

# OBSTETRICS & GYNAECOLOGY

LAWRENCE IMPEY  
TIM CHILD

4TH EDITION

 WILEY-BLACKWELL





# Obstetrics & Gynaecology

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- MCQs and EMQs
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# Obstetrics & Gynaecology

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**4th edition**



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## Preface to the fourth edition

In this 4th edition, we hold to the same principles as the first: to be concise with words not the facts, with the emphasis on clarity, principles of management and easy access to the information. However, the text has been completely updated to reflect new information and practice. This book is primarily meant to help medical students pass and even do really well in their exams, but

its clarity and emphasis on management should also prove useful to practising doctors to structure their knowledge and improve their practice.

Lawrence Impey  
Tim Child 2012



## Preface to the first edition

This book is written for the UK medical student, in line with changes in medical education and the advent of the core curriculum. The level of information is enough to allow a high mark in the final obstetrics and gynaecology examinations. But its strong emphasis on management should also be useful for practising doctors and those about to take postgraduate examinations.

As a student and then a lecturer I was always surprised at the deficiencies of many textbooks: how they failed to emphasize what was common or important, how little emphasis they placed on 'what to do' in a real situation, and how little they allowed understanding of the subject. Problem-based learning is in part a backlash against this. Yet there remains a need for a comprehensive yet straightforward textbook. In this, the space given to

each topic reflects its importance. Subjects are cross-referenced (page cross-references are indicated by superior square brackets). The information is up to date, evidence-based where possible, and referenced, at least for important, new or contentious issues. At the end of each chapter, summaries of all the major topics should aid revision and prevent the need for a separate revision text. At the end of the book, separate management sections describe what to do in all the common clinical situations, from the management of slow progress in labour to the management of the subfertile couple.

Lawrence Impey  
1999

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Lawrence Impey  
Tim Child

# List of abbreviations

ACE	angiotensin-converting enzyme	CVP	central venous pressure
ACT	artemisin combination therapy	CVS	chorionic villus sampling
ACTH	adrenocorticotrophic hormone	D&C	dilatation and curettage
AD	Alzheimer's disease	DCDA	dichorionic diamniotic
AFP	alpha fetoprotein	DES	diethylstilboestrol
AIDS	acquired immune deficiency syndrome	DEXA	dual X-ray absorptometry
ALP	alkaline phosphatase	DI	donor insemination
ALT	alanine aminotransferase	DIC	disseminated intravascular coagulation
AMH	anti-müllerian hormone	DLE	diathermy loop excision
AP	antero-posterior	DNA	deoxyribonucleic acid
APH	anteartum haemorrhage	DVT	deep vein thrombosis
ARDS	adult respiratory distress syndrome	DZ	dizygotic
ARM	artificial rupture of membranes	ECG	electrocardiogram
ASD	atrial septal defect	ECV	external cephalic version
AST	aspartate aminotransferase	EDD	expected day of delivery
BCG	Bacille bilié de Calmette–Guérin	EFM	electronic fetal monitoring
β-hCG	human chorionic gonadotrophin beta-subunit	EIA	enzyme immunoassay
BMD	bone mineral density	EPAU	early pregnancy assessment unit
BMI	body mass index	EPDS	Edinburgh Postnatal Depression Scale
BP	blood pressure	ERPC	evacuation of retained products of conception
BSO	bilateral salpingo-oöphorectomy	eSET	elective single embryo transfer
BV	bacterial vaginosis	ESR	erythrocyte sedimentation rate
CA	carcinoma	EUA	examination under anaesthetic
CA 125	serum cancer antigen 125	FBC	full blood count
CEMACH	Confidential Enquiry into Maternal and Child Health	FBS	fetal blood sampling
CGH	comparative genomic hybridisation	FER	frozen embryo replacement
CGIN	cervical glandular intraepithelial neoplasia	FFP	fresh frozen plasma
CHC	combined hormonal contraception	FHR	fetal heart rate
CIN	cervical intraepithelial neoplasia	FIGO	International Federation of Gynaecology and Obstetrics
CMV	cytomegalovirus	FISH	fluorescence <i>in situ</i> hybridization
CNST	Clinical Negligence Scheme for Trusts	FSD	female sexual dysfunction
COC	combined oral contraceptive	FSH	follicle-stimulating hormone
CPP	chronic pelvic pain	G&S	group and save
CRP	C-reactive protein	GBS	group B streptococcus
CSF	cerebrospinal fluid	GFR	glomerular filtration rate
CT	computed tomography	GnRH	gonadotrophin-releasing hormone
CTG	cardiotocography	GSI	genuine stress incontinence
CVA	cerebrovascular accident	HAART	highly active antiretroviral therapy

**x** List of Abbreviations

Hb	haemoglobin	MSU	mid-stream urine
HbF	fetal haemoglobin	MZ	monozygotic
hCG	human chorionic gonadotrophin	NAAT	nucleic acid amplification test
HELLP	(syndrome of) haemolysis, elevated liver enzymes and low platelets	NEC	necrotizing enterocolitis
HFEA	Human Fertilization and Embryology Authority	NHS	National Health Service
HIV	human immunodeficiency virus	NICE	National Institute for Clinical Excellence
HMB	heavy menstrual bleeding	NPV	negative predictive value
HPV	human papilloma virus	NSAID	non-steroidal anti-inflammatory drug
HRT	hormone replacement therapy	NTD	neural tube defect
HSG	hysterosalpingogram	OA	occipito-anterior
HSV	herpes simplex virus	OAB	overactive bladder
HVS	high vaginal swab	OCP	oral contraceptive pill
IA	intermittent auscultation	OHSS	ovarian hyperstimulation syndrome
IBS	irritable bowel syndrome	OP	occipito-posterior
ICAS	Independent Complaints Advocacy Service	OT	occipito-transverse
ICSI	intracytoplasmic sperm injection	PAPPA	pregnancy-associated plasma protein A
Ig	immunoglobulin	PBS	painful bladder syndrome
i.m.	intramuscular	PCA	patient-controlled analgesia
IMB	intermenstrual bleeding	PCB	postcoital bleeding
IPT	intermittent preventive treatment	PCO	polycystic ovary
IUD	intrauterine device	PCOS	polycystic ovary syndrome
IUGR	intrauterine growth restriction	PCP	<i>Pneumocystis carinii</i> pneumonia
IUI	intrauterine insemination	PCR	polymerase chain reaction
IUS	intrauterine system	PDA	patent ductus arteriosus
i.v.	intravenous	PET	positron emission tomography
IVF	<i>in vitro</i> fertilization	PFMT	pelvic floor muscle training
IVP	intravenous pyelogram	PGD	preimplantation genetic diagnosis
KOH	potassium hydroxide	PGE <sub>2</sub>	prostaglandin E <sub>2</sub>
LARC	long-acting reversible contraceptive	PGF <sub>2a</sub>	prostaglandin F <sub>2a</sub>
LAVH	laparoscopic assisted vaginal hysterectomy	PGS	preimplantation genetic screening
LDH	lactic dehydrogenase	PI	Pearl index
LFT	liver function test	PID	pelvic inflammatory disease
LH	luteinizing hormone	PIGF	placental growth factor
LLETZ	large loop excision of transformation zone	PMB	postmenopausal bleeding
LMP	last menstrual period	PMS	premenstrual syndrome
LMWH	low-molecular-weight heparin	POP	progestogen-only pill
LN	lymph node	PPH	postpartum haemorrhage
LSCS	lower segment Caesarean section	PPV	positive predictive value
LUNA	laparoscopic uterine nerve ablation	PSV	peak velocity in systole
MC	monochorionic	RCT	randomized controlled trial
MCA	middle cerebral artery	SBR	serum bilirubin
MCDA	monochorionic diamniotic	SD	standard deviation
MCHC	mean cell haemoglobin concentration	SFD	small for dates
MCMA	monochorionic monoamniotic	SHBG	steroid hormone binding globulin
MCV	mean cell volume	SIDS	sudden infant death syndrome
MRI	magnetic resonance imaging	SLE	systemic lupus erythematosus
		SROM	spontaneous rupture of membranes
		SSR	surgical sperm retrieval
		SSRI	selective serotonin reuptake inhibitor

STI	sexually transmitted infection	U&E	urea and electrolytes
T3	triiodothyronine	UA	umbilical artery
T4	thyroxine	UAE	uterine artery embolization
TAH	total abdominal hysterectomy	UDCA	ursodeoxycholic acid
TB	tuberculosis	USS	ultrasound scan
TCRE	transcervical resection of endometrium	UTI	urinary tract infection
TCRF	transcervical resection of fibroid	VBAC	vaginal delivery after a previous Caesarean section
TEDS	thromboembolic disease stockings	VDRL	Venereal Disease Research Laboratories
TENS	transcutaneous electrical nerve stimulation	VE	vaginal examination
TFT	thyroid function test	VEGF	vascular endothelial growth factor
TLH	total laparoscopic hysterectomy	VH	vaginal hysterectomy
TOP	termination of pregnancy	VIN	vulvar intraepithelial neoplasia
TOT	trans-obdurator tape	VMA	vanillymandelic acid
TSH	thyroid-stimulating hormone	VQ	ventilation/ perfusion
TTN	transient tachypnoea of the newborn	VSD	ventricular septal defect
TTTS	twin-twin transfusion syndrome	VTE	venous thromboembolism
TVS	transvaginal sonography	WBC	white blood cell count
TVT	tension-free vaginal tape	WHO	World Health Organization

# List of journal abbreviations

Acta Obstet Gynecol Scand	Acta Obstetricia et Gynecologica Scandinavica
AmJOG	American Journal of Obstetrics and Gynecology
Ann Intern Med	Annals of Internal Medicine
Ann Neurol	Annals of Neurology
BJOG	BJOG: an International Journal of Obstetrics and Gynaecology
BMC Public Health	BMC Public Health
BMJ	British Medical Journal
Br J Cancer	British Journal of Cancer
Clin Perinatol	Clinics in Perinatology
Cochrane	Cochrane Database System Review
Contraception	Contraception
Curr Opin Obstet Gynecol	Current Opinions in Obstetrics and Gynecology
Curr Opin Rheum	Current Opinions in Rheumatology
Diabetes Care	Diabetes Care
Diabetes Metab	Diabetes and Metabolism
Epilepsia	Epilepsia
Eur J Obstet Gynecol Reprod Biol	European Journal of Obstetrics Gynecology and Reproductive Biology
Fertil Steril	Fertility and Sterility
Fetal Diagn Ther	Fetal Diagnosis and Therapy
Genet Med	Genetics in Medicine
Gynecol Oncol	Gynecologic Oncology
Hum Reprod	Human Reproduction
Hum Reprod Update	Human Reproduction Update
J Clin Oncol	Journal of Clinical Oncology
J Matern Fetal Neonatal Med	Journal of Maternal–Fetal and Neonatal Medicine
J Med Screen	Journal of Medical Screening
J Natl Cancer Inst	Journal of the National Cancer Institute
J Obstet Gynaecol Res	Journal of Obstetrics and Gynaecology Research
J Periodontol	Journal of Periodontology
JAMA	Journal of the American Medical Association
JCEM	Journal of Clinical Endocrinology and Metabolism
Lancet	Lancet
Mal J	Malaria Journal
Nat Genet	Nature Genetics
NEJM	New England Journal of Medicine
Neurol	Neurology
Obstet Gynecol	Obstetrics and Gynecology
Oncologist	Oncologist

Paediatrics  
Prenat Diagn  
Reprod Biomed Online  
Rheumatology  
Semin Fetal Neonatal Med  
Soc Sci Med  
Ultrasound Obstet Gynecol

Paediatrics  
Prenatal Diagnosis  
Reproductive Biomedicine Online  
Rheumatology  
Seminars in Fetal and Neonatal Medicine  
Social Science and Medicine  
Ultrasound in Obstetrics and Gynecology



# Gynaecology section

- 1 The History and Examination in Gynaecology, 3
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# 1

## The history and examination in gynaecology

The remit of the doctor is to improve quality of life, not just to treat life-threatening disease: if a symptom is causing distress, treatment should be considered. The type and extent of treatment is determined largely by the patient: the doctor gives information and advice, so the patient can give her *informed* consent. The patient's history should be used not only to help make a diagnosis but also to discover how much her symptom(s) is/are affecting her. Or she may simply be concerned as to the cause of her symptoms (e.g. malignancy) and reassurance is enough.

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### The gynaecological history

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#### Personal details

Ask her name, age and occupation.

#### Presenting complaint(s)

How long has the problem been present and how much does it affect her? If it is pain, what alleviates and what exacerbates it, where is it and what is its nature? Allow the patient to elaborate as there may be more than one problem, initially without asking direct questions, perhaps asking her to rate her problems in order of severity. Has she ever consulted a doctor about this problem before and, if so, what has been done? If there are multiple presenting complaints, these should be put in order of severity/effect on her life.

#### Specific gynaecological questions

These are asked next, starting with ones that are relevant to this presenting complaint. For example, if it is a menstrual problem, the most appropriate next questions concern menstruation; if it is a urinary problem, one should ask all the appropriate urinary tract questions next.

*Menstrual questions:* How often does she menstruate (how many days from the first day of bleeding to the next first day?) and how long does menstruation last? (4/28 means bleeding lasts for 4 days and occurs every 28 days.) Is it regular or irregular? Is it heavy? (Number of pads/tampons used or the presence of clots can be useful.) Is it or the days leading up to it painful? Is there ever intermenstrual bleeding (IMB) [→ p.15]? Is there ever post-coital bleeding (PCB) [→ p.18]? Is there ever vaginal discharge and, if so, what is it like? Does she experience premenstrual tension? When was her last menstrual period (LMP)? If postmenopausal, has there been postmenopausal bleeding (PMB)?

*Sexual/contraceptive questions:* Is she sexually active? If so, is it painful? If so, is it on penetration (superficial dyspareunia) or deep inside (deep dyspareunia) and is it during and/or after (delayed). What contraceptive (if appropriate) does she use and what has she used in the past?

*Cervical smear questions:* When was her last cervical smear? (This should be done every 3 years between the

ages of 25 and 49 years, every 5 years between 50 and 64 years, and not performed thereafter unless never screened or history of recent abnormal tests.) Has she ever had an abnormal smear? If so, what was done [→ p.34]?

*Urinary/prolapse questions:* Does she experience frequency (normal is four to seven times per day), nocturia (micturition at night) or urgency (a severe desire to void)? Does she ever leak urine, including when asleep (nocturnal enuresis)? If so, how severe is it and with what is it associated (e.g. coughing, lifting/straining or urgency)? Is there ever dysuria (pain on micturition) or haematuria (blood in the urine)? Does she ever get a dragging sensation or feel a mass in or at the vagina?

#### Menstrual questions

How often and for how long?  
Heavy or painful?  
Regularity?  
Intermenstrual bleeding (IMB) or postcoital bleeding (PCB)?  
When was her last menstrual period (LMP)?

### Other history

*Past obstetric history:* This should be brief. Start with 'Have you ever been pregnant'? If the answer is 'No', go on to past medical history. If 'Yes', ask details about previous pregnancies in chronological order. See Chapter 16 for explanation of parity and gravidity. Of deliveries, ask when, what weight, how was the infant born and how the infant is now. Ask about any major complications in the pregnancy or labour.

*Past medical history:* First ask about any previous, particularly gynaecological, operations, however distant. Then directly ask about venous thrombosis, diabetes, lung and heart disease, hypertension, jaundice, etc. as in any medical history. If you elicit no significant history, ask 'Have you ever been in hospital'?

*Systems review:* Ask the usual cardiovascular, respiratory and neurological questions. In particular ask about urinary and gastrointestinal symptoms in view of the close pelvic relationship.

*Drugs:* Does she take any regular medication including prescribed, over-the-counter or complementary? Consider asking about illegal drug use if relevant.

*Family history:* Is there a family history of breast or ovarian carcinoma, of diabetes, venous thromboembolism, heart disease or hypertension?

*Personal/social history:* Does she smoke? Does she drink alcohol? If either, how much? Is she in a married or stable relationship and, if not, is there support at home? Where does she live and what sort of accommodation is it?

*Allergies:* Ask specifically about penicillin and latex.

#### Presenting the history

Start by summing up the important points, including relevant gynaecological questions:

This is . . . , who is a . . . year-old . . . (parity), with a . . . (time) history of . . . , who . . . (most significant findings in history).

Example: This is Mrs X, who is a 38-year-old nulliparous woman, with a 3-month history of postcoital bleeding (PCB), who has a normal menstrual cycle and last had a cervical smear 7 years ago.

N.B. By mentioning the last smear, you have shown understanding that PCB may be a symptom of cervical carcinoma.

Now go through the history in some detail.  
Then sum up again, in one sentence.

#### Gynaecological history: specific essential questions

Presenting complaint, its history  
Menstrual questions: last menstrual period (LMP), cycle, flow, intermenstrual bleeding (IMB), postcoital bleeding (PCB)  
Urinary/prolapse questions  
Sexual/contraceptive questions  
Cervical smear history  
Past obstetric history

### Other questions

Now ask 'Is there anything else you think I ought to know'? This gives her the opportunity to help you if you have not discovered all the important facts.

### Summarizing the history

1 Could the symptoms be a manifestation of underlying disease that needs to be treated? (For example, erratic menstrual bleeding may be a sign of malignancy.)

2 Are the symptoms themselves causing physical damage? (For example, erratic menstrual bleeding may lead to severe anaemia.)

3 Are the symptoms themselves causing distress? (For example, erratic menstrual bleeding may disrupt a woman's life such that she may feel unable to leave the home.) Or is she unconcerned?

## The gynaecological examination

### General examination

This is to:

1 Seek the effects (e.g. secondary spread of malignancy) or, more rarely, the causes (e.g. thyroid abnormalities cause menstrual disturbances) of gynaecological problems.

2 Assess general health and incidental disease, particularly if an anaesthetic may be needed.

General appearance and weight, temperature, blood pressure and pulse, and possible anaemia, jaundice or lymphadenopathy should be noted. More detailed examination of the rest of the body is often perfunctory in the young, fit patient, but is important in the older or more sick patient, or in those about to have an anaesthetic.

### Breast and axillary examination

This can be performed as a screening test for breast cancer, although breast examination is not routinely undertaken in UK gynaecological practice unless investigating a potentially malignant pelvic mass (Fig. 1.1).

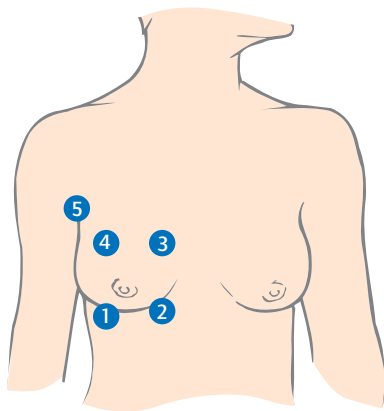


Fig. 1.1 Examination of the breast.

The patient sits back, the breasts are inspected for irregularities and all four breast quadrants are palpated as the patient lies supine with her hands behind her head. The axilla, a principal area for lymph drainage, is then palpated with the patient's arm resting on the examiner's shoulder.

### Abdominal examination

The patient lies comfortably on her back with her head on a pillow, discreetly exposed from the xiphisternum to the symphysis pubis. The bladder should be empty.

#### Inspect

Look for scars, particularly just above the symphysis pubis and in the umbilicus. Look at the distribution of body hair, for irregularities, striae and hernias.

#### Palpate

Ask about tenderness first, then palpate gently around the abdomen looking for masses or tenderness. Then palpate specifically for masses from above the umbilicus down to the symphysis pubis (Fig. 1.2). If any masses

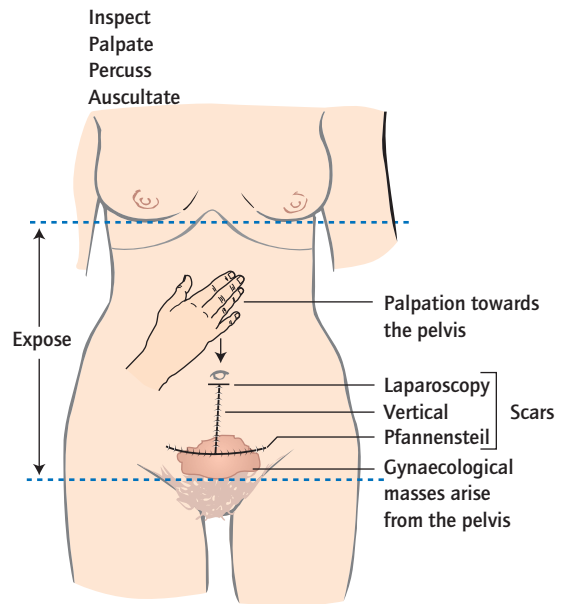


Fig. 1.2 Abdominal examination.

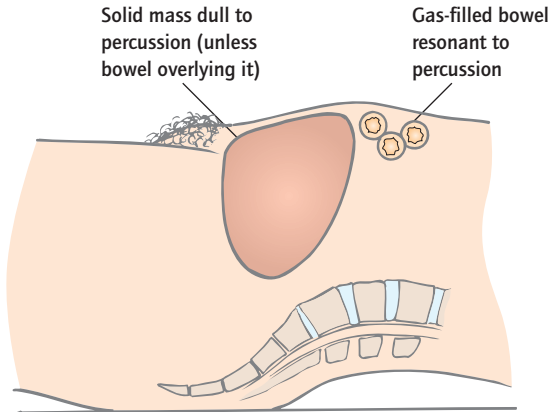


Fig. 1.3 Percussion of the abdomen.

are present, do they arise from the pelvis (i.e. can you get below them)?

### Percuss

Go around the abdomen. The bowel is resonant; fluid-filled and solid cavities (e.g. masses, full bladder) are dull (Fig. 1.3). Look for shifting dullness (free fluid).

### Auscultate

Listen to the bowel sounds.

#### Gynaecological examination

General  
(Breast)  
Abdomen  
Pelvic palpation: digital  
Cervical/vaginal inspection: speculum

### Vaginal examination

Ensure privacy, explain simply what you intend and ask for the patient's permission. Offer her the opportunity to use the bathroom first. A chaperone must be offered, whether you are male or female, and the presence and name of the chaperone documented in the notes. Use lubricating jelly. A metal speculum should be warmed. Internal examination is often uncomfortable, but severe tenderness is abnormal.

### Inspect

The vulva and the vaginal orifice are inspected first. Are there any coloured areas, ulcers or lumps on the vulva? Is a prolapse evident at the introitus? Three types of examination have different purposes.

### Digital bimanual examination

This assesses the pelvic organs. The patient lies flat, with her ankles together drawn up towards her buttocks and knees apart. Warn the patient before you touch her and ask her to let you know if she finds the examination too uncomfortable. The left hand is placed on the abdomen above the symphysis pubis and is pushed down into the pelvis, so that the organs are palpated between it and two fingers are gently inserted into the vagina (Fig. 1.4a,b).

*The uterus* is normally the size and shape of a small pear. Size, consistency, regularity, mobility, anteversion or retroversion and tenderness are assessed.

*The cervix* is normally the first part of the uterus to be felt vaginally and the os is felt as an opening like a toy car tyre. Is the cervix hard or irregular?

*The adnexa* (lateral to the uterus on either side, containing tube and ovary): tenderness and size and consistency of any mass are assessed. Is it separate from the uterus?

*The pouch of Douglas* (behind the cervix): the utero-sacral ligaments should be palpable. Are these even, irregular or tender, or is there a mass?

### Cusco's speculum examination

This allows inspection of the cervix and vaginal walls. The patient lies as for the digital examination. With the blades closed and parallel to the labia and the opening mechanism pointing to the patient's right, gently insert the speculum (Fig. 1.5a). Then rotate it 90° anteriorly and insert it as far as it will go without causing discomfort (Fig. 1.5b). Open it slowly under direct vision and the cervix will come into view (Fig. 1.5c). Common mistakes include not inserting the speculum sufficiently deep and/or posterior with an antverted uterus. The cervix may be very anterior with a retroverted uterus. Look for ulceration, spontaneous bleeding or irregularities. A cervical smear can be taken. Now slightly withdraw the speculum under direct vision and

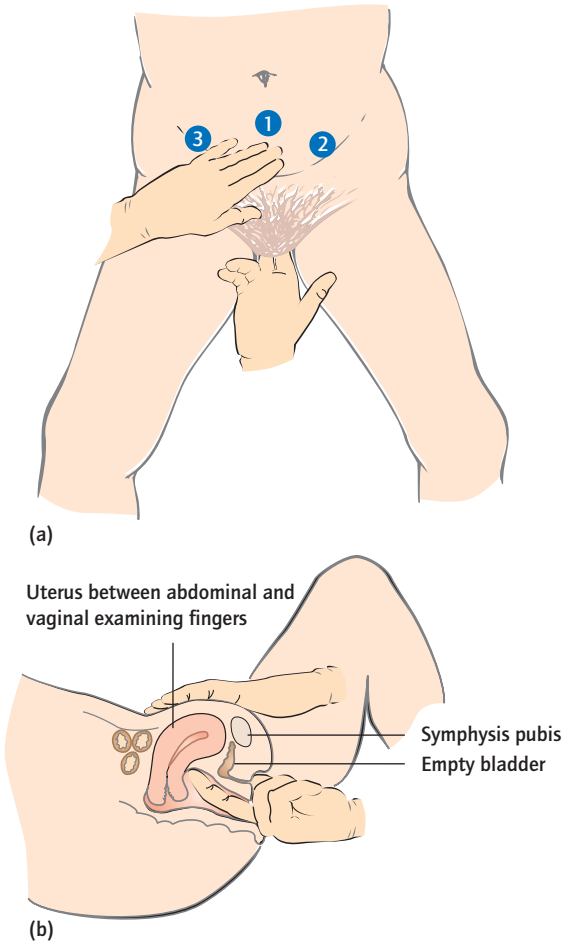


Fig. 1.4 Digital bimanual vaginal examination: (a) bimanually palpate areas 1, 2, 3 in order; (b) digital bimanual palpation of the pelvis.

partly close it without catching the cervix. Slowly withdraw it just open, allowing inspection of the vaginal walls to the introitus, and then close the speculum and remove it, rotating the speculum through 90° on the way out.

**Sims' speculum**

This allows better inspection of the vaginal walls and, specifically, the prolapse. The patient should be positioned in the left lateral position with the legs partly curled up. Insert the curved speculum into the vagina

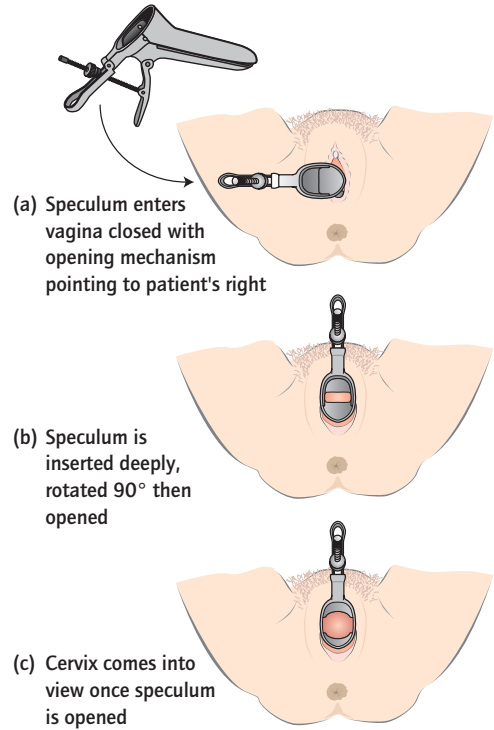


Fig. 1.5 Cusco's speculum examination of the cervix and vaginal walls. (a) Speculum enters vagina closed with opening mechanism pointing to patient's right. (b) Speculum is inserted deep, rotated 90°, then opened. (c) The cervix comes into view once the speculum is opened.

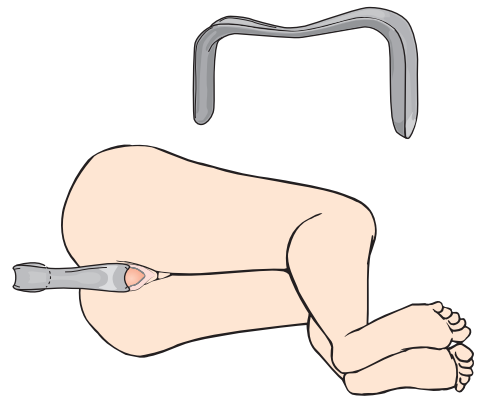


Fig. 1.6 Sims' speculum examination of the vaginal walls.

from behind, with one end pressing against the posterior wall to allow inspection of the anterior wall. Then reverse the speculum, pressing back the anterior wall so that the posterior wall can be seen (Fig. 1.6). If the patient is asked to bear down, the prolapse of either wall and the cervix or vaginal vault can be assessed.

## Rectal examination

This is occasionally appropriate if there is posterior wall prolapse, to distinguish between an enterocoele and a rectocoele, and in assessing malignant cervical disease. It may also be necessary if the woman complains of cyclical rectal bleeding, possibly due to rectovaginal endometriosis.

### Presenting the examination

Present the examination findings, including relevant positive or negative findings:

Mrs X is . . . (describe general appearance sensitively), her blood pressure, temperature and pulse are . . . and abdominal and pelvic examination reveals . . . There is . . . (mention important positive and negative findings).

Example: Mrs X looks thin and clinically anaemic, her blood pressure is 120/60mmHg, temperature is normal and pulse is 90 beats/min; abdominal examination reveals a mass arising from the pelvis up to the level of the umbilicus, with no obvious ascites. There is no lymphadenopathy or breast abnormality.

N.B. By mentioning ascites, lymphadenopathy and the breasts, you demonstrated your understanding of the possible aetiology and effects of a pelvic mass.

Management plan. Now decide on a course of action. Plan what investigations (if any) are needed and what course of action (if any) is most appropriate.

### Gynaecological History at a Glance

<b>Personal details</b>	Name, age, occupation
<b>Presenting complaint</b>	Details, time-scale, any previous treatment. Prioritize
<b>Gynaecological questions</b>	(Start with most relevant to complaint)
Menstrual:	Last menstrual period (LMP), cycle, heaviness, intermenstrual bleeding (IMB), postcoital bleeding (PCB)
Sex/contraceptive:	Sexually active, dyspareunia, contraception?
Cervical smear:	Last smear, ever abnormal?
Urinary/prolapse	Frequency, incontinence, lump at introitus
<b>Other history</b>	Past obstetric history: Ever pregnant? If so, details Past medical history: Operations, major illnesses. Ever in hospital? Systems review, drugs, personal (smoking, alcohol), social, family history (particularly breast/ovarian/heart disease), allergies
<b>Summarize</b>	Presenting complaint and relevant history findings

### Gynaecological Examination at a Glance

<b>General</b>	Appearance, anaemia, lymph nodes, blood pressure, pulse
<b>(Breasts/axillae)</b>	Inspect, palpate
<b>Abdomen</b>	Inspect, palpate (particularly suprapubically), percuss, auscultate
<b>Vaginal</b>	Inspect vulva; digital examination; Cusco's speculum, Sims' speculum if prolapse
<b>Summarize</b>	Positive and important negative findings; consider management

# 2

## The menstrual cycle and its disorders

### Physiology

#### Puberty

This is the onset of sexual maturity, marked by the development of secondary sex characteristics. The *menarche*, or onset of menstruation, is normally the last manifestation of puberty in the female, and in the West occurs on average at 13 years of age. Normal puberty is controlled centrally. The hypothalamic–pituitary axis can be considered as ‘waking’ and then ‘waking up’ the ovaries. After the age of 8 years, hypothalamic gonadotrophin-releasing hormone (GnRH) pulses increase in amplitude and frequency, such that pituitary follicle-stimulating hormone (FSH) and then luteinizing hormone (LH) release increases. These stimulate oestrogen release from the ovary (Figs 2.1, 2.2).

Oestrogen is responsible for the development of secondary sexual characteristics: the *thelarche*, or beginning of breast development, occurs first at 9–11 years; the *adrenarche*, or growth of pubic hair (also dependent on adrenal activity), starts at 11–12 years; the final stage is the *menarche* (Fig. 2.2). Menstruation may be irregular at first; as oestrogen secretion rises, it will become regular. Pregnancy is now possible. These changes are accompanied by the growth spurt, due to increased growth hormone release. By the age of 16 years, most growth has finished and the epiphyses fuse. The average age of the menarche is reducing.

#### The menstrual cycle

The hormonal changes of the menstrual cycle cause ovulation and induce changes in the endometrium that prepare it for implantation should fertilization occur.

#### Days 1–4: menstruation

At the start of the menstrual cycle (designated as the first day of menstruation) the endometrium is shed as its hormonal support is withdrawn. Myometrial contraction, which can be painful, also occurs.

#### Days 5–13: proliferative phase

Pulses of GnRH from the hypothalamus stimulate LH and FSH release which induce follicular growth. The follicles produce oestradiol and inhibin which suppress FSH secretion in a ‘negative feedback’, such that (normally) only one follicle and oocyte matures. As oestradiol levels continue to rise and reach their maximum, however, a ‘positive-feedback’ effect on the hypothalamus and pituitary causes LH levels to rise sharply: ovulation follows 36 hours after the LH surge. The oestradiol also causes the endometrium to re-form and become ‘proliferative’: it thickens as the stromal cells proliferate and the glands elongate.

#### Days 14–28: luteal/secretory phase

The follicle from which the egg was released becomes the corpus luteum. This again produces oestradiol, but relatively more progesterone, levels of which peak around a week later (day 21 of a 28-day cycle). This induces ‘secretory’ changes in the endometrium, whereby the stromal cells enlarge, the glands swell and the blood supply increases. Towards the end of the luteal phase, the corpus luteum starts to fail if the egg is not fertilized, causing progesterone and oestrogen levels to fall. As its hormonal support is withdrawn, the endometrium breaks down, menstruation follows and the cycle restarts (Fig. 2.3). Continuous administration of exogenous progestogens maintains a secretory endometrium. This can be used to delay menstruation.

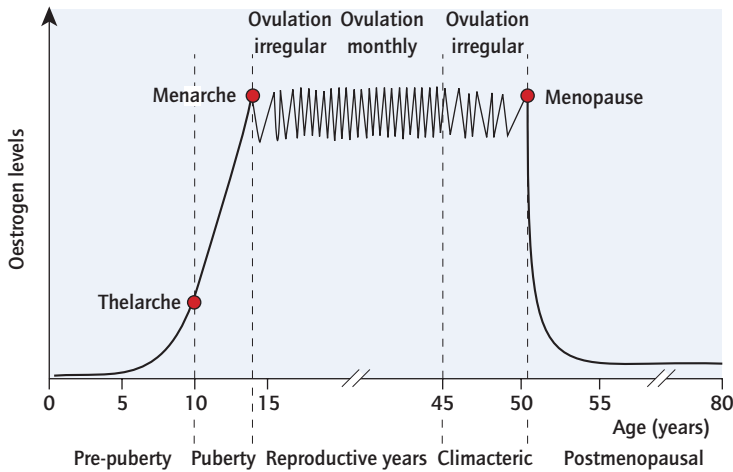


Fig. 2.1 Oestrogen levels in a lifetime.

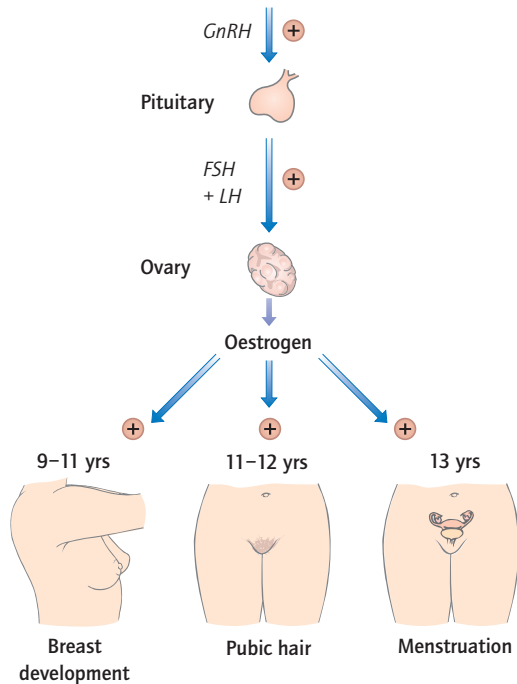


Fig. 2.2 Endocrine changes during puberty. FSH, follicle-stimulating hormone; GnRH, gonadotrophin-releasing hormone; LH, luteinizing hormone.

**Normal menstruation**

- Menarche <16 years
- Menopause >45 years
- Menstruation <8 days in length
- Blood loss <80mL
- Cycle length 23–35 days
- No intermenstrual bleeding (IMB)

**Abnormal menstruation and definitions of terms**

Menorrhagia	Heavy menstrual bleeding
Intermenstrual bleeding	Bleeding between periods
Irregular periods	Periods outside the range of 23–35 days with a variability of >7 days between the shortest and longest cycle
Postcoital bleeding	Bleeding after intercourse
Primary amenorrhoea	Periods never start
Secondary amenorrhoea	Periods stop for 6 months or more
Oligomenorrhoea	Infrequent periods (>every 35 days–6 months)
Postmenopausal bleeding	Bleeding 1 year after the menopause
Dysmenorrhoea	Painful periods
Premenstrual syndrome	Psychological and physical symptoms worse in the luteal phase

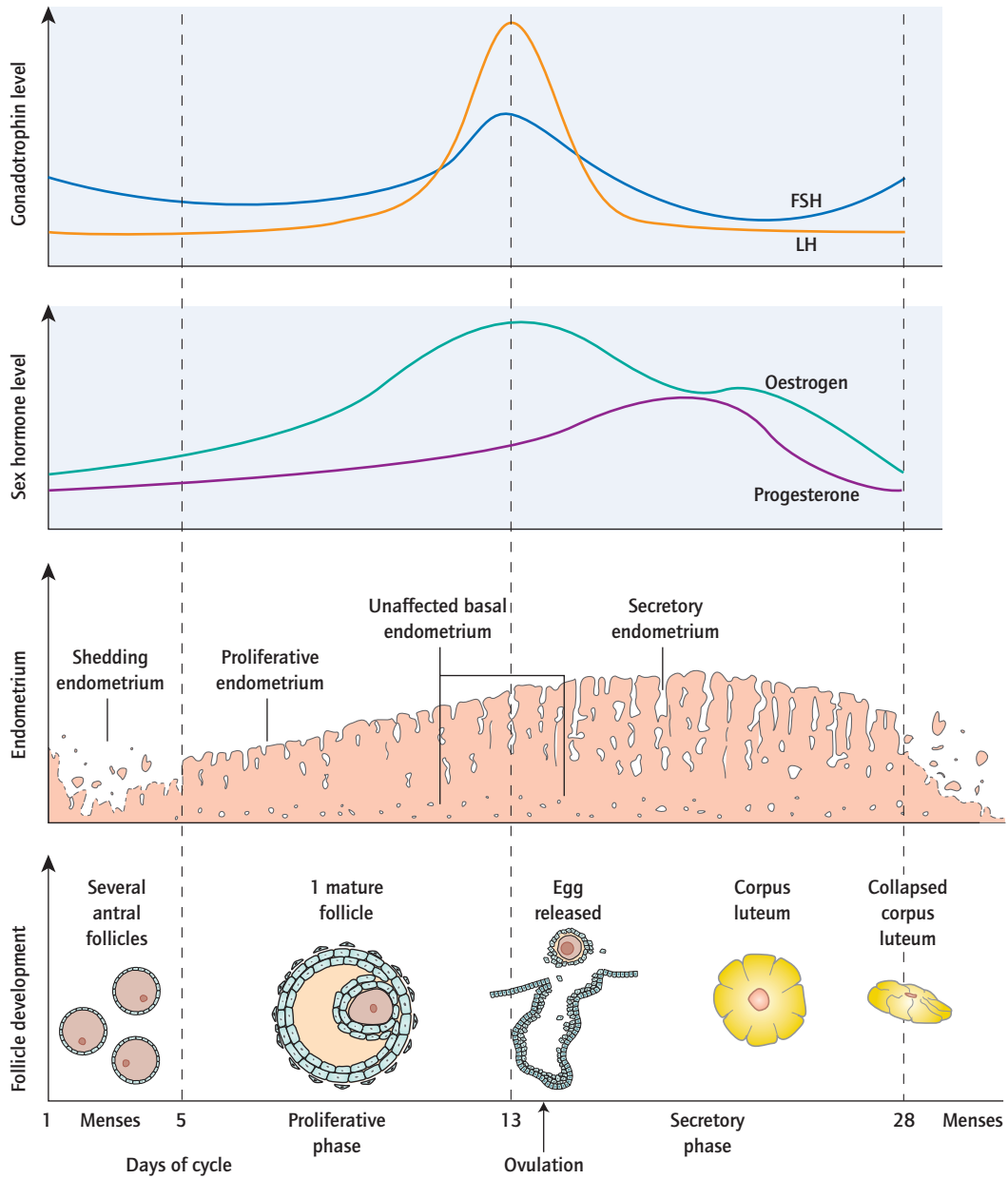


Fig. 2.3 The menstrual cycle. FSH, follicle-stimulating hormone; LH, luteinizing hormone.

## Heavy menstrual bleeding (menorrhagia)

### Definition

Menorrhagia (heavy menstrual bleeding, HMB) is excessive bleeding in an otherwise normal menstrual cycle. This is subjective, as what constitutes heavy bleeding to one woman may be quite normal for another. *Clinical definition:* This is excessive menstrual blood loss that interferes with the woman's physical, emotional, social and material quality of life, and which can occur alone or in combination with other symptoms. *Objective definition:* This is blood loss of >80 mL in an otherwise normal menstrual cycle. This value corresponds to the maximum amount that a woman on a normal diet can lose per cycle without becoming iron deficient. In practice, actual blood loss is rarely measured.

### Epidemiology

One-third of women complain of heavy periods although most do not seek medical help.

### Aetiology

The majority of women with menorrhagia have no histological abnormality that can be implicated in its causation. Most women with regular cycles are ovulatory, and menorrhagia may result from subtle abnormalities of endometrial haemostasis or uterine prostaglandin levels. Uterine fibroids (approximately 30% of women with HMB) and polyps (approximately 10% of women with HMB) are the most common form of pathology found. Chronic pelvic infection, ovarian tumours, and endometrial and cervical malignancy (Fig. 2.4) usually cause irregular bleeding. Thyroid disease, haemostatic disorders, such as von Willebrand's disease, and anticoagulant therapy are rare causes of menorrhagia. A coagulopathy may be suggested by a history of excessive bleeding after surgery/trauma or easy bruising.

### Clinical features

*History:* This should assess both the amount and timing of the bleeding. A menstrual calendar is helpful. 'Flooding' and the passage of large clots indi-

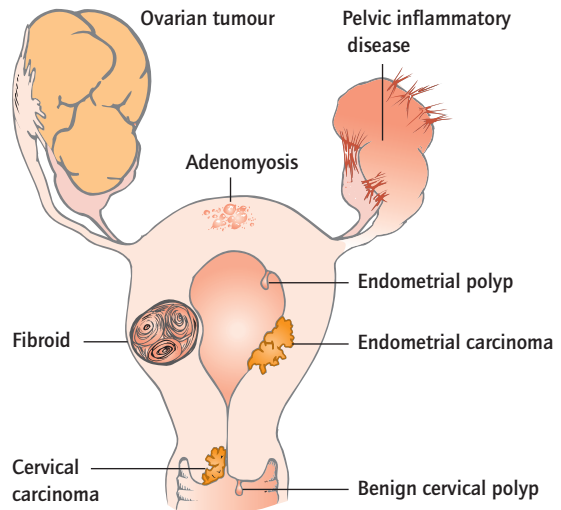


Fig. 2.4 Anatomical causes of menorrhagia.

cate excessive loss. Any method of contraception should be ascertained.

*Examination:* Anaemia is common. Pelvic signs are often absent. Irregular enlargement of the uterus suggests fibroids; tenderness with or without enlargement suggests adenomyosis. An ovarian mass or fibroids may be felt.

### Investigations

*To assess the effect of blood loss and fitness,* the patient's haemoglobin is checked.

*To exclude systemic causes,* coagulation and thyroid function are checked only if the history is suggestive of a problem.

*To exclude local organic causes,* a transvaginal ultrasound of the pelvis is performed (Fig. 2.5). This will assess endometrial thickness, exclude a uterine fibroid or ovarian mass and detect larger intrauterine polyps. If the endometrial thickness is >10 mm or a polyp is suspected, or if the woman is over 40 years old with recent onset menorrhagia, or also has IMB, or has not responded to treatment, an *endometrial biopsy* (at hysteroscopy or with a Pipelle; Fig. 2.6) is performed to exclude endometrial malignancy or premalignancy [→ p.27]. *Hysteroscopy* allows, in addition to biopsy, an inspection of the uterine cavity, and therefore detection of polyps and submucous fibroids that could be

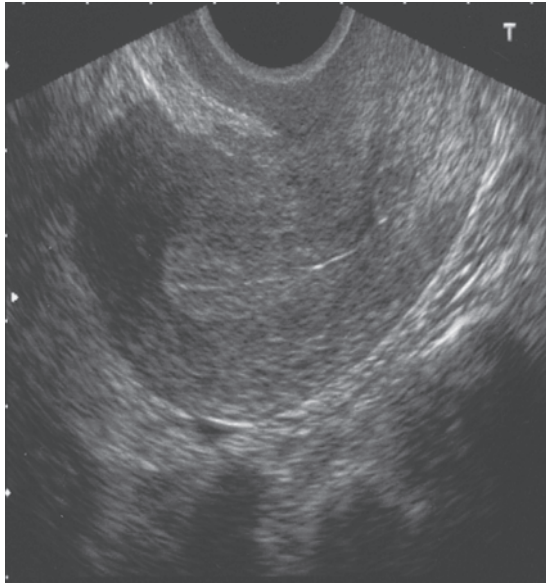


Fig. 2.5 Transvaginal ultrasound of a normal uterus and mid-cycle endometrium.

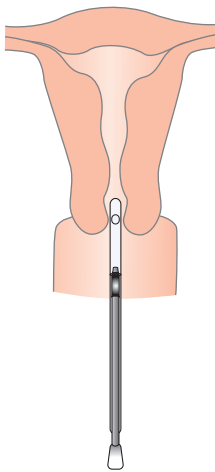
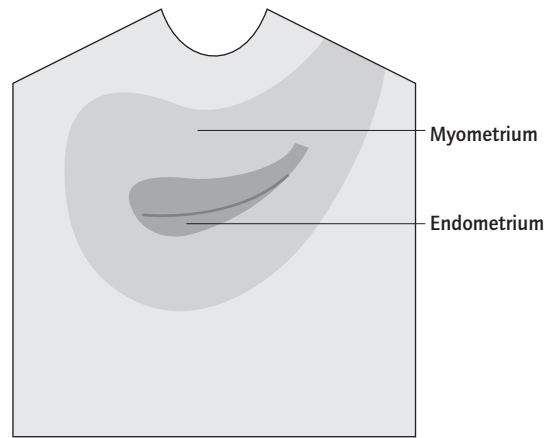


Fig. 2.6 Pipelle endometrial biopsy going through the cervix.

resected. A dilatation and curettage (D&C) is not a treatment for menorrhagia.

## Management

Treatment can be instigated once pathology has been excluded and depends on the woman's contraceptive needs (Fig. 2.7). Thus, while intrauterine progestogens are very effective and recommended as a first line by the

National Institute for Clinical Excellence (NICE), this is not an option for a woman who wishes to conceive (<http://guidance.nice.org.uk/CG44/niceguidance/pdf/English>).

## Medical treatment

### First line

*Intrauterine system (IUS):* This progestogen-impregnated intrauterine device (IUD; Fig. 2.8) is a 'coil' [→ p.103] that reduces menstrual flow by >90% with considerably fewer side effects than systemic progestogens. It is a highly effective alternative to both medical and surgical treatment of menorrhagia. It is a contraceptive and also provides the progestogen component of hormone replacement. It should be distinguished from copper IUDs which may increase menstrual loss.

### Second line

*Antifibrinolytics* (tranexamic acid) are taken during menstruation only. By reducing fibrinolytic activity this can reduce blood loss by about 50%. There are few side effects and in the UK it is available without prescription.

*Non-steroidal anti-inflammatory drugs* (NSAIDs; e.g. mefenamic acid) inhibit prostaglandin synthesis, reducing blood loss in most women by about 30%. They are

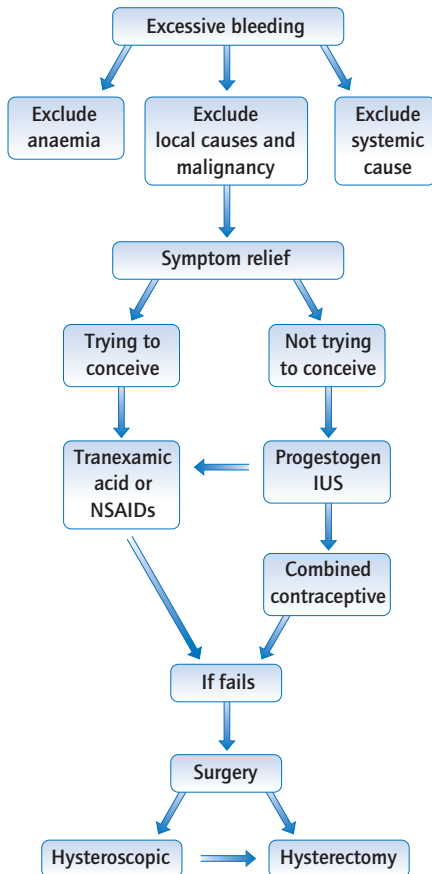


Fig. 2.7 Management of heavy menstruation. IUS, intrauterine system; NSAIDs, non-steroidal anti-inflammatory drugs.

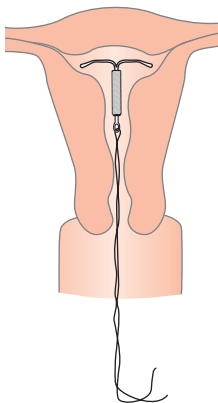


Fig. 2.8 Progestogen impregnated intrauterine system (IUS) *in situ* in the uterus.

also useful for dysmenorrhoea. Side effects are similar to those of aspirin. Ibuprofen and aspirin are available without prescription.

*The combined oral contraceptive* usually induces lighter menstruation, but is less effective if pelvic pathology is present. Its role is more limited because its complications [→ p.100] are more common in older patients and it is these patients who have the most menstrual problems.

### Third line

*Progestogens* [→ p.102] taken in high doses orally or by intramuscular injection will cause amenorrhoea, but bleeding will follow withdrawal.

*Gonadotrophin-releasing hormone* [→ p.69] agonists produce amenorrhoea. Unless add-back hormone replacement therapy (HRT) is used, duration is limited to 6 months. Even so, concerns remain about osteoporosis and cardiovascular disease. Bleeding will follow withdrawal.

### Pharmacological treatments for menorrhagia

#### First line

Intrauterine system (IUS)

#### Second line

Antifibrinolytics (tranexamic acid)  
Non-steroidal anti-inflammatory drugs (NSAIDs)  
Combined oral contraceptive

#### Third line

Progestogens (high dose oral or intramuscular)  
Gonadotrophin-releasing hormone (GnRH) analogues

### Surgical treatment

#### Hysteroscopic

*Polyp removal:* If localized abnormalities such as polyps are seen they can be resected. This can be performed under general or local anaesthesia.

*Endometrial ablation techniques* involve removal or destruction of endometrium. Amenorrhoea or lighter periods usually follow. Long-term patient satisfaction with endometrial destructive techniques is less than with hysterectomy, although surgical complications and hospital stay are less (Cochrane 2006: CD003855). Such techniques are most effective. Endometrial ablation is most appropriate in older women with pure menorrhagia and when the uterus is <10 weeks' size. The procedures reduce fertility but are non-sterilizing and so effective contraception should be advised.