

Edited by LOUISE C KENNY and FERGUS McCARTHY

21st EDITION

OBSTETRICS

by Ten Teachers





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First published in 1917 as 'Midwifery', *Obstetrics by Ten Teachers* is well established as a concise, yet comprehensive, guide within its field. The 21st Edition has been thoroughly updated by its latest team of 'teachers', integrating clinical material with the latest scientific developments that underpin patient care.

Each chapter is highly structured, with learning objectives, definitions, aetiology, clinical features, investigations, treatments and key point summaries and additional reading where appropriate. A key theme for this edition is 'professionalism' and information specific to this is threaded throughout the text.

Along with its companion *Gynaecology by Ten Teachers*, 21st Edition, the books continue to provide an accessible 'one stop shop' in obstetrics and gynaecology for a new generation of doctors.



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Within these twenty-first editions of *Obstetrics by Ten Teachers* terms such as woman/women, maternal, father, paternal, breastfeed, breastfeeding, breast fed and breast milk have been used throughout, but we wish to respectfully acknowledge that not all people who parent, are pregnant, give birth, need obstetric or gynaecological care, or are assigned biologically female or biologically male at birth, identify with these genders.

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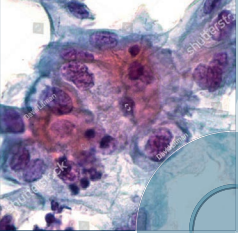
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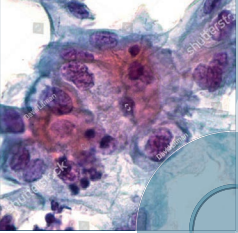
This book is dedicated to Elaine, Vivienne, Alannah, Matthew and Evan (FMC)
And to my Mum (LCK)



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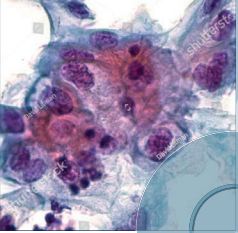


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Additional resources for students and lecturers to accompany this textbook are available online.

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Preface

Obstetrics by Ten Teachers, first published in 1917, is now in its 21st Edition. An iconic text, it remains the oldest and one of the most respected and popular English-language texts in the discipline.

The 21st Edition builds on the solid foundations of over a century of previous editions but reflects recent advances in the field as well as the evolution of medical education. It contains new material, extensive online resources and additional tools for self-assessment, written by a new generation of 'Ten Teachers'. They are all leading clinicians, renowned in their fields, and all are intimately involved in the delivery of both undergraduate and postgraduate training in the UK and Ireland, allowing the book to reflect the current undergraduate curriculum. This volume has been carefully edited to ensure consistency of structure, style and content in common with its sister text, *Gynaecology by Ten Teachers*. The books can therefore be used together or independently as required.

It has been an honour and a privilege to edit a textbook that we once read as students and we fully

appreciate the responsibility of revisiting a much-loved classic, particularly at this critical juncture for women's health. After almost a century of improvement, maternal mortality rates in some high-resource settings are increasing, largely driven by inequalities and disadvantage. Moreover, conditions that affect women more than men garner less research funding. Women have, for example, been historically under-represented in clinical trials and, despite work to rectify this bias, women are not necessarily included in proportions that match the prevalence or burden of disease. Consequently, effective cures for diseases that have been known about since the time of Hippocrates, such as pre-eclampsia, remain elusive. We therefore hope that the latest edition of *Obstetrics by Ten Teachers* inspires the next generation of doctors to follow the authors and editors into this discipline. There remains much to be done to make pregnancy and childbirth safe, fulfilling and equitable, everywhere and for everyone.



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Abbreviations

2D	two-dimensional
3D	three-dimensional
4D	four-dimensional
AA	arterioarterial
AC	abdominal circumference
ACE	angiotensin-converting enzyme
A:Cr	albumin to creatinine
AED	anti-epileptic drug
AFI	amniotic fluid index
AFP	alpha-fetoprotein
AIDS	acquired immunodeficiency syndrome
ALARA	as low as reasonably achievable
AP	anterior–posterior
APH	antepartum haemorrhage
APS	antiphospholipid syndrome
ARM	artificial rupture of membranes
ART	antiretroviral therapy
AS	aortic stenosis
AV	arteriovenous
BAPM	British Association of Perinatal Medicine
BMI	body mass index
BNF	British National Formulary
BPD	biparietal diameter/bronchopulmonary dysplasia
bpm	beats per minute
BPP	biophysical profile
CF	cystic fibrosis
cffDNA	cell-free fetal deoxyribonucleic acid
CI	confidence interval
CMA	chromosomal microarray analysis
CMV	cytomegalovirus
CNS	central nervous system
COVID-19	coronavirus disease 2019
CPAP	continuous positive airway pressure
CPD	cephalopelvic disproportion
CPR	cardiopulmonary resuscitation
CRL	crown–rump length
CRM	clinical risk management
CT	computed tomography
CTG	cardiotocograph(y)
CVS	chorionic villus sampling

DDH	developmental dysplasia of the hip
DMD	Duchenne muscular dystrophy
DNA	deoxyribonucleic acid
DOHaD	Developmental Origins of Health and Disease
DV	ductus venosus
DVT	deep vein thrombosis
DWI	diffusion weighted imaging
ECG	electrocardiogram
ECV	external cephalic version
EDD	estimated date of delivery
(a)EEG	(amplitude integrated) electroencephalography
EFM	electronic fetal monitoring
EFW	estimated fetal weight
EIA	enzyme immunoassay
EMQ	extended matching question
ERCS	elective repeat caesarean section
ESBL	extended spectrum β -lactamase
FBC	full blood count
FBM	fetal breathing movement
FEV ₁	forced expiratory volume in 1 second
fFN	fetal fibronectin
FGF(R)	fibroblast growth factor (receptor)
FGM	female genital mutilation
FGR	fetal growth restriction
FHR	fetal heart rate
FL	femur length
FOQ	family origin questionnaire
FVS	fetal varicella syndrome
GBS	group B <i>Streptococcus</i>
GCS	Glasgow Coma Score
GDM	gestational diabetes mellitus
GP	general practitioner
GUM	genitourinary medicine
Hb	haemoglobin
HbA	adult haemoglobin
HbAC	haemoglobin C trait
HbAS	sickle cell trait
HbA1c	glycated haemoglobin
HBcAb	hepatitis B core antibody
HbF	fetal haemoglobin
HBsAb	hepatitis B surface antibody
HBsAg	hepatitis B surface antigen
HbSC	sickle cell/haemoglobin C disease
HbSS	sickle cell disease
HBV	hepatitis B virus
HC	head circumference
(β)hCG	(beta-)human chorionic gonadotrophin



HCV	hepatitis C virus
HDFN	haemolytic disease of the fetus and newborn
HELLP	haemolysis, elevated liver enzymes and low platelets
HG	hyperemesis gravidarum
HIE	hypoxic-ischaemic encephalopathy
HIV	human immunodeficiency virus
HMO	human milk oligosaccharide
HSV	herpes simplex virus
IBD	inflammatory bowel disease
Ig	immunoglobulin
IM	intramuscular
iNO	inhaled nitric oxide
IOL	induction of labour
IQ	intelligence quotient
ISUOG	International Society of Ultrasound in Obstetrics and Gynecology
IUT	intrauterine transfusion
IV	intravenous
IVF	in vitro fertilization
IVH	intraventricular haemorrhage
LLETZ	large loop excision of the transformation zone
LMP	last menstrual period
LMWH	low-molecular-weight heparin
MBRRACE-UK	Mothers and Babies, Reducing Risk through Audits and Confidential Enquiries across the UK
MCA	middle cerebral artery
MCMA	monochorionic monoamniotic
M, C & S	microscopy, culture and sensitivity
MDT	multidisciplinary team
MEOWS	Modified Early Obstetric Warning System
MI	myocardial infarction
MMR	mumps, measles, rubella
MoM	multiples of median
MRI	magnetic resonance imaging
MRSA	methicillin-resistant <i>Staphylococcus aureus</i>
MS	multiple sclerosis
MSAF	meconium staining of amniotic fluid
MSU	midstream urine specimen
NEC	necrotizing enterocolitis
NICE	National Institute for Health and Care Excellence
NICU	neonatal intensive care unit
NIPT	non-invasive prenatal testing
NLS	Newborn Life Support
NRP	Newborn Resuscitation Program
NSAID	non-steroidal anti-inflammatory drug
NT	nuchal translucency
OA	occipito-anterior
OASI	obstetric anal sphincter injury

OGTT	oral glucose tolerance test
OP	occipito-posterior
OR	odds ratio
OT	occipito-transverse
OT(R)(-A)	oxytocin (receptor) (antagonist)
PAPP-A	pregnancy-associated plasma protein-A
PCR	polymerase chain reaction
P:Cr	protein to creatinine ratio
PDA	patent ductus arteriosus
PE	pulmonary embolism
PG	prostaglandin
PH	pulmonary hypertension
PIGF	placental growth factor
PPH	postpartum haemorrhage
PPHN	persistent pulmonary hypertension of the newborn
PPROM	pre-labour/prolonged premature rupture of membranes
PROM	preterm rupture of membranes
PSV	peak systolic velocity
PTL	preterm labour
RA	rheumatoid arthritis
RCM	Royal College of Midwives
RCOG	Royal College of Obstetricians and Gynaecologists
RDS	respiratory distress syndrome
REM	rapid eye movement
RhD	rhesus factor D
RNA	ribonucleic acid
ROP	retinopathy of prematurity
RR	relative risk
SBA	single best answer
SCBU	special care baby unit
SCD	sickle cell disease
SFH	symphysis–fundal height
sFlt-1	soluble fms-like tyrosine kinase
SGA	small for gestational age
SLE	systemic lupus erythematosus
SROM	spontaneous rupture of the membranes
SSRI	selective serotonin reuptake inhibitor
SUDEP	sudden unexpected death in epilepsy
(f)T3	(free) triiodothyronine
(f)T4	(free) thyroxine
TAPS	twin anaemia–polycythaemia sequence
TENS	transcutaneous electrical nerve stimulation
TH	therapeutic hypothermia
TRAP	twin reversed arterial perfusion
TSH	thyroid-stimulating hormone
TTTS	twin-to-twin transfusion syndrome
uE3	unconjugated oestriol



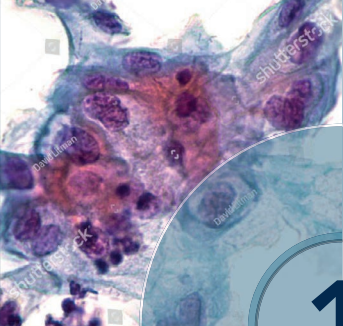
UKOSS	UK Obstetric Surveillance Survey
UTI	urinary tract infection
VBAC	vaginal birth after caesarean
VDRL	venereal diseases research laboratory
VEGF	vascular endothelial growth factor
VTE	venous thromboembolism
VWF	von Willebrand factor
VZIG	varicella zoster immunoglobulin
VZV	varicella zoster virus
WHO	World Health Organization



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Obstetric history and examination

PHILIPPA J MARSDEN

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Obstetric history	2	Further reading	13

Learning Objectives

- Understand the concept of preconceptual counselling and the opportunity that it provides.
- Understand the principles of taking an obstetric history.
- Understand the key components of an obstetric examination.
- Be able to perform an appropriate obstetric examination.

INTRODUCTION

Taking an obstetric history and performing an obstetric examination differs from a history and examination in other specialities in that the patient is often healthy and simply undergoing a normal life event. Antenatal care is designed to support the normal physiological process and to detect early signs of complications. For patients with a more complicated history, a detailed history and risk assessment offers a personalised approach with the opportunity to plan antenatal care carefully. The types of questions asked during the history change with gestation, as does the purpose and nature of the examination, and questioning and examination must always be undertaken with care and sensitivity.

PRECONCEPTUAL COUNSELLING

Pregnancy is increasingly being achieved in those of an advanced age, who frequently have one or more pre-existing medical conditions. As more patients with chronic illness look to conceive, who often have

high levels of insight into their conditions, obstetricians are increasingly having the opportunity to meet with patients prior to conception to discuss their medical conditions and provide advice on optimizing their pregnancy and maximizing their chances of a healthy uncomplicated pregnancy. This often occurs via a preconceptual clinic.

The main purposes of preconceptual counselling are as follows:

- optimize maternal health before embarking on a pregnancy
 - recognise issues
 - amend lifestyle
 - address social issues
- reduce maternal and perinatal morbidity and mortality
- address chronic medical conditions
- address medications used (are they pregnancy friendly?)
- discuss the impact of the disease process on pregnancy versus the impact of pregnancy on the disease process

- address challenges to falling pregnant – fertility issues
- plan antenatal follow-up and any screening needed for when pregnancy occurs
- discuss mode of delivery
- address breastfeeding – which medications are suitable
- plan postnatal follow-up and contraception

OBSTETRIC HISTORY

INTRODUCTION

When meeting a patient for the first time, introduce yourself and tell the patient why you have come to see them. Make sure that the patient is seated comfortably. Some patients may want another person to be present and this wish should be respected. A qualified interpreter (or interpreting service) should be used if appropriate.

The questions asked must be tailored to the purpose of the visit. At the booking visit, the history must be thorough and meticulously recorded. Once this baseline information is established, there is no need to go over this information at every visit. Everyone should attend for routine antenatal visits, usually performed by the midwife, and occasionally some attend for a specific reason or because a complication has developed.

Some areas of the obstetric history cover subjects that are intensely private. It is vital to maintain confidentiality and to be aware of and be sensitive to each individual situation.

DATING THE PREGNANCY

Pregnancy was historically dated from the last menstrual period (LMP), because the LMP was considered more reliable than the date of conception. The median duration from the first day of the LMP to birth is 40 weeks, and this can be used to work out the estimated date of delivery (EDD). This explains why, although a human pregnancy is approximately 38 weeks in duration, we refer to the length of pregnancy as 40 weeks in duration. However, the National Institute for Health and Care Excellence (NICE) guideline on antenatal care recommends that pregnancy dates are set by ultrasound using the crown–rump



Figure 1.1 Gestation calendar wheel.

measurement between 11 weeks and 2 days and 14 weeks and 1 day. Almost everyone undergoing antenatal care in the UK will have an ultrasound scan late in the first trimester or early in the second trimester, and the EDD is determined at this point. Accurate dating early in pregnancy is important for assessing fetal growth in later pregnancy and reduces the risk of premature planned deliveries, such as induction of labour for postmature pregnancies (>41 weeks' gestation) and elective caesarean sections.

In the first trimester, there are pregnancy calculators (wheels) (Figure 1.1) available and pregnancy calculator apps for smartphones that can work out the EDD for you (Figure 1.2), which are useful before the dating scan.

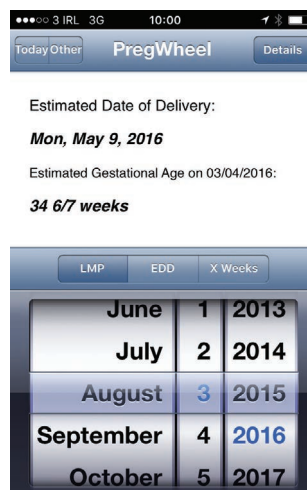


Figure 1.2 Gestation calendar app on a smartphone. (Courtesy of Dr Andrew Yu, Yale University.)

SOCIAL HISTORY

The social history is an important part of the obstetric history, as social circumstances can have a dramatic influence on pregnancy outcome, and requires considerable sensitivity. Mothers and Babies, Reducing Risk through Audits and Confidential Enquiries across the UK (MBRRACE-UK) has consistently reported that maternal mortality is highest among those who are older and those living in the most deprived areas. Recent reports highlighted that a quarter of those who died, whose birthplace was known, were born outside the UK and almost 1 in 10 had severe and multiple disadvantages including substance misuse, domestic abuse and mental health issues. Of those that died, 20% were known to social services and to child protection services.

Women from Black, Asian and minority ethnic groups have a much higher chance of dying during pregnancy or after birth and, although they have more health problems and are more affected by social and economic problems, systemic racism and racial bias may also affect their care. This is extremely important to remember when taking a history at any point in pregnancy, as there is evidence from Black, Asian and minority ethnic groups that they are treated differently, receive less empathy from health professionals, are not listened to, are not taken seriously and are less likely to disclose worries (**Figure 1.3**).

Women who are experiencing domestic abuse are at higher risk of abuse during pregnancy and of adverse pregnancy outcomes; because they may be prevented from attending antenatal appointments, they may be concerned that disclosure of their abuse may worsen their situation and they may be anxious about the reaction of health professionals. One-third of those who experience domestic abuse do so for the first time while pregnant, and pregnancy and the post-partum period is a risk factor for domestic abuse leading to homicide, with one in seven maternal deaths occurring in those who have told their health professional they are in an abusive relationship. This is why it is important to ask about domestic abuse in every pregnancy.

Enquiring about domestic abuse is difficult. It is recommended that everyone who is pregnant is seen on their own at least once during their pregnancy, so that they can discuss this, if needed, away from an abusive partner. If you happen to be the person with whom this information is shared, you must ensure that it is passed on to the relevant team, as this may be the only opportunity that the patient has to disclose it. It is a good idea to practise with your peers asking about domestic abuse sensitively, demonstrating empathy and compassion and signposting to support.

Smoking, alcohol and drug intake also form part of the social history. Smoking causes placental dysfunction and thus increases the risk of miscarriage,

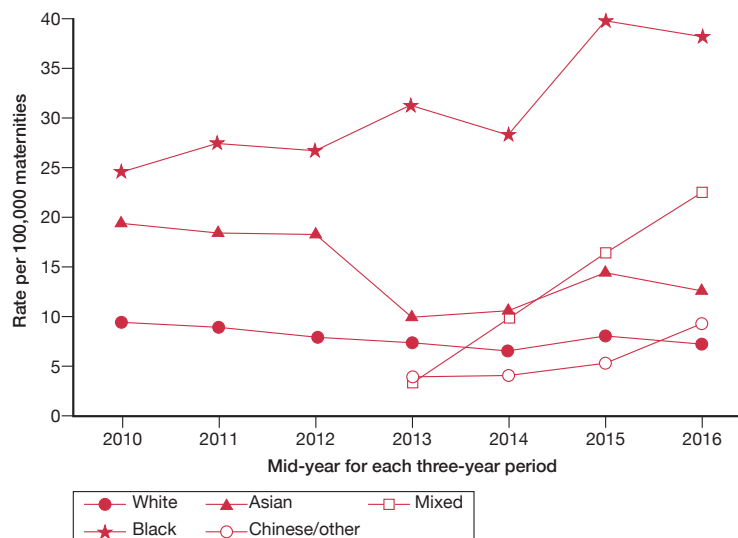


Figure 1.3 Maternal mortality rates from 2009 to 2017 among people from different ethnic groups in the UK.

stillbirth and neonatal death. There are interventions that can be offered to those who are still smoking in pregnancy (see **Chapters 3 and 6**).

Complete abstinence from alcohol is advised, as the safety of alcohol is not proven. However, alcohol is probably not harmful in small amounts (less than one drink per day). Binge drinking is particularly harmful and can lead to a constellation of features in the baby known as fetal alcohol syndrome (see **Chapters 3 and 6**).

Enquiring about recreational drug taking is more difficult. Approximately 0.5–1% of women continue to take recreational drugs during pregnancy. Be careful not to make assumptions. During the booking visit, the midwife should enquire directly about drug taking. If it is seen as part of the long list of routine questions asked at this visit, it is perceived as less threatening. However, sometimes this information comes to light at other times. Cocaine and crack cocaine are the most harmful of the recreational drugs taken, but all have some effects on the pregnancy, and all have financial implications (see **Chapter 6**).

The following are important aspects of the social history:

- whether the patient is single or in a relationship and what support they have at home
- what sort of housing the patient lives in (e.g. a flat with lots of stairs and no lift may be problematic)
- whether the patient works and, if so, for how long they are planning to work during the pregnancy
- whether the patient smokes/drinks or uses recreational drugs

PREVIOUS OBSTETRIC HISTORY

Past obstetric history is one of the most important areas for establishing risk in the current pregnancy. It is helpful to list the pregnancies in date order and to discover what the outcome was in each pregnancy.

The features that are likely to have impact on future pregnancies include:

- preterm delivery (increased risk of preterm birth)
- pre-eclampsia (increased risk of pre-eclampsia/fetal growth restriction)

- abruption (increased risk of recurrence)
- congenital abnormality (recurrence risk depends on type of abnormality)
- macrosomic baby (may be related to gestational diabetes)
- fetal growth restriction (increased recurrence)
- unexplained stillbirth (increased risk of gestational diabetes)

The method of delivery for any previous births must be recorded, as this can have implications for planning in the current pregnancy, particularly if there has been a previous caesarean section, difficult vaginal birth, postpartum haemorrhage or significant perineal trauma.

The shorthand for describing the number of previous pregnancies can be confusing:

- *gravidity* is the total number of pregnancies, regardless of how they ended
- *parity* is the number of live births or stillbirths, after 24 weeks. Note that miscarriages are denoted as a + (see below) and twins count as 2

Therefore, someone who has had six miscarriages with only one live baby born at 32 weeks and is pregnant again will be gravida 8, para 1 + 6.

In practice, when presenting a history, it is much easier to describe exactly what has happened; for example, 'JA is in their eighth pregnancy. They have had six miscarriages at gestations of 8–12 weeks and one spontaneous delivery of a live baby boy at 32 weeks. Baby Tom is now 2 years old and healthy.'

PAST GYNAECOLOGICAL HISTORY

EARLY PREGNANCY

In the first trimester, taking a detailed gynaecological history is important, particularly if scanning is not available and the LMP is being used to date the pregnancy. People with polycystic ovary syndrome can have very long menstrual cycles and may have ovulated much later in the cycle. Contraceptive history can also be relevant if conception has occurred soon after stopping the combined oral contraceptive pill or depot progesterone preparations, as, again, this makes dating by LMP more difficult. Also, some people will conceive with an intrauterine device still in situ. This carries an increased risk of miscarriage.

Previous episodes of pelvic inflammatory disease increase the risk of ectopic pregnancy. This is only of relevance in early pregnancy. However, it is important to establish that any infections have been adequately treated and that the partner was also treated. Chlamydia infection is common in teenagers and can cause problems if the baby is untreated.

Previous ectopic pregnancy increases the risk of recurrence from 1 in 100 pregnancies to 18 in 100. Those who have had an ectopic pregnancy should be offered an early ultrasound scan to establish the site of any future pregnancies.

RISK FACTORS FOR LATER PREGNANCY

The date of the last cervical smear should be noted. Every year, a small number of people are diagnosed as having cervical cancer in pregnancy. It is important that smears are not deferred in anyone at increased risk of cervical disease (e.g. previous cervical smear abnormality or very overdue smear). Gently taking a smear in the first trimester does not cause miscarriage and expectant parents should be reassured about this. If there has been irregular bleeding, the cervix should at least be examined to ensure that there are no obvious lesions present.

If someone has undergone treatment for cervical changes, this should be noted. Treatment to the cervix by knife cone biopsy or large loop excision of the transformation zone (LLETZ) can be associated with an increased risk of preterm birth, and depending on the depth of biopsy, measuring the cervical length in the second trimester may be recommended.

Recurrent miscarriage may be associated with a number of problems. Antiphospholipid syndrome increases the risk of further pregnancy loss, fetal growth restriction, pre-eclampsia and venous thromboembolism and patients need a great deal of support during pregnancy if they have experienced recurrent pregnancy losses.

Termination of pregnancy is a sensitive subject and, as first trimester terminations of pregnancy are not usually relevant to the pregnancy, information about such terminations must be sensitively requested and recorded. Some people do not wish this to be recorded in their hand-held notes. However, second-trimester terminations and

terminations for congenital abnormalities may be relevant, and a sensitive way to ask is 'Have you had any other pregnancies?' allowing for disclosure of previous pregnancies.

Previous gynaecological surgery should be asked about, especially if it involved the uterus, and the presence of pelvic masses such as ovarian cysts and fibroids should also be noted, as both of these issues may also pose problems during pregnancy and may have an impact on delivery. A history of endometriosis is also important to be aware of, because of the adhesions and scarring associated with that disease, which can make a caesarean section complicated.

Having a history of subfertility and fertility treatment may increase anxiety about pregnancy and birth and therefore should be noted if the couple wish. However, legally, you should only write down in notes that a pregnancy is conceived by in vitro fertilization (IVF) or donor egg or sperm if you have written permission from the parent. Generally, if the patient has told you themselves that the pregnancy was an assisted conception, it is reasonable to state that in your presentation.

MEDICAL AND SURGICAL HISTORY

All pre-existing medical disease should be carefully noted and any associated drug history also recorded. The major pre-existing diseases that have an impact on pregnancy and their potential effects are covered in **Chapter 10**.

Previous surgery should be noted. Occasionally, surgery has been performed for conditions that may continue to be a problem during pregnancy and at delivery, such as Crohn disease.

A history of mental health illness is important to record. These enquiries should be made in a sensitive way at the antenatal booking visit and should include the severity of the illness and whether they received consultant care. If someone has had children before, it is important to ask whether they had problems with depression or 'the blues' after the births of any of them. People with significant mental illness in pregnancy should be cared for by a multidisciplinary perinatal mental health team, including the midwife, general practitioner, hospital consultant and psychiatric team.

BOX 1.1: Major pre-existing diseases that have an impact on pregnancy

- Diabetes mellitus
- Hypertension
- Cardiac disease
- Epilepsy
- Renal disease
- Connective tissue diseases (e.g. systemic lupus erythematosus)
- Venous thromboembolic disease: increased risk during pregnancy
- Human immunodeficiency virus (HIV) infection

DRUG HISTORY

It is vital to establish what drugs have been taken, for which condition and for what duration during pregnancy. This includes over-the-counter medication and homeopathic/herbal remedies.

Pre-pregnancy counselling is advised for those with significant medical conditions and those who are taking potentially harmful drugs. In some cases, medication needs to be changed before pregnancy, if that is possible (e.g. anyone taking sodium valproate for epilepsy should be seen by a neurologist and counselled about changing to an alternative). Some people also need to know that they must continue their medication if they find out they are pregnant; for example, people with epilepsy often reduce or stop their medication for fear of potential fetal effects, with detriment to their own health. There are many instances in which there needs to be a discussion as to the pros and cons of taking medication in pregnancy; for example, someone with significant mental illness may be advised to continue medication, whereas someone with milder mental health issues may choose to stop medication pre-pregnancy after careful counselling.

The most important aspect here is that, once you have ascertained the drug history, you should give advice about the medication only if you have the knowledge and expertise to do so. The British National Formulary (BNF) does not give enough information to allow people to make an informed choice about the medication they take, but there are national organizations and websites that have much more information

Table 1.1 Organizations that offer advice on medicines during pregnancy and when breastfeeding

Type of information	Organization(s)
Evidence-based safety information about medication, vaccines, and chemical and radiological exposures in pregnancy	UK Teratology Information Service (UKTIS): https://uktis.org/ Best Use of Medicines in Pregnancy (BUMPS): https://www.medicinesinpregnancy.org/
Information about drugs/products and breastfeeding	UK Drugs in Lactation Advisory Service: http://www.midlandsmedicines.nhs.uk/content.asp?section=6&subsection=17&pageldx=1

or are happy to be contacted for queries about medication in pregnancy and when breastfeeding. No one must ever be told to stop medication or not breastfeed without checking the full facts. **Table 1.1** sets out organizations that offer advice on medicines during pregnancy and when breastfeeding.

FAMILY HISTORY

Family history is important if it can have:

- an impact on the health of the parent in pregnancy or afterwards
- implications for the fetus or baby

A family history of certain conditions is particularly significant, namely a maternal history of a first-degree relative (sibling or parent) with:

- diabetes (increased risk of gestational diabetes)
- thromboembolic disease (increased risk of thrombophilia, thrombosis)
- pre-eclampsia (increased risk of pre-eclampsia)
- serious mental health illness (increased risk of puerperal psychosis)

For both parents, it is important to know about any family history of babies with congenital abnormality and any potential genetic problems, such as haemoglobinopathies.

Finally, any known allergies should be recorded. If someone gives a history of allergy, it is important

to ask about how this was diagnosed and what sort of problems it causes.

OBSTETRIC EXAMINATION

In any clinical setting, attention to infection control is paramount. Arms should be bare from the elbow down and hands should always be washed or gel should be used before and after any patient contact. Before moving on to examine the patient, it is important to be aware of the clinical context. The examination should be directed at the presenting problem, if any, and the gestation. For instance, it is generally unnecessary to spend time defining the presentation at 24 weeks' gestation unless the presenting problem is threatened preterm labour.

MATERNAL WEIGHT AND HEIGHT

The measurement of weight and height at the initial examination is important, to identify people who are significantly underweight or overweight. Those with a body mass index (BMI: weight [kg]/height [m²]) of <20 are at higher risk of fetal growth restriction and increased perinatal mortality. In the obese (BMI >30), the risks of gestational diabetes, venous thromboembolism and pre-eclampsia are increased. Additionally, fetal assessment, by both palpation and ultrasound, is more difficult. Obesity is also associated with increased birthweight and a higher perinatal mortality rate. Those with morbid obesity require referral to specialized clinics, which include antenatal anaesthetic assessments to plan the possible use of regional anaesthesia.

In those of normal weight at booking and in whom nutrition is of no concern, there is no need to repeat weight measurement in pregnancy.

BLOOD PRESSURE MEASUREMENT

Blood pressure measurement is an important aspect of antenatal care. The first recording of blood pressure should be made as early as possible in pregnancy and thereafter it should be performed at every visit.

Hypertension diagnosed for the first time in early pregnancy (blood pressure >140/90 mmHg on two separate occasions at least 4 hours apart) should

prompt a search for underlying causes (e.g. renal or endocrine). Although 90% of cases will be due to chronic hypertension, this is a diagnosis of exclusion and can be confidently made only when other secondary causes have been excluded (see **Chapter 9**).

BOX 1.2: How to measure blood pressure in pregnancy

- Measure the blood pressure in a seated or semi-recumbent position.
- Use an appropriately sized cuff. Using one too small will overestimate blood pressure.
- If using an automated device, check it has been validated for use in pregnancy.
- Ensure that manual devices have been recently calibrated.
- Convention is to use Korotkoff V (i.e. disappearance of sounds), as this is more reproducible than Korotkoff IV.
- Deflate the cuff slowly so that you can record the blood pressure to the nearest 2 mmHg.
- Do not round up or down.

URINARY EXAMINATION

Early in pregnancy, all patients should be offered routine screening for asymptomatic bacteriuria by midstream urine culture. Identification and treatment of asymptomatic bacteriuria reduces the risk of pyelonephritis. The risk of ascending urinary tract infection in pregnancy is much higher than in the non-pregnant state. Acute pyelonephritis increases the risk of pregnancy loss/premature labour and is associated with considerable maternal morbidity.

At repeat visits, urinalysis using automated reagent strip readers should be performed. If there is proteinuria after 20 weeks, a thorough evaluation with regard to a diagnosis of pre-eclampsia should be undertaken.

GENERAL MEDICAL EXAMINATION

In those who are fit and healthy presenting for a routine visit, there is little benefit in a full formal physical examination. However, if a patient presents with a problem or is in certain at-risk groups, there may be a need to undertake a much more thorough physical examination.

CARDIOVASCULAR EXAMINATION

Routine auscultation for maternal heart sounds in those who are asymptomatic with no cardiac history is unnecessary. However, if someone has previously lived in an area where rheumatic heart disease is prevalent and/or has a known history of heart murmur or heart disease, a cardiovascular examination during pregnancy is indicated.

BREAST EXAMINATION

Formal breast examination is not necessary. Everyone should, however, be encouraged to perform self-examination at regular intervals.

EXAMINATION OF THE PREGNANT ABDOMEN

Always have a chaperone with you to perform this examination and, before starting, ask about pain and areas of tenderness.

In pregnancy, the abdomen should be examined in a semi-recumbent position to avoid aortocaval compression. The abdomen should be exposed from just below the breasts to the symphysis fundus.

Inspection

- Assess the shape of the uterus and note any asymmetry.
- Look for fetal movements.
- Note any signs of pregnancy such as striae gravidarum (stretch marks) or linea nigra (the faint brown line running from the umbilicus to the symphysis pubis).
- Look for scars. The common areas to find scars are:
 - suprapubic (caesarean section, laparotomy for ectopic pregnancy or ovarian masses)
 - sub-umbilical (laparoscopy)
 - right iliac fossa (appendicectomy)
 - right upper quadrant (cholecystectomy)

Palpation

The purpose of palpating the pregnant abdomen is to assess:

- the number of babies
- the size of the baby

- the lie of the baby
- the presentation of the baby
- whether the baby presenting part is engaged

Symphysis–fundal height measurement

Symphysis–fundal height (SFH) should be measured and recorded at each antenatal appointment from 24 weeks' gestation. Most UK hospitals now use customized SFH charts, which are generated at the first antenatal visit and are customized to each individual, taking into account the height, weight, ethnicity and parity (**Figure 1.4**). Using two standard deviations of the mean, it is possible to define the 10th and 90th centile values and these are normally marked on the chart.

Feel carefully for the top of the fundus and for the upper border of the symphysis pubis. The recommended method is using a tape measure with the centimetre marks face down, to place the tape measure at the top of the fundus and measure to the symphysis pubis (i.e. from the variable point to the fixed point). Turn the tape measure over and read the measurement. The fundal height approximates with the gestation so that, at 36 weeks, the fundal height should be approximately $36 \text{ cm} \pm 3 \text{ cm}$. However, customized growth charts are more sensitive and specific and serial measurements are of greater value in detecting growth trends than one-off measurements. It is therefore recommended that the measurement is plotted on a customized growth chart.

A large SFH raises the possibility of:

- a multiple pregnancy
- macrosomia
- polyhydramnios

A small SFH raises the possibility of:

- fetal growth restriction
- oligohydramnios

Fetal lie, presentation and engagement

After measuring the SFH, next palpate to count the number of fetal poles (**Figure 1.5**). A pole is a head or a bottom. If you can feel one or two, it is likely to be a singleton pregnancy. If you can feel three or four, a twin pregnancy is likely. Sometimes, large fibroids can mimic a fetal pole; remember this if there is a history of fibroids.

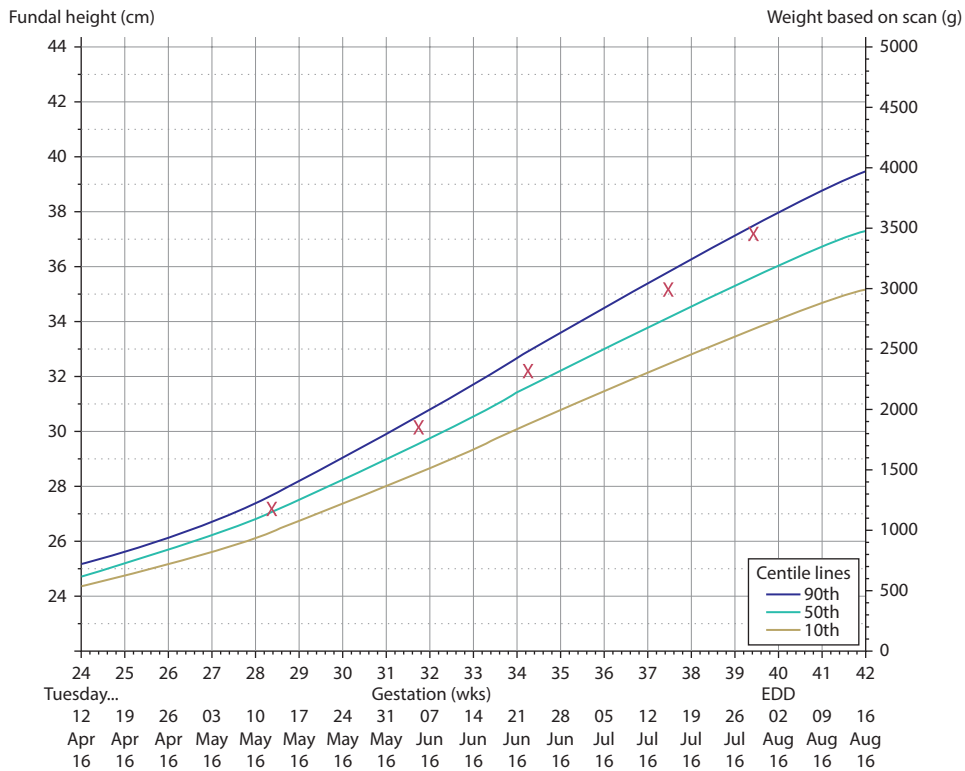


Figure 1.4 A customized symphysis–fundal height chart illustrating the 10th, 50th and 90th centiles and normal fetal growth. (Courtesy of Perinatal Institute.)

Determination of the fetal lie and presentation is of most importance in late pregnancy, as the likelihood of labour increases (i.e. after 36 weeks in an uncomplicated pregnancy). In addition, it is at this point in pregnancy that it is important to diagnose a breech presentation.



Figure 1.5 Palpation of the gravid abdomen.

If there is a pole over the pelvis, the lie is longitudinal regardless of whether the other pole is lying more to the left or right. An oblique lie is where the leading pole does not lie over the pelvis, but just to one side; a transverse lie is where the fetus lies directly across the abdomen.

Presentation can be either cephalic or breech. Using a two-handed approach and watching the face for pain or discomfort, gently feel for the presenting part. The head is generally much firmer than the bottom, although even in experienced hands it can sometimes be very difficult to tell. At the same time as feeling for the presenting part, assess whether it is engaged or not. If the whole head is palpable and it is easily movable, the head is likely to be ‘free’. This equates to five-fifths palpable and is recorded as 5/5. As the head descends into the pelvis, less can be felt. When the head is no longer movable, it has ‘engaged’ and only one- or two-fifths will be palpable (**Figure 1.6**). You will see

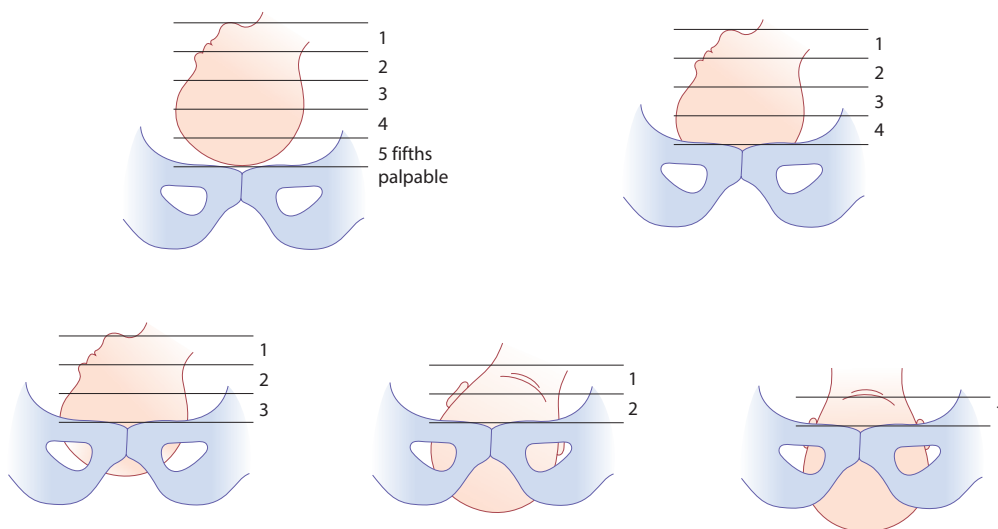


Figure 1.6 Palpation of the fetal head to assess engagement.

different methods from midwives and obstetricians of palpating the baby's head. There is no evidence that one technique is better or more uncomfortable than another and the most important aspect is to be considerate and watch for pain or discomfort while you are palpating.

Gentle palpation of the abdomen may reveal where the baby's back is (i.e. the side that feels fuller and smoother), as this will make auscultating the fetal heart beat easier, but don't worry if you can't. It takes a lot of experience.

Auscultation

If the fetus has been active during your examination and the mother reports that the baby is active, it is not necessary to auscultate the fetal heart. However, parents often like to hear their baby's heartbeat and nowadays most midwives and obstetricians use a hand-held Doppler device, which allows them to hear their baby's heartbeat. However, you may also see a Pinard stethoscope being used, particularly by community midwives. With both, place the device over where the fetal shoulder is likely to be (i.e. in a cephalic presentation, that would be halfway between the umbilicus and the anterior superior iliac spine on the side of the back). Hearing the heart sounds with a Pinard takes a lot of practise. If you cannot hear the fetal heart, never say that you cannot detect a heartbeat; instead, ask for help.

With twins, it is likely that a Doppler on a cardiograph (CTG) machine is necessary to be confident that both fetal hearts have been heard.

PELVIC EXAMINATION

Routine pelvic examination during antenatal visits is not necessary. However, there are circumstances in which a vaginal examination is necessary (in most cases, a speculum examination is all that is needed). These include:

- excessive or offensive discharge
- vaginal bleeding (in the known absence of a placenta praevia)
- to perform a cervical smear
- to confirm potential rupture of membranes
- to confirm and assess the extent of female genital mutilation (FGM) in those who have been subjected to this

Before commencing the examination, consent must be sought and a chaperone (nurse, midwife, etc.; never a relative) must be present (regardless of the gender of the examiner).

Assemble everything you will need (swabs, etc.) and ensure the light source works. Position the patient semi-recumbent with knees drawn up and ankles together. Ensure that the patient is adequately covered. If performing a speculum examination, a

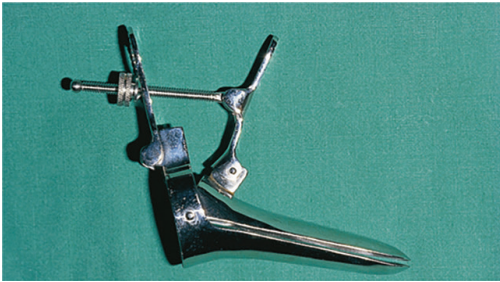


Figure 1.7 A Cusco speculum.

Cusco speculum is usually used (**Figure 1.7**). Select an appropriate size. Proceed as follows:

1. Wash your hands and put on a pair of gloves.
2. Use a plastic speculum.
3. Apply sterile lubricating gel or cream to the blades of the speculum. Do not use antiseptic cream if taking swabs for bacteriology.
4. Gently part the labia.
5. Introduce the speculum with the blades in the vertical plane.
6. As the speculum is gently introduced, aiming towards the sacral promontory (i.e. slightly downwards), rotate the speculum so that it comes to lie in the horizontal plane with the ratchet uppermost.
7. The blades can then slowly be opened until the cervix is visualized. Sometimes minor adjustments need to be made at this stage.
8. Assess the cervix and take any necessary samples.
9. Gently close the blades and remove the speculum, reversing the manoeuvres needed to insert it. Take care not to catch the vaginal epithelium when removing the speculum.

A digital examination may be performed when an assessment of the cervix is required. This can provide information about the consistency and effacement of the cervix that is not obtainable from a speculum examination.

The contraindications to digital examination are:

- known placenta praevia or vaginal bleeding when the placental site is unknown and the presenting part unengaged
- pre-labour rupture of the membranes (increased risk of ascending infection)

The patient should be positioned as before. Examining from the patient's right, two fingers of the gloved right hand are gently introduced into the vagina and advanced until the cervix is palpated. Prior to induction of labour, a full assessment of the Bishop's score can be made (see **Chapter 12**).

OTHER ASPECTS OF THE EXAMINATION

In anyone with suspected pre-eclampsia, the reflexes should be assessed. These are most easily checked at the ankle. The presence of more than three beats of clonus is pathological (see **Chapter 9**).

Oedema of the extremities affects 80% of term pregnancies and is not a good indicator for pre-eclampsia as it is so common. However, the presence of non-dependent oedema such as facial oedema should be noted.

KEY LEARNING POINTS

- Always introduce yourself and say who you are.
- Make sure you are wearing your identity badge.
- Wash your hands or use alcohol gel.
- Be courteous and gentle.
- Always ensure the patient is comfortable and warm.
- Always have a chaperone present when you examine patients.
- Explain what you are going to do and as you go along.
- Ask the patient to let you know if there is any discomfort.
- Tailor your history and examination to find the key information you need.
- Adapt to new findings as you go along.
- Present in a clear way.
- Be aware of giving sensitive information in a public setting.

PRESENTATION SKILLS

Part of the art of taking a history and performing an examination is being able to pass this information on to others in a clear and concise format. It is not necessary to give a full list of negative findings;

it is enough to summarize negatives, such as there is no important medical, surgical or family history of note. Adapt your style of presentation to meet the situation. A very concise presentation is needed for a busy ward round. In an examination, a full and thorough presentation may be required. Be very aware of giving sensitive information in a ward setting where other patients may be within hearing distance. The following template will prove useful for ensuring that you capture all the relevant history.

HISTORY TEMPLATE

DEMOGRAPHIC DETAILS

- Name
- Age
- Occupation
- Make a note of ethnic background

PREGNANCY SUMMARY

- Gestation and dates as calculated from ultrasound
- Gravidity/parity
- Whether singleton/multiple
- Presenting complaint or reason for attending

PRESENTING COMPLAINT

- Details of the presenting problem (if any) or reason for attendance (such as problems in a previous pregnancy).
- What action has been taken?
- Is there a plan for the rest of the pregnancy?
- What are the plans for birth, mode of birth and timing?
- What are the patient's main concerns?

CURRENT PREGNANCY

- Any other problems so far?
- Are they under consultant care? Ask why?
- Have they had additional tests?
- Have they been admitted to hospital for anything?

ULTRASOUND

- What scans have been performed? Were any problems identified?

PAST OBSTETRIC HISTORY

- List the previous pregnancies and their outcomes in order, including date, timing and mode of birth, and any complications for mum or baby

GYNAECOLOGICAL HISTORY

- Any gynaecological problems in the past?
- When was the last cervical smear? Was it normal? Have there ever been any that were abnormal? If yes, what treatment has been undertaken?
- Previous gynaecological surgery

PAST MEDICAL AND SURGICAL HISTORY

- Relevant medical problems
- Any previous operations: type of anaesthetic used, any complications

PSYCHIATRIC HISTORY

- Post-partum blues or depression
- Depression unrelated to pregnancy
- Major psychiatric illness

FAMILY HISTORY

- Diabetes, hypertension, genetic problems, psychiatric problems, etc.

SOCIAL HISTORY

- Smoking/alcohol/drugs
- Marital status
- Occupation, partner's occupation
- Who is available to help at home?
- Are there any housing problems?

DRUGS

- All medication including over-the-counter medication
- Folate supplementation

ALLERGIES

- To what?
- What problems do they cause?

FURTHER READING

- NICE (2012). *Antenatal Care*. Quality standard [QS22]. Last updated 14 February 2023. <http://www.nice.org.uk/guidance/qs22>.
- MBRRACE-UK. *Saving Lives, Improving Mothers' Care and Lessons Learned to Inform Maternity Care from the UK and Ireland*. <https://www.npeu.ox.ac.uk/mbrance-uk/reports>.

SELF-ASSESSMENT

For interactive SBAs and EMQs relating to this chapter, visit www.routledge.com/cw/mccarthy.

CASE HISTORY 1

Preconception counselling is an increasingly important part of obstetric care, as it provides obstetricians an opportunity to review patients prior to getting pregnant and provide advice on maximizing the chance of a successful pregnancy outcome.

Mrs Singh is originally from Pakistan and attends your preconception clinic, as she intends to conceive. She gives her history with the following key points:

- A** 10-year history of systemic lupus erythematosus
- B** previously on mycophenolate mofetil and cyclophosphamide
- C** last lupus flare was 1 month ago
- D** switched to azathioprine 1 month ago
- E** on an angiotensin-converting enzyme inhibitor
- F** creatinine 246 $\mu\text{mol/L}$, protein creatinine ratio 174 mg/mmol
- G** not using any contraceptives

Address each of these points by identifying the key risk and what influence this may have on pregnancy. Suggest an action point to potentially improve the outcome or address the issue.

ANSWERS

- A** Systemic lupus erythematosus is an autoimmune condition associated with increased risks of adverse pregnancy outcome including miscarriage, pre-eclampsia, growth restriction and stillbirth. The patient should be counselled regarding this.

Pregnancy increases the risk of flare-ups by 40–60%.

- B** Mycophenolate mofetil and cyclophosphamide are teratogenic and are contraindicated in pregnancy. If they have been used recently, appropriate time should be given to allow 'wash out'.
- C** The best chance of a good pregnancy outcome is related to stable/quiescent disease. Ideally, medical conditions should be stable for 6 months prior to conception with no changes to medications in this period.
- D** Azathioprine is safe to use in pregnancy, as the fetal liver lacks the enzyme that converts azathioprine to its active metabolites.
- E** Angiotensin-converting enzyme inhibitor is contraindicated in pregnancy and an alternative agent must be used. Consultation with a renal physician should occur.
- F** These levels indicate significant renal impairment, which increases the possibility of an adverse pregnancy outcome. Consultation with a renal physician should occur and optimization of medicine and renal function should occur prior to conception.
- G** Until optimal control of the systemic lupus erythematosus occurs, the patient should be advised not to become pregnant. All efforts should focus on making the systemic lupus erythematosus as stable as possible and improving the patient's renal function. This will maximize their chances of having as healthy a pregnancy as possible with minimal risks to their baby.

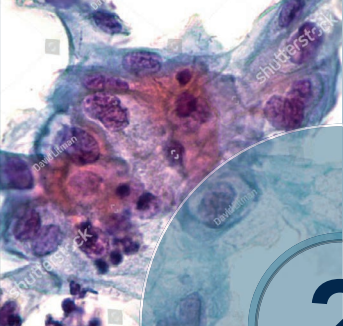
CASE HISTORY 2

Mrs O'Shea, a 41-year-old single woman from Ireland, attends your clinic for a booking visit. This is her second pregnancy and her first child is in foster care. She gives a history of alcohol and drug use and smokes 30 cigarettes daily. She also reports having an abusive partner.

Identify the key issues raised and prepare a plan for management during the pregnancy.

ANSWER

Mrs O'Shea is a very high-risk pregnancy with significant concerns for both herself and her baby's health. Firstly, a social work review should occur with the inclusion of child protection services. This should also address Mrs O'Shea's own safety due to her abusive partner. She should be counselled regarding drug and smoking cessation and offered support to assist her with this. She should be managed within a perinatal medicine high-risk clinic with a multidisciplinary input.



2

Antenatal care

FERGUS McCARTHY

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- Learning Objectives**
- Understand the principles of routine antenatal care.
 - Be aware of the rationale for, and purpose of, clinical investigations during each trimester.
 - Differentiate normal pregnancy symptoms from potential underlying pathology.

INTRODUCTION

Every year in England and Wales, approximately 700,000 babies are delivered. The majority of pregnancies occur in those who are healthy and low risk with no pre-existing medical problems and result in spontaneous vaginal deliveries. A minority will have pre-existing medical conditions that may be affected by pregnancy or may affect the course of pregnancy and require specialist input. The purpose of antenatal care is to optimize pregnancy outcomes by providing support and reassurance to those who are low risk and, by stratifying care, allowing those at high risk of adverse pregnancy events to receive specialized care in a timely manner.

This chapter provides information on best practice for baseline care of all pregnancies and comprehensive information on the antenatal care in the case of the uncomplicated singleton pregnancy. It provides evidence-based information on baseline

investigations that are performed and indications for referral to specialist care.

DEVELOPMENT OF ANTENATAL CARE

Modern maternity care has evolved over more than 100 years. Many of the changes have been driven by political and consumer pressure and a recognition of the need to align appropriate care to optimal outcomes. Antenatal care continues to evolve with the ongoing publication of good-quality research aimed at optimizing perinatal outcomes, but the scope and delivery of antenatal care varies widely across the globe, with maternal mortality rates varying substantially between low- and high-income countries. According to the World Health Organization (WHO), in 2020, globally there were approximately 800 maternal deaths a day from preventable causes

related to pregnancy and childbirth, meaning that someone dies as a result of pregnancy around every 2 minutes; 99% of all these maternal deaths occur in low-income countries.

HISTORY OF MATERNITY CARE IN THE UK

In 1929, the government in the UK released a document that set out a minimum standard for antenatal care that was so prescriptive in its recommendations that, until very recently, it was practised in many regions, despite the lack of research to demonstrate its effectiveness. The National Health Service Act 1946 came into effect on 5 July 1948 and created the NHS in England and Wales. The introduction of the NHS allowed maternity services to be available to all without cost. As part of these arrangements, a specified fee was paid to the general practitioner (GP) depending on whether they were on the obstetric list (undertaking pregnancy care). This encouraged a large number of GPs to take an interest in maternity care, reversing the previous trend to leave this work to midwives.

Antenatal care became perceived as beneficial, acceptable and available for all. This was reinforced by the finding that the perinatal death rate seemed to be inversely proportional to the number of antenatal visits. In 1963, the first perinatal mortality study showed that the perinatal mortality rate was lowest for those who attended between 10 and 24 times in pregnancy. This failed to take into account prematurity and poor education as reasons for decreased visits and increased mortality. However, antenatal care became established, and with increased professional contact came the drive to continue to improve outcomes, with an emphasis on decreasing maternal and perinatal mortality.

The development and introduction of ultrasound to antenatal care late in the 1960s had a considerable influence on antenatal care, initially limited to confirming multifetal pregnancies, but later being used increasingly for the detection of fetal anomalies. This new intervention became quickly established, but limited evidence exists supporting its routine regular use. The move towards hospital deliveries began in the early 1950s. At this time, with limited hospital maternity facilities, one in three were planned home

deliveries. The Cranbrook Report in 1959 recommended that there be sufficient hospital maternity beds for 70% of all deliveries to take place in hospital, and the subsequent Peel Report (1970) recommended that a bed should be available for every woman to deliver in hospital if she so wished.

Obstetricians were not alone in the movement towards hospital deliveries. Parents themselves were pushing to at least be allowed the choice to deliver in hospital. By 1972, only 1 in 10 deliveries were planned for home, and the publication of the Short Report (1980) from the Social Services Committee led to further centralization of hospital delivery. It made a number of recommendations. Among these were the following:

- An increasing number of births should occur in large units; assessment of pregnancy should be improved for smaller consultant units and isolated GP units and home deliveries should be phased out further.
- It should be mandatory that all those who are pregnant should be seen at least twice by a consultant obstetrician – preferably as soon as possible after the first visit to the GP in early pregnancy and again in late pregnancy.

This and subsequent reports – including UK government reports in 1982, 1984 and 1985, *Birth to Five* (Department of Health, 2005) and the *2012/13 Choice Framework* (Department of Health, 2012) – led to a policy of increasing centralization of units for delivery and, consequently, maternity care.

The gradual decline in maternal and perinatal mortality was thought to be due in greater part to hospital deliveries, although proof of this was lacking. Indeed, the decline in perinatal mortality was least in those years when hospitalization increased the most. As other new interventions became available and were increasingly used, such as continuous fetal monitoring and induction of labour, a change in practice began to establish these as the norm for most births, without robust evaluation of their impact through randomized controlled trials or other high-quality research methodology. In England and Wales between 1966 and 1974, the induction rate rose from 12.7% to 38.9%. During the 1980s, with increasing consumer awareness, the unquestioning acceptance

of unproven technologies was challenged. Groups such as the National Childbirth Trust began to question not only the need for any intervention but also the need to come to the hospital at all. The professional bodies also began to question the effectiveness of antenatal care.

The government set up an expert committee to review policy on maternity care and to make recommendations. This committee published the report *Changing Childbirth* (Department of Health, Report of the Expert Maternity Group, 1993), which provided purchasers and providers with a number of action points aiming to improve choice, information and continuity of care for everyone during pregnancy. It outlined a number of indicators of success to be achieved within 5 years:

- the carriage of hand-held notes in pregnancy
- midwifery-led care in 30% of pregnancies
- a known midwife at delivery in 75% of cases
- a reduction in the number of antenatal visits for those with low-risk pregnancies

This landmark report provided a new impetus to examine the provision of maternity care in the UK and enshrined choice as a concept in maternity care.

More recently, government publications on maternity care such as *Maternity Matters* (2007) have aimed to address inequalities in maternity care provision and uptake; this publication enables commissioners to assess maternity care in their area and to ensure that safe and effective care is available to all pregnant women. Antenatal and postnatal care now centres on increased choice and empowerment of couples, including birth at home or in a stand-alone midwifery unit. The most recent *National Maternity Review* report (2016) led to the introduction of the Maternity Transformation Programme, which emphasizes the following principles:

- personalized woman-centred care
- continuity of carer
- better postnatal and perinatal mental health care
- a fairer payment system for different types of care
- safer care, with multi-professional working and training, and measurement of performance using routinely collected data

Despite the call for safer, personalized care, in 2017 the discovery of a large series of adverse outcomes at one NHS Trust in England led to bereaved parents to call for a public inquiry. The final report of the Ockenden review, commissioned by the Secretary of State of Health, was published in 2022. One of the main findings was that patient safety was often overlooked in the pursuit of a vaginal birth and that the affected hospital failed to learn from repeated adverse outcomes. The report also included wide-ranging recommendations for maternity services across England, including standards around workforce planning, staffing, multidisciplinary training and learning from adverse outcomes.

OVERVIEW OF ANTENATAL CARE

The aims of antenatal care are to:

- optimize pregnancy outcomes for parents and babies
- prevent, detect and manage those factors that adversely affect the health of the pregnant woman and baby
- provide advice, reassurance, education and support for the pregnant woman and their family
- deal with the 'minor ailments' of pregnancy
- provide general health screening

Antenatal care aims to make the pregnant woman the focus. They should be treated with kindness and dignity at all times, and due respect given to personal, cultural and religious beliefs. Services should be readily accessible and there should be continuity of care. There is a need for high-quality, culturally appropriate, verbal and written information on which women can base their choices through a truly informed decision-making process that is led by them.

In the UK and many countries worldwide, maternity care is provided by a community-based team of midwives and family practitioners (such as GPs), a hospital consultant team or a combination of the two. In the case of a complex pregnancy, a hospital-based obstetric team leads the antenatal care and