# Antenatal examinations and diagnosis of pregnancy

See also the separate Antenatal Care, Antenatal Screening for Down's Syndrome and Prenatal Diagnosis articles. This article cannot cover all areas of clinical practice associated with the proper care of pregnant women but gives an overview of important areas, based on the latest guidance. The National Institute for Health and Care Excellence (NICE) provides full advice on the routine care of healthy pregnant women [1] .

## Diagnosis of pregnancy and calculation of gestational age [1] [2]

### Pregnancy diagnosis

- Diagnosis of pregnancy is best confirmed using a urine-testing kit that determines the presence of beta human chorionic gonadotrophin (beta-hCG) and many women will use this method to confirm their pregnancy.
- Where the absence of menses is the only current indicator of early pregnancy, it is important to confirm pregnancy using a testing kit.

### Calculation of gestational age

- An early ultrasound scan should be offered at 11-14 weeks, to determine gestational age and detect multiple pregnancies. It may also be part of the screening for fetal anomalies when the nuchal translucency is measured. Accurate gestational age assessment helps optimal antenatal care by, for example, reducing the need for induction of labour at >41 weeks.
- Crown-rump length is the best surrogate measure of gestational age in the first trimester.

- Pregnant women who present at or beyond 14 weeks of gestation should be offered an ultrasound scan to estimate gestational age, using head circumference or biparietal diameter. If the crown-rump length is above 84 mm, the gestational age should also be estimated using head circumference or biparietal diameter. By the second or third trimester, multiple parameters may be used, including biparietal diameter, head and abdominal circumference and femur length.

## Frequency and number of antenatal assessments in uncomplicated pregnancies[1]

- Nulliparous patients with uncomplicated pregnancies should be seen over a schedule of ten appointments.
- Parous women with uncomplicated pregnancies should be seen over a schedule of seven appointments.

## The first antenatal appointment[1]

NICE recommends that the first antenatal appointment take place early in pregnancy (before 12 weeks) and that it may need to be booked as a double appointment due to the large amount of information and assessments that are required. Information must be imparted in a way the woman can understand and backed up with written information, so she is in a position to make informed choices regarding options and care in her pregnancy.

Information and advice which should be covered in the first appointment is detailed in the separate Antenatal Care article.

Examination routinely done at the first appointment includes:

- Measurement of weight and height in order to determine body mass index (BMI).
- Measurement of baseline blood pressure (BP).
- Testing of urine for glycosuria/proteinuria.

## Pelvic examination

Routine antenatal pelvic examination is not recommended as it does not accurately assess gestational age, nor does it accurately predict preterm birth or cephalopelvic disproportion.

## Breast examination

Routine breast examination is also not recommended.

## Weight[1]

The patient should be weighed at booking and her height measured so that BMI can be calculated as weight in kilograms/(height in metres)$^2$. This can be used as a baseline for future weighing where it is clinically indicated.

Routine weighing at antenatal appointments is no longer recommended unless there is a clinical indication.

## Urine testing[1] [3]

- Test for asymptomatic bacteriuria early in pregnancy using dipstick testing; send midstream specimen of urine (MSU) if indirect test is positive.
- Test for proteinuria at each antenatal appointment (along with BP as part of regular surveillance for pre-eclampsia).
- Check for glycosuria at every visit; if there is glycosuria of more than 2+ on one occasion, or 1+ on two or more occasions, test further to exclude gestational diabetes. An oral two-hour glucose tolerance test is normally used. See the separate Glucose Tolerance Tests and Gestational Diabetes articles.

## Blood pressure[1]

- Measure BP at booking and at every subsequent appointment.

- More frequent BP measurements should be performed in women with any risk factors for pre-eclampsia (determined at booking):
    - Age >40.
    - Nulliparous
    - Family history.
    - Previous history of pre-eclampsia.
    - BMI ≥35 at presentation.
    - Multiple pregnancy.
    - Pregnancy interval of more than 10 years.
    - Vascular disease - eg, hypertension.
    - Renal disease.
    - Diabetes mellitus.

Schedule further appointments accordingly to allow appropriate monitoring of BP. Where it is raised, NICE advises that:

- A single diastolic blood pressure of 110 mm Hg or two consecutive readings of 90 mm Hg at least four hours apart and/or significant proteinuria (1+) should prompt increased surveillance.
- If the systolic blood pressure is above 160 mm Hg on two consecutive readings at least four hours apart, treatment should be considered.

## Abdominal examination [1]

- From 24 weeks, symphysis-fundal height should be measured and recorded at each appointment. If a fetus appears to be small or large for gestational age, this can be further assessed by ultrasound.
- After 36 weeks, palpate the abdomen for possible malpresentation and confirm with an ultrasound scan if suspected.

NICE does NOT recommend:

- Routine fetal auscultation by Pinard or Doppler in low-risk pregnancies, although this may be done if it is reassuring to women and requested. It is also required if there is clinical need, to help confirm the fetus is alive.
- Routine fetal movement counting by pregnant women.

## Ultrasound

Offer an ultrasound examination:

- Early in pregnancy (at 10-14 weeks) to:
  - Determine gestational age.
  - Detect multiple pregnancies.
  - Be part of the screening process for Down's syndrome and other chromosomal anomalies. (Nuchal translucency measured if screening desired.)
- At 18-20 weeks, for congenital and structural anomalies - eg, cardiac, neural tube defects, renal abnormalities.
- If the placenta is over the cervical os, offer a scan at 32 weeks, for placenta praevia.
- If abnormalities are detected on clinical examination, such as malpresentation or being small or large for gestational age, or polyhydramnios is suspected.

## Criteria for more specialised care[4]

The triennial confidential report of maternal and child health identifies many high-risk scenarios in pregnancy. There is a more than four-fold difference in maternal mortality rates amongst women from Black ethnic backgrounds and an almost two-fold difference amongst women from Asian ethnic backgrounds compared to white women,

Cardiac disease remains the largest single cause of maternal deaths. Neurological causes (epilepsy and stroke) are the second most common cause of maternal death.

There was a statistically non-significant decrease in maternal death rates from direct causes between 2014-16 and 2017-19. Thrombosis and thromboembolism remain the leading causes of direct maternal death during or up to six weeks after the end of pregnancy. 8% of the women who died during or up to a year after pregnancy in the UK in 2016-18 were at severe and multiple disadvantage. The main elements of multiple disadvantage were a mental health diagnosis, substance use and domestic abuse.

Women with pre-existing medical morbidity should be seen in coordinated multidisciplinary medical and obstetric clinics. Although the following list is not exhaustive, these conditions can be associated with more adverse outcomes and warrant specialist opinion:

- Cardiac disease, including hypertension.
- Renal disease.
- Diabetes treated with insulin, or any other endocrinological disorder.
- Treated psychiatric disorder.
- Haematological disease including propensity to thromboembolism and autoimmune disorder, such as antiphospholipid syndrome.
- Epilepsy requiring anticonvulsant therapy.
- Any current or recently treated malignant disease.
- Significant respiratory impairment, including severe asthma.
- Problematic alcohol use.
- Regular/problematic use of recreational drugs such as heroin, cocaine, crack, ecstasy, etc.
- Chronic viral infections - eg, HIV, hepatitis B virus (HBV), hepatitis C virus (HCV).
- Autoimmune disorders.
- Previous uterine surgery including caesarean section, myomectomy or cone biopsy.
- BMI <18 or >30 $kg/m^2$.

- Women at higher risk of complications during pregnancy (eg, older than 40 years), smokers, very young mothers, and those without social support.
- Problems associated with previous pregnancies:
    - Recurrent miscarriage (>3 consecutive pregnancy losses or a mid-trimester loss).
    - Preterm birth.
    - Severe pre-eclampsia, HELLP syndrome (**H**aemolysis, **EL** (elevated liver) enzymes, **LP** (low platelet) count), or eclampsia.
    - Rhesus isoimmunisation or other significant blood group autoantibodies.
    - Previous antepartum haemorrhage or postpartum haemorrhage on two occasions.
    - Retained placenta on two occasions.
    - Puerperal psychosis.
    - Grand multiparity (>6 children).
    - Previous stillbirth or neonatal death.
    - Small-for-gestational-age infant (<5th centile).
    - Large-for-gestational-age infant (>95th centile).
    - Baby weighing <2.5 kg or >4.5 kg.
    - Baby with a structural or chromosomal anomaly.

## Further reading


- Fernandez Turienzo C, Sandall J, Peacock JL; Models of antenatal care to reduce and prevent preterm birth: a systematic review and meta-analysis. BMJ Open. 2016 Jan 12;6(1):e009044. doi: 10.1136/bmjopen-2015-009044.
- Symon A, Pringle J, Downe S, et al; Antenatal care trial interventions: a systematic scoping review and taxonomy development of care models. BMC Pregnancy Childbirth. 2017 Jan 6;17(1):8. doi: 10.1186/s12884-016-1186-3.

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