care (FFPRHC): Dr Susan Brechin (Co-ordinator); Dr Gillian Penney (Director), Ms Lisa Allerton (Research Assistant) in collaboration with the British Association for Sexual Health and HIV (BASHH): Dr Janet Wilson (Consultant in GUM, Leeds General Infirmary, Leeds). This Guidance was developed in consultation with a multidisciplinary expert group: Dr Lesley Bacon (Consultant in Sexual and Reproductive Health, Lewisham, South East London); Dr Steve Baguley (Consultant in GUM, Woolmanhill Hospital, Aberdeen); Ms Toni Belfield (Director of Information, fpa, London); Dr Kirsten Black (Staff Grade Doctor, Lambeth Reproductive Health Service, London/FFPRHC Education Committee Representative); Dr Sylvia Ellis (Clinical Director, Ella Gordon Unit, Portsmouth); Professor Catherine Ison (HPA Centre for Infections, London); Dr Eva Jungmann (Consultant Physician in GUM/HIV, Archway Sexual Health Clinic, London); Ms Carmel Kelly (Clinical Nurse Specialist in GUM/HIV, Royal Victoria Hospital, Belfast); Dr Neil Lazaro (Hospital Practitioner in GUM, Ashton Community Care Centre, Lancaster); Dr Louise Massey (Consultant in Public Health, Wolverhampton/City Primary Care Trust/Trainee Member of CEU/FFPRHC Education Committee Representative; Ms Margaret McArthur (Nurse Team Leader, Square 13 Family Planning and Reproductive Service, Aberdeen); Dr Hamish Mackenzie (Head of Department of Microbiology, University of Aberdeen, Aberdeen); Dr Chris Wilkinson (Lead Consultant in Sexual and Reproductive Health, Margaret Pyke and Mortimer Market Centres, London/Member of the FFPRHC Clinical Effectiveness Committee). Trainees involved in the expert group: Dr Catriona Melville (Subspecialty Trainee in Sexual and Reproductive Healthcare, The Sandyford Initiative, Glasgow); Dr Louise Melvin (Clinical Research Fellow, Edinburgh); Dr Rachel DeSouza (Subspecialty Trainee in Sexual and Reproductive Health, Margaret Pyke Centre, London).

This Guidance is also available online at www.ffprhc.uk. Evidence tables are available on the FFPRHC website. These summarise relevant published evidence on use of contraception outside product licence, which was identified and appraised in the development of this Guidance. The clinical recommendations within this Guidance are based on evidence whenever possible.

	Grades of Recommendations
A	Evidence based on randomised controlled trials (RCTs)
B	Evidence based on other robust experimental or observational studies
C	Evidence is limited but the advice relies on expert opinion and has the endorsement of respected authorities
	Good Practice Point where no evidence exists but where best practice is based on the clinical experience of the expert group

Electronic searches were performed for: MEDLINE (CD Ovid version) (1996–2005); EMBASE (1996–2005); PubMed (1996–2005); The Cochrane Library (to February 2005) and the US National Guideline Clearing House. The searches were performed using relevant medical subject headings (MeSH), terms and text words. The Cochrane Library was searched for systematic reviews, meta-analyses and controlled trials relevant to vaginal discharge. Previously existing guidelines from BASHH and FFPRHC, the Royal College of Obstetricians and Gynaecologists (RCOG), the World Health Organization, the Department of Health, the British Medical Association, the Royal College of Nursing, the Royal College of General Practitioners and reference lists of identified publications were also searched. Similar search strategies have been used in the development of other national guidelines. Selected key publications were appraised according to standard methodological checklists before conclusions were considered as evidence. Evidence was graded as above, using a scheme similar to that adopted by the RCOG and other guideline development organisations.