



**National Institute for
Health and Clinical Excellence**

Quick reference guide

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Hypertension in pregnancy

The management of hypertensive disorders
during pregnancy



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NICE clinical guidelines are recommendations about the treatment and care of people with specific diseases and conditions in the NHS in England and Wales.

This guidance represents the view of NICE, which was arrived at after careful consideration of the evidence available. Healthcare professionals are expected to take it fully into account when exercising their clinical judgement. However, the guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer, and informed by the summary of product characteristics of any drugs they are considering.

Implementation of this guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to avoid unlawful discrimination and to have regard to promoting equality of opportunity. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties.

Introduction

- Most hypertensive disorders that occur during pregnancy develop for the first time in the second half of pregnancy.
- New hypertension can occur without significant proteinuria (gestational hypertension) or with significant proteinuria (pre-eclampsia).
- Hypertensive disorders during pregnancy can occur in women with chronic hypertension (pre-existing hypertension).
- Hypertensive disorders during pregnancy carry risks for the woman and are among the leading causes of maternal death in the UK.
- Hypertensive disorders also carry a risk for the baby in terms of higher rates of perinatal mortality, preterm birth and low birth weight.

Woman-centred care

Treatment and care should take into account women's individual needs and preferences. Good communication is essential, supported by evidence-based information, to allow women to reach informed decisions about their care. Follow advice on seeking consent from the Department of Health or Welsh Assembly Government if needed. If the woman agrees, families and carers should have the opportunity to be involved in decisions about treatment and care.

Drug information

Drug names are marked with * if they do not have UK marketing authorisation for the indication in question at the time of publication (August 2010). Informed consent should be obtained and documented.

It is assumed that prescribers will use a drug's summary of product characteristics to inform decisions made with individual patients. Drugs for which particular attention should be paid to the contraindications and special warnings during pregnancy and lactation are marked with † and detailed on page 20.

Key priorities for implementation

Reducing the risk of hypertensive disorders in pregnancy

- Advise women at high risk of pre-eclampsia to take 75 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.

Management of pregnancy with chronic hypertension

- Tell 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 other antihypertensive treatment with the healthcare professional responsible for managing their hypertension, if they are planning pregnancy.
- In pregnant women with uncomplicated chronic hypertension aim to keep blood pressure lower than 150/100 mmHg.

Assessment of proteinuria in hypertensive disorders of pregnancy

- Use an automated reagent-strip reading device or a spot urinary protein:creatinine ratio for estimating proteinuria in a secondary care setting.

Management of pregnancy with gestational hypertension

- Offer women with gestational hypertension an integrated package of care covering admission to hospital, treatment, measurement of blood pressure, testing for proteinuria and blood tests as shown on pages 10–12.

Management of pregnancy with pre-eclampsia

- Offer women with pre-eclampsia an integrated package of care covering admission to hospital, treatment, measurement of blood pressure, testing for proteinuria and blood tests as shown on pages 13–15.
- Consultant obstetric staff should document in the woman's notes the maternal (biochemical, haematological and clinical) and fetal thresholds for elective birth before 34 weeks in women with pre-eclampsia.
- Offer all women who have had pre-eclampsia a medical review at the postnatal review (6–8 weeks after the birth).

* Unlicensed indication – obtain and document informed consent.

Key priorities for implementation *continued*

Advice and follow-up care at transfer to community care

- Tell women who had pre-eclampsia that their risk of developing:
 - gestational hypertension in a future pregnancy ranges from about 1 in 8 (13%) pregnancies to about 1 in 2 (53%) pregnancies
 - pre-eclampsia in a future pregnancy is up to about 1 in 6 (16%) pregnancies
 - pre-eclampsia in a future pregnancy is about 1 in 4 (25%) pregnancies if their pre-eclampsia was complicated by severe pre-eclampsia, HELLP syndrome or eclampsia and led to birth before 34 weeks, and about 1 in 2 (55%) pregnancies if it led to birth before 28 weeks.

Definitions

Chronic hypertension Hypertension present at booking visit or before 20 weeks, or that is being treated at time of referral to maternity services. Can be primary or secondary in aetiology.

Degrees of hypertension

Mild Diastolic blood pressure 90–99 mmHg, systolic blood pressure 140–149 mmHg.

Moderate Diastolic blood pressure 100–109 mmHg, systolic blood pressure 150–159 mmHg.

Severe Diastolic blood pressure \geq 110 mmHg, systolic blood pressure \geq 160 mmHg.

Eclampsia Convulsive condition associated with pre-eclampsia.

Gestational hypertension New hypertension presenting after 20 weeks without significant proteinuria.

Pre-eclampsia New hypertension presenting after 20 weeks with significant proteinuria.

Severe pre-eclampsia Pre-eclampsia with severe hypertension and/or with symptoms, and/or biochemical and/or haematological impairment.

Significant proteinuria See 'Assessment of proteinuria', page 6.

Offer birth means to offer elective early birth through induction of labour or by caesarean section if indicated.

Abbreviations

ACE inhibitor	angiotensin-converting enzyme inhibitor	BP	blood pressure
ALT	alanine aminotransferase	DBP	diastolic blood pressure
ARB	angiotensin II receptor blocker	FBC	full blood count
AST	aspartate aminotransferase	HELLP	haemolysis, elevated liver enzymes and low platelet count
BMI	body mass index		

Reducing the risk of hypertensive disorders in pregnancy

Symptoms of pre-eclampsia

- Tell women to seek advice from a healthcare professional immediately if they experience any of:
 - severe headache
 - severe pain just below ribs
 - problems with vision such as blurring or flashing before eyes
 - vomiting
 - sudden swelling of face, hands or feet.

[This recommendation is adapted from 'Antenatal care: routine care for the healthy pregnant woman' (NICE clinical guideline 62)¹].

Lifestyle interventions

- Offer advice on rest, exercise and work in line with 'Antenatal care: routine care for the healthy pregnant woman' (NICE clinical guideline 62)¹.

Pharmacological interventions

- Do not use the following to prevent hypertensive disorders in pregnancy:
 - nitric oxide donors
 - diuretics
 - progesterone
 - low molecular weight heparin.

Nutritional supplements and diet

- Do not recommend the following solely with the aim of preventing hypertensive disorders during pregnancy:
 - taking supplements of magnesium, folic acid, antioxidants (vitamins C and E), fish or algal oils, or garlic
 - restricting salt intake.

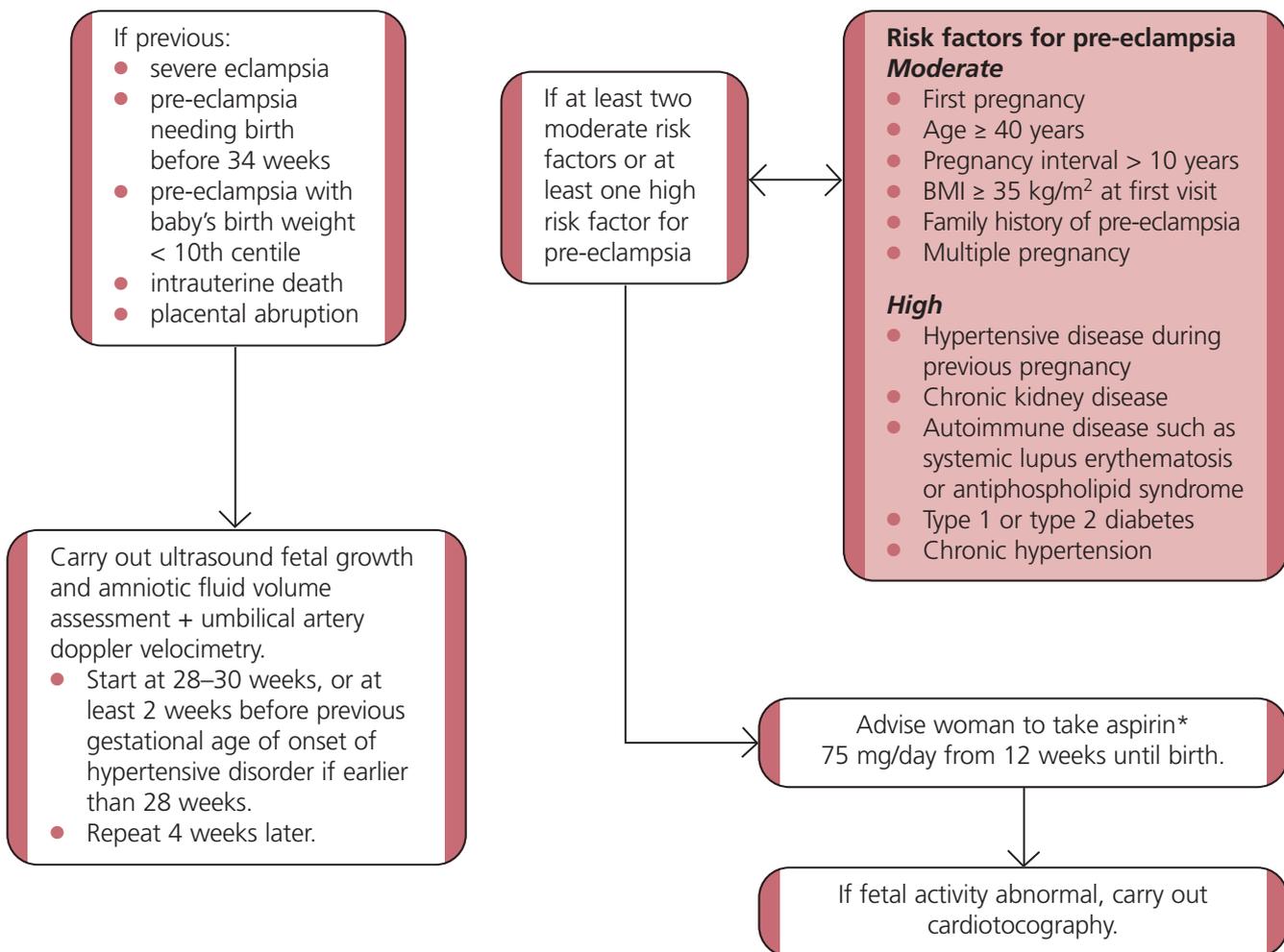
Assessment of proteinuria

- Use an automated reagent-strip reading device or a spot urinary protein:creatinine ratio to estimate proteinuria in secondary care.
- If an automated reagent-strip reading device shows proteinuria $\geq 1+$, use a spot urinary protein:creatinine ratio or 24-hour urine collection to quantify proteinuria.
- Diagnose significant proteinuria if urinary protein:creatinine ratio > 30 mg/mmol or a validated 24-hour urine collection result shows > 300 mg protein.
- Where 24-hour urine collection is used to quantify proteinuria, there should be a recognised method of evaluating completeness of the sample.

¹ Available from www.nice.org.uk/guidance/CG62

Moderate and high risk of pre-eclampsia

Antenatal care and fetal monitoring



* Unlicensed indication – obtain and document informed consent.

Chronic hypertension

Pre-pregnancy advice

Antihypertensive treatment

Tell women who are taking ACE inhibitors, ARBs or chlorothiazide:

- there is an increased risk of congenital abnormalities if ACE inhibitors or ARBs are taken during pregnancy
- there may be an increased risk of congenital abnormalities and neonatal complications if chlorothiazide is taken during pregnancy
- limited evidence shows no increased risk of congenital abnormalities with other antihypertensive treatments
- to discuss other antihypertensive treatments with the healthcare professional responsible for managing their hypertension, if they are planning pregnancy.

Dietary sodium

- Encourage the woman to lower dietary sodium intake or use sodium substitute. [This recommendation is adapted from 'Hypertension: management of hypertension in adults in primary care' (NICE clinical guideline 34)].

Antenatal care

Consultations

- Schedule additional appointments based on individual needs.

Timing of birth

If BP < 160/110 mmHg with or without antihypertensive treatment:

- do not offer birth before 37 weeks
- after 37 weeks, timing of and maternal and fetal indications for birth should be agreed between woman and senior obstetrician.

If refractory severe chronic hypertension, offer birth after course of corticosteroids (if required) has been completed.

Antihypertensive treatment

- Stop ACE inhibitors and ARBs within 2 days of notification of pregnancy and offer alternatives.
- Offer antihypertensive treatment based on pre-existing treatment, side-effect profile and teratogenicity.
- Aim for BP < 150/100 mmHg.
- If target organ damage, aim for BP < 140/90 mm Hg.
- Do not offer treatment to lower DBP to < 80 mmHg.
- If secondary chronic hypertension, offer referral to specialist in hypertensive disorders.

Fetal monitoring

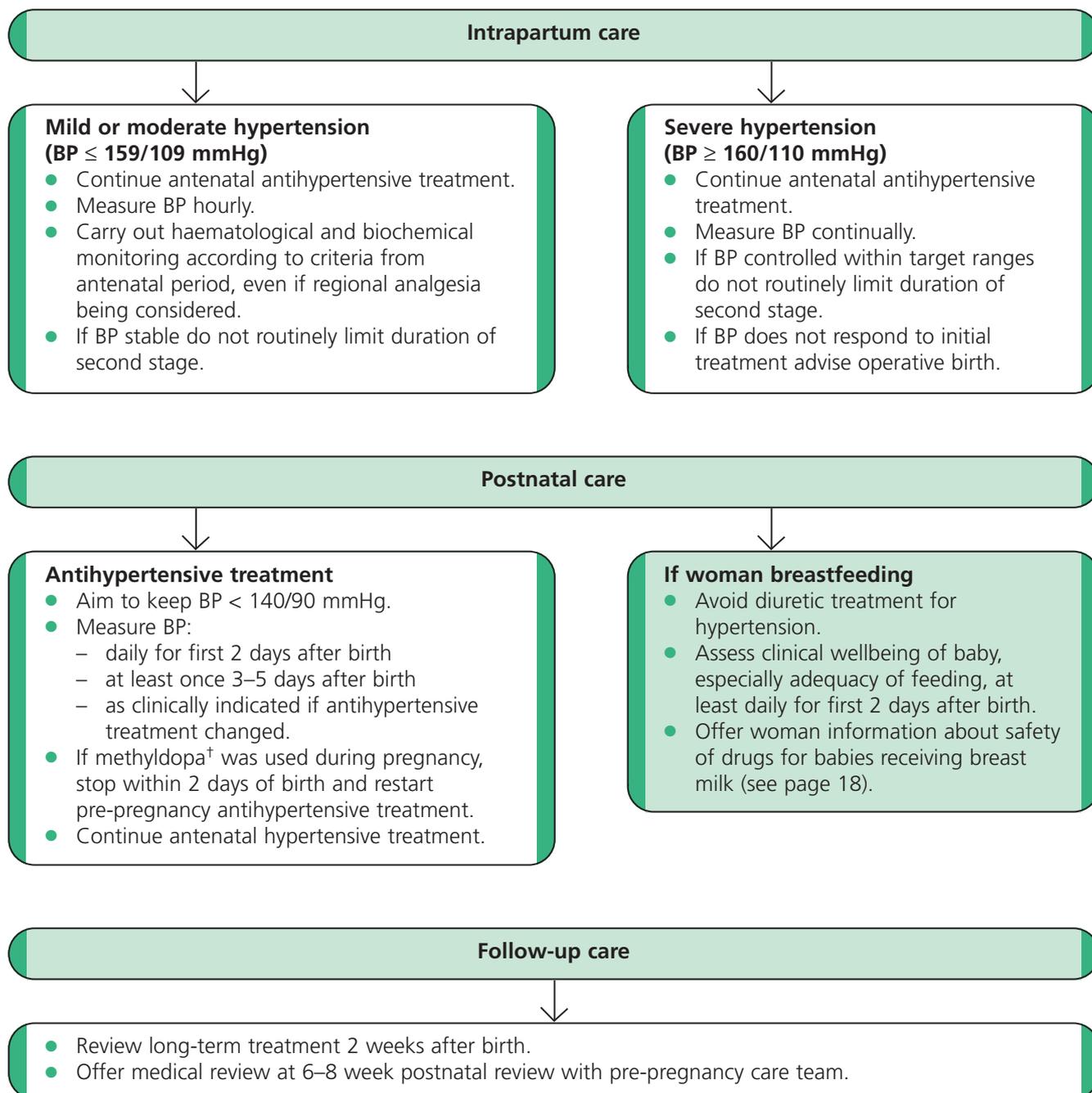
At 28–30 and 32–34 weeks carry out

- Ultrasound fetal growth and amniotic fluid volume assessment.
- Umbilical artery doppler velocimetry.

If results normal do not repeat after 34 weeks unless clinically indicated.

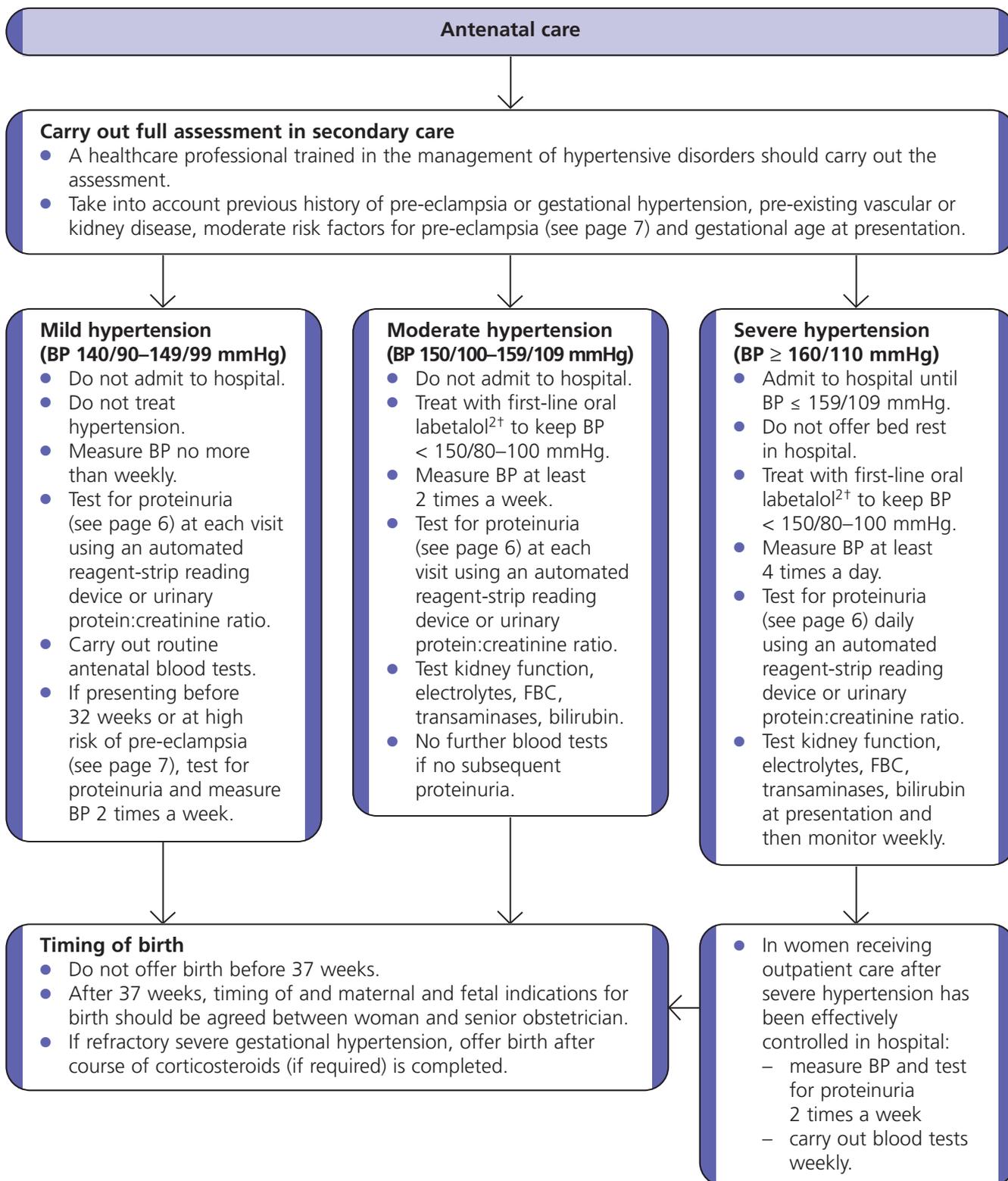
If fetal activity abnormal carry out

- Cardiotocography.



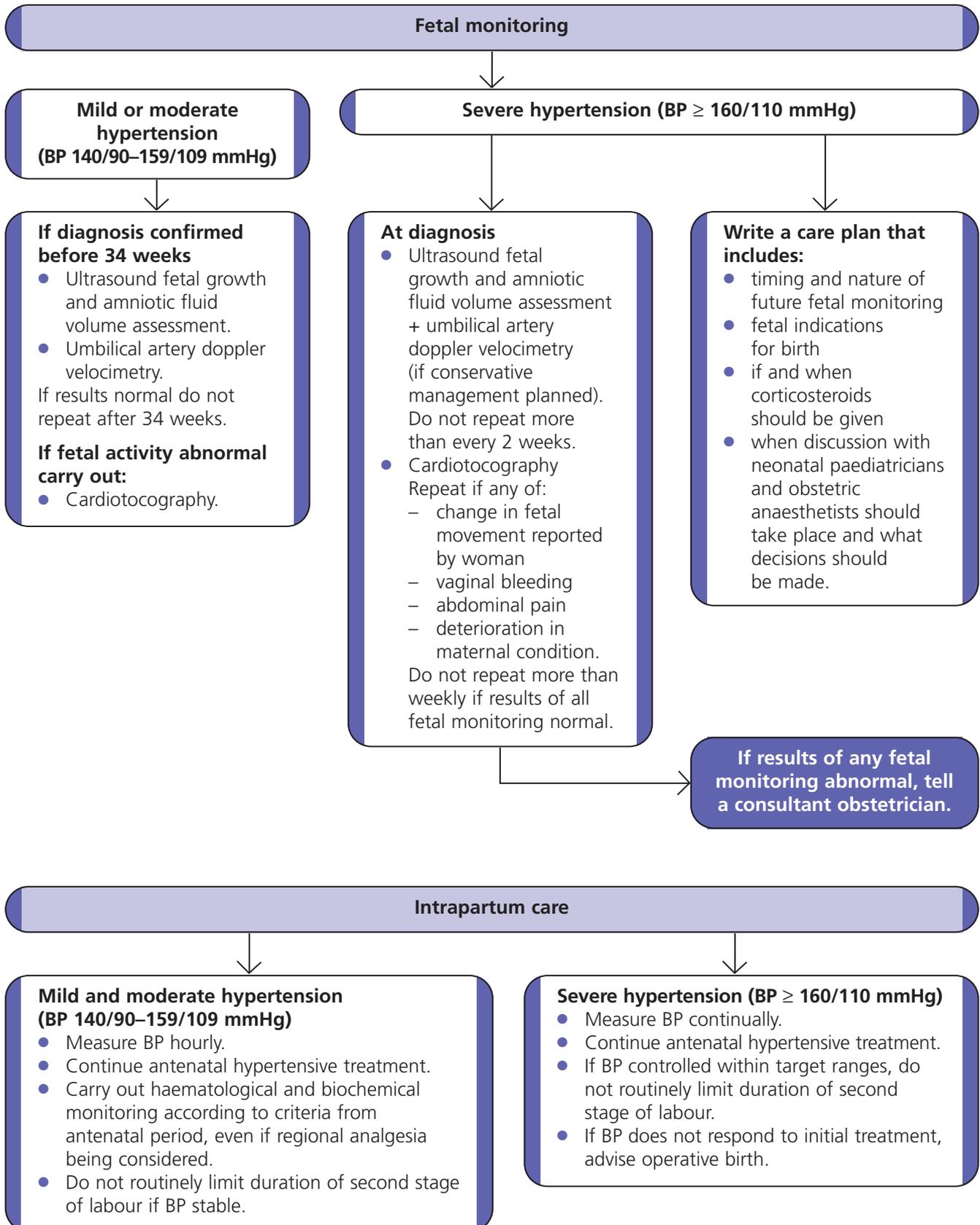
[†] See page 20 for contraindications and special warnings during pregnancy and lactation.

Gestational hypertension



² Offer treatment other than labetalol[†] only after considering side-effect profiles for the woman, fetus and newborn baby. Alternatives include methyldopa[†] and nifedipine[†].

[†] See page 20 for contraindications and special warnings during pregnancy and lactation.



Postnatal care

- Continue antenatal antihypertensive treatment.
- If no antenatal antihypertensive treatment, start antihypertensive treatment if BP \geq 150/100 mmHg.
- Measure BP:
 - daily for first 2 days after birth
 - at least once 3–5 days after birth
 - as clinically indicated if antihypertensive treatment changed.
- If methyldopa[†] was used during pregnancy, stop within 2 days of birth.
- If BP falls to $<$ 130/80 mmHg, reduce antihypertensive treatment.
- If BP falls to $<$ 140/90 mmHg, consider reducing antihypertensive treatment.

If woman breastfeeding

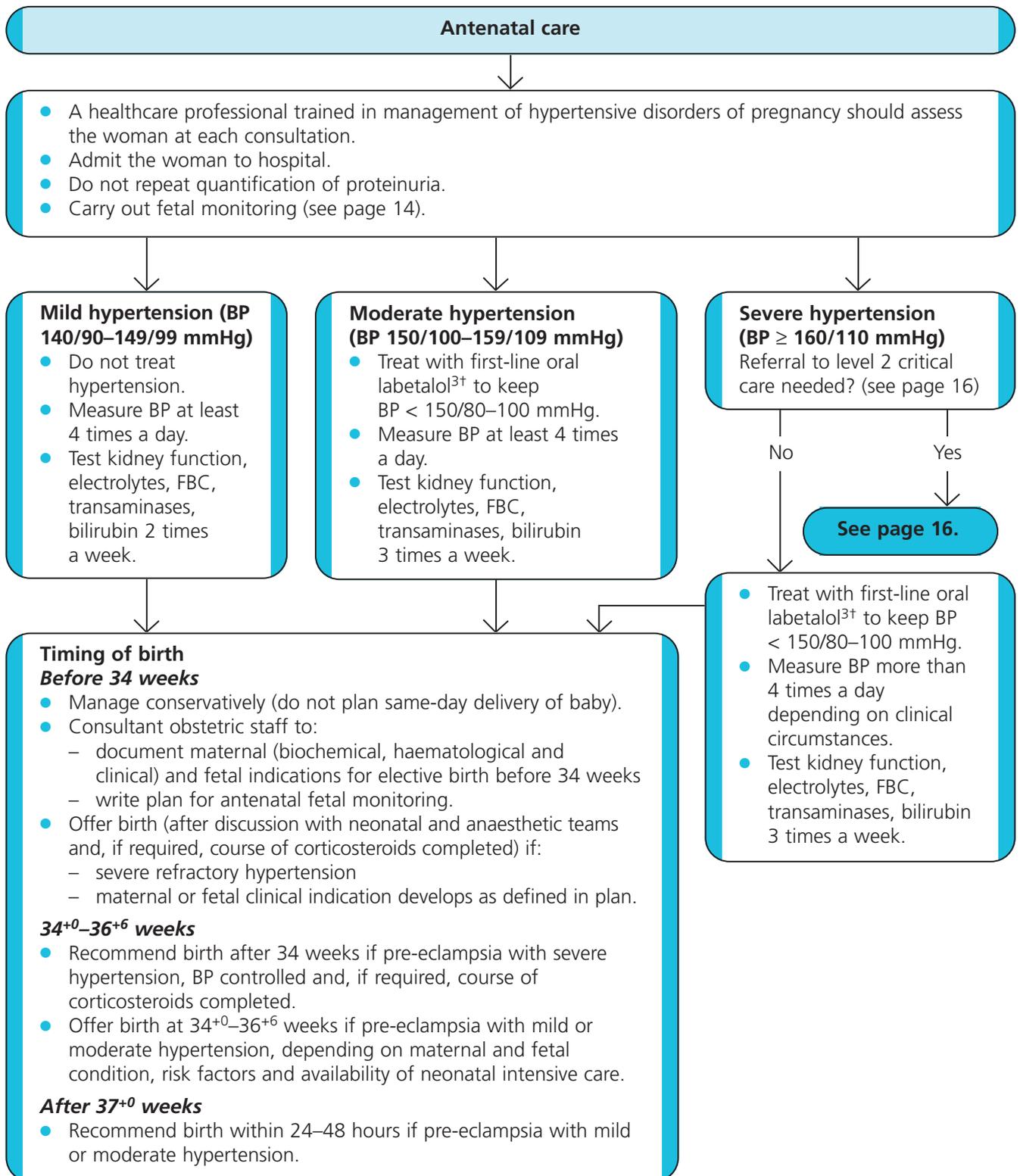
- Avoid diuretic treatment for hypertension.
- Assess clinical wellbeing of baby, especially adequacy of feeding, at least daily for first 2 days after birth.
- Offer woman information about safety of drugs for babies receiving breast milk (see page 18).

Follow-up care

- At transfer to community care, write a care plan that includes:
 - 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.
- If antihypertensive treatment is to be continued, offer medical review 2 weeks after transfer to community care.
- Offer medical review at 6–8 week postnatal review.
- If antihypertensive treatment is to be continued after 6–8 week postnatal review, offer specialist assessment of hypertension.

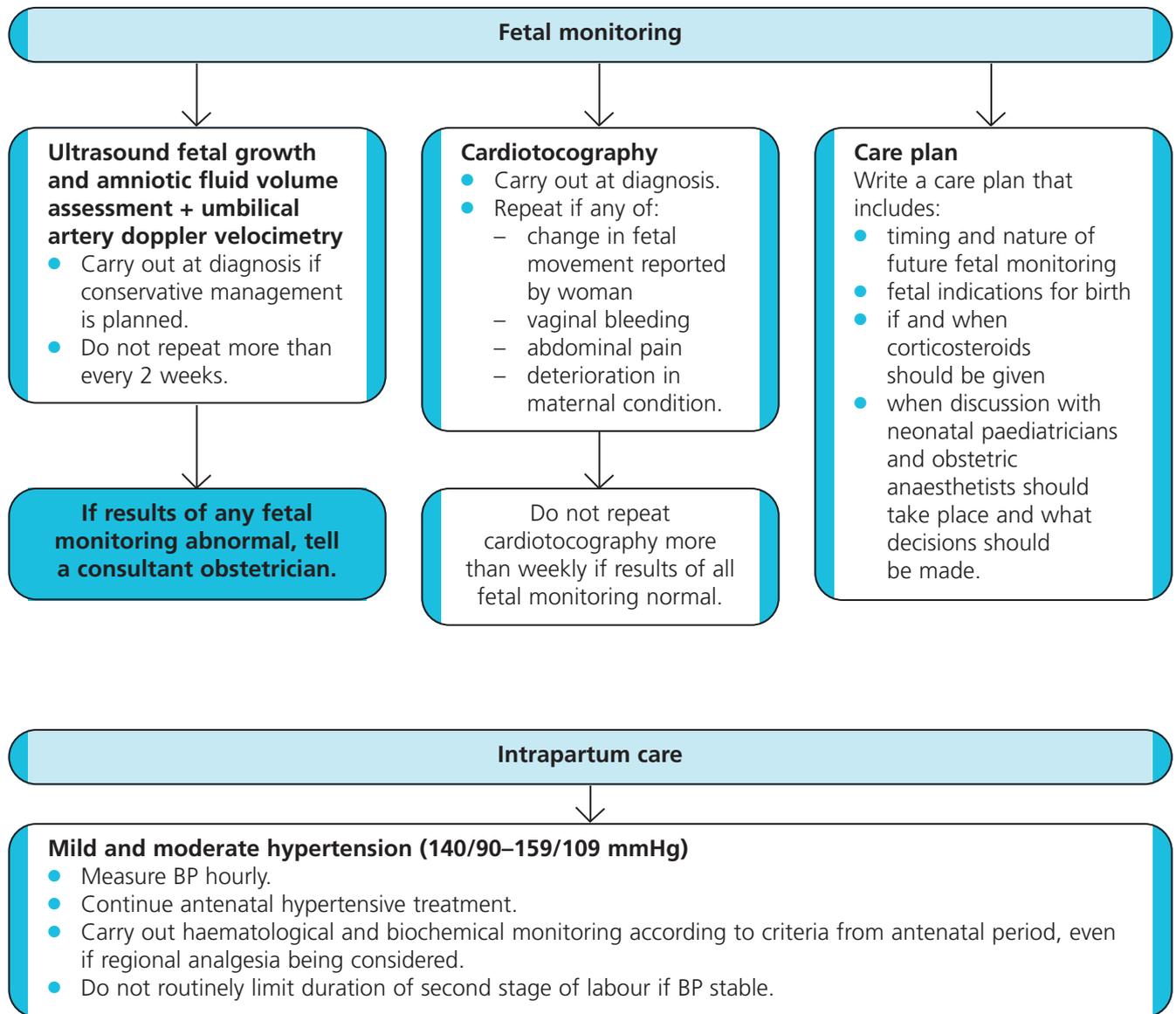
[†] See page 20 for contraindications and special warnings during pregnancy and lactation.

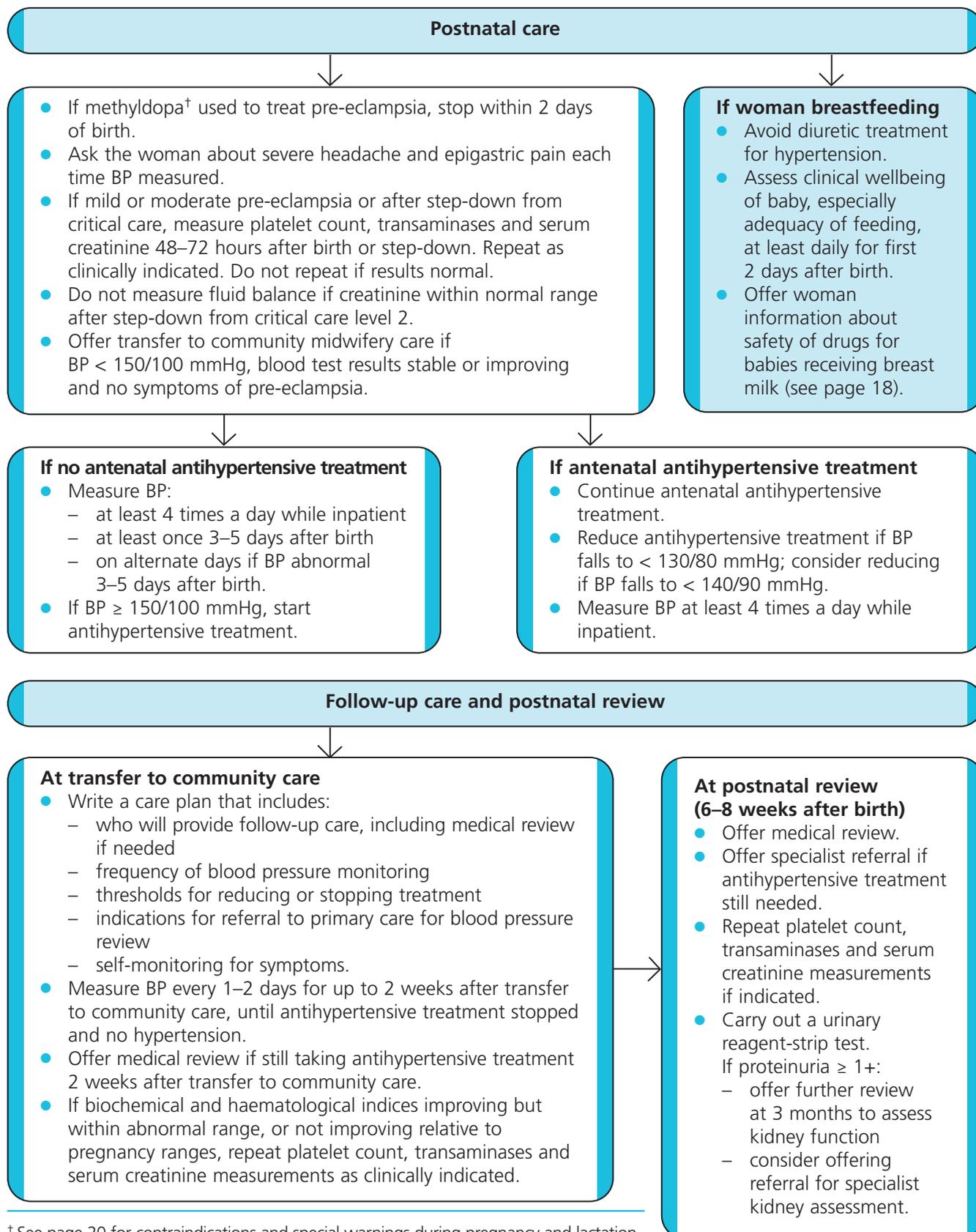
Pre-eclampsia



³ Offer treatment other than labetalol[†] only after considering side-effect profiles for the woman, fetus and newborn baby. Alternatives include methyldopa[†] and nifedipine[†].

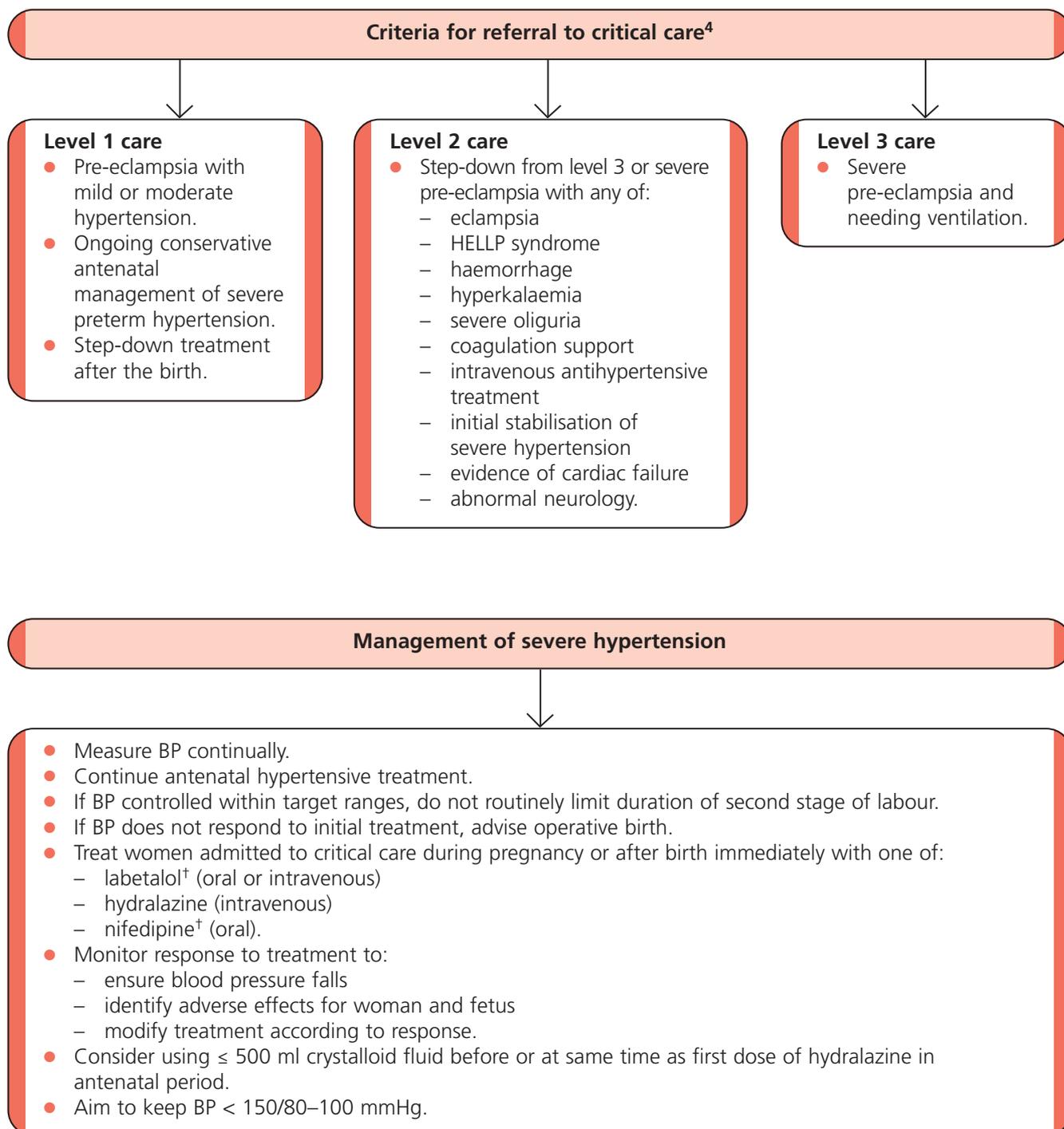
[†] See page 20 for contraindications and special warnings during pregnancy and lactation.





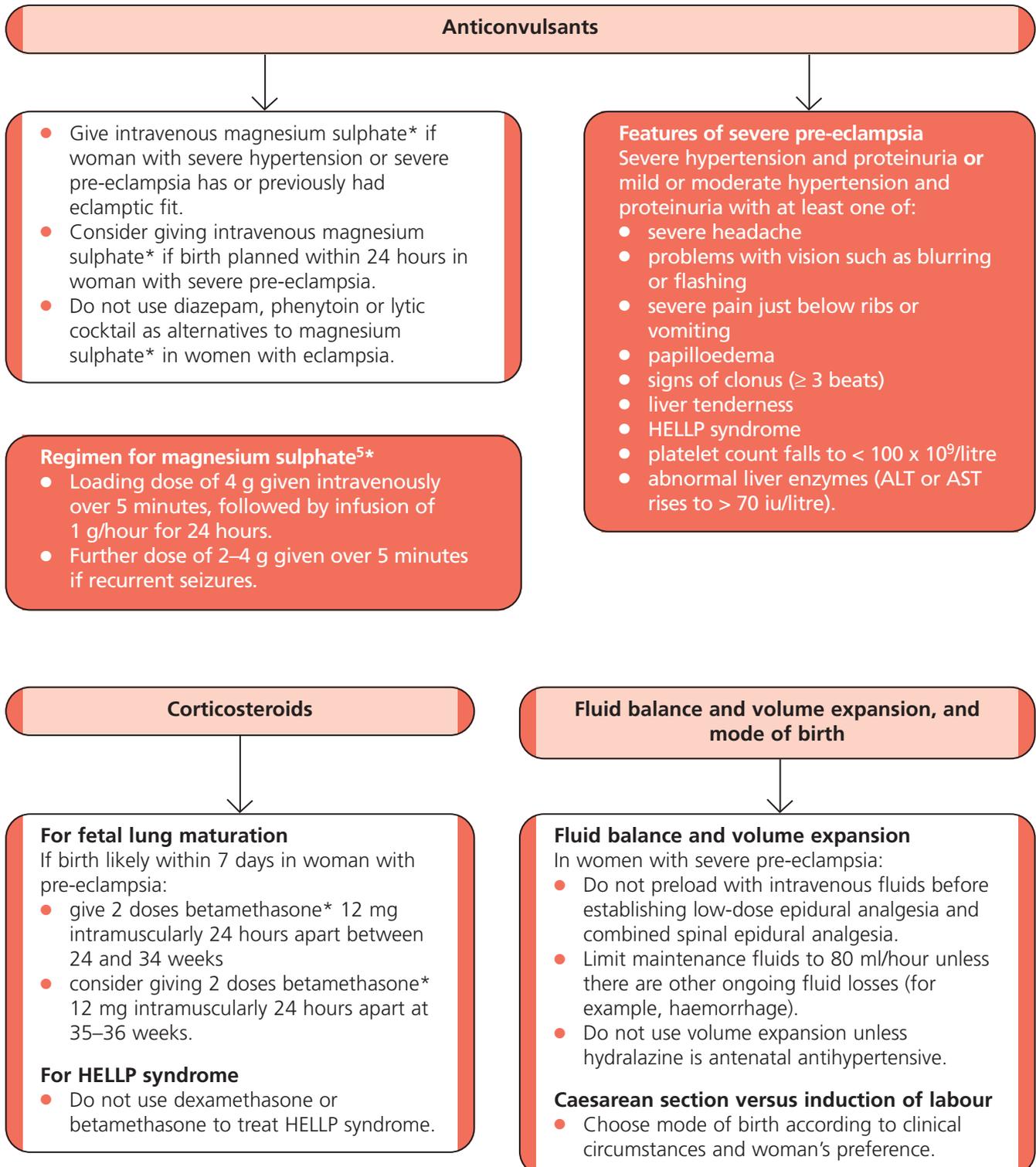
[†] See page 20 for contraindications and special warnings during pregnancy and lactation.

Severe hypertension, severe pre-eclampsia and eclampsia in critical care



⁴ Adapted by the Guideline Development Group from Intensive Care Society (2002) Standards and Guidelines.

[†] See page 20 for contraindications and special warnings during pregnancy and lactation.



⁵ The Eclampsia Trial Collaborative Group (1995) Which anticonvulsant for women with eclampsia? Evidence from the Collaborative Eclampsia Trial. *Lancet* 345:1455–63.

* Unlicensed indication – obtain and document informed consent.

Advice for women, their community midwives and primary care physicians

Breastfeeding

- Tell women that the following drugs have **no known adverse effects** on babies receiving breast milk:
 - labetalol[†]
 - nifedipine[†]
 - enalapril[†]
 - captopril[†]
 - atenolol[†]
 - metoprolol[†].
- Tell women that there is **insufficient evidence on the safety** of the following drugs in babies receiving breast milk:
 - ARBs
 - amlodipine
 - ACE inhibitors other than enalapril[†] and captopril[†].

Weight management

- Advise women who have had pre-eclampsia to achieve and keep BMI 18.5–24.9 kg/m² before next pregnancy (in line with 'Obesity: the prevention, identification, assessment and management of overweight and obesity in adults and children' [NICE clinical guideline 43]).

[†] See page 20 for contraindications and special warnings during pregnancy and lactation.

Long-term health risks

Future risk	Hypertensive disorder		
	Gestational hypertension	Pre-eclampsia	Severe pre-eclampsia, HELLP syndrome or eclampsia
Gestational hypertension in future pregnancy	Risk ranges from about 1 in 6 (16%) to about 1 in 2 (47%).	Risk ranges from about 1 in 8 (13%) to about 1 in 2 (53%).	
Pre-eclampsia in future pregnancy	Risk ranges from 1 in 50 (2%) to about 1 in 14 (7%).	Risk up to about 1 in 6 (16%). No additional risk if interval before next pregnancy < 10 years.	If birth was needed before 34 weeks risk is about 1 in 4 (25%). If birth was needed before 28 weeks risk is about 1 in 2 (55%).
Cardiovascular disease	Increased risk of hypertension and its complications.	Increased risk of hypertension and its complications.	Increased risk of hypertension and its complications.
End-stage kidney disease		If no proteinuria and no hypertension at 6–8 week postnatal review, relative risk increased but absolute risk low. No follow-up needed.	
Thrombophilia		Routine screening not needed.	

Drug information

Atenolol is licensed for the treatment of hypertension and is already used widely in UK postnatal obstetric practice, but the SPCs (August 2010) advise that anticipated benefit be weighed against the possible risks of its use in the first and second trimesters of pregnancy, and in women who may become pregnant or who are breastfeeding. Informed consent to the use of atenolol in these situations should be obtained and documented.

Captopril is licensed for the treatment of hypertension and is already used in UK postnatal obstetric practice, but the SPC (August 2010) advises that it is contraindicated in the second and third trimesters of pregnancy and in lactation, and that it is not recommended during the first trimester of pregnancy. Informed consent to the use of captopril in these situations should be obtained and documented.

Enalapril is licensed for the treatment of hypertension and is already used widely in UK postnatal obstetric practice, but the SPC (August 2010) advises that it is contraindicated in the second and third trimesters of pregnancy and that it is not recommended during the first trimester of pregnancy or in breastfeeding for preterm infants and for the first few weeks after delivery. Informed consent to the use of enalapril in these situations should be obtained and documented.

Labetalol is licensed for the treatment of hypertension, including during pregnancy and is already used widely in UK obstetric practice, but the SPC (August 2010) advises that it should only

be used during the first trimester of pregnancy if the potential benefit outweighs the potential risk, and that breastfeeding is not recommended. Informed consent to the use of labetalol in these situations should be obtained and documented.

Methyldopa is licensed for the treatment of hypertension and is already used widely in UK obstetric practice, but the SPC (August 2010) advises that its use in women who are, or may become, pregnant or who are breastfeeding their newborn infant requires that anticipated benefits be weighed against possible risks. Informed consent to the use of methyldopa in these situations should be obtained and documented.

Metoprolol is licensed for the treatment of hypertension and is already used widely in UK postnatal obstetric practice, but the SPCs (August 2010) advise that anticipated benefit be weighed against the possible risks of its use in women who are pregnant or breastfeeding. Informed consent to the use of metoprolol in these situations should be obtained and documented.

Nifedipine is licensed for the treatment of hypertension and is already used widely in UK obstetric practice, but the SPCs (August 2010) advise that it is contraindicated in pregnancy before week 20, or that it should not be administered during the entire pregnancy or in women who may become pregnant. It also advises that nifedipine should not be used during breastfeeding. Informed consent to the use of nifedipine in these situations should be obtained and documented.

Further information

Ordering information

You can download the following documents from www.nice.org.uk/guidance/CG107

- The NICE guideline – all the recommendations.
- A quick reference guide (this document) – a summary of the recommendations for healthcare professionals.
- ‘Understanding NICE guidance’ – a summary for patients and carers.
- The full guideline – all the recommendations, details of how they were developed, and reviews of the evidence they were based on.

For printed copies of the quick reference guide or ‘Understanding NICE guidance’, phone NICE publications on 0845 003 7783 or email publications@nice.org.uk and quote:

- N2139 (quick reference guide)
- N2140 (‘Understanding NICE guidance’).

Implementation tools

NICE has developed tools to help organisations implement this guidance (see www.nice.org.uk/guidance/CG107).

Related NICE guidance

For information about NICE guidance that has been issued or is in development, see www.nice.org.uk

Weight management before, during and after pregnancy. NICE public health guidance 27 (2010). Available from: www.nice.org.uk/guidance/PH27

How to stop smoking in pregnancy and following childbirth. NICE public health guidance 26 (2010). Available from: www.nice.org.uk/guidance/PH26

Prevention of cardiovascular disease at population level. NICE public health guidance 25

(2010). Available from:

www.nice.org.uk/guidance/PH25

Chronic kidney disease. NICE clinical guideline 73 (2008). Available from:

www.nice.org.uk/guidance/CG73

Induction of labour. NICE clinical guideline 70 (2008). Available from:

www.nice.org.uk/guidance/CG70

Diabetes in pregnancy. NICE clinical guideline 63 (2008). Available from:

www.nice.org.uk/guidance/CG63

Antenatal care. NICE clinical guideline 62 (2008). Available from:

www.nice.org.uk/guidance/CG62

Maternal and child nutrition. NICE public health guidance 11 (2008). Available from:

www.nice.org.uk/guidance/PH11

Smoking cessation services. NICE public health guidance 10 (2008). Available from:

www.nice.org.uk/guidance/PH10

Intrapartum care. NICE clinical guideline 55 (2007). Available from: www.nice.org.uk/guidance/CG55

Obesity. NICE clinical guideline 43 (2006). Available from:

www.nice.org.uk/guidance/CG43

Postnatal care. NICE clinical guideline 37 (2006). Available from: www.nice.org.uk/guidance/CG37

Hypertension. NICE clinical guideline 34 (2006). Available from:

www.nice.org.uk/guidance/CG34

Caesarean section. NICE clinical guideline 13 (2004). Available from:

www.nice.org.uk/guidance/CG13

Updating the guideline

This guideline will be updated as needed, and information about the progress of any update will be available at

www.nice.org.uk/guidance/CG107

About this booklet

This is a quick reference guide that summarises the recommendations NICE has made to the NHS in 'Hypertension in pregnancy: the management of hypertensive disorders during pregnancy' (NICE clinical guideline 107).

Who should read this booklet?

This quick reference guide is for GPs, midwives, obstetricians and other staff who care for women with hypertensive disorders in pregnancy.

Who wrote the guideline?

The guideline was developed by the National Collaborating Centre for Women's and Children's Health, which is linked with the Royal College of Obstetricians and Gynaecologists. The Collaborating Centre worked with a group of healthcare professionals (including consultants, GPs and midwives), patients and carers, and technical staff, who reviewed the evidence and drafted the recommendations. The recommendations were finalised after public consultation.

For more information on how NICE clinical guidelines are developed, go to www.nice.org.uk

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