

Diabetes in pregnancy (update)

NICE guideline

Draft for consultation, September 2014

If you wish to comment on this version of the guideline, please be aware that all the supporting information and evidence is contained in the full version.

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Introduction

Approximately 700,000 women give birth in England and Wales each year, and up to 5% of these women have either pre-existing diabetes or gestational diabetes. Of women who have diabetes during pregnancy, it is estimated that approximately 87.5% have gestational diabetes (which may or may not resolve after pregnancy), 7.5% have type 1 diabetes and the remaining 5% have type 2 diabetes. The prevalence of type 1 diabetes, and especially type 2 diabetes, has increased in recent years. The incidence of gestational diabetes is also increasing as a result of higher rates of obesity in the general population and more pregnancies in older women.

Diabetes in pregnancy is associated with risks to the woman and to the developing fetus. Miscarriage, pre-eclampsia and preterm labour are more common in women with pre-existing diabetes. In addition, diabetic retinopathy can worsen rapidly during pregnancy. Stillbirth, congenital malformations, macrosomia, birth injury, perinatal mortality and postnatal adaptation problems (such as hypoglycaemia) are more common in babies born to women with pre-existing diabetes.

This guideline contains recommendations for managing diabetes and its complications in women who are planning pregnancy and those who are already pregnant. The guideline focuses on areas where additional or different care should be offered to women with diabetes and their newborn babies. Where the evidence supports it, the guideline makes separate recommendations for women with pre-existing diabetes and women with gestational diabetes. The term 'women' is used in the guideline to refer to all females of childbearing age, including young women who have not yet transferred from paediatric to adult services.

Reasons for this update

Several developments have occurred since publication of the original Diabetes in pregnancy guideline in 2008 that have prompted this update.

New studies on diagnosing and treating gestational diabetes have been published. The landmark [HAPO \(Hyperglycemia and Adverse Pregnancy Outcome\)](http://www.nejm.org/doi/full/10.1056/NEJMoa0707943) [http://www.nejm.org/doi/full/10.1056/NEJMoa0707943] study resulted in consensus guidance on the definition of gestational diabetes that has been adopted by the World Health Organization and which would result in many more women being diagnosed with gestational diabetes. This has been the subject of wide debate, and a cost–benefit analysis of the new guidance was a priority for this guideline update.

Other topics that have been reviewed include using newer technologies for monitoring blood glucose (for example, continuous glucose monitoring) and blood ketones, the role of HbA_{1c} (glycated haemoglobin) levels in diagnosing diabetes in pregnant women and managing their diabetes, the role of specialist (multidisciplinary) teams, blood glucose targets before and during pregnancy, and the timing and best test for diagnosing continuing glucose intolerance in women after the birth.

Drug recommendations

The guideline will assume that prescribers will use a drug's summary of product characteristics to inform decisions made with individual patients.

This guideline recommends some drugs for indications for which they do not have a UK marketing authorisation at the date of publication, if there is good evidence to support that use. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. The patient (or those with authority to give consent on their behalf) should provide informed consent, which should be documented. See the General Medical Council's [Good practice in prescribing and managing medicines and devices](#) for further information. Where recommendations have been made for the use of drugs outside their licensed indications ('off-label use'), these drugs are marked with a footnote in the recommendations.

Patient-centred care

This guideline offers best practice advice on the care of women with diabetes in pregnancy.

Patients and healthcare professionals have rights and responsibilities as set out in the [NHS Constitution for England](#) – all NICE guidance is written to reflect these. Treatment and care should take into account individual needs and preferences. Patients should have the opportunity to make informed decisions about their care and treatment, in partnership with their healthcare professionals. If the patient is under 16, their family or carers should also be given information and support to help the child or young person to make decisions about their treatment. Healthcare professionals should follow the [Department of Health's advice on consent](#). If someone does not have capacity to make decisions, healthcare professionals should follow the [code of practice that accompanies the Mental Capacity Act](#) and the supplementary [code of practice on deprivation of liberty safeguards](#).

NICE has produced guidance on the components of good patient experience in adult NHS services. All healthcare professionals should follow the recommendations in [Patient experience in adult NHS services](#).

If a young person is moving between paediatric and adult services, care should be planned and managed according to the best practice guidance described in the Department of Health's [Transition: getting it right for young people](#).

Adult and paediatric healthcare teams should work jointly to provide assessment and services to young women with diabetes. Diagnosis and management should be reviewed throughout the transition process, and there should be clarity about who is the lead clinician to ensure continuity of care.

Strength of recommendations

Some recommendations can be made with more certainty than others. The Guideline Development Group makes a recommendation based on the trade-off between the benefits and harms of an intervention, taking into account the quality of the underpinning evidence. For some interventions, the Guideline Development Group is confident that, given the information it has looked at, most patients would choose the intervention. The wording used in the recommendations in this guideline denotes the certainty with which the recommendation is made (the strength of the recommendation).

For all recommendations, NICE expects that there is discussion with the patient about the risks and benefits of the interventions, and their values and preferences. This discussion aims to help them to reach a fully informed decision (see also 'Patient-centred care').

Interventions that must (or must not) be used

We usually use 'must' or 'must not' only if there is a legal duty to apply the recommendation. Occasionally we use 'must' (or 'must not') if the consequences of not following the recommendation could be extremely serious or potentially life threatening.

Interventions that should (or should not) be used – a 'strong' recommendation

We use 'offer' (and similar words such as 'refer' or 'advise') when we are confident that, for the vast majority of patients, an intervention will do more good than harm, and be cost effective. We use similar forms of words (for example, 'Do not offer...') when we are confident that an intervention will not be of benefit for most patients.

Interventions that could be used

We use 'consider' when we are confident that an intervention will do more good than harm for most patients, and be cost effective, but other options may be similarly cost effective. The choice of intervention, and whether or not to have the intervention at all, is more likely to depend on the patient's values

and preferences than for a strong recommendation, and so the healthcare professional should spend more time considering and discussing the options with the patient.

Recommendation wording in guideline updates

NICE began using this approach to denote the strength of recommendations in guidelines that started development after publication of the 2009 version of 'The guidelines manual' (January 2009). This does not apply to any recommendations shaded in grey and ending [2008] (see 'Update information' box below for details about how recommendations are labelled). In particular, for recommendations labelled [2008], the word 'consider' may not necessarily be used to denote the strength of the recommendation.

Update information

This guidance is an update of NICE clinical guideline 63 (published March 2008) and will replace it.

Recommendations with an evidence review

New recommendations have been added on the following topics:

- oral contraceptive use for women with diabetes
- information and advice for women with diabetes who are planning to become pregnant
- monitoring blood ketones and blood glucose and HbA_{1c} target values for women with diabetes who are planning to become pregnant
- screening, diagnosing and treating gestational diabetes

You are invited to comment on the new and updated recommendations in this guideline. These are marked as:

- **[new 2015]** if the evidence has been reviewed and the recommendation has been added or updated
- **[2015]** if the evidence has been reviewed but no change has been made to the recommended action.

You are also invited to comment on recommendations that NICE proposes to delete from the 2008 guideline, because either the evidence has been reviewed and the recommendations have been updated, or NICE has updated other relevant guidance and has replaced the original recommendations.

Appendix A sets out these recommendations and includes details of replacement recommendations. Where there is no replacement recommendation, an explanation for the proposed deletion is given.

Recommendations without an evidence review

NICE is piloting a new process for identifying and labelling changes to recommendations that have not undergone an evidence review as part of the

update. In this guideline:

- minor editorial changes that do not affect the content of the recommendation have not been highlighted in yellow
- the definition of an 'amended' recommendation has been expanded (see below).

Where recommendations are shaded in grey and end **[2008]**, the evidence has not been reviewed since the original guideline. We will not be able to accept comments on these recommendations.

Where recommendations are shaded in grey and end **[2008, amended 2015]**, the evidence has not been reviewed but either:

- changes have been made to the recommendation wording that change the meaning (for example, because of equalities duties or a change in the availability of drugs, or incorporated guidance has been updated) **or**
- NICE has made editorial changes to the original wording to clarify the action to be taken.

These changes are marked with yellow shading, and explanations of the reasons for the changes are given in appendix A for information. We will not routinely accept comments on these recommendations, but will respond if particular concerns are raised around the proposed amendments.

The original NICE guideline and supporting documents are available [here](#).

Key priorities for implementation

The following recommendations have been identified as priorities for implementation. The full list of recommendations is in [section 1](#).

Preconception planning and care

- Advise women with diabetes who are planning to become pregnant to aim for the same capillary blood glucose target ranges as recommended for all people with type 1 diabetes¹. **[new 2015] [1.1.17]**

Gestational diabetes

- Diagnose gestational diabetes if the woman has either:
 - a fasting plasma glucose level of 5.6 mmol/litre or above **or**
 - a 2-hour plasma glucose level of 7.8 mmol/litre or above. **[new 2015] [1.2.8]**

Antenatal care for women with diabetes

- Advise pregnant women with diabetes who are on metformin, insulin or glibenclamide to maintain their blood glucose level above 4 mmol/litre and below the following target levels, if these are achievable without causing problematic hypoglycaemia:
 - fasting: 5.3 mmol/litre
 - 1-hour postprandial: 7.8 mmol/litre
 - 2-hour postprandial: 6.4 mmol/litre. **[new 2015] [1.3.8]**
- Exclude diabetic ketoacidosis as a matter of urgency **in any woman with diabetes** who becomes unwell during pregnancy. **[2008, amended 2015] [1.3.21]**
- At antenatal appointments, provide care specifically for women with diabetes, in addition to the care provided routinely for healthy pregnant

¹ Because of a lack of evidence on blood glucose targets for women with diabetes who are planning pregnancy, target ranges will be taken from the Type 1 diabetes guideline update (consultation scheduled 10 December 2014 to 4 March 2015). This recommendation will be replaced by one containing the target ranges when Type 1 diabetes guideline is published (expected August 2015).

women (see [Antenatal care: routine care for the healthy pregnant woman](#) [NICE clinical guideline 62]). Table 1 describes how care for women with diabetes differs from routine antenatal care. At each appointment, offer the woman ongoing opportunities for information and education. **[2008, amended 2015] [1.3.35]**

Table 1 Timetable of antenatal appointments

Appointment	Care for women with diabetes during pregnancy*
Booking appointment (joint diabetes and antenatal care) – ideally by 10 weeks	<p>Discuss information, education and advice about how diabetes will affect the pregnancy, birth and early parenting (such as breastfeeding and initial care of the baby).</p> <p>If the woman has been attending for preconception care and advice, continue to provide information, education and advice in relation to achieving optimal blood glucose control (including dietary advice).</p> <p>If the woman has not attended for preconception care and advice, give information, education and advice for the first time, take a clinical history to establish the extent of diabetes-related complications (including neuropathy and vascular disease), and review drugs for diabetes and its complications.</p> <p>Offer retinal assessment and renal assessment for women with pre-existing diabetes if these have not been undertaken in previous 12 months.</p> <p>Arrange contact with the diabetes care team every 1–2 weeks throughout pregnancy for all women with diabetes.</p> <p>Measure HbA_{1c} levels for women with pre-existing diabetes to determine the level of risk for the pregnancy.</p> <p>Offer self-monitoring of blood glucose or a 75 g 2-hour OGTT as soon as possible for women with a history of gestational diabetes who book in the first trimester.</p> <p>Confirm viability of pregnancy and gestational age at 7–9 weeks.</p>
16 weeks	<p>Offer retinal assessment at 16–20 weeks to women with pre-existing diabetes if diabetic retinopathy was present at their first antenatal clinic visit.</p> <p>Offer self-monitoring of blood glucose or a 75 g 2-hour OGTT as soon as possible for women with a history of gestational diabetes who book in the second trimester.</p>
20 weeks	<p>Offer an ultrasound scan for detecting structural anomalies and examination of the four-chamber view of the fetal heart and outflow tracts.</p>
28 weeks	<p>Offer ultrasound monitoring of fetal growth and amniotic fluid volume.</p> <p>Offer retinal assessment to women with pre-existing diabetes if no diabetic retinopathy was present at their first antenatal clinic visit.</p> <p>Women diagnosed with gestational diabetes as a result of routine antenatal screening at 24–28 weeks enter the care pathway.</p>
32 weeks	<p>Offer ultrasound monitoring of fetal growth and amniotic fluid volume.</p> <p>Offer to nulliparous women all routine investigations normally scheduled for 31 weeks in routine antenatal care.</p>
34 weeks	<p>No additional or different care for women with diabetes.</p>
36 weeks	<p>Offer ultrasound monitoring of fetal growth and amniotic fluid volume.</p> <p>Provide information and advice about:</p> <ul style="list-style-type: none"> • timing, mode and management of birth

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	<ul style="list-style-type: none"> analgesia and anaesthesia changes to blood glucose-lowering therapy during and after birth care of the baby after birth initiation of breastfeeding and the effect of breastfeeding on blood glucose control contraception and follow-up.
37 weeks	Offer induction of labour, or caesarean section if indicated; otherwise await spontaneous labour.
38 weeks	Offer tests of fetal wellbeing.
39 weeks	Offer tests of fetal wellbeing. Advise women with uncomplicated gestational diabetes to give birth no later than 39 weeks+6 days.
<p>* Women with diabetes should also receive routine care according to the schedule of appointments in Antenatal care: routine care for the healthy pregnant woman (NICE clinical guideline 62), including appointments at 25 weeks (for nulliparous women) and 34 weeks, but with the exception of the appointment for nulliparous women at 31 weeks.</p> <p>OGTT = oral glucose tolerance test.</p>	

Intrapartum care

- Advise pregnant women with type 1 or type 2 diabetes and no other complications to have an elective birth by induction of labour, or by elective caesarean section if indicated, between 37 weeks+0 days and 38 weeks+6 days of pregnancy. **[new 2015] [1.4.2]**
- Advise women with gestational diabetes to give birth no later than 39 weeks+6 days, and offer elective birth (induction or caesarean section) to women who have not given birth by this time. **[new 2015] [1.4.4]**

Postnatal care

- For women who were diagnosed with gestational diabetes and whose blood glucose levels returned to normal after the birth:
 - Offer lifestyle advice (including weight control, diet and exercise).
 - Offer one of the following postnatal tests to exclude diabetes:
 - a fasting plasma glucose test 6–13 weeks after the birth (for practical reasons this might take place at the 6-week postnatal check) **or**
 - an HbA_{1c} test at 13 weeks or later if a fasting plasma glucose test is not possible.

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- Do not routinely offer a 75 g 2-hour OGTT. **[new 2015] [1.6.11]**
- Offer an annual HbA_{1c} test to women who were diagnosed with gestational diabetes who have a negative postnatal screen for diabetes. **[new 2015] [1.6.14]**

1 Recommendations

The following guidance is based on the best available evidence. The [full guideline](#) [\[hyperlink to be added for final publication\]](#) gives details of the methods and the evidence used to develop the guidance.

1.1 *Preconception planning and care*

Information about outcomes and risks for mother and baby

- 1.1.1 Aim to empower women with diabetes to have a positive experience of pregnancy and childbirth by providing information, advice and support that will help to reduce the risks of adverse pregnancy outcomes for mother and baby. **[2008]**
- 1.1.2 Explain to women with diabetes who are planning to become pregnant that establishing good blood glucose control before conception and continuing this throughout pregnancy will reduce the risk of miscarriage, congenital malformation, stillbirth and neonatal death. It is important to explain that risks can be reduced but not eliminated. **[2008]**
- 1.1.3 Give women with diabetes who are planning to become pregnant, and their family members, information about how diabetes affects pregnancy and how pregnancy affects diabetes. The information should cover:

- the role of diet, body weight and exercise
- the risks of hypoglycaemia and impaired awareness of hypoglycaemia during pregnancy
- how nausea and vomiting in pregnancy can affect blood glucose control
- the increased risk of having a baby who is large for gestational age, which increases the likelihood of birth trauma, induction of labour and caesarean section
- the need for assessment of diabetic retinopathy before and during pregnancy

- the need for assessment of diabetic nephropathy before pregnancy
- the importance of maternal blood glucose control during labour and birth and early feeding of the baby, in order to reduce the risk of neonatal hypoglycaemia
- the possibility of temporary health problems in the baby during the neonatal period, which may require admission to the neonatal unit
- the risk of the baby developing obesity and/or diabetes in later life. **[2008]**

The importance of planning pregnancy and the role of contraception

- 1.1.4 **Ensure that the importance of avoiding an unplanned pregnancy is an essential component of diabetes education from adolescence for women with diabetes. **[2008, amended 2015]****
- 1.1.5 Explain to women with diabetes that their choice of contraception should be based on their own preferences and any risk factors (as indicated by [UK medical eligibility criteria for contraceptive use \[UKMEC\] 2009 \[revised 2010\]](#)). **[new 2015]**
- 1.1.6 Advise women with diabetes that they can use oral contraceptives (if there are no standard contraindications to their use). **[new 2015]**
- 1.1.7 Advise women with diabetes who are planning to become pregnant:
- that the risks associated with pregnancy in women with diabetes increase with how long the woman has had diabetes
 - to use contraception until good blood glucose control (assessed by HbA_{1c} level² – see recommendation 1.1.18) has been established

² HbA_{1c} values are reported in mmol/mol, using the [International Federation of Clinical Chemistry and Laboratory Medicine \(IFCC\) standardised HbA_{1c} test](#). The equivalent values in %, using the Diabetes Control and Complications Trial (DCCT)-aligned HbA_{1c} test, are reported in parentheses.

- that blood glucose targets, glucose monitoring, drugs for treating diabetes (including insulin regimens for insulin-treated diabetes) and drugs for complications of diabetes will need to be reviewed before and during pregnancy
- that extra time and effort is needed to manage diabetes during pregnancy and that she will have frequent contact with healthcare professionals. **[2015]**

1.1.8 Give women with diabetes who are planning to become pregnant information about the local arrangements for support during pregnancy, including emergency contact numbers. **[2015]**

Diet, dietary supplements and body weight

1.1.9 Offer women with diabetes who are planning to become pregnant individualised dietary advice. **[2008]**

1.1.10 Offer women with diabetes who are planning to become pregnant and who have a BMI above 27 kg/m² advice on how to lose weight, in line with [Obesity: guidance on the prevention, identification, assessment and management of overweight and obesity in adults and children](#) (NICE clinical guideline 43). **[2008]**

1.1.11 Advise women with diabetes who are planning to become pregnant to take folic acid (5 mg/day) until 12 weeks of gestation to reduce the risk of having a baby with a neural tube defect. **[2008]**

Monitoring blood glucose and ketones in the preconception period

1.1.12 Offer women with diabetes who are planning to become pregnant monthly measurement of their HbA_{1c} level². **[2008]**

1.1.13 Offer women with diabetes who are planning to become pregnant a meter for self-monitoring of blood glucose. **[2008]**

1.1.14 If a woman with diabetes who is planning to become pregnant needs intensification of blood glucose-lowering therapy, advise her to increase the frequency of self-monitoring of blood glucose to

include fasting levels and a mixture of preprandial and postprandial levels. **[2008]**

- 1.1.15 Offer women with type 1 diabetes who are planning to become pregnant blood ketone testing strips and a meter, and advise them to test for ketonaemia if they become hyperglycaemic or unwell. **[new 2015]**

Target blood glucose and HbA_{1c} levels in the preconception period

1.1.16 Agree individualised targets for self-monitoring of blood glucose with women who have diabetes and are planning to become pregnant, taking into account the risk of hypoglycaemia. **[2008]**

- 1.1.17 Advise women with diabetes who are planning to become pregnant to aim for the same capillary blood glucose target ranges as recommended for all people with type 1 diabetes³. **[new 2015]**

- 1.1.18 Advise women with diabetes who are planning to become pregnant to aim to keep their HbA_{1c} level⁴ below 48 mmol/mol (6.5%), if this is achievable without causing problematic hypoglycaemia. **[new 2015]**

- 1.1.19 Reassure women that any reduction in HbA_{1c} level towards the target of 48 mmol/mol (6.5%) is likely to reduce the risk of congenital malformations in the baby. **[new 2015]**

- 1.1.20 Strongly advise women with diabetes whose HbA_{1c} level is above 86 mmol/mol (10%) not to get pregnant. **[2015]**

³ Because of a lack of evidence on blood glucose targets for women with diabetes who are planning pregnancy, target ranges will be taken from the Type 1 diabetes guideline update (consultation scheduled 10 December 2014 to 4 March 2015). This recommendation will be replaced by one containing the target ranges when Type 1 diabetes guideline is published (expected August 2015).

⁴ HbA_{1c} values are reported in mmol/mol, using the [International Federation of Clinical Chemistry and Laboratory Medicine \(IFCC\) standardised HbA_{1c} test](#). The equivalent values in %, using the Diabetes Control and Complications Trial (DCCT)-aligned HbA_{1c} test, are reported in parentheses.

Safety of drugs for diabetes before and during pregnancy

- 1.1.21 Women with diabetes may be advised to use metformin⁵ as an adjunct or alternative to insulin in the preconception period and during pregnancy, when the likely benefits from improved blood glucose control outweigh the potential for harm. All other oral blood glucose-lowering agents should be discontinued before pregnancy and insulin substituted. **[2008]**
- 1.1.22 Be aware that data from clinical trials and other sources do not suggest that the rapid-acting insulin analogues (aspart and lispro) adversely affect the pregnancy or the health of the fetus or newborn baby. **[2008]**
- 1.1.23 Explain to women with insulin-treated diabetes who are planning to become pregnant that there is insufficient evidence about the use of long-acting insulin analogues during pregnancy. Therefore isophane insulin (also known as NPH insulin) remains the first choice for long-acting insulin during pregnancy. **[2008]**

Safety of drugs for complications of diabetes before and during pregnancy

- 1.1.24 Angiotensin-converting enzyme inhibitors and angiotensin-II receptor antagonists should be discontinued before conception or as soon as pregnancy is confirmed. Alternative antihypertensive agents suitable for use during pregnancy should be substituted. **[2008]**
- 1.1.25 Statins should be discontinued before pregnancy or as soon as pregnancy is confirmed. **[2008]**

⁵ Although metformin is commonly used in UK clinical practice in the management of diabetes in pregnancy and lactation, and there is strong evidence for its effectiveness and safety (presented in the full version of the guideline), at the time of consultation (September 2014) metformin did not have a UK marketing authorisation for this indication. The SPC advises that when a patient plans to become pregnant and during pregnancy, diabetes should not be treated with metformin but insulin should be used to maintain blood glucose levels. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See the [General Medical Council's Good practice in prescribing and managing medicines and devices](#) for further information.

Removing barriers to the uptake of preconception care and when to offer information

- 1.1.26 Explain to women with diabetes about the benefits of preconception blood glucose control at each contact with healthcare professionals, including their diabetes care team, from adolescence. **[2008]**
- 1.1.27 Document the intentions of women with diabetes regarding pregnancy and contraceptive use at each contact with their diabetes care team from adolescence. **[2008]**
- 1.1.28 **Ensure that preconception care for women with diabetes is** given in a supportive environment, and encourage the woman's partner or other family member to attend. **[2008, amended 2015]**

Education and advice

- 1.1.29 Offer women with diabetes who are planning to become pregnant a structured education programme as soon as possible if they have not already attended one (see [Guidance on the use of patient-education models for diabetes](#) [NICE technology appraisal guidance 60]). **[2008]**
- 1.1.30 Offer women with diabetes who are planning to become pregnant preconception care and advice before discontinuing contraception. **[2008]**

Retinal assessment in the preconception period

- 1.1.31 Offer retinal assessment (see recommendation 1.1.32) to women with diabetes seeking preconception care at their first appointment (unless they have had an annual retinal assessment in the last 6 months) and then annually if no diabetic retinopathy is found. **[2008]**
- 1.1.32 Carry out retinal assessment by digital imaging with mydriasis using tropicamide, in line with the UK National Screening Committee's recommendations for annual mydriatic 2-field digital

photographic screening as part of a systematic screening programme. **[2008]**

- 1.1.33 Advise women with diabetes who are planning to become pregnant to defer rapid optimisation of blood glucose control until after retinal assessment and treatment have been completed. **[2008]**

Renal assessment in the preconception period

- 1.1.34 Offer women with diabetes a renal assessment, including a measure of microalbuminuria, before discontinuing contraception. If serum creatinine is abnormal (120 micromol/litre or more), the urinary albumin:creatinine ratio is greater than 30 mg/mmol or the estimated glomerular filtration rate (eGFR) is less than 45 ml/minute/1.73 m², referral to a nephrologist should be considered before discontinuing contraception. **[2008, amended 2015]**

1.2 Gestational diabetes

Screening for and diagnosing gestational diabetes

- 1.2.1 So that women can make an informed decision about screening and testing for gestational diabetes, explain that:
- in some women, gestational diabetes will respond to changes in diet and exercise
 - most women (about 70%) will need oral blood glucose-lowering agents or insulin therapy if changes in diet and exercise do not control gestational diabetes effectively
 - if gestational diabetes is not detected and controlled, there is a small increased risk of serious adverse birth complications such as shoulder dystocia
 - a diagnosis of gestational diabetes will lead to increased monitoring, and may lead to increased interventions, during both pregnancy and labour. **[new 2015]**

1.2.2 **Screen for gestational diabetes** using risk factors in a healthy population. At the booking appointment, determine the following risk factors for gestational diabetes:

- BMI above 30 kg/m²
- previous macrosomic baby weighing 4.5 kg or above
- previous gestational diabetes
- family history of diabetes (first-degree relative with diabetes)
- **minority ethnic family origin with a high prevalence of diabetes.**

Offer women with any one of these risk factors testing for gestational diabetes (see recommendations 1.2.5–1.2.7). **[2008, amended 2015]**

1.2.3 Do not screen for gestational diabetes using fasting plasma glucose, random blood glucose, glucose challenge test or urinalysis for glucose. **[2015]**

1.2.4 If glycosuria is detected by routine urinalysis, particularly in the first trimester, consider further testing of glucose tolerance. **[new 2015]**

1.2.5 Use the 2-hour 75 g oral glucose tolerance test (OGTT) to test for gestational diabetes. **[2015]**

1.2.6 Offer women who have had gestational diabetes in a previous pregnancy:

- early self-monitoring of blood glucose **or**
- a 75 g 2-hour OGTT as soon as possible after booking (whether in the first or second trimester), and a further 75 g 2-hour OGTT at 24–28 weeks if the results of the first OGTT are normal. **[new 2015]**

1.2.7 Offer women with any of the other risk factors for gestational diabetes (see recommendation 1.2.2) a 75 g 2-hour OGTT at 24–28 weeks. **[2015]**

- 1.2.8 Diagnose gestational diabetes if the woman has either:
- a fasting plasma glucose level of 5.6 mmol/litre or above **or**
 - a 2-hour plasma glucose level of 7.8 mmol/litre or above. **[new 2015]**

- 1.2.9 Inform the primary healthcare team when a woman is diagnosed with gestational diabetes [see also [Patient experience in adult NHS services](#) (NICE clinical guideline 138)]. **[new 2015]**

Interventions for gestational diabetes

- 1.2.10 Explain to women with gestational diabetes:
- about the implications (both short and long term) of the diagnosis for her and her baby
 - that good blood glucose control throughout pregnancy will reduce the risk of fetal macrosomia, trauma during birth (for her and her baby), induction of labour and/or caesarean section, neonatal hypoglycaemia and perinatal death
 - that treatment includes changes in diet and exercise, and could involve drugs. **[new 2015]**
- 1.2.11 Teach women with gestational diabetes about self-monitoring of blood glucose. **[2015]**
- 1.2.12 Use the same targets for blood glucose control for women with gestational diabetes as for women with pre-existing diabetes (see recommendation 1.3.8). **[2015]**
- 1.2.13 Tailor blood glucose-lowering therapy to the blood glucose profile and personal preferences of the woman with gestational diabetes. **[new 2015]**
- 1.2.14 Offer women advice about changes in diet and exercise at the time of diagnosis of gestational diabetes. **[new 2015]**

- 1.2.15 Advise women with gestational diabetes to eat a healthy diet during pregnancy, and emphasise that foods with a low glycaemic index should replace those with a high glycaemic index. **[new 2015]**
- 1.2.16 Advise women with gestational diabetes to take regular exercise (such as walking for 30 minutes after a meal) to improve blood glucose control. **[new 2015]**
- 1.2.17 Offer a trial of changes in diet and exercise to women with gestational diabetes who have a fasting blood glucose level below 7 mmol/litre at diagnosis. **[new 2015]**
- 1.2.18 Offer metformin⁶ to women with gestational diabetes if blood glucose targets are not met using changes in diet and exercise within 1–2 weeks. **[new 2015]**
- 1.2.19 Offer addition of insulin to the treatments of changes in diet, exercise and metformin⁶ for women with gestational diabetes if blood glucose targets are not met. **[new 2015]**
- 1.2.20 Offer immediate treatment with insulin and/or metformin⁶, as well as changes in diet and exercise, to women with gestational diabetes who have a fasting blood glucose level of 7 mmol/litre or above at diagnosis. **[new 2015]**
- 1.2.21 Consider glibenclamide⁷ for women with gestational diabetes:

⁶ Although metformin is commonly used in UK clinical practice in the management of diabetes in pregnancy and lactation, and there is strong evidence for its effectiveness and safety (presented in the full version of the guideline), at the time of consultation (September 2014) metformin did not have a UK marketing authorisation for this indication. The summary of product characteristics advises that when a patient plans to become pregnant and during pregnancy, diabetes should not be treated with metformin but insulin should be used to maintain blood glucose levels. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See the [General Medical Council's Good practice in prescribing and managing medicines and devices](#) for further information.

⁷ At the time of consultation (September 2014) glibenclamide was contraindicated for use up to gestational week 11 and did not have UK marketing authorisation for use during the second and third trimesters of pregnancy in women with gestational diabetes. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See the [General Medical Council's Good practice in prescribing and managing medicines and devices](#) for further information.

- who cannot tolerate metformin **or**
- in whom blood glucose targets are not achieved with metformin but who decline insulin therapy. **[new 2015]**

1.2.22 Refer all women with gestational diabetes to a dietitian. **[new 2015]**

1.3 Antenatal care for women with diabetes

This section should be read in conjunction with [Antenatal care: routine care for the healthy pregnant woman](#) (NICE clinical guideline 62).

Monitoring blood glucose and ketones

Blood glucose

- 1.3.1 Advise pregnant women with type 1 diabetes to test their fasting, preprandial, 1-hour postprandial and bedtime blood glucose levels daily during pregnancy. **[new 2015]**
- 1.3.2 Advise pregnant women with type 2 diabetes or gestational diabetes who are on a multiple daily insulin injection regimen to test their fasting, preprandial, 1-hour postprandial and bedtime blood glucose levels daily during pregnancy. **[new 2015]**
- 1.3.3 Advise pregnant women with type 2 diabetes or gestational diabetes to test their fasting and 1-hour postprandial blood glucose levels daily during pregnancy if they are:
- on diet and exercise therapy **or**
 - taking oral therapy (with or without diet and exercise therapy) or single-dose intermediate-acting or long-acting insulin. **[new 2015]**

Ketones

- 1.3.4 Offer pregnant women with diabetes blood ketone testing strips and a meter, and advise them to test for ketonaemia if they become hyperglycaemic or unwell. **[new 2015]**

- 1.3.5 Explain to pregnant women with any form of diabetes that they are at risk of developing ketoacidosis, and that if they become hyperglycaemic, ketonaemic (see recommendation 1.3.4) or unwell they should seek urgent medical advice. **[new 2015]**
- 1.3.6 Test pregnant women with diabetes for ketonaemia if they present with hyperglycaemia or are unwell. **[new 2015]**

Target blood glucose levels

- 1.3.7 Agree individualised targets for self-monitoring of blood glucose with women with diabetes in pregnancy, taking into account the risk of hypoglycaemia. **[2008]**
- 1.3.8 Advise pregnant women with diabetes who are on metformin, insulin or glibenclamide to maintain their blood glucose level above 4 mmol/litre and below the following target levels, if these are achievable without causing problematic hypoglycaemia:
- fasting: 5.3 mmol/litre
 - 1-hour postprandial: 7.8 mmol/litre
 - 2-hour postprandial: 6.4 mmol/litre. **[new 2015]**

Monitoring HbA_{1c}

- 1.3.9 Do not use HbA_{1c} levels routinely to assess a woman's blood glucose control in the second and third trimesters of pregnancy. **[2008]**
- 1.3.10 Measure HbA_{1c} levels in all pregnant women with pre-existing diabetes at the booking appointment to determine the level of risk for the pregnancy. **[new 2015]**
- 1.3.11 Measure HbA_{1c} levels in all women with a diagnosis of gestational diabetes to identify women who might have pre-existing type 2 diabetes. **[new 2015]**
- 1.3.12 Consider using HbA_{1c} levels to assess a woman's blood glucose control in the second and/or third trimester of pregnancy if:

- the woman measures her capillary blood glucose values less frequently than advised (see recommendations 1.3.1–1.3.3) **or**
- confirmation is needed that the woman is achieving blood glucose targets **or**
- the woman needs reassurance that her blood glucose control is optimised. **[new 2015]**

Managing diabetes during pregnancy

Insulin treatment and risks of hypoglycaemia

- 1.3.13 Be aware that the rapid-acting insulin analogues (aspart and lispro) have advantages over soluble human insulin during pregnancy and consider their use. **[2008]**
- 1.3.14 Advise women with insulin-treated diabetes of the risks of hypoglycaemia and impaired awareness of hypoglycaemia in pregnancy, particularly in the first trimester. **[2008]**
- 1.3.15 Advise pregnant women with insulin-treated diabetes to always have available a fast-acting form of carbohydrate (for example, dextrose tablets or sugar-containing drinks). **[2008, amended 2015]**
- 1.3.16 Provide glucagon to pregnant women with type 1 diabetes for use if needed. Instruct the woman and her partner or other family members in its use. **[2008, amended 2015]**
- 1.3.17 Offer women with insulin-treated diabetes continuous subcutaneous insulin infusion (CSII; also known as insulin pump therapy) during pregnancy if adequate blood glucose control is not obtained by multiple daily injections of insulin without significant disabling hypoglycaemia⁸. **[2008]**

⁸ For the purpose of this guidance, 'disabling hypoglycaemia' means the repeated and unpredicted occurrence of hypoglycaemia requiring third-party assistance that results in continuing anxiety about recurrence and is associated with significant adverse effect on quality of life.

Continuous blood glucose monitoring

- 1.3.18 Do not offer continuous glucose monitoring routinely to pregnant women with diabetes. **[new 2015]**
- 1.3.19 Consider continuous glucose monitoring for pregnant women on insulin therapy:
- who have problematic severe hypoglycaemia (with or without impaired awareness of hypoglycaemia) **or**
 - who have unstable blood glucose levels (to minimise variability) **or**
 - to gain information about variability in blood glucose levels. **[new 2015]**
- 1.3.20 Ensure that support is available for pregnant women who are using continuous glucose monitoring, including 24-hour contact with a member of the diabetes care team who is expert in its use. **[new 2015]**

Diabetic ketoacidosis

- 1.3.21 Exclude diabetic ketoacidosis as a matter of urgency **in any woman with diabetes** who becomes unwell during pregnancy. **[2008, amended 2015]**
- 1.3.22 During pregnancy, admit immediately women who are suspected of having diabetic ketoacidosis for level 2 critical care⁹, where they can receive both medical and obstetric care. **[2008]**

Retinal assessment during pregnancy

- 1.3.23 Offer pregnant women with pre-existing diabetes retinal assessment by digital imaging with mydriasis using tropicamide following their first antenatal clinic appointment, and again at 28 weeks if the first assessment is normal. If any diabetic

⁹ Level 2 critical care is defined as care for patients requiring detailed observation or intervention, including support for a single failing organ system or postoperative care and those 'stepping down' from higher levels of care.

- retinopathy is present, perform an additional retinal assessment at 16–20 weeks. **[2008]**
- 1.3.24 If retinal assessment has not been performed in the last 12 months, offer it as soon as possible after the first contact in pregnancy in women with pre-existing diabetes. **[2008]**
- 1.3.25 Diabetic retinopathy should not be considered a contraindication to rapid optimisation of blood glucose control in women who present with a high HbA_{1c} in early pregnancy. **[2008]**
- 1.3.26 **Ensure that women who have proliferative diabetic retinopathy diagnosed during pregnancy** have ophthalmological follow-up for at least 6 months after the birth of the baby. **[2008, amended 2015]**
- 1.3.27 Diabetic retinopathy should not be considered a contraindication to vaginal birth. **[2008]**

Renal assessment during pregnancy

- 1.3.28 If renal assessment has not been undertaken in the preceding 12 months in women with pre-existing diabetes, arrange it at the first contact in pregnancy. If the serum creatinine is abnormal (120 micromol/litre or more), **the urinary albumin:creatinine ratio is greater than 30 mg/mmol** or total protein excretion exceeds 2 g/day, referral to a nephrologist should be considered (eGFR should not be used during pregnancy). Thromboprophylaxis should be considered for women with proteinuria above 5 g/day (macroalbuminuria). **[2008, amended 2015]**

Screening for congenital malformations

- 1.3.29 Offer women with diabetes an **ultrasound scan for detecting structural abnormalities and** examination of the four-chamber view of the fetal heart and outflow tracts at **20 weeks**. **[2008, amended 2015]**

Monitoring fetal growth and wellbeing

- 1.3.30 Offer pregnant women with diabetes ultrasound monitoring of fetal growth and amniotic fluid volume every 4 weeks from 28 to 36 weeks. **[2008]**
- 1.3.31 Routine monitoring of fetal wellbeing (using methods such as fetal umbilical artery Doppler recording, fetal heart rate recording and biophysical profile testing) before 38 weeks is not recommended in pregnant women with diabetes, unless there is a risk of intrauterine growth restriction. **[2008, amended 2015]**
- 1.3.32 Provide an individualised approach to monitoring fetal growth and wellbeing for women with diabetes and a risk of intrauterine growth restriction (macrovascular disease and/or nephropathy). **[2008, amended 2015]**

Organisation of antenatal care

- 1.3.33 Offer immediate contact with a joint diabetes and antenatal clinic to women with diabetes who are pregnant. **[2008]**
- 1.3.34 Ensure that women with diabetes have contact with the diabetes care team for assessment of blood glucose control every 1–2 weeks throughout pregnancy. **[2008, amended 2015]**
- 1.3.35 At antenatal appointments, provide care specifically for women with diabetes, in addition to the care provided routinely for healthy pregnant women (see [Antenatal care: routine care for the healthy pregnant woman](#) [NICE clinical guideline 62]). Table 1 describes how care for women with diabetes differs from routine antenatal care. At each appointment, offer the woman ongoing opportunities for information and education. **[2008, amended 2015]**

Table 1 Timetable of antenatal appointments

Appointment	Care for women with diabetes during pregnancy*
Booking appointment (joint diabetes and antenatal care) – ideally by 10 weeks	<p>Discuss information, education and advice about how diabetes will affect the pregnancy, birth and early parenting (such as breastfeeding and initial care of the baby).</p> <p>If the woman has been attending for preconception care and advice, continue to provide information, education and advice in relation to achieving optimal blood glucose control (including dietary advice).</p> <p>If the woman has not attended for preconception care and advice, give information, education and advice for the first time, take a clinical history to establish the extent of diabetes-related complications (including neuropathy and vascular disease), and review drugs for diabetes and its complications.</p> <p>Offer retinal assessment and renal assessment for women with pre-existing diabetes if these have not been undertaken in previous 12 months.</p> <p>Arrange contact with the diabetes care team every 1–2 weeks throughout pregnancy for all women with diabetes.</p> <p>Measure HbA_{1c} levels for women with pre-existing diabetes to determine the level of risk for the pregnancy.</p> <p>Offer self-monitoring of blood glucose or a 75 g 2-hour OGTT as soon as possible for women with a history of gestational diabetes who book in the first trimester.</p> <p>Confirm viability of pregnancy and gestational age at 7–9 weeks.</p>
16 weeks	<p>Offer retinal assessment at 16–20 weeks to women with pre-existing diabetes if diabetic retinopathy was present at their first antenatal clinic visit.</p> <p>Offer self-monitoring of blood glucose or a 75 g 2-hour OGTT as soon as possible for women with a history of gestational diabetes who book in the second trimester.</p>
20 weeks	<p>Offer an ultrasound scan for detecting structural anomalies and examination of the four-chamber view of the fetal heart and outflow tracts.</p>
28 weeks	<p>Offer ultrasound monitoring of fetal growth and amniotic fluid volume.</p> <p>Offer retinal assessment to women with pre-existing diabetes if no diabetic retinopathy was present at their first antenatal clinic visit.</p> <p>Women diagnosed with gestational diabetes as a result of routine antenatal screening at 24–28 weeks enter the care pathway.</p>
32 weeks	<p>Offer ultrasound monitoring of fetal growth and amniotic fluid volume.</p> <p>Offer to nulliparous women all routine investigations normally scheduled for 31 weeks in routine antenatal care.</p>
34 weeks	No additional or different care for women with diabetes.
36 weeks	<p>Offer ultrasound monitoring of fetal growth and amniotic fluid volume.</p> <p>Provide information and advice about:</p> <ul style="list-style-type: none"> • timing, mode and management of birth • analgesia and anaesthesia

	<ul style="list-style-type: none"> • changes to blood glucose-lowering therapy during and after birth • care of the baby after birth • initiation of breastfeeding and the effect of breastfeeding on blood glucose control • contraception and follow-up.
37 weeks	Offer induction of labour, or caesarean section if indicated; otherwise await spontaneous labour.
38 weeks	Offer tests of fetal wellbeing.
39 weeks	Offer tests of fetal wellbeing. Advise women with uncomplicated gestational diabetes to give birth no later than 39 weeks+6 days.
<p>* Women with diabetes should also receive routine care according to the schedule of appointments in Antenatal care: routine care for the healthy pregnant woman (NICE clinical guideline 62), including appointments at 25 weeks (for nulliparous women) and 34 weeks, but with the exception of the appointment for nulliparous women at 31 weeks.</p> <p>OGTT = oral glucose tolerance test.</p>	

Preterm labour in women with diabetes

- 1.3.36 Diabetes should not be considered a contraindication to antenatal steroids for fetal lung maturation or to tocolysis. **[2008]**
- 1.3.37 In women with insulin-treated diabetes who are receiving steroids for fetal lung maturation, **give** additional insulin according to an agreed protocol and monitor them closely. **[2008, amended 2015]**
- 1.3.38 Do not use betamimetic drugs for tocolysis in women with diabetes. **[2008]**

1.4 *Intrapartum care*

Timing and mode of birth

- 1.4.1 Discuss the timing and mode of birth with pregnant women with diabetes during antenatal appointments, especially during the third trimester. **[new 2015]**
- 1.4.2 Advise pregnant women with type 1 or type 2 diabetes and no other complications to have an elective birth by induction of labour, or by

elective caesarean section if indicated, between 37 weeks+0 days and 38 weeks+6 days of pregnancy. **[new 2015]**

- 1.4.3 Consider birth before 37 weeks+0 days for women with type 1 or type 2 diabetes if there are metabolic or any other maternal or fetal complications. **[new 2015]**
- 1.4.4 Advise women with gestational diabetes to give birth no later than 39 weeks+6 days, and offer elective birth (induction or caesarean section) to women who have not given birth by this time. **[new 2015]**
- 1.4.5 Consider birth before 39 weeks+6 days for women with gestational diabetes if there are maternal or fetal complications. **[new 2015]**

- 1.4.6 Diabetes should not in itself be considered a contraindication to attempting vaginal birth after a previous caesarean section. **[2008]**
- 1.4.7 Explain to pregnant women with diabetes who have an ultrasound-diagnosed macrosomic fetus about the risks and benefits of vaginal birth, induction of labour and caesarean section. **[2008]**

Anaesthesia

- 1.4.8 Offer women with diabetes and comorbidities such as obesity or autonomic neuropathy an anaesthetic assessment in the third trimester of pregnancy. **[2008]**
- 1.4.9 If general anaesthesia is used for the birth in women with diabetes, monitor blood glucose every 30 minutes from induction of general anaesthesia until after the baby is born and the woman is fully conscious. **[2008]**

Blood glucose control during labour and birth

- 1.4.10 Monitor capillary blood glucose every hour during labour and birth in women with diabetes, and **ensure that it is maintained** between 4 and 7 mmol/litre. **[2008, amended 2015]**

- 1.4.11 Intravenous dextrose and insulin infusion should be considered for women with type 1 diabetes from the onset of established labour. **[2008]**
- 1.4.12 **Use** intravenous dextrose and insulin infusion during labour and birth for women with diabetes whose blood glucose is not maintained between 4 and 7 mmol/litre. **[2008, amended 2015]**

1.5 Neonatal care

Initial assessment and criteria for admission to intensive or special care

- 1.5.1 Advise women with diabetes to give birth in hospitals where advanced neonatal resuscitation skills are available 24 hours a day. **[2008]**
- 1.5.2 Babies of women with diabetes should stay with their mothers unless there is a clinical complication or there are abnormal clinical signs that warrant admission for intensive or special care. **[2008]**
- 1.5.3 Carry out blood glucose testing routinely in babies of women with diabetes at 2–4 hours after birth. Carry out blood tests for polycythaemia, hyperbilirubinaemia, hypocalcaemia and hypomagnesaemia for babies with clinical signs. **[2008]**
- 1.5.4 Perform an echocardiogram for babies of women with diabetes if they show clinical signs associated with congenital heart disease or cardiomyopathy, including heart murmur. The timing of the examination will depend on the clinical circumstances. **[2008]**
- 1.5.5 Admit babies of women with diabetes to the neonatal unit if they have:

- hypoglycaemia associated with abnormal clinical signs
- respiratory distress
- signs of cardiac decompensation from congenital heart disease or cardiomyopathy

- signs of neonatal encephalopathy
- signs of polycythaemia and are likely to need partial exchange transfusion
- need for intravenous fluids
- need for tube feeding (unless adequate support is available on the postnatal ward)
- jaundice requiring intense phototherapy and frequent monitoring of bilirubinaemia
- been born before 34 weeks (or between 34 and 36 weeks if dictated clinically by the initial assessment of the baby and feeding on the labour ward). **[2008]**

1.5.6 Do not transfer babies of women with diabetes to community care until they are at least 24 hours old, and not before you are satisfied that the baby is maintaining blood glucose levels and is feeding well. **[2008]**

Preventing and assessing neonatal hypoglycaemia

1.5.7 All maternity units should have a written policy for the prevention, detection and management of hypoglycaemia in babies of women with diabetes. **[2008]**

1.5.8 Test the blood glucose of babies of women with diabetes using a quality-assured method validated for neonatal use (ward-based glucose electrode or laboratory analysis). **[2008]**

1.5.9 **Women with diabetes should feed their babies** as soon as possible after birth (within 30 minutes) and then at frequent intervals (every 2–3 hours) until feeding maintains pre-feed blood glucose levels at a minimum of 2.0 mmol/litre. **[2008, amended 2015]**

1.5.10 If blood glucose values are below 2.0 mmol/litre on 2 consecutive readings despite maximal support for feeding, if there are abnormal clinical signs or if the baby will not feed orally effectively, **use** additional measures such as tube feeding or intravenous dextrose.

Only implement additional measures if one or more of these criteria are met. **[2008, amended 2015]**

- 1.5.11 Test blood glucose levels in babies of women with diabetes who present with clinical signs of hypoglycaemia, and treat **those who are hypoglycaemic** with intravenous dextrose as soon as possible. **[2008, amended 2015]**

1.6 Postnatal care

Blood glucose control, drugs and breastfeeding

- 1.6.1 Women with insulin-treated pre-existing diabetes should reduce their insulin immediately after birth and monitor their blood glucose levels carefully to establish the appropriate dose. **[2008]**
- 1.6.2 Explain to women with insulin-treated pre-existing diabetes that they are at increased risk of hypoglycaemia in the postnatal period, especially when breastfeeding, and advise them to have a meal or snack available before or during feeds. **[2008]**
- 1.6.3 Women who have been diagnosed with gestational diabetes should discontinue blood glucose-lowering therapy immediately after birth. **[2008]**
- 1.6.4 Women with pre-existing type 2 diabetes who are breastfeeding can resume or continue to take metformin¹⁰ and glibenclamide¹¹

¹⁰ Although metformin is commonly used in UK clinical practice in the management of diabetes in pregnancy and lactation, and there is strong evidence for its effectiveness and safety (presented in the full version of the guideline), at the time of consultation (September 2014) metformin did not have a UK marketing authorisation for this indication. The summary of product characteristics advises that when a patient plans to become pregnant and during pregnancy, diabetes should not be treated with metformin but insulin should be used to maintain blood glucose levels. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See the [General Medical Council's Good practice in prescribing and managing medicines and devices](#) for further information.

¹¹ At the time of consultation (September 2014) glibenclamide was contraindicated for use up to gestational week 11 and did not have UK marketing authorisation for use during the second and third trimesters of pregnancy in women with gestational diabetes. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See the [General Medical Council's Good practice in prescribing and managing medicines and devices](#) for further information.

immediately after birth, but should avoid other oral blood glucose-lowering agents while breastfeeding. **[2008]**

- 1.6.5 Women with diabetes who are breastfeeding should continue to avoid any drugs for the treatment of diabetes complications that were discontinued for safety reasons in the preconception period. **[2008]**

Information and follow-up after birth

Women with pre-existing diabetes

- 1.6.6 Refer women with pre-existing diabetes back to their routine diabetes care arrangements. **[2008]**
- 1.6.7 Remind women with diabetes of the importance of contraception and the need for preconception care when planning future pregnancies. **[2008]**

Women diagnosed with gestational diabetes

- 1.6.8 Test blood glucose in women who were diagnosed with gestational diabetes to exclude persisting hyperglycaemia before they are transferred to community care. **[2008]**
- 1.6.9 Remind women who were diagnosed with gestational diabetes of the symptoms of hyperglycaemia. **[2008]**
- 1.6.10 Explain to women who were **diagnosed with gestational diabetes about** the risks of gestational diabetes in future pregnancies, and offer them **screening for diabetes** when planning future pregnancies (see recommendations 1.6.11–1.6.14). **[2008, amended 2015]**
- 1.6.11 For women who were diagnosed with gestational diabetes and whose blood glucose levels returned to normal after the birth:
- Offer lifestyle advice (including weight control, diet and exercise).
 - Offer one of the following postnatal tests to exclude diabetes:

- a fasting plasma glucose test 6–13 weeks after the birth (for practical reasons this might take place at the 6-week postnatal check) **or**
- an HbA_{1c} test at 13 weeks or later if a fasting plasma glucose test is not possible.
- Do not routinely offer a 75 g 2-hour OGTT. **[new 2015]**

1.6.12 For women having a fasting plasma glucose test as the postnatal screening test:

- Advise women with a fasting plasma glucose level below 6.0 mmol/litre that:
 - they have a low probability of having diabetes at present
 - they should continue to follow the lifestyle advice (including weight control, diet and exercise) given after the birth
 - they will need an annual screening test to check that their blood glucose levels are normal.
- Offer women with a fasting plasma glucose level of 6.0–6.9 mmol/litre a 75 g 2-hour OGTT to determine if they have diabetes.
- Offer women with a fasting plasma glucose level of 7.0 mmol/litre or above a repeat fasting plasma glucose test, an HbA_{1c} test or a 75 g 2-hour OGTT to determine if they have diabetes. **[new 2015]**

1.6.13 For women having an HbA_{1c} test as the postnatal screening test:

- Advise women with an HbA_{1c} level below 39 mmol/mol (5.7%) that:
 - they have a low probability of having diabetes at present
 - they should continue to follow the lifestyle advice (including weight control, diet and exercise) given after the birth
 - they will need an annual screening test to check that their blood glucose levels are normal.

- Offer women with an HbA_{1c} level of between 39 and 46 mmol/mol (5.7% and 6.4%) a 75 g 2-hour OGTT to determine if they have diabetes.
- Offer women with an HbA_{1c} level of 47 mmol/mol (6.5%) or above a repeat HbA_{1c} test to determine if they have diabetes. **[new 2015]**

1.6.14 Offer an annual HbA_{1c} test to women who were diagnosed with gestational diabetes who have a negative postnatal screen for diabetes. **[new 2015]**

1.6.15 Offer women who were diagnosed with gestational diabetes early self-monitoring of blood glucose or an OGTT in future pregnancies. Offer a subsequent OGTT if the test results in early pregnancy are normal (see recommendation 1.2.6). **[2008, amended 2015]**

2 Research recommendations

The Guideline Development Group has made the following recommendations for research, based on its review of evidence, to improve NICE guidance and patient care in the future. The Guideline Development Group's full set of research recommendations is detailed in the [full guideline](#).

2.1 *Preconception care for women with diabetes: blood glucose targets*

What are the roles of insulin pump therapy and continuous glucose monitoring in helping women with diabetes to achieve blood glucose targets before pregnancy?

Why this is important

Babies born to women with diabetes have a high risk of having congenital malformations and this risk is greater if blood glucose control is poor around the time of conception. However, lowering the risk to that of women without diabetes would require normalisation of blood glucose levels, and this is difficult to achieve without increasing the risk of serious hypoglycaemia.

Insulin pump therapy and continuous glucose monitoring have been shown to reduce both blood glucose levels and rates of hypoglycaemia in the non-pregnant population, but it is uncertain if this holds true before conception and in early pregnancy. There is therefore an urgent need to test the effectiveness and acceptability of these technologies in women with diabetes who are planning pregnancy. This would be best undertaken in a randomised controlled trial of women with diabetes trying to conceive. Women would be allocated to receive either conventional care (self-monitoring of blood glucose and insulin adjustment) or insulin pump therapy and continuous glucose monitoring.

2.2 *Screening for gestational diabetes*

When should screening for gestational diabetes take place – in the first or second trimester?

Why this is important

Conventionally, screening for gestational diabetes takes place in the second trimester. Intervention has been shown to improve outcomes for women diagnosed with gestational diabetes. However, maternal age and obesity are increasing, and some women (especially those from populations with a high incidence of type 2 diabetes) enter pregnancy with undiagnosed type 2 diabetes, but may not be tested for diabetes until the second trimester. This exposes the woman and the fetus to risks resulting from early and prolonged maternal hyperglycaemia. It is presumed that this is associated with increased morbidity. UK population studies are needed to establish the incidence of glucose intolerance in women in the first trimester, and well-designed randomised controlled trials are needed to establish if screening, diagnosis and intervention in the first rather than the second trimester improves maternal, fetal and neonatal outcomes, including fetal hyperinsulinaemia.

2.3 *Barriers to achieving blood glucose targets before and during pregnancy*

What are the barriers that women experience to achieving blood glucose targets?

Why this is important

Achieving good blood glucose control both before and during pregnancy in women with pre-existing diabetes is vital for normal fetal development in the first trimester. Good control also helps to prevent macrosomia and other complications in the third trimester in women with pre-existing or gestational diabetes. Whereas many women manage to achieve these targets, a proportion of women continue to find it difficult to do so. A number of factors could be involved, such as health beliefs, a poor understanding of the importance of good blood glucose control, an inability to be able to comply with a demanding regimen of up to 7-times daily blood glucose testing, and the need to adjust insulin dosage. A better understanding of the barriers in this cohort of women is needed so that healthcare professionals can work to overcome them. Robust qualitative studies are needed to explore these barriers, with the aim of improving blood glucose control and fetal outcomes in pregnancy for women with pre-existing diabetes and women with gestational diabetes.

2.4 *Risk of fetal death for women with diabetes*

How can fetuses at risk of intrauterine death be identified in women with diabetes?

Why this is important

Unexpected intrauterine death remains a significant contributor to perinatal mortality in pregnant women with diabetes. Conventional tests of fetal wellbeing (umbilical artery Doppler ultrasound, cardiotocography and other biophysical tests) have been shown to have poor sensitivity for predicting such events. Alternative approaches that include measurements of erythropoietin in the amniotic fluid and MRI spectroscopy may be effective, but there is currently insufficient clinical evidence to evaluate them. Well-designed randomised controlled trials that are sufficiently powered are needed to determine whether these approaches are clinically and cost effective.

2.5 *Postnatal treatment for women diagnosed with gestational diabetes*

Are there effective long-term pharmacological interventions that can be recommended postnatally for women who have been diagnosed with gestational diabetes to prevent the onset of type 2 diabetes?

Why this is important

Gestational diabetes is one of the strongest risk factors for the subsequent development of type 2 diabetes: up to 50% of women diagnosed with gestational diabetes develop type 2 diabetes within 5 years of the birth. There are some data suggesting that changes in diet and exercise, with or without metformin, can prevent type 2 diabetes developing in non-pregnant middle-aged people with glucose intolerance, but there are no studies specifically in women with a past history of gestational diabetes. There is thus an urgent need to investigate what interventions may delay or prevent type 2 diabetes developing in this high-risk population of women. Undertaking a formal randomised controlled trial involving long-term outcomes is often not feasible in practice. However, it would be possible to have a quasi-randomised study comparing 2 populations of women with similar demographic profiles who had gestational diabetes. One population would be encouraged at their annual check to follow a specific diet and exercise regime and those in the other population would not. The incidence of the development of type 2 diabetes in the 2 groups at 5, 10 and 20 years would be compared.

3 Other information

3.1 *Scope and how this guideline was developed*

NICE guidelines are developed in accordance with a [scope](#) that defines what the guideline will and will not cover.

How this guideline was developed

NICE commissioned the National Collaborating Centre for Women's and Children's Health to develop this guideline. The Centre established a Guideline Development Group (see [section 4](#)), which reviewed the evidence and developed the recommendations.

The methods and processes for developing NICE clinical guidelines are described in [The guidelines manual](#).

3.2 Related NICE guidance

Details are correct at the time of consultation on the guideline (September 2014). Further information is available on [the NICE website](#).

Published

General

- [Patient experience in adult NHS services](#). NICE clinical guidance 138 (2012).
- [Medicines adherence](#). NICE clinical guidance 76 (2009).

Condition-specific

- [Chronic kidney disease](#). NICE clinical guideline 182 (2014).
- [Obesity: working with local communities](#). NICE public health guidance 42 (2012).
- [Preventing type 2 diabetes: risk identification and interventions for individuals at high risk](#). NICE public health guidance 38 (2012).
- [Caesarean section](#). NICE clinical guideline 132 (2011).
- [Multiple pregnancy](#). NICE clinical guideline 129 (2011).
- [Diabetic foot problems](#). NICE clinical guideline 119 (2011).
- [Preventing type 2 diabetes: population and community-level interventions](#). NICE public health guidance 35 (2011).

DRAFT FOR CONSULTATION

- [Weight management before, during and after pregnancy](#). NICE public health guidance 27 (2010).
- [Hypertension in pregnancy](#). NICE clinical guideline 107 (2010).
- [Type 2 diabetes: newer agents](#). NICE clinical guideline 87 (2009).
- [Continuous subcutaneous insulin infusion for the treatment of diabetes mellitus](#). NICE technology appraisal guidance 151 (2008).
- [Induction of labour](#). NICE clinical guideline 70 (2008).
- [Antenatal care](#). NICE clinical guideline 62 (2008).
- [Smoking cessation services](#). NICE public health guidance 10 (2008).
- [Intrapartum care](#). NICE clinical guideline 55 (2007).
- [Antenatal and postnatal mental health](#). NICE clinical guideline 45 (2007).
- [Obesity](#). NICE clinical guideline 43 (2006).
- [Nutrition support in adults](#). NICE clinical guideline 32 (2006).
- [Postnatal care](#). NICE clinical guideline 37 (2006).
- [Four commonly used methods to increase physical activity](#). NICE public health guidance 2 (2006).

Under development

NICE is developing the following guidance (details available from [the NICE website](#)):

- Obesity (update). NICE clinical guideline. Publication expected November 2014.
- Intrapartum care (update). NICE clinical guideline. Publication expected December 2014.
- Type 1 diabetes in adults (update). NICE clinical guideline. Publication expected August 2015.
- Type 2 diabetes in adults (update). NICE clinical guideline. Publication expected August 2015.
- Diabetes in children and young people (update). NICE clinical guideline. Publication expected August 2015.

4 The Guideline Development Group, National Collaborating Centre and NICE project team

4.1 *Guideline Development Group*

The Guideline Development Group members listed are those for the 2015 update. For the composition of the previous Guideline Development Group, see the [full guideline](#).

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Appendix A: Recommendations from NICE clinical guideline 63 (2008) that have been deleted or changed

Recommendations to be deleted

The table shows recommendations from 2008 that NICE proposes deleting in the 2015 update. The right-hand column gives the replacement recommendation, or explains the reason for the deletion if there is no replacement recommendation

Recommendation in 2008 guideline	Comment
<p>1.1.5.4 Women with type 1 diabetes who are planning to become pregnant should be offered ketone testing strips and advised to test for ketonuria or ketonaemia if they become hyperglycaemic or unwell.</p>	<p>The GDG noted that Diabetes in children and young people GDG was recommending testing for ketonaemia rather than ketonuria and agreed this was a more accurate screen for ketosis, so deleted 'testing for ketonuria'</p>
<p>1.1.4.2a If it is safely achievable, women with diabetes who are planning to become pregnant should aim to maintain their HbA_{1c} below 6.1%.</p> <p>1.1.4.2b Women should be reassured that any reduction in HbA_{1c} towards the target of 6.1% is likely to reduce the risk of congenital malformations.</p>	<p>The GDG amended the HbA_{1c} values in these recommendations to align with the evidence reviewed replacing 6.1% with 48 mmol/mol (6.5%) evidence (see recommendation 1.1.18).</p>
<p>1.2.1.1 Healthcare professionals should be aware that the following have been shown to be independent risk factors for gestational diabetes:</p> <ul style="list-style-type: none"> • body mass index above 30 kg/m² • previous macrosomic baby weighing 4.5 kg or above • previous gestational diabetes • family history of diabetes (first-degree relative with diabetes) • family origin with a high prevalence of diabetes: <ul style="list-style-type: none"> – South Asian (specifically women whose country of family origin is India, Pakistan or Bangladesh) – black Caribbean – Middle Eastern (specifically women whose country of family origin is Saudi Arabia, United Arab Emirates, Iraq, Jordan, Syria, Oman, Qatar, Kuwait, Lebanon or Egypt). 	<p>This recommendation is redundant because the recommendation about screening for gestational diabetes using risk factors included the same list.</p>
<p>1.2.2.2 In order to make an informed decision about screening and testing for gestational diabetes, women should be informed that:</p> <ul style="list-style-type: none"> ▪ in most women, gestational diabetes will respond to changes in diet and exercise ▪ some women (between 10% and 20%) will need oral hypoglycaemic agents or insulin therapy if diet and exercise are not effective in controlling gestational diabetes ▪ if gestational diabetes is not 	<p>The GDG noted changed the first two bullet points to reflect the evidence (see recommendation 1.2.1):</p> <ul style="list-style-type: none"> • in some women, gestational diabetes will respond to changes in diet and exercise • most women (about 70%) will need oral blood glucose-lowering agents or insulin therapy if changes in diet and exercise do not control gestational diabetes effectively

<p>detected and controlled there is a small risk of birth complications such as shoulder dystocia</p> <ul style="list-style-type: none"> ▪ a diagnosis of gestational diabetes may lead to increased monitoring and interventions during both pregnancy and labour. 	
<p>1.2.2.4a The 2 hour 75 g oral glucose tolerance test (OGTT) should be used to test for gestational diabetes and diagnosis made using the criteria defined by the World Health Organization</p>	<p>One of the update questions for the guideline examined which were the best diagnostic criteria for gestational diabetes. The GDG ended up not recommending the WHO criteria so the second half of the sentence was deleted.</p>
<p>1.2.2.4b Women who have had gestational diabetes in a previous pregnancy should be offered early self-monitoring of blood glucose or OGTT at 16–18 weeks, and a further OGTT at 28 weeks if the results are normal.</p>	<p>As a result of reviewing the evidence for screening for gestational diabetes, the GDG concluded that some women with previous gestational diabetes would actually have developed unrecognised type 2 diabetes since the last pregnancy. For these women, leaving the screening for glucose intolerance until ‘16–18 weeks’ was too late. So they replaced this phrase in the recommendation with ‘as soon as possible after booking’ (see recommendation 1.2.6).</p>
<p>1.2.2.6 Women with gestational diabetes should be informed that good glycaemic control throughout pregnancy will reduce the risk of fetal macrosomia, trauma during birth (to themselves and the baby), induction of labour or caesarean section, neonatal hypoglycaemia and perinatal death.</p> <p>1.2.2.7 Women with gestational diabetes should be offered information covering:</p> <ul style="list-style-type: none"> • the role of diet, body weight and exercise • the increased risk of having a baby who is large for gestational age, which increases the likelihood of birth trauma, induction of labour and caesarean section • the importance of maternal glycaemic control during labour and birth and early feeding of the baby in order to reduce the risk of neonatal hypoglycaemia • the possibility of transient morbidity in the baby during the neonatal period, which may require admission to the neonatal unit ▪ • the risk of the baby developing 	<p>The GDG felt that these recommendations about information-giving for women with gestational diabetes were too complex and could be simplified to:</p> <p>1.2.10 Explain to women with gestational diabetes:</p> <ul style="list-style-type: none"> • about the implications (both short and long term) of the diagnosis for her and her baby • that good blood glucose control throughout pregnancy will reduce the risk of fetal macrosomia, trauma during birth (for her and her baby), induction of labour and/or caesarean section, neonatal hypoglycaemia and perinatal death • that treatment includes changes in diet and exercise, and could involve drugs. [new 2015]

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<p>obesity and/or diabetes in later life.</p>	
<p>1.2.2.8 Women with gestational diabetes should be advised to choose, where possible, carbohydrates from low glycaemic index sources, lean proteins including oily fish and a balance of polyunsaturated fats and monounsaturated fats.</p>	<p>The GDG felt that these recommendations were too complex and could be simplified to: 1.2.15 Advise women with gestational diabetes to eat a healthy diet during pregnancy, and emphasise that foods with a low glycaemic index should replace those with a high glycaemic index. [new 2015]</p>
<p>1.2.2.9 Women with gestational diabetes whose pre-pregnancy body mass index was above 27 kg/m² should be advised to restrict calorie intake (to 25 kcal/kg/day or less) and to take moderate exercise (of at least 30 minutes daily).</p>	<p>The GDG felt that these recommendations were too specific and not supported in the original guideline by the evidence and could be clarified and made more generally applicable by changing to: 1.2.14 Offer women advice about changes in diet and exercise at the time of diagnosis of gestational diabetes. [new 2015] 1.2.16 Advise women with gestational diabetes to take regular exercise (such as walking for 30 minutes after a meal) to improve blood glucose control. [new 2015]</p>
<p>1.2.2.10 Hypoglycaemic therapy should be considered for women with gestational diabetes if diet and exercise fail to maintain blood glucose targets during a period of 1–2 weeks 1.2.2.12 Hypoglycaemic therapy for women with gestational diabetes (which may include regular insulin, rapid-acting insulin analogues [aspart and lispro] and/or hypoglycaemic agents [metformin and glibenclamide] should be tailored to the glycaemic profile of, and acceptability to, the individual woman.</p>	<p>After reviewing the evidence the GDG made more comprehensive and detailed recommendations about treatment of women with gestational diabetes (recommendations 1.2.18 to 1.2.21)</p>
<p>1.2.2.11 Hypoglycaemic therapy should be considered in women with gestational diabetes if ultrasound investigation suggests incipient fetal macrosomia (abdominal circumference above the 70th percentile) at diagnosis.</p>	<p>The GDG reasoned that this was an unrealistic recommendation in the original guideline for several reasons. A fetus could be on the 70th centile for two reasons: (a) that was where he/she should be and has normal growth, or (b) is larger than he/she should be because of excessive growth resulting from maternal diabetes. In the former case the hypoglycaemic therapy would be introduced unnecessarily; in the latter case the hypoglycaemic therapy might be too late to arrest or reverse the abnormal growth. Thus the recommendation was</p>

	deleted.
1.3.2.1 Women with diabetes should be advised to test fasting blood glucose levels and blood glucose levels 1 hour after every meal during pregnancy. 1.3.2.2 Women with insulin-treated diabetes should be advised to test blood glucose levels before going to bed at night during pregnancy.	After reviewing the evidence the GDG made more comprehensive recommendations about monitoring glucose and ketones in pregnancy (see recommendations 1.3.1 to 1.3.6).
1.3.2.3 Women with type 1 diabetes who are pregnant should be offered ketone testing strips and advised to test for ketonuria or ketonaemia if they become hyperglycaemic or unwell.	The GDG noted that the Diabetes in children and young people GDG was recommending testing for ketonaemia and not ketonuria and agreed this was a more accurate screen for ketosis, so deleted 'testing for ketonuria'.
1.3.1.2 If it is safely achievable, women with diabetes should aim to keep fasting blood glucose between 3.5 and 5.9 mmol/litre and 1 hour postprandial blood glucose below 7.8 mmol/litre during pregnancy	The GDG changed the recommended targets on the basis of the evidence they reviewed – see recommendation 1.3.8.
1.4.1.1 Pregnant women with diabetes who have a normally grown fetus should be offered elective birth through induction of labour, or by elective caesarean section if indicated, after 38 completed weeks	The GDG made many more recommendations in this section on the basis of the evidence they reviewed – see recommendations 1.4.2 to 1.4.5.
1.6.2.4 Women who were diagnosed with gestational diabetes should be offered lifestyle advice (including weight control, diet and exercise) and offered a fasting plasma glucose measurement (but not an OGTT) at the 6 week postnatal check and annually thereafter.	The GDG made many more recommendations in this section on the basis of the evidence they reviewed – see recommendations 1.6.11 to 1.6.15.

Amended recommendation wording

Recommendations are labelled **[2008, amended 2015]** if the evidence has not been reviewed but either:

- changes have been made to the recommendation wording that change the meaning **or**
- NICE has made editorial changes to the original wording to clarify the action to be taken.

These changes are marked with yellow shading.

Recommendation(s) in 2008 guideline	Recommendation(s) in current guideline	Reason for change
<p>Women with diabetes should be offered a renal assessment, including a measure of microalbuminuria, before discontinuing contraception. If serum creatinine is abnormal (120 micromol/litre or more) or the estimated glomerular filtration rate (eGFR) is less than 45 ml/minute/1.73 m², referral to a nephrologist should be considered before discontinuing contraception. (1.1.11.1)</p>	<p>Offer women with diabetes a renal assessment, including a measure of microalbuminuria, before discontinuing contraception. If serum creatinine is abnormal (120 micromol/litre or more), the urinary albumin:creatinine ratio is greater than 30 mg/mmol or the estimated glomerular filtration rate (eGFR) is less than 45 ml/minute/1.73 m², referral to a nephrologist should be considered before discontinuing contraception. [2008, amended 2015] (1.1.34)</p>	<p>The text 'the urinary albumin:creatinine ratio is greater than 30 mg/mmol' has been added because this is the threshold used to define severe Chronic kidney disease (NICE clinical guideline 182). Minor editing changes to reflect current NICE style.</p>
<p>Screening for gestational diabetes using risk factors is recommended in a healthy population. At the booking appointment, the following risk factors for gestational diabetes should be determined:</p> <ul style="list-style-type: none"> • body mass index above 30 kg/m² • previous macrosomic baby weighing 4.5 kg or above • previous gestational diabetes • family history of diabetes (first-degree relative with diabetes) • family origin with a high prevalence of diabetes: <ul style="list-style-type: none"> – South Asian (specifically women whose country of family origin is India, Pakistan or Bangladesh) – black Caribbean – Middle Eastern (specifically women whose country of 	<p>Screen for gestational diabetes using risk factors in a healthy population. At the booking appointment, determine the following risk factors for gestational diabetes:</p> <ul style="list-style-type: none"> • BMI above 30 kg/m² • previous macrosomic baby weighing 4.5 kg or above • previous gestational diabetes • family history of diabetes (first-degree relative with diabetes) • minority ethnic family origin with a high prevalence of diabetes. <p>Offer women with any one of these risk factors testing for gestational diabetes (see recommendations 1.2.5–1.2.7). [2008, amended 2015] (1.2.2)</p>	<p>The GDG advised that the sub-bullets listing different family origin in the original recommendation did not cover all minority ethnic groups that have a high prevalence of diabetes. It is important that women in groups other than those that were listed are not overlooked for screening. Minor editing changes to reflect current NICE style, and the verb has been changed (no change to meaning).</p>

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<p>family origin is Saudi Arabia, United Arab Emirates, Iraq, Jordan, Syria, Oman, Qatar, Kuwait, Lebanon or Egypt).</p> <p>Women with any one of these risk factors should be offered testing for gestational diabetes (see recommendation 1.2.2.4). (4.3.1.1)</p>		
<p>During pregnancy, women with insulin-treated diabetes should be provided with a concentrated glucose solution and women with type 1 diabetes should also be given glucagon; women and their partners or other family members should be instructed in their use. (1.3.3.3)</p>	<p>Advise pregnant women with insulin-treated diabetes to always have available a fast-acting form of carbohydrate (for example, dextrose tablets or sugar-containing drinks). [2008, amended 2015] (1.3.15)</p> <p>Provide glucagon to pregnant women with type 1 diabetes for use if needed. Instruct the woman and her partner or other family members in its use. [2008, amended 2015] (1.3.16)</p>	<p>The GDG advised that the original recommendation no longer reflects usual clinical practice, and the changes take this into account. It was also felt that the information is clearer if it is divided into 2 recommendations because the actions are different in each.</p> <p>Minor editing changes to reflect current NICE style.</p>
<p>During pregnancy, women with type 1 diabetes who become unwell should have diabetic ketoacidosis excluded as a matter of urgency. (1.3.3.5)</p>	<p>Exclude diabetic ketoacidosis as a matter of urgency in any woman with diabetes who becomes unwell during pregnancy. [2008, amended 2015] (1.3.21)</p>	<p>The GDG advised that women with any form of diabetes, not only type 1 diabetes, are at risk of diabetic ketoacidosis.</p> <p>Minor editing changes to reflect current NICE style.</p>
<p>If renal assessment has not been undertaken in the preceding 12 months in women with pre-existing diabetes, it should be arranged at the first contact in pregnancy. If serum creatinine is abnormal (120 micromol/litre or more) or if total protein excretion exceeds 2 g/day, referral to a nephrologist should be considered (eGFR should not be used during</p>	<p>If renal assessment has not been undertaken in the preceding 12 months in women with pre-existing diabetes, arrange it at the first contact in pregnancy. If the serum creatinine is abnormal (120 micromol/litre or more), the urinary albumin:creatinine ratio is greater than 30 mg/mmol or total protein excretion exceeds 2 g/day, referral to a nephrologist should be considered (eGFR</p>	<p>The text 'the urinary albumin:creatinine ratio is greater than 30 mg/mmol' has been added because this is the threshold used to define severe disease in Chronic kidney disease (NICE clinical guideline 182).</p> <p>Minor editing changes to reflect current NICE style.</p>

<p>pregnancy). Thromboprophylaxis should be considered for women with proteinuria above 5 g/day (macroalbuminuria). (1.3.5.1)</p>	<p>should not be used during pregnancy). Thromboprophylaxis should be considered for women with proteinuria above 5 g/day (macroalbuminuria). [2008, amended 2015] (1.3.28)</p>	
<p>Women with diabetes should be offered antenatal examination of the four-chamber view of the fetal heart and outflow tracts at 18–20 weeks. (1.3.6.1)</p>	<p>Offer women with diabetes an ultrasound scan for detecting structural abnormalities and examination of the four-chamber view of the fetal heart and outflow tracts at 20 weeks. [2008, amended 2015] (1.3.29)</p>	<p>When reviewing and updating the Table of antenatal appointments in recommendation 1.3.35, the GDG became aware of some inconsistencies between the recommendations about the use of ultrasound to screen for structural abnormalities in the 2008 guideline. The relevant 2008 recommendations were recommendation 1.3.6.1 (listed) and the following wording in Table 1 (recommendation 1.3.8.3): ‘Offer four-chamber view of the fetal heart and outflow tracts plus scans that would be offered at 18–20 weeks as part of routine antenatal care’.</p> <p>However, the 2008 full guideline states that the ultrasound scan for detecting structural anomalies and anatomical examination of the four-chamber view of the fetal heart plus outflow tracts should take place at 20 weeks. This was because visualisation of fetal cardiac anatomy, including the four-chamber view, was better at 20 weeks than at 18 weeks.</p> <p>In view of this duplication of recommendations and inconsistency in gestational age, the GDG felt that it would be better to bring together the</p>

		<p>separate recommendations about screening for congenital abnormalities (scanning for structural abnormalities in general, scanning the four-chamber view of the fetal heart and performing the ultrasound scan at 20 weeks [rather than the usual 18 weeks in a non-diabetic pregnancy]) into 1 recommendation for greater clarity.</p> <p>Minor editing changes to reflect current NICE style.</p>
<p>Routine monitoring of fetal wellbeing before 38 weeks is not recommended in pregnant women with diabetes, unless there is a risk of intrauterine growth restriction.</p>	<p>Routine monitoring of fetal wellbeing (using methods such as fetal umbilical artery Doppler recording, fetal heart rate recording and biophysical profile testing) before 38 weeks is not recommended in pregnant women with diabetes, unless there is a risk of intrauterine growth restriction. [2008, amended 2015] (1.3.31)</p>	<p>Details have been added to the recommendation to make it clear which types of monitoring are being referred to – this recommendation does not refer to standard checks carried out by midwives.</p>
1.3.8.3	1.3.35	<p>Details in table 1 (Timetable of antenatal appointments) have been amended (highlighted in yellow in the table) to match changes to recommendations elsewhere in the guideline.</p> <p>Minor editing changes to reflect current NICE style.</p>
<p>Babies of women with diabetes who present with clinical signs of hypoglycaemia should have their blood glucose tested and be treated with intravenous dextrose as soon as possible. (1.5.2.5)</p>	<p>Test blood glucose levels in babies of women with diabetes who present with clinical signs of hypoglycaemia, and treat those who are hypoglycaemic with intravenous dextrose as soon as possible. [2008, amended 2015] (1.5.11)</p>	<p>The GDG recommended adding the text ‘those who are hypoglycaemic’ for clarity.</p> <p>Minor editing changes to reflect current NICE style.</p>
<p>Women who were diagnosed with gestational diabetes (including those with ongoing impaired</p>	<p>Explain to women who were diagnosed with gestational diabetes about the risks of gestational</p>	<p>The text ‘(including those with ongoing impaired glucose regulation)’ has been removed because it</p>

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<p>glucose regulation) should be informed about the risks of gestational diabetes in future pregnancies and they should be offered screening (OGTT or fasting plasma glucose) for diabetes when planning future pregnancies. (1.6.2.5)</p>	<p>diabetes in future pregnancies, and offer them screening for diabetes when planning future pregnancies (see recommendation 1.6.14). [2008, amended 2015] (1.6.10)</p>	<p>did not make any sense: anyone with 'ongoing impaired glucose regulation' needs ongoing surveillance and care from the diabetic team. This recommendation was intended for women who have no evidence of any glucose intolerance after birth.</p> <p>The text '(OGTT or fasting plasma glucose)' has been removed because details of screening tests are covered in subsequent new recommendations.</p> <p>Minor editing changes to reflect current NICE style, and the verb used has been changed (without changing the meaning)</p>
<p>Women who were diagnosed with gestational diabetes (including those with ongoing impaired glucose regulation) should be offered early self-monitoring of blood glucose or an OGTT in future pregnancies. A subsequent OGTT should be offered if the test results in early pregnancy are normal (see recommendation 1.2.2.4). (1.6.2.6)</p>	<p>Offer women who were diagnosed with gestational diabetes early self-monitoring of blood glucose or an OGTT in future pregnancies. Offer a subsequent OGTT if the test results in early pregnancy are normal (see recommendation 1.2.6). [2008, amended 2015] (1.6.15)</p>	<p>The text '(including those with ongoing impaired glucose regulation)' has been removed because it did not make sense: anyone with 'ongoing impaired glucose regulation' needs ongoing surveillance and care from the diabetic team. This recommendation was intended for women who have no evidence of any glucose intolerance after birth.</p>
<p>1.1.2.1, 1.1.8.3, 1.3.4.4, 1.3.7.3, 1.3.8.2, 1.3.9.2, 1.4.3.1, 1.4.3.3, 1.5.2.3, 1.5.2.4</p>	<p>1.1.4, 1.1.28, 1.3.26, 1.3.32, 1.3.34, 1.3.37, 1.4.10, 1.4.12, 1.5.9, 1.5.10,</p>	<p>NICE has made editorial changes to the original wording to clarify the action to be taken (no change to meaning): a verb has been added, or the verb used has been changed.</p>

Changes to recommendation wording for clarification only

Recommendation numbers in current guideline	Comment
All recommendations except those labelled [new 2015]	Recommendations have been edited into the direct style (in line with current NICE style for recommendations in clinical guidelines) where possible. Where applicable, terminology has been made consistent within the guideline and with terminology that will be used in other updates of NICE guidelines on diabetes (type 1 diabetes, type 2 diabetes, diabetes in children and young people; publication expected August 2015) – for example, ‘impaired awareness of hypoglycaemia’ rather than ‘hypoglycaemia unawareness’; ‘blood glucose control’ rather than ‘glycaemic control’; ‘blood glucose-lowering therapy’ rather than ‘hypoglycaemic therapy’. Yellow highlighting has not been applied to any of these changes.