Antenatal Care

The purpose of antenatal care is to optimize pregnancy outcomes for women and their babies through providing support and reassurance to low-risk women and by stratifying care, allowing those at high risk of adverse pregnancy events to receive specialized care in a timely manner.

Routine antenatal care describes the standard schedule of appointments, investigations and interventions offered to all pregnant women from healthcare services.

Antenatal care aims to identify risk factors for the development of complications in pregnancy and birth, prevent or treat these complications if they occur, and offer screening for specific pathologies in both the woman and the baby.

Pregnancy is a unique physiological state which may be associated with complications due to pre-existing medical conditions and gestation-specific conditions arising in otherwise healthy women.

The pattern of care – with monthly visits to an antenatal clinic until 32 weeks' gestation, fortnightly until 36 weeks and weekly until birth – has changed only marginally to the current recommended schedule of appointments

Women in their first pregnancy, with no complications arising, should receive ten appointments and those in subsequent pregnancies require seven appointments.

The aims of antenatal care are to:

1● provide high-quality information that can be easily understood;

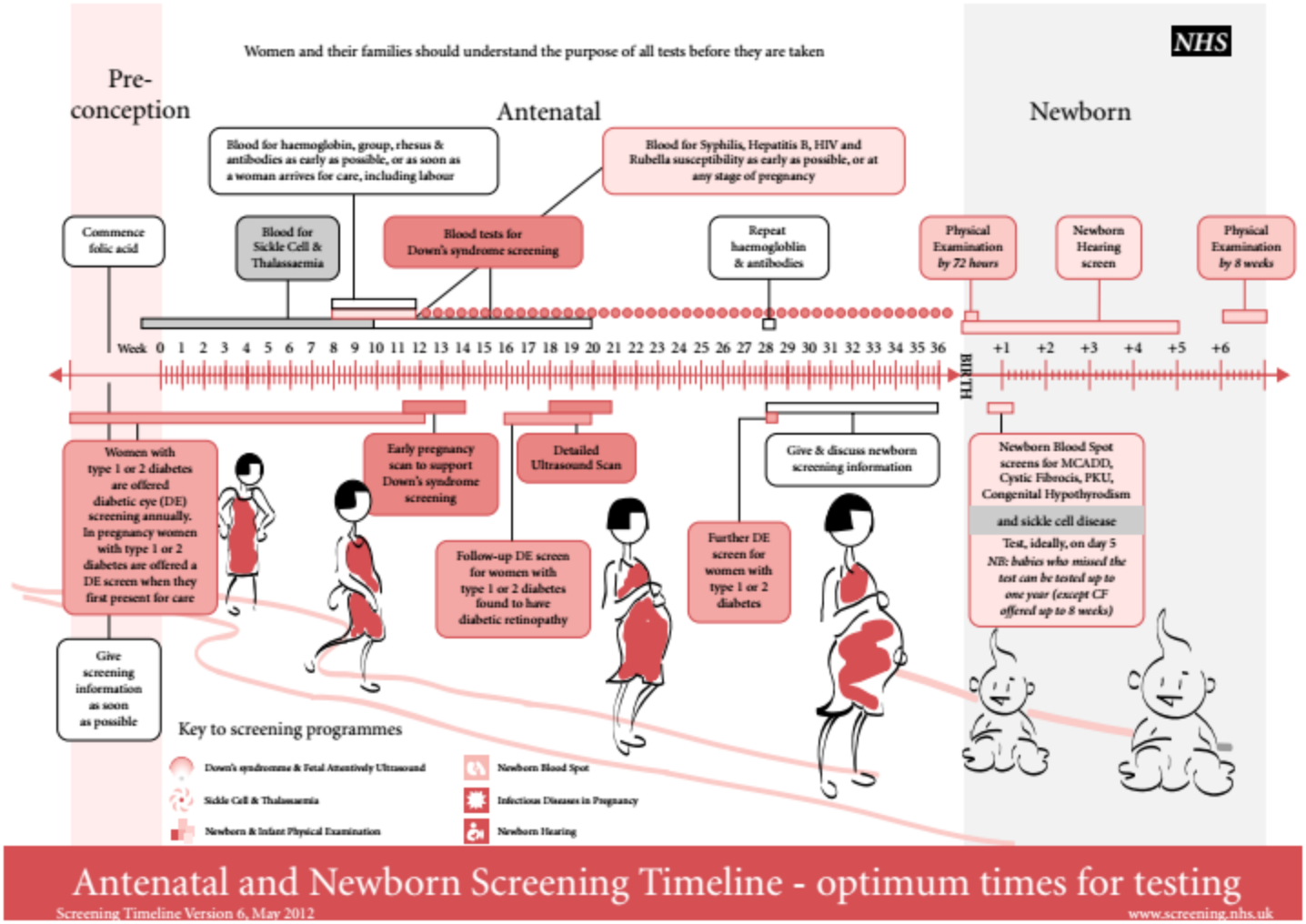
2● provide an informed choice about the pathways of antenatal care;

3● offer evidence-based treatment options for medical conditions pre-existing or arising in pregnancy;

4● identify and screen for maternal and fetal complications;

5● assess maternal and fetal wellbeing throughout pregnancy;

6● provide advice and education on the normal symptoms of pregnancy.



Antenatal and Newborn Screening Timeline - optimum times for testing

Screening Timeline Version 6, May 2012

www.screening.nhs.uk

Confirmation of pregnancy:

- The **symptoms** of pregnancy (breast tenderness,nausea, amenorrhoea, urinary frequency) **combined with a positive urinary or serum pregnancy test** are usually sufficient confirmation of a pregnancy, and an internal examination to assess uterine size is usually not necessary.

All pregnant women should be offered a ‘dating scan’, which both confirms the pregnancy and accurately dates it.

It may be possible to hear the fetal heart with the Doppler ultrasound from approximately 12 weeks onwards

A pregnancy can be dated either by using the date of the first day of the last menstrual period (LMP) or, more accurately, by ultrasound scan.

Menstrual EDD

- EDD(expected date of delivery) can be calculated from the first day of the last menstrual period. However, this method assumes a 28-day menstrual cycle, ovulation on day 14 of this cycle, and an accurate recollection by the woman of her LMP.

- In reality, the timing of ovulation is variable within a cycle andmost women do not have a period every 28 day Furthermore, many studies have shown poor recollection of the LMP.

Dating by ultrasound

For these reasons, dating by an ultrasound scan in thefirst or early second trimester is generally considereto be more accurate, especially if there is menstrual irregularity or uncertainty regarding the LMPز

National recommendations state that all women should be offered a dating scan, ideally between 10and 14 weeks, and that the EDD predicted by this scan should be used in preference to the menstrual EDD.

Benefits of a dating scan

1. Accurate dating in women with irregular menstrual cycles or poor recollection of LMP.
2. Reduced incidence of induction of labour for 'prolonged pregnancy' .
3. Maximizing the potential for serum screening to detect fetal abnormalities.
4. Early detection of multiple pregnancies.
5. Detection of otherwise asymptomatic failed intrauterine pregnancies

Booking visit:

A comprehensive history should be elicited and a full physical examination undertaken

- Risk factors from past history should be highlighted.
- It is essential to obtain past obstetric notes if it is thought that this information may change the management.
- History of inheritable diseases in close relatives should be sought, and history of migration and travel may identify risk for diseases such as haemoglobinopathies, some forms of hepatitis, and HIV infection.

Booking visit cont:

This antenatal appointment should occur ideally between 10 and 12 weeks' gestation and should include:

1● Gestational age assessment with ultrasound scan offered between 11+0 weeks and 13+6 weeks, to determine gestational age, detect multiple pregnancies and offer nuchal translucency (NT) measurement for screening;

2● Assessment of maternal and obstetric risk factors to identify women who may require additional antenatal care;

3● Ask about any past or present severe mental illness or psychiatric treatment;

4● Ask about the woman's occupation, to identify potential risks;

5● Plan lead care professional (midwife or obstetrician);

6● Plan pattern of care for pregnancy;

7● Discussion on antenatal screening;

8● Measure height and weight and calculate BMI.

9● Measure blood pressure and test urine for proteinuria;

10● Information on how the baby develops during pregnancy, nutrition, diet (including vitamin D supplements if necessary) and exercise;

11● Monitor smoking status and offer smoking cessation advice and information on the specific risks of smoking during pregnancy (such as low birthweight and preterm birth);

12● Information on pregnancy care pathway including parent education and infant feeding;

13● Information on options for place of birth and different modes of birth.

Booking investigations

1.*Full blood count*

A full blood count is a screen for anaemia and thrombocytopenia, both of which may require further investigation.

Anaemia in pregnancy is most frequently caused by iron deficiency; however, awide variety of other causes must be considered,especially if the haemoglobin value is below 9.0 g/dL.

A haemoglobin level of 11 g/dL or more is considered normal early in pregnancy, with the upper limit of the 'normal range' dropping to 10.5 g/dL by28 weeks gestation.

Routine iron supplements are not recommended unless the Hb falls below these values and tests suggest iron deficiency.

A full blood count is normally repeated at 28 weeks gestation

2.Blood group and red cell antibodies

Recording the blood group at this point will help with cross -matching blood at a later date if an emergency arises.

Women found to be rhesus D negative will be offered prophylactic anti-D administration to prevent rhesus D iso-immunization and haemolytic disease of the fetus and newborn in future pregnancies.

Prophylactic anti-D is either given as a single dose at 28 weeks gestation, or in divided doses at 28 and34 weeks.

Other possible isoimmunizing events, such as threatened miscarriage after 12 weeks gestation, antepartum haemorrhage and delivery of the baby will require additional anti-D prophylaxis in rhesusD-negative women.

Other red cell antibodies may also cause fetal and neonatal haemolysis, and problems with blood cross-matching in the event of maternal haemorrhage.

These atypical red cell antibodies most commonly arise from previous blood transfusions

Screening tests for these antibodies are performed for a second time in all women at 28 weeks gestation.

3.Urinalysis

A midstream urine sample should be s ent early in pregnancy to detect asymptomatic bacteriuria,which is common in pregnancy.

Treating otherwise unidentified urinary infections reduces the chances of developing pyelonephritis.

4.Rubella

Vertical transmission of rubella from a mother to her fetus carries a high risk of causing serious congenital abnormalities, especially in the first trimester.

Women who are found to be rubella non-immune should be strongly advised to avoid infectious contacts and should undergo rubella immunization after the current pregnancy to protect their future pregnancies.

The theoretical risk of viral reactivation from the vaccine means it should not be given during pregnancy, and pregnancy should be avoided for the three months following immunization.

A history of previous immunization is not a guarantee ofpermanent immunity

5.Hepatitis B

The presence of antibodies to the hepatitis B surface antigen represents immunity resulting either from previous infection or from immunization and should not cause concern.

The presence of the surface antigen itself, or the ‘e’ antigen, represents either a recent infection or carrier status. Vertical transmission to the fetus may occur, mostly during labour, and horizontal transmission to maternity staff or the newborn infant can follow contact with bodily fluids. Immunization of the baby after birth minimizes the transmission risk.

All babies born to hepatitis B carriers should be actively immunized (vaccination) and those born to women who are highly infective should also receive passive immunization with hepatitis B immunoglobulin (HBIG)

6.Human immunodeficiency virus

Without screening, less than half of all pregnant women infected with human immunodeficiency virus (HIV) are aware of their status.

In known HIV-positive mothers, the use of antiretroviral agents, elective Caesarean section and avoidance of breastfeeding may reduce the vertical transmission rate from approximately 30 per cent to less than 1 per cent.

Knowledge of HIV infection is therefore vital if the offspring are to be protected. Screening only those women at high risk of HIV infection (e.g. intravenous drug abusers, recent immigrants from central Africa) misses a significant number of cases.

7.Syphilis

The incidence of syphilis has been rising over the last ten years. It can be vertically transmitted to the fetus, with serious consequences.
This transmission can be prevented simply by treatment of the mother with antibiotics, and screening in pregnancy can be justified.

Serological screening tests for syphilis are notorious for giving false positive results. Other treponemal infections (endemic in some countries) and a variety of other medical conditions may give positive results in the absence of syphilis.

Women who have been successfully treated in the past may still have positive serology. Interpretation of positive screening results requires specialist skills,and genitourinary medicine teams are usually consulted.

8.Haemoglobin studies

All women should be offered screening for haemoglobinopathies.

The thalassaemias and sicklecell diseases are carried in an autosomal recessive fashion and the partner of a carrier, or fully affected woman, should also be offered carrier testing.

If both the woman and the father of the baby are found to be carriers there is a one in four risk that the pregnancy will be affected by the full condition.

Prenatal genetic tests following chorionic villus sampling (CVS) or amniocentesis can usually definitively diagnose or exclude the condition in the fetus.

In areas where the prevalence of these conditions is low, screening is performed using the Family Origin Questionnaire and a routine full blood count.

Women from the Eastern Mediterranean, India, West Indies, South-East Asia and the Middle East are at greatest risk.

If the questionnaire indicates a high risk of thalassaemia or sickle-cell disease, or if the mean corpuscular haemoglobin is low, then formal laboratory screening with liquid chromatography should be carried out.

9.Other routine booking investigations

At the current time, the evidence base does not support routine screening for bacterial vaginosis, cytomegalovirus, toxoplasmosis, hepatitis C or group B streptococcus colonization.

Cervical smears and vaginal swabs are not routinely taken at the booking visit.

However,smears should be performed during pregnancy on women with an abnormal cervix on examination or those who are overdue for a smear and are likely to default in the post-natal period.

The request form should state clearly that the woman is pregnant, as this will affect interpretation of the cytology

Table 2.2 Summary of booking investigations

Investigation	Indication
FBC	Haemoglobin, platelet count, mean cell volume
MSU	Asymptomatic bacteriuria
Blood group and antibody screen	Rhesus status and atypical antibodies
Haemoglobinopathy screening	Screening is based on the FOQ and blood test results
Infection screen	Hepatitis B, syphilis, HIV, (and rubella status)
Dating scan and first trimester screening	Accurate pregnancy dating with provision of risk assessment for trisomy 21, 18 and 13 and identification of major congenital anomalies

FBC, full blood count; FOQ, Family Origin Questionnaire; HIV, human immunodeficiency virus; MSU, mid-stream urine.

Supplements and lifestyle advice

Folic acid and other vitamins

Folic acid is the only vitamin supplement that is recommended for use
before pregnancy and up to 12wks gestation for women who are otherwise eating a healthy balanced diet.

Recommended doses of folic acid

- 400micrograms/day folic acid has been shown to reduce the occurrence of neural tube defects.
- For women at higher risk (e.g. previous affected child, women with
epilepsy, diabetes, and obesity), a dose of 5mg/day is recommended

Iron

- Routine supplementation is not necessary and should be only prescribed when medically indicated. However, it may be considered routine in areas where incidence of iron-deficiency anaemia is high.

- The amount of elemental iron in an adult female is 5g. She will need 1mg/day before menstrual age, 2mg/day during reproductive age, and 3mg/day during pregnancy

Calcium

Supplementation may be necessary if intake of calcium is low; however,
the ideal is increased calcium by dietary intake.

Iodine

Deficiency is endemic in some parts of the world, and can cause cretinism
and neonatal hypothyroidism.
Supplementation with iodinized salt or oil should be considered.

Zinc

Low serum levels have been associated with an increased risk of preterm labour and growth restriction, but increased intake from dietary sources, such as milk and dairy products, should be sufficient.

Vitamin A supplementation (intake >700micrograms/day) might be teratogenic and should be avoided, as should consumption of productshigh in vitamin A, such as liver and pate.

Vitamin D deficiency :

is common in pregnant women from certain high risk groups.

Vitamin D supplements are found in multivitamin preparations designed for pregnancy, and women should be encouraged to take these, particularly if they have risk factors for defi ciency

Table 5.1 Recommended schedule of antenatal visits (NICE Clinical Guideline 62)

Visit	Purpose	Primips	Multips
Initial contact	Information giving, including folic acid supplementation, food hygiene Lifestyle issues and screening tests offered	•	•
Booking (by 10w)	Extensive information giving Identification of women needing additional care Offer screening tests Offer dating scan, Down's syndrome (DS) screening and detailed scan Calculate BMI, measure BP, test urine	•	•
Dating scan (10–14w)	To accurately determine gestational age, finalize EDD and to detect multiple pregnancies	•	•
16w	Review test results. Offer quadruple test if not yet screened for DS Provide information with focus on the detailed scan BP/urine dip	•	•
18–20w	Ultrasound for structural anomalies	•	•
25w	Information giving, BP/urine dip/symphysiofundal height measurement (SFH)	•	
28w	Information giving, BP/urine dip/SFH Second screen for anaemia and red cell antibodies Anti-D prophylaxis for RhD-negative women	•	•
31w	Information giving, BP/urine dip/SFH	•	
34w	Provide information with a focus on labour and birth BP/urine dip/SFH 2nd dose of prophylactic anti-D (depending on local dosage schedule)	•	•
36w	Provide information with a focus on breastfeeding, Vitamin K for the newborn, care of the baby, post-natal issues Palpation for fetal presentation BP/urine dip/SFH	•	•
38w	Provide information with a focus on prolonged pregnancy Palpation for fetal presentation BP/urine dip/SFH	•	•
40w	Provide further information with a focus on prolonged pregnancy Palpation for fetal presentation BP/urine dip/SFH	•	
41w	Offer membrane sweep and formal induction of labour Palpation for fetal presentation BP/urine dip/SFH	•	•

Screening for fetal abnormalities

This is a routine aspect of antenatal care, offered to all women in some form or another.

Initial discussion of these screening tests usually occurs at the booking visit to establish the wishes of the couple. Provision of high-quality unbiased information is critical at this point so that women and their partners can make an informed choice.

These tests are not mandatory, and many choose not to have them

The tests themselves are carried out between 11 and 22 week s gestation and include:

- screening for Down's syndrome.. Essentially they include a nuchal translucency scan at 11–14 weeks gestation, with or without biochemical tests, or biochemical blood tests in isolation at 15–20 weeks;

- screening for neural tube defects (e.g. spina bifida, anence phaly) with maternal serum alphafetoprotein levels at 15–20 weeks gestation.
- This blood test has been mostly superseded by routine detailed structural scanning at 18–20 weeks and is likely to become obsolete in the near future;

screening for structural congenital abnormalities

- by ultrasound examination at 18 to 20weeks.

Screening for clinical conditions later in pregnancy

All women should be assessed at booking for risk factors for gestational diabetes.

If risk factors are present, the woman should be offered a 2-hour75 g oral glucose tolerance test (OGTT) at 24–28 weeks gestation. It is imperative that the woman is informed why these tests have been recommended, and what the implications of a positive screening result would be. A previous history of gestational diabetes should prompt glucose monitoring, or an OGTT, at 16–18 weeks. If these results are normal, the test should be repeated at 24–28 weeks

Risk factors for screening for gestational diabetes

- BMI above 30 kg/m2.
- Previous baby weighing 4.5 kg, or above.
- Previous gestational diabetes.
- First-degree r elative with diabetes.
- Family o rigin from high prevalence area (South Asian,blac k Caribbean and Middle Easter

Pre-eclampsia and preterm birth

- All women should be screened at every antenatal visit for pre-eclampsia by measurement of blood pressure and urinalysis for protein.

- Extra antenatal visits,above the minimum schedule, will be indicated for women with risk factors for pre-eclampsia elicited by the booking history and examination, or for women who have a rise in blood pressure above certain limits, or those who develop proteinuria or symptoms

suggestive of pre-eclampsia. Other screening tests for pre-eclampsia, based on blood tests or ultrasound scanning, are not recommended for routine antenatalcare.

Women without a history of preterm birth should not be routinely offered screening tests for preterm labour, such as bacterial swabs, or cervical length scans

Fetal growth and well-being

- Symphysis-fundal height measurements should be performed wit h a tape-measure at every antenatal appointment from 25 weeks gestation and the values plotted on a centile chart, ideally customized to the woman herself.

- Concerns that fetal growth may be slow, or has stopped altogether, should be addressed by ultrasound scanning

- routine growth scans are not recommended in the absence of specific risk factors, and the evidence base does not support their use if the uterus is felt to be large-for-dates, unless there are concerns about polyhydramnios.

- Women should not be advised to routinely count fetal movements in normal pregnancies, however, further fetal assessment is indicated if the woman perceives a reduction in movements

It is still common practice
to listen to the fetal heart at each antenatal visit in the second and third trimester, either with a Pinnard stethoscope or Doppler ultrasound.