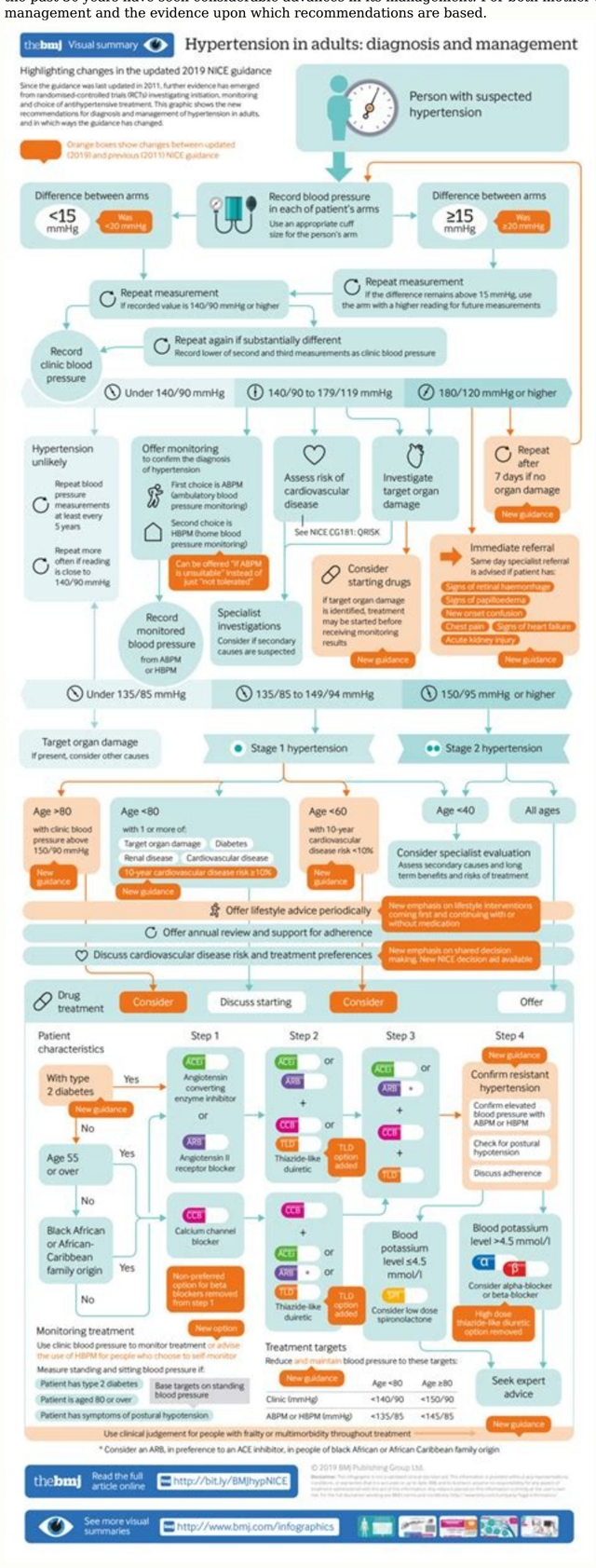


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Hypertension in pregnancy nice guidelines 2019

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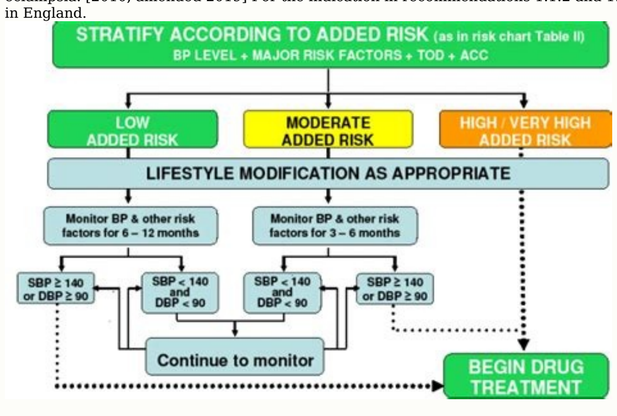
Hypertension in pregnancy may indicate a chronic medical problem, gestational hypertension (new hypertension without proteinuria) or pre-eclampsia (new hypertension with new proteinuria). Chronic hypertension can mimic gestational hypertension and strongly predisposes to superimposed pre-eclampsia. Gestational hypertension is often benign but may also be an early stage in the development of pre-eclampsia.Pre-eclampsia is not benign. Previously the first cause of maternal death in the UK, it is now the second.1 Maternal deaths from pre-eclampsia have not fallen recently and, most disturbingly, are associated with the highest rates of substandard care, of all causes of maternal deaths.1 It is also the most important reason for iatrogenic prematurity, a major contributor to perinatal mortality and a substantial cause of fetal growth restriction, especially with preterm disease.2 Pre-eclampsia cannot be reliably prevented or reversed once it is established except by delivery, which removes the cause—namely, the placenta. Nevertheless, the past 30 years have seen considerable advances in its management. For both mother and baby the outlook is better than it was, at least in the developed world.The new NICE guidelines for the management of hypertension in pregnancy (available on line at , comprising more than 1000 pages including appendices, ambitiously review every aspect of management and the evidence upon which recommendations are based.



The breadth of the guidelines reflects the complexities of their subject. They deal with many specific obstetric issues but of course the management of hypertension itself is a primary focus. Cardiovascular, obstetric or intensive care doctors will, or may be, involved at some stage, and these guidelines are also addressed to them.Hypertension is defined as in table 1. Methods of measuring blood pressure are specified separately in the NICE guidelines on antenatal care3, where the need to use devices validated specifically for use … Page 2 Hypertensive disorders during pregnancy affect around 8% to 10% of all pregnant women and can be associated with substantial complications for the woman and the baby. Women can have hypertension before pregnancy or it can be diagnosed in the first 20 weeks (known as chronic hypertension), new onset of hypertension occurring in the second half of pregnancy (gestational hypertension) or new hypertension with features of multi-organ involvement (pre-eclampsia). Although the proportion of women with pregnancy hypertensive disorders overall appears to have stayed reasonably stable, maternal mortality from hypertensive causes has fallen dramatically: less than 1 woman in every million who gives birth now dies from pre-eclampsia. There is consensus that introduction of the 2010 NICE evidence-based guidelines, together with the findings from the confidential enquiry into maternal deaths, has made a pivotal contribution to this fall in maternal mortality.

However, hypertension in pregnancy continues to cause substantial maternal morbidity, stillbirths and neonatal deaths, and perinatal morbidity. Women with hypertension in pregnancy are also at increased risk of cardiovascular disease later in life. Variations in care contribute to inequity in adverse outcomes. Adoption and implementation of evidence-based national guidelines have a central role in reducing this variance and improving care and outcomes across the maternity service. Research that has been done since publication of the previous guideline has addressed areas of uncertainty and highlighted where the recommendations can be updated. A surveillance report from 2017 identified new studies in the following areas: management of pregnancy with chronic hypertension management of pregnancy with gestational hypertension management of pregnancy with pre-eclampsia breastfeeding advice and follow-up care at transfer to community care.

The scope of this update was limited to these sections; it did not include other areas being looked at by other groups (for example, screening strategies for pre-eclampsia, which is being evaluated by the UK National Screening Committee), and did not look into alternative approaches to categorisation of hypertension in pregnancy (for example, looking at treatment for all types of pregnancy hypertension together, rather than within the subdivisions of chronic hypertension, gestational hypertension and pre-eclampsia). This update has also clarified the basis for the current definition of pre-eclampsia, in order to better align with the stated aims of the 2010 guideline to be consistent with those agreed by the International Society for the Study of Hypertension in Pregnancy (ISSHP). The aim of the 2019 guideline is to present updated evidence-based recommendations, relevant to practising clinicians, while identifying outstanding areas of uncertainty that need further research. There is a strong argument for uptake of these new guidelines into clinical practice, in order to minimise unnecessary variance and provide optimal care for women and their babies. In doing this, low rates of maternal mortality should be maintained, and progress on reduction of maternal morbidity and perinatal morbidity and mortality can be pursued. 1.1.1 Advise pregnant women to see a healthcare professional immediately if they experience symptoms of pre-eclampsia. Symptoms include: severe headache problems with vision, such as blurring or flashing before the eyes severe pain just below the ribs vomiting sudden swelling of the face, hands or feet. See the NICE guideline on antenatal care for advice on risk factors and symptoms of pre-eclampsia. [2010, amended 2019] For the indication in recommendations 1.1.2 and 1.1.3, although its use is common in UK clinical practice, at the time of publication (June 2019), aspirin did not have a UK marketing authorisation. Community pharmacies cannot legally sell aspirin as a pharmacy medicine for prevention of pre-eclampsia in pregnancy in England.



Aspirin for this indication must be prescribed.

Table 16. Anti-hypertensive Drugs Commonly Used in Pregnancy

Drug	Remarks
Methyldopa	Oral 250 mg tds, doubling every 48 hours (up to 1 gm tds) until BP well controlled. Oldest anti-hypertensive agent used in pregnancy, with best safety profile.
Labetalol	Oral 100 mg bd, doubling every 48 hours (up to 400mg bd) until BP well controlled.
Nifedipine	Oral 10 mg tds, up to 20 mg tds, usually as second line anti-hypertensive, when BP poorly controlled despite maximum doses of methyldopa ± labetalol.

Drug	Remarks
Hydralazine*	5 mg IV bolus or IM, then 5–10 mg every 20–40 minutes up to 30 mg, or IV infusion of 0.5-10 mg per hour.
Labetalol	20 mg IV bolus, then 40 mg 10–15 minutes later, then 80 mg every 10–15 minutes, up to 220 mg; or continuous IV infusion of 1–2 mg/minute until BP stabilizes, then stop or reduce to 0.5 mg/minute. May cause fetal bradycardia.
Nifedipine	Oral 5–10 mg stat (repeat in 30 minutes if necessary), especially prior to transferring a patient from a peripheral clinic to hospital. After the initial emergency dose, 10–20 mg can be given every 3–6 hours until BP stabilizes.

* Hydralazine is no longer recommended as first line treatment for acute hypertensive crisis in pregnancy.[255]

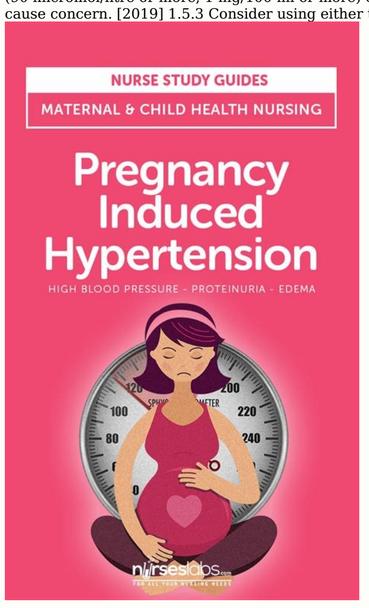
Table 18. Anti-convulsant for Eclampsia (and Severe Preeclampsia)

Drug	Remarks
Magnesium Sulphate[265,266]	IV: 4g slow bolus over 10 minutes, followed by 1-2 g/hour maintenance infusion given via a controlled infusion pump. IM: 4g IV slow bolus over 10 minutes, followed immediately by 10g IM, then 5 g IM every 4 hours in alternate buttock. Clinical monitoring is of utmost importance, looking for signs of toxicity (especially loss of deep tendon reflexes, respiratory depression with rate <16/minute) and renal impairment (hourly urine output <30 ml/hour).
Diazepam[266]	10 mg IV bolus, followed by 40 mg in 5% dextrose slow infusion so that patient remains sedated.

The prescriber should see the summary of product characteristics for the manufacturer's advice on use in pregnancy. See NICE's information on prescribing medicines. 1.1.2 Advise pregnant women at high risk of pre-eclampsia to take 75 mg to 150 mg of aspirin daily from 12 weeks until the birth of the baby. Women at high risk are those with any of the following: hypertensive disease during a previous pregnancy chronic kidney disease autoimmune disease such as systemic lupus erythematosus or antiphospholipid syndrome type 1 or type 2 diabetes chronic hypertension. [2010, amended 2019] 1.1.3 Advise pregnant women with more than 1 moderate risk factor for pre-eclampsia to take 75 mg to 150 mg of aspirin daily from 12 weeks until the birth of the baby. Factors indicating moderate risk are: nulliparity age 40 years or older pregnancy interval of more than 10 years body mass index (BMI) of 35 kg/m2 or more at first visit family history of pre-eclampsia multi-fetal pregnancy. [2010, amended 2019] 1.1.4 Do not use the following to prevent hypertensive disorders during pregnancy: nitric oxide donors progesterone diuretics low molecular weight heparin. [2010] 1.1.5 Do not recommend the following supplements solely with the aim of preventing hypertensive disorders during pregnancy: magnesium folic acid antioxidants (vitamins C and E) fish oils or algal oils garlic. [2010] 1.1.6 Do not recommend salt restriction during pregnancy solely to prevent gestational hypertension or pre-eclampsia. [2010] 1.1.7 Give the same advice on rest, exercise and work to women with chronic hypertension or at risk of hypertensive disorders during pregnancy as healthy pregnant women. See the NICE guideline on antenatal care. [2010, amended 2019] 1.2.1 Interpret proteinuria measurements for pregnant women in the context of a full clinical review of symptoms, signs and other investigations for pre-eclampsia. [2019] 1.2.2 Use an automated reagent-strip reading device for dipstick screening for proteinuria in pregnant women in secondary care settings. [2019] 1.2.3 If dipstick screening is positive (1+ or more), use albumin:creatinine ratio or protein:creatinine ratio to quantify proteinuria in pregnant women. [2019] 1.2.4 Do not use first morning urine void to quantify proteinuria in pregnant women. [2019] 1.2.5 Do not routinely use 24-hour urine collection to quantify proteinuria in pregnant women. [2019] 1.2.6 If using protein:creatinine ratio to quantify proteinuria in pregnant women: use 30 mg/mmol as a threshold for significant proteinuria if the result is 30 mg/mmol or above and there is still uncertainty about the diagnosis of pre-eclampsia, consider re-testing on a new sample, alongside clinical review. [2019] 1.2.7 If using albumin:creatinine ratio as an alternative to protein:creatinine ratio to diagnose pre-eclampsia in pregnant women with hypertension: use 8 mg/mmol as a diagnostic threshold if the result is 8 mg/mmol or above and there is still uncertainty about the diagnosis of pre-eclampsia, consider re-testing on a new sample, alongside clinical review. [2019] 1.3.1 Offer women with chronic hypertension referral to a specialist in hypertensive disorders of pregnancy to discuss the risks and benefits of treatment. [2010, amended 2019] 1.3.2 Advise women who take angiotensin-converting enzyme (ACE) inhibitors or angiotensin II receptor blockers (ARBs): that there is an increased risk of congenital abnormalities if these drugs are taken during pregnancy to discuss alternative antihypertensive treatment with the healthcare professional responsible for managing their hypertension, if they are planning pregnancy to discuss alternative treatment with the healthcare professional responsible for managing their condition, if ACE inhibitors or ARBs are being taken for other conditions such as renal disease. [2010, amended 2019]In 2014, the Medicines and Healthcare products Regulatory Agency (MHRA) issued a drug safety update on ACE inhibitors and angiotensin II receptor antagonists: not for use in pregnancy, which states 'Use in women who are planning pregnancy should be avoided unless absolutely necessary, in which case the potential risks and benefits should be discussed'. 1.3.3 Stop antihypertensive treatment in women taking ACE inhibitors or ARBs if they become pregnant (preferably within 2 working days of notification of pregnancy) and offer alternatives. [2010] 1.3.4 Advise women who take thiazide or thiazide-like diuretics: that there may be an increased risk of congenital abnormalities and neonatal complications if these drugs are taken during pregnancy to discuss alternative antihypertensive treatment with the healthcare professional responsible for managing their hypertension, if they are planning pregnancy. [2010, amended 2019] 1.3.5 Advise women who take antihypertensive treatments other than ACE inhibitors, ARBs, thiazide or thiazide-like diuretics that the limited evidence available has not shown an increased risk of congenital malformation with such treatments. [2010, amended 2019] 1.3.6 Offer pregnant women with chronic hypertension advice on: 1.3.7 Continue with existing antihypertensive treatment if safe in pregnancy, or switch to an alternative treatment, unless: sustained systolic blood pressure is less than 110 mmHg or sustained diastolic blood pressure is less than 70 mmHg or the woman has symptomatic hypotension. [2019] 1.3.8 Offer antihypertensive treatment to pregnant women who have chronic hypertension and who are not already on treatment if they have: sustained systolic blood pressure of 140 mmHg or higher or sustained diastolic blood pressure of 90 mmHg or higher. [2019] 1.3.9 When using medicines to treat hypertension in pregnancy, aim for a target blood pressure of 135/85 mmHg. [2019] 1.3.10 Consider labetalol to treat chronic hypertension in pregnant women. Consider nifedipine for women in whom labetalol is not suitable, or methyldopa if both labetalol and nifedipine are not suitable. Base the choice on any pre-existing treatment, side-effect profiles, risks (including fetal effects) and the woman's preference. [2019]At the time of publication (June 2019), some brands of nifedipine were specifically contraindicated during pregnancy by the manufacturer in its summary of product characteristics. Refer to the individual summaries of product characteristics for each preparation of nifedipine for further details. See NICE's information on prescribing medicines. 1.3.11 Offer pregnant women with chronic hypertension aspirin 75 mg to 150 mg once daily from 12 weeks. [2019]Although its use is common in UK clinical practice, at the time of publication (June 2019), aspirin did not have a UK marketing authorisation for this indication. Community pharmacies cannot legally sell aspirin as a pharmacy medicine for prevention of pre-eclampsia in pregnancy in England. Aspirin for this indication must be prescribed. The prescriber should see the summary of product characteristics for the manufacturer's advice on use in pregnancy. See NICE's information on prescribing medicines. 1.3.12 Offer placental growth factor (PLGF)-based testing to help rule out pre-eclampsia between 20 weeks and 36 weeks and 6 days of pregnancy, if women with chronic hypertension are suspected of developing pre-eclampsia. (See the NICE diagnostics guidance on PLGF-based testing to help diagnose suspected preterm pre-eclampsia). [2019, amended 2023] 1.3.13 In women with chronic hypertension, schedule additional antenatal appointments based on the individual needs of the woman and her baby. This may include: weekly appointments if hypertension is poorly controlled appointments every 2 to 4 weeks if hypertension is well-controlled. [2010, amended 2019] 1.3.14 Do not offer planned early birth before 37 weeks to women with chronic hypertension whose blood pressure is lower than 160/110 mmHg, with or without antihypertensive treatment, unless there are other medical indications. [2010, amended 2019] 1.3.15 For women with chronic hypertension whose blood pressure is lower than 160/110 mmHg after 37 weeks, with or without antihypertensive treatment, timing of birth and maternal and fetal indications for birth should be agreed between the woman and the senior obstetrician. [2010] 1.3.16 If planned early birth is necessary (see recommendation 1.5.7 in the section on timing of birth), offer a course of antenatal corticosteroids and magnesium sulfate if indicated, in line with the NICE guideline on preterm labour and birth. [2010, amended 2019] 1.3.17 In women with chronic hypertension who have given birth, measure blood pressure: daily for the first 2 days after birth at least once between day 3 and day 5 after birth as clinically indicated if antihypertensive treatment is changed after birth.
[2010] 1.3.18 In women with chronic hypertension who have given birth: 1.3.19 If a woman has taken methyldopa to treat chronic hypertension during pregnancy, stop within 2 days after the birth and change to an alternative antihypertensive treatment (for choice of antihypertensive during the postnatal period, see the section on antihypertensive treatment during the postnatal period, including during breastfeeding). [2010, amended 2019] 1.3.20 Offer women with chronic hypertension a medical review 6 to 8 weeks after the birth with their GP or specialist as appropriate. [2010, amended 2019] 1.4.1 In women with gestational hypertension, a full assessment should be carried out in a secondary care setting by a healthcare professional who is trained in the management of hypertensive disorders of pregnancy. [2010, amended 2019] 1.4.2 In women with gestational hypertension, take account of the following risk factors that require additional assessment and follow-up: nulliparity age 40 years or older pregnancy interval of more than 10 years family history of pre-eclampsia multi-fetal pregnancy BMI of 35 kg/m2 or more gestational age at presentation previous history of pre-eclampsia or gestational hypertension pre-existing vascular disease pre-existing kidney disease. [2010] 1.4.3 Offer women with gestational hypertension the tests and treatment listed in table 1. [2019] 1.4.4 Offer placental growth factor (PLGF)-based testing to help rule out pre-eclampsia in women presenting with suspected pre-eclampsia (for example, with gestational hypertension) between 20 weeks and 36 weeks and 6 days of pregnancy. (See the NICE diagnostics guidance on PLGF-based testing to help diagnose suspected preterm pre-eclampsia.) [2019, amended 2023] 1.4.5 Consider labetalol to treat gestational hypertension. Consider nifedipine for women in whom labetalol is not suitable, and methyldopa if labetalol or nifedipine are not suitable.



Base the choice on side-effect profiles, risk (including fetal effects) and the woman's preferences. [2010, amended 2019]At the time of publication (June 2019), some brands of nifedipine were specifically contraindicated during pregnancy by the manufacturer in its summary of product characteristics. Refer to the individual summaries of product characteristics for each preparation of nifedipine for further details. See NICE's information on prescribing medicines. 1.4.6 Do not offer bed rest in hospital as a treatment for gestational hypertension. [2010] 1.4.7 Do not offer planned early birth before 37 weeks to women with gestational hypertension whose blood pressure is lower than 160/110 mmHg, unless there are other medical indications.
[2010, amended 2019] 1.4.8 For women with gestational hypertension whose blood pressure is lower than 160/110 mmHg after 37 weeks, timing of birth, and maternal and fetal indications for birth should be agreed between the woman and the senior obstetrician. [2010, amended 2019] 1.4.9 If planned early birth is necessary (see recommendation 1.5.7 in the section on timing of birth), offer a course of antenatal corticosteroids and magnesium sulfate if indicated, in line with the NICE guideline on preterm labour and birth. [2010, amended 2019] 1.4.10 In women with gestational hypertension who have given birth, measure blood pressure: daily for the first 2 days after birth at least once between day 3 and day 5 after birth as clinically indicated if antihypertensive treatment is changed after birth. [2010] 1.4.11 In women with gestational hypertension who have given birth: continue antihypertensive treatment if required (for choice of antihypertensive during the postnatal period, see the section on antihypertensive treatment during the postnatal period, including during breastfeeding) advise women that the duration of their postnatal antihypertensive treatment will usually be similar to the duration of their antenatal treatment (but may be longer) reduce antihypertensive treatment if their blood pressure falls below 130/80 mmHg. [2010, amended 2019] 1.4.12 If a woman has taken methyldopa to treat gestational hypertension, stop within 2 days after the birth and change to an alternative treatment if necessary (for choice of antihypertensive during the postnatal period, see the section on antihypertensive treatment during the postnatal period, including during breastfeeding). [2010, amended 2019] 1.4.13 For women with gestational hypertension who did not take antihypertensive treatment and have given birth, start antihypertensive treatment if their blood pressure is 150/100 mmHg or higher. [2010, amended 2019] 1.4.14 Write a care plan for women with gestational hypertension who have given birth and are being transferred to community care that includes all of the following: who will provide follow-up care, including medical review if needed frequency of blood pressure monitoring needed thresholds for reducing or stopping treatment indications for referral to primary care for blood pressure review.
[2010] 1.4.15 Offer women who have had gestational hypertension and who remain on antihypertensive treatment, a medical review with their GP or specialist 2 weeks after transfer to community care. [2010, amended 2019] 1.4.16 Offer all women who have had gestational hypertension a medical review with their GP or specialist 6 to 8 weeks after the birth. [2010, amended 2019] 1.5.1 Assessment of women with pre-eclampsia should be performed by a healthcare professional trained in the management of hypertensive disorders of pregnancy. [2010, amended 2019] 1.5.2 Carry out a full clinical assessment at each antenatal appointment for women with pre-eclampsia, and offer admission to hospital for surveillance and any interventions needed if there are concerns for the wellbeing of the woman or baby. Concerns could include any of the following: sustained systolic blood pressure of 160 mmHg or higher any maternal biochemical or haematological investigations that cause concern, for example, a new and persistent: rise in creatinine (90 micromol/litre or more, 1 mg/100 ml or more) or rise in alanine transaminase (over 70 IU/litre, or twice upper limit of normal range) or fall in platelet count (under 150,000/microlitre) signs of impending eclampsia signs of impending pulmonary oedema other signs of severe pre-eclampsia suspected fetal compromise any other clinical signs that cause concern. [2019] 1.5.3 Consider using either the fullPIERS or PREP-S validated risk prediction models to help guide decisions about the most appropriate place of care (such as the need for in utero transfer) and thresholds for intervention.



[2019] 1.5.4 When using a risk prediction model, take into account that: fullPIERS is intended for use at any time during pregnancy PREP-S is intended for use only up to 34 weeks of pregnancy fullPIERS and PREP-S models do not predict outcomes for babies. [2019] 1.5.5 Offer women with pre-eclampsia the tests and treatments listed in table 2. [2019] 1.5.6 Offer labetalol to treat hypertension in pregnant women with pre-eclampsia. Offer nifedipine for women in whom labetalol is not suitable, and methyldopa if labetalol or nifedipine are not suitable. Base the choice on any pre-existing treatment, side-effect profiles, risks (including fetal effects) and the woman's preference. [2010, amended 2019]At the time of publication (June 2019), some brands of nifedipine were specifically contraindicated during pregnancy by the manufacturer in its summary of product characteristics. Refer to the individual summaries of product characteristics for each preparation of nifedipine for further details. See NICE's information on prescribing medicines. 1.5.7 Record maternal and fetal thresholds for planned early birth before 37 weeks in women with pre-eclampsia. Thresholds for considering planned early birth could include (but are not limited to) any of the following known features of severe pre-eclampsia: inability to control maternal blood pressure despite using 3 or more classes of antihypertensives in appropriate doses maternal pulse oximetry less than 90% progressive deterioration in liver function, renal function, haemolysis, or platelet count ongoing neurological features, such as severe intractable headache, repeated visual scotomata, or eclampsia placental abruption reversed end-diastolic flow in the umbilical artery doppler velocimetry, a non-reassuring cardiotocograph, or stillbirth. Other features not listed above may also be considered in the decision to plan early birth. [2019]Be aware that some pulse oximeters can underestimate or overestimate oxygen saturation levels, especially if the saturation level is borderline. Overestimation has been reported in people with dark skin. See also the NHS England Patient Safety Alert on the risk of harm from inappropriate placement of pulse oximeter probes.
1.5.8 Involve a senior obstetrician in any decisions on timing of birth for women with pre-eclampsia. [2010, amended 2019] 1.5.9 Discuss with the anaesthetic team if birth is planned in a woman with pre-eclampsia. [2010, amended 2019] 1.5.10 Discuss with the neonatal team if birth is planned in a woman with pre-eclampsia, and neonatal complications are anticipated. [2010, amended 2019] 1.5.11 Offer intravenous magnesium sulfate and a course of antenatal corticosteroids if indicated, if early birth is planned for women with preterm pre-eclampsia, in line with the NICE guideline on preterm labour and birth. [2010, amended 2019] 1.5.12 Decide on timing of birth in women with pre-eclampsia as recommended in table 3.
[2019] 1.5.13 In women with pre-eclampsia who did not take antihypertensive treatment and have given birth, measure blood pressure: at least 4 times a day while the woman is an inpatient at least once between day 3 and day 5 after birth on alternate days until normal, if blood pressure was abnormal on days 3 to 5. [2010] 1.5.14 In women with pre-eclampsia who did not take antihypertensive treatment and have given birth, start antihypertensive treatment if blood pressure is 150/100 mmHg or higher. [2010] 1.5.15 Ask women with pre-eclampsia who have given birth about severe headache and epigastric pain each time blood pressure is measured. [2010] 1.5.16 In women with pre-eclampsia who took antihypertensive treatment and have given birth, measure blood pressure: at least 4 times a day while the woman is an inpatient every 1 to 2 days for up to 2 weeks after transfer to community care until the woman is off treatment and has no hypertension. [2010] 1.5.17 For women with pre-eclampsia who have taken antihypertensive treatment and have given birth: 1.5.18 If a woman has taken methyldopa to treat pre-eclampsia, stop within 2 days after the birth and change to an alternative treatment if necessary (for choice of antihypertensive during the postnatal period, see the section on antihypertensive treatment during the postnatal period, including during breastfeeding). [2010, amended 2019] 1.5.19 Offer women with pre-eclampsia who have given birth transfer to community care if all of the following criteria have been met: there are no symptoms of pre-eclampsia blood pressure, with or without treatment, is 150/100 mmHg or less blood test results are stable or improving. [2010, amended 2019] 1.5.20 Write a care plan for women with pre-eclampsia who have given birth and are being transferred to community care that includes all of the following: who will provide follow-up care, including medical review if needed frequency of blood pressure monitoring thresholds for reducing or stopping treatment indications for referral to primary care for blood pressure review self-monitoring for symptoms. [2010] 1.5.21 Offer women who have had pre-eclampsia and who remain on antihypertensive treatment, a medical review with their GP or specialist 2 weeks after transfer to community care. [2010, amended 2019] 1.5.22 Offer all women who have had pre-eclampsia a medical review with their GP or specialist 6 to 8 weeks after the birth. [2010, amended 2019] 1.5.23 In women who have pre-eclampsia with mild or moderate hypertension, or after step-down from critical care: measure platelet count, transaminases and serum creatinine 48 to 72 hours after birth or step-down do not repeat platelet count, transaminases or serum creatinine measurements if results are normal at 48 to 72 hours. [2010] 1.5.24 If biochemical and haematological indices are outside the reference range in women with pre-eclampsia who have given birth, repeat platelet count, transaminases and serum creatinine measurements as clinically indicated until results return to normal. [2010, amended 2019] 1.5.25 In women with pre-eclampsia who have given birth, carry out a urinary reagent-strip test 6 to 8 weeks after the birth.
[2010] 1.5.26 Offer women who had pre-eclampsia and still have proteinuria (1+ or more) at 6 to 8 weeks after the birth, a further review with their GP or specialist at 3 months after the birth to assess kidney function. [2010, amended 2019] 1.5.27 Consider referring women with an abnormal kidney function assessment at 3 months for a specialist kidney assessment in line with the NICE guideline on chronic kidney disease. [2010, amended 2019] 1.6.1 In women with chronic hypertension, carry out an ultrasound for fetal growth and amniotic fluid volume assessment, and umbilical artery doppler velocimetry at 28 weeks, 32 weeks and 36 weeks. [2010, amended 2019] 1.6.2 In women with chronic hypertension, only carry out cardiotocography if clinically indicated.
[2010, amended 2019] 1.6.3 In women with gestational hypertension, carry out an ultrasound for fetal growth and amniotic fluid volume assessment and umbilical artery doppler velocimetry at diagnosis and if normal repeat every 2 to 4 weeks, if clinically indicated. [2010, amended 2019] 1.6.4 In women with gestational hypertension, only carry out cardiotocography if clinically indicated. [2010, amended 2019] 1.6.5 Carry out cardiotocography at diagnosis of pre-eclampsia or severe gestational hypertension.
[2010] 1.6.6 If conservative management of pre-eclampsia or severe gestational hypertension is planned, carry out all the following tests at diagnosis: ultrasound for fetal growth and amniotic fluid volume assessment umbilical artery doppler velocimetry. [2010] 1.6.7 If the results of all fetal monitoring are normal in women with pre-eclampsia or severe gestational hypertension, do not routinely repeat cardiotocography unless clinically indicated. [2010, amended 2019] 1.6.8 In women with pre-eclampsia or severe gestational hypertension, repeat cardiotocography if any of the following occur: the woman reports a change in fetal movement vaginal bleeding abdominal pain deterioration in maternal condition. [2010] 1.6.9 In women with pre-eclampsia or severe gestational hypertension, repeat ultrasound for fetal growth and amniotic fluid volume assessment or umbilical artery doppler velocimetry every 2 weeks, with subsequent surveillance and monitoring determined by the findings of these scans. [2010, amended 2019] 1.6.10 For women with pre-eclampsia or severe gestational hypertension, write a care plan that includes all of the following: the timing and nature of future fetal monitoring fetal indications for birth and if and when antenatal corticosteroids should be given plans for discussion with neonatal paediatricians and obstetric anaesthetists. [2010, amended 2019] 1.6.11 Carry out an ultrasound for fetal growth and amniotic fluid volume assessment and umbilical artery doppler velocimetry starting at between 28 and 30 weeks (or at least 2 weeks before previous gestational age of onset if earlier than 28 weeks) and repeating 4 weeks later in women with previous: severe pre-eclampsia pre-eclampsia that resulted in birth before 34 weeks pre-eclampsia with a baby whose birth weight was less than the 10th centile intrauterine death placental abruption. [2010] 1.6.12 In women who need additional fetal monitoring (see recommendation 1.6.11), carry out cardiotocography only if clinically indicated. [2010, amended 2019] 1.7.1 Give advice and treatment to women with hypertensive disorders of pregnancy in line with the NICE guideline on intrapartum care, unless there are recommendations in this guideline on the same topic. Offer care in accordance with the NICE guideline on intrapartum care for women with hypertension whether treated or untreated, and not just on the basis of blood pressure in labour. [2010, amended 2019] 1.7.3 During labour, measure blood pressure: hourly, in women with hypertension every 15 to 30 minutes until blood pressure is less than 160/110 mmHg in women with severe hypertension. [2010, amended 2019] 1.7.4 Continue use of antenatal antihypertensive treatment during labour. [2010] 1.7.6 Do not preload women who have severe pre-eclampsia with intravenous fluids before establishing low-dose epidural analgesia or combined spinal epidural analgesia. [2010, amended 2019] 1.7.7 Do not routinely limit the duration of the second stage of labour in women with controlled hypertension. [2010, amended 2019] 1.7.8 Consider operative or assisted birth in the second stage of labour for women with severe hypertension whose hypertension has not responded to initial treatment. [2010, amended 2019] 1.8.1 If a woman in a critical care setting who has severe hypertension or severe pre-eclampsia has or previously had an eclamptic fit, give intravenous magnesium sulfate. [2010] 1.8.2 Consider giving intravenous magnesium sulfate to women with severe pre-eclampsia who are in a critical care setting if birth is planned within 24 hours. [2010] 1.8.3 Consider the need for magnesium sulfate treatment, if 1 or more of the following features of severe pre-eclampsia is present: ongoing or recurring severe headaches visual scotomata nausea or vomiting epigastric pain oliguria and severe hypertension progressive deterioration in laboratory blood tests (such as rising creatinine or liver transaminases, or falling platelet count). [2010, amended 2019] 1.8.4 Use the Collaborative Eclampsia Trial regimen for administration of magnesium sulfate: A loading dose of 4 g should be given intravenously over 5 to 15 minutes, followed by an infusion of 1 g/hour maintained for 24 hours. If the woman has had an eclamptic fit, the infusion should be continued for 24 hours after the last fit. Recurrent fits should be treated with a further dose of 2 g to 4 g given intravenously over 5 to 15 minutes. [2010, amended 2019]The MHRA has issued a warning about the risk of skeletal adverse effects in the neonate following prolonged or repeated use of magnesium sulfate in pregnancy. Maternal administration of magnesium sulfate for longer than 5 to 7 days in pregnancy has been associated with skeletal adverse effects and hypocalcaemia and hypermagnesemia in neonates. If use of magnesium sulfate in pregnancy is prolonged or repeated, consider monitoring of neonates for abnormal calcium and magnesium levels and skeletal adverse effects. 1.8.5 Do not use diazepam, phenytoin or other anticonvulsants as an alternative to magnesium sulfate in women with eclampsia. [2010, amended 2019] 1.8.6 Treat women with severe hypertension who are in critical care during pregnancy or after birth immediately with 1 of the following: labetalol (oral or intravenous) oral nifedipine intravenous hydralazine. [2010, amended 2019]At the time of publication (June 2019), some brands of nifedipine were specifically contraindicated during pregnancy by the manufacturer in its summary of product characteristics.
Refer to the individual summaries of product characteristics for each preparation of nifedipine for further details. See NICE's information on prescribing medicines. 1.8.7 In women with severe hypertension who are in critical care, monitor their response to treatment: to ensure that their blood pressure falls to identify adverse effects for both the woman and the baby to modify treatment according to response. [2010] 1.8.8 Consider using up to 500 ml crystalloid fluid before or at the same time as the first dose of intravenous hydralazine in the antenatal period. [2010] 1.8.9 If early birth is considered likely within 7 days in women with pre-eclampsia, offer a course of antenatal corticosteroids in line with the NICE guideline on preterm labour and birth. [2010, amended 2019] 1.8.10 Do not use dexamethasone or betamethasone for the treatment of HELLP syndrome. [2010] 1.8.11 Do not use volume expansion in women with severe pre-eclampsia unless hydralazine is the antenatal antihypertensive. [2010] 1.8.12 In women with severe pre-eclampsia, limit maintenance fluids to 80 ml/hour unless there are other ongoing fluid losses (for example, haemorrhage). [2010] 1.8.13 Choose mode of birth for women with severe hypertension, severe pre-eclampsia or eclampsia according to the clinical circumstances and the woman's preference. [2010] 1.8.14 Refer women with severe hypertension or severe pre-eclampsia to the appropriate critical care setting using the criteria in table 4. [2010] For the indications in recommendations 1.9.4, 1.9.6 and 1.9.8, in 2009, the Medicines and Healthcare products Regulatory Agency (MHRA) issued a drug safety update on ACE inhibitors and angiotensin II receptor antagonists: recommendations on how to use during breastfeeding, and a subsequent clarification was issued in 2014 stating that 'although ACE inhibitors and angiotensin II receptor antagonists are generally not recommended for use by breastfeeding mothers, they are not absolutely contraindicated. Healthcare professionals may prescribe these medicines during breastfeeding if they consider that this treatment is essential for the lactating mother. In mothers who are breastfeeding older infants, the use of captopril, enalapril, or quinapril may be considered if an ACE inhibitor is necessary for the mother. Careful follow-up of the infant for possible signs of hypotension is recommended'. For the indications in recommendations 1.9.5 and 1.9.6, at the time of publication (June 2019), some brands of nifedipine were specifically contraindicated during pregnancy by the manufacturer in its summary of product characteristics. Refer to the individual summaries of product characteristics for each preparation of nifedipine for further details. See NICE's information on prescribing medicines. 1.9.1 Advise women with hypertension who wish to breastfeed that their treatment can be adapted to accommodate breastfeeding, and that the need to take antihypertensive medication does not prevent them from breastfeeding. [2019] 1.9.2 Explain to women with hypertension who wish to breastfeed that: antihypertensive medicines can pass into breast milk most antihypertensive medicines taken while breastfeeding only lead to very low levels in breast milk, so the amounts taken in by babies are very small and would be unlikely to have any clinical effect most medicines are not tested in pregnant or breastfeeding women, so disclaimers in the manufacturer's information are not because of any specific safety concerns or evidence of harm.Make decisions on treatment together with the woman, based on her preferences. [2019] 1.9.3 As antihypertensive agents have the potential to transfer into breast milk: consider monitoring the blood pressure of babies, especially those born preterm, who have symptoms of low blood pressure for the first few weeks when discharged home, advise women to monitor their babies for drowsiness, lethargy, pallor, cold peripheries or poor feeding. [2019] 1.9.4 Offer enalapril to treat hypertension in women during the postnatal period, with appropriate monitoring of maternal renal function and maternal serum potassium. [2019] 1.9.5 For women of black African or Caribbean family origin with hypertension during the postnatal period, consider antihypertensive treatment with: nifedipine or amlodipine if the woman has previously used this to successfully control her blood pressure. [2019] 1.9.6 For women with hypertension in the postnatal period, if blood pressure is not controlled with a single medicine, consider a combination of nifedipine (or amlodipine) and enalapril. If this combination is not tolerated or is ineffective, consider either: adding atenolol or labetalol to the combination treatment or swapping 1 of the medicines already being used for atenolol or labetalol. [2019] 1.9.7 When treating women with antihypertensive medication during the postnatal period, use medicines that are taken once daily when possible. [2019] 1.9.8 Where possible, avoid using diuretics or angiotensin receptor blockers to treat hypertension in women in the postnatal period who are breastfeeding or expressing milk. [2010, amended 2019] 1.9.9 Treat women with hypertension in the postnatal period who are not breastfeeding and who are not planning to breastfeed in line with the NICE guideline on hypertension in adults. [2019] 1.10.1 Advise women with hypertensive disorders of pregnancy that the overall risk of recurrence in future pregnancies is approximately 1 in 5 (see table 5). [2019] 1.10.2 Advise women who have had a hypertensive disorder of pregnancy that this is associated with an increased risk of hypertension and cardiovascular disease in later life (see table 6). [2019] Notes: Risks described are overall estimates, summarised from risk ratios, odds ratios and hazard ratios. Increased risk is compared to the background risk in women who did not have hypertensive disorders during pregnancy. Absolute risks are not reported, because these will vary considerably, depending on the follow-up time (range from 1 to 40 years postpartum). 1.10.3 Advise women who have had a hypertensive disorder of pregnancy to discuss how to reduce their risk of cardiovascular disease, including hypertensive disorders, with their GP or specialist. This may include: 1.10.4 In women who have had pre-eclampsia or hypertension with early birth before 34 weeks, consider pre-pregnancy counselling to discuss possible risks of recurrent hypertensive disorders of pregnancy, and how to lower them for any future pregnancies. [2019] 1.10.5 Advise women who have had pre-eclampsia to achieve and keep a BMI within the healthy range before their next pregnancy (18.5 to 24.9 kg/m2). See also the NICE guideline on obesity. [2010, amended 2019] 1.10.6 Advise women who have had pre-eclampsia that the likelihood of recurrence increases with an inter-pregnancy interval greater than 10 years. [2010, amended 2019] 1.10.7 Tell women with a history of pre-eclampsia who have no proteinuria and no hypertension at the postnatal review (6 to 8 weeks after the birth) that although the relative risk of end-stage kidney disease is increased, the absolute risk is low and no further follow-up is necessary. [2010] 1.10.8 Do not routinely perform screening for thrombophilia in women who have had pre-eclampsia. [2010] Hypertension that is present at the booking visit, or before 20 weeks, or if the woman is already taking antihypertensive medication when referred to maternity services. It can be primary or secondary in aetiology. A convulsive condition associated with pre-eclampsia. New hypertension presenting after 20 weeks of pregnancy without significant proteinuria. Haemolysis, elevated liver enzymes and low platelet count.
Blood pressure of 140 mmHg systolic or higher, or 90 mmHg diastolic or higher. [2019] A pregnancy with more than 1 baby (such as twins, triplets). New onset of hypertension (over 140 mmHg systolic or over 90 mmHg diastolic) after 20 weeks of pregnancy and the coexistence of 1 or more of the following new-onset conditions: proteinuria (urine protein:creatinine ratio of 30 mg/mmol or more or albumin:creatinine ratio of 8 mg/mmol or more, or at least 1 g/litre [2+] on dipstick testing) or other maternal organ dysfunction: renal insufficiency (creatinine 90 micromol/litre or more, 1.02 mg/100 ml or more) liver involvement (elevated transaminases [alanine aminotransferase or aspartate aminotransferase over 40 IU/litre] with or without right upper quadrant or epigastric abdominal pain) neurological complications such as eclampsia, altered mental status, blindness, stroke, clonus, severe headaches or persistent visual scotomata haematological complications such as thrombocytopenia (platelet count below 150,000/microlitre), disseminated intravascular coagulation or haemolysis uteroplacental dysfunction such as fetal growth restriction, abnormal umbilical artery doppler waveform analysis, or stillbirth. Blood pressure over 160 mmHg systolic or over 110 mmHg diastolic. Pre-eclampsia with severe hypertension that does not respond to treatment or is associated with ongoing or recurring severe headaches, visual scotomata, nausea or vomiting, epigastric pain, oliguria and severe hypertension, as well as progressive deterioration in laboratory blood tests such as rising creatinine or liver transaminases or falling platelet count, or failure of fetal growth or abnormal doppler findings.