eclampsia or if they have or have previously had an eclamptic fit. Consider intravenous magnesium sulfate in severe pre-eclampsia if birth is planned within 24 hours.

In women with pre-eclampsia where early birth is considered likely within 7 days, consider a course of antenatal corticosteroids for fetal lung maturation.

Appropriate antihypertensive treatment should be continued if required after birth (with dose adjustment according to blood pressure).

Women who have been managed with methyldopa during pregnancy should discontinue treatment within 2 days of the birth and switch to an alternative antihypertensive.

Post-birth, advise women with hypertension that the need to take antihypertensives does not prevent them from breastfeeding should they wish to do so, although very low levels of antihypertensive medicines can pass into breast milk and most medicines are not tested in pregnant or breastfeeding women. For women who decide to breastfeed, offer enalapril maleate p. 180 first-line to treat hypertension during the post-natal period, and monitor maternal renal function and serum potassium. In women of black African or African-Caribbean family origin consider nifedipine or amlodipine p. 168 first line. If blood pressure is not controlled with a single drug consider a combination of nifedipine (or amlodipine) and enalapril. If this combination is not tolerated or ineffective consider either adding labetalol hydrochloride or atenolol p. 164 to the combination treatment or swapping one of the medicines being used for atenolol or labetalol. Blood pressure monitoring should be considered in babies born to mothers taking antihypertensives who are breastfeeding, and women should be advised to monitor their babies for any adverse reactions for example: drowsiness, lethargy, pallor, cold peripheries or poor feeding).

Women with hypertension in the postnatal period who are not and do not plan to breastfeed should be treated the same way as patients in the section *Drugs for hypertension*.

Following birth, women remaining on antihypertensives should have their treatment reviewed 2 weeks after the birth. Women treated for hypertension during pregnancy should have a medical review 6-8 weeks after birth with their GP or specialist. Ⓐ

Advanced Pharmacy Services

Patients with hypertension may be eligible for the New Medicines Service / Medicines Use Review service provided by a community pharmacist. For further information, see *Advanced Pharmacy Services* in Medicines optimisation p. 18.

Useful Resources

Hypertension in pregnancy: diagnosis and management. National Institute for Health and Care Excellence guideline NG133. June 2019. www.nice.org.uk/guidance/ng133

Hypertension in adults: diagnosis and management. National Institute for Health and Care Excellence guideline NG136. August 2019. www.nice.org.uk/guidance/ng136

Chronic kidney disease in adults: assessment and management. National Institute for Health and Care Excellence guideline CG182. July 2014 (updated January 2015). www.nice.org.uk/guidance/cg182

Risk estimation and the prevention of cardiovascular disease. Scottish Intercollegiate Guidelines Network. Clinical guideline 149. June 2017. www.sign.ac.uk/sign-149-risk-estimation-and-the-prevention-of-cardiovascular-disease.html

Management of diabetes. Scottish Intercollegiate Guidelines Network. Clinical guideline 116. March 2010 (updated November 2017). www.sign.ac.uk/sign-116-and-154-diabetes.html

Antihypertensive drugs

Vasodilator antihypertensive drugs

Vasodilators have a potent hypotensive effect, especially when used in combination with a beta-blocker and a thiazide. **Important:** see Hypertension (hypertensive crises) for a warning on the hazards of a very rapid fall in blood pressure.

Hydralazine hydrochloride p. 192 is given by mouth as an adjunct to other antihypertensives for the treatment of resistant hypertension but is rarely used; when used alone it causes tachycardia and fluid retention.

Sodium nitroprusside p. 193 [unlicensed] is given by intravenous infusion to control severe hypertensive emergencies when parenteral treatment is necessary.

Minoxidil p. 192 should be reserved for the treatment of severe hypertension resistant to other drugs. Vasodilatation is accompanied by increased cardiac output and tachycardia and the patients develop fluid retention. For this reason the addition of a beta-blocker and a diuretic (usually furosemide p. 241, in high dosage) are mandatory. Hypertrichosis is troublesome and renders this drug unsuitable for females.

Prazosin p. 827, doxazosin p. 826, and terazosin p. 829 have alpha-blocking and vasodilator properties.

Ambrisentan p. 195, bosentan p. 195, iloprost p. 197, macitentan p. 196, sildenafil p. 859, and tadalafil p. 860 are licensed for the treatment of pulmonary arterial hypertension and should be used under specialist supervision. Epoprostenol p. 123 can be used in patients with primary pulmonary hypertension resistant to other treatments. Bosentan is also licensed to reduce the number of new digital ulcers in patients with systemic sclerosis and ongoing digital ulcer disease. Riociguat p. 196 is licensed for the treatment of pulmonary arterial hypertension and chronic thromboembolic pulmonary hypertension; it should be used under specialist supervision.

Sitaxentan has been withdrawn from the market because the benefit of treatment does not outweigh the risk of severe hepatotoxicity.

Centrally acting antihypertensive drugs

Methyldopa p. 157 is a centrally acting antihypertensive; it may be used for the management of hypertension in pregnancy.

Clonidine hydrochloride p. 156 has the disadvantage that sudden withdrawal of treatment may cause severe rebound hypertension.

Moxonidine p. 157, a centrally acting drug, is licensed for mild to moderate essential hypertension. It may have a role when thiazides, calcium-channel blockers, ACE inhibitors, and beta-blockers are not appropriate or have failed to control blood pressure.

Adrenergic neurone blocking drugs

Adrenergic neurone blocking drugs prevent the release of noradrenaline from postganglionic adrenergic neurones. These drugs do not control supine blood pressure and may cause postural hypotension. For this reason they have largely fallen from use, but may be necessary with other therapy in resistant hypertension.

Guanethidine monosulfate, which also depletes the nerve endings of noradrenaline, is licensed for rapid control of blood pressure, however alternative treatments are preferred.

Alpha-adrenoceptor blocking drugs

Prazosin has post-synaptic alpha-blocking and vasodilator properties and rarely causes tachycardia. It may, however, reduce blood pressure rapidly after the first dose and should be introduced with caution. Doxazosin, indoramin p. 827, and terazosin have properties similar to those of prazosin.