

- Encourage milk expression from the infected breast manually or by breast pump
- Attend to breast engorgement and cracked nipples

Treatment

If systemic symptoms develop:

- antibiotics: resolution without progression to an abscess will usually be prevented by antibiotics⁶

di/(flu)cloxacillin 500 mg (o) 6 hourly for at least 5 and up to 10 days

or (if hypersensitive to penicillin),⁹ cephalixin 500 mg (o) 6 hourly for at least 5 days

If severe cellulitis, di/(flu)cloxacillin 2 g (IV) 6 hourly, then switch to oral therapy when symptoms are resolving

- therapeutic ultrasound (2 W/cm² for 6 minutes) daily for 2–3 days
- ibuprofen or paracetamol for pain

§ Granulomatous mastitis¹⁰

Granulomatous mastitis is a rare cause of mastitis in non-lactating women. It is rare in Page 1069 postmenopausal women. Its aetiology is unknown, but it may be triggered by trauma, autoimmune disease and may be linked to *Corynebacterium* species. Clinical presentation is commonly a unilateral firm mass and can be associated with abscess. Treatment includes immunosuppression (steroids or methotrexate), antibiotics, incision and drainage of abscess, and sometimes surgical excision. It can take 12 months to resolve.

§ Breast abscess

If tenderness and redness persist beyond 48 hours and an area of tense induration develops, then a breast abscess has formed (see FIG. 93.2).



FIGURE 93.2 Localised cellulitis and breast abscess in a breastfeeding mother

The preferred treatment is aspiration drainage with a large bore needle under ultrasound guidance for the best cosmetic outcome. Often multiple aspirations are required. Adjunct treatment is antibiotics, rest and complete emptying of the breast. Breastfeeding can continue, with provision of lactation support. Surgical drainage may be required but should be avoided if possible because of the risk of milk fistula formation.

Breast lumps and pain

The outstanding causes of pain or significant discomfort associated with breast lumps are breast abscess and inflammatory breast cancer. Pain is an uncommon presenting symptom of breast cancer and is usually due to localised inflammation. About 1 in 4 patients with breast cancer will experience pain so it is misleading to consider that cancerous lumps are not painful. Benign lumps that can cause considerable discomfort are fibrocystic breasts, fibroadenoma and phyllodes tumour, which can be very large and fast growing (but 25% of these are malignant).

Inflammatory breast cancer

Also referred to as ‘mastitis carcinomatosa’, this rare condition develops quickly with florid redness, swelling, dimpling and heaviness of the breast. It is not as painful as it appears and can be confused with mastitis but does not respond to antibiotics.

Refer immediately.

Lumps in the breast

See TABLE 93.2 for causes of breast lumps.

Table 93.2 Causes of breast lumps in women:
diagnostic strategy model

Probability diagnosis

- Fibrocystic disease (32%)
- Fibroadenoma (23%)
- Cancer (22%)
- Cysts (10%)
- Breast abscess/periareolar inflammation
- Lactation cyst (galactocele)

Serious disorders not to be missed

Vascular:

- thrombophlebitis (Mondor disease)

Infection:

- mastitis/breast abscess
- tuberculosis

Cancer:

- invasive breast carcinoma
- ductal carcinoma in situ (DCIS)
- Paget disease of the nipple
- sarcoma
- lymphoma
- mastitis carcinomatosa

Other:

- phyllodes tumour

Pitfalls (often missed)

Intraductal papilloma

Lipoma

Mammary duct ectasia

Fat necrosis/fibrosis

Note: Statistics for probability diagnosis courtesy MA Henderson, PBR Kitchen, PR Hayes, University of Melbourne Department of Surgery, Breast Clinic, St Vincent's Hospital, Melbourne

Key facts and checkpoints

- The commonest lumps are those associated with mammary dysplasia (32%).¹¹ See [TABLE 93.2](#).
- Fibrocystic disease is also a common cause of cysts, especially in the premenopause phase.
- Over 75% of isolated breast lumps prove to be benign, but clinical identification of a malignant tumour can only definitely be made following aspiration biopsy or histological examination of the tumour.¹¹
- The investigation of a new breast lump requires a very careful history and the triple test.
- Breast cancer is the most common cancer in females. The risk of developing breast cancer before age 85 in Australian women is 1 in 8.¹²
- Breast cancer is uncommon under the age of 30 but it then steadily increases to a maximum at the age of about 60 years, being the most common cancer in women over 50 years. The average age of diagnosis is 60.7 years.¹³ [FIGURE 93.3](#) highlights the changing frequencies of different discrete breast lumps with age.¹⁴
- A ‘dominant’ breast lump in an older woman should be regarded as malignant.

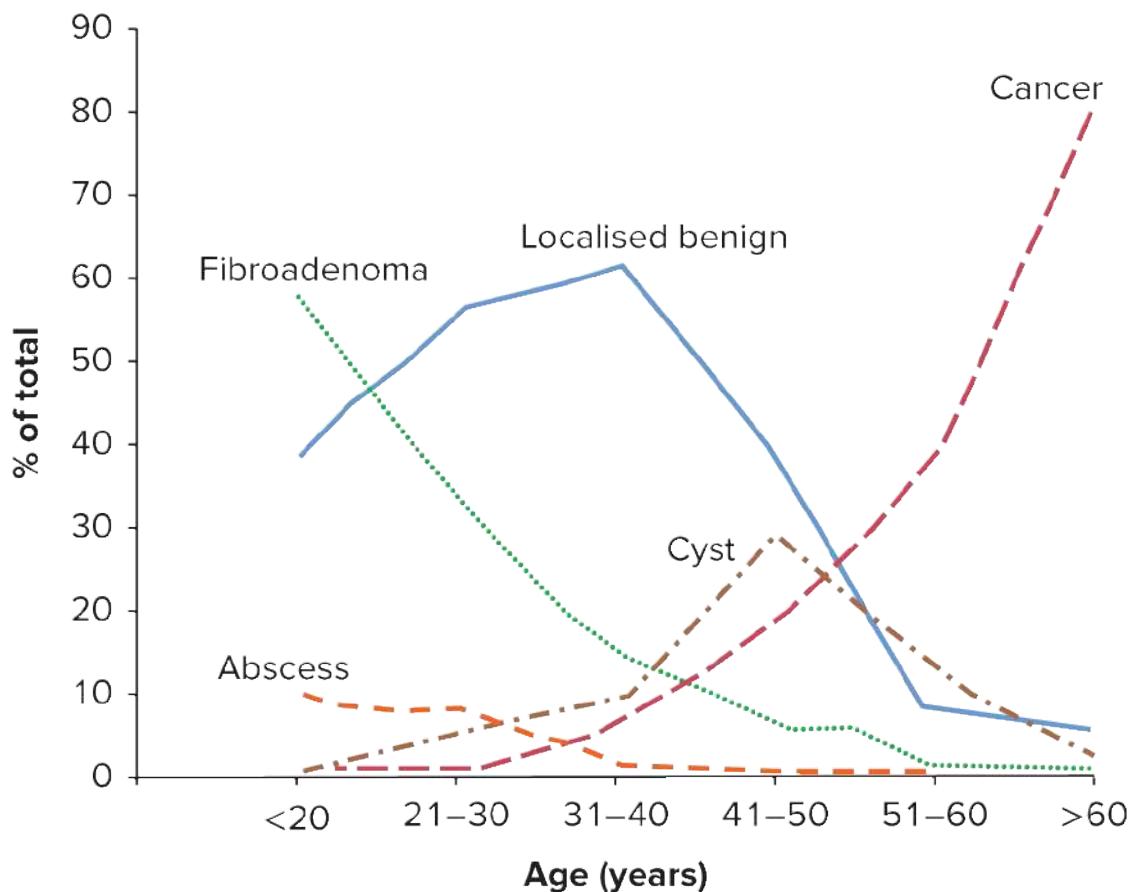


FIGURE 93.3 Changing frequencies of different discrete breast lumps with age

Source: Dixon JM, Mansel RE. Congenital problems and aberrations of normal breast development. In: Dixon JM, ed., *ABC of Breast Diseases*. London: British Medical Journal Publishing Group, 1995. Courtesy of Anthea Carter. Reproduced with permission from Anthea Carter.

The triple test

1. History and clinical breast examination
2. Imaging—mammography and/or ultrasound ± MRI
3. Fine-needle aspiration cytology and/or core biopsy

The clinical approach

This is based on following a careful history and examination.

History

The history should include a family history of breast or ovarian disease and the patient's past history, including trauma, previous breast pain and details about pregnancies (complications of lactation such as mastitis, nipple problems and milk retention).

Key questions¹¹

- Have you had any previous problems with your breasts?
- Have you noticed any breast pain or discomfort?
- Do you have any problems such as increased swelling or tenderness before your periods?
- Is the lump constant or changing?
- Have you noticed lumpiness in your breasts before?
- Has the lumpy area been red or hot?
- Have you noticed any discharge from your nipple or nipples?
- Has there been any change in your nipples?
- Does/did your mother or sisters or any close relatives have any breast problems?

Breast symptoms⁴

- Lump (76%)
- Tenderness or pain (10%)
- Nipple changes (8%)
- Nipple discharge (2%)
- Breast or nipple asymmetry or skin dimpling (4%)
- Periareolar inflammation
- Skin thickening or ridging

Important 'tell-tale' symptoms are illustrated in [FIGURE 93.4](#) .

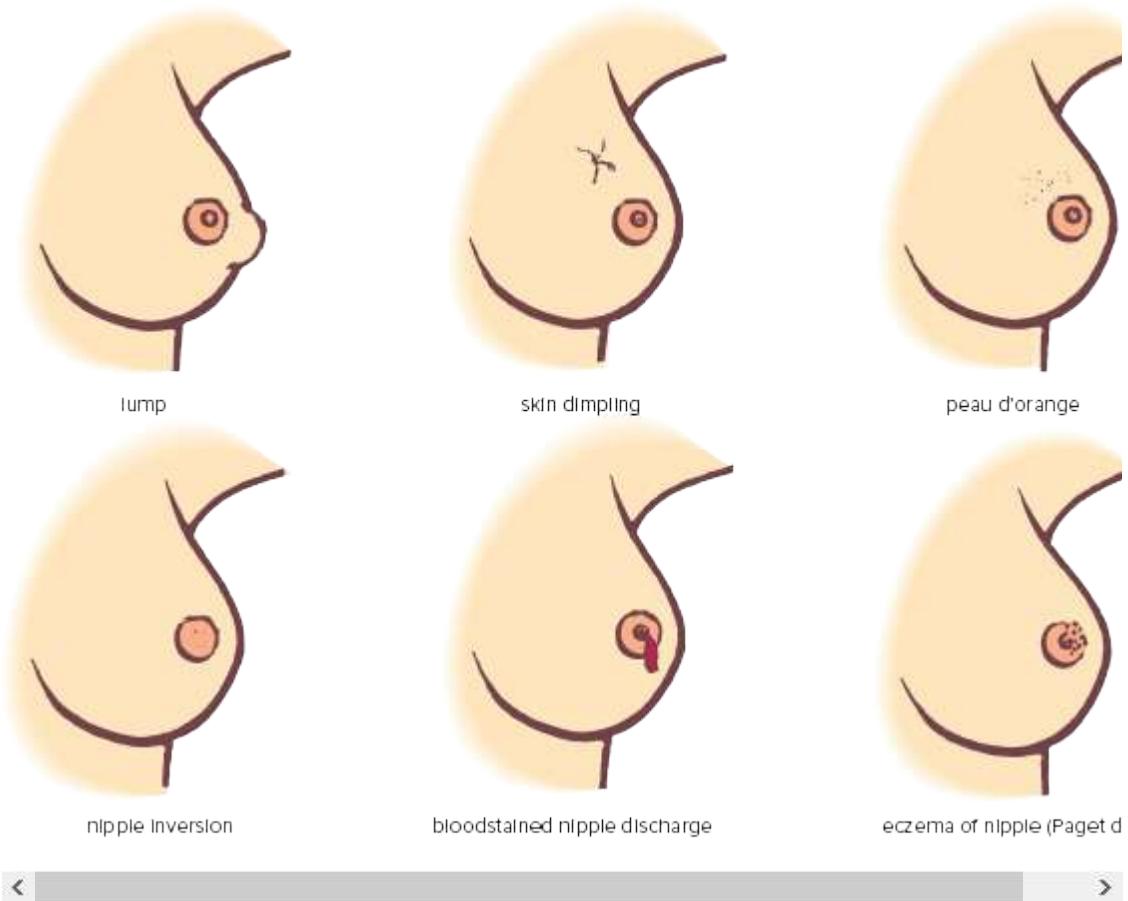


FIGURE 93.4 Important ‘tell-tale’ symptoms of breast cancer

Nipple discharge¹⁵

The diagnostic strategy is outlined in TABLE 93.3 .

Table 93.3 Nipple discharge: diagnostic strategy model

Probability diagnosis

- Physiological
- Pregnancy
- Intraduct papilloma
- Lactation/lactation cysts
- Mammary dysplasia

Serious disorders not to be missed

- Infection:

- acute mastitis/discharging breast abscess
- areolar abscess (infected gland of Montgomery)
- tuberculosis abscess

Cancer:

- intraduct carcinoma
- invasive carcinoma
- Paget disease of nipple

Other:

- hyperprolactinaemia
- hypothyroidism

Pitfalls (often missed)

Mammary duct ectasia

Drugs (e.g. chlorpromazine, metoclopramide, OCP, cimetidine, opioids, amphetamines, CCBs, SSRIs, tricyclic antidepressants, phenothiazine)

Rarities:

- mammary duct fistula
- mechanical stimulation

The discharge may be intermittent, from one or both nipples. It can be induced by quadrant compression. A common reason is physiological, which is usually part of a normal hormonal process.

Types of discharge

- Bloodstained:

 intraduct papilloma (commonest)

 intraduct carcinoma

 fibrocystic breasts

- Green–grey:

 fibrocystic breasts

 mammary duct ectasia

- Yellow:

 fibrocystic breasts

- intraduct carcinoma (serous)
 - breast abscess (pus)
- Milky white (galactorrhoea):
 - lactation cysts
 - lactation
 - hyperprolactinaemia
 - drugs (e.g. antipsychotic, cocaine)



< >

FIGURE 93.5 Woman with advanced breast cancer showing peau d'orange sign, brawny oedema and breast retraction

Periareolar inflammation

This presents as pain around the areola with reddening of the skin, tenderness and

swelling. Causes may be inverted nipple or mammary duct ectasia.

Paget disease of the nipple

This rare but interesting sign and condition usually occurs in middle-aged and elderly women (see FIG. 93.6). It starts as an eczematous-looking, dry scabbing red rash of the nipple which is often misdiagnosed and then proceeds to ulceration of the nipple and areola (see TABLE 93.4). It is almost always due to an underlying malignancy. Diagnosis is made by punch biopsy of the nipple.



FIGURE 93.6 Paget disease of the breast: note the erythematous, eczematous, scaly appearance of the nipple

Table 93.4 Differences between Paget disease and eczema of the nipple¹⁵

Page 1	Page 2
Paget disease	Eczema
Unilateral	Bilateral
Older patients	Younger: reproductive years

Ulceration	Ulceration rare
Possible nipple discharge	No discharge
Not pruritic	Pruritic
No pustules or vesicles	Pustules and vesicles
Deformity of nipple	Normal nipple
Possible palpable lump	No lump
Mammographic changes	Normal mammogram

Examination of the breasts

Page 1072

Objectives

- Identify a dominant lump (one that differs from the remainder of the breast tissue).
- Identify a lump that may be malignant.
- Screen the breasts for early development of cancer.

Time of examination: ideally, 4 days after the end of the period.

Red flag pointers for breast lumps

- Hard and irregular lump
- Skin dimpling and puckering
- Skin oedema ('peau d'orange') ([FIG. 93.5](#))
- Nipple discharge
- Nipple distortion
- Nipple eczema
- Postmenopausal women

Method¹¹

- Inspection: sitting—patient seated upright on side of couch in good light, arms by sides, facing

the doctor, undressed to waist.

A Look for:

- asymmetry of breasts or a visible lump
- localised discolouration of the skin
- nipples:
 - for retraction or ulceration
 - for variations in the level (e.g. elevation on one side)
 - or discharge (e.g. bloodstained, clear, yellow)
- skin attachment or tethering → dimpling of skin (accentuate this sign by asking patient to raise her arms above her head)
- appearance of small nodules of growth
- visible veins (if unilateral they suggest a cancer)¹⁶
- peau d'orange due to dermal oedema

B Raise arms above the head (renders variations in nipple level and skin tethering more obvious). Hands are pressed on the hips to contract pectoralis major to note if there is a deep attachment of the lump.

1. Examination of lymph glands in sitting position: patient with hands on hips. Examine axillary and supraclavicular glands from behind and front.

Note: The draining lymphatic nodes are in the axillae, supraclavicular fossae and internal mammary chain.

2. Palpation:

A Patient still seated: palpate breast with flat of hand and then palpate the bulk of the breast between both hands.

B In supine position:

- patient lies supine on couch with arms above head
- turn body (slight rotation) towards midline so breasts 'sit' as flat as possible on chest wall

Method

- Use the pulps of the fingers rather than the tips with the hand laid flat on the breast.

- Move the hand in slow circular movements.

Examine up and down the breast in vertical strips beginning from the axillary tail (see FIG. 93.7).

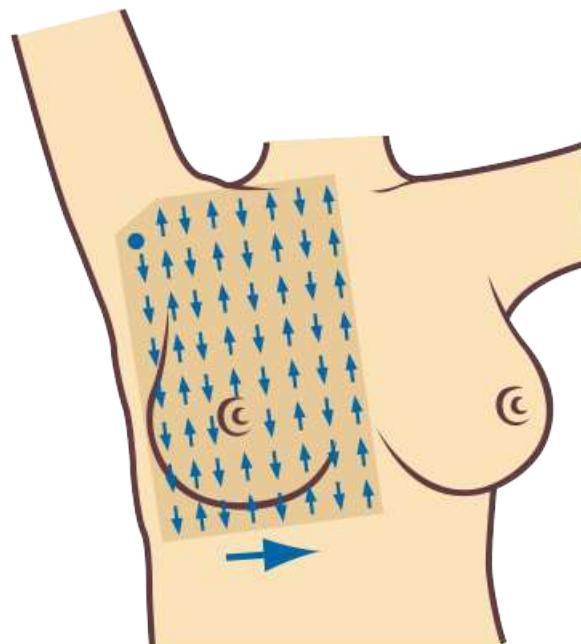


FIGURE 93.7 Systematic examination of the breast

Systematically cover the six areas of the breast (see FIG. 93.8):

- the four quadrants
- the axillary tail
- the region deep to the nipple and areola

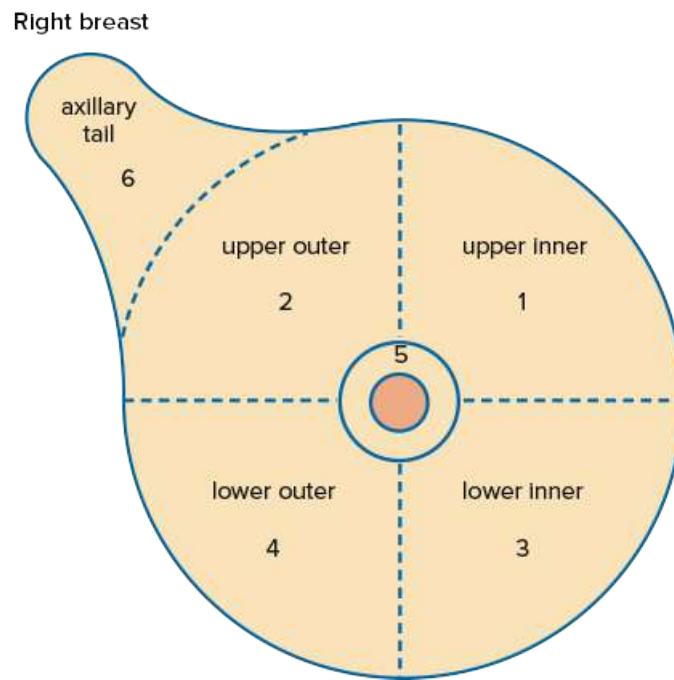


FIGURE 93.8 The six areas of the breast

- I. If a suspicious lump is present, inspect liver, lungs and spine.

Page 1073

Note:

- Most cancers occur in the upper outer quadrant (see FIG. 93.9).¹⁵
- A useful diagram to record the findings is shown in FIGURE 93.10 .

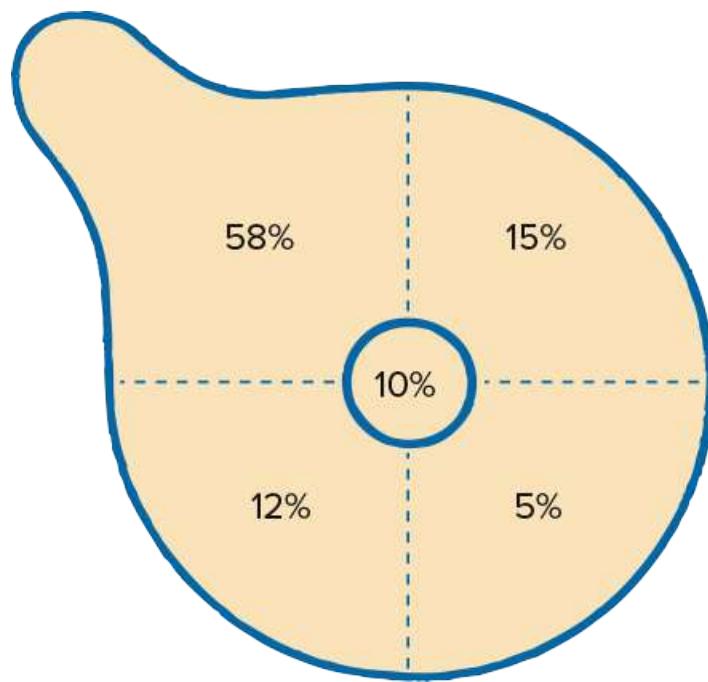


FIGURE 93.9 Relative frequencies of breast cancer at various anatomical segments

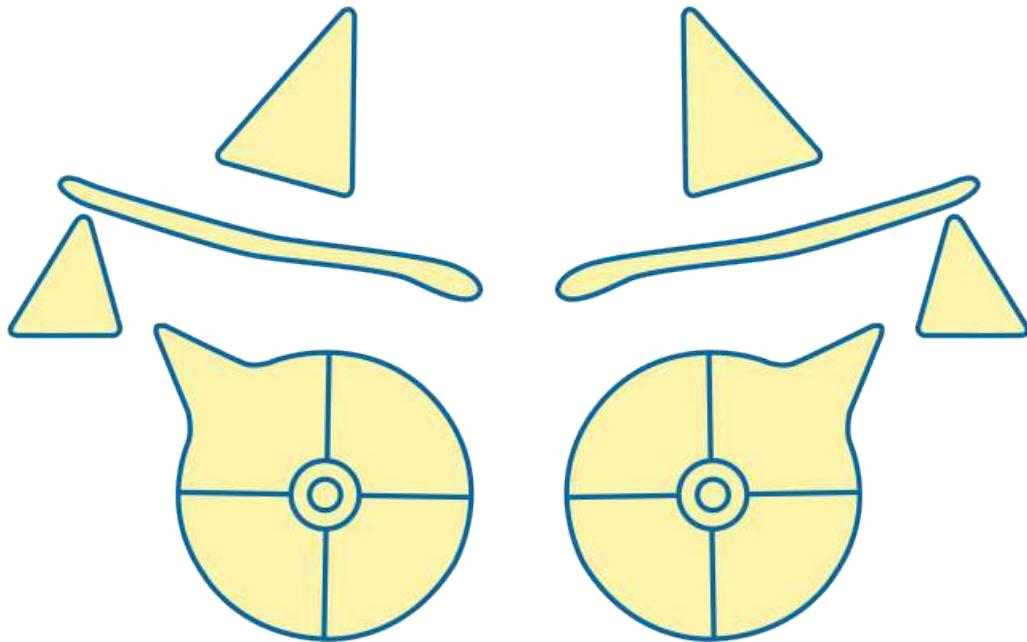


FIGURE 93.10 Diagrammatic scheme for recording the features of breast lumps and any lymphadenopathy (axilla and supraclavicular triangles)

- Lumps that are usually benign and require no immediate action are: tiny (<4 mm) nodules in subcutaneous tissue (usually in the areolar margin); elongated ridges, usually bilateral and in the lower aspects of the breasts; and rounded soft nodules (usually <6 mm) around the areolar margin.¹⁷
- A hard mass is suspicious of malignancy but cancer can be soft because of fat entrapment.
- The inframammary ridge, which is usually found in the heavier breast, is often nodular and firm to hard.
- Lumpiness (if present) is usually most marked in the upper outer quadrant.

If a solitary lump is present, assess it for:

- position (breast quadrant and proximity to nipple)
- size and shape
- consistency (firm, hard, cystic, soft)
- tenderness
- mobility and fixation
- attachment to skin or underlying muscle

Investigations

Page 1074

X-ray mammography

Mammography can be used as a screening procedure and as a diagnostic procedure. It is currently the most effective screening tool for breast cancer.² Positive signs of malignancy include an irregular infiltrating mass with focal spotty microcalcification.

Screening:

- established benefit for women over 50 years
- possible benefit for women in their 40s
- follow-up in those with breast cancer, as 6% develop in the opposite breast
- localisation of the lesion for fine-needle aspiration

Breast ultrasound

This is mainly used to elucidate an area of breast density and is the best method of defining benign breast disease, especially with cystic changes. It is generally most useful in women less than 35 years old (as compared with X-ray mammography).

Useful for:

- pregnant and lactating breast
- differentiating between fluid-filled cysts and solid mass
- palpable masses at periphery of breast tissue (not screened by mammography)
- for more accurate localisation of lump during fine-needle aspiration

An age-related schemata for likely diagnosis and appropriate investigations is presented in [TABLE 93.5](#).

Table 93.5 Age-related schemata for likely diagnoses and appropriate investigations¹⁷

1 Very young women—12 to 25 years

Inflamed cysts or ducts, usually close to areola

Fibroadenomata, often giant

Hormonal thickening, not uncommon

Malignancy rare

Investigations:

- mammography contraindicated
- ultrasound helpful

2 Young women—26 to 35 years

Classic fibroadenomata

Fibrocystic disease with or without discharge

Cysts less common

Malignancy uncommon

Investigations:

- mammography: breasts often very dense, use 3D mammography
- ultrasound often diagnostic

3 Women—36 to 50 years (premenopausal)

Cysts

Fibrocystic disease, discharges, duct papillomas

Malignancy common

Fibroadenomata occur but cannot assume

Inflammatory processes not uncommon

Investigations:

- mammography useful
 - targeted ultrasound useful
-

4 Women—over 50 years (postmenopausal)

Any new discrete mass—malignant until proven otherwise

Any new thickening—regard with suspicion

Inflammatory lesions—probably duct ectasia (follow to resolution)

Cysts unlikely

Investigations:

- mammography usually diagnostic (first line)
 - ultrasound may be useful
-

5 Women—over 50 years, on hormones

Any new mass—regard with suspicion

Cysts may occur—usually asymptomatic

Hormonal change not uncommon

Investigations:

- mammography usually diagnostic but breast may become more dense
 - ultrasound may be useful if above normal or unhelpful and lump suspicious
-

Source: Reproduced with permission from Hirst C. Managing the breast lump. Solving the dilemma—reassurance versus investigation. Aust Fam Physician, 1989; 18: 121–6.

Breast MRI

Breast MRI is not routinely performed but may be useful in the following scenarios:

- presence of a clinically suspicious lump which is negative on routine imaging
- triple test is not concordant
- high-risk groups (BRCA mutation, category 3 family history), especially premenopausal women with dense breast tissue
- in diagnosed malignancy to determine extent of disease

Breast imaging for palpable lumps—summary

- <35 years: bilateral ultrasound; bilateral mammography if ultrasound suspicious

- 35–50 years: bilateral mammography + bilateral ultrasound
- >50 years: bilateral mammography ± bilateral ultrasound

Needle aspiration and biopsy techniques

- Cyst aspiration
- Fine-needle aspiration biopsy: this is a very useful diagnostic test in solid lumps, and has an accuracy of 90–95% (better than mammography)¹⁵
- Large needle (core needle) biopsy for tissue diagnosis and histological features in suspected malignancy
- Surgical biopsy (excision)

Page 1075

Tumour markers

There are no screening blood test tumour markers specific for breast cancer, although CA 1-53 can be used in monitoring metastatic breast cancer.

Oestrogen receptors are uncommon in normal breasts but are found in two-thirds of breast cancers, although the incidence varies with age. They are good prognostic indicators. Progesterone receptors can also be estimated. Oestrogen and progesterone receptors are measured on breast cancers from core tissue or excision specimens but cannot be measured on FNA samples.

Some breast cancer cells have an over-expression of a protein called human epidermal growth factor receptor 2 (HER2) on their surface, which makes them divide and grow aggressively (HER2 positive).

Fine-needle aspiration of breast lump

This simple technique is very useful, especially if the lump is a cyst, and will have no adverse effects if the lump is not malignant. If it is, the needle biopsy will help with the preoperative cytological diagnosis.

Follow-up: the plan for aspiration is outlined in [FIGURE 93.11](#) .

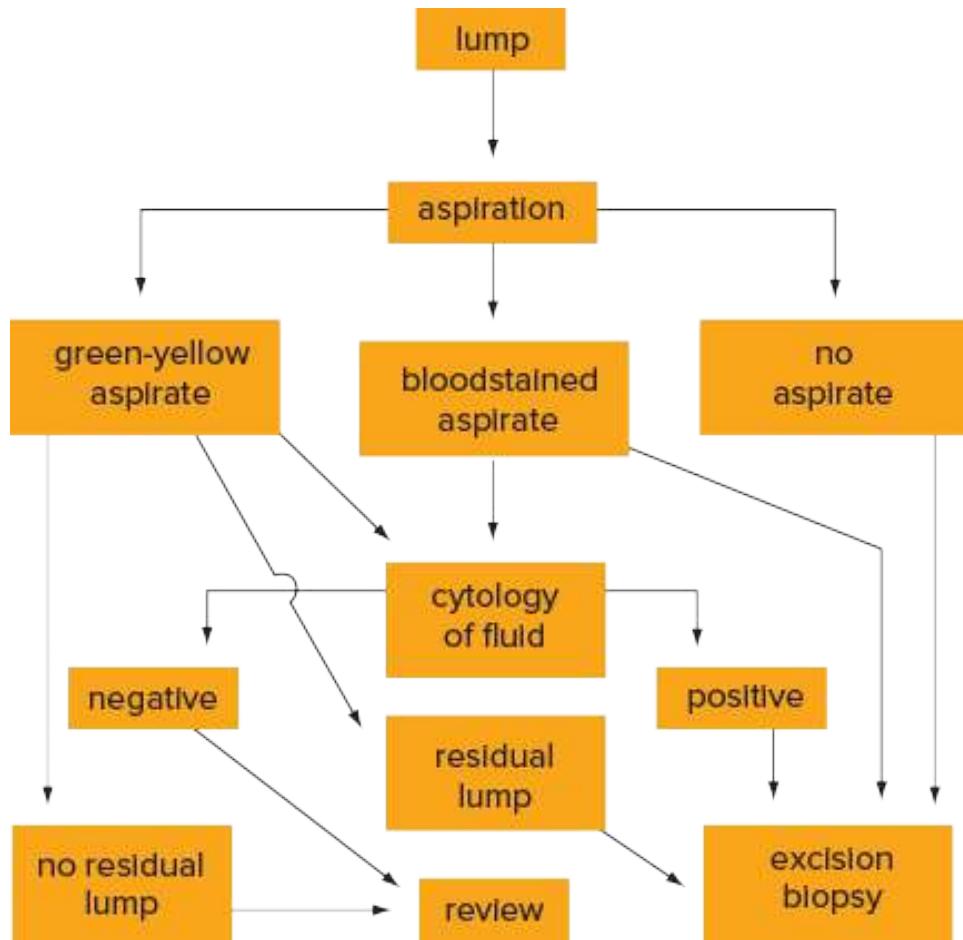


FIGURE 93.11 Scheme for management of a breast lump by fine-needle aspiration

Summary: investigation of a breast lump

If the patient presenting with a breast lump is younger than 35, perform an ultrasound;¹⁸ if older than 35 perform a mammogram and an ultrasound. If the lump is cystic—aspire; if solid—perform a fine-needle biopsy and then manage according to outcomes. If it is suspicious, an excisional biopsy is the preferred option.

More than 99% of breast cancers will be detected if any component of an appropriately performed triple test is positive.¹⁹

Indications for biopsy or excision of lump

- The cyst fluid is bloodstained.

- The lump does not disappear completely with aspiration.
- The swelling recurs within 1 month.

Breast cancer

Breast cancer is uncommon under the age of 30 but it then steadily increases to a maximum at the age of about 60 years.¹⁵ About one-third of women who develop breast cancer are premenopausal and two-thirds postmenopausal. Ninety per cent of breast cancers are invasive ductal carcinomas, the remainder being lobular carcinomas, papillary carcinomas, medullary carcinomas and colloid or mucoid carcinomas.¹¹

Risk factors include:

- increasing age (>40 years)
- living in a Western population
- pre-existing benign breast lumps
- alcohol intake >2 SDs/day
- use of menopause hormonal therapy (MHT) (combined oestrogen and progestogen) >5 years
- personal history of breast cancer
- family history in a first-degree relative (raises risk about threefold)
- known genetic mutations *BRCA1* or *BRCA2*
- nulliparity
- late menopause (after 53)
- obesity
- childless until after 30 years of age
- early menarche²
- ionising radiation exposure
- Ashkenazi Jewish ancestry

Familial breast cancer

Up to 5% of cases are familial, with most being autosomal dominant. There is a strong Page 1076

predisposition from mutations in the genes *BRCA1* and *BRCA2*. Refer to CHAPTER 23 .

Clinical features

- The majority of patients with breast cancer present with a lump (76%).¹⁵
- The lump is usually painless (10% associated with pain).
- Usually the lump is hard and irregular.
- Nipple changes, discharge, retraction or distortion.
- Rarely cancer can present with Paget disease of breast (nipple eczema) or inflammatory breast cancer.
- Rarely it can present with symptoms of distant metastases to other organs (e.g. back pain, dyspnoea, weight loss, headache).

Note: There are basically three presentations of the disease:

- the vast majority present with a local breast lump¹¹
- ductal carcinoma in situ—often asymptomatic and detected on routine breast screening
- some present with metastatic disease

Of those who present with local disease, approximately 50% will develop metastatic disease.

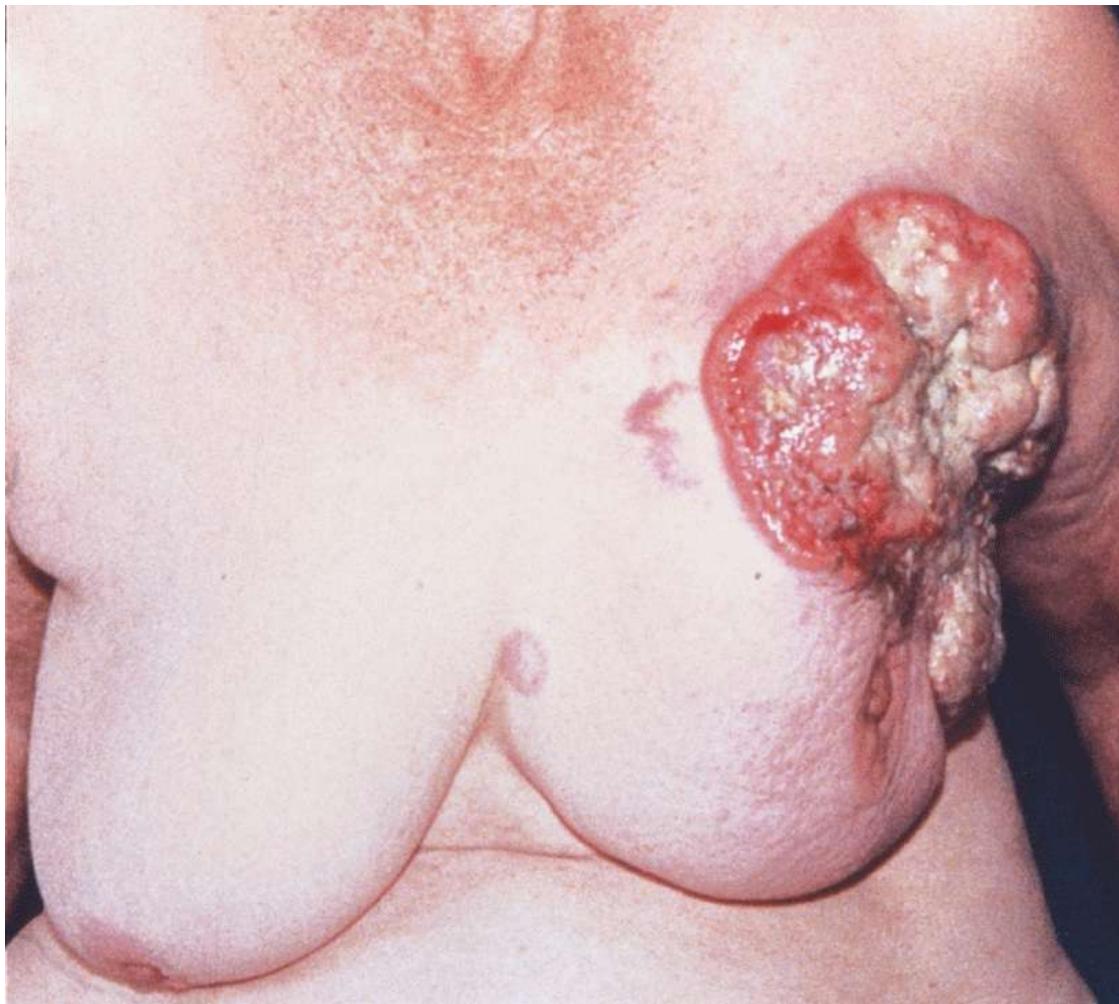


FIGURE 93.12 Advanced adenocarcinoma of breast in patient showing denial for a problem of 2 years' duration

Photo courtesy Dr Victor Vanco

Management

Immediate referral to an expert surgeon on suspicion or proof of breast cancer is essential.

Guidelines for referral include:¹⁹

- any positive component of the triple test
- incomplete cyst aspiration
- spontaneous unilateral bloody or serous discharge from a single duct (especially in women aged 60 years and over)

- persistent eczematoid changes of nipple that do not respond to topical treatment
- unresolving inflammatory mastitis

The treatment has to be individualised according to the nature of the lump, age of the patient and staging. Accurate staging requires knowledge of whether the draining lymph nodes are involved with the tumour, as this is the single most powerful predictor of subsequent metastases and death. Staging for systemic disease also requires full blood examination and liver function tests (including alkaline phosphatase). A bone scan may be used as a valuable baseline. Size and histological grading of tumour plus nodal status and receptor status are the most important prognostic factors.

Optimal management of locally advanced breast cancer is a combined approach that uses chemotherapy, radiotherapy, surgery and/or endocrine therapy if applicable (level IV evidence).

Surgical options are:

- lumpectomy to negative margin
- mastectomy
- mastectomy with reconstruction
- staging of the axilla with sentinel node biopsy (if no evidence of node involvement)
- axillary clearance if evidence of node involvement

Most relapses after surgery occur in the first 3 years.

Neoadjuvant chemotherapy may be offered prior to surgery in patients with high-grade, aggressive, large tumours, or hormone-resistant or HER2 receptor positive patients.

Ductal carcinoma in situ

DCIS is a non-invasive abnormal proliferation of milk duct epithelial cells within the ductal–lobular system and is a precursor lesion for invasive breast cancer. Since mammography screening it is readily detected as a cluster of pleomorphic microcalcifications and now comprises about 20% of breast cancer. It may present clinically with a palpable mass or nipple discharge or Paget disease of the nipple with or without a mass.

Management

Management is surgical excision, with options including total mastectomy with or without reconstruction, or breast-conserving therapy with or without radiotherapy. Patients usually have an excellent outcome with low local recurrence rates and a survival of at least 98%.²⁰

Adjuvant therapy for breast cancer

The consultant will choose the most appropriate surgical and adjuvant treatments (which are designed to treat and destroy micrometastatic disease) for the individual patient.

The National Breast Cancer Consensus report emphasised that ‘continuing care should be coordinated through the patient’s GP as the impact of treatment may last longer than therapy and support must continue’. The report made the following recommendations:²¹

- Tumour excision followed by whole breast irradiation was the most preferred local therapy for most women with stage I or II cancer.
- Total mastectomy and breast-conservation surgery had an equivalent effect on survival.
- Total mastectomy is preferred for a large tumour, multifocal disease, previous irradiation and extensive tumour on mammography.
- Recommendations for radiotherapy after mastectomy are:²²

tumours >4 cm in diameter

axillary node involvement of >3 nodes

the presence of positive or close tumour margins

- Cytotoxic chemotherapy has an important place in management, especially in young, healthy women who are oestrogen receptor negative and have visceral spread.²³
- Adjuvant hormonal therapy by the anti-oestrogen agent tamoxifen 20 mg (o) daily if oestrogen receptor positive, which is a specific modulating agent, is widely used and is most suitable in postmenopausal women. The usual course is 5 years.

Adjunct agents available for treatment include:²⁴

- anti-oestrogens (E receptor blockers or SERMS): tamoxifen, toremifene
- aromatase inhibitors (for hormone receptor +ve cancer in postmenopausal women): anastrozole, letrozole, exemestane
- monoclonal antibodies: trastuzumab (Herceptin) or pertuzumab (Perjeta) for HER2 positive cancers
- bisphosphonates: recommended for women with bony metastases since evidence indicates reversal of bone density loss and cancer recurrence²³
- progestones (e.g. medroxyprogesterone acetate)
- OCP or menopausal hormone therapy (if taken) should be ceased, and pregnancy is

inadvisable

Fibrocystic breasts

Synonyms: fibroadenosis, chronic mastitis, mammary dysplasia, cystic hyperplasia, fibrocystic disease.

Clinical features

- Most common in women between 30 and 50 years
- Hormone-related (between menarche and menopause)
- Pain and tenderness and swelling
- Premenstrual discomfort or pain and increased swelling
- Fluctuation in the size of the mass
- Usually settles after the period
- Unilateral or bilateral
- Nodularity ± a discrete mass
- Ache may extend down inner aspect of upper arm
- Nipple discharge may occur (various colours, mainly green–grey)
- Most cysts are premenopausal (final 5 years before menopause)

Examination. Look for lumpiness in one or both breasts, usually upper outer quadrant.

Management

- Consider mammography if diffuse lumpiness is present in patient >40 years.
- Perform needle biopsy if a discrete lump is present and aspirate palpable cysts.
- Reassure patient that there is no cancer.
- Give advice to alleviate mastalgia (see treatment for cyclical mastalgia).
- Use analgesics as necessary.
- Surgically remove undiagnosed mass lesions.

Breast cyst

- Common in women aged 40–50 years (perimenopausal)
- Less common under 30 years
- Associated with mammary dysplasia
- Tends to regress after menopause
- Pain and tenderness variable, most asymptomatic
- Has a 1 in 1000 incidence of cancer
- Usually lined by duct epithelium

Examination. Look for a discrete smooth well-circumscribed mass, firm, relatively mobile, that is rarely fluctuant.

[Page 1078](#)

Diagnosis

- Mammography
- Ultrasound (investigation of choice)
- Cytology of aspirate

Management

- Drainage with a fine-needle aspiration
- Surgery is rarely required

⌚ Localised nodularity

Usually:

- in upper outer quadrant of breast
- a physiological change to breast
- managed with clinical surveillance
- investigate with imaging in older women if asymmetric or perceived change

⌚ Lactation cysts (galactoceles)

- These milk-containing cysts arise during pregnancy and present postpartum with similar signs to perimenopausal cysts.

- They vary from 1–5 cm in diameter.
- Treat by aspiration: fluid may be clear or milky.

Fibroadenoma

Clinical features

- A discrete, asymptomatic lump
- Usually in 20s (range: second to sixth decade, commonly 15–35 years)
- Firm, smooth and mobile (the ‘breast mouse’)
- Usually rounded
- Usually in upper outer quadrant
- May double in size every 12 months¹⁶

Management

Ultrasound and fine-needle aspiration or core biopsy with cytology are recommended plus mammography in older women. If needle aspiration or core biopsy is negative, the patient can be reassured and followed up until the fibroadenoma is deemed stable. A repeat ultrasound and examination within 6–12 months is ideal. Excision biopsy if large (>3–4 cm), continues to enlarge, suspicious biopsy or woman >40 years.

Phyllodes tumour²⁵

These are a rare subset of fibroepithelial lesions that are usually benign but 25% are malignant and metastasise. They are completely excised with a rim of normal breast tissue.

Fat necrosis

Fat necrosis is usually the end result of a large bruise or trauma that may be subtle, such as protracted breastfeeding. The mass that results is often accompanied by skin or nipple retraction and thus closely resembles cancer. If untreated it usually disappears but the diagnosis can only be made on excision biopsy.

The full triple test is required.

Duct papillomas

These are benign hyperplastic lesions within large mammary ducts and are not premalignant (nor usually palpable). They present with nipple bleeding or a bloodstained discharge and must be

differentiated from infiltrating carcinoma. Mammography and ductography are usually of limited value. Ultrasound can visualise intraductal lesions from 3 mm and vascularity. The involved duct and affected breast segment should be excised because there is a small (<10%) association of intraductal papilloma with papillary DCIS or papillary carcinoma.²⁵

§ Mammary duct ectasia

Synonyms: plasma cell mastitis, periductal mastitis.

In this benign condition a whole breast quadrant may be indurated and tender. The larger breast ducts are dilated. The lump is usually located near the margin of the areola and is a firm or hard, tender, poorly defined swelling. There may be a toothpaste-like nipple discharge. It is a troublesome condition with a tendency to repeated episodes of periareolar inflammation with recurrent abscesses and fistula formation. Many cases settle but sometimes surgical intervention is necessary to make the diagnosis. The condition is most common in the decade around menopause.

§ Lymphoedema of arm

This is a long-term complication of surgery plus irradiation for breast cancer treatment when there is a failure of the lymphatic system to adequately drain extracellular fluid. The limb feels tight and heavy with decreased mobility. Exclude obstruction of the deep venous system by Doppler ultrasound.

Skin changes can occur from long-term lymphoedema without treatment, and cellulitis from abrasions and wounds is a concern.

Management

- Encourage movement; elevation of the arm on a pillow at night; avoid slings
- Early intervention improves long-term outcomes; refer to lymphoedema therapist
- Physiotherapy: a reduction phase with non-elasticised bandages then maintenance with graduated pressure support sleeves
- Elastic sleeves worn all day but not at night
- Lymphoedema massage at home
- Skin hygiene: regular use of non-perfumed emollients, prevention of infection and injury.
- Avoid sunburn and insect bites
- Avoid BP measurement, venesection and IV therapy in that arm
- Consider diuretics to relieve pressure

Page 1079

The problem of mammary prostheses¹⁷

Clinical examination is still necessary and fortunately the residual mammary tissue is usually spread over the prosthesis in a thin, easily palpable layer. The areas of clinical difficulty lie at the margin of the prosthesis, especially in the upper outer quadrant where most of the breast tissue is displaced. It should be noted that mammography may be of limited value in the presence of prostheses, especially if a fibrous capsule exists around the prosthesis. Ultrasound examination may be helpful to also detect periprosthetic fluid.

Breast implants can rupture and leak, and can develop capsular contracture which may require surgical intervention based on severity of symptoms. Breast MRI, CT or ultrasound can diagnose intra or extra-capsular rupture. Breast implants have a small risk of implant-associated anaplastic large cell lymphoma (BIA-ALCL), currently estimated to be between 1 in 1000 to 1 in 10 000. The risk is thought to be linked to time (median time is 8 years) and textured implants.

Breast lumps in children

There are several benign conditions that can cause a breast lump in children, although the commonest presentation is a diffuse breast enlargement.

Neonatal enlargement²⁶

Newborn babies of either sex can present with breast hyperplasia and secretion of breast milk (see CHAPTER 84). This is due to transplacental passage of lactogenic hormones. The swelling usually lasts 7–10 days if left alone. Any attempts to manipulate the breasts to facilitate emptying will prolong the problem.

Premature hyperplasia²⁶

The usual presentation is the development of one breast in girls commonly 7–9 years of age but sometimes younger. The feature is a firm discoid lump 1–2 cm in diameter, situated deep to the nipple. The same change may follow in the other breast within 3–12 months. Reassurance and explanation is the management and biopsy must be avoided at all costs.

Counselling of patients

‘Treat the whole woman, not merely her breasts.’¹⁷ Extreme anxiety is generated by the discovery of a breast lump and it is important that women are encouraged to visit their doctor early, especially as they can learn that there is a 90% chance of their lump being benign. It is possible that denial may be a factor or there is a hidden agenda to the consultation. The decision to perform a lumpectomy or a mastectomy should take the patient’s feelings into consideration—many do fear that a breast remnant may be a focus for cancer. Long-standing doctor–patient relationships are the ideal basis for coping with the difficulties.

Screening

For asymptomatic, low-risk women, screening mammography is advised every 2 years between the ages of 50 and 74 (see CHAPTER 6). In Australia, screening mammography is optional for women aged between 40 and 49. Technically, it is a better diagnostic tool in older women because of the less dense and glandular breast tissue. It has a specificity of around 90%.

The Familial Risk Assessment—Breast and Ovarian Cancer (FRA–BOC) online tool can be used to guide screening for women at increased risk. This can be accessed at: <https://canceraustralia.gov.au/clinical-best-practice/gynaecological-cancers/familial-risk-assessment-fra-boc>.

A FRA–BOC risk assessment places women in one of three categories:

- Category 1—at (or slightly above) average risk. Optional 2-yearly mammograms from 40 years, routinely recommended from age 50.
- Category 2—moderately increased risk. Annual mammograms from age 40 may be recommended if the woman has a first-degree relative <50 years diagnosed with breast cancer. Otherwise, routine 2-yearly mammograms are advised.
- Category 3—potentially high risk. Referral to a family cancer clinic recommended for possible genetic testing. Increased surveillance is determined on an individual basis.

Breast self-examination is a controversial issue and has no proven benefit in reducing Page 1080 morbidity and mortality. The false-positive rate is high, especially in those under 40 years. There is also insufficient evidence to support routine clinical breast examination, although there may be a role for it in the case of women who are not participating in regular mammographic screening. Breast awareness, which involves being familiar with the look and feel of one's breasts and presenting early if a change is detected, should be promoted to all women.

When to refer

- Undiagnosed localised breast pain or lump
- Following cyst aspiration:
 - blood in aspirate
 - palpable residual lump
 - recurrence of the cyst
- Patients given antineoplastic drugs, whether for adjuvant therapy or for advanced disease, require skilled supervision

Lumps that require investigation and referral are presented in TABLE 93.6 .

Table 93.6 Lumps that require investigation and referral

- A stony, hard lump or area, regardless of size, history or position
- A new palpable ‘anything’ in a postmenopausal woman
- A persisting painless asymmetrical thickening
- An enlarging mass—cyclic or not
- A ‘slow-to-resolve’ or recurrent inflammation
- A bloodstained or serous nipple discharge
- Skin dimpling, of even a minor degree, or retraction of the nipple
- A new thickening or mass in the vicinity of a scar

Source: Reproduced with permission from Hirst C. Managing the breast lump. Solving the dilemma—reassurance versus investigation. Aust Fam Physician, 1989; 18: 121–6.

Practice tips

- Although breast cancer rarely causes mastalgia, it should be excluded.
- Think of *C. albicans* if mastitis is very severe with hot shooting pains, especially after antibiotic treatment.
- Mastitis should be treated vigorously—it is a serious condition.
- Any doubtful breast lump should be removed.
- Never assume a palpable mass is a fibroadenoma or cyst—any lump requires a triple test.
- Any eczematous rash appearing on the nipple or areola may indicate underlying breast cancer.
- Never ignore skin dimpling even if no underlying mass is palpable.¹⁷
- Never ignore a woman’s insistence that an area of her breast is different or has changed.¹⁷
- Mammography can detect breast cancers that are too small to feel.

Patient education resources

Hand-out sheets from *Murtagh's Patient Education* 8th edition:

- Painful breasts
- Breast cancer
- Breast lumps
- Breast awareness and breast self-examination

References

- 1 Ryan P. *A Very Short Textbook of Surgery* (2nd edn). Canberra: Dennis & Ryan, 1990: 10.
- 2 Barracough B. The fibrocystic breast—clinical assessment, diagnosis and treatment. *Modern Medicine Australia*, 1990; 33(4): 16–25.
- 3 Rosolowich V et al. Mastalgia. *J Obstet Gynaecol Can*, 2006; 28(1): 49–57.
- 4 Mazza D. *Women's Health in General Practice* (2nd edn). Sydney: Churchill Livingstone, Elsevier, 2011: 189.
- 5 Cusack L, Brennan M. Breast symptoms. Check Unit 474, Melbourne: RACGP, 2011: 13–14.
- 6 Blommers J et al. Evening primrose oil and fish oil for severe chronic mastalgia: a randomized, double-blind, controlled trial. *Am J Obst Gynecol*, 2002; 187: 1389–94.
- 7 Brennan M. Mastalgia: an approach to management (update). *Medical Observer*, 2008: 1–3.
- 8 Srivastava A et al. Evidence-based management of mastalgia: a meta-analysis of randomised trials. *Breast*, 2007; 16(5): 503–12.
- 9 Lactational mastitis [published 2019]. In: *Therapeutic Guidelines* [digital]. Melbourne: Therapeutic Guidelines Limited; 2019. www.tg.org.au, accessed April 2021.
- 10 Brennan ME, Morgan M, Heilat GB, Kanesalingam K. Granulomatous lobular mastitis: clinical update and case study, *AJGP*, 2020; 49(1): 44–7
- 11 Green M. Breast cancer. In: *MIMS Disease Index* (2nd edn). Sydney: IMS Publishing, 1996: 83–5.
- 12 Australian Cancer Incidence and Mortality (ACIM) books. Breast Cancer for Australia (ICD-IO C50). Available from: www.aihw.gov.au/acim-books/, accessed March 2014.

- 13** Australian Institute of Health and Welfare & Australasian Association of Cancer Registries 2012. *Cancer in Australia: an overview, 2012. Cancer Series No. 74, Cat. No. CAN 70.* Canberra: AIHW.
- 14** Dixon JM, Mansel RE. Congenital problems and aberrations of normal breast development. In: Dixon JM, ed., *ABC of Breast Diseases*. London: British Medical Journal Publishing Group, 1995. Page 1081
- 15** Fox J. Breast problems. In: Smith JA et al., eds, *Hunt and Marshall's Clinical Problems in General Surgery* (2nd edn), Sydney: Elsevier, 2010: 67–76.
- 16** Talley N, O'Connor S. *Clinical Examination* (7th edn). Sydney: Elsevier, 2010: 435–7.
- 17** Hirst C. Managing the breast lump. Solving the dilemma—reassurance versus investigation. *Aust Fam Physician*, 1989; 18: 121–6.
- 18** Crea P. Benign breast diseases: a management guide for GPs. *Modern Medicine Australia*, 1995; 38(8): 74–88.
- 19** Cancer Australia, Australian Government. The investigation of a new breast symptom: a guide for general practitioners, 2017. Available from: <https://canceraustralia.gov.au/publications-and-resources/cancer-australia-publications/investigation-new-breast-symptom-guide-general-practitioners>, accessed April 2021.
- 20** Stuart K et al. Ductal carcinoma in situ. *Aust Fam Physician*, 2005; 34(11): 949–53.
- 21** Coates A. Breast Cancer Consensus report. *Med J Aust*, 1994; 161: 510–13.
- 22** Wetzig NR. Breast cancer: how to treat. *Australian Doctor*, 19 October 2001: I–VIII.
- 23** Crea P, Segelov E, Yeo B. Breast cancer—part 2: how to treat. *Australian Doctor*, 20 Nov 2010: 23–9.
- 24** Boyages J, Prassar G. Adjuvant hormonal treatment of breast cancer. *Medical Observer*, 3 August 2012: 27–9.
- 25** Burkitt H, Quick C, Gatt D. *Essential Surgery* (2nd edn). Edinburgh: Churchill Livingstone, 1996: 542.
- 26** Hutson JM, Beasley SW, Woodward AA. Jones, *Clinical Paediatric Surgery*. Melbourne: Blackwell Scientific Publications, 1992: 266–7.

94 Abnormal uterine bleeding

*The classification system for abnormal uterine bleeding uses nine basic categories, separated into structural and non-structural conditions: (PALM-COEIN) **P**olyp, **A**denomyosis, **L**eiomysoma, **M**alignancy–**C**oagulopathy, **O**vulatory disorders, **E**ndometrium, **I**atrogenic and **N**ot otherwise specified.*

FEDERATION OF GYNAECOLOGY AND OBSTETRICS, 2011¹

Abnormal uterine bleeding (AUB) is a common problem encountered in general practice and refers to any change in the regularity, frequency, heaviness or length of menstruation. Heavy menstrual bleeding (HMB) is the most common presentation of AUB. A careful history is vital, as women who have always experienced heavy bleeding may consider this normal. A classification of abnormal uterine bleeding is presented in TABLE 94.1 .

Table 94.1 Classification of abnormal uterine bleeding

Abnormal rhythm

Irregularity of cycle

Intermenstrual bleeding

Postcoital bleeding

Postmenopausal bleeding

Abnormal amount

Increased amount = heavy menstrual bleeding (previously called menorrhagia)

Combination (rhythm and amount)

Irregular and light periods = oligomenorrhoea

Absence of periods = amenorrhoea

Key facts and checkpoints

- Up to 25% of women of reproductive age experience abnormal uterine bleeding (AUB).²
- At least 4% of consultations in general practice deal with AUB.
- There is no pathology diagnosed in 50% of women with AUB.
- The possibility of pregnancy and its complications, such as ectopic pregnancy, miscarriage (threatened, complete or incomplete), hydatidiform mole or choriocarcinoma should be kept in mind.³
- A menstrual record is a useful way to recognise patterns of blood loss.
- Heavy menstrual bleeding (HMB) accounts for 25–30% of iron-deficiency anaemia.
- Two common organic causes of HMB are fibroids and adenomyosis (presence of endometrium in the uterine myometrium).⁴
- Various drugs can alter menstrual bleeding (e.g. anticoagulants, cannabis, steroids).
- The possibility of genital tract malignancy should be considered in women who present with intermenstrual bleeding (IMB), postcoital bleeding (PCB) and postmenopausal bleeding.

Defining what is normal and what is abnormal

This feature is based on a meticulous history, an understanding of the physiology and physiopathology of the menstrual cycle and a clear understanding of what is normal. Most girls reach menarche by the age of 13 (range 10–16 years).⁵ Irregular, painful and heavy periods are more common in the first 2–3 years after menarche and during perimenopause due to a higher number of anovulatory cycles.

Once ovulation and regular menstruation are established the cycle usually follows a predictable pattern and any deviation can be considered as abnormal uterine bleeding (see TABLE 94.2).

Table 94.2 Normal menstruation in the reproductive age group

	Mean	Range
Length of cycle	26–28 days	21–35 days
Menstrual flow	3–4 days	2–7 days
Normal blood loss	30–40 mL	20–80 mL

Source: Fung⁵

A normal endometrial thickness, as measured by ultrasound (best on days 4–7 of cycle), is between 6 and 12 mm in premenopausal women, <5 mm in perimenopausal women and ≤4 mm in postmenopausal women.

Page 1083

Relationship of bleeding to age

Heavy menstrual bleeding (HMB) due to anovulatory cycles (ovulatory dysfunction) is more common at the extremes of the reproductive era (see FIG. 94.1).^{3,4} The incidence of malignant disease as a cause of bleeding increases with age, being greatest after the age of 45, while endometrial cancer is predicted to be less than 1 in 100 000 in women under the age of 35.⁵

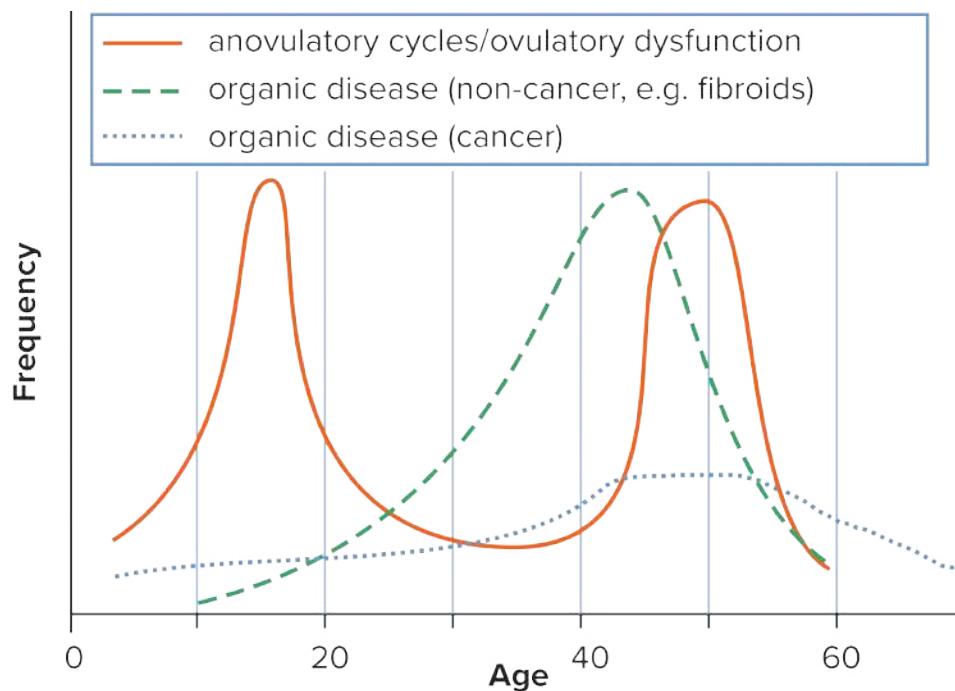


FIGURE 94.1 The relationship between age and various causes of abnormal uterine bleeding. Heavy menstrual bleeding due to anovulatory cycles is more common in the extremes of the reproductive era, while the incidence of cancer as a cause of bleeding is greatest in the perimenopausal and postmenopausal phases.

Source: Reproduced with permission from Mackay EV, Beischer NA, Pepperell RJ et al. *Illustrated Textbook of Gynaecology* (2nd edn). Sydney: WB Saunders, 1992: 77–107.

Heavy menstrual bleeding

Excessive menstrual blood loss which interferes with the woman's physical, emotional, social and material quality of life, and which can occur alone or in combination with other symptoms.²

Heavy menstrual bleeding (HMB)

Heavy menstrual bleeding (HMB) is the commonest cause of iron-deficiency anaemia in the Western world. Causes of HMB are diverse and can be categorised into structural and non-structural, with some women having more than one cause. The terms 'menorrhagia' and 'dysfunctional uterine bleeding' are no longer recommended. When no cause is found, the problem is considered a primary disorder of the endometrium, with disruption of mechanisms regulating endometrial haemostasis.

The most common structural causes are leiomyomata (fibroids, 30%), endometrial polyps (10%), endometriosis, adenomyosis ('endometriosis' of the myometrium) and PID.³

50% of women with HMB experience associated pain (dysmenorrhoea) even in the absence of uterine pathology.² Consider endometriosis and PID as other causes of pain with HMB. A summary of the diagnostic strategy model is presented in TABLE 94.3 .

Table 94.3 HMB: diagnostic strategy model

Probability diagnosis

- Ovulatory dysfunction
- Fibroids
- Complications of hormone therapy
- Adenomyosis

Serious disorders not to be missed (see TABLE 94.4)

Disorders of pregnancy:

- ectopic pregnancy
- abortion or miscarriage

Neoplasia:

- cervical cancer
- endometrial cancer

- oestrogen-producing ovarian tumour (cancer)
- gestational trophoblastic disease
- leukaemia
- benign tumours (polyps, etc.)

Endometrial hyperplasia

Severe infections:

- PID

Pitfalls (often missed)

Genital tract trauma

Copper IUD

Adenomyosis/endometriosis

SLE

Rarities:

- endocrine disorders (e.g. thyroid disease)
- bleeding disorder (e.g. von Willebrand disease, usually diagnosed in early teens)
- liver disease

Seven masquerades checklist

Depression (association)

Diabetes

Drugs

Anaemia (association)

Thyroid disorder (hypothyroidism)

Is the patient trying to tell me something?

Consider associated anxiety and depression.

Table 94.4 Important ‘not to be missed’ causes of irregular bleeding⁶

15–20	20–30	30–45	45–55	55+ (years)
Chlamydia/PID		Endometrial/ovarian cancer		
Pregnancy and pregnancy complications				
		Endometrial polyps Endometrial hyperplasia		

Acute heavy bleeding or ‘flooding’ most often occurs in pubertal girls before regular ovulation is established. Rarely, a coagulopathy may be the cause in teenagers with acute severe bleeding.

History

A meticulous history should include details of the use of tampons, pads, menstrual cups or period underwear, frequency of changes and their degree of saturation. Ask about clotting, flooding and pain. A pictorial blood assessment chart can be a very useful guide.

Page 1084

Enquire about contraceptive use and dyspareunia and take a sexual history. A history of smoking and psychosocial factors should also be checked.

Questions need to be directed to rule out:⁵

- pregnancy or pregnancy complications (e.g. ectopic pregnancy)
- trauma of the genital tract
- medical disorders (e.g. bleeding disorder)
- endocrine disorders
- cancer of the genital tract
- complications of hormonal contraception or replacement therapy

Examination⁵

A general physical examination should aim at ruling out anaemia, evidence of a bleeding disorder and any other stigmata of relevant medical or endocrine disease.

Specific examinations include:

- speculum examination: ?ulcers (cervical cancer) or polyps
- cervical screening test (if due)
- abdominal examination (an enlarged fibroid uterus may be palpable)
- bimanual pelvic examination: ?uterine or adnexal tenderness, size and regularity of uterus

It is prudent to avoid vaginal examination in selected patients, such as a young adolescent girl, as the procedure is unhelpful and unnecessarily traumatic.

Investigations

Abnormal pelvic examination findings, persistent symptoms, older patients and other suspicions of disease indicate further investigation to confirm symptoms of menorrhagia and exclude pelvic or systemic pathology.

Consider foremost:

- full blood count (to exclude anaemia and thrombocytopenia)
- iron studies: serum ferritin
- pregnancy testing (β -hCG)

Special investigations (if indicated):

- first pass urine or vaginal swabs for STIs (chlamydia, gonorrhoea, mycoplasma)
- serum biochemical screen
- coagulation profile screen
- thyroid function tests, especially TSH
- tests for SLE: antinuclear antibodies
- transvaginal ultrasound

Transvaginal ultrasound: should be used when structural causes are suspected, there is increased risk of malignancy or no response to 6 months of medical therapy. It is best performed in the first 5 to 10 days of the menstrual cycle when endometrial thickness is most easily assessed.² An endometrial thickness >12 mm for premenopausal, ≥ 5 mm for perimenopausal and >4 mm in postmenopausal women requires endometrial biopsy.

Note: Hysteroscopy and D&C remain the gold standard for abnormal uterine bleeding.⁷

Medical and surgical management^{8,9,10}

Medical

It is important to offer initial oral treatment at the first visit, even while waiting for investigations. Treatment regimens are presented in TABLE 94.5. Appropriate initial oral treatment is with fibrinolytic inhibitors or antiprostaglandin agents, given as soon as possible and throughout the menses. The agent of first choice is usually tranexamic acid, which reduces blood loss by about 50%. These agents are simple to use, generally very safe and can be used over long periods of time.

Page 1085

Table 94.5 Regimens used in management of HMB¹⁰ (includes options)

Therapy	Mean reduction ⁹ in blood loss 80 mL/cycle %
52 mg levonorgestrel (LNG-IUD), Mirena	94
Oral progestogen:	83
• norethisterone 5 mg tds on days 5–26 of cycle	
Tranexamic acid 1 g (o) 6 hourly on days 1–4 of menstruation	47
Combined oral contraceptive pill	43
NSAIDs (oral):	29
• ibuprofen 400 mg 3–4 times daily	
• naproxen 500 mg statim then 250 mg every 6–8 hours	
• mefenamic acid 500 mg tds	

The most effective medical treatment is the 52 mg levonorgestral intra-uterine device (LNG-IUD, Mirena), which has a mean reduction in blood loss of 94% and should be offered to women if clinically appropriate.² It should be noted that the lower dose LNG-IUD (Kyleena) is not indicated for HMB.

Alternative hormonal agents include oral progestogens, the combined oral contraceptive pill (COCOP) and vaginal ring. Running hormone pills or vaginal rings together in an extended regimen may also be helpful.

Oral progestins administered to women from day 5 to day 26 of their cycle result in a significant reduction in menstrual blood loss. Adverse side effects of oral progestins include weight gain, bloating, breast tenderness, headaches, acne and depressed mood, rendering it more suitable for short-term therapy.

Intramuscular medroxyprogesterone acetate (Depo-Provera) will induce amenorrhoea in approximately 50% of users within 1 year; however, studies for its use in HMB are limited.

Surgical treatment

This is indicated if menorrhagia interferes with lifestyle despite medical treatments. Uterus-preserving options should be offered initially. Options include:

- myomectomy
- polypectomy

- uterine artery embolisation
- endometrial ablation (provided no contraindications)
- hysterectomy (appropriate for women with increased endometrial cancer risk, e.g. endometrial hyperplasia)

Practice tip

Acute severe uterine bleeding:¹⁰

- tranexamic acid 1–1.5 g (o) 6–8 hourly until bleeding stops
or
- norethisterone 5–10 mg (o) 4 hourly until bleeding stops
or
- medroxyprogesterone 10 mg (o) 4 to 8 hourly until bleeding stops
or
- ethinyloestradiol 30–35 mcg combined oral contraceptive pill, 6 hourly until bleeding stops, re-evaluate after 48 hours

Uterine fibroids (leiomyoma)

Fibroids are benign tumours of smooth muscle of the myometrium. They are usually classified according to their location: submucosal, intramural, subserosal and cervical. They are oestrogen-dependent and shrink with the onset of menopause.

Clinical features

- Affects 40–80% of women by age 50 years
- Only 1 in 800 develop malignancy
- Usually asymptomatic

Symptoms

- Often asymptomatic if small
- Menorrhagia

- Dysmenorrhoea
- Pelvic discomfort ± pain (pressure) including dyspareunia
- Bladder dysfunction
- Pain with torsion of pedunculated fibroid
- Pain with ‘red degeneration’—only in pregnancy (pain, fever, local tenderness)

Other features

- Infertility (acts like IUCD if submucosal)
- Calcification

Examination

- Bulky uterus

Investigations

- Transvaginal ultrasound
- FBE ?anaemia

Management

- Medical management the same as for HMB
- Levonorgestrel IUD has now largely taken over as the preferred treatment
- GnRH analogues—especially if >42 years can shrink fibroids (maximum 6 months)—use only immediately pre-operative
- Surgical options:
 - myomectomy (remove fibroids only, esp. child-bearing years)
 - hysteroscopic resection/endometrial ablation
 - hysterectomy
- Other options: uterine artery embolisation, Magnetic Resonance-guided Focused Ultrasound Surgery (MRgFUS)

Page 1086

Intermenstrual bleeding (IMB) and postcoital

bleeding (PCB)

It is important to note that genital tract malignancy is an uncommon cause of bleeding at any stage, but must be considered in all patients. In particular, postcoital bleeding (PCB) is regarded as a cardinal symptom of cervical cancer.

Causes¹¹

- Periovulatory bleeding (normal variant)
- Defective luteal phase (causes premenstrual spotting)
- Endometriosis (causes pre- and postmenstrual spotting)
- Hormonal contraceptives and copper IUD
- Menopausal hormone therapy
- Pregnancy—early loss or ectopic
- Cervical ectropion
- STIs causing cervicitis or PID (especially if PCB)
- Polyps—cervical, endometrial
- Uterine fibroids
- Cervical cancer
- Endometrial/myometrial hyperplasia and malignancy

Examination

Perform an abdominal, bimanual pelvic examination and speculum examination. Check for cervical ectropion, presence of polyps, vaginal discharge and cervical tenderness. Note any friability of the cervix.

Investigations

- Cervical cancer ‘co-test’ (i.e. HPV and liquid-based cytology)
- Transvaginal ultrasound (especially for IMB)
- Endocervical swabs for chlamydia and gonorrhoea PCR
- Pregnancy test (if appropriate)

Management¹¹

All women with persistent PCB require the cervical cancer co-test and gynaecologist referral for colposcopy. Immediate referral is not required after a single episode, provided examination and the co-test are normal. A second episode mandates referral.¹²

If the suspected cause of PCB is a cervical ectropion, persistent bleeding still requires referral. Various ablative treatment methods are available, but are appropriate only once pathology has been excluded.

Irregular bleeding while taking hormonal therapies should be investigated and referral considered if bleeding is excessively frequent, prolonged or new in onset. Consider ceasing hormonal therapy to assess whether symptoms resolve.

Persistent IMB requires gynaecologist referral for hysteroscopy with endometrial biopsy.

Postmenopausal bleeding¹³

Postmenopausal bleeding suggests cervical or endometrial/myometrial cancer in up to 25% of cases.³ Other causes include polyps, atrophic vaginitis, menopausal hormone therapy, endometrial hyperplasia and urethral caruncle. It is worth noting that tamoxifen can increase the risk of endometrial cancer. Earlier referral is indicated for women on tamoxifen who present with PMB.

Transvaginal ultrasound should be performed. Gynaecologist referral is not immediately indicated if the ultrasound reveals an endometrial thickness ≤ 4 mm and there are no suspicious features. However, if endometrial thickness is >4 mm or there is persistent bleeding, referral is indicated with a view to a diagnostic procedure (hysteroscopy and D&C).

Cervical cancer

This should be the diagnosis until proved otherwise for postcoital bleeding.

Clinical features

- Peak incidence in sixth decade
- 80% due to squamous cell carcinoma
- Risk factors (refer to CHAPTER 91)

Page 1087

Symptoms

- Postcoital bleeding
- Intermenstrual bleeding

- Vaginal discharge—may be offensive

Mainly diagnosed on routine screening.

Examination

- Ulceration or mass on cervix
- Bleeds readily on contact—may be friable

Management

- Urgent gynaecological referral

§ Endometrial cancer

This is the diagnosis until proved otherwise in any woman presenting with postmenopausal bleeding.

Clinical features

- Peak incidence 50–70 years

- Risk factors:

age

obesity

nulliparity

late menopause

diabetes mellitus

history of chronic anovulatory bleeding

polycystic ovarian syndrome

drugs (e.g. unopposed oestrogen, tamoxifen)

family history—breast, ovarian, endometrial or colon cancer (Lynch syndrome)

Symptoms

Ninety per cent present with abnormal bleeding, especially postmenopausal bleeding.⁴

Note: Intermenstrual bleeding or persistent bleeding in postmenopausal women should be treated

with suspicion.

Examination

- Uterus usually feels normal, but may be bulky.

Investigations

- Cervical cytology—detects some cases. Endometrial cancer is not excluded by normal cervical cytology
- Transvaginal ultrasound/endometrial biopsy

Management

- Urgent gynaecological referral

Amenorrhoea and oligomenorrhoea¹¹

Amenorrhoea is classified as primary or secondary. Primary amenorrhoea is the failure of the menses to start by 16 years of age.³ Secondary amenorrhoea is the absence of menses for over 6 months in a woman who has had established menstruation.

Primary amenorrhoea

The main approach is to differentiate primary amenorrhoea from delayed puberty, in which there are no signs of sexual maturation by age 13. Causes include:

- hypothalamic amenorrhoea:
 - excessive exercise
 - low body mass
 - severe chronic illness
 - psychological stress
- PCOS
- imperforate hymen
- congenital absence of uterus or vagina
- chromosomal anomalies (e.g. Kallmann syndrome, Turner syndrome)
- pituitary tumours

Diagnostic tests include serum FSH, LH, prolactin, oestradiol and also chromosome analysis. Early referral is appropriate.

Secondary amenorrhoea

The most common causes in general practice are PCOS and hypothalamic amenorrhoea.

- Hypothalamic amenorrhoea:

excessive exercise

low body mass

severe chronic illness

psychological stress

- PCOS
- Pregnancy
- Hyperprolactinaemia
- Premature ovarian insufficiency
- Medication (e.g. hormonal contraception, antipsychotics, opiates, chemotherapy)
- Post-pill amenorrhoea
- Thyroid dysfunction
- Adrenal disorders (e.g. Cushing disease, congenital adrenal hyperplasia)
- Asherman syndrome (following gynaecological surgery)

Gynaecological intervention is appropriate for women with prolonged amenorrhoea due to the increased risk of endometrial cancer.

Oligomenorrhoea

Infrequent and usually irregular periods, where the cycles are between 6 weeks and 6 months. PCOS is the most common cause.

Premature ovarian insufficiency

Apart from iatrogenic causes, this may be caused by idiopathic early menopause and autoimmune ovarian failure. Other genetic associations are Turner syndrome and Fragile X pre-

mutation. It is considered a hormonal deficiency and requires hormonal therapy with either combined oral contraception or menopausal hormonal therapy (see [CHAPTER 97](#)).

When to refer

- Women with persistent IMB and/or PCB
- Women with persistent postmenopausal bleeding
- Women with persistent increased endometrial thickness on transvaginal ultrasound Page 1088
- Possibility of intra-uterine pathology
- The patient does not respond to initial therapy
- There is evidence of underlying disease (e.g. endometriosis, SLE)
- Surgery is indicated

Practice tip

- Non-menstrual bleeding suggests cancer until proved otherwise: it may be postcoital (cervical cancer); intermenstrual (common with hormonal contraception); postmenopausal (endometrial cancer).

Patient education resources

Hand-out sheets from *Murtagh's Patient Education* 8th edition:

- Fibroids
- Menorrhagia (heavy periods)
- Understanding your menstrual cycle

References

- 1 Munro MG, Critchley HOD, Broder MS, Fraser IS, FIGO Working Group on Menstrual Disorders. FIGO classification system (PALM-COEIN) for causes of abnormal uterine bleeding in nongravid women of reproductive age. *Int J Gynaecol Obstet*, 2011; 113(1): 3-13.
- 2 Australian Commission on Safety and Quality in Health Care. *Heavy Menstrual Bleeding*

Clinical Care Standard. Sydney: ACSQHC, 2017.

- 3 Mackay EV et al. *Illustrated Textbook of Gynaecology* (2nd edn). Sydney: WB Saunders, 1992: 77–107.
- 4 O'Connor V, Kovacs G. *Obstetrics, Gynaecology and Women's Health*. Cambridge: Cambridge University Press, 2003: 466–8.
- 5 Fung P. Abnormal uterine bleeding. Modern Medicine Australia, 1992; May: 58–66.
- 6 Read C, May T, Stellingwerff M. Irregular vaginal bleeding: how to treat. Australian Doctor, 18 May 2007: 27–32.
- 7 Barton S, ed. *Clinical Evidence*. London: BMJ Publishing Group, 2001: 1311–16.
- 8 Quinlivan J, Petersen RW. Menorrhagia. Medical Observer, 16 April 2004: 31–4.
- 9 Baber R. What's new in the management of heavy menstrual bleeding? Medicine Today, 2011; 12(12): 61–4.
- 10 Menstrual disorders [published 2020]. In: *Therapeutic Guidelines* [digital]. Melbourne: Therapeutic Guidelines Limited; 2020. www.tg.org.au, accessed April 2021.
- 11 Family Planning NSW. *Reproductive and Sexual Health: An Australian Clinical Practice Handbook* (3rd edn). Sydney: Family Planning NSW, 2016.
- 12 Cancer Council Australia Cervical Cancer Screening Guidelines Working Party. National Cervical Screening Program: guidelines for the management of screen-detected abnormalities, screening in specific populations and investigation of abnormal vaginal bleeding. Sydney: Cancer Council Australia, 2016. Available from: www.wiki.cancer.org.au/australia/Guidelines:Cervical_cancer/Screening, accessed May 2021.
- 13 Cancer Australia. Abnormal vaginal bleeding in post-menopausal women. A diagnostic guide for general practitioners and gynaecologists. Available from: www.canceraustralia.gov.au/sites/default/files/publications/ncgc-vaginal-bleeding-flowcharts-march-2011_504af02038614.pdf, accessed May 2021.

95 Lower abdominal and pelvic pain in women

Man endures pain as an undeserved punishment, woman accepts it as a natural heritage.

ANONYMOUS

Pain in the lower abdomen and pelvis is one of the most frequent symptoms experienced by women. The diagnostic approach requires a wide variety of consultative skills, especially when the pain is chronic. The examination of acute abdominal pain has been simplified by sensitive serum pregnancy tests, ultrasound and laparoscopy. However, an accurate history and examination for all types of pain will generally pinpoint the diagnosis. The ever-present problem of PID, a significant cause of infertility in women, demands an early diagnosis and appropriate management.

Key facts and checkpoints

- A distinction has to be made between acute, chronic and recurrent pain.
- Ectopic pregnancy remains a potentially lethal condition and its diagnosis still requires a high index of suspicion.
- Sudden sharp pain in the pelvis that becomes more generalised indicates rupture of an ectopic pregnancy or an ovarian cyst.
- Recurrent sharp, self-limiting pain indicates a ruptured Graafian follicle (mittelschmerz).
- Recurrent pain related to menstruation is typical of dysmenorrhoea or endometriosis.
- Endometriosis affects 1 in 9 women. On average, it takes 6½ years for endometriosis to be diagnosed.¹
- The principal afferent pathways of the pelvic viscera arise from T10–12, L1 and

S2–4. Thus disorders of the bladder, rectum, lower uterus, cervix and upper vagina can refer pain to the low back, buttocks and posterior thigh.²

- Chronic or persistent pelvic pain (PPP) is a complex neuromuscular-psychosocial disorder and estimated to affect 15–25% of women.³

A diagnostic approach

A summary of the diagnostic strategy model is presented in TABLE 95.1 .

Table 95.1 Lower abdominal and pelvic pain in women: diagnostic strategy model

Probability diagnosis

Primary dysmenorrhoea

Mittelschmerz

Pelvic/abdominal adhesions

Endometriosis

Serious disorders not to be missed

Ectopic pregnancy

Neoplasia:

- ovary
- cervix and uterus
- other pelvic structures

Severe infections:

- PID
- pelvic abscess

Acute appendicitis

Internal iliac claudication

Pitfalls (often missed)

Endometriosis/adenomyosis

Torsion of ovary or pedunculated fibroid

Constipation/faecal impaction

Irritable bowel syndrome

Malpositioned IUD

Pudendal neuralgia

Referred pain (to pelvis):

- appendicitis
- cholecystitis
- diverticulitis
- urinary tract disorders

Transvaginal mesh complications

Ovarian vein incompetence/pelvic congestion syndrome

Seven masquerades checklist

Depression

Drugs

Spinal dysfunction (referred pain)

UTI

Is the patient trying to tell me something?

Often relevant

Probability diagnosis

The commonest causes are primary dysmenorrhoea, the pain of a ruptured Graafian follicle (mittelschmerz), endometriosis and adhesions. In many instances of pain no diagnosis is made as no pathological cause can be found.

[Page 1090](#)

Serious disorders not to be missed

The potentially lethal problem of a ruptured ectopic pregnancy must not be missed, hence the axiom ‘be ectopic minded’. PID can be overlooked, especially if chronic, and requires early diagnosis and aggressive treatment. Neoplasia must be considered, especially malignancy of pelvic structures, including the ‘silent’ ovarian cancer.

Pitfalls

Several disorders are very difficult to diagnose and these include haemorrhage into the ovary or a cyst, torsion of the ovary or pedunculated fibroid. Endometriosis may be missed so it is important to be familiar with its symptoms. Chronic constipation may be a trap.

Seven masquerades checklist

Two important conditions to consider are urinary tract infection and spinal dysfunction. Just as disorders of the pelvic organs, such as endometriosis and PID, can refer pain to the low back and buttocks, so can disorders of the lumbosacral spine cause referred pain to the lower abdomen and groin.

Psychogenic considerations

These are extremely relevant. Problems in the patient's social, marital or sexual relationships should be evaluated, especially in the assessment of chronic pain. Up to 50% of patients with persistent pelvic pain (PPP) have a history of physical, sexual and emotional abuse or trauma and about one-third have positive screening results for post-traumatic stress disorder.⁴

The clinical approach

History

The pain history should be linked with the menstrual cycle and the possibility of an early pregnancy. Enquire about dyspareunia, on entry or on deep penetration, and contraceptive use. Note obstetric and past surgical histories. The severity of the pain can be assessed as follows:⁵

- interference with daily activity
- number of days off work or study
- resulting in confinement to bed

In this way the pain can be classified objectively as mild, moderate or severe.

The typical pain patterns in relation to menstruation are shown in FIGURE 95.1 .

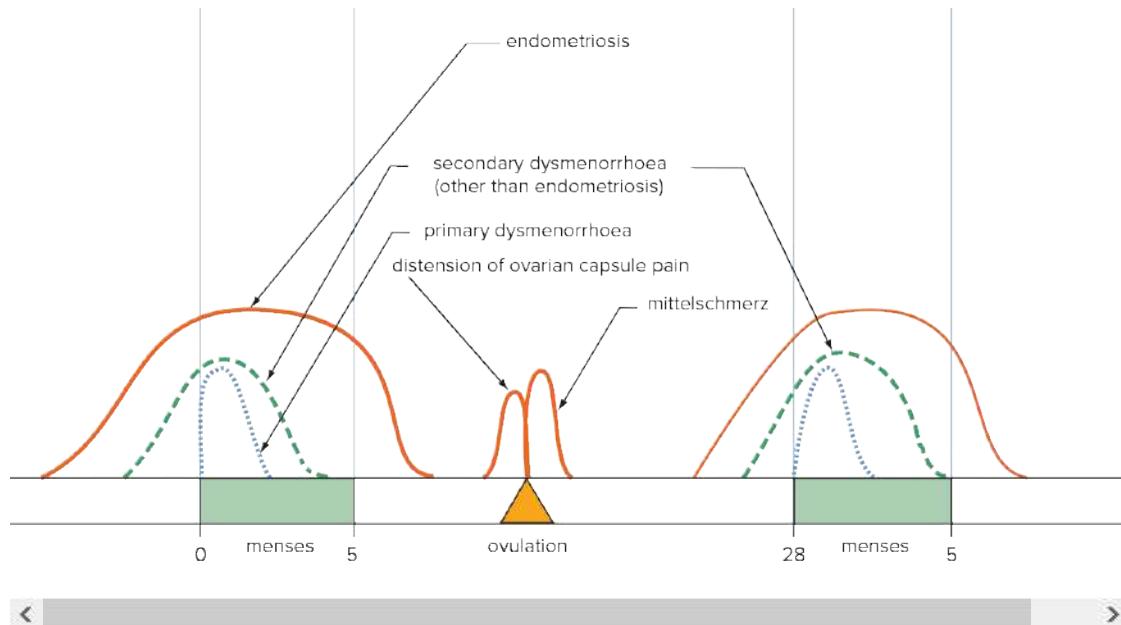


FIGURE 95.1 Typical pain patterns for menstrual cycle-related gynaecological pain

Examination

Use the traditional abdominal and pelvic examination to identify the site of tenderness and rebound tenderness, and any abdominal or pelvic masses.

When clinically indicated, the pelvis should be examined by speculum and bimanual palpation. Instrumental vaginal examinations are unlikely to be indicated in young women who are not yet sexually active. However, sexual experience does not automatically mean that an internal or instrumental examination is either necessary or acceptable to a young person.⁶

Page 1091

Proper assessment can be difficult if the patient is anticipating pain, if there is abdominal scarring or obesity, or if extreme tenderness is present. It is therefore important to give a thorough explanation, give permission to end the examination at any time and obtain consent to proceed. Offer a chaperone or support person to be present.

Investigations

Investigations may be selected from:

- FBC
- ESR/CRP
- Urine microscopy and culture
- Endocervical and vaginal swabs—*Chlamydia* and *N. Gonorrhoeae* PCR
- Serum β-hCG assay
- Urinary β-hCG tests (can be negative in the presence of an ectopic pregnancy)

Imaging:

- transvaginal ultrasound, indicated for:
 - to define a gestation sac
 - pelvic pain
 - a palpable pelvic or lower abdominal mass

Laparoscopy may be indicated if the history and examination are suggestive of ectopic pregnancy and ultrasound fails to confirm an intra-uterine pregnancy.

Acute pain

The causes of acute pain are summarised in TABLE 95.2 . The patient is usually young (20–30 years old), sexually active and distressed by the pain, and should be considered foremost to have a bleeding ectopic pregnancy. Important differential diagnoses include acute PID, rupture or torsion of an ovarian cyst and acute appendicitis. Cases of acute ruptured ectopics are easier to diagnose in the presence of circulatory collapse.

Table 95.2 Causes of acute lower abdominal and pelvic pain in women²

Genital

- Pelvic inflammatory disease (PID)
- Ovarian torsion
- Ovarian cyst–rupture, haemorrhage or torsion
- Threatened or incomplete abortion
- Ectopic pregnancy
- Uterine fibroid–degeneration, torsion
- Malpositioned IUD
- Endometriosis–ruptured or bleeding endometrioma

Non-genital

- Acute appendicitis
- Bowel obstruction
- Urinary tract infection (cystitis)
- Ureteric colic (calculus)
- Inflammatory bowel disease

Diverticulitis

Functional

- Primary dysmenorrhoea
- Irritable bowel syndrome

Ectopic pregnancy

Ectopic pregnancy occurs approximately once in every 100 clinically recognised pregnancies. If ruptured it can be a rapid, fatal condition so we have to be ‘ectopic minded’. It is the commonest cause of intraperitoneal haemorrhage. There is usually a history of a missed period but a normal menstrual history may be obtained in some instances.

Clinical features of a ruptured ectopic pregnancy

- Average patient in mid-20s
- First pregnancy in one-third of patients
- Patient at risk:
 - previous ectopic pregnancy
 - previous PID
 - previous abdominal or pelvic surgery, especially sterilisation reversal
 - endometriosis
 - in-vitro fertilisation



DxT amenorrhoea (65–80%) + lower abdominal pain (95+%) + abnormal vaginal bleeding (65–85%) → ectopic pregnancy

- Pre-rupture symptoms (many cases):
 - pregnancy of unknown location
 - cramping pains in one or other iliac fossa
 - vaginal bleeding
- Rupture:
 - excruciating pain (see FIG. 95.2)
 - circulatory collapse

Note: In 10–15% there is no abnormal bleeding.

- Pain may radiate to rectum (lavatory sign), vagina or leg
- Signs of pregnancy (e.g. enlarged breasts and uterus) usually not present

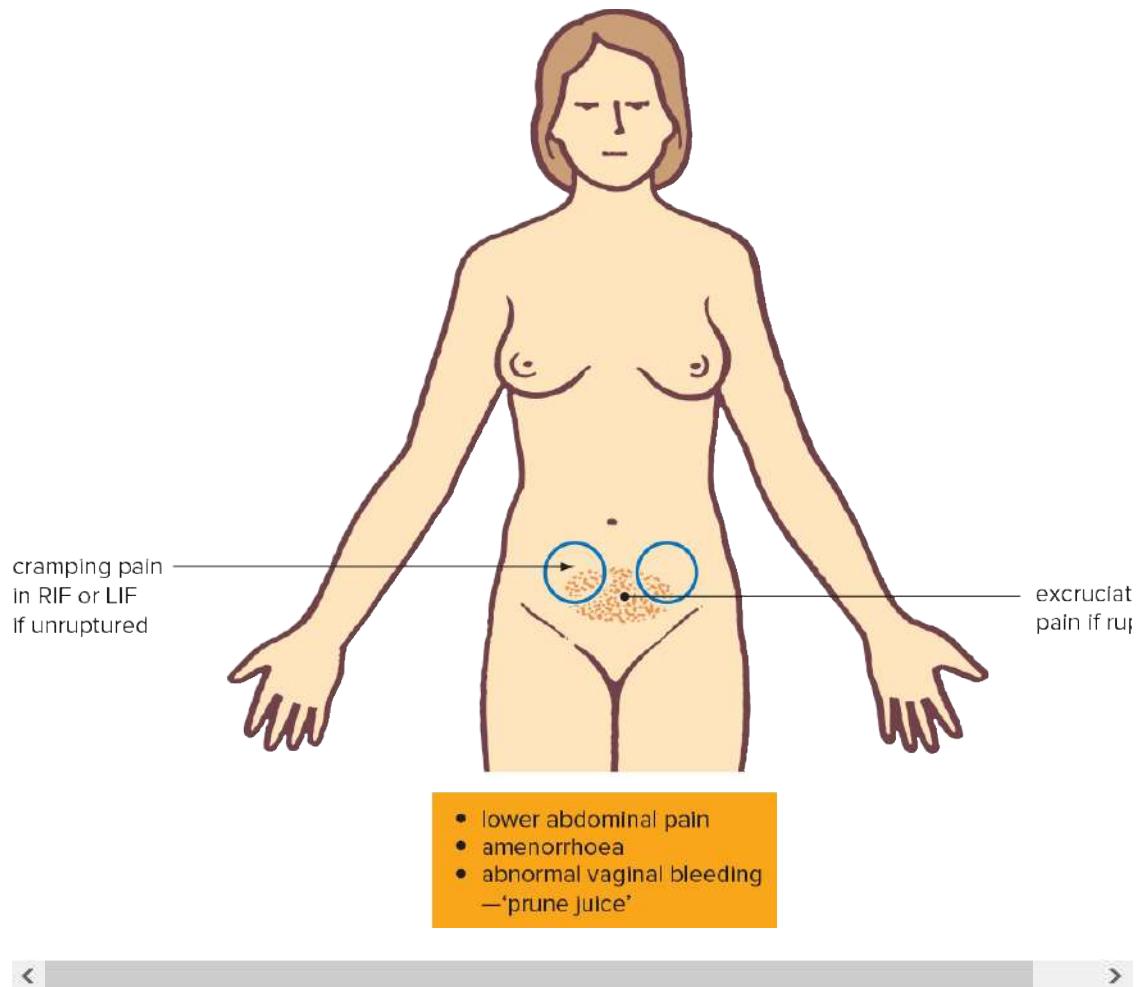


FIGURE 95.2 Clinical features of ectopic pregnancy

Examination

- Deep tenderness in iliac fossa

Page 1092

- Vaginal examination:

tenderness on bimanual pelvic examination (pain on cervical provocation, i.e. cervical motion tenderness)

palpable adnexal mass

soft cervix

- Bleeding (prune juice appearance)
- Temperature and pulse usually normal early

Diagnosis⁷

It is possible to diagnose ectopic pregnancy at a very early stage of pregnancy.

- Urine pregnancy test (positive in most ectopics)
- Serum β -hCG assay—may need serial quantitative tests to distinguish an ectopic from a normal intra-uterine pregnancy (IUP). If it is >2000 IU/L, an IUP should be visible on vaginal ultrasound. If the uterus is empty, ectopic is more likely. If <2000 IU/L, repeat every second day to see if it is increasing normally as expected in a normal IUP.
- Transvaginal ultrasound can diagnose at 5–6 weeks (empty uterus, tubal sac, fluid in cul-de-sac)
- Laparoscopy (the definitive diagnostic procedure)

Ectopic pregnancy diagnosis

- β -hCG assay
- Transvaginal ultrasound
- Laparoscopy

Management

Possible options are surgery, medical or expectant management (in a small number of carefully selected cases). Medical management involves injecting intramuscular methotrexate, while surgery involves salpingectomy or salpingostomy. Surgery should be performed laparoscopically wherever possible. Rupture with blood loss (usually about 7% of cases⁸) demands urgent surgery.

Post management

- Successful pregnancy 60–65%
- Subsequent risk of ectopic pregnancy 10–15%

Pelvic inflammatory disease (PID)

Pelvic inflammatory disease (PID) is a syndrome of inflammatory disorders of the female upper genital tract, including endometritis, salpingitis, tubo-ovarian abscess and pelvic peritonitis. PID is most commonly sexually acquired, although non-sexually acquired PID may result from gynaecological procedures such as IUD insertion.⁹

PID may be either acute, which causes sudden severe symptoms, or chronic, with milder symptoms and more gradual onset. A high index of suspicion is required in young sexually active women who present with new onset pelvic pain. Recent partner change is an important risk factor.¹⁰

There are serious consequences of PID, namely tubal factor infertility (20%), chronic pelvic pain (20%) and ectopic pregnancy (10%). The risk of complications increases significantly with repeated episodes.¹¹

Clinical features

Acute PID:

- Fever $\geq 38^{\circ}\text{C}$
- Moderate to severe lower abdominal pain
- Nausea, vomiting

Chronic PID:

- Ache in the lower back
- Mild lower abdominal pain

Both acute and chronic:

- Dyspareunia
- Vaginal bleeding (postcoital, intermenstrual or heavy menstrual bleeding)
- Abnormal, perhaps offensive, purulent vaginal discharge
- Painful or frequent urination

Examination

- In acute PID there may be lower abdominal tenderness \pm rigidity.
- Pelvic examination: in acute PID there is unusual vaginal warmth, cervical motion tenderness and adnexal tenderness. Speculum examination usually reveals a red inflamed cervix and a purulent discharge.

Causes¹⁰

- Polymicrobial
- No pathogen is identified in most (70%) cases
- STIs—*Chlamydia trachomatis* (most common), *Neisseria gonorrhoeae*, *Mycoplasma genitalium*
- Vaginal flora

- Changes in the cervicovaginal environment may allow vaginal bacteria to ascend to the upper genital tract

Diagnosis^{10,11}

Diagnosis is clinical and may be difficult, as signs and symptoms can be non-specific and correlate poorly with the extent of inflammation. The most common symptoms are vaginal discharge, lower abdominal pain and dyspareunia. The most common signs are adnexal tenderness and cervical motion tenderness. Rapid response to antibiotic treatment is highly predictive of PID. The presence of STI supports the diagnosis.

Investigations

- Endocervical swabs for NAAT (e.g. PCR), *N. gonorrhoeae*, *C. trachomatis* and *M. genitalium*
- Endocervical swab for culture
- Blood culture if febrile
- Pelvic ultrasound to detect alternative causes of pain

Treatment

Sexually acquired infection⁹

Begin treatment immediately with a provisional diagnosis, without waiting for test results. For mild to moderate infection (treated as an outpatient):

ceftriaxone 500 mg (in 2 ml 1% lignocaine) IM or 500 mg IV, as a single dose (for gonorrhoea)

plus

metronidazole 400 mg (o) 12 hourly for 14 days

plus

doxycycline 100 mg (o) 12 hourly for 14 days

Note: If *M. genitalium* confirmed, prescribe 2 weeks of moxifloxacin 400 mg daily for 14 days. If pregnant or breastfeeding, instead of doxycycline use azithromycin 1 mg (o) as single dose, repeated 1 week later.

Postprocedural pelvic infection⁹

For mild infection use amoxicillin + clavulanate 875 + 125 mg (o), bd for 14 days. If hypersensitive to penicillins, use trimethoprim + sulfamethoxazole (160 + 800 mg orally) and

metronidazole (400 mg orally) bd for 14 days. Consider switching to intravenous therapy if no response within 72 hours.

Further management¹⁰

- Avoid sexual intercourse for a week following treatment or until symptoms resolve.
- IUD should be removed if there is no response to treatment in 48 to 72 hours.
- A new IUD can be inserted once the infection has resolved.
- Current sexual partners should be treated with agents effective against *C. trachomatis* (and *N. gonorrhoeae* if likely), irrespective of test results.
- If a sexually transmitted pathogen is identified, perform a test of cure 1 month after starting treatment.

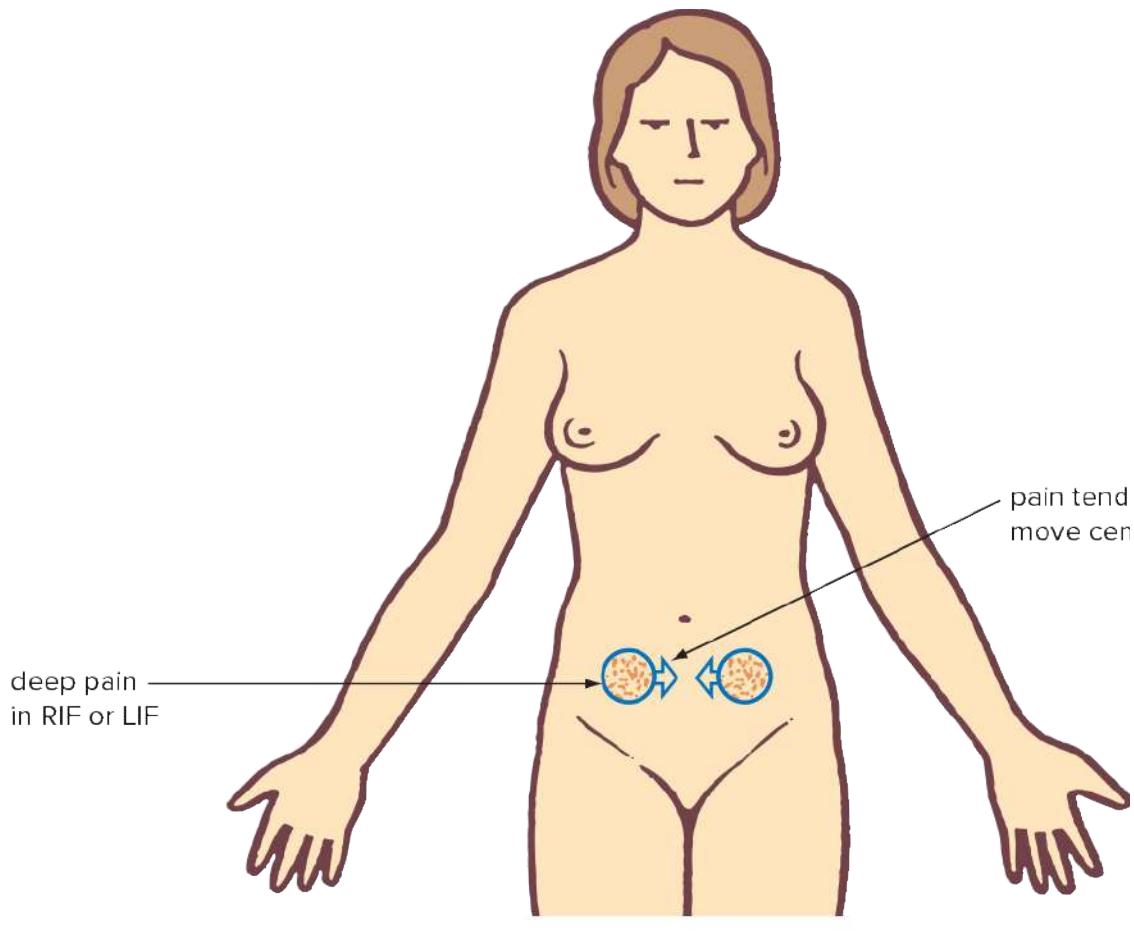
⌚ Ruptured ovarian (Graafian) follicle (mittelschmerz)

When the Graafian follicle ruptures a small amount of blood mixed with follicular fluid is usually released into the pouch of Douglas. This may cause peritonism (mittelschmerz), which is different from the unilateral pain experienced just before ovulation due to distension of the ovarian capsule.

[Page 1094](#)

Clinical features

- Onset of pain in mid-cycle
- Deep pain in one or other iliac fossa (RIF > LIF)
- Often described as a ‘horse kick pain’
- Pain tends to move centrally (see FIG. 95.3)
- Heavy feeling in pelvis
- Relieved by sitting or supporting lower abdomen
- Pain lasts from a few minutes to hours (average 5 hours)
- Patient otherwise well



- deep ache in lower abdomen
- lateral then shifts centrally
- heavy feeling in pelvis

< >

FIGURE 95.3 Typical clinical features of a ruptured Graafian follicle (mittelschmerz)

Note: Sometimes it can mimic acute appendicitis.

Management

- Explanation and reassurance
- Simple analgesics: aspirin or paracetamol
- ‘Hot-water bottle’ comfort if pain severe

Ovarian tumours

Benign ovarian tumours, particularly ovarian cysts, may be asymptomatic but will cause pain if complicated. They are common in women under 50 years of age. Ovarian cysts are best defined by transvaginal ultrasound, which can identify whether haemorrhage has occurred inside or outside the cyst.

Symptoms

- Pain (usually torsion or haemorrhage)
- Pressure symptoms (e.g. bloating, difficulty emptying bladder or bowel)

Ruptured ovarian cyst

The cysts tend to rupture just prior to ovulation or following coitus.

Clinical features

- Patient usually 15–25 years
- Sudden onset of pain in one or other iliac fossa
- May be nausea and vomiting
- No systemic signs
- Pain usually settles within a few hours

Signs

- Tenderness and guarding in iliac fossa
- PR: tenderness in rectovaginal pouch

Investigation

- Transvaginal ultrasound

Page 1095

Management

- Appropriate explanation and reassurance
- Conservative:
 - simple cyst <4 cm
 - internal haemorrhage

minimal pain

- Needle vaginal drainage by ultrasonography for a simple larger cyst

- Laparoscopic surgery:

complex cysts

large cysts

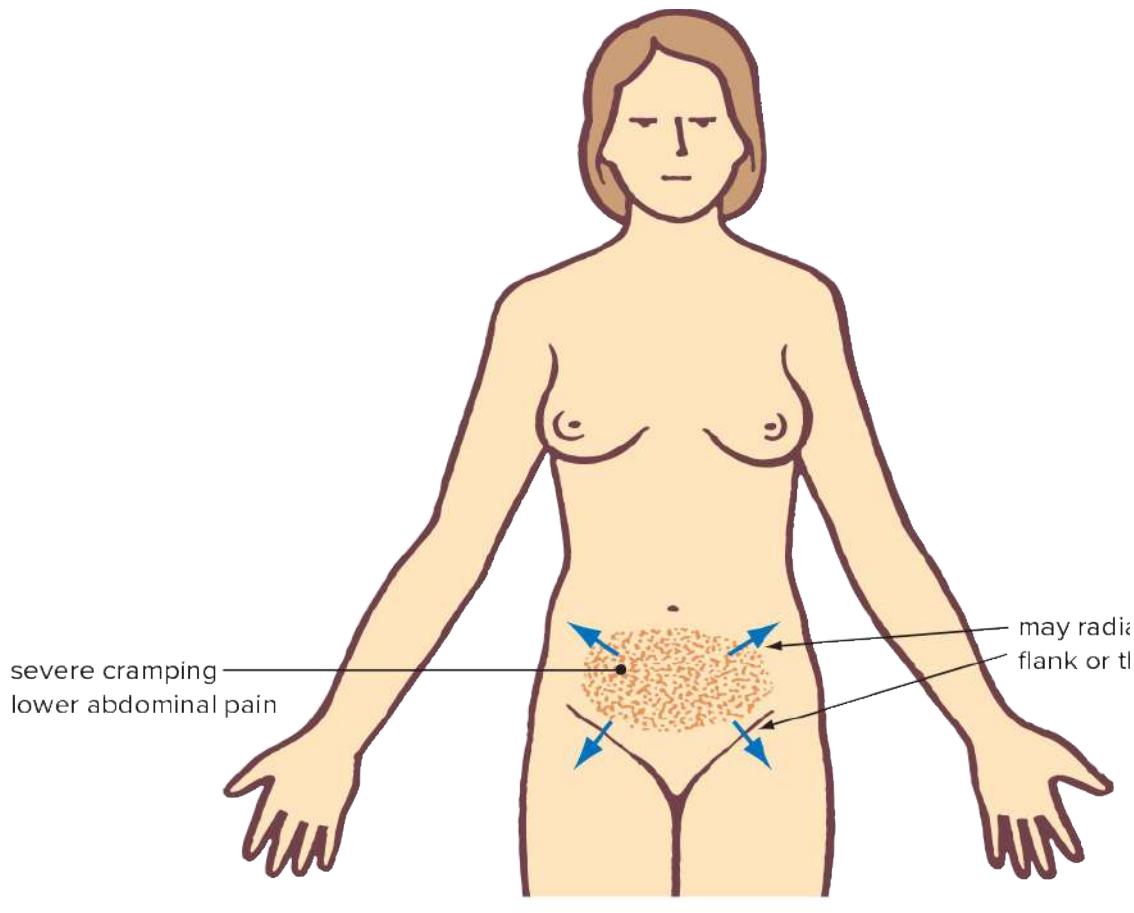
external bleeding

Acute torsion of ovarian cyst

Torsions are mainly from dermoid cysts and, when right-sided, may be difficult to distinguish from acute pelvic appendicitis.

Clinical features

- Severe cramping lower abdominal pain (see FIG. 95.4)
- Diffuse pain
- Pain may radiate to the flank, back or thigh
- Repeated vomiting
- Exquisite pelvic tenderness
- Patient looks ill



- diffuse severe pain
- repeated vomiting
- patient looks ill
- exquisite pelvic tenderness

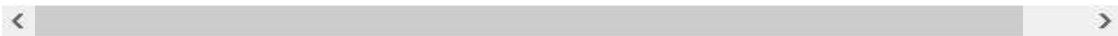


FIGURE 95.4 Typical clinical features of acute torsion of an ovarian cyst

Signs

- Smooth, rounded, mobile mass palpable in abdomen
- May be tenderness and guarding over the mass, especially if leakage

Diagnosis

- Pelvic ultrasound

Treatment

- Laparoscopy for cystectomy

Malignant ovarian tumours

Ovarian cancer has an incidence of 10 cases per 10 000 women per year and accounts for 5% of all cancers in women and 20% of all gynaecological cancers. It is responsible for more gynaecological cancer deaths because the tumour is often well advanced at the time of clinical presentation. Earlier discovery may sometimes be made on routine examination or because of investigation of non-specific pelvic symptoms.

Ovarian cancer tends to remain asymptomatic for a long period. No age group is spared but it becomes progressively more common after 45 years (peak incidence 60–65 years) (see [CHAPTER 17](#)).

[Page 1096](#)

The familial causes and relationship to breast and colorectal cancer are being delineated. Refer to [CHAPTER 23](#) .

Risk factors

- Age
- Family history
- Nulliparity
- BRCA 1 and BRCA 2 gene mutations
- Ashkenazi Jewish ancestry

Protective factors

- COC pill
- Pregnancy

Clinical features

- Constitutional symptoms: fatigue, anorexia
- Ache or discomfort in lower abdomen or pelvis
- Abdominal bloating and ‘fullness’
- Gastrointestinal dysfunction (e.g. epigastric discomfort, diarrhoea, constipation, wind)
- Sensation of pelvic heaviness
- Genitourinary symptoms (e.g. frequency, urgency, prolapse)

- ± Abnormal uterine bleeding
- Postmenopausal bleeding
- Dyspareunia and/or dysmenorrhoea (10–20%)
- ± Weight loss
- A bimanual examination assists diagnosis—look for mass, ascites, pleural effusion

A pelvic mass plus ascites usually indicates ovarian cancer but occasionally may be caused by a benign ovarian fibroma (Meigs syndrome—a triad of benign ovarian tumour + ascites + pleural effusion).

Note: Any ovary that is easily palpable is usually abnormal (normal ovary rarely >4 cm).

Diagnosis

- Pelvic ultrasound with transvaginal and transabdominal views
- Tumour markers such as CA-125, β -hCG (choriocarcinoma), human epididymis protein 4 (HE4) and alpha-fetoprotein should be measured only if the ultrasound raises suspicion of malignancy.¹²

Refer urgently to gynaecologist. Treatment is usually laparoscopy ± adjuvant chemotherapy.

Dysmenorrhoea

Dysmenorrhoea (painful periods) may be functional in the absence of organic disease (known as primary dysmenorrhoea). Primary dysmenorrhoea is more common in adolescent women. Secondary dysmenorrhoea is painful menstruation that is due to pelvic pathology.

⌚ Primary (functional) dysmenorrhoea

This is menstrual pain associated with ovarian cycles without any pathologic findings. The pain usually commences within 1–2 years after menarche and becomes less severe with age. It affects about 50% of menstruating women and up to 95% of adolescents.

Clinical features

- Low midline abdominal pain
- Pain radiates to back or thighs (see FIG. 95.5)
- Varies from a dull dragging to a severe cramping pain
- Maximum pain at beginning of the period

- May commence up to 12 hours before menses appears
- Usually lasts 24 hours but may persist for 2–3 days
- May be associated with nausea and vomiting, headache, syncope or flushing
- No abnormal findings on examination

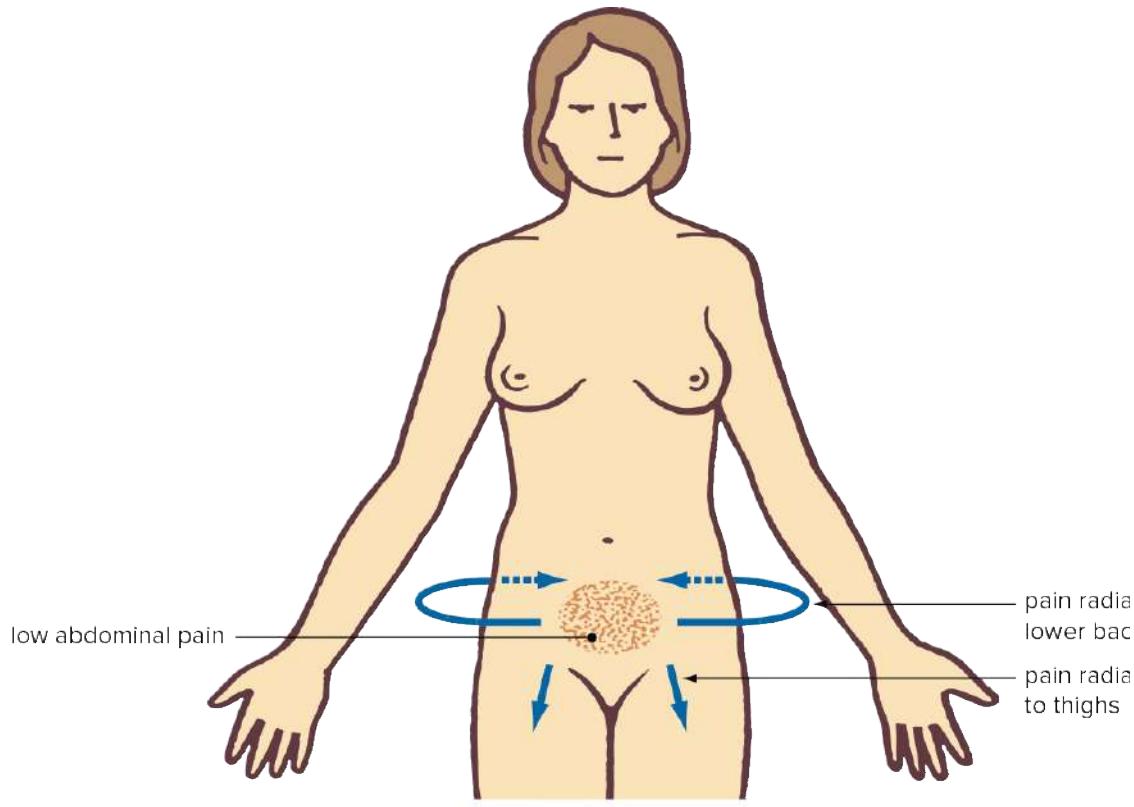


FIGURE 95.5 Typical pain of dysmenorrhoea

Management

- Full explanation and appropriate reassurance
- Promote a healthy lifestyle:
 - regular exercise
 - avoid smoking and excessive alcohol
- Recommend relaxation techniques such as yoga
- Avoid exposure to extreme cold

- Place a hot-water bottle over the painful area

Medication

Options include (trying in order):

- simple analgesics (e.g. aspirin or paracetamol)
- NSAIDs

naproxen 500 mg (o) initially then 250 mg every 6–8 hours (max. 1250 mg/day)

or

ibuprofen 200–400 mg (o) tds (max. 1600 mg/day)

commence at first suggestion of pain in the first 3 days of the period

- combined oral contraceptive pill

If not helped by these treatments, further investigation is required for a possible secondary cause.

Page 1097

⌚ Secondary dysmenorrhoea

Secondary dysmenorrhoea is menstrual pain for which an organic cause can be found. The pain begins as a dull pelvic ache 3–4 days before menses and becomes more severe during menstruation.

Commonest causes:

- endometriosis, adenomyosis (a major cause)
- PID
- submucous myoma
- intra-uterine polyp
- pelvic adhesions

Investigations

Investigations include ultrasound and laparoscopy. Management involves treating the cause. Consider medical management for possible endometriosis.

⌚ Endometriosis

Endometriosis is a chronic inflammatory gynaecological condition caused by hormone-dependent growth of endometrial-like tissue outside of the uterus, usually on the peritoneum and ovaries.¹³ Deposits may be superficial or infiltrating, causing haemorrhage, adhesions and ultimately dense scar tissue changes. Endometriosis infiltrating the myometrium is referred to as adenomyosis.

Endometriosis is the most common single cause of chronic pelvic pain in women.¹⁴ The average time to diagnosis is 6.5 years. Patients experience varying degrees of symptoms according to the site and severity of the endometriosis deposits.

The diagnosis may be masked by the COC pill. Pregnancy is beneficial but recurrence can follow.

Clinical features¹⁵

- 5–10% incidence
- Puberty to menopause, peak 25–35 years
- Possible family history (3–10-fold increase risk in first-degree relatives)¹³
- Dysmenorrhoea
- Gastrointestinal symptoms during menses (e.g. painful defecation, diarrhoea)
- Urinary symptoms: dysuria, frequency
- Pain may radiate to lower back, legs or rectum
- Subfertility
- Dyspareunia
- Non-specific pelvic pain
- Heavy menstrual bleeding
- Premenstrual spotting
- Acute pain with rupture of endometrioma

Page 1098



DxT dysmenorrhoea + heavy menstrual bleeding + dyspareunia = abdominal/pelvic pain → endometriosis

Possible signs

- Fixed uterine retroversion
- Tenderness and nodularity in the pouch of Douglas/retrovaginal septum
- Uterine enlargement and tenderness

Diagnosis

- Consider endometriosis in any woman with painful periods that do not respond to NSAIDs and significantly interfere with daily functioning
- The gold standard of diagnosis is by direct visual inspection at laparoscopy
- Diagnostic laparoscopy is not always required and a presumed clinical diagnosis may be appropriate¹⁴
- Transvaginal pelvic ultrasound may identify adenomyosis, ovarian endometrioma or rectal endometriosis (normal findings do not exclude diagnosis)

Treatment¹³

- Careful explanation
- Approach depends on the patient's age, impact and severity of symptoms and family planning
- Options include analgesia, hormonal and surgical treatment
- *Analgesia* (first line): NSAIDs, paracetamol or combination
- *Hormonal* (aims to suppress the disease process):

combined hormonal contraception: oral contraceptive pill or vaginal ring, consider extended or continuous use

progesterogens:

- levonorgestrel-releasing IUD 52 mg (Mirena), 5 yearly
- dienogest 2 mg (o) daily
- norethisterone 5–10 mg (o) daily (up to 10 mg bd)
- medroxyprogesterone acetate (depot) 150 mcg IM 12 weekly

GnRH analogues, e.g. goserelin 3.6 mg SC implant every 28 days or nafarelin 200 mcg intranasally bd for up to 6 months (requires specialist advice)

hormonal therapy is often used post surgery to prevent recurrence

- *Surgical:* Laparoscopy is indicated for diagnosis and excision/ablation of disease, especially if there is associated infertility. General principle is ‘the first go is the best go’¹⁴ as there is the risk of scarring from repeated procedures. Recurrence of symptoms is common. Hysterectomy may be recommended.
- Many patients will develop chronic pelvic pain, which requires a multidimensional approach (see below).

Pelvic adhesions

Pelvic adhesions may be the cause of pelvic pain, infertility, dysmenorrhoea and intestinal pain. They can be diagnosed and removed laparoscopically when the adhesions are well visualised and there are no intestinal loops firmly stuck together.

Chronic/persistent pelvic pain (PPP)

Chronic or persistent pelvic pain (PPP) is defined as non-cyclical pelvic pain present for at least six months that is severe enough to cause functional disability or require treatment.¹⁶

PPP is a challenging presentation which can be viewed as a complex neuromuscular-psychosocial disorder. Multiple systems can be involved, including gynaecological, urological, gastrointestinal, musculoskeletal and psychological.¹⁶ There is a high incidence of associated mental illness, past trauma and post-traumatic stress disorder.

It is important to identify and ensure adequate management of treatable causes. Common causes of chronic pelvic pain are listed in TABLE 95.3 . A feature of chronic pain is central sensitisation, which causes hyperalgesia and allodynia (see CHAPTER 82).

Table 95.3 Causes of chronic lower abdominal and pelvic pain in women^{2,17}

Genital

Endometriosis/adenomyosis

Pelvic inflammatory disease (chronic; adhesions)

Ovarian pathology

Prolapse

Vulvodynia (dysaesthetic vulvodynia, vulvar vestibular syndrome)

Chronic vulvovaginal candidiasis

Pudendal neuralgia

Fibromyomata (rarely)

Non-genital

Adhesions

Inflammatory bowel disease

Diverticular disease

Irritable bowel syndrome

Pelvic congestion syndrome

Urinary disorders, e.g. interstitial cystitis

Features

- Affects 15–25% of women
- Endometriosis causes 33%, adhesions 24%
- Reason for up to 40% of laparoscopies, 5% of hysterectomies
- Possible symptoms:³

dysmenorrhoea/cyclical aggravation of pain

dyspareunia

difficulty inserting tampons or menstrual cups

vulvovaginal irritation or pain

bladder symptoms (frequency, dysuria, urgency)

irritable bowel (bloating, alternating bowel habit)

sensitivity to light touch in the lower abdominal or genital region

- musculoskeletal involvement (pain with movement or prolonged positions)
- psychosocial difficulties (social withdrawal, hypervigilance to pain, low self-confidence)

Page 1099

Management³

Like all chronic pain, a multidimensional approach is indicated (see CHAPTER 82). A reduction of pain with improved function and well-being may be more achievable than cure.

A helpful approach is to address four components of PPP—pelvic organ pain, pelvic muscle

pain, central sensitisation and psychological sequelae:

- Pelvic organ pain
 - minimise the number of periods if there is dysmenorrhoea (hormonal contraceptives, GnRG agonists)
 - hysterectomy is not considered a cure
 - avoid repeated laparoscopies
 - avoid bladder irritants (caffeine, acidic drinks, stay hydrated)
 - treat symptoms of overactive bladder (see [CHAPTER 65](#))
 - treat vulvovaginal irritation (see [CHAPTER 99](#))
 - treat symptoms of irritable bowel (see [CHAPTER 34](#))
- Pelvic muscle pain
 - keep active, avoid aggravating activities
 - pelvic physiotherapy
 - botulinum toxin injection for severe cases
- Central sensitisation (see [CHAPTER 82](#))
 - patient education
 - exercise
 - relaxation strategies
 - optimisation of sleep
 - neuropathic pain medications—amitriptyline, SNRIs, gabapentinoids
- Psychological sequelae
 - re-engagement with family, friends and community
 - psychological therapy

Pudendal neuralgia³

Pudendal neuralgia causes a burning or sharp pain in the ‘saddle’ area, anywhere from the clitoris back to the anal area, often when sitting. It may be uni- or bilateral and may be associated with increased clitoral arousal. There is often associated bladder or bowel irritation.

Causes¹⁸

- Childbirth trauma
- Injury or pelvic/perineal trauma
- Gynaecological or colorectal surgery
- Cycling
- Excessive physical exercise
- Musculoskeletal issues
- Straining with bowel or bladder emptying

Note: There is usually a combination of causes.

Management

- Avoiding activities that compress the nerve, such as cycling

- Modify sexual practices to avoid pain
- A ‘U-shaped’ foam cushion with the front and centre area cut out when sitting
- Pelvic physiotherapy to relax and/or stretch pelvic muscles and reduce pressure on pudendal nerve
- Avoid straining with bowels or bladder
- TENS machine
- Neuropathic pain medications
- Interventional management:¹⁸
 - Injections such as cortisone, hyaluronic acid, botox, platelet-rich plasma
 - Pulsed radiofrequency treatment
 - Pudendal nerve release surgery
 - Implantable neuromodulation devices

When to refer

- All cases of ‘unexplained infertility’
- Patients with suspected endometriosis, not responding to analgesia or hormonal therapy
- Severe pelvic pain in pregnancy
- Pregnancy of unknown location
- Patients with positional dyspareunia
- Symptomatic or complex ovarian cysts
- Patients with complex or chronic pelvic pain

[Page 1100](#)

Practice tips

- Think of endometriosis and ovarian cysts in any woman with lower abdominal pain.
- In any woman whose normal activities are disturbed by dysmenorrhoea unrelieved by NSAIDs, endometriosis should be suspected.
- After surgical emergencies have been excluded in a young woman with acute pelvic pain, consider PID.
- A positive β-hCG plus an empty uterus and an adnexal mass are the classic diagnostic features of ectopic pregnancy.

Patient education resources

Hand-out sheets from *Murtagh's Patient Education* 8th edition:

- Dysmenorrhoea (painful periods)
- Endometriosis
- Pelvic inflammatory disease

References

- 1 Endometriosis Australia. Endo Facts (2020). Available from: www.endometriosisaustralia.org/research, accessed April 2021.
- 2 Soo Keat Khoo. Lower abdominal pain in women. *Patient Management (Suppl)*, 1990; August: 13–23.
- 3 Evans S. Management of persistent pelvic pain in girls and women. *Aust Fam Physician*, July 2015; 44(7): 454–9.
- 4 Engeler D et al. European Association of Urology. Guidelines on Chronic Pelvic Pain. Available from: <http://uroweb.org/wp-content/uploads/EAU-Guidelines-Chronic-Pelvic-Pain-2015.pdf>, accessed May 2021.
- 5 Forbes KL. Lower abdominal and pelvic pain in the female: a gynaecological approach. *Modern Medicine Australia*, 1991; September: 24–31.
- 6 Royal Australasian College of Physicians (RACP). *Genital Examination of Young Girls* (April 2018). Available from: <https://www.racp.edu.au/docs/default-source/advocacy-library/genital-examinations-in-girls-and-young-women-a-clinical-practice-guideline.pdf>, accessed April 2021.
- 7 O'Connor V, Kovacs G. *Obstetrics, Gynaecology and Women's Health*. Cambridge: Cambridge University Press, 2003: 325–7.
- 8 Porter R, Kaplan J. *The Merck Manual of Diagnosis and Treatment* (19th edn). Whitehouse Station, 2011: 2664–5.
- 9 Genital and sexually transmitted infections [published 2019]. In: *Therapeutic Guidelines* [digital]. Melbourne: Therapeutic Guidelines Limited; 2019. www.tg.org.au, accessed April 2021.
- 10 Australian Sexual Health Alliance. *Australian STI Management Guidelines For Use in Primary Care*. Available from: www.sti.guidelines.org.au, accessed April 2021.
- 11 Dynan L. Pelvic inflammatory disease. *Aust Fam Physician*, Nov 2006; (35)11: 858–62.

- 12 Yeoh M. Investigation and management of an ovarian mass. *Aust Fam Physician*, Jan/Feb 2015; (44)1: 48–52.
- 13 Endometriosis. [published 2020]. In: *Therapeutic Guidelines* [digital]. Melbourne: Therapeutic Guidelines Limited; 2020. www.tg.org.au, accessed May 2021.
- 14 Abbott J. A pragmatic approach to surgical management of endometriosis. *O&G Magazine*, 2019; 21(2).
- 15 Johnson NP, Hummelshoj L, The World Endometriosis Society Montpellier Consortium. Consensus on current management of endometriosis. *Hum Reprod*, 2013; 28(6): 1552–68.
- 16 Saha S. What else could it be? Causes of pelvic pain. *O&G Magazine*, 2019; 21(2).
- 17 Stone K. Scope of medical imaging for pelvic pain. *O&G Magazine*, 2019; 21(2).
- 18 Women's Health & Research Institute of Australia. Pudendal neuralgia. Available from: www.whria.com.au/for-patients/pelvic-pain/pudendal-neuralgia/, accessed May 2021.

96 Premenstrual syndrome

Shivering, lassitude and heaviness of the head denotes the onset of menstruation ... mistiness of vision is relieved by menstruation.

HIPPOCRATES, 400 BCE

Premenstrual syndrome (PMS) is defined as a disorder of non-specific somatic, psychological or behavioural symptoms occurring during the late luteal phase of the menstrual cycle.¹

The pathogenesis of PMS is still uncertain. Among the proposed causes are pyridoxine deficiency, excess prostaglandin production, hypoglycaemia and neurotransmitter (in particular, GABA) abnormalities. However, PMS is most probably related to enhanced sensitivity to progestogen with an underlying serotonin deficiency.²

Key facts and checkpoints

- PMS increases in incidence after 30 years, with a peak incidence in the 30–40 years age group.
- PMS also occurs in the 45–50 years age group, when it may alternate with menopausal symptoms, causing clinical confusion.³
- The symptoms of PMS decrease in severity just before and during menstruation.
- The symptoms cannot be explained by the presence of various psychological or psychiatric disorders.
- The severe form of PMS is classified in the *Diagnostic and Statistical Manual of Mental Disorders* (4th and 5th edns) as premenstrual dysphoric disorder (PMDD).

Incidence

Up to 90% of women may experience premenstrual symptoms, which can vary from moderately

severe in 20–40% of women to disabling in 2–9%.⁴ And perhaps 2–5% of women experience symptoms so debilitating as to significantly reduce their quality of life. In this case, they are considered to have premenstrual dysphoric disorder (PMDD).¹

Symptoms

Various symptoms from among the 150 reported are summarised in FIGURE 96.1 .

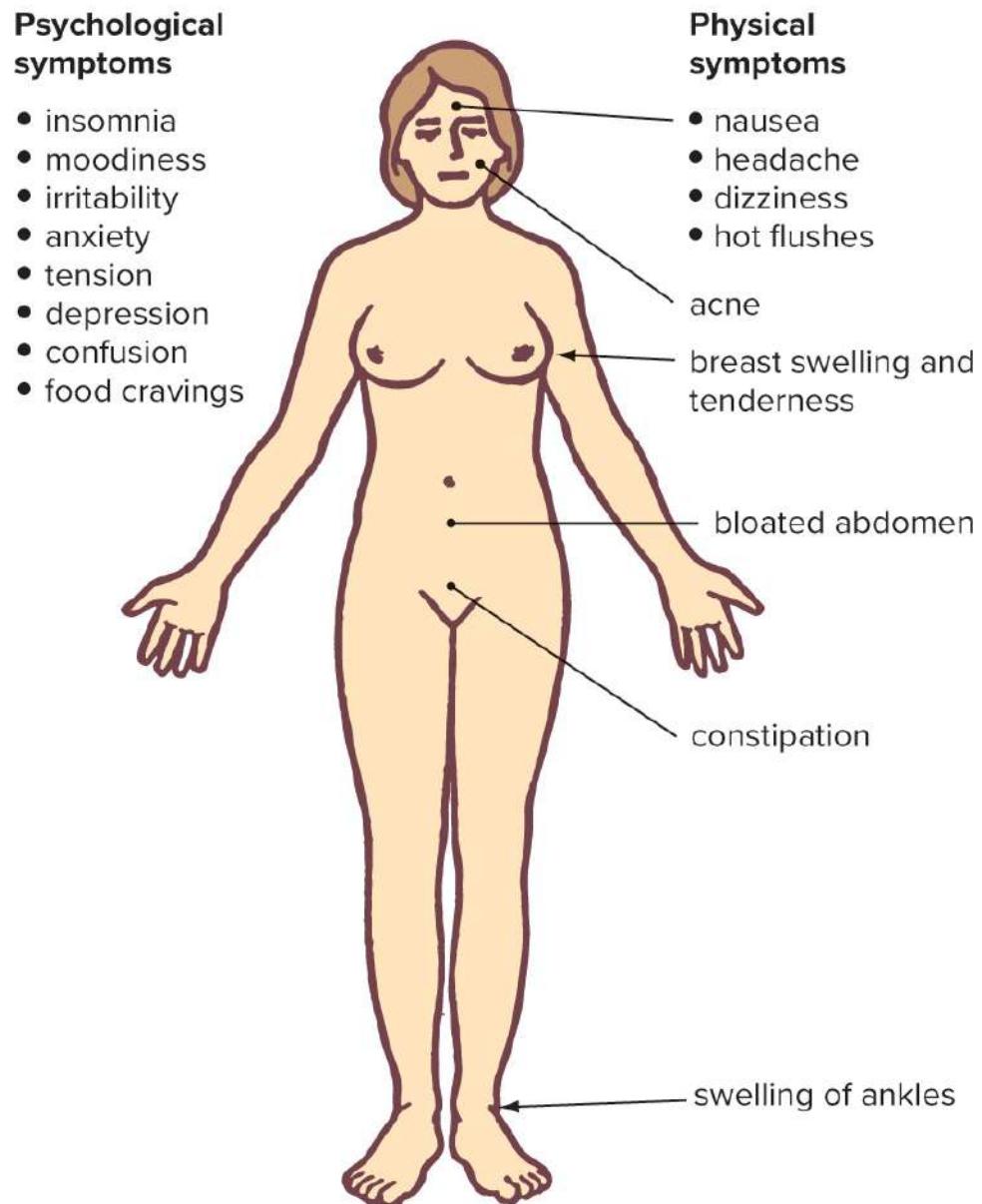


FIGURE 96.1 Symptoms of premenstrual syndrome

Symptoms usually reach a peak during the last 5 premenstrual days and remit within a few days of menstruation. Typically, they recur in subsequent cycles, although variation between cycles is common. The most common psychological symptoms are depression and irritability, while headache, bloating and breast tenderness are the most common physical symptoms.

Classification of PMS

It is convenient to classify PMS in terms of severity of symptoms.³

1. *Mild*: symptoms signal onset of menstruation. No medical advice sought or needed.
2. *Moderate*: symptoms annoying but insufficient to interfere with function at home or work. Medical advice sought in about one-third.
3. *Severe*: symptoms are such that functions at work or home are disrupted. Medical advice is usually sought. This disruptive form is labelled PMDD (see TABLE 96.1).

Table 96.1 Summary of PMDD criteria^{*5}

- | | |
|---|---|
| A | Symptoms must occur during the week before menses and start to improve within a few days after onset of menses |
| B | One (or more) of the following symptoms must be present and marked: <ol style="list-style-type: none">1. Affective lability2. Irritability or anger3. Depressed mood or dysphoria4. Anxiety, tension or feelings of being on edge |
| C | One or more of the following to reach a total of 5 symptoms when combined with those from criterion B above: <ol style="list-style-type: none">1. Decreased interest in usual activities2. Concentration difficulties3. Marked lack of energy; lethargy4. Marked change in appetite, overeating or food cravings5. Hypersomnia or insomnia6. Feeling overwhelmed or out of control7. Other physical symptoms (e.g. breast tenderness, bloating) |
| D | Symptoms must interfere with work, school, productivity, usual activities or relationships |
| E | Symptoms must not merely be an exacerbation of another disorder such as major depression |
| F | Criteria for A must be confirmed by prospective daily ratings for at least two |

cycles

- G The symptoms are not attributable to the physiological effects of a substance or other medical condition
-

*Adapted from *DSM-5-TR*

Page 1102

Differential diagnosis³

- Endometriosis
- Menopause
- Mastalgia
- Other causes of fluid retention—kidney or adrenal
- Thyroid disorder (hyper- or hypoactivity)
- Anaemia
- Polycystic ovarian syndrome
- Psychiatric disorders: depression, mania

Diagnosis

- Thorough history—including diet, exercise habits, psychosocial background, emotional influences and family history
- Menstrual calendar—for 3 months, showing timing of the three main symptoms³
- Physical examination to exclude gynaecological, endocrine or other systemic disease; and also include:
 - breast examination (if breast tenderness)
 - cervical screening test
- Investigations (to exclude other causes):
 - thyroid function tests
 - full blood count
 - electrolytes and creatinine

FSH and oestradiol—if perimenopause suspected
serum androgens—if oligomenorrhoea present

Management^{2,4}

The basic aim of management is to reassure and treat the woman in such a way that she makes changes in her lifestyle to cope with the hormonal dysfunction rather than rely on medication. The management strategies include the following, with the emphasis on lifestyle factors.

Explanation, reassurance and insight

Cognitive-based therapy, which has been shown to have a positive effect in several RCTs,⁴ is very helpful for the patient to understand the nature of their symptoms and to receive appropriate support and empathy. The patient may wish to inform family and close friends, to encourage extra support while symptoms occur.

Keeping a diary³

Advise the patient to keep a daily diary of all her symptoms and when they occur over a 2–3 month period. This information should help her to plan around her symptoms: for example, avoid too many social events and demanding business appointments at the time when PMS symptoms are worst.

Dietary advice¹

Advise the patient to eat regularly and sensibly; eat small, frequent meals and aim for ideal weight.

Increase amount of low-GI complex carbohydrates, leafy green vegetables and legumes.

Decrease or avoid: refined sugar, salt, alcohol, caffeine (tea, coffee, chocolate), tobacco, red meat and excessive fluid intake during premenstrual phase. Decrease total protein to 1 g/kg/day; decrease fats.⁶

Exercise

Recommend a program of regular exercise such as swimming, aerobics, jogging or tennis. Such exercise has been proven to decrease depression, anxiety and fluid retention premenstrually.⁶

Relaxation

Advise patients to plan activities that they find relaxing and enjoyable at the appropriate time. Consider stress reduction therapy, including meditation, yoga, relaxation techniques and appropriate counselling.

Appropriate dress

Advise sensible dressing to manage breast tenderness and a bloated abdomen, such as a firm-fitting bra and loose-fitting clothes around the abdomen.

Medication

Pharmaceutical agents that have been used with success in some patients and little or no relief in others include diuretics (e.g. spironolactone), vitamins and minerals (e.g. pyridoxine and evening primrose oil), simple anti-inflammatories (e.g. aspirin, mefenamic acid) and hormonal preparations such as the combined oral contraceptive (COC). A combination of agents may have to be used.

It is worth noting that progestins used alone are ineffective and may even aggravate symptoms, but can be used in conjunction with oestrogen to protect the endometrium.⁴

Supplements

Women often enquire about the use of vitamins, minerals and herbal remedies for PMS. Evidence to support the use of complementary and alternative medicines is limited. The following may be considered:^{1,7}

- pyridoxine/vitamin B6 up to 100 mg daily (beware nerve damage to hands/feet with higher doses)
- elemental calcium, 1200 mg to 1500 mg daily (two randomised controlled trials have shown significant benefit)
- elemental magnesium up to 400 mg daily (minimal evidence)
- evening primrose oil 500 mg daily (no benefit over placebo)
- *Agnus castus* (Premular) is an extract of the berries from the chaste tree (small randomised controlled trials have indicated some benefit over placebo)

Oral contraception⁴

It is appropriate to use a COC-containing ethinyloestradiol and drospirenone since a meta-analysis of drospirenone, which is a progestogen derivative of spironolactone, concluded that it was effective in reducing the severe symptoms of PMDD. Extended/continuous use or shorter hormone-free intervals may benefit mood symptoms.

ethinyloestradiol 20 mcg + drospirenone 3 mg (o) once daily on days 1–24 of a 28-day cycle

Moderate to severe symptoms^{4,8}

A trial of an SSRI or SNRI is warranted in women with incapacitating PMDD who are

unresponsive to other treatments. SSRIs are most commonly used but SNRIs are also effective. No one drug is considered more effective than another.

fluoxetine 20 mg mane for 14 days before the anticipated onset of menstruation⁴

or

sertraline 50 mg daily for 14 days before the anticipated onset of menstruation

Practice tip

Moderate to severe PMDD:

- fluoxetine 20 mg (o) or sertraline 50 mg (o) daily in morning for 14 days before anticipated onset of menstruation and through to the first full day of menses of each cycle

When to refer³

- If the recommended approach of support, education, reassurance and stress management is still not effective.
- Consider specialist referral if symptoms are severe or do not respond to other therapies.
- Refer to a gynaecologist if underlying disease is suspected or proven (e.g. polycystic ovarian syndrome, endometriosis).
- Refer to an endocrinologist if an endocrine disorder such as adrenal, pituitary or thyroid is suspected or proven.
- Refer to a psychiatrist if depression worsens, is not cyclical or psychosis develops.

Practice tips

- Keeping a daily diary of symptoms is very helpful for both patient and clinician.
- Aim for lifestyle changes and commonsense non-pharmacological management.
- Allow at least three cycles of treatment to provide reasonable time for a particular medication to take effect.
- Be careful of overdiagnosing PMS and overlooking disorders such as depression, which may be exacerbated in the premenstrual phase.

Patient education resource

Hand-out sheet from *Murtagh's Patient Education* 8th edition:

Page 1104

- Premenstrual syndrome

Resources

National Association of Premenstrual Syndrome: www.pms.org.uk

References

- 1 Foran T. Management of premenstrual syndrome: how to treat. Australian Doctor, 28 November 2013.
- 2 Mazza D. *Women's Health in General Practice* (2nd edn). Sydney: Elsevier, 2011: 16–21.
- 3 Smith M. Premenstrual syndrome. In: *MIMS Disease Index*. Sydney: IMS Publishing, 1991–92: 439–41.
- 4 Premenstrual syndrome and premenstrual dysphoric disorder [published 2020]. In: *Therapeutic Guidelines* [digital]. Melbourne: Therapeutic Guidelines Limited; 2020. www.tg.org.au, accessed April 2021.
- 5 Premenstrual dysphoric disorder. In: *Diagnostic and Statistical Manual of Mental Disorders* (5th edn). Arlington: American Psychiatric Association, 2013: 191–4.
- 6 Papadakis MA, McPhee SJ. *Current Medical Diagnosis and Treatment* (52nd edn). New York: The McGraw-Hill Companies, 2013: 749–50.
- 7 Wyatt K et al. Premenstrual syndrome. Clinical Evidence, 2000; 4: 1121.
- 8 Brown J et al. Selective serotonin reuptake inhibitors for premenstrual syndrome. Cochrane Database Syst Rev, 2009 Apr 15; Issue 2: Art No. CD006586 (PMID 19370644).

97 The menopause

Every woman should use what Mother Nature gave her before Father Time takes it away.

LAURENCE J PETER, 1977

Definitions

The WHO has defined the menopause as signifying the permanent cessation of menstruation, resulting from the loss of ovarian follicular activity.¹ In most Western women, it occurs between the ages of 45 and 55 years, with an average age of 51.5 years.² Premature menopause (or premature ovarian insufficiency) is menopause occurring before age 40, while early menopause occurs before 45.

The term is used in a broader sense to include the perimenopausal phase when ovarian function waxes and wanes and the periods become irregular. This may last 2–5 years and sometimes longer and involves the premenopausal and menopausal phases.

The postmenopause is the period following the menopause but cannot be defined until after 12 months of spontaneous amenorrhoea, except in women who have had an oophorectomy.

Surgical menopause is known as bilateral oophorectomy.

Summary

The climacteric can be subdivided into four phases:

Phase 1 Premenopausal: up to 5 years before the last menstrual period.

Phase 2 Perimenopausal: the presence of early menopausal symptoms with changes in menstrual cycle.

Phase 3 Menopausal: the last menstrual period.

Phase 4 Postmenopausal: the phase beginning 12 months after the last menstrual cycle.

Osteoporosis

Osteoporosis, which literally means ‘porous bone’, is reduced bone mass per unit volume. Osteoporosis is usually addressed in the context of the menopause because the drop in oestrogen levels causes accelerated loss of bone mass (10% the first 5 years after menopause).

Osteoporosis is diagnosed on the presence of a fragility fracture, when a fracture occurs following a fall from standing height or less, that would not be expected under normal circumstances. It is also defined by bone mineral density (BMD) as a T score of ≤ -2.5 (see CHAPTER 81). Loss of bone density can be largely prevented by correcting oestrogen deficiency.

Physiology of the menopause

FIGURE 97.1 provides an overview of how menopausal symptoms are related to ovarian follicular activity and hormonal activity.

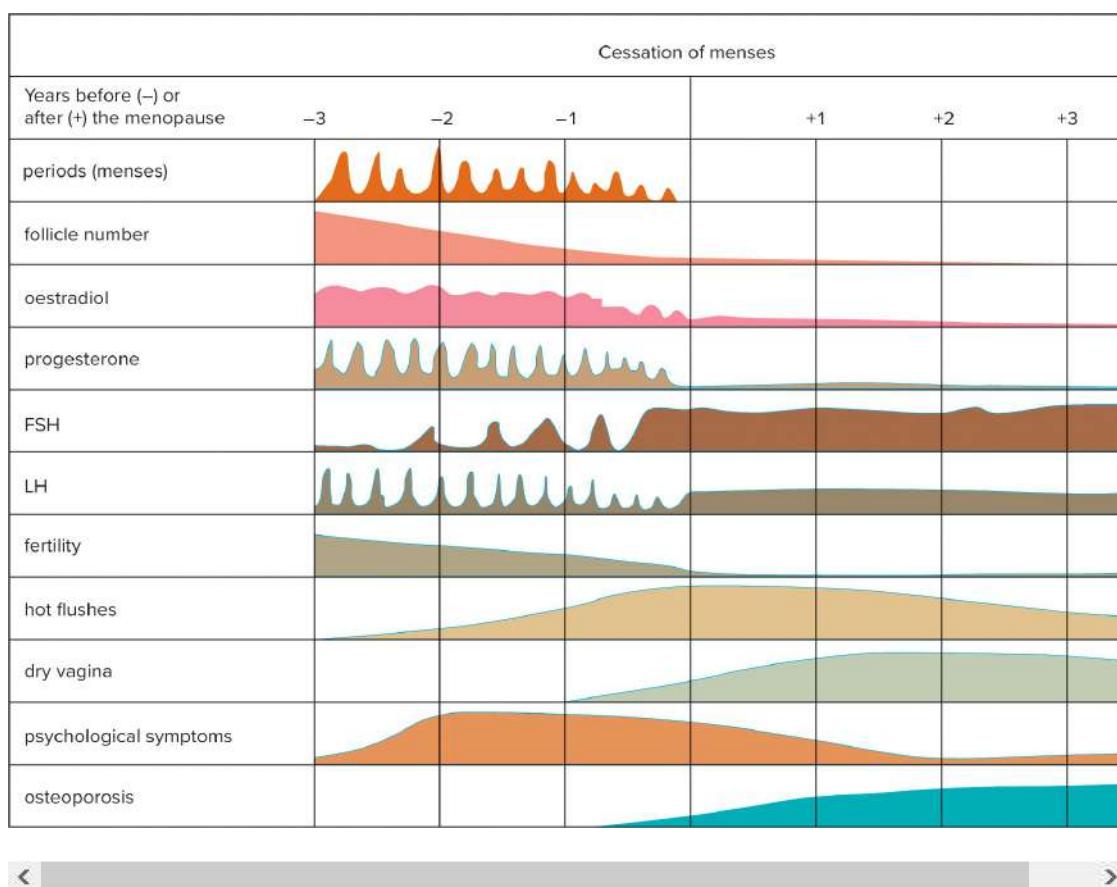


FIGURE 97.1 Schematic representation of some clinical, biological and endocrinological features of the perimenopausal and postmenopausal phases

Source: Reproduced with permission from Burger H. Talking women: HRT and breast cancer risk. Medical Observer, 1 August

Women are born with their total complement of ovarian primary follicles. The peak number is reached at about 20 weeks' gestation, while in their mother's womb, with an average number of 6 million. From this point, a female constantly loses gametes, reaching 1 million at birth and about 400 000 by puberty. A woman will ovulate 400–500 times in her lifetime and will begin the menopause transition when there are only a few thousand follicles remaining.

The number of follicles declines rapidly as the menopause approaches, with an insufficient number to stimulate cyclical activity. Oestrogen levels fall and this has a positive feedback on the pituitary, increasing FSH levels to 10–15 times that of the follicular phase of the cycle, while LH levels rise about threefold. The ovary secretes minimal oestrogen but continues to secrete significant amounts of androgens. Reduced oestrogen is the main cause of menopausal symptoms such as hot flushes.

Clinical features

In the early menopausal transition, the cycle length may vary by about 7 days (e.g. a 28-day cycle becomes 21). The late menopausal transition is characterised by two or more skipped menstrual cycles.⁴ Variability of the heaviness of periods is common and the pattern can be erratic, with prolonged bleeding episodes or scanty menses, interspersed with regular ovarian activity. Uncommonly, women may experience regular periods until complete cessation.

Because small amounts of oestrogen are still being produced in the adrenal glands, Page 1106 symptoms other than cessation of periods may be mild or absent. Around 20% will have no symptoms at all, while another 20% will be severely affected, with symptoms continuing into their 60s or later.⁵ Up to 80% of women experience vasomotor symptoms for an average duration of 5 years (range 1–10 years).³

Hot flushes

The classic vasomotor symptom of menopause is the hot flush. A hot flush lasts 1–2 minutes, begins in the chest and then spreads up over the face and body. There may be associated redness, sweats which can be drenching, panic attacks, palpitations and faintness. Fever is a differential diagnosis. During a menopausal flush, skin temperature increases, but core temperature remains stable.

Symptoms

Vasomotor:¹

- hot flushes (80%)
- night sweats (70%)
- palpitations (30%)

- lightheadedness/dizziness
- migraine

Psychological:

- irritability
- depression
- anxiety
- tearfulness
- loss of concentration
- poor short-term memory
- unloved feelings
- sleep disturbances
- mood changes
- loss of self-confidence
- decline in libido

Urogenital (60%):

- atrophic vaginitis
- vaginal dryness (45%); itching; burning
- dyspareunia/sexual dysfunction
- bladder dysfunction (e.g. frequency, dysuria)
- stress incontinence/prolapse

Musculoskeletal:

- non-specific muscular aches
- non-specific joint aches and pains

Skin and other tissue changes:

- dry skin

- formication (17%)
- new facial hair
- breast glandular tissue atrophy

Other:

- unusual tiredness
- headache

Page 1107

Clinical approach

A thorough evaluation of the patient is important, including a good history.

History

Enquire about any symptoms related to oestrogen deficiency, with an emphasis on the menstrual history and vasomotor symptoms. Take a general medical and gynaecological history, including sexual history, contraception, smoking, drug and alcohol, sleep, micturition and social history, including relationships. Enquire about mental state symptoms, such as irritability, depression, anxiety and loss of self-esteem. Ask how the symptoms are affecting quality of life, particularly sleep disturbance. A symptom score card is a helpful aid.

Consider all women at the menopause to be at risk for cardiovascular disease, cancer (especially breast, ovary and cervix), diabetes and osteoporosis.²

Information on family history of osteoporosis, cancer and cardiovascular disease should be sought.

Physical examination

The general examination should include measurement of blood pressure, weight, height and waist circumference. Consider breast examination, abdominal palpation, vaginal examination and cervical screening test (if due).

Investigations²

Apart from a cervical screening test, the following tests should be considered:

- full blood count and iron studies (if heavy or abnormal menstrual bleeding)
- fasting lipids including HDL and fasting glucose
- liver function tests

- thyroid stimulating hormone (TSH)
- urinalysis (if urinary symptoms)
- screening mammography (if due)
- transvaginal ultrasound (if abnormal vaginal bleeding)
- bone density study (if risk factors)

Diagnosis

Menopause is a retrospective diagnosis, which can be made after 12 months of amenorrhoea in women over 50 and after 2 years in women younger than 50. The diagnosis of perimenopause is made by taking a thorough menstrual history.

Investigating hormone levels is usually unnecessary and often unhelpful, with frequent fluctuations during perimenopause. Testing may be appropriate for younger patients (<45 years), amenorrhoeic women with a levonorgestrel IUD and women who have undergone hysterectomy. For these women, it is common practice to check for an elevated FSH (>30).

Differential diagnosis of menopause syndrome

- Depression
 - Anaemia
 - Thyroid dysfunction
 - Hyperparathyroidism
 - Diabetes
 - Medications (e.g. SSRIs)
 - Gynaecological disorders
- dysfunctional uterine bleeding

Management

Education and lifestyle

Patients should receive adequate understanding, support and explanation, with the emphasis being that the menopause is a natural life transition. It is also important to provide education on long-term health implications, such as cardiovascular disease risk and osteoporosis.

Always consider this as an opportunity to holistically review a woman's health and reinforce the

importance of a healthy lifestyle, including:

- healthy, balanced diet
- maintain a healthy weight
- adequate relaxation
- adequate exercise (especially weight-bearing)
- adequate calcium intake (3 serves per day)
- smoking cessation
- safe alcohol intake

Menopausal hormone therapy

The principle indication of menopausal hormone therapy (MHT) is for the relief of Page 1108 troublesome vasomotor symptoms. The regimen is tailored to the individual patient and depends on several factors, including previous hysterectomy, menopausal phase, predominant symptoms and age. MHT has also been known as hormone replacement therapy (HRT).

The Women's Health Initiative study⁶

The arguably flawed Women's Health Initiative (WHI) trial investigated the use of long-term MHT in postmenopausal women with an intact uterus using long-term combined oral oestrogen and progesterone. The study raised concerns about the safety of MHT, with an increased risk of breast cancer (1.26-fold), coronary heart disease (1.29-fold), stroke (1.41-fold) and pulmonary embolism (2.13-fold) with prolonged use greater than 5 years.⁷ The study also found a reduction in risk of bowel cancer and fracture in these women, and reduction of breast cancer risk in women using oestrogen-only MHT. The trial did not include people using other forms of MHT, such as patches, gels or implants.

The recently published long-term follow-up of WHI participants found no difference in the rate of all-cause mortality between women randomised to MHT or placebo. Moreover, for women aged 50–59 years who were randomised to MHT, the hazard ratio for all-cause mortality during the intervention phase of the study was 0.69.⁸

Studies show that the influence of the WHI study has resulted in women being inappropriately discouraged from the use of MHT.⁹

Benefits and risks of MHT

MHT is the most effective method for relieving distressing symptoms such as hot flushes, urogenital symptoms, sleeplessness and joint symptoms (level I and II evidence) (NHMRC

criteria).¹⁰

Risks differ depending on the age of the woman and the route of administration. The recent National Institute for Health and Care Excellence (NICE) guideline on menopause management concluded the following.⁹

- MHT was the most appropriate treatment for menopausal symptoms.
- MHT improved bone density and reduced fracture.
- CVD risk was not increased among women using MHT and may be reduced (in normal target population).
- Venous thromboembolism (VTE) risk was increased among women using oral MHT but not among women using non-oral therapy.
- Breast cancer risk was not increased for women taking oestrogen but was increased with long-duration use in women taking combined oestrogen and progestin therapy. The effect reduced after ceasing therapy.

In regard to breast cancer risk, studies suggest that other progestogens, specifically micronised progesterone and dydrogesterone, may be associated with a lower risk than medroxyprogesterone acetate. For women with a high risk of breast cancer, even for those with *BRCA* mutations, there is no evidence of a greater increase in risk with MHT than that observed with MHT in the general population.¹¹

The International Menopause Society advises that MHT carries few risks when prescribed for symptomatic women without contraindications if initiated in women aged under 60 years or within 10 years of menopause.

If MHT is required beyond 60 years, oral oestrogen and tibolone are not recommended due to increased stroke risk.

Practice tip

In women without contraindications, MHT carries few risks if initiated before the age of 60 or within 10 years of menopause.

Contraindications to MHT²

Important contraindications to MHT are listed in TABLE 97.1 .

Table 97.1 Contraindications (absolute or relative) to MHT¹¹

Contraindications to MHT:

- breast, endometrial and other hormone-dependent cancers (current or previous)
- undiagnosed vaginal bleeding

Relative contraindications (transdermal MHT is preferred):

- established cardiovascular disease
- venous thromboembolic disease
- active liver disease
- possibly migraine with aura

Note: Hypertension is not a contraindication.

MHT regimens

The appropriate regimen depends on presence of a uterus and whether the woman is perimenopausal or postmenopausal. Current regimens include the following hormonal treatments:

- oestrogen
- progestogen
- selective oestrogen receptor modulator (SERM)
- tibolone
- testosterone

Golden rule

A progestogen must be used with oestrogen if the woman still has a uterus.

Page 1109

Oestrogen

Oestrogen comes in various preparations: oral, transdermal (patches, gels) and topical vaginal preparations (see TABLE 97.2). Topical preparations are appropriate for women with genitourinary symptoms only and will be discussed later in the chapter. A goal of therapy is to prescribe the lowest possible dose to relieve symptoms. Oestrogenic side effects include breast

tenderness and nausea.

Table 97.2 Oestrogens used in the menopause¹²

Generic name	Daily dose range	Trade name
Oral preparations		
Conjugated equine oestrogen (CEE)	0.3–1.25 mg	Premarin
Oestradiol	0.5–2 mg	Estrofem, Zumenon
Oestradiol valerate	0.5–2 mg	Progynova
Transdermal patch		
Oestradiol	25–100 mcg	Climara, Estraderm, Estradot
Transdermal gel		
Oestradiol hemihydrate	0.5–1.5 mg	Sandrena
Oestradiol	0.75–3 mg	Estrogel

Progestogen

Progestogen is given to women with a uterus and may be given continuously or cyclically (see TABLE 97.3). If a progestogen is not used in addition to oestrogen, many women will develop endometrial hyperplasia and there is a 5–10 times increased risk of endometrial cancer. If given cyclically, it is given for the 1st to the 14th day of the calendar month and a withdrawal bleed will occur.

The intrauterine device (IUD) containing the progestogen levonorgestrel (52 mg Mirena) may also be combined with oestrogen and has the added benefits of providing contraception and managing heavy menstrual bleeding.

Table 97.3 Progestogens used in the menopause^{10,12}

Generic name	Daily dose range	Trade name
Oral preparations		

Medroxyprogesterone acetate	2.5–20 mg	Provera, Rolvera
Norethisterone	1.25–5 mg	Primolut N
Micronised progesterone	100–200 mg	Prometrium
Intrauterine device		
Levonorgestrel (LNG) IUD	20 mcg	Mirena

Micronised progesterone became available on the Australian market in 2016 and is available in oral and vaginal (pessary and gel) preparations. Mild sedation can occur and, as such, it should be taken at night.¹³

Selective oestrogen receptor modulator (SERM)¹⁴

The SERM bazedoxifene has been developed as an alternative to progestogen for endometrial protection. SERMs act only on oestrogen receptors, with different effects in different tissues. Bazedoxifene has an oestrogenic effect on bone and improves bone density, while exerting an anti-oestrogenic effect on the breast and endometrium. It offers superior rates of amenorrhoea compared to other MHTs and does not increase mammographic density or breast pain.

Bazedoxifene is combined with conjugated oestrogen in what is called a TSEC (tissue-selective oestrogen complex). It is suitable for use in postmenopausal women. An increased risk of VTE has been reported for both oral oestrogen and SERMs and while early studies do not reveal an additive effect on the VTE risk, the true risk remains unknown. It should not be used by women at high risk of VTE.

TSEC dose: CEE 0.45 mg + bazedoxifene 20 mg (o) daily

Tibolone

This is a selective tissue oestrogenic activity regulator with combined oestrogenic, progestogenic and androgenic properties that can be used as an excellent alternative to conventional MHT in postmenopausal women. Positive effects are on vasomotor and urogenital symptoms, sexual function, bone density and fracture risk. It is unsuitable in perimenopausal women because of an increased risk of breakthrough bleeding. It is an appropriate alternative to oestrogen therapy for women who have undergone hysterectomy. Adverse effects with breakthrough bleeding and virilisation are a concern.¹⁰

Dose: tibolone 2.5 mg (o) daily

Page 1110

Testosterone

Testosterone is usually reserved for postmenopausal women whose libido does not improve with MHT alone. Side effects include acne, increased hair growth, weight gain and fluid retention.

Long-term safety is unknown and treatment should be avoided in women with a history of a hormone dependent cancer (e.g. breast cancer). Blood testosterone levels should be tested prior to and during treatment, noting that endogenous testosterone levels do not predict response to therapy.

Dose: testosterone 1% cream, starting 0.5 mL (5 mg) daily (max. dose 15 mg)

How to prescribe MHT

TABLE 97.4 presents current commonly used regimens.

Table 97.4 Menopausal hormonal therapy (options)

Uterus intact	Post-hysterectomy
Transdermal O + P patch	Oral O
Transdermal O + oral P	Transdermal O
Transdermal O + LNG-IUD	Tibolone
Oral O + oral P	
Oral O + LNG-IUD	
Oral O + SERM (i.e. TSEC)	
Tibolone	

O = oestrogen

P = progestogen

LNG-IUD = levonorgestrel IUD

SERM = selective oestrogen receptor modulator

TSEC = tissue-selective oestrogen complex

Source: Adapted from Jane and Davis, Figure 3²

Previous hysterectomy

Women do not need a progestogen and should be prescribed continuous oestrogen in either a transdermal or oral preparation. Transdermal delivery of oestrogen has a lower VTE risk.

Perimenopausal women

For women whose LMP was less than 12 months ago, the progestogen should be cyclical. Use of continuous oestrogen and progestogen too soon after the LMP can result in unpredictable breakthrough bleeding. The exception is with the use of the levonorgestrel (LNG) intra-uterine system, which can be used with oral oestrogen. After 12 months of cyclical MHT, it is reasonable to transition to a continuous regimen.

Oestrogen and progesterone can be administered separately or in combined preparations. Combined cyclical preparations available in Australia are listed in TABLE 97.5 .

Table 97.5 Cyclical MHT preparations available in Australia^{2,12}

Generic name	Daily dose*	Trade name
Oral preparations		
Oestradiol/ dydrogesterone	1 mg/10 mg, 2 mg/10 mg	Femoston
Oestradiol/ norethisterone	1 mg/1 mg, 2 mg/1 mg	Trisequens
Transdermal patch		
Oestradiol/norethisterone	50 mcg/140 mcg, 50 mcg/250 mcg	Estalis Sequi

*Progesterogen for 14 out of 28 days only

Combined hormonal contraception is an appropriate alternative to cyclical MHT and can be used up to 50–51 years, provided there are no contraindications (see CHAPTER 92). Contraception is advisable for 12 months after the last period for women over 50 years and for 2 years for those under 50 years.

Postmenopausal women

For women whose LMP was more than 12 months ago, continuous combined oestrogen plus progestogen therapy can be used (see TABLE 97.6).

Table 97.6 Continuous MHT preparations available in Australia^{2,12}

Generic name	Daily dose	Trade name
Oral preparations		
Oestradiol/drospirenone	1 mg/2 mg, 1 mg/5 mg	Angeliq 1/2, Femoston- Conti
Oestradiol/norethisterone	1 mg/0.5 mg, 2 mg/1 mg	Kliovance, Kliogest
Conjugated equine oestrogen (CEE)/medroxyprogesterone acetate	0.625 mg/2.5 mg, 0.625 mg/5 mg	Premia