Salbutamol

Guaifenesin

Ventolin® Expectorant

FORMULATION

*Salbutamol + Guaifenesin (Ventolin® Expectorant) Capsules:* Grey and blue, hard gelatin capsules marked with ‘VENTOLIN EXPECTORANT’ and ‘GlaxoSmithKline’. Each capsule contains 100mg Guaifenesin and 2mg Salbutamol (as sulfate).

*Salbutamol + Guaifenesin (Ventolin® Expectorant) Syrup Sugar Free:* Each 5mL of orange flavored syrup contains 50mg Guaifenesin and 1.0mg Salbutamol (as sulfate).

PHARMACOLOGICAL PROPERTIES

Pharmacodynamic properties

Salbutamol is a selective β₂ adrenoceptor agonist. At therapeutic doses it acts on the β₂ adrenoceptors of bronchial muscle, with little or no action on the β₁ adrenoceptors of cardiac muscle.

Guaifenesin can make the viscous mucus of the respiratory pathway more fluid and therefore expectoration and reduces cough.

Pharmacokinetics

Salbutamol administered intravenously has a half-life of 4 to 6 hours and is cleared partly renally and partly by metabolism to the inactive 4'-O-sulfate (phenolic sulfate) which is also excreted primarily in the urine. The faeces are a minor route of excretion. The majority of a dose of salbutamol given intravenously, orally or by inhalation is excreted within 72 hours. Salbutamol is bound to plasma proteins to the extent of 10%.

After oral administration, salbutamol is absorbed from the gastrointestinal tract and undergoes considerable first-pass metabolism to the phenolic sulfate. Both unchanged drug and conjugate are excreted primarily in the urine. The bioavailability of orally administered salbutamol is about 50%.

Pre-clinical Safety Data

In common with other potent selective β₂ receptor agonists, salbutamol has been shown to be teratogenic in mice when given subcutaneously. In a reproductive study, 9.3% of foetuses were found to have cleft palate, at 2.5mg/kg, 4 times the maximum human oral dose. In rats, treatment at the levels of 0.5, 2.32, 10.75 and 50mg/kg/day orally throughout pregnancy resulted in no significant foetal abnormalities. The only toxic effect was an increase in neonatal mortality at the highest dose level as the result of lack of maternal care. A reproductive study in rabbits revealed cranial malformations in 37% of foetuses at 50mg/kg/day, 78 times the maximum human oral dose.

INDICATIONS

Salbutamol is a selective β₂ adrenoceptor agonist. At therapeutic doses it acts on the β₂ adrenoceptors of bronchial muscle, with little or no action on the β₁ adrenoceptors of the heart. The combination of salbutamol with guaifenesin is designed to relieve respiratory obstruction and improve pulmonary ventilation.

Bronchodilators should not be the only or main treatment in patients with severe or unstable asthma. Severe asthma requires regular medical assessment as death may occur. Patients with severe asthma have constant symptoms and frequent exacerbations, with limited physical capacity, and PEF values below 60% predicted at baseline with greater than 30% variability, usually not returning entirely to normal after a bronchodilator. These patients will require high dose inhaled (e.g. >1mg/day beclomethasone dipropionate) or oral corticosteroid therapy. Sudden worsening of symptoms may require increased corticosteroid dosage which should be administered under urgent medical supervision.

Respiratory disorders where bronchospasm and excessive secretion of tenacious mucus are complicating factors, e.g. bronchial asthma, chronic bronchitis and emphysema.

DOSAGE AND ADMINISTRATION

Salbutamol has a duration of action of 4 to 6 hours in most patients.

Increasing use of β₂ agonists may be a sign of worsening asthma. Under these conditions a reassessment of the patient’s therapy plan may be required and concomitant glucocorticosteroid therapy should be considered.

As there may be adverse effects associated with excessive dosing, the dosage or frequency of administration should only be increased on medical advice.
### Salbutamol + Guaifenesin (Ventolin® Expectorant) Capsule

**Adults & Children over 12 years:** 1-2 capsules two or three times a day.  
**Children 6-12 years:** 1 capsule two or three times a day.  
**Below 6 years:** Not recommended.

The capsule may be swallowed whole or the contents may be dispersed in a little water to produce a pleasantly flavoured suspension, if preferred.

### Salbutamol + Guaifenesin (Ventolin® Expectorant) Syrup

**Adults:** 10 to 20mL of expectorant syrup (2-4 mg salbutamol) two or three times a day.  
**Children:**  
- **2-6 years:** 5 to 10mL of expectorant syrup (1-2 mg salbutamol) two or three times daily.  
- **7-12 years:** 10mL of expectorant syrup (2 mg salbutamol) two or three times daily.  
- **Over 12 years:** 10 to 20mL of expectorant syrup (2-4mg salbutamol) two or three times daily.

The volumes of syrup quoted are based on a formulation strength of 2 mg salbutamol per 10mL of syrup.

### CONTRAINDICATIONS

Salbutamol + Guaifenesin (Ventolin® Expectorant) syrup is contraindicated in patients with a history of hypersensitivity to any of its components.

Although intravenous salbutamol and occasionally salbutamol tablets are used in the management of premature labour uncomplicated by conditions such as placenta praevia, ante-partum haemorrhage or toxaemia of pregnancy, salbutamol presentations should not be used for threatened abortion.

### WARNINGS & PRECAUTIONS

#### General

The management of asthma should normally follow a stepwise programme, and patient response should be monitored clinically and by lung function tests. Increasing use of short-acting inhaled β₂ agonists to control symptoms indicates deterioration of asthma control. Under these conditions, the patient’s therapy plan should be reassessed. Sudden and progressive deterioration in asthma control is potentially life-threatening and consideration should be given to starting or increasing corticosteroid therapy. In patients considered at risk, daily peak flow monitoring may be instituted.

Patients should be warned that if either the usual relief is diminished or the usual duration of action reduced, they should not increase the dose or its frequency of administration, but should seek medical advice.

Salbutamol should be administered cautiously to patients with thyrotoxicosis.

Potentially serious hypokalaemia may result from β₂ agonist therapy mainly from parenteral and nebulised administration. Particular caution is advised in acute severe asthma as this effect may be potentiated by concomitant treatment with xanthine derivatives, steroids, diuretics and by hypoxia. It is recommended that serum potassium levels are monitored in such situations.

In common with other β-adrenoceptor agonists, Salbutamol (Ventolin®) can induce reversible metabolic changes, for example increased blood sugar levels. The diabetic patient may be unable to compensate for this and the development of ketoacidosis has been reported. Concurrent administration of corticosteroids can exaggerate this effect.

### DRUG INTERACTIONS

Salbutamol and non-selective β-blocking drugs, such as propranolol, should not usually be prescribed together.

Salbutamol is not contra-indicated in patients under treatment with monoamine oxidase inhibitors (MAOIs).

### PREGNANCY AND LACTATION

Administration of drugs during pregnancy should only be considered if the expected benefit to the mother is greater than any possible risk to the foetus.

During worldwide marketing experience, rare cases of various congenital anomalies, including cleft palate and limb defects have been reported in the offspring of patients being treated with salbutamol. Some of the mothers were taking multiple medications during their pregnancies. Because no consistent pattern of defects can be discerned, and baseline rate for congenital anomalies is 2-3%, a relationship with salbutamol use cannot be established.

As salbutamol is probably secreted in breast milk its use in nursing mothers is not recommended unless the expected benefits outweigh any potential risk. It is not known whether salbutamol in breast milk has a harmful effect on the neonate.

### Effects on Ability to Drive and Use Machines

None reported.
ADVERSE EFFECTS

Salbutamol + Guaifenesin (Ventolin® Expectorant) syrup may cause a fine tremor of skeletal muscle, usually the hands are most obviously affected. This effect is dose related and is common to all β-adrenergic stimulants.

A few patients experience a feeling of tension; this is also due to the effects on skeletal muscle and not to direct CNS stimulation.

Occasionally headaches have been reported.

Peripheral vasodilatation and a compensatory small increase in heart rate may occur in some patients.

Hypersensitivity reactions including angioedema, urticaria, bronchospasm, hypotension and collapse have been reported very rarely.

There have been very rare reports of muscle cramps.

Potentially serious hypokalaemia may result from β₂ agonist therapy.

As with other β₂ agonists hyperactivity has been reported rarely in children.

Side effects associated with guaifenesin are rare.

Tachycardia may occur in some patients.

Cardiac arrhythmias (including atrial fibrillation, supraventricular tachycardia and extrasystoles) may occur in susceptible patients.

OVERDOSAGE

The preferred antidote for overdosage with salbutamol is a cardioselective β-blocking agent. However, β-blocking drugs should be used with caution in patients with a history of bronchospasm.

Hypokalaemia may occur following overdose with salbutamol. Serum potassium levels should be monitored.

INCOMPATIBILITY

Salbutamol + Guaifenesin (Ventolin® Expectorant) syrup: Dilution with Syrup BP or Sobitol solution is not recommended as this may result in precipitation of the cellulose thickening agent. Admixture of Salbutamol + Guaifenesin (Ventolin® Expectorant) Syrup with other liquid preparations is not recommended.

STORAGE CONDITION

Salbutamol + Guaifenesin (Ventolin® Expectorant) Capsule should be stored below 30°C.

Salbutamol + Guaifenesin (Ventolin® Expectorant) Syrup should be stored at a temperature not exceeding 30°C. Protect from light.

INSTRUCTION FOR USE/HANDLING

Dilution:
Salbutamol + Guaifenesin (Ventolin® Expectorant) syrup may be diluted with Unpreserved Syrup BP. The resulting mixture should be protected from light and will keep for 14 days.

AVAILABILITY

Ventolin® Expectorant Capsule: Cartons of 50 capsules, foil-wrapped.
Ventolin® Expectorant Syrup Sugar Free: Bottles of 60 and 120mL.

CAUTION

Foods, Drugs, Devices and Cosmetics Act prohibits dispensing without prescription.

Keep all medicines out of reach of children.

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