

INDICATIONS AND DOSE

- **Hyperension** in patients stabilised on the individual components in the same proportions
- **Adult:** (consult product literature)

MEDICAL FORMS

- There can be variation in the licensing of different medicines containing the same drug.
- **Modified-release tablet**
- **CATIONARY AND ADVISORY LABELS** 25
- **Tablet (Solid)**
- **Felodipine** 2.5 mg, **Ramipril** 2.5 mg, **Trandolapril** 2.5 mg/2.5 mg modified-release tablets | 28 tablet [Box] £24.55
- **Felodipine** 5 mg, **Ramipril** 5 mg, **Trandolapril** 5 mg/5 mg modified-release tablets | 28 tablet [Box] £16.13 DT price = £16.13

Trandolapril

INDICATIONS AND DOSE

- **Mild to moderate hypertension**
- **Adult:** Initially 500 micrograms once daily; increased to 1–2 mg once daily, dose to be increased at intervals of 2–4 weeks; maximum 4 mg per day
- **Prophylaxis after myocardial infarction** in patients with left ventricular dysfunction (starting as early as 3 days after infarction)
- **Adult:** Initially 500 micrograms once daily, then increased to up to 4 mg once daily, doses to be increased gradually

- **SIDE-EFFECTS:** Alopecia · angina · arrhythmias · asthma · bronchitis · cerebral haemorrhage · dry mouth · dyspnoea · hot flashes · ileus · myocardial infarction · nervousness · palpitation · postnasal-like effluence · skin reactions · sleep disturbances · Stevens-Johnson syndrome · sweating · syncope · tachycardia · toxic epidermal necrolysis · transient ischaemic attacks

SIDE-EFFECTS, FURTHER INFORMATION

- **Symptomatic hypotension:** If symptomatic hypotension develops during titration, do not increase dose further; if possible, reduce dose of any adjunctive treatment and if this is not effective or feasible, reduce dose of trandolapril.

- **BREAST FEEDING:** Not recommended; alternative treatment options, with better established safety information during breast-feeding, are available.

- **HEPATIC IMPAIRMENT:** Trandolapril is a prodrug and requires close monitoring in patients with hepatic impairment.

- **RENAL IMPAIRMENT:** Max. 2 mg daily if eGFR less than 10 mL/minute/1.73 m².

MEDICAL FORMS

- There can be variation in the licensing of different medicines containing the same drug. Forms available from special-order manufacturers include: oral suspension

Capsule

- **TRANDOLAPRIL (Non-proprietary)**
- **Trandolapril 500 microgram** Trandolapril 500microgram capsules | 14 capsule [Box] £1.92 DT price = £1.97
- **Trandolapril 1 mg** Trandolapril 1mg capsules | 28 capsule [Box] £20.00 DT price = £19.99
- **Trandolapril 2 mg** Trandolapril 2mg capsules | 28 capsule [Box] £10.40 DT price = £7.60
- **Trandolapril 4 mg** Trandolapril 4mg capsules | 28 capsule [Box] £14.19 DT price = £14.01

ANGIOTENSIN-II RECEPTOR ANTAGONISTS

Angiotensin-II receptor antagonists

CONTRA-INDICATIONS

- **Angiotensin-II receptor antagonist** with aliskiren is contra-indicated in patients with an eGFR less than 60 mL/minute/1.73 m²; the combination of an angiotensin-II receptor antagonist with aliskiren is contra-indicated in patients with diabetes mellitus

- **CAUTIONS:** Afro-Caribbean patients—particularly those with left ventricular hypertrophy (may not benefit from an angiotensin-II receptor antagonist) · aortic or mitral valve stenosis · elderly (lower initial doses may be appropriate) · hypertrophic cardiomyopathy · patients with a history of angioedema · patients with primary aldosteronism (may not benefit from an angiotensin-II receptor antagonist) · renal artery stenosis

- **INTERACTIONS:** → Appendix 1 (angiotensin-II receptor antagonists).

- **SIDE-EFFECTS:** Hypertkalaemia · angioedema (may be delayed onset) · symptomatic hypotension including dizziness (particularly in patients with intravascular volume depletion, e.g. those taking high-dose diuretics)

- **PREGNANCY:** Angiotensin-II receptor antagonists should be avoided in pregnancy unless essential. They may adversely affect fetal and neonatal blood pressure control and renal function; neonatal skull defects and oligohydramnios have also been reported.

- **BREAST FEEDING:** Information on the use of angiotensin-II receptor antagonists in breast-feeding is limited. They are not recommended in breast-feeding and alternative treatment options, with better established safety information during breast-feeding, are available.

- **RENAL IMPAIRMENT:** Use with caution, starting with low dose, and adjust according to response.

- **MONITORING REQUIREMENTS:** Monitor plasma-potassium concentration, particularly in the elderly and in patients with renal impairment.

Azilsartan medoxomil

INDICATIONS AND DOSE

- **Hypertension**
- **Adult:** Initially 40 mg once daily, increased if necessary to 80 mg once daily
- **Adult 18–74 years:** Initially 40 mg once daily, increased if necessary to 80 mg once daily
- **Adult 75 years and over:** Initially 20–40 mg once daily, increased if necessary to 80 mg once daily
- **Hypertension with intravascular volume depletion**
- **Adult:** Initially 20–40 mg daily, increased if necessary to 80 mg daily

CAUTIONS

- **Common or very common** Diarrhoea · raised creatine kinase
- **Uncertain** Hypernatraemia · peripheral oedema · raised creatinine · malaise
- **HEPATIC IMPAIRMENT:** Manufacturer advises to consider initial dose of 20 mg in mild to moderate impairment (limited information available).
- **Manufacturer advises** avoid in severe impairment (no information available). Manufacturer advises monitor closely in mild to moderate hepatic impairment (limited information available).

RENAL IMPAIRMENT

- **Manufacturer advises** caution in severe impairment—no information available.

MEDICAL FORMS

- There can be variation in the licensing of different medicines containing the same drug.

Tablet

- **Azilsartan medoxomil** 20 mg **Ecani** 20mg tablets | 28 tablet [Box] £16.80 DT price = £16.80
- **Azilsartan medoxomil** 40 mg **Ecani** 40mg tablets | 28 tablet [Box] £16.80 DT price = £16.80
- **Azilsartan medoxomil** 80 mg **Ecani** 80mg tablets | 28 tablet [Box] £19.95 DT price = £19.95

Candesartan cilexetil

INDICATIONS AND DOSE

- **Hypertension**
- **Adult:** Initially 8 mg once daily, increased if necessary up to 32 mg once daily, doses to be increased at intervals of 4 weeks; usual dose 8 mg once daily
- **Hyperension with intravascular volume depletion**
- **Adult:** Initially 4 mg once daily, increased if necessary up to 32 mg daily, doses to be increased at intervals of 4 weeks; usual dose 8 mg once daily
- **Heart failure with impaired left ventricular systolic function** when ACE inhibitors are not tolerated | Heart failure with impaired left ventricular systolic function in conjunction with an ACE inhibitor (under expert supervision)
- **Adult:** Initially 4 mg once daily, increased at intervals of at least 2 weeks to 'target' dose of 32 mg once daily or to maximum tolerated dose

- **CONTRA-INDICATIONS:** Cholestasis
- **SIDE-EFFECTS:**
 - **Common or very common** Headache · vertigo
 - **Very rare** Arthralgia · back pain · blood disorders · cough · hepatitis · hyponatraemia · myalgia · nausea · pruritus · rash · urticaria
- **HEPATIC IMPAIRMENT:** Initially 4 mg once daily in mild or moderate impairment. Avoid in severe hepatic impairment.
- **RENAL IMPAIRMENT:** Initially 4 mg daily. Use with caution if eGFR less than 15 mL/minute/1.73 m²—limited experience.

MEDICAL FORMS

- There can be variation in the licensing of different medicines containing the same drug. Forms available from special-order manufacturers include: oral solution, oral suspension
- **CANDESARTAN CILEXETIL (Non-proprietary)**
- **Candesartan cilexetil** 2 mg **Candesartan** 2mg tablets | 7 tablet [Box] £3.40 DT price = £3.53
- **Candesartan cilexetil** 4 mg **Candesartan** 4mg tablets | 7 tablet [Box] £3.88 DT price = £0.83 | 28 tablet [Box] £9.78
- **Candesartan cilexetil** 8 mg **Candesartan** 8mg tablets | 28 tablet [Box] £9.89 DT price = £1.23
- **Candesartan cilexetil** 16 mg **Candesartan** 16mg tablets | 28 tablet [Box] £12.72 DT price = £1.57
- **Candesartan cilexetil** 32 mg **Candesartan** 32mg tablets | 28 tablet [Box] £16.13 DT price = £2.20
- **Amias (Teva UK Ltd)**
- **Candesartan cilexetil** 2 mg **Amias** 2mg tablets | 7 tablet [Box] £3.56 DT price = £1.53
- **Candesartan cilexetil** 4 mg **Amias** 4mg tablets | 7 tablet [Box] £3.88 DT price = £0.83 | 28 tablet [Box] £9.78
- **Candesartan cilexetil** 8 mg **Amias** 8mg tablets | 28 tablet [Box] £9.89 DT price = £1.23

Eprosartan

INDICATIONS AND DOSE

- **Hypertension**
- **Adult:** 600 mg once daily
- **SIDE-EFFECTS:**
 - **Common or very common** Headache · nausea · rhinitis · diarrhoea · malaise · vomiting
- **HEPATIC IMPAIRMENT:** Caution in mild or moderate liver disease. Avoid in severe impairment.
- **RENAL IMPAIRMENT:** Caution if eGFR less than 30 mL/minute/1.73 m².

MEDICAL FORMS

- There can be variation in the licensing of different medicines containing the same drug. Forms available from special-order manufacturers include: oral solution, oral suspension

Tablet

- **CATIONARY AND ADVISORY LABELS** 21
- **EPROSARTAN (Non-proprietary)**
- **Eprosartan (as Eprosartan mesilate)** 300 mg **Eprosartan** 300mg tablets | 28 tablet [Box] £7.31 DT price = £7.31
- **Eprosartan (as Eprosartan mesilate)** 400 mg **Eprosartan** 400mg tablets | 56 tablet [Box] £25.98 DT price = £25.85
- **Eprosartan (as Eprosartan mesilate)** 600 mg **Eprosartan** 600mg tablets | 28 tablet [Box] £14.31 DT price = £14.31
- **Teveten (Boehr Products Ltd)**
- **Eprosartan (as Eprosartan mesilate)** 300 mg **Teveten** 300mg tablets | 28 tablet [Box] £7.31 DT price = £7.31
- **Eprosartan (as Eprosartan mesilate)** 600 mg **Teveten** 600mg tablets | 28 tablet [Box] £14.31 DT price = £14.31

Ibuprofen

INDICATIONS AND DOSE

- **Hypertension**
- **Adult 18–74 years:** Initially 150 mg once daily, increased if necessary to 300 mg once daily
- **Adult 75 years and over:** Initially 75–150 mg once daily, increased if necessary to 300 mg once daily
- **Hypertension in patients receiving haemodialysis**
- **Adult:** Initially 75–150 mg once daily, increased if necessary to 300 mg once daily
- **Renal disease in hypertensive type 2 diabetes mellitus**
- **Adult:** Initially 75–150 mg once daily, increased if tolerated to 300 mg once daily
- **Adult 75 years and over:** Initially 75–150 mg once daily, increased if tolerated to 300 mg once daily
- **Renal disease in hypertensive type 2 diabetes mellitus in patients receiving haemodialysis**
- **Adult:** Initially 75–150 mg once daily, increased if tolerated to 300 mg once daily

SIDE-EFFECTS

- **Common or very common** Fatigue · musculoskeletal pain · nausea · vomiting
- **Uncertain** Chest pain · cough · diarrhoea · dyspnoea · flushing · sexual dysfunction · tachycardia
- **Rare** Rash · urticaria

- **Angina**
BY MOUTH
• Adult: 1 capsule twice daily
- **PRESCRIBING AND DISPENSING INFORMATION** Only indicated when calcium-channel blocker or beta-blocker alone proves inadequate.
- **MEDICINAL FORMS**
There can be variation in the licensing of different medicines containing the same drug.
Modified-release capsule
CAUTIONARY AND ADVISORY LABELS 8, 25
• Beta-adalat (Bayer Plc)
Atenolol 50 mg, Nitrendipine 20 mg Beta-adalat modified-release capsules | 28 capsule [Pxx] £9.90
• Teint (AstraZeneca UK Ltd)
Atenolol 50 mg, Nitrendipine 20 mg Teint 50mg/20mg modified-release capsules | 28 capsule [Pxx] £12.76

Bisoprolol fumarate

- **INDICATIONS AND DOSE**
Hypertension | Angina
BY MOUTH
• Adult: 5–10 mg once daily; maximum 20 mg per day
Adjust in heart failure
BY MOUTH
• Adult: Initially 1.25 mg once daily for 1 week, dose to be taken in the morning, then increased if tolerated to 2.5 mg once daily for 1 week, then increased if tolerated to 3.75 mg once daily for 1 week, then increased if tolerated to 5 mg once daily for 4 weeks, then increased if tolerated to 7.5 mg once daily for 4 weeks, then increased if tolerated to 10 mg once daily; maximum 10 mg per day
- **CONTRA-INDICATIONS** Acute or decompensated heart failure requiring intravenous inotropes; sino-atrial block
- **CAUTIONS** Ensure heart failure not worsening before increasing dose
- **SIDE-EFFECTS**
 - Uncommon Cramp · depression · muscle weakness
 - Rare Hearing impairment · Hypertriglyceridaemia · syncope
 - Very rare Conjunctivitis
- **HEPATIC IMPAIRMENT** Max. 10 mg daily in severe impairment.
- **RENAL IMPAIRMENT** Reduce dose if eGFR less than 20 mL/minute/1.73 m² (max. 10 mg daily).
- **MEDICINAL FORMS**
There can be variation in the licensing of different medicines containing the same drug. Forms available from special-order manufacturers include: oral solution, oral suspension
- **Tablet**
CAUTIONARY AND ADVISORY LABELS 8
• BISOPROLOL FUMARATE (Non-proprietary)
Bisoprolol fumarate 1.25 mg Bisoprolol 1.25mg tablets | 28 tablet [Pxx] £7.43 DT price = £1.21
Bisoprolol fumarate 2.5 mg Bisoprolol 2.5mg tablets | 28 tablet [Pxx] £4.39 DT price = £1.12
Bisoprolol fumarate 3.75 mg Bisoprolol 3.75mg tablets | 28 tablet [Pxx] £6.50 DT price = £1.72
Bisoprolol fumarate 5 mg Bisoprolol 5mg tablets | 28 tablet [Pxx] £3.89 DT price = £0.96
Bisoprolol fumarate 7.5 mg Bisoprolol 7.5mg tablets | 28 tablet [Pxx] £5.89 DT price = £1.42
Bisoprolol fumarate 10 mg Bisoprolol 10mg tablets | 28 tablet [Pxx] £5.89 DT price = £1.02
• Cardior (Merck Serono Ltd)
Bisoprolol fumarate 1.25 mg Cardior 1.25mg tablets | 28 tablet [Pxx] £2.35 DT price = £1.21

Carvedilol

- **INDICATIONS AND DOSE**
Hypertension
BY MOUTH
• Adult: Initially 12.5 mg once daily for 2 days, then increased to 25 mg once daily; increased if necessary up to 50 mg daily, dose to be increased at intervals of at least 2 weeks and can be given as a single dose or in divided doses
Elderly: Initially 12.5 mg daily, initial dose may provide satisfactory control
- **Angina**
BY MOUTH
• Adult: Initially 12.5 mg twice daily for 2 days, then increased to 25 mg twice daily
Adjust to diuretics, digoxin, or ACE inhibitors in symptomatic chronic heart failure
- **BY MOUTH**
• Adult: Initially 3.125 mg twice daily, dose to be taken with food, then increased to 6.25 mg twice daily, then increased to 12.5 mg twice daily, then increased to 25 mg twice daily, dose should be increased at intervals of at least 2 weeks up to the highest tolerated dose, max. 25 mg twice daily in patients with severe heart failure or body-weight less than 85 kg; max. 50 mg twice daily in patients over 85 kg
- **CONTRA-INDICATIONS** Acute or decompensated heart failure requiring intravenous inotropes
- **SIDE-EFFECTS** Allergic skin reactions · angina · AV block · changes in liver enzymes · depressed mood · disturbance of micturition · influenza-like symptoms · leucopenia · nasal stuffiness · postural hypotension · thrombocytopenia · wheezing
- **PREGNANCY** Information on the safety of carvedilol during pregnancy is lacking. If carvedilol is used close to delivery, infants should be monitored for signs of alpha-blockade (as well as beta-blockade).
- **BREAST FEEDING** Infants should be monitored as there is a risk of possible toxicity due to alpha-blockade (in addition to beta-blockade).
- **HEPATIC IMPAIRMENT** Avoid in hepatic impairment.
- **MONITORING REQUIREMENTS** Monitor renal function during dose titration in patients with heart failure who also have renal impairment, low blood pressure, ischaemic heart disease, or diffuse vascular disease.
- **MEDICINAL FORMS**
There can be variation in the licensing of different medicines containing the same drug. Forms available from special-order manufacturers include: oral suspension, suppository
- **Tablet**
CAUTIONARY AND ADVISORY LABELS 8
• CARVEDILOL (Non-proprietary)
Carvedilol 3.125 mg Carvedilol 3.125mg tablets | 28 tablet [Pxx] £6.00 DT price = £1.26
Carvedilol 6.25 mg Carvedilol 6.25mg tablets | 28 tablet [Pxx] £6.99 DT price = £1.31
Carvedilol 12.5 mg Carvedilol 12.5mg tablets | 28 tablet [Pxx] £9.99 DT price = £1.29
Carvedilol 25 mg Carvedilol 25mg tablets | 28 tablet [Pxx] £12.50 DT price = £1.41

Celiprolol hydrochloride

- **INDICATIONS AND DOSE**
Mild to moderate hypertension
BY MOUTH
• Adult: 200 mg once daily, dose to be taken in the morning, then increased if necessary to 400 mg once daily
- **SIDE-EFFECTS**
 - Rare Depression · pneumonitis
 - Frequency not known Hot flushes
- **BREAST FEEDING** Manufacturers advise avoidance.
- **HEPATIC IMPAIRMENT** Consider dose reduction.
- **RENAL IMPAIRMENT** Reduce dose by half if eGFR 15–40 mL/minute/1.73 m². Avoid if eGFR less than 15 mL/minute/1.73 m².
- **MEDICINAL FORMS**
There can be variation in the licensing of different medicines containing the same drug. Forms available from special-order manufacturers include: oral suspension
- **Tablet**
CAUTIONARY AND ADVISORY LABELS 8, 22
• CELIPROLOL HYDROCHLORIDE (Non-proprietary)
Celiprolol hydrochloride 200 mg Celiprolol 200mg tablets | 28 tablet [Pxx] £9.25 DT price = £3.88
Celiprolol hydrochloride 400 mg Celiprolol 400mg tablets | 28 tablet [Pxx] £39.63 DT price = £10.32
• Celicet (Zentiva)
Celiprolol hydrochloride 200 mg Celicet 200mg tablets | 28 tablet [Pxx] £19.83 DT price = £3.88
Celiprolol hydrochloride 400 mg Celicet 400mg tablets | 28 tablet [Pxx] £39.65 DT price = £10.32

Co-tenidone

- Also consider properties of the Thiazides class, p. 159
- **INDICATIONS AND DOSE**
Hypertension
BY MOUTH
• Adult: 50/12.5 mg daily, alternatively increased if necessary to 100/25 mg daily, doses higher than 50 mg atenolol rarely necessary
Dose equivalence and conversion
A mixture of atenolol and chloralidone in mass proportions corresponding to 4 parts of atenolol and 1 part chloralidone.
- **SIDE-EFFECTS** Allergic interstitial nephritis · jaundice
- **PREGNANCY** Avoid. Diuretics not used to treat hypertension in pregnancy.
- **BREAST FEEDING** Atenolol present in milk in greater amounts than some other beta-blockers. Possible toxicity due to beta-blockade—monitor infant. Large doses of chloralidone may suppress lactation.
- **RENAL IMPAIRMENT** Avoid if eGFR less than 30 mL/minute/1.73 m²—consider alternative treatment.

Esmolol hydrochloride

- **INDICATIONS AND DOSE**
Short-term treatment of supraventricular arrhythmias (including atrial fibrillation, atrial flutter, sinus tachycardia) | Tachycardia and hypertension in peri-operative period
BY INTRAVENOUS INFUSION
• Adult: 50–200 micrograms/kg/minute, consult product literature for details of dose titration and doses during peri-operative period
- **SIDE-EFFECTS** Thrombophlebitis · venous irritation
- **BREAST FEEDING** Manufacturer advises avoidance.
- **RENAL IMPAIRMENT** Manufacturer advises caution.
- **MEDICINAL FORMS**
There can be variation in the licensing of different medicines containing the same drug.
Solution for injection
• Esmolol (Baxter Healthcare Ltd)
Esmolol hydrochloride 10 mg per 1 mL Brevibloc Premixed 100mg/10mL solution for injection vials | 5 vial [Pxx] no price available
Solution for infusion
• Brevibloc (Baxter Healthcare Ltd)
Esmolol hydrochloride 10 mg per 1 mL Brevibloc Premixed 2.5g/250mL infusion bags | 1 bag [Pxx] £89.69
- **Tablet**
There can be variation in the licensing of different medicines containing the same drug.
CAUTIONARY AND ADVISORY LABELS 8
• CO-TENIDONE (Non-proprietary)
Atenolol 50 mg, Chloralidone 12.5 mg Co-tenidone 50mg/12.5mg tablets | 28 tablet [Pxx] £3.92 DT price = £4.14
Atenolol 100 mg, Chloralidone 25 mg Co-tenidone 100mg/25mg tablets | 28 tablet [Pxx] £4.85 DT price = £3.72
• Tenoret (AstraZeneca UK Ltd)
Atenolol 50 mg, Chloralidone 12.5 mg Tenoret 50mg/12.5mg tablets | 28 tablet [Pxx] £5.18 DT price = £4.14
• Tenoretic (AstraZeneca UK Ltd)
Atenolol 100 mg, Chloralidone 25 mg Tenoretic 100mg/25mg tablets | 28 tablet [Pxx] £5.18 DT price = £3.72

Olodaterol

INDICATIONS AND DOSE

Maintenance treatment of chronic obstructive pulmonary disease

- ▶ **BY INHALATION**
- Adult: 5 micrograms once daily
- Dose equivalence and conversion
- 2 puffs is equivalent to 5 micrograms.

CAUTIONS

- **CAUTIONS** Aneurysm • convulsive disorders
- **SIDE EFFECTS**
- **Uncommon** Dizziness • nasopharyngitis
- **Rare** Arrhythmia • hypertension
- **PREGNANCY** Manufacturer advises avoid—no information available.
- **BREAST FEEDING** Manufacturer advises avoid—present in milk in animal studies.
- **HEPATIC IMPAIRMENT** Use with caution in severe hepatic impairment—no information available.
- **PATIENT AND CARER ADVICE** Patients or carers should be given advice on how to administer olodaterol solution for inhalation.

MEDICINAL FORMS

There can be variation in the licensing of different medicines containing the same drug.

Pressurised Inhalation

- ▶ **Striverdi Respimat** (Boehringer Ingelheim Ltd) ▼
- Olodaterol (as Olodaterol hydrochloride) 2.5 microgram per 1 dose Striverdi Respimat 2.5micrograms/dose solution for inhalation cartridge with device | 60 dose [Bnf] £26.35 DT price - £26.35

Salmeterol

INDICATIONS AND DOSE

Reversible airways obstruction in patients requiring long-term regular bronchodilator therapy/ Nocturnal asthma in patients requiring long-term regular bronchodilator therapy/ Prevention of exercise-induced bronchospasm in patients requiring long-term regular bronchodilator therapy/ Chronic asthma only in patients who regularly use an inhaled corticosteroid (not for immediate relief of acute asthma)

- ▶ **BY INHALATION OF AEROSOL OR BY INHALATION OF POWDER**
- Child 5-11 years: 50 micrograms twice daily
- Child 12-17 years: 50 micrograms twice daily, dose may be increased in more severe airway obstruction;
- Increased to 100 micrograms twice daily
- Adult: 50 micrograms twice daily, dose may be increased in more severe airway obstruction; increased to 100 micrograms twice daily

Chronic obstructive pulmonary disease

- ▶ **BY INHALATION OF AEROSOL OR BY INHALATION OF POWDER**
- Adult: 50 micrograms twice daily

PHARMACOKINETICS

At recommended inhaled doses, the duration of action of salmeterol is about 12 hours.

- ▶ **UNLICENSED USE** Neovent® not licensed for use in children under 12 years.

Important safety information

- ▶ **CHM ADVICE**
- ▶ To ensure safe use, the CHM has advised that for the management of chronic asthma, long-acting beta₂ agonist (salmeterol) should:
- be added only if regular use of standard-dose inhaled corticosteroids has failed to control asthma adequately;

- not be initiated in patients with rapidly deteriorating asthma;
- be introduced at a low dose and the effect properly monitored before considering dose increase;
- be discontinued in the absence of benefit;
- not be used for the relief of exercise-induced asthma symptoms unless regular inhaled corticosteroids are also used;
- be reviewed as clinically appropriate: stepping down therapy should be considered when good long-term asthma control has been achieved.

SIDE EFFECTS

- **PREGNANCY** Inhaled drugs for asthma can be taken as normal during pregnancy.

- **BREAST FEEDING** Inhaled drugs for asthma can be taken as normal during breast-feeding.

PATIENT AND CARER ADVICE

- **Medicines for Children leaflet:** Salmeterol inhaler for asthma prevention (propylaxis) www.medicinesforchildren.org.uk/salmeterol-inhaler-for-asthma-prevention
- Advise patients that salmeterol should **not** be used for relief of acute attacks, not to exceed prescribed dose, and to follow manufacturer's directions; if a previously effective dose of inhaled salmeterol fails to provide adequate relief, a doctor's advice should be obtained as soon as possible.
- Patients should be advised to report any deterioration in symptoms following initiation of treatment with a long-acting beta₂ agonist.

MEDICINAL FORMS

There can be variation in the licensing of different medicines containing the same drug.

Pressurised Inhalation

- ▶ **SALMETEROL** (Non-proprietary)
- Salmeterol (as Salmeterol xinafoate) 25 microgram per 1 dose Salmeterol 25micrograms/dose inhaler CFC free | 120 dose [Bnf] £29.26 DT price - £29.26
- **Severent Evohaler** (Glaxosmithkline UK Ltd)
- Salmeterol (as Salmeterol xinafoate) 25 microgram per 1 dose Severent 25micrograms/dose Evohaler | 120 dose [Bnf] £29.26 DT price - £29.26
- Brands may include: Neovent, Vertrine
- ▶ **Inhalation powder**
- **Severent Accuhaler** (Glaxosmithkline UK Ltd)
- Salmeterol (as Salmeterol xinafoate) 50 microgram per 1 dose Severent 50micrograms/dose Accuhaler | 60 dose [Bnf] £29.26 DT price - £29.26

Also available in combination with *fluticasone*, p. 231

BETA₂ AGONISTS (SHORT-ACTING)

Salbutamol (Albuterol)

INDICATIONS AND DOSE

Asthma | Other conditions associated with reversible airways obstruction

BY MOUTH USING IMMEDIATE-RELEASE MEDICINES

- Adult: 4 mg 3-4 times a day, maximum single dose 8 mg (but unlikely to provide much extra benefit or to be tolerated); inhalation route preferred over oral route, use elderly dose for sensitive patients
- Elderly: Initially 2 mg 3-4 times a day, maximum single dose 8 mg (but unlikely to provide much extra benefit or to be tolerated); inhalation route preferred over oral route

- ▶ **BY SUBCUTANEOUS INJECTION OR BY INTRAMUSCULAR INJECTION**
- Adult: 500 micrograms every 4 hours if required

BY SLOW INTRAVENOUS INJECTION

- Adult: 250 micrograms, repeated if necessary, injection to be diluted to a concentration of 50 micrograms/mL, reserve intravenous beta₂ agonists for those in whom inhaled therapy cannot be used reliably

BY INTRAVENOUS INFUSION

- Adult: Initially 5 micrograms/minute, adjusted according to response and heart rate, usual dose 3-20 micrograms/minute, higher doses may be required, reserve intravenous beta₂ agonists for those in whom inhaled therapy cannot be used reliably

BY INHALATION OF AEROSOL

- Adult: 100-200 micrograms, up to 4 times a day for persistent symptoms
- ▶ **BY INHALATION OF NEBULISED SOLUTION**
- Adult: 2.5-5 mg, repeated up to 4 times daily or more frequently in severe cases

Prophylaxis of allergen- or exercise-induced bronchospasm

BY INHALATION OF AEROSOL

Moderate, severe, or life-threatening acute asthma

- ▶ **BY INHALATION OF NEBULISED SOLUTION**
- Child 1 month-4 years: 2.5 mg, then 2.5 mg every 20-30 minutes or when required, give via oxygen-driven nebuliser if available
- Child 5-11 years: 2.5-5 mg, then 2.5-5 mg every 20-30 minutes or when required, give via oxygen-driven nebuliser if available
- Child 12-17 years: 5 mg, then 5 mg every 20-30 minutes or when required, give via oxygen-driven nebuliser if available

- Adult: 5 mg, then 5 mg every 20-30 minutes or when required, give via oxygen-driven nebuliser if available
- Moderate and severe acute asthma

BY INHALATION OF AEROSOL

- Child: 2-10 puffs, each puff is to be inhaled separately, then 2-10 puffs every 10-20 minutes or when required, give via large volume spacer, give via close-fitting face mask in children under 3 years
- Adult: 2-10 puffs, each puff is to be inhaled separately, then 2-10 puffs every 10-20 minutes or when required, give via large volume spacer, give via close-fitting face mask in children under 3 years

Exacerbation of reversible airways obstruction (including nocturnal asthma), Prophylaxis of allergen- or exercise-induced bronchospasm

BY INHALATION OF AEROSOL

- Child: 100-200 micrograms, up to 4 times a day for persistent symptoms

BY MOUTH

- Child 1 month-1 year: 100 micrograms/kg 3-4 times a day (max. per dose 2 mg), inhalation route preferred over oral route
- Child 2-5 years: 1-2 mg 3-4 times a day, inhalation route preferred over oral route
- Child 6-11 years: 2 mg 3-4 times a day, inhalation route preferred over oral route
- Child 12-17 years: 2-4 mg 3-4 times a day, inhalation route preferred over oral route
- Chronic asthma
- ▶ **BY MOUTH USING MODIFIED-RELEASE MEDICINES**
- Child 3-11 years: 4 mg twice daily
- Child 12-17 years: 8 mg twice daily
- Adult: 8 mg twice daily

Uncomplicated premature labour (between 22 and 37 weeks of gestation) (specialist use only)

BY INTRAVENOUS INFUSION

- Adult: Initially 10 micrograms/minute, rate increased gradually according to response at 10-minute intervals until contractions diminish then increase rate slowly until contractions cease (maximum rate 45 micrograms/minute), maintain rate for 1 hour after contractions have stopped, then gradually reduce by 50% every 6 hours, maximum duration 48 hours

VENTOLIN ACCUHALER®

Acute bronchospasm

BY INHALATION OF POWDER

- ▶ Adult: Initially 200 micrograms, up to 4 times daily for persistent symptoms

Prophylaxis of allergen- or exercise-induced bronchospasm

BY INHALATION OF POWDER

Adult: 200 micrograms

SALBUTOLIN NOVOLIZER®

Acute bronchospasm

BY INHALATION OF POWDER

- ▶ Adult: Initially 100-200 micrograms, up to 800 micrograms daily for persistent symptoms

Prophylaxis of allergen- or exercise-induced bronchospasm

BY INHALATION OF POWDER

Adult: 200 micrograms

PULVINAL® SALBUTAMOL

Acute bronchospasm

BY INHALATION OF POWDER

Adult: 200 micrograms

EASVHALER® SALBUTAMOL

Acute bronchospasm

BY INHALATION OF POWDER

- ▶ Adult: Initially 100-200 micrograms, increased if necessary to 400 micrograms, maximum

Prophylaxis of allergen- or exercise-induced bronchospasm

BY INHALATION OF POWDER

Adult: 200 micrograms

ASMASAL CLICKHALER®

Acute bronchospasm

BY INHALATION OF POWDER

- ▶ Adult: 1-2 puffs, up to 4 times daily for persistent symptoms

Prophylaxis of allergen- or exercise-induced bronchospasm

BY INHALATION OF POWDER

Adult: 1-2 puffs

PHARMACOKINETICS

At recommended inhaled doses, the duration of action of salbutamol is about 3 to 5 hours.

UNLICENSED USE

- ▶ With oral use Syrup and tablets not licensed for use in children under 2 years.
- ▶ With intravenous use Administration of undiluted salbutamol injection through a central venous catheter is not licensed.

CONTRA-INDICATIONS

- ▶ When used for uncomplicated premature labour under specialist supervision abruptio placentae • antepartum haemorrhage • cord compression • eclampsia - history of cardiac disease • intra-uterine fetal death • intra-uterine infection • placenta praevia • pulmonary hypertension • severe pre-eclampsia •

224 Airways disease, obstructive

significant risk factors for myocardial ischaemia • threatened miscarriage

CAUTIONS

- With intravenous use, mild to moderate pre-eclampsia (when used for uncomplicated premature labour) • suspected cardiovascular disease (should be assessed by a cardiologist before initiating therapy for uncomplicated premature labour)

SIDE-EFFECTS

- GENERAL SIDE-EFFECTS
Lactic acidosis (with high doses) • nausea

SPECIFIC SIDE-EFFECTS

- When used for uncomplicated premature labour
bronchospasm • muscle tension • pulmonary oedema • vomiting
- BREAST FEEDING
Inhaled drugs for asthma can be taken as normal during breast-feeding.

MONITORING REQUIREMENTS

- In uncomplicated premature labour it is important to monitor blood pressure, pulse rate (should not exceed 120 beats per minute), ECG (discontinue treatment if signs of myocardial ischaemia develop), blood glucose and lactate concentrations, and the patient's fluid and electrolyte status (avoid over-hydration—discontinue drug immediately and initiate diuretic therapy if pulmonary oedema occurs).

DIRECTIONS FOR ADMINISTRATION

- When used by inhalation
For nebulisation, dilute nebuliser solution with a suitable volume of sterile Sodium Chloride 0.9% solution according to nebuliser type and duration of administration; salbutamol and ipratropium bromide solutions are compatible and can be mixed for nebulisation.

- When used by continuous intravenous infusion
For bronchodilation, dilute to a concentration of 200 micrograms/mL with Glucose 5% or Sodium Chloride 0.9%.

- For premature labour, dilute with Glucose 5% to a concentration of 200 micrograms/mL for use in a syringe pump or for other infusion methods (preferably via controlled infusion device), dilute to a concentration of 20 micrograms/mL; close attention to patient's fluid and electrolyte status essential.

PATIENT AND CARER ADVICE

- Medicines for Children leaflet: Salbutamol inhaler for asthma and wheeze www.medicinesforchildren.org.uk/salbutamol-inhaler-for-asthma-and-wheeze

- For inhalation by aerosol or dry powder, advise patients and carers not to exceed prescribed dose and to follow manufacturer's directions; if a previously effective dose of inhaled salbutamol fails to provide at least 3 hours relief, a doctor's advice should be obtained as soon as possible. For inhalation by nebuliser, the dose given by nebuliser is substantially higher than that given by inhaler. Patients should therefore be warned that it is dangerous to exceed the prescribed dose and they should seek medical advice if they fail to respond to the usual dose of the respirator solution.

MEDICINAL FORMS

- There can be variation in the licensing of different medicines containing the same drug.

Tablet

SALBUTAMOL (Non-proprietary)

- Salbutamol (as salbutamol sulfate) 2 mg Salbutamol 2mg tablets | 28 tablet [\[BN\]](#) £113.09 DT price = £104.95
- Salbutamol (as salbutamol sulfate) 4 mg Salbutamol 4mg tablets | 28 tablet [\[BN\]](#) £115.76 DT price = £107.43

Modified-release capsule

- CAUTIONARY AND ADVISORY LABELS 25
- Ventmax SR (Chiesi Ltd)
- Salbutamol (as salbutamol sulfate) 4 mg Ventmax SR 4mg capsules | 56 capsule [\[BN\]](#) £8.08 DT price = £8.08

- Salbutamol (as salbutamol sulfate) 8 mg Ventmax SR 8mg capsules | 56 capsule [\[BN\]](#) £9.69 DT price = £9.69

Oral solution

- SALBUTAMOL (Non-proprietary)
- Salbutamol (as salbutamol sulfate) 400 microgram per 1 ml Salbutamol 2mg/5ml oral solution sugar free (sugar-free) | 150 ml [\[BN\]](#) no price available DT price = £0.72

- Ventolin (GlaxoSmithKline UK Ltd)
- Salbutamol (as salbutamol sulfate) 400 microgram per 1 ml Ventolin 2mg/5ml syrup (sugar-free) | 150 ml [\[BN\]](#) £0.72 DT price = £0.72

Solution for injection

- Ventolin (GlaxoSmithKline UK Ltd)
- Salbutamol (as salbutamol sulfate) 500 microgram per 1 ml Ventolin 500micrograms/1ml solution for injection ampoules | 5 ampoule [\[BN\]](#) £1.91

Solution for infusion

- Ventolin (GlaxoSmithKline UK Ltd)
- Salbutamol (as salbutamol sulfate) 1 mg per 1 ml Ventolin 5mg/5ml solution for infusion ampoules | 10 ampoule [\[BN\]](#) £4.16

Pressurised inhalation

- SALBUTAMOL (Non-proprietary)
- Salbutamol (as salbutamol sulfate) 100 microgram per 1 dose Salbutamol 100micrograms/dose inhaler CFC free | 200 dose [\[BN\]](#) £1.50 DT price = £1.50

- Ventolin Eohaler (GlaxoSmithKline UK Ltd)
- Salbutamol (as salbutamol sulfate) 100 microgram per 1 dose Ventolin 100micrograms/dose Eohaler | 200 dose [\[BN\]](#) £1.50 DT price = £1.50

- Brands may include *AirSalb*, *Aironin*, *Aironir*, *Autohaler*, *Asmate*, *Salamol*, *Salamol Easy-Breathe*

Inhalation powder

- SALBUTAMOL (Non-proprietary)
- Salbutamol 100 microgram per 1 dose Easyhaler Salbutamol sulfate 100micrograms/dose dry powder inhaler | 200 dose [\[BN\]](#) £3.31 DT price = £3.31

- Salbutamol 200 microgram per 1 dose Easyhaler Salbutamol sulfate 200micrograms/dose dry powder inhaler | 200 dose [\[BN\]](#) £6.63

- Asmateal Clickhaler (Focus Pharmaceuticals Ltd)
- Salbutamol (as salbutamol sulfate) 95 microgram per 1 dose Asmateal 95micrograms/dose Clickhaler | 200 dose [\[BN\]](#) £5.01 DT price = £5.05

- Pulvinal (Salbutamol) (Chiesi Ltd)
- Salbutamol 200 microgram per 1 dose Pulvinal Salbutamol 200micrograms/dose dry powder inhaler | 100 dose [\[BN\]](#) £4.85 DT price = £4.85

- Sabulin Novolizer (Meda Pharmaceuticals Ltd)
- Salbutamol (as salbutamol sulfate) 100 microgram per 1 dose Sabulin Novolizer 100micrograms/dose inhalation powder | 200 dose [\[BN\]](#) £4.95

- Ventolin Accuhaler (GlaxoSmithKline UK Ltd)
- Salbutamol 200 microgram per 1 dose Ventolin 200micrograms/dose Accuhaler | 60 dose [\[BN\]](#) £3.00 DT price = £3.00

- SALBUTAMOL (Non-proprietary)
- Salbutamol (as salbutamol sulfate) 1 mg per 1 ml Salbutam 2.5mg/2.5ml nebuliser liquid unit dose Steripoule vials | 20 unit dose [\[BN\]](#) £2.87 DT price = £1.91

- Ventolin (GlaxoSmithKline UK Ltd)
- Salbutamol (as salbutamol sulfate) 2 mg per 1 ml Ventolin 5mg/2.5ml nebuliser liquid unit dose vials | 20 unit dose [\[BN\]](#) £7.00 DT price = £1.91

- Ventolin Nebules (GlaxoSmithKline UK Ltd)
- Salbutamol (as salbutamol sulfate) 2 mg per 1 ml Ventolin 2.5mg/2.5ml nebuliser liquid unit dose Steripoule vials | 20 unit dose [\[BN\]](#) £6.08 DT price = £3.82

- Ventolin Nebules (GlaxoSmithKline UK Ltd)
- Salbutamol (as salbutamol sulfate) 1 mg per 1 ml Ventolin 2.5mg/2.5ml nebuliser liquid unit dose Steripoule vials | 20 unit dose [\[BN\]](#) £2.18 DT price = £2.18

- Ventolin Nebules (GlaxoSmithKline UK Ltd)
- Salbutamol (as salbutamol sulfate) 2 mg per 1 ml Ventolin 5mg/2.5ml nebuliser liquid unit dose Steripoule vials | 20 unit dose [\[BN\]](#) £2.78 DT price = £3.82

Also available in combination with ipratropium, p. 218

Terbutaline sulfate

INDICATIONS AND DOSE

- Asthma (other conditions associated with reversible airways obstruction)

BY MOUTH

- Adult: Initially 2.5 mg 3 times a day for 1–2 weeks, then increased to up to 5 mg 3 times a day, use by inhalation preferred over by mouth

BY SUBCUTANEOUS INJECTION OR BY SLOW INTRAVENOUS INFUSION

- Adult: 250–500 micrograms up to 4 times a day, reserve intravenous beta₂ agonists for those in whom inhaled therapy cannot be used reliably or there is no current effect

BY CONTINUOUS INTRAVENOUS INFUSION

- Adult: 90–300 micrograms/hour for 8–10 hours, to be administered as a solution containing 3–5 micrograms/mL, high doses require close monitoring, reserve intravenous beta₂ agonists for those in whom inhaled therapy cannot be used reliably or there is no current effect

BY INHALATION OF POWDER

- Adult: 500 micrograms up to 4 times a day, for persistent symptoms

BY INHALATION OF NEBULISED SOLUTION

- Adult: 5–10 mg 2–4 times a day, additional doses may be necessary in severe acute asthma

Acute asthma

BY SUBCUTANEOUS INJECTION OR BY SLOW INTRAVENOUS INFUSION

- Child 2–14 years: 10 micrograms/kg up to 4 times a day (max. per dose 300 micrograms), reserve intravenous beta₂ agonists for those in whom inhaled therapy cannot be used reliably or there is no current effect
- Child 15–17 years: 250–500 micrograms up to 4 times a day, reserve intravenous beta₂ agonists for those in whom inhaled therapy cannot be used reliably or there is no current effect

BY CONTINUOUS INTRAVENOUS INFUSION

- Child: Loading dose 2–4 micrograms/kg, then 1–10 micrograms/kg/hour, dose to be adjusted according to response and heart rate, close monitoring is required for doses above 10 micrograms/kg/hour, reserve intravenous beta₂ agonists for those in whom inhaled therapy cannot be used reliably or there is no current effect

Moderate, severe, or life-threatening acute asthma

BY INHALATION OF NEBULISED SOLUTION

- Child 1 month–4 years: Initially 5 mg, then 5 mg every 20–30 minutes or when required, give via oxygen-driven nebuliser if available
- Child 5–11 years: Initially 5–10 mg, then 5–10 mg every 20–30 minutes or when required, give via oxygen-driven nebuliser if available
- Child 12–17 years: Initially 10 mg, then 10 mg every 20–30 minutes or when required, give via oxygen-driven nebuliser if available

- Adult: Initially 10 mg, then 10 mg every 20–30 minutes or when required, give via oxygen-driven nebuliser if available

Exacerbation of reversible airways obstruction (including nocturnal asthma). Prevention of exercise-induced bronchospasm

BY INHALATION OF POWDER

- Child 5–17 years: 500 micrograms up to 4 times a day, for occasional use only
- By mouth
- Child 1 month–6 years: 75 micrograms/kg 3 times a day (max. per dose 2.5 mg)

Airways disease, obstructive 225

- Child 7–14 years: 2.5 mg 2–3 times a day
- Child 15–17 years: Initially 2.5 mg 3 times a day, then increased if necessary to 5 mg 3 times a day

- Uncomplicated premature labour (between 22 and 37 weeks of gestation) (specialist supervision in hospital) by INTRAVENOUS INFUSION

- Adult: Initially 5 micrograms/minute for 20 minutes, then increased in steps of 2.5 micrograms/minute every 20 minutes until contractions have ceased (more than 10 micrograms/minute should not be exceeded), continue for 1 hour, then reduced in steps of 2.5 micrograms/minute every 20 minutes to lowest dose that maintains suppression (maximum total duration 48 hours)

PHARMACOKINETICS

- At recommended inhaled doses, the duration of action of terbutaline is about 3 to 5 hours.

UNLICENSED USE

- Tablets not licensed for use in children under 7 years. Injection not licensed for use in children under 2 years.

CONTRA-INDICATIONS

- When used for uncomplicated premature labour abruptio placentae • antepartum haemorrhage • cord compression • eclampsia • history of cardiac disease • intra-uterine foetal death • intra-uterine infection • placenta praevia • pulmonary hypertension • severe pre-eclampsia • significant risk factors for myocardial ischaemia • threatened miscarriage

CAUTIONS

- Mild to moderate pre-eclampsia (when used for uncomplicated premature labour) • suspected cardiovascular disease (should be assessed by a cardiologist before initiating therapy for uncomplicated premature labour)

SIDE-EFFECTS

GENERAL SIDE-EFFECTS

Nausea

SPECIFIC SIDE-EFFECTS

- When used for uncomplicated premature labour muscle tension • pulmonary oedema • vomiting
- PREGNANCY
Inhaled drugs for asthma can be taken as normal during pregnancy.
- BREAST FEEDING
Inhaled drugs for asthma can be taken as normal during breast-feeding.

MONITORING REQUIREMENTS

- In uncomplicated premature labour it is important to monitor blood pressure, pulse rate (should not exceed 120 beats per minute), ECG (discontinue treatment if signs of myocardial ischaemia develop), blood glucose and lactate concentrations, and the patient's fluid and electrolyte status (avoid over-hydration—discontinue drug immediately and initiate diuretic therapy if pulmonary oedema occurs).

DIRECTIONS FOR ADMINISTRATION

- When used by inhalation
For nebulisation, dilute nebuliser solution with sterile Sodium Chloride 0.9% solution according to nebuliser type and duration of administration; terbutaline and ipratropium bromide solutions are compatible and may be mixed for nebulisation.

With intravenous use in children

- For continuous intravenous infusion, dilute to a concentration of 5 micrograms/mL with Glucose 5% or Sodium Chloride 0.9%, if fluid-restricted, dilute to a concentration of 100 micrograms/mL.

- With intravenous use in adults
For bronchodilation by continuous intravenous infusion, dilute 1.5–2.5 mg with 500 mL glucose 5% or sodium chloride 0.9% and give over 8–10 hours. For premature labour by continuous intravenous infusion, dilute in glucose 5% and give via controlled infusion device preferably a syringe pump; if

584 Corticosteroid responsive conditions

BNF 11

intermittently or via drip tubing in Glucose 5% or Sodium chloride 0.9%.

- **PATIENT AND CAREER ADVICE** Patient counselling is advised for hydrocortisone tablets and injections (steroid card).
- **LESS SUITABLE FOR PRESCRIBING** Hydrocortisone as the sodium phosphate is less suitable for prescribing as paracetamol and pain (particularly in the perineal region) may follow intravenous injection. Efcortisol® is less suitable for prescribing.
- **EXCEPTIONS TO LEGAL CATEGORY**
- With intramuscular use or intravenous use Prescription only medicine restriction does not apply where administration is for saving life in emergency.

There can be variation in the licensing of different medicines containing the same drug. Forms available from special-order manufacturers include: suppository, oral suspension, oral solution, capsule, liquid

MEDICINAL FORMS

CAUTIONARY AND ADVISORY LABELS 10, 21

Hydrocortisone 10 mg Hydrocortisone 10mg tablets

30 tablet [BNF] £87.00 DT price = £55.78

Hydrocortisone 20 mg Hydrocortisone 20mg tablets

30 tablet [BNF] £102.75 DT price = £88.75

Modified-release tablet

CAUTIONARY AND ADVISORY LABELS 10, 22, 25

Hydrocortisone 5 mg Prednolone 5mg modified-release tablets

50 tablet [BNF] £242.50

Hydrocortisone 20 mg Prednolone 20mg modified-release tablets

50 tablet [BNF] £400.00

Solution for injection

CAUTIONARY AND ADVISORY LABELS 10

Hydrocortisone (as Hydrocortisone sodium phosphate) 100 mg per 1 ml Efcortisol 100mg/1ml solution for injection ampoules

5 ampoule [BNF] £5.38

Efcortisol 500mg/5ml solution for injection ampoules

5 ampoule [BNF] £24.45

Powder for solution for injection

Solid-Cortef (Pfizer Ltd)

Hydrocortisone (as Hydrocortisone sodium succinate) 100 mg Solid-Cortef 100mg powder for solution for injection vials

10 vial [BNF] £9.17

Powder and solvent for solution for injection

CAUTIONARY AND ADVISORY LABELS 10

Hydrocortisone (as Hydrocortisone sodium succinate) 100 mg Solid-Cortef 100mg powder and solvent for solution for injection vials

1 vial [BNF] £1.16

Suspension for injection

Hydrocortisone (as Hydrocortisone sodium succinate) 25 mg per 1 ml Hydrocortisab 25mg/1ml suspension for injection ampoules

10 ampoule [BNF] £68.72 DT price = £68.72

Foam

EXCIPIENTS: May contain cetylalcohol (including cetyl and stearyl alcohol), hydroxybenzoates (parabens), propylene glycol

Colloidal Media Pharmaceuticals Ltd

Hydrocortisone acetate 100 mg per 1 gram Colloidal 10% aerosol

14 dose [BNF] £9.33 DT price = £9.33

Methylprednisolone

INDICATIONS AND DOSE

Suppression of inflammatory and allergic disorders

Cerebral oedema associated with malignancy

Adult: Usual dose 2–40 mg daily

BY INTRAMUSCULAR INJECTION OR BY SLOW INTRAVENOUS INJECTION OR BY INTRAVENOUS INFUSION

Adult: Initially 10–500 mg

Treatment of graft rejection reactions

BY INTRAVENOUS INFUSION

Adult: Up to 1 g daily for up to 3 days

DEPO-MEDROL®

Local inflammation of joints and soft tissues

BY INTRA-ARTICULAR INJECTION

Adult: 4–80 mg, select dose according to size, where appropriate dose may be repeated at intervals of 7–35 days, for details consult product literature

Suppression of inflammatory and allergic disorders

BY DEEP INTRAMUSCULAR INJECTION

Adult: 40–120 mg, then 40–120 mg after 2–3 weeks if required, to be injected into the gluteal muscle

CAUTIONS

With intravenous use Rapid intravenous administration of large doses associated with cardiovascular collapse

DIRECTIONS FOR ADMINISTRATION For intravenous infusion (as sodium succinate) (Solu-Medrol®), give continuous or intermittently or via drip tubing in Glucose 5% or Sodium chloride 0.9%. Reconstitute initially with water for injections; doses up to 250 mg should be given over at least 5 minutes, high doses over at least 30 minutes.

PATIENT AND CAREER ADVICE Patient counselling is advised for methylprednisolone tablets and injections (steroid card).

MEDICINAL FORMS

There can be variation in the licensing of different medicines containing the same drug. Forms available from special-order manufacturers include: oral suspension

Tablet

CAUTIONARY AND ADVISORY LABELS 10, 21

Methylprednisolone 2 mg Medrone 2mg tablets

30 tablet [BNF] £3.88

Methylprednisolone 4 mg Medrone 4mg tablets

30 tablet [BNF] £6.19

Methylprednisolone 16 mg Medrone 16mg tablets

30 tablet [BNF] £17.17

Methylprednisolone 100 mg Medrone 100mg tablets

20 tablet [BNF] £48.32

Powder and solvent for solution for injection

CAUTIONARY AND ADVISORY LABELS 10

METHYLPREDNISOLONE (Non-proprietary)

Methylprednisolone (as Methylprednisolone sodium succinate) 500 mg Methylprednisolone sodium succinate 500mg powder for solution for injection vials

1 vial [BNF] £9.60

Methylprednisolone (as Methylprednisolone sodium succinate) 1g Methylprednisolone 1g powder and solvent for solution for injection vials

1 vial [BNF] £17.30

Methylprednisolone (as Methylprednisolone sodium succinate) 40 mg Soli-Medrone 40mg powder and solvent for solution for injection vials

1 vial [BNF] £1.58

Methylprednisolone (as Methylprednisolone sodium succinate) 125 mg Soli-Medrone 125mg powder and solvent for solution for injection vials

1 vial [BNF] £4.75

Methylprednisolone (as Methylprednisolone sodium succinate) 500 mg Soli-Medrone 500mg powder and solvent for solution for injection vials

1 vial [BNF] £9.60

Methylprednisolone (as Methylprednisolone sodium succinate) 1g Soli-Medrone 1g powder and solvent for solution for injection vials

1 vial [BNF] £17.30

Suppression for injection

CAUTIONARY AND ADVISORY LABELS 10

Depo-Medrol (Pfizer Ltd)

Methylprednisolone acetate 40 mg per 1 ml Depo-Medrolone 40mg/ml suspension for injection vials

1 vial [BNF] £34.44 DT price = £34.44

Depo-Medrolone 80mg/2ml suspension for injection vials

1 vial [BNF] £61.39

Depo-Medrolone 120mg/5ml suspension for injection vials

1 vial [BNF] £83.96 DT price = £83.96

Prednisolone

INDICATIONS AND DOSE

Exacerbation of chronic obstructive pulmonary disease (if increased breathlessness interferes with daily activities)

Adult: 30 mg daily for 7–14 days

Severe croup (before transfer to hospital) Mild croup that might cause complications (before transfer to hospital)

Child: 1–2 mg/kg

Mild to moderate acute asthma (when oral corticosteroid taken for more than a few days) Severe or life-threatening acute asthma (when oral corticosteroid taken for more than a few days)

Child: 1–2 mg/kg

Child: 1 month–11 years: 2 mg/kg once daily (max. per dose 60 mg) for up to 3 days, longer if necessary

Adult to moderate acute asthma Severe or life-threatening acute asthma

Child: 1 month–11 years: 1–2 mg/kg once daily (max. per dose 40 mg) for up to 3 days, longer if necessary

Child: 12–17 years: 40–50 mg daily for at least 5 days

Adult: 40–50 mg daily for at least 5 days

Suppression of inflammatory and allergic disorders

Adult: Initially 10–20 mg daily, dose preferably taken in the morning after breakfast, can often be reduced within a few days but may need to be continued for several weeks or months; maintenance 2.5–15 mg daily; higher doses may be needed; cushingoid side-effects increasingly likely with doses above 7.5 mg daily

BY INTRAMUSCULAR INJECTION

Adult: 25–100 mg 1–2 times a week, as prednisolone acetate

Suppression of inflammatory and allergic disorders (initial dose in severe disease)

Adult: Initially up to 60 mg daily, dose preferably taken in the morning after breakfast, can often be reduced within a few days but may need to be continued for several weeks or months

Idiopathic thrombocytopenic purpura

Adult: 1 mg/kg daily, gradually reduce dose over several weeks

Ulcerative colitis (Crohn's disease)

Adult: Initially 20–40 mg daily until remission occurs, followed by reducing doses, up to 60 mg daily, may be used in some cases, doses preferably taken in the morning after breakfast

Dental ulcerative colitis

Adult: 1 metered application 1–2 times a day for 2 weeks, continued for further 2 weeks if good

Corticosteroid responsive conditions 585

response, to be inserted into the rectum, 1 metered application contains 20 mg prednisolone

Rectal complications of Crohn's disease

BY RECTUM USING SUPPOSITORIES

Adult: 5 mg twice daily, to be inserted in the rectum morning and night, after a bowel movement

Rectal and rectosigmoidal ulcerative colitis Rectal and rectosigmoidal Crohn's disease

BY RECTUM USING ENEMA

Adult: 20 mg daily for 2–4 weeks, continued if response good, to be used at bedtime

Proctitis

BY RECTUM USING RECTAL FOAM

Adult: 1 metered application 1–2 times a day for 2 weeks, continued for further 2 weeks if good response, to be inserted into the rectum, 1 metered application contains 20 mg prednisolone

BY RECTUM USING SUPPOSITORIES

Adult: 5 mg twice daily, to be inserted in the rectum morning and night, after a bowel movement

Neuritic pain or weakness heralding rapid onset of permanent nerve damage (during reversal reactions multibacillary leprosy)

BY MOUTH

Adult: Initially 40–60 mg daily, dose to be instituted at once

Generalised myasthenia gravis (when given on alternate days)

INITIALLY BY MOUTH

Adult: Initially 10 mg once daily on alternate days, then increased in steps of 10 mg once daily on alternate days, increased to 1–1.5 mg/kg once daily on alternate days (max. per dose 100 mg)

Generalised myasthenia gravis in ventilated patients (when given on alternate days)

BY MOUTH

Adult: Initially 1.5 mg/kg once daily on alternate days (max. per dose 100 mg)

Generalised myasthenia gravis (when giving daily)

BY MOUTH

Adult: Initially 5 mg daily, increased in steps of 5 mg daily, maintenance 60–80 mg daily, alternatively maintenance 0.75–1 mg/kg daily, ventilated patients may be started on 1.5 mg/kg (max. 100 mg) on alternate days

Ocular myasthenia

BY MOUTH

Adult: Usual dose 10–40 mg once daily on alternate days, reduce to minimum effective dose

Reduction in rate of joint destruction in moderate to severe rheumatoid arthritis of less than 2 years' duration

BY MOUTH

Adult: 7.5 mg daily

Polymyalgia rheumatica

BY MOUTH

Adult: 10–15 mg daily until remission of disease activity; maintenance 7.5–10 mg daily, reduce gradually to maintenance dose. Many patients require treatment for at least 2 years and in some patients it may be necessary to continue long term low-dose corticosteroid treatment

Giant cell (temporal) arteritis

BY MOUTH

Adult: 40–60 mg daily until remission of disease activity, the higher dose being used if visual symptoms occur; maintenance 7.5–10 mg daily, reduce gradually to maintenance dose. Many patients require treatment for at least 2 years and in

continued →

some patients it may be necessary to continue long term low-dose corticosteroid treatment

Polyarteritis nodosa / Polymyositis / Systemic lupus erythematosus

BY MOUTH
Adult: Initially 60 mg daily, then maintenance 10–15 mg daily

Pneumocystis pneumonia in moderate to severe infections associated with HIV infection

BY MOUTH
Adult: 50–80 mg daily for 5 days, the dose is then reduced to complete 21 days of treatment,

corticosteroid treatment should ideally be started at the same time as the anti-pneumocystis therapy and certainly no later than 24–72 hours afterwards. The corticosteroid should be withdrawn before anti-pneumocystis treatment is complete

Short-term prophylaxis of episodic cluster headache as monotherapy or in combination with verapamil during verapamil titration

BY MOUTH
Adult: 60–100 mg once daily for 2–5 days, then reduced in steps of 10 mg every 2–3 days until prednisolone is discontinued

Anorexia (symptom control in palliative care)

BY MOUTH
Adult: 15–30 mg daily

DELTA58

Local inflammation of joints
BY INTRA-ARTICULAR INJECTION

Adult: 5–25 mg dose according to size; not more than 3 joints should be treated on any one day; where appropriate may be repeated when relapse occurs, for details consult product literature

CONTRA-INDICATIONS

With rectal use: Bowel perforation, extensive fistulas, intestinal obstruction, recent intestinal anastomoses

CAUTIONS

With rectal use: Systemic absorption may occur with rectal preparations

With systemic use: Duchenne's muscular dystrophy (possible transient rhabdomyolysis and myoglobinuria following strenuous physical activity)

PREGNANCY As it crosses the placenta 88% of prednisolone is inactivated.

With systemic use: Pregnant women with fluid retention should be monitored closely.

BREAST FEEDING Prednisolone appears in small amounts in breast milk but maternal doses of up to 40 mg daily are unlikely to cause systemic effects in the infant.

With systemic use: Infant should be monitored for adrenal suppression if mother is taking a dose higher than 40 mg.

PATIENT AND CAREER ADVICE

Medicines for Children leaflet: Prednisolone for asthma www.medicinesforchildren.org.uk/prednisolone-for-asthma and Prednisolone (oral) for nephrotic syndrome www.medicinesforchildren.org.uk/prednisolone-oral-for-nephrotic-syndrome

Patient counselling is advised for prednisolone tablets (steroid card).

MEDICINAL FORMS

There can be variation in the licensing of different medicines containing the same drug. Forms available from special-order manufacturers include: oral suspension, oral solution, enema

Tablet

CAUTIONARY AND ADVISORY LABELS 10, 21
Prednisolone 1 mg Prednisolone 1mg tablets | 28 tablet [Eco] £4.00 DT price = £1.08 | 100 tablet [Eco] no price available

Prednisolone 5 mg Prednisolone 5mg tablets | 28 tablet [Eco] £11.00 DT price = £1.25 | 100 tablet [Eco] no price available
Prednisolone 25 mg Prednisolone 25mg tablets | 56 tablet [Eco] £75.00 DT price = £50.00

Brands may include Peranti

Soluble tablet

CAUTIONARY AND ADVISORY LABELS 10, 13, 21

PREDNISOLONE (Non-proprietary)

Prednisolone (as Prednisolone sodium phosphate) 5 mg Prednisolone 5mg soluble tablets | 30 tablet [Eco] £53.46 DT price = £53.46

Gastro-resistant tablet

CAUTIONARY AND ADVISORY LABELS 5, 10, 25

PREDNISOLONE (Non-proprietary)

Prednisolone 2.5 mg Prednisolone 2.5mg gastro-resistant tablets | 28 tablet [Eco] £15.45 DT price = £1.59 | 30 tablet [Eco] £9.36 | 100 tablet [Eco] £13.43

Prednisolone 5 mg Prednisolone 5mg gastro-resistant tablets | 28 tablet [Eco] £13.50 DT price = £1.65 | 30 tablet [Eco] £5.29 | 100 tablet [Eco] £13.54

Delacortril Emecic Alliance Pharmaceuticals Ltd

Prednisolone 2.5 mg Delacortril 2.5mg gastro-resistant tablets | 30 tablet [Eco] £1.16

Prednisolone 5 mg Delacortril 5mg gastro-resistant tablets | 30 tablet [Eco] £1.19

Brands may include Dilacont

Oral solution

PREDNISOLONE (Non-proprietary)

Prednisolone 1 mg per 1 ml Prednisolone 5mg/5ml oral solution unit dose | 10 unit dose [Eco] £11.41

Suspension for injection

Delastab (AMCO)

Prednisolone acetate 25 mg per 1 ml Delastab 25mg/1ml suspension for injection ampoules | 10 ampoule [Eco] £68.72

Foam

PREDNISOLONE (Non-proprietary)

Prednisolone (as Prednisolone sodium metasulphobenzate) 20 mg per 1 application Prednisolone 20mg/application foam enema | 14 dose [Eco] £68.00 DT price = £68.00

Suppository

PREDNISOLONE (Non-proprietary)

Prednisolone (as Prednisolone sodium phosphate) 5 mg Prednisolone sodium phosphate 5mg suppositories | 10 suppository [Eco] £27.50 DT price = £27.50

Enema

Predsol (Focus Pharmaceuticals Ltd)

Prednisolone sodium phosphate 200 microgram per 1 ml Predsol 20mg/100ml retention enema | 7 enema [Eco] £75.07 DT price = £75.00

Prednisone

INDICATIONS AND DOSE

Moderate to severe rheumatoid arthritis

BY MOUTH USING MODIFIED-RELEASE MEDICINES

Adult: 10–20 mg daily, adjusted according to response dose to be taken at bedtime

HEPATIC IMPAIRMENT Monitor patient closely in hepatic impairment.

PATIENT AND CAREER ADVICE Patient counselling is advised for prednisone tablets (steroid card).

MEDICINAL FORMS

There can be variation in the licensing of different medicines containing the same drug.

Modified-release tablet

CAUTIONARY AND ADVISORY LABELS 10, 21, 25
Lodotra (Napp Pharmaceuticals Ltd)

Prednisone 1 mg Lodotra 1mg modified-release tablets | 30 tablet [Eco] £26.70

Prednisone 2 mg Lodotra 2mg modified-release tablets | 30 tablet [Eco] £26.70 | 100 tablet [Eco] £89.00

Prednisone 5 mg Lodotra 5mg modified-release tablets | 30 tablet [Eco] £26.70 | 100 tablet [Eco] £89.00

Triamcinolone acetoneide

INDICATIONS AND DOSE

Suppression of inflammatory and allergic disorders

BY DEEP INTRAMUSCULAR INJECTION

Adult: 40 mg (max. per dose 100 mg), repeated if necessary, dose given for depot effect, to be administered into gluteal muscle; repeated at intervals according to patient's response

VENALOG[®] VIAS

Local inflammation of joints and soft tissues

BY INTRA-ARTICULAR INJECTION

Adult: 5–40 mg (max. per dose 80 mg), for further details consult product literature, select dose according to size. For doses below 5 mg use Adacorty[®]

intracortical/intra-articular injection, where appropriate dose may be repeated when relapse occurs.

ADACORTY[®] INTRA-ARTICULAR/INTRADERMAL

Local inflammation of joints and soft tissues

BY INTRA-ARTICULAR INJECTION

Adult: 2.5–15 mg, adjusted according to size (for larger doses use Kenalog[®]). Where appropriate dose may be repeated when relapse occurs, for details consult product literature.

BY INTRADERMAL INJECTION

Adult: 2–3 mg, max. 5 mg at any one site (total max. 30 mg). Where appropriate may be repeated at intervals of 1–2 weeks, for details consult product literature

CAUTIONS

With intramuscular use: High dosage (may cause proximal myopathy), avoid in chronic therapy

PATIENT AND CAREER ADVICE Patient counselling is advised for triamcinolone acetoneide injection (steroid card).

MEDICINAL FORMS

There can be variation in the licensing of different medicines containing the same drug.

Suspension for injection

CAUTIONARY AND ADVISORY LABELS 10
Kenalog (Kenalog-Benly Alcohol)

Kenalog intra-articular / intradermal (Bristol-Myers Squibb Pharmaceuticals Ltd)

Triamcinolone acetoneide 10 mg per 1 ml Kenalog intra-articular / intradermal 40mg/1ml suspension for injection vials | 5 vial [Eco] DT price = £7.45

Triamcinolone acetoneide 10 mg per 1 ml Adacorty intra-articular / intradermal 50mg/5ml suspension for injection vials | 1 vial [Eco] DT price = £4.47

Kenalog (Bristol-Myers Squibb Pharmaceuticals Ltd)

Triamcinolone acetoneide 40 mg per 1 ml Kenalog intra-articular / intradermal 40mg/1ml suspension for injection vials | 5 vial [Eco] DT price = £7.45

Triamcinolone acetoneide

Kenalog

Kenalog intra-articular / intradermal 10mg/1ml suspension for injection ampoules | 5 ampoule [Eco] £4.47 DT price = £4.47

Kenalog (Bristol-Myers Squibb Pharmaceuticals Ltd)

Triamcinolone acetoneide 40 mg per 1 ml Kenalog intra-articular / intradermal 40mg/1ml suspension for injection vials | 5 vial [Eco] DT price = £7.45

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Kenalog (Bristol-Myers Squibb Pharmaceuticals Ltd)

Cushing's syndrome and disease 587

The dosages of metyrapone used are either low, and tailored to cortisol production, or high, in which case corticosteroid replacement therapy is also needed.

IMIDAZOLE ANTIFUNGALS

Ketoconazole

DRUG ACTION An imidazole derivative which acts as a potent inhibitor of cortisol and aldosterone synthesis by inhibiting the activity of 17 α -hydroxylase, 11-hydroxylase and at higher doses the cholesterol side-chain cleavage enzyme. It also inhibits the activity of adrenal C17-20 lyase enzymes resulting in androgen synthesis inhibition, and may have a direct effect on corticotropic tumour cells in patients with Cushing's disease.

INDICATIONS AND DOSE

Endogenous Cushing's syndrome (specialist use only)

BY MOUTH

Adult: Initially 400–600 mg daily in 2–3 divided doses, increased to 800–1200 mg daily; maintenance 400–800 mg daily in 2–3 divided doses, for dose titrations in patients with established dose, adjustments in adrenal insufficiency, or consultant corticosteroid replacement therapy, consult product literature; maximum 1200 mg per day

Important safety information

CHMP ADVICE: KETOCONAZOLE (JULY 2013)

The CHMP has recommended that the marketing authorisation for oral ketoconazole to treat fungal infections should be suspended. The CHMP concluded that the risk of hepatotoxicity associated with oral ketoconazole is greater than the benefit in treating fungal infections. Doctors should review patients who are being treated with oral ketoconazole for fungal infections, with a view to stopping treatment or choosing an alternative treatment. Patients with a prescription of oral ketoconazole for fungal infections should be referred back to their doctors. Oral ketoconazole for Cushing's syndrome and topical products containing ketoconazole are not affected by this advice.

CONTRA-INDICATIONS Acquired QTc prolongation • avoid concomitant use of hepatotoxic drugs • congenital QTc prolongation

CAUTIONS Risk of adrenal insufficiency

INTERACTIONS → Appendix 1 (antifungals, imidazole).

SIDE-EFFECTS

Common or very common Abdominal pain • adrenal insufficiency • diarrhoea • hepatic enzymes increased • nausea • pruritus • rash • vomiting

Uncommon Alopecia • dizziness • headache • malaise • somnolence • thrombocytopenia • urticaria

Rare Hepatic failure • hepatitis • jaundice • liver damage

Very rare Pyrexia

Frequency not known Alcohol intolerance • anorexia • arthralgia • azoospermia • dermatitis • dry mouth • dysgeusia • dyspepsia • epistaxis • erectile dysfunction • erythema • flatulence • gynaecomastia • hot flush • increased appetite • insomnia • menstrual disorder • myalgia • nervousness • parasthesia • peripheral oedema • photophobia • photosensitivity • raised intracranial pressure • reduced testosterone concentrations • tongue discoloration • xeroderma

SIDE-EFFECTS, FURTHER INFORMATION

Hepatotoxicity Potentially life-threatening hepatotoxicity reported rarely.

Endocrine system

6

Endocrine system

Endocrine system

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