

**ANNEX I**  
**SUMMARY OF PRODUCT CHARACTERISTICS**

## 1. NAME OF THE MEDICINAL PRODUCT

Ventavis 10 microgram/ml nebuliser solution  
Ventavis 20 microgram/ml nebuliser solution

## 2. QUALITATIVE AND QUANTITATIVE COMPOSITION

### Ventavis 10 microgram/ml nebuliser solution

1 ml solution contains 10 microgram iloprost (as iloprost trometamol).  
Each ampoule with 1 ml solution contains 10 microgram iloprost.  
Each ampoule with 2 ml solution contains 20 microgram iloprost.

### Ventavis 20 microgram/ml nebuliser solution

1 ml solution contains 20 microgram iloprost (as iloprost trometamol).  
Each ampoule with 1 ml solution contains 20 microgram iloprost.

### Excipient with known effect

- Ventavis 10 microgram/ml:  
Each ml contains 0.81 mg ethanol 96% (equivalent to 0.75 mg ethanol)
- Ventavis 20 microgram/ml:  
Each ml contains 1.62 mg ethanol 96% (equivalent to 1.50 mg ethanol).

For the full list of excipients, see section 6.1.

## 3. PHARMACEUTICAL FORM

Nebuliser solution.

### Ventavis 10 microgram/ml nebuliser solution

Clear, colourless solution.

### Ventavis 20 microgram/ml nebuliser solution

Clear, colourless to slightly yellowish solution.

## 4. CLINICAL PARTICULARS

### 4.1 Therapeutic indications

Treatment of adult patients with primary pulmonary hypertension, classified as NYHA functional class III, to improve exercise capacity and symptoms.

### 4.2 Posology and method of administration

Drug product	Suitable inhalation device (nebuliser) to be used		
Ventavis 10 microgram/ml	Breelib	I-Neb AAD	Venta-Neb
Ventavis 20 microgram/ml	Breelib	I-Neb AAD	

Ventavis should only be initiated and monitored by a physician experienced in the treatment of pulmonary hypertension.

## Posology

### *Dose per inhalation session*

At initiation of Ventavis treatment the first inhaled dose should be 2.5 microgram iloprost as delivered at the mouthpiece of the nebuliser. If this dose is well tolerated, dosing should be increased to 5 microgram iloprost and maintained at that dose. In case of poor tolerability of the 5 microgram dose, the dose should be reduced to 2.5 microgram iloprost.

### *Daily dose*

The dose per inhalation session should be administered 6 to 9 times per day according to the individual need and tolerability.

### *Duration of treatment*

The duration of treatment depends on clinical status and is left to the physician's discretion. Should patients deteriorate on this treatment intravenous prostacyclin treatment should be considered.

## Special populations

### *Hepatic impairment*

Iloprost elimination is reduced in patients with hepatic dysfunction (see section 5.2).

To avoid undesired accumulation over the day, special caution has to be exercised with these patients during initial dose titration. Initially, doses of 2.5 microgram iloprost should be administered using Ventavis 10 microgram/ml with dosing intervals of 3-4 hours (corresponds to administration of max. 6 times per day). Thereafter, dosing intervals may be shortened cautiously based on individual tolerability. If a dose up to 5 microgram iloprost is indicated, again dosing intervals of 3-4 hours should be chosen initially and shortened according to individual tolerability. An accumulation of iloprost following treatment over several days is not likely due to the overnight break in administration of the medicinal product.

### *Renal impairment*

There is no need for dose adaptation in patients with a creatinine clearance >30 ml/min (as determined from serum creatinine using the Cockcroft and Gault formula). Patients with a creatinine clearance of ≤30 ml/min were not investigated in the clinical trials. Data with intravenously administered iloprost indicated that the elimination is reduced in patients with renal failure requiring dialysis. Therefore, the same dosing recommendations as in patients with hepatic impairment (see above) are to be applied.

### *Paediatric population*

The safety and efficacy of Ventavis in children aged up to 18 years have not been established. No data from controlled clinical trials are available.

## Method of administration

Ventavis is intended for inhalation use by nebulisation.

To minimize accidental exposure it is recommended to keep the room well ventilated.

The ready-to-use Ventavis nebuliser solution is administered with a suitable inhalation device (nebuliser) (see below and section 6.6).

Patients stabilised on one nebuliser should not switch to another nebuliser without supervision by the treating physician as different nebulisers have been shown to produce aerosols with slightly different physical characteristics and delivery of the solution that may be faster (see section 5.2).

- **Breelib**

Breelib is a small handheld, battery-powered, breath activated, vibrating mesh technology system.

*Ventavis 10 microgram/ml (1 ml ampoule) and Ventavis 20 microgram/ml nebuliser solution*

Ventavis 10 microgram/ml nebuliser solution (1 ml ampoule) delivers 2.5 microgram and Ventavis 20 microgram/ml nebuliser solution delivers 5 microgram at the mouthpiece of the Breelib nebuliser.

At initiation of Ventavis treatment or if the patient is switched from an alternative device, the first inhalation should be made with 1 ml ampoule of Ventavis 10 microgram/ml (see section 4.4). If inhalation with Ventavis 10 microgram/ml is well tolerated, the dose should be increased by using Ventavis 20 microgram/ml. This dose should be maintained. In case of poor tolerability of Ventavis 20 microgram/ml, the dose should be reduced by using 1 ml ampoule of Ventavis 10 microgram/ml (see section 4.4).

The duration of an inhalation session with Breelib nebuliser is approximately 3 minutes, which reflects the higher delivery rate of the Breelib compared to other nebulisers.

Patients initiating Ventavis treatment or switching from an alternative device to Breelib should be closely supervised by the treating physician to ensure that dose and speed of inhalation are well tolerated.

When using the Breelib nebuliser please follow the instructions for use provided with the device. Fill the medication chamber with Ventavis immediately before use.

- **I-Neb AAD**

The I-Neb AAD system is a portable, hand-held, vibrating mesh technology nebuliser system. This system generates droplets by ultrasound, which forces the solution through a mesh. The I-Neb AAD nebuliser has been shown to be suitable for the administration of Ventavis 10 microgram/ml (1 ml ampoule) and 20 microgram/ml nebuliser solution. The Mass Median Aerodynamic Diameter (MMAD) of the aerosol measured using I-Neb nebulising systems equipped with power level 10 disc was similar between Ventavis 20 microgram/ml (golden programme) and Ventavis 10 microgram/ml (purple programme) nebuliser solutions (i.e.: around 2 micrometres) but with faster delivery when using Ventavis 20 microgram/ml.

The dose delivered by the I-Neb AAD system is controlled by the medication chamber in combination with a control disc. Each medication chamber is colour coded and has a corresponding colour coded control disc.

*Ventavis 10 microgram/ml nebuliser solution (1 ml ampoule)*

At initiation of Ventavis treatment with I-Neb system the first inhaled dose should be 2.5 microgram iloprost as delivered at the mouthpiece of the nebuliser using 1 ml ampoule of Ventavis 10 microgram/ml. If this dose is well tolerated, dosing should be increased to 5 microgram iloprost using 1 ml ampoule of Ventavis 10 microgram/ml and maintained at that dose. In case of poor tolerability of the 5 microgram dose, the dose should be reduced to 2.5 microgram iloprost.

This nebuliser monitors the breathing pattern to determine the aerosol pulse time required to deliver the pre-set dose of 2.5 or 5 microgram iloprost.

For the 2.5 microgram dose of Ventavis 10 microgram/ml the medication chamber with the red coloured latch is used together with the red control disc.

For the 5 microgram dose of Ventavis 10 microgram/ml the medication chamber with the purple coloured latch is used together with the purple control disc.

For each inhalation session with the I-Neb AAD, the content of one 1 ml ampoule of Ventavis 10 microgram/ml, with two coloured rings (white - yellow), is transferred into the medication chamber immediately before use.

Drug product	Ampoule coloured ring	Dosage	I-Neb AAD		Estimated inhalation time
			Medication chamber latch	Control disc	
Ventavis 10 mcg/ml	1 ml ampoule white - yellow ring	2.5 mcg	red	red	3.2 min
		5 mcg	purple	purple	6.5 min

*Ventavis 20 microgram/ml nebuliser solution*

Only patients who are maintained at the 5 microgram dose and who have repeatedly experienced extended inhalation times with Ventavis 10 microgram/ml, which could result in incomplete inhalation, may be considered suitable for switching to Ventavis 20 microgram/ml.

Close supervision by the treating physician is necessary if switching from Ventavis 10 microgram/ml to Ventavis 20 microgram/ml to control the acute tolerance relating to faster delivery rate of iloprost with the double concentration.

This nebuliser monitors the breathing pattern to determine the aerosol pulse time required to deliver the pre-set dose of 5 microgram iloprost.

For the 5 microgram dose of Ventavis 20 microgram/ml the medication chamber with the gold coloured latch is used together with the gold control disc.

For each inhalation session with the I-Neb AAD, the content of one 1 ml ampoule of Ventavis 20 microgram/ml with two coloured rings (yellow - red), is transferred into the medication chamber immediately before use.

Drug product	Ampoule coloured rings	Dosage	I-Neb AAD	
			Medication chamber latch	Control disc
Ventavis 20 mcg/ml	1 ml ampoule yellow - red ring	5 mcg	golden	golden

- **Venta-Neb**

Venta-Neb, a portable ultrasonic battery-powered nebuliser, has been shown to be suitable for the administration of Ventavis 10 microgram/ml nebuliser solution (2 ml ampoule). The measured MMAD of the aerosol droplets was 2.6 micrometres.

At initiation of Ventavis treatment with Venta-Neb the first inhaled dose should be 2.5 microgram iloprost as delivered at the mouthpiece of the nebuliser using 2 ml ampoule of Ventavis 10 microgram/ml. If this dose is well tolerated, dosing should be increased to 5 microgram iloprost using 2 ml ampoule of Ventavis 10 microgram/ml and maintained at that dose. In case of poor tolerability of the 5 microgram dose, the dose should be reduced to 2.5 microgram iloprost.

For each inhalation session with the Venta-Neb, the content of one 2 ml ampoule of Ventavis 10 microgram/ml with two coloured rings (white – pink) is transferred into the nebuliser medication chamber immediately before use.

Two programmes can be operated:

P1 Programme 1: 5 microgram active substance on the mouth piece 25 inhalation cycles.

P2 Programme 2: 2.5 microgram active substance on the mouth piece 10 inhalation cycles.

The selection of the pre-set programme is made by the physician.

Venta-Neb prompts the patient to inhale by an optical and an acoustic signal. It stops after the pre-set dose has been administered.

To obtain the optimal droplet size for the administration of Ventavis 10 microgram/ml nebuliser solution the green baffle plate should be used. For details refer to the instruction manual of the Venta-Neb nebuliser.

<b>Drug product</b>	<b>Ampoule coloured ring</b>	<b>Dose of iloprost at mouthpiece</b>	<b>Estimated inhalation time</b>
Ventavis 10 mcg/ml	2 ml ampoule white - pink ring	2.5 mcg 5 mcg	4 min 8 min

#### Other nebulising systems

The efficacy and tolerability of inhaled iloprost when administered with other nebulising systems, which provide different nebulisation characteristics of iloprost solution, have not been established.

### **4.3 Contraindications**

- Hypersensitivity to the active substance or to any of the excipients listed in section 6.1.
- Conditions where the effects of Ventavis on platelets might increase the risk of haemorrhage (e.g. active peptic ulcers, trauma, intracranial haemorrhage).
- Severe coronary heart disease or unstable angina.
- Myocardial infarction within the last six months.
- Decompensated cardiac failure if not under close medical supervision.
- Severe arrhythmias.
- Cerebrovascular events (e.g. transient ischaemic attack, stroke) within the last 3 months.
- Pulmonary hypertension due to venous occlusive disease.
- Congenital or acquired valvular defects with clinically relevant myocardial function disorders not related to pulmonary hypertension.

### **4.4 Special warnings and precautions for use**

The use of Ventavis is not recommended in patients with unstable pulmonary hypertension, with advanced right heart failure. In case of deterioration or worsening of right heart failure transfer to other medicinal products should be considered.

#### Hypotension

Blood pressure should be checked while initiating Ventavis. In patients with low systemic blood pressure and in patients with postural hypotension or receiving medicinal products known to reduce blood pressure levels, care should be taken to avoid further hypotension. Ventavis should not be initiated in patients with systolic blood pressure less than 85 mmHg.

Physicians should be alerted to the presence of concomitant conditions or medicinal products that might increase the risk of hypotension and syncope (see section 4.5).

#### Syncope

The pulmonary vasodilatory effect of inhaled iloprost is of short duration (one to two hours). Syncope is a common symptom of the disease itself and can also occur under therapy. Patients who experience syncope in association with pulmonary hypertension should avoid any exceptional

straining, for example during physical exertion. Before physical exertion it might be useful to inhale. The increased occurrence of syncope can reflect therapeutic gaps, insufficient effectiveness and/or deterioration of the disease. The need to adapt and/or change the therapy should be considered (see section 4.8).

#### Patients with diseases of the respiratory tract

Ventavis inhalation might entail the risk of inducing bronchospasm, especially in patients with bronchial hyperactivity (see section 4.8). Moreover, the benefit of Ventavis has not been established in patients with concomitant Chronic Obstructive Pulmonary Disease (COPD) and severe asthma. Patients with concomitant acute pulmonary infections, COPD and severe asthma should be carefully monitored.

#### Pulmonary veno-occlusive disease

Pulmonary vasodilators may significantly worsen the cardiovascular status of patients with pulmonary veno-occlusive disease. Should signs of pulmonary oedema occur, the possibility of associated pulmonary veno-occlusive disease should be considered and treatment with Ventavis should be discontinued.

#### Interruption of therapy

In case of interruption of Ventavis therapy, the risk of rebound effect is not formally excluded. Careful monitoring of the patient should be performed when inhaled iloprost therapy is stopped and an alternative treatment should be considered in critically ill patients.

#### Renal or hepatic impairment

Data with intravenously administered iloprost indicated that the elimination is reduced in patients with hepatic dysfunction and in patients with renal failure requiring dialysis (see section 5.2). A cautious initial dose titration using dosing intervals of 3-4 hours is recommended (see section 4.2).

#### Serum glucose levels

Prolonged oral treatment with iloprost clathrate in dogs up to one year was associated with slightly increased fasted serum glucose levels. It cannot be excluded that this is also relevant to humans on prolonged Ventavis therapy.

#### Undesirable exposure to Ventavis

To minimise accidental exposure, it is recommended to use Ventavis with nebulisers with inhalation-triggered systems (such as Breelib or I-Neb), and to keep the room well ventilated. Newborns, infants and pregnant women should not be subjected to Ventavis in the room air.

#### Skin and eye contact, oral ingestion

Ventavis nebuliser solution should not come into contact with skin and eyes; oral ingestion of Ventavis solution should be avoided. During nebulisation sessions a facial mask must be avoided and only a mouthpiece should be used.

#### Ventavis contains ethanol

This medicinal product contains small amounts of ethanol (alcohol), less than 100 mg per dose.

### Switching to the Breelib nebuliser

Limited data are available on the use of the Breelib nebuliser. For patients being switched from an alternative device to the Breelib nebuliser the first inhalation should be made with Ventavis 10 microgram/ml (1ml ampoule) delivering 2.5 microgram iloprost at the mouthpiece and under close medical supervision to ensure that the faster inhalation provided by Breelib is well tolerated. First dosing with 2.5 microgram should be done even if patients had already been stable on 5 microgram inhaled with an alternative device (see section 4.2).

### **4.5 Interaction with other medicinal products and other forms of interaction**

Iloprost may increase the effects of vasodilators and antihypertensive agents and then favour the risk of hypotension (see section 4.4). Caution is recommended in case of co-administration of Ventavis with other antihypertensive or vasodilating agents as dose adjustment might be required.

Since iloprost inhibits platelet function its use with the following substances may enhance iloprost-mediated platelet inhibition, thereby increasing the risk of bleeding:

- anticoagulants, such as
  - heparin,
  - oral anticoagulants (either coumarin-type or direct),
- or other inhibitors of platelet aggregation, such as
  - acetylsalicylic acid,
  - non-steroidal anti-inflammatory medicinal products,
  - non-selective phosphodiesterase inhibitors like pentoxifylline,
  - selective phosphodiesterase 3 (PDE3) inhibitors like cilostazol or anagrelide,
  - ticlopidine,
  - clopidogrel,
  - glycoprotein IIb/IIIa antagonists, like
    - abciximab,
    - eptifibatide,
    - tirofiban,
  - defibrotide.

A careful monitoring of the patients taking anticoagulants or other inhibitors of platelet aggregation according to common medical practice is recommended.

Intravenous infusion of iloprost has no effect either on the pharmacokinetics of multiple oral doses of digoxin or on the pharmacokinetics of co-administered tissue plasminogen activator (t-PA) in patients. Although, clinical studies have not been conducted, *in vitro* studies investigating the inhibitory potential of iloprost on the activity of cytochrome P450 enzymes revealed that no relevant inhibition of drug metabolism via these enzymes by iloprost is to be expected.

### **4.6 Fertility, pregnancy and lactation**

#### Women of childbearing potential

Women of childbearing potential should use effective contraceptive measures during treatment with Ventavis.

#### Pregnancy

Women with pulmonary hypertension (PH) should avoid pregnancy as it may lead to life-threatening exacerbation of the disease.

Animal studies have shown reproductive effects (see section 5.3).

There is a limited amount of data from the use of iloprost in pregnant women. If a pregnancy occurs, taking into account the potential maternal benefit, the use of Ventavis during pregnancy may be



considered, only following careful benefit-risk evaluation, in those women who choose to continue their pregnancy, despite the known risks of pulmonary hypertension during pregnancy.

#### Breast-feeding

It is not known whether iloprost/metabolites are excreted in human breast milk. Very low levels of iloprost into milk were observed in rats (see section 5.3). A potential risk to the breast-feeding child cannot be excluded and it is preferable to avoid breast-feeding during Ventavis therapy.

#### Fertility

Animal studies have not shown harmful effect of iloprost on fertility.

#### **4.7 Effects on ability to drive and use machines**

Ventavis has major influence on the ability to drive and use machines for patients experiencing hypotensive symptoms such as dizziness.

Care should be exercised during initiation of therapy until any effects on the individual have been determined.

#### **4.8 Undesirable effects**

##### Summary of the safety profile

In addition to local effects resulting from administration of iloprost by inhalation such as cough, adverse reactions with iloprost are related to the pharmacological properties of prostacyclins.

The most frequently observed adverse reactions ( $\geq 20\%$ ) in clinical trials include vasodilatation (including hypotension), headache and cough. The most serious adverse reactions were hypotension, bleeding events, and bronchospasm.

##### Tabulated list of adverse reactions

The adverse reactions reported below are based on pooled clinical trial data from phase II and III clinical trials involving 131 patients taking the medicinal product and on data from post-marketing surveillance. The frequencies of adverse reactions are defined as very common ( $\geq 1/10$ ) and common ( $\geq 1/100$  to  $< 1/10$ ). The adverse reactions identified only during post-marketing surveillance, and for which a frequency could not be estimated from clinical trial data, are listed under "Frequency not known".

Within each frequency grouping, adverse reactions are presented in order of decreasing seriousness.

<b>System organ class (MedDRA)</b>	<b>Very common (≥1/10)</b>	<b>Common (≥1/100 to &lt;1/10)</b>	<b>Not known (cannot be estimated from the available data)</b>
<b>Blood and lymphatic system disorders</b>	Bleeding events*§		Thrombocytopenia
<b>Immune system disorders</b>			Hypersensitivity
<b>Nervous system disorders</b>	Headache	Dizziness	
<b>Cardiac disorders</b>		Tachycardia Palpitations	
<b>Vascular disorders</b>	Vasodilatation Flushing	Syncope <sup>§</sup> (see section 4.4) Hypotension*	
<b>Respiratory, thoracic and mediastinal disorders</b>	Chest discomfort / chest pain Cough	Dyspnoea Pharyngolaryngeal pain Throat irritation	Bronchospasm* (see section 4.4) / Wheezing
<b>Gastrointestinal disorders</b>	Nausea	Diarrhoea Vomiting Mouth and tongue irritation including pain	Dysgeusia
<b>Skin and subcutaneous tissue disorders</b>		Rash	
<b>Musculoskeletal and connective tissue disorders</b>	Pain in jaw/trismus		
<b>General disorders and administration site condition</b>	Peripheral oedema <sup>§</sup>		

\* Life-threatening and/or fatal cases have been reported.

§ see section “Description of selected adverse reactions”

#### Description of selected adverse reactions

Bleeding events (mostly epistaxis and haemoptysis) were very common as expected in this patient population with a high proportion of patients taking anticoagulant co-medication. The risk of bleeding may be increased in patients when potential inhibitors of platelet aggregation or anticoagulants are given concomitantly (see section 4.5). Fatal cases included cerebral and intracranial haemorrhage.

Syncope is a common symptom of the disease itself, but can also occur under therapy. The increased occurrence of syncope can be related to the deterioration of the disease or insufficient effectiveness of the product (see section 4.4).

In clinical trials peripheral oedema was reported in 12.2% of patients on iloprost and 16.2% of patients on placebo. Peripheral oedema is a very common symptom of the disease itself, but can also occur under therapy. The occurrence of peripheral oedema can be related to the deterioration of the disease or insufficient effectiveness of the product.

#### Reporting of suspected adverse reactions

Reporting suspected adverse reactions after authorisation of the medicinal product is important. It allows continued monitoring of the benefit/risk balance of the medicinal product. Healthcare professionals are asked to report any suspected adverse reactions **via the national reporting system listed in [Appendix V](#)**.

## 4.9 Overdose

### Symptoms

Cases of overdose were reported. Symptoms of overdoses are mainly related to the vasodilatory effect of iloprost. Frequently observed symptoms following overdose are dizziness, headache, flushing, nausea, jaw pain or back pain. Hypotension, an increase of blood pressure, bradycardia or tachycardia, vomiting, diarrhoea and limb pain might also be possible.

### Management

A specific antidote is not known. Interruption of the inhalation session, monitoring and symptomatic measures are recommended.

## 5. PHARMACOLOGICAL PROPERTIES

### 5.1 Pharmacodynamic properties

Pharmacotherapeutic group: Antithrombotic agents, platelet aggregation inhibitors excluding heparin, ATC code: B01AC11

Iloprost, the active substance of Ventavis, is a synthetic prostacyclin analogue. The following pharmacological effects have been observed *in vitro*:

- Inhibition of platelet aggregation, platelet adhesion and release reaction
- Dilatation of arterioles and venules
- Increase of capillary density and reduction of increased vascular permeability caused by mediators such as serotonin or histamine in the microcirculation
- Stimulation of endogenous fibrinolytic potential

The pharmacological effects after inhalation of Ventavis are:

Direct vasodilatation of the pulmonary arterial bed occur with consecutive significant improvement of pulmonary artery pressure, pulmonary vascular resistance and cardiac output as well as mixed venous oxygen saturation.

In a small, randomised, 12-week double-blinded, placebo-controlled study (the STEP trial), 34 patients treated with bosentan 125 mg twice per day for at least 16 weeks who were in stable haemodynamic conditions before enrolment, tolerated the addition of inhaled iloprost at the concentration of 10 microgram/ml (up to 5 microgram 6 to 9 times per day during waking hours). The mean daily inhaled dose was 27 microgram and the mean number of inhalations per day was 5.6. The acute adverse effects in patients receiving concomitant bosentan and iloprost were consistent with those observed in the larger experience of the phase 3 study in patients receiving only iloprost. No reliable conclusion could be drawn on efficacy of the association as the sample size was limited and the study was of short duration.

No clinical trial data are available comparing directly in intra-patient observations the acute haemodynamic response after intravenous to that after inhaled iloprost. The haemodynamics observed suggest an acute response with preferential effect of inhaled treatment on the pulmonary vessels. The pulmonary vasodilatory effect of each single inhalation levels off within one to two hours.

However, the predictive value of these acute haemodynamic data are considered to be of limited value as acute response does not in all cases correlate with long-term benefit of treatment with inhaled iloprost.

### Efficacy in adult patients with pulmonary hypertension

A randomised, double-blind, multi-centre, placebo-controlled phase III trial (study RRA02997) has been conducted in 203 adult patients (inhaled iloprost at the concentration of 10 microgram/ml: N=101; placebo n=102) with stable pulmonary hypertension. Inhaled iloprost (or placebo) was added to patients' current therapy, which could include a combination of anticoagulants, vasodilators (e.g. calcium channel blockers), diuretics, oxygen, and digitalis, but not PGI<sub>2</sub> (prostacyclin or its analogues). 108 of the patients included were diagnosed with primary pulmonary hypertension, 95 were diagnosed with secondary pulmonary hypertension of which 56 were associated with chronic thromboembolic disease, 34 with connective tissue disease (including CREST and scleroderma) and 4 were considered appetite suppressant medicinal product related. The baseline 6-minute walk test values reflected a moderate exercise limitation: in the iloprost group the mean was 332 metres (median value: 340 metres) and in the placebo group the mean was 315 metres (median value: 321 metres). In the iloprost group, the median daily inhaled dose was 30 microgram (range 12.5 to 45 microgram/day). The primary efficacy endpoint defined for this study, was a combined response criterion consisting of improvement in exercise capacity (6-minute walk test) at 12 weeks by at least 10% versus baseline, and improvement by at least one NYHA class at 12 weeks versus baseline, and no deterioration of pulmonary hypertension or death at any time before 12 weeks. The rate of responders to iloprost was 16.8% (17/101) and the rate of responders in the placebo group was 4.9% (5/102) (p=0.007).

In the iloprost group, the mean change from baseline after 12 weeks of treatment in the 6-minute walking distance was an increase of 22 metres (-3.3 metres in the placebo group, no data imputation for death or missing values).

In the iloprost group the NYHA class was improved in 26% of patients (placebo: 15%) (p = 0.032), unchanged in 67.7% of patients (placebo: 76%) and deteriorated in 6.3% of patients (placebo: 9%). Invasive haemodynamic parameters were assessed at baseline and after 12 weeks treatment.

A subgroup analysis showed that no treatment effect was observed as compared to placebo on the 6-minute walk test in the subgroup of patients with secondary pulmonary hypertension. A mean increase in the 6-minute walk test of 44.7 metres from a baseline mean value of 329 metres vs. a change of -7.4 metres from a baseline mean value of 324 metres in the placebo group (no data imputation for death or missing values) was observed in the subgroup of 49 patients with primary pulmonary hypertension receiving treatment of inhaled iloprost for 12 weeks (46 patients in the placebo group).

### Paediatric population

No study has been performed with Ventavis in children with pulmonary hypertension.

## **5.2 Pharmacokinetic properties**

### Absorption

When iloprost at the concentration of 10 microgram/ml is administered via inhalation in patients with pulmonary hypertension or healthy volunteers (iloprost dose at the mouthpiece: 5 microgram: inhalation time in between 4.6 – 10.6 min), mean peak serum concentrations of about 100 to 200 picogram/ml were observed at the end of inhalation session. These concentrations decline with half-lives between approximately 5 and 25 minutes. Within 30 minutes to 2 hours after the end of inhalation, iloprost is not detectable in the central compartment (limit of quantification 25 picogram/ml).

### Distribution

No studies performed following inhalation.

Following intravenous infusion, the apparent steady-state volume of distribution was 0.6 to 0.8 l/kg in healthy subjects. Total plasma protein binding of iloprost is concentration-independent in the range of 30 to 3,000 picogram/ml and amounts to approximately 60%, of which 75% is due to albumin binding.

### Biotransformation

No studies to investigate the metabolism of iloprost were performed following inhalation of Ventavis.

After intravenous administration, iloprost is extensively metabolised via  $\beta$ -oxidation of the carboxyl side chain. No unchanged substance is eliminated. The main metabolite is tetranor-iloprost, which is found in the urine in free and conjugated form. Tetranor-iloprost is pharmacologically inactive as shown in animal experiments. Results of *in vitro* studies reveal that CYP 450-dependent metabolism plays only a minor role in the biotransformation of iloprost. Further *in vitro* studies suggest that metabolism of iloprost in the lungs is similar after intravenous administration or inhalation.

### Elimination

No studies performed following inhalation.

In subjects with normal renal and hepatic function, the disposition of iloprost following intravenous infusion is characterised in most cases by a two-phase profile with mean half-lives of 3 to 5 minutes and 15 to 30 minutes. The total clearance of iloprost is about 20 ml/kg/min, which indicates extrahepatic contribution to the metabolism of iloprost.

A mass-balance study was done using  $^3\text{H}$ -iloprost in healthy subjects. Following intravenous infusion, the recovery of total radioactivity is 81 %, and the respective recoveries in urine and faeces are 68% and 12%. The metabolites are eliminated from plasma and urine in 2 phases, for which half-lives of about 2 and 5 hours (plasma) and 2 and 18 hours (urine) have been calculated.

### Pharmacokinetics after use with different nebulisers

#### Breelib nebuliser:

Pharmacokinetics of iloprost were investigated in a randomised, crossover study with 27 patients, stable on Ventavis 10 microgram/ml inhaled with I-Neb, following inhalation of single doses of 2.5 or 5 microgram iloprost using the Breelib or the I-Neb AAD nebuliser. Following inhalation of these doses with the Breelib the maximum plasma concentrations ( $C_{\max}$ ) and systemic exposures (AUC (0- $t_{\text{last}}$ )) increased dose-proportionally.

$C_{\max}$  and AUC (0- $t_{\text{last}}$ ) after inhalation of 5 microgram iloprost administered as Ventavis 20 microgram/ml using the Breelib were 77% and 42%, respectively higher compared to inhalation of the same dose using Ventavis 10 microgram/ml and the I-Neb AAD system.  $C_{\max}$  and AUC (0- $t_{\text{last}}$ ) of iloprost after inhalation with Breelib were, however, still in the range of values observed with Ventavis 10 microgram/ml using other inhalers across different studies.

#### I-Neb AAD nebuliser:

Pharmacokinetics under the specific study conditions of extended inhalation time, were investigated in a randomised, crossover study with 19 healthy adult men following inhalation of single doses of Ventavis 10 microgram/ml and Ventavis 20 microgram/ml (dose of 5 microgram iloprost at the mouthpiece) using the I-Neb. Comparable systemic exposures (AUC (0- $t_{\text{last}}$ )) and approximately 30% higher maximum serum concentrations ( $C_{\max}$ ) were found following inhalation of Ventavis 20 microgram/ml compared to Ventavis 10 microgram/ml which was in line with the observed shorter inhalation time using Ventavis 20 microgram/ml.

### Other special populations

#### *Renal impairment*

In a study with intravenous infusion of iloprost, patients with end-stage renal failure undergoing intermittent dialysis treatment are shown to have a significantly lower clearance

(mean CL =  $5 \pm 2$  ml/minute/kg) than that observed in patients with renal failure not undergoing intermittent dialysis treatment (mean CL =  $18 \pm 2$  ml/minute/kg).

#### *Hepatic impairment*

Because iloprost is extensively metabolised by the liver, the plasma levels of the active substance are influenced by changes in hepatic function. In an intravenous study, results were obtained involving 8 patients suffering from liver cirrhosis. The mean clearance of iloprost is estimated to be 10 ml/minute/kg.

#### *Gender*

Gender is not of clinical relevance to the pharmacokinetics of iloprost.

#### *Elderly*

Pharmacokinetics in elderly patients have not been investigated.

### **5.3 Preclinical safety data**

#### Systemic toxicity

In acute toxicity studies, single intravenous and oral doses of iloprost caused severe symptoms of intoxication or death (intravenous) at doses about two orders of magnitude above the intravenous therapeutic dose. Considering the high pharmacological potency of iloprost and the absolute doses required for therapeutic purposes the results obtained in acute toxicity studies do not indicate a risk of acute adverse effects in humans. As expected for a prostacyclin, iloprost produced haemodynamic effects (vasodilatation, reddening of skin, hypotension, inhibition of platelet function, respiratory distress) and general signs of intoxication such as apathy, gait disturbances, and postural changes.

Continuous intravenous/subcutaneous infusion of iloprost up to 26 weeks in rodents and non-rodents did not cause any organ toxicity at dose levels which exceeded the human therapeutic systemic exposure between 14 and 47 times (based on plasma levels). Only expected pharmacological effects like hypotension, reddening of skin, dyspnoea, increased intestinal motility were observed.

In a chronic inhalation study in rats over 26 weeks, the highest achievable dose of 48.7 microgram/kg/day was identified as 'no observed adverse effect level' (NOAEL). Systemic exposures exceeded human therapeutic exposures after inhalation by factors of more than 10 ( $C_{max}$ , cumulative AUC).

#### Genotoxic potential, tumourigenicity

*In vitro* (bacterial, mammalian cells, human lymphocytes) and *in vivo* studies (micronucleus test) for genotoxic effects have not produced any evidence for a mutagenic potential.

No tumourigenic potential of iloprost was observed in tumourigenicity studies in rats and mice.

#### Reproductive toxicology

In embryo- and foetotoxicity studies in rats continuous intravenous administration of iloprost led to anomalies of single phalanges of the forepaws in a few foetuses/pups without dose dependence.

These alterations are not considered as teratogenic effects, but are most likely related to iloprost induced growth retardation in late organogenesis due to haemodynamic alterations in the foetoplacental unit. No disturbance of postnatal development and reproductive performance was seen in the offspring that were raised, indicating that the observed retardation in rats was compensated during the postnatal development. In comparable embryotoxicity studies in rabbits and monkeys no such digit anomalies or other gross-structural anomalies were observed even after considerably higher dose levels which exceeded the human dose multiple times.

In rats, passage of low levels of iloprost and/or metabolites into the milk was observed (less than 1% of iloprost dose given intravenously). No disturbance of post-natal development and reproductive performance was seen in animals exposed during lactation.

#### Local tolerance, contact sensitising and antigenicity potential

In inhalation studies in rats, the administration of an iloprost formulation with a concentration of 20 microgram/ml up to 26 weeks did not cause any local irritation of the upper and lower respiratory tract.

A dermal sensitisation (maximisation test) and an antigenicity study in guinea pigs showed no sensitising potential.

## **6. PHARMACEUTICAL PARTICULARS**

### **6.1 List of excipients**

Trometamol  
Ethanol 96%  
Sodium chloride  
Hydrochloric acid (for pH adjustment)  
Water for injections

### **6.2 Incompatibilities**

In the absence of compatibility studies, this medicinal product must not be mixed with other medicinal products.

### **6.3 Shelf life**

Ventavis 10 microgram/ml nebuliser solution  
2 years.

Ventavis 20 microgram/ml nebuliser solution  
5 years.

### **6.4 Special precautions for storage**

This medicinal product does not require any special storage conditions.

### **6.5 Nature and contents of container**

#### **Ventavis 10 microgram/ml nebuliser solution**

- 1 ml ampoules, colourless, glass type I, containing 1 ml nebuliser solution, ring coded with two coloured rings (white - yellow).
- 3 ml ampoules, colourless, glass type I, containing 2 ml nebuliser solution, ring coded with two coloured rings (white - pink).

*Ampoules with 1 ml nebuliser solution (for the use of Breelib or I-Neb AAD):*

Packages containing:

- 30 ampoules
- 42 ampoules.

Multipacks containing:

- 168 (4x42) ampoules
- 168 (4x42) ampoules co-packed with Breelib consumables set (containing 1 mouthpiece and 1 medication chamber).

*Ampoules with 2 ml nebuliser solution (for the use of Venta-Neb):*

Packages containing:

- 30 ampoules
- 90 ampoules
- 100 ampoules
- 300 ampoules.

Multipacks containing:

- 90 (3x30) ampoules
- 300 (10x30) ampoules.

### **Ventavis 20 microgram/ml nebuliser solution**

- 1 ml ampoules, colourless, glass type I, containing 1 ml nebuliser solution, ring coded with two coloured rings (yellow - red).

*Ampoules with 1 ml nebuliser solution (for the use of Breelib or I-Neb AAD):*

Packages containing:

- 30 ampoules
- 42 ampoules.

Multipacks containing:

- 168 (4x42) ampoules
- 168 (4x42) ampoules co-packed with Breelib consumables set (containing 1 mouthpiece and 1 medication chamber).

Not all pack sizes may be marketed.

## **6.6 Special precautions for disposal and other handling**

For each inhalation session the content of one opened ampoule of Ventavis has to be transferred completely into the medication chamber immediately before use.

After each inhalation session, any solution remaining in the nebuliser should be discarded. In addition, instructions for hygiene and cleaning of the nebulisers provided by the device manufacturers should be followed carefully.

Any unused medicinal product or waste material should be disposed of in accordance with local requirements.

## **7. MARKETING AUTHORISATION HOLDER**

Bayer AG  
51368 Leverkusen  
Germany



## **8. MARKETING AUTHORISATION NUMBER(S)**

### **Ventavis 10 microgram/ml nebuliser solution**

EU/1/03/255/001  
EU/1/03/255/002  
EU/1/03/255/003  
EU/1/03/255/004  
EU/1/03/255/005  
EU/1/03/255/006  
EU/1/03/255/007  
EU/1/03/255/008  
EU/1/03/255/011  
EU/1/03/255/013

### **Ventavis 20 microgram/ml nebuliser solution**

EU/1/03/255/009  
EU/1/03/255/010  
EU/1/03/255/012  
EU/1/03/255/014

## **9. DATE OF FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION**

Date of first authorisation: 16 September 2003  
Date of latest renewal: 26 August 2013

## **10. DATE OF REVISION OF THE TEXT**

Detailed information on this medicinal product is available on the website of the European Medicines Agency <http://www.ema.europa.eu>.

## **ANNEX II**

- A. MANUFACTURER RESPONSIBLE FOR BATCH RELEASE**
- B. CONDITIONS OR RESTRICTIONS REGARDING SUPPLY AND USE**
- C. OTHER CONDITIONS AND REQUIREMENTS OF THE MARKETING AUTHORISATION**
- D. CONDITIONS OR RESTRICTIONS WITH REGARD TO THE SAFE AND EFFECTIVE USE OF THE MEDICINAL PRODUCT**

## **A. MANUFACTURER RESPONSIBLE FOR BATCH RELEASE**

Name and address of the manufacturer responsible for batch release

Berlimed S.A.  
Poligono Industrial Santa Rosa s/n  
28806 Alcalá de Henares  
Madrid  
Spain

## **B. CONDITIONS OR RESTRICTIONS REGARDING SUPPLY AND USE**

Medicinal product subject to restricted medical prescription (see Annex I: Summary of Product Characteristics, section 4.2).

## **C. OTHER CONDITIONS AND REQUIREMENTS OF THE MARKETING AUTHORISATION**

### **• Periodic Safety Update Reports**

The requirements for submission of periodic safety update reports for this medicinal product are set out in the list of Union reference dates (EURD list) provided for under Article 107c(7) of Directive 2001/83/EC and any subsequent updates published on the European medicines web-portal.

## **D. CONDITIONS OR RESTRICTIONS WITH REGARD TO THE SAFE AND EFFECTIVE USE OF THE MEDICINAL PRODUCT**

### **• Risk Management Plan (RMP)**

The MAH shall perform the required pharmacovigilance activities and interventions detailed in the agreed RMP presented in Module 1.8.2 of the Marketing Authorisation and any agreed subsequent updates of the RMP.

An updated RMP should be submitted:

- At the request of the European Medicines Agency;
- Whenever the risk management system is modified, especially as the result of new information being received that may lead to a significant change to the benefit/risk profile or as the result of an important (pharmacovigilance or risk minimisation) milestone being reached.

**ANNEX III**  
**LABELLING AND PACKAGE LEAFLET**

## **A. LABELLING**

**PARTICULARS TO APPEAR ON THE OUTER PACKAGING  
OUTER CARTON**

**30 AMPOULES WITH 2 ML**  
**90 AMPOULES WITH 2 ML**  
**90 (3 x 30) AMPOULES WITH 2 ML**  
**100 AMPOULES WITH 2 ML**  
**300 AMPOULES WITH 2 ML**  
**300 (10 x 30) AMPOULES WITH 2 ML**

**1. NAME OF THE MEDICINAL PRODUCT**

Ventavis 10 microgram/ml nebuliser solution  
Iloprost

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

1 ml solution contains 10 microgram iloprost (as iloprost trometamol).  
Each ampoule with 2 ml solution contains 20 microgram iloprost.

**3. LIST OF EXCIPIENTS**

Excipients:  
trometamol, ethanol 96%, sodium chloride, hydrochloric acid (for pH adjustment), water for injections.

**4. PHARMACEUTICAL FORM AND CONTENTS**

Nebuliser solution.  
30 ampoules with 2 ml.  
90 ampoules with 2 ml.  
Multipack: 90 (3 x 30) ampoules with 2 ml.  
100 ampoules with 2 ml.  
300 ampoules with 2 ml.  
Multipack: 300 (10 x 30) ampoules with 2 ml.

**5. METHOD AND ROUTE(S) OF ADMINISTRATION**

Inhalation use.  
Read the package leaflet before use.  
For administration with the Venta-Neb.

**6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT  
OF THE SIGHT AND REACH OF CHILDREN**

Keep out of the sight and reach of children.

**7. OTHER SPECIAL WARNING(S), IF NECESSARY**

**8. EXPIRY DATE**

EXP

**9. SPECIAL STORAGE CONDITIONS**

**10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE**

**11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER**

Bayer AG  
51368 Leverkusen  
Germany

**12. MARKETING AUTHORISATION NUMBER(S)**

EU/1/03/255/001 [30 x 2 ml]  
EU/1/03/255/006 [90 x 2 ml]  
EU/1/03/255/007 [90 (3 x 30 ) x 2 ml]  
EU/1/03/255/002 [100 x 2 ml]  
EU/1/03/255/003 [300 x 2 ml]  
EU/1/03/255/008 [300 (10 x 30 ) x 2 ml]

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

Ventavis 10 microgram/ml; 2 ml

**17. UNIQUE IDENTIFIER – 2D BARCODE**

2D barcode carrying the unique identifier included.

**18. UNIQUE IDENTIFIER – HUMAN READABLE DATA**

PC:  
SN:  
NN:



**PARTICULARS TO APPEAR ON THE OUTER PACKAGING  
INNER CARTON WITHOUT BLUE BOX**

**PACK WITH 30 AMPOULES IN A CARTON WITH 90 (3 x 30) AMPOULES WITH 2 ML  
PACK WITH 30 AMPOULES IN A CARTON WITH 300 (10 x 30) AMPOULES WITH 2 ML**

**1. NAME OF THE MEDICINAL PRODUCT**

Ventavis 10 microgram/ml nebuliser solution  
Iloprost

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

1 ml solution contains 10 microgram iloprost (as iloprost trometamol).  
Each ampoule with 2 ml solution contains 20 microgram iloprost.

**3. LIST OF EXCIPIENTS**

Excipients:  
trometamol, ethanol 96%, sodium chloride, hydrochloric acid (for pH adjustment), water for injections.

**4. PHARMACEUTICAL FORM AND CONTENTS**

Nebuliser solution.  
30 ampoules with 2 ml. Component of a multipack, can't be sold separately.  
**Part of a multipack containing 90 ampoules with 2 ml.**  
**Part of a multipack containing 300 ampoules with 2 ml.**

**5. METHOD AND ROUTE(S) OF ADMINISTRATION**

Inhalation use.  
Read the package leaflet before use.  
For administration with the Venta-Neb.

**6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT  
OF THE SIGHT AND REACH OF CHILDREN**

Keep out of the sight and reach of children.

**7. OTHER SPECIAL WARNING(S), IF NECESSARY**

**8. EXPIRY DATE**

EXP

**9. SPECIAL STORAGE CONDITIONS**

**10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE**

**11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER**

Bayer AG  
51368 Leverkusen  
Germany

**12. MARKETING AUTHORISATION NUMBER(S)**

EU/1/03/255/007 [90 (3 x 30) x 2 ml]  
EU/1/03/255/008 [300 (10 x 30) x 2 ml]

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

Medicinal product subject to medical prescription.

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

Ventavis 10 microgram/ml; 2 ml

**17. UNIQUE IDENTIFIER – 2D BARCODE**

Not applicable.

**18. UNIQUE IDENTIFIER – HUMAN READABLE DATA**

Not applicable.

**PARTICULARS TO APPEAR ON THE OUTER PACKAGING  
OUTER CARTON**

**30 AMPOULES WITH 1 ML**  
**42 AMPOULES WITH 1 ML**  
**168 (4 x 42) AMPOULES WITH 1 ML**

**1. NAME OF THE MEDICINAL PRODUCT**

Ventavis 10 microgram/ml, nebuliser solution  
Iloprost

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

1 ml solution contains 10 microgram iloprost (as iloprost trometamol).  
Each ampoule with 1 ml solution contains 10 microgram iloprost.

**3. LIST OF EXCIPIENTS**

Excipients:  
trometamol, ethanol 96%, sodium chloride, hydrochloric acid (for pH adjustment), water for injections.

**4. PHARMACEUTICAL FORM AND CONTENTS**

Nebuliser solution.  
30 ampoules with 1 ml.  
42 ampoules with 1 ml.  
Multipack: 168 (4 x 42) ampoules with 1 ml.

**5. METHOD AND ROUTE(S) OF ADMINISTRATION**

Inhalation use.  
Read the package leaflet before use.  
For administration with the Breelib or the I-Neb.

**6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT  
OF THE SIGHT AND REACH OF CHILDREN**

Keep out of the sight and reach of children.

**7. OTHER SPECIAL WARNING(S), IF NECESSARY**

**8. EXPIRY DATE**

EXP

**9. SPECIAL STORAGE CONDITIONS**

**10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE**

**11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER**

Bayer AG  
51368 Leverkusen  
Germany

**12. MARKETING AUTHORISATION NUMBER(S)**

EU/1/03/255/004 [30 x 1 ml]  
EU/1/03/255/011 [42 x 1 ml]  
EU/1/03/255/005 [168 (4 x 42) x 1 ml]

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

Ventavis 10 microgram/ml; 1 ml

**17. UNIQUE IDENTIFIER – 2D BARCODE**

2D barcode carrying the unique identifier included.

**18. UNIQUE IDENTIFIER – HUMAN READABLE DATA**

PC:  
SN:  
NN:

**PARTICULARS TO APPEAR ON THE OUTER PACKAGING  
OUTER CARTON**

**168 (4 x 42) AMPOULES WITH 1 ML CO-PACKED WITH BREELIB CONSUMABLES SET**

**1. NAME OF THE MEDICINAL PRODUCT**

Ventavis 10 microgram/ml, nebuliser solution  
Iloprost

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

1 ml solution contains 10 microgram iloprost (as iloprost trometamol).  
Each ampoule with 1 ml solution contains 10 microgram iloprost.

**3. LIST OF EXCIPIENTS**

Excipients:  
trometamol, ethanol 96%, sodium chloride, hydrochloric acid (for pH adjustment), water for injections.

**4. PHARMACEUTICAL FORM AND CONTENTS**

Nebuliser solution.  
Multipack: 168 (4 x 42) ampoules with 1 ml co-packed with Breelib consumables set (containing 1 mouthpiece and 1 medication chamber).

**5. METHOD AND ROUTE(S) OF ADMINISTRATION**

Inhalation use.  
Read the package leaflet before use.  
For administration with the Breelib.

**6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE SIGHT AND REACH OF CHILDREN**

Keep out of the sight and reach of children.

**7. OTHER SPECIAL WARNING(S), IF NECESSARY**

**8. EXPIRY DATE**

EXP

**9. SPECIAL STORAGE CONDITIONS**

**10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE**

**11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER**

Bayer AG  
51368 Leverkusen  
Germany

**12. MARKETING AUTHORISATION NUMBER(S)**

EU/1/03/255/013 [168 (4 x 42) x 1 ml] co-packed with Breelib consumables set (containing 1 mouthpiece and 1 medication chamber).

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

Ventavis 10 microgram/ml; 1 ml

**17. UNIQUE IDENTIFIER – 2D BARCODE**

2D barcode carrying the unique identifier included.

**18. UNIQUE IDENTIFIER – HUMAN READABLE DATA**

PC:  
SN:  
NN:

**PARTICULARS TO APPEAR ON THE OUTER PACKAGING  
INNER CARTON WITHOUT BLUE BOX**

**PACK WITH 42 AMPOULES IN A CARTON WITH 168 (4 x 42) AMPOULES WITH 1 ML  
PACK WITH 42 AMPOULES IN A CARTON WITH 168 (4 x 42) AMPOULES WITH 1 ML  
CO-PACKED WITH BREELIB CONSUMABLES SET**

**1. NAME OF THE MEDICINAL PRODUCT**

Ventavis 10 microgram/ml, Nebuliser solution  
Iloprost

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

1 ml solution contains 10 microgram iloprost (as iloprost trometamol).  
Each ampoule with 1 ml solution contains 10 microgram iloprost.

**3. LIST OF EXCIPIENTS**

Excipients:  
trometamol, ethanol 96%, sodium chloride, hydrochloric acid (for pH adjustment), water for injections.

**4. PHARMACEUTICAL FORM AND CONTENTS**

Nebuliser solution.  
42 ampoules with 1 ml. Component of a multipack, can't be sold separately.  
**Part of a multipack containing 168 (4 x 42) ampoules with 1 ml.**  
**Part of a multipack containing 168 (4 x 42) ampoules with 1 ml co-packed with Breelib consumables set** (containing 1 mouthpiece and 1 medication chamber).

**5. METHOD AND ROUTE(S) OF ADMINISTRATION**

Inhalation use.  
Read the package leaflet before use.

**6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT  
OF THE SIGHT AND REACH OF CHILDREN**

Keep out of the sight and reach of children.

**7. OTHER SPECIAL WARNING(S), IF NECESSARY**

**8. EXPIRY DATE**

EXP

**9. SPECIAL STORAGE CONDITIONS**

**10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE**

**11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER**

Bayer AG  
51368 Leverkusen  
Germany

**12. MARKETING AUTHORISATION NUMBER(S)**

EU/1/03/255/005 [168 (4 x 42) x 1 ml]  
EU/1/03/255/013 [168 (4 x 42) x 1 ml] co-packed with Breelib consumables set (containing 1 mouthpiece and 1 medication chamber).

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

Medicinal product subject to medical prescription.

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

Ventavis 10 microgram/ml; 1 ml

**17. UNIQUE IDENTIFIER – 2D BARCODE**

Not applicable.

**18. UNIQUE IDENTIFIER – HUMAN READABLE DATA**

Not applicable.



**MINIMUM PARTICULARS TO APPEAR ON SMALL IMMEDIATE PACKAGING UNITS**  
**AMPOULE WITH 1 ML**

**1. NAME OF THE MEDICINAL PRODUCT AND ROUTE(S) OF ADMINISTRATION**

Ventavis 10 microgram/ml nebuliser solution  
Iloprost  
Inhalation use

**2. METHOD OF ADMINISTRATION**

**3. EXPIRY DATE**

EXP

**4. BATCH NUMBER**

Lot

**5. CONTENTS BY WEIGHT, BY VOLUME OR BY UNIT**

1 ml

**6. OTHER**

**MINIMUM PARTICULARS TO APPEAR ON SMALL IMMEDIATE PACKAGING UNITS**  
**AMPOULE WITH 2 ML**

**1. NAME OF THE MEDICINAL PRODUCT AND ROUTE(S) OF ADMINISTRATION**

Ventavis 10 microgram/ml nebuliser solution  
Iloprost  
Inhalation use

**2. METHOD OF ADMINISTRATION**

**3. EXPIRY DATE**

EXP

**4. BATCH NUMBER**

Lot

**5. CONTENTS BY WEIGHT, BY VOLUME OR BY UNIT**

2 ml

**6. OTHER**

**PARTICULARS TO APPEAR ON THE OUTER PACKAGING  
OUTER CARTON**

**30 AMPOULES WITH 1 ML**  
**42 AMPOULES WITH 1 ML**  
**168 (4 x 42) AMPOULES WITH 1 ML**

**1. NAME OF THE MEDICINAL PRODUCT**

Ventavis 20 microgram/ml nebuliser solution  
Iloprost

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

1 ml solution contains 20 microgram iloprost (as iloprost trometamol).  
Each ampoule with 1 ml solution contains 20 microgram iloprost.

**3. LIST OF EXCIPIENTS**

Excipients:  
trometamol, ethanol 96%, sodium chloride, hydrochloric acid (for pH adjustment), water for injections.

**4. PHARMACEUTICAL FORM AND CONTENTS**

Nebuliser solution.  
30 ampoules with 1 ml  
42 ampoules with 1 ml  
Multipack: 168 (4 x 42) ampoules with 1 ml

**5. METHOD AND ROUTE(S) OF ADMINISTRATION**

Inhalation use.  
Read the package leaflet before use.  
For administration with the Breelib or the I-Neb.

**6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT  
OF THE SIGHT AND REACH OF CHILDREN**

Keep out of the sight and reach of children.

**7. OTHER SPECIAL WARNING(S), IF NECESSARY**

**8. EXPIRY DATE**

EXP

**9. SPECIAL STORAGE CONDITIONS**

**10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE**

**11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER**

Bayer AG  
51368 Leverkusen  
Germany

**12. MARKETING AUTHORISATION NUMBER(S)**

EU/1/03/255/009 [30 x 1 ml]  
EU/1/03/255/012 [42 x 1 ml]  
EU/1/03/255/010 [168 (4 x 42) x 1 ml]

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

Ventavis 20 microgram/ml; 1 ml

**17. UNIQUE IDENTIFIER – 2D BARCODE**

2D barcode carrying the unique identifier included.

**18. UNIQUE IDENTIFIER – HUMAN READABLE DATA**

PC:  
SN:  
NN:

**PARTICULARS TO APPEAR ON THE OUTER PACKAGING  
OUTER CARTON**

**168 (4 x 42) AMPOULES WITH 1 ML CO-PACKED WITH BREELIB CONSUMABLES SET**

**1. NAME OF THE MEDICINAL PRODUCT**

Ventavis 20 microgram/ml nebuliser solution  
Iloprost

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

1 ml solution contains 20 microgram iloprost (as iloprost trometamol).  
Each ampoule with 1 ml solution contains 20 microgram iloprost.

**3. LIST OF EXCIPIENTS**

Excipients:  
trometamol, ethanol 96%, sodium chloride, hydrochloric acid (for pH adjustment), water for injections.

**4. PHARMACEUTICAL FORM AND CONTENTS**

Nebuliser solution.  
Multipack: 168 (4 x 42) ampoules with 1 ml co-packed with Breelib consumables set (containing 1 mouthpiece and 1 medication chamber).

**5. METHOD AND ROUTE(S) OF ADMINISTRATION**

Inhalation use.  
Read the package leaflet before use.  
For administration with the Breelib.

**6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE SIGHT AND REACH OF CHILDREN**

Keep out of the sight and reach of children.

**7. OTHER SPECIAL WARNING(S), IF NECESSARY**

**8. EXPIRY DATE**

EXP

**9. SPECIAL STORAGE CONDITIONS**

**10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE**

**11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER**

Bayer AG  
51368 Leverkusen  
Germany

**12. MARKETING AUTHORISATION NUMBER(S)**

EU/1/03/255/014 [168 (4 x 42) x 1 ml] co-packed with Breelib consumables set (containing 1 mouthpiece and 1 medication chamber).

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

Ventavis 20 microgram/ml; 1 ml

**17. UNIQUE IDENTIFIER – 2D BARCODE**

2D barcode carrying the unique identifier included.

**18. UNIQUE IDENTIFIER – HUMAN READABLE DATA**

PC:  
SN:  
NN:

**PARTICULARS TO APPEAR ON THE OUTER PACKAGING  
INNER CARTON WITHOUT BLUE BOX**

**PACK WITH 42 AMPOULES IN A CARTON WITH 168 (4 x 42) AMPOULES WITH 1 ML  
PACK WITH 42 AMPOULES IN A CARTON WITH 168 (4 x 42) AMPOULES WITH 1 ML  
CO-PACKED WITH BREELIB CONSUMABLES SET**

**1. NAME OF THE MEDICINAL PRODUCT**

Ventavis 20 microgram/ml nebuliser solution  
Iloprost

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

1 ml solution contains 20 microgram iloprost (as iloprost trometamol).  
Each ampoule with 1 ml solution contains 20 microgram iloprost.

**3. LIST OF EXCIPIENTS**

Excipients:  
trometamol, ethanol 96%, sodium chloride, hydrochloric acid (for pH adjustment), water for injections.

**4. PHARMACEUTICAL FORM AND CONTENTS**

Nebuliser solution.  
42 ampoules with 1 ml. Component of a multipack, can't be sold separately.  
**Part of a multipack containing 168 (4 x 42) ampoules with 1 ml.**  
**Part of a multipack containing 168 (4 x 42) ampoules with 1 ml co-packed with Breelib consumables set** (containing 1 mouthpiece and 1 medication chamber).

**5. METHOD AND ROUTE(S) OF ADMINISTRATION**

Inhalation use.  
Read the package leaflet before use.

**6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT  
OF THE SIGHT AND REACH OF CHILDREN**

Keep out of the sight and reach of children.

**7. OTHER SPECIAL WARNING(S), IF NECESSARY**

**8. EXPIRY DATE**

EXP

**9. SPECIAL STORAGE CONDITIONS**

**10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE**

**11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER**

Bayer AG  
51368 Leverkusen  
Germany

**12. MARKETING AUTHORISATION NUMBER(S)**

EU/1/03/255/010 [168 (4 x 42) x 1 ml]  
EU/1/03/255/014 [168 (4 x 42) x 1 ml] co-packed with Breelib consumables set (containing 1 mouthpiece and 1 medication chamber).

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

Medicinal product subject to medical prescription.

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

Ventavis 20 microgram/ml; 1 ml

**17. UNIQUE IDENTIFIER – 2D BARCODE**

Not applicable.

**18. UNIQUE IDENTIFIER – HUMAN READABLE DATA**

Not applicable.



**MINIMUM PARTICULARS TO APPEAR ON SMALL IMMEDIATE PACKAGING UNITS**  
**AMPOULE WITH 1 ML**

**1. NAME OF THE MEDICINAL PRODUCT AND ROUTE(S) OF ADMINISTRATION**

Ventavis 20 microgram/ml nebuliser solution  
Iloprost  
Inhalation use

**2. METHOD OF ADMINISTRATION**

**3. EXPIRY DATE**

EXP

**4. BATCH NUMBER**

Lot

**5. CONTENTS BY WEIGHT, BY VOLUME OR BY UNIT**

1 ml

**6. OTHER**

**B. PACKAGE LEAFLET**

## **Package leaflet: Information for the user**

### **Ventavis 10 microgram/ml nebuliser solution**

Iloprost

**Read all of this leaflet carefully before you start using this medicine because it contains important information for you.**

- Keep this leaflet. You may need to read it again.
- If you have any further questions, ask your doctor, pharmacist or nurse.
- This medicine has been prescribed for you only. Do not pass it on to others. It may harm them, even if their signs of illness are the same as yours.
- If you get any side effects, talk to your doctor, pharmacist or nurse. This includes any possible side effects not listed in this leaflet. See section 4.

#### **What is in this leaflet**

1. What Ventavis is and what it is used for
2. What you need to know before you use Ventavis
3. How to use Ventavis
4. Possible side effects
5. How to store Ventavis
6. Contents of the pack and other information

#### **1. What Ventavis is and what it is used for**

##### **What Ventavis is**

The active substance of Ventavis is iloprost. It imitates a natural substance in the body called prostacyclin. Ventavis inhibits unwanted blocking or narrowing of blood vessels and allows more blood to flow through the vessels.

##### **What Ventavis is used for**

Ventavis is used to treat moderate cases of primary pulmonary hypertension (PPH) in adult patients. PPH is a category of pulmonary hypertension where the cause of the high blood pressure is not known.

This is a condition where blood pressure is too high in the blood vessels between the heart and the lungs.

Ventavis is used to improve exercise capacity (the ability to carry out physical activity) and symptoms.

##### **How Ventavis works**

Breathing in the mist carries Ventavis to the lungs, where it can work most effectively in the artery between heart and lungs. Improved blood flow leads to a better supply of oxygen to the body and reduced strain on the heart.

## 2. What you need to know before you use Ventavis

### Do not use Ventavis

- **if you are allergic** to iloprost or any of the other ingredients of this medicine (listed in section 6),
- **if you are at risk of bleeding**— for example, if you have an active ulcer of the stomach or of the first part of the small intestine (duodenal ulcers), if you have suffered a physical injury (trauma), if you are at risk of bleeding within the skull,
- **if you have a heart problem**, such as
  - poor blood flow to the heart muscles (severe coronary heart disease or unstable angina). Symptoms can include chest pain,
  - a heart attack within the last six months,
  - a weak heart (decompensated cardiac failure) which is not under close medical observation,
  - severe unstable heartbeat,
  - a defect of the heart valves (inborn or acquired) that causes the heart to work poorly (not related to pulmonary hypertension),
- **if you have had a stroke within the last 3 months**, or any other occurrence that reduced the blood supply to the brain (e.g. transient ischaemic attack),
- **if your pulmonary hypertension is due to a blocked or narrowed vein** (venous occlusive disease).

### Warnings and precautions

Talk to your doctor, pharmacist or nurse before using Ventavis:

- Inhaling Ventavis might trigger breathing difficulties (see section 4), especially in patients with bronchospasm (sudden constriction of the muscles in the walls of the small airways) and wheezing. Tell your doctor if you have a **lung infection, severe asthma, or chronic lung disease** (chronic obstructive pulmonary disease). Your doctor will monitor you closely.
- **Your blood pressure will be checked before treatment and if it is too low** (less than 85 mmHg for the upper value) then therapy with Ventavis should not be started.
- In general, you will need to **take special care to try and avoid effects of low blood pressure**, such as fainting and dizziness:
  - Tell your doctor if you are taking any other medication because the combined effect with Ventavis may lower your blood pressure further (see below "Other medicines and Ventavis").
  - Stand up slowly when you get out of chairs or bed.
  - If you tend to faint as soon as you get out of bed, it may be helpful to take your first dose of the day while you are still lying down.
  - If you tend to experience fainting episodes, avoid any exceptional straining, for example during physical exertion; it might be useful to inhale Ventavis before.
- Fainting episodes may be due to the underlying disease. Tell your doctor if they get worse. He/she may consider adjusting your dose or changing your treatment.
- **If you suffer from a weak heart condition such as right heart failure, and feel that your disease is worsening**, tell your doctor. Symptoms can include swelling of feet and ankles, shortness of breath, palpitations, urinating more frequently at night or oedema. Your doctor will consider changing your treatment.
- **If you experience difficulty breathing, cough up blood, and/or sweat excessively these may be signs that you have water in the lungs** (lung oedema). Stop using Ventavis and tell your doctor immediately. He/she will look for the cause and take appropriate measures.
- **If you have liver problems or very severe kidney problems, requiring dialysis**, tell your doctor. You may be gradually introduced to the prescribed dose or be prescribed a lower dose of Ventavis than for other patients (see section 3. "How to use Ventavis").

### **Contact of Ventavis with skin or swallowing Ventavis**

- Do NOT let Ventavis solution come into contact with your skin or eyes. If it does, rinse the skin or your eyes immediately with plenty of water.
- Do NOT drink or swallow Ventavis solution. If you swallow it accidentally, drink plenty of water and tell your doctor.

### **Children and adolescents**

The safety and efficacy of Ventavis in children aged up to 18 years have not been established.

### **Other medicines and Ventavis**

**Tell your doctor or pharmacist if you are** using, have recently used or might use any other medicines. Ventavis and certain other medicines may affect each other in the way they work in your body.

Tell your doctor if you are taking:

- **Medicines used to treat high blood pressure or heart disease**, such as
  - beta blockers,
  - nitro-vasodilators,
  - ACE inhibitors.Your blood pressure may drop much further.  
Your doctor may change the dosage.
- **Medicines that thin the blood or inhibit blood clotting**, this includes
  - acetylsalicylic acid (ASA - a compound found in many medicines that lower fever and relieve pain),
  - heparin,
  - coumarin-type anticoagulants, such as warfarin or phenprocoumon,
  - non-steroidal anti-inflammatory drugs,
  - non-selective phosphodiesterase inhibitors, such as pentoxifylline,
  - selective phosphodiesterase 3 (PDE 3) inhibitors, such as cilostazol or anagrelide,
  - ticlopidine,
  - clopidogrel,
  - glycoprotein IIb/IIIa antagonists, such as
    - abciximab,
    - eptifibatide,
    - tirofiban,
  - defibrotide.Your doctor will monitor you carefully.

Before taking any medicine ask your doctor or pharmacist, who has more information on medicines to be careful with or avoid when using Ventavis.

### **Ventavis with food and drink**

Food or drink is not expected to affect Ventavis. However, you should avoid taking food or drink during inhalation.

### **Pregnancy**

- **If you suffer from pulmonary hypertension**, avoid getting pregnant as pregnancy may lead to a worsening of your condition and may even endanger your life.
- **If you could get pregnant**, use reliable contraception from the time you start treatment and during treatment.
- **If you are pregnant, think you might be or are planning to have a baby**, tell your doctor straight away. Ventavis should only be used during pregnancy if your doctor decides that the potential benefit outweighs the potential risk to you and the foetus.

### **Breast-feeding**

It is not known whether Ventavis passes into human milk. A potential risk to the breast-feeding child cannot be excluded and it is preferable to avoid breast-feeding during Ventavis therapy.

Ask your doctor or pharmacist for advice before taking any medicine.

**Newborns, infants and pregnant women should not be in the same room while you are inhaling Ventavis.**

### **Driving and using machines**

Ventavis lowers blood pressure and may cause dizziness or light-headedness in some people.

Do not drive or operate any tools or machines if you feel these effects.

### **Ventavis contains ethanol**

**Ventavis contains** small amounts of **ethanol** (alcohol), less than 100 mg per dose.

## **3. How to use Ventavis**

Ventavis therapy should only be initiated by a physician experienced in treatment of pulmonary hypertension.

### **How much to inhale and for how long**

Always use this medicine exactly as your doctor has told you. Check with your doctor if you are not sure.

The dose of Ventavis and the duration of treatment that is right for you depend on your individual condition. Your doctor will advise you. Do not change the recommended dose without consulting your doctor first.

Different nebuliser devices can be used to administer Ventavis. Depending on the type of device used and dose prescribed, 1 ml or 2 ml of Ventavis 10 microgram/ml are appropriate.

- **Breelib nebuliser**

If you are starting Ventavis treatment or if you switch from an alternative device your first inhalation will be with Ventavis 10 microgram/ml (1 ml ampoule with white and yellow rings). If you tolerate this dose well, your next inhalation will be with Ventavis 20 microgram/ml (ampoule with yellow and red rings). You should continue on this dose.

If you cannot tolerate inhalation of Ventavis 20 microgram/ml talk to your doctor who may decide that you should take Ventavis 10 microgram/ml (1 ml ampoule).

**Most people will have 6 to 9 inhalation sessions** spread throughout the day. One inhalation session with Breelib will usually last about 3 minutes.

Your doctor will supervise your treatment when you start using the Breelib nebuliser to ensure that you tolerate dose and speed of inhalation well.

- **I-Neb AAD nebuliser (1 ml ampoule with white and yellow rings)**

In general, when starting Ventavis treatment the first inhaled dose should be 2.5 microgram iloprost as delivered at the mouthpiece. If you tolerate this dose well, your dose should be increased to 5 microgram iloprost and you should continue on this dose. If you are unable to tolerate the 5 microgram dose, the dose should be reduced to 2.5 microgram.

**Most people will have 6 to 9 inhalation sessions** spread throughout the day. One inhalation session will usually last about 4 to 10 minutes with I-Neb AAD depending on the prescribed dose.

- **Venta-Neb nebuliser (2 ml ampoule with white and pink rings)**

In general, when starting Ventavis treatment the first inhaled dose should be 2.5 microgram iloprost as delivered at the mouthpiece. If you tolerate this dose well, your dose should be increased to 5 microgram and you should continue on this dose. If you are unable to tolerate the 5 microgram dose, the dose should be reduced to 2.5 microgram.

**Most people will have 6 to 9 inhalation sessions** spread throughout the day. One inhalation session with Venta-Neb will usually last about 4 to 10 minutes depending on the prescribed dose.

Depending on your individual needs, Ventavis can be used for long term treatment.

### **If you have kidney or liver problems**

There is no need to alter the dose in patients with mild or moderate kidney problems (patients with a creatinine clearance > 30 ml/min).

If you have very severe kidney problems and require dialysis or if you have liver problems, your doctor will introduce you to Ventavis gradually and possibly prescribe fewer daily inhalations. Start therapy by inhaling 2.5 microgram iloprost using 1 ml ampoule of Ventavis 10 microgram/ml (with white and yellow rings). Use dosing intervals of 3 – 4 hours (this corresponds to a maximum of 6 administrations per day). Thereafter, your doctor may cautiously shorten the dosing intervals depending on how you tolerate the treatment. If your doctor decides to further increase the dose up to 5 microgram, again dosing intervals of 3 - 4 hours should be chosen initially and shortened depending on how you tolerate the treatment.

If you feel that the effect of Ventavis is too strong or too weak, **talk to your doctor or pharmacist**. Ask your doctor to have someone help you become thoroughly familiar with the use of the nebuliser. You should not switch to another nebuliser without consulting the doctor who is treating you.

### **How to inhale**

For each inhalation session you should use a new ampoule of Ventavis. Just before you start to inhale, break the glass ampoule and pour the solution into the medication chamber following the instructions for use of the nebuliser.

Follow carefully the instructions that come with the nebuliser especially the instructions on hygiene and cleaning of the nebuliser.

Always take Ventavis exactly as your doctor has told you.

- Ventavis 10 microgram/ml nebuliser solution is inhaled using the nebulisers your doctor prescribed (either the Breelib, the Venta-Neb or the I-Neb AAD system).
- The nebuliser turns Ventavis solution into a mist which you breathe in through your mouth.
- For the inhalation you should use a mouthpiece to prevent Ventavis coming into contact with your skin. Do not use a facial mask.
- Follow carefully any instructions that come with the nebuliser. Check with your doctor or pharmacist if you are unsure.
- Any Ventavis solution remaining in the nebuliser after inhalation must be thrown away (see section 5).

### Room ventilation

Be sure to ventilate or air the room in which you have taken your Ventavis treatment. Other people might accidentally be exposed to Ventavis through the room air. In particular, newborns, infants and pregnant women should not be in the same room while you are inhaling Ventavis.

- **Breelib**

Fill the medication chamber with Ventavis immediately before use. For filling please follow the instructions for use of the nebuliser.

Device	Drug product	Dose of iloprost at mouthpiece	Estimated inhalation time
Breelib	Ventavis 10 mcg/ml (1 ml ampoule with white and yellow rings)	2.5 mcg	3 minutes

- **I-Neb AAD**

1. Just before you start to inhale, break the glass ampoule containing 1 ml solution, which has two coloured rings (white - yellow), and pour the complete contents into the nebuliser medication chamber.
2. The pre-set dose provided by the I-Neb AAD system is controlled by the medication chamber in combination with a control disc. There are two different colour coded medication chambers. For each medication chamber there is a corresponding colour coded control disc:
  - For the **2.5 microgram** dose the medication chamber **with the red coloured latch is used together with the red control disc.**
  - For the **5 microgram** dose the medication chamber with **the purple coloured latch is used together with the purple control disc.**
3. In order to ensure that you receive the prescribed dose, check the colour of the medication chamber and the colour of the control disc. They should both have the same colour, either red for the 2.5 microgram dose or purple for the 5 microgram dose.

Device	Dose of iloprost at mouthpiece	Estimated inhalation time
I-Neb AAD	2.5 microgram 5 microgram	3.2 min 6.5 min

The table below provides a summary of the user instructions of the I-Neb:

Drug product	Ampoule coloured ring	Dosage	I-Neb AAD	
			Medication chamber latch	Control disc
Ventavis 10 mcg/ml	1 ml ampoule white - yellow ring	2.5 mcg	red	red
		5 mcg	purple	purple



- **Venta-Neb**

1. Just before you start to inhale, break the glass ampoule containing 2 ml solution, which has two coloured rings (white-pink), and pour the complete contents into the nebuliser medication chamber.
2. Two programmes can be operated:
3. Your doctor will adjust Venta-Neb to the programme you need to receive the dose prescribed for you.
  - P1 Programme 1: 5 microgram active substance on the mouth piece 25 inhalation cycles.
  - P2 Programme 2: 2.5 microgram active substance on the mouth piece 10 inhalation cycles.
4. You should use the green baffle plate to obtain the optimal droplet size for the administration of Ventavis.

Device	Dose of iloprost at mouthpiece	Estimated inhalation time
Venta-Neb	2.5 microgram	4 min
	5 microgram	8 min

For further details please refer to the instruction manual of the nebuliser device or ask your doctor.

**If you use more Ventavis than you should**

Using more Ventavis than you should may lead to dizziness, headache, flushing (reddening of the face), nausea (feeling sick), jaw pain or back pain.

You may also experience a decrease or an increase in blood pressure, bradycardia (reduced heart rate), tachycardia (increased heart rate), vomiting, diarrhoea or limb pain. If any of these happen when you have used more Ventavis than you should:

- stop the inhalation session
- talk to your doctor

Your doctor will monitor you and treat any resulting symptoms. A specific antidote is not known.

**If you forget to use Ventavis**

Do not take a double dose to make up for a forgotten dose. Please ask your doctor what you should do.

**If you stop taking Ventavis**

If you stop or wish to stop treatment, discuss it with your doctor first.

If you have any further questions on the use of this medicine, ask your doctor, pharmacist or nurse.

**4. Possible side effects**

Like all medicines, this medicine can cause side effects, although not everybody gets them.

The following **serious side effects** may occur. In this case talk to your doctor immediately.

**Very common** (may affect more than 1 in 10 people):

- Bleeding events (mostly nosebleed (epistaxis) and coughing up blood (haemoptysis)) may very commonly occur, especially if you are also taking blood-thinning medicines (anticoagulants). The risk of bleeding may be increased in patients when inhibitors of platelet aggregation or anticoagulants are given at the same time (see also section 2). Very rarely, fatal cases including bleeding in the brain (cerebral and intracranial haemorrhage) have been reported.

**Common** (may affect up to 1 in 10 people):

- Fainting (syncope) is a symptom of the illness itself but can also occur during treatment with Ventavis (see also section 2 "Warnings and precautions", for advice on what you can do to avoid this).
- Low blood pressure (hypotension)

**Not known** (cannot be estimated from the available data):

- Bronchospasm (sudden constriction of the muscles in the walls of the small airways) and wheezing (see also section 2 "Warnings and precautions")

Below we list other possible side effects by how likely they are:

**Very common:** may affect more than 1 in 10 people

- widening of the blood vessels (vasodilatation). Symptoms can be flushing or reddening of the face.
- chest discomfort / chest pain
- coughing
- headache
- nausea
- pain in jaw/spasm of the jaw muscles (trismus)
- swelling of the limbs (peripheral oedema)

**Common:** may affect up to 1 in 10 people

- breathing difficulties (dyspnoea)
- dizziness
- vomiting
- diarrhoea
- pain when swallowing (pharyngolaryngeal irritation)
- throat irritation
- mouth and tongue irritation including pain
- rash
- fast heartbeat (tachycardia)
- awareness of fast or hard heartbeat (palpitations)

**Not known:** frequency cannot be estimated from the available data.

- reduction in the number of blood platelets (thrombocytopenia)
- hypersensitivity (i.e. allergy)
- disturbed sense of taste (dysgeusia)

#### **Other possible effects**

- Swelling, mainly of the ankles and legs, due to fluid retention (peripheral oedema) is a very common symptom of the illness itself but can also occur during treatment with Ventavis.

#### **Reporting of side effects**

If you get any side effects talk to your doctor. This includes any possible side effects not listed in this leaflet. You can also report side effects directly **via the national reporting system listed in [Appendix V](#)**. By reporting side effects, you can help provide more information on the safety of this medicine.

## **5. How to store Ventavis**

Keep this medicine out of the sight and reach of children.

Do not use this medicine after the expiry date which is stated on the carton and ampoule.

This medicine does not require any special storage conditions.

Any Ventavis solution remaining in the nebuliser after inhalation must be thrown away.

Do not throw away any medicines via wastewater or household waste. Ask your pharmacist how to throw away medicines you no longer use. These measures will help protect the environment.

## 6. Contents of the pack and other information

### What Ventavis contains:

- **The active substance** is iloprost.  
1 ml solution contains 10 microgram iloprost (as iloprost trometamol).  
Each ampoule with 1 ml contains 10 microgram iloprost.  
Each ampoule with 2 ml contains 20 microgram iloprost.
- **The other ingredients** are trometamol, ethanol, sodium chloride, hydrochloric acid for pH adjustment, and water for injections.

### What Ventavis looks like and content of the pack:

Ventavis is a clear, colourless nebuliser solution for inhalation with the Breelib, the I-Neb or the Venta-Neb nebuliser.

Ventavis 10 microgram/ml is provided in colourless ampoules, containing either 1 ml or 2 ml nebuliser solution.

*Ventavis 10 microgram/ml is available in the following packs:*

- 1 ml ampoules for use with Breelib or I-Neb nebulisers:
  - Pack containing 30 or 42 ampoules for use with the Breelib and I-Neb nebuliser.
  - Multipack containing 168 (4x42) ampoules for use with the Breelib and I-Neb nebuliser.
  - Multipack containing 168 (4x42) ampoules with Breelib consumables set (containing 1 mouthpiece and 1 medication chamber).

The ampoules containing 1 ml are marked with two coloured rings (white - yellow).

- 2 ml ampoules for the use with Venta-Neb:
  - Pack containing 30, 90, 100 or 300 ampoules.
  - Multipack containing 90 (3x30) or 300 (10x30) ampoules.

The ampoules containing 2 ml are marked with two coloured rings (white – pink).

Not all pack-sizes may be marketed.

### Marketing Authorisation Holder:

Bayer AG  
51368 Leverkusen  
Germany

### Manufacturer:

Berlimed S.A.  
Poligono Industrial Santa Rosa s/n  
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For any information about this medicine, please contact the local representative of the Marketing Authorisation Holder.

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**This leaflet was last revised in**

Detailed information on this medicine is available on the European Medicines Agency website:  
<http://www.ema.europa.eu>. There are also links to other websites about rare diseases and treatments.

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**The following information is intended for healthcare professionals only:**

**Instructions for use and handling**

Patients stabilised on one nebuliser should not switch to another nebuliser without close supervision by the treating doctor as different nebulisers have been shown to produce aerosols with slightly different physical characteristics and may have faster delivery of the solution (see section 5.2 of the Summary of Product Characteristics).

To minimise accidental exposure, it is recommended to keep the room well ventilated.

- **Breelib**

When using the Breelib nebuliser please follow the instructions for use provided with the device. Fill the medication chamber with Ventavis immediately before use.

Device	Drug product	Dose of iloprost at mouthpiece	Estimated inhalation time
Breelib	Ventavis 10 mcg/ml (1 ml ampoule with white and yellow rings)	2.5 mcg	3 minutes

- **I-Neb AAD**

The I-Neb AAD System is a portable, hand-held, vibrating mesh technology nebuliser system. This system generates droplets by ultrasound, which forces the solution through a mesh. The I-Neb AAD nebuliser has been shown to be suitable for the administration of Ventavis 10 microgram/ml (1 ml ampoule with white and yellow rings).

The measured MMAD of the aerosol droplets was 2.1 micrometres.

This nebuliser monitors the breathing pattern to determine the aerosol pulse time required to deliver the pre-set dose of 2.5 or 5 microgram iloprost.

The dose delivered by the I-Neb AAD system is controlled by the medication chamber in combination with a control disc. Each medication chamber is colour coded and has a corresponding colour coded control disc.

- For the **2.5 microgram** dose the medication chamber with **the red latch is used together with the red control disc**.
- For the **5 microgram** dose the medication chamber with **the purple coloured latch is used together with the purple control disc**.

For each inhalation session with the I-Neb AAD, the content of one 1 ml ampoule of Ventavis, with two coloured rings (white - yellow) is transferred into the medication chamber immediately before use.

Device	Dose of iloprost at mouthpiece	Estimated inhalation time
I-Neb AAD	2.5 microgram 5 microgram	3.2 min 6.5 min

The table below provides a summary of the user instructions of the I-Neb for Ventavis:

Drug product	Ampoule coloured ring	Dosage	I-Neb AAD	
			Medication chamber latch	Control disc
Ventavis 10 mcg/ml	1 ml ampoule white - yellow ring	2.5 mcg	red	red
		5 mcg	purple	purple

- **Venta-Neb**

Venta-Neb, a portable ultrasonic battery-powered nebuliser, has also been shown to be suitable for the administration of Ventavis 10 microgram/ml. The measured MMAD of the aerosol droplets was 2.6 micrometres. For each inhalation session, the content of one ampoule containing 2 ml of Ventavis 10 microgram/ml nebuliser solution and marked with two coloured rings (white – pink) is transferred into the nebuliser medication chamber immediately before use.

Two programmes can be operated:

- P1 Programme 1: 5 microgram active substance on the mouth piece 25 inhalation cycles.
- P2 Programme 2: 2.5 microgram active substance on the mouth piece 10 inhalation cycles.

The selection of the pre-set programme is made by the doctor.

Venta-Neb prompts the patient to inhale by an optical and an acoustic signal. It stops after the pre-set dose has been administered. To obtain the optimal droplet size for the administration of Ventavis the green baffle plate should be used. For details refer to the instruction manual of the Venta-Neb nebuliser.

Device	Dose of iloprost at mouthpiece	Estimated inhalation time
Venta-Neb	2.5 microgram 5 microgram	4 min 8 min

The efficacy and tolerability of inhaled iloprost when administered with other nebulising systems, which provide different nebulisation characteristics of iloprost solution, have not been established.

## Package leaflet: Information for the user

### Ventavis 20 microgram/ml nebuliser solution Iloprost

**Read all of this leaflet carefully before you start using this medicine because it contains important information for you.**

- Keep this leaflet. You may need to read it again.
- If you have any further questions, ask your doctor, pharmacist or nurse.
- This medicine has been prescribed for you only. Do not pass it on to others. It may harm them, even if their signs of illness are the same as yours.
- If you get any side effects, talk to your doctor, pharmacist or nurse. This includes any possible side effects not listed in this leaflet. See section 4.

#### What is in this leaflet

1. What Ventavis is and what it is used for
2. What you need to know before you use Ventavis
3. How to use Ventavis
4. Possible side effects
5. How to store Ventavis
6. Contents of the pack and other information

#### 1. What Ventavis is and what it is used for

##### What Ventavis is

The active substance of Ventavis is iloprost. It imitates a natural substance in the body called prostacyclin. Ventavis inhibits unwanted blocking or narrowing of blood vessels and allows more blood to flow through the vessels.

##### What Ventavis is used for

Ventavis is used to treat moderate cases of primary pulmonary hypertension (PPH) in adult patients. PPH is a category of pulmonary hypertension where the cause of the high blood pressure is not known.

This is a condition where blood pressure is too high in the blood vessels between the heart and the lungs.

Ventavis is used to improve exercise capacity (the ability to carry out physical activity) and symptoms.

##### How Ventavis works

Breathing in the mist carries Ventavis to the lungs, where it can work most effectively in the artery between heart and lungs. Improved blood flow leads to a better supply of oxygen to the body and reduced strain on the heart.

#### 2. What you need to know before you use Ventavis

##### Do not use Ventavis

- **if you are allergic** to iloprost or any of the other ingredients of this medicine (listed in section 6),
- **if you are at risk of bleeding**– for example, if you have an active ulcer of the stomach or of the first part of the small intestine (duodenal ulcers), if you have suffered a physical injury (trauma), if you are at risk of bleeding within the skull,

- **if you have a heart problem**, such as
  - poor blood flow to the heart muscles (severe coronary heart disease or unstable angina). Symptoms can include chest pain,
  - a heart attack within the last six months,
  - a weak heart (decompensated cardiac failure) which is not under close medical observation,
  - severe unstable heartbeat,
  - a defect of the heart valves (inborn or acquired) that causes the heart to work poorly (not related to pulmonary hypertension),
- **if you have had a stroke within the last 3 months**, or any other occurrence that reduced the blood supply to the brain (e.g. transient ischaemic attack),
- **if your pulmonary hypertension is due to a blocked or narrowed vein** (venous occlusive disease).

### Warnings and precautions

Talk to your doctor, pharmacist or nurse before using Ventavis:

- Inhaling Ventavis might trigger breathing difficulties (see section 4), especially in patients with bronchospasm (sudden constriction of the muscles in the walls of the small airways) and wheezing. Tell your doctor if you have **a lung infection, severe asthma, or chronic lung disease** (chronic obstructive pulmonary disease). Your doctor will monitor you closely.
- **Your blood pressure will be checked before treatment and if it is too low** (less than 85 mmHg for the upper value) then therapy with Ventavis should not be started.
- In general, you will need to **take special care to try and avoid effects of low blood pressure**, such as fainting and dizziness:
  - Tell your doctor if you are taking any other medication because the combined effect with Ventavis may lower your blood pressure further (see below “Other medicines and Ventavis”).
  - Stand up slowly when you get out of chairs or bed.
  - If you tend to faint as soon as you get out of bed, it may be helpful to take your first dose of the day while you are still lying down.
  - If you tend to experience fainting episodes, avoid any exceptional straining, for example during physical exertion; it might be useful to inhale Ventavis before.
- Fainting episodes may be due to the underlying disease. Tell your doctor if they get worse. He/she may consider adjusting your dose or changing your treatment.
- **If you suffer from a weak heart condition such as right heart failure, and feel that your disease is worsening**, tell your doctor. Symptoms can include swelling of feet and ankles, shortness of breath, palpitations, urinating more frequently at night or oedema. Your doctor will consider changing your treatment.
- **If you experience difficulty breathing, cough up blood, and/or sweat excessively these may be signs that you have water in the lungs** (lung oedema). Stop using Ventavis and tell your doctor immediately. He/she will look for the cause and take appropriate measures.
- **If you have liver problems or very severe kidney problems, requiring dialysis**, tell your doctor. You may be gradually introduced to the prescribed dose or be prescribed a lower dose of Ventavis than for other patients (see section 3. “How to use Ventavis”).

### Contact of Ventavis with skin or swallowing Ventavis

- Do NOT let Ventavis solution come into contact with your skin or eyes. If it does, rinse the skin or your eyes immediately with plenty of water.
- Do NOT drink or swallow Ventavis solution. If you swallow it accidentally, drink plenty of water and tell your doctor.

### Children and adolescents

The safety and efficacy of Ventavis in children aged up to 18 years have not been established.



### **Other medicines and Ventavis**

**Tell your doctor or pharmacist if you are** using, have recently used or might use any other medicines. Ventavis and certain other medicines may affect each other in the way they work in your body.

Tell your doctor if you are taking:

- **Medicines used to treat high blood pressure or heart disease**, such as
  - beta blockers,
  - nitro-vasodilators,
  - ACE inhibitors.

Your blood pressure may drop much further.

Your doctor may change the dosage.

- **Medicines that thin the blood or inhibit blood clotting**, this includes
  - acetylsalicylic acid (ASA - a compound found in many medicines that lower fever and relieve pain),
  - heparin,
  - coumarin-type anticoagulants, such as warfarin or phenprocoumon,
  - non-steroidal anti-inflammatory drugs,
  - non-selective phosphodiesterase inhibitors, such as pentoxifylline,
  - selective phosphodiesterase 3 (PDE 3) inhibitors, such as cilostazol or anagrelide,
  - ticlopidine,
  - clopidogrel,
  - glycoprotein IIb/IIIa antagonists, such as
    - o abciximab,
    - o eptifibatide,
    - o tirofiban,
  - defibrotide.

Your doctor will monitor you carefully.

Before taking any medicine ask your doctor or pharmacist, who has more information on medicines to be careful with or avoid when using Ventavis.

### **Ventavis with food and drink**

Food or drink is not expected to affect Ventavis. However, you should avoid taking food or drink during inhalation.

### **Pregnancy**

- **If you suffer from pulmonary hypertension**, avoid getting pregnant as pregnancy may lead to a worsening of your condition and may even endanger your life.
- **If you could get pregnant**, use reliable contraception from the time you start treatment and during treatment.
- **If you are pregnant, think you might be or are planning to have a baby**, tell your doctor straight away. Ventavis should only be used during pregnancy if your doctor decides that the potential benefit outweighs the potential risk to you and the foetus.

### **Breast-feeding**

It is not known whether Ventavis passes into human milk. A potential risk to the breast-feeding child cannot be excluded and it is preferable to avoid breast-feeding during Ventavis therapy.

Ask your doctor or pharmacist for advice before taking any medicine.

**Newborns, infants and pregnant women should not be in the same room while you are inhaling Ventavis.**

### **Driving and using machines**

Ventavis lowers blood pressure and may cause dizziness or light-headedness in some people. Do not drive or operate any tools or machines if you feel these effects.

### **Ventavis contains ethanol**

**Ventavis contains** small amounts of **ethanol** (alcohol), less than 100 mg per dose.

## **3. How to use Ventavis**

Ventavis therapy should only be initiated by a physician experienced in treatment of pulmonary hypertension.

### **How much to inhale and for how long**

Always use this medicine exactly as your doctor has told you. Check with your doctor if you are not sure.

The dose of Ventavis and the duration of treatment that is right for you depend on your individual condition. Your doctor will advise you. Do not change the recommended dose without consulting your doctor first.

Different nebuliser devices can be used to administer Ventavis 20µg/ml.

- **Breelib nebuliser**

If you are starting Ventavis treatment or if you switch from an alternative device your first inhalation will be with Ventavis 10 microgram/ml (1 ml ampoule with white and yellow rings). If you tolerate this dose well, your next inhalation will be with Ventavis 20 microgram/ml (ampoule with yellow and red rings). You should continue on this dose.

If you cannot tolerate inhalation of Ventavis 20 microgram/ml talk to your doctor who may decide that you should take Ventavis 10 microgram/ml (1 ml ampoule).

**Most people will have 6 to 9 inhalation sessions** spread throughout the day. One inhalation session with Breelib will usually last about 3 minutes.

Your doctor will supervise your treatment when you start using the Breelib nebuliser to ensure that you tolerate dose and speed of inhalation well.

- **I-Neb nebuliser**

As you repeatedly experience extended inhalation treatment times with Ventavis 10 microgram/ml (1 ml ampoule with white and yellow rings), your doctor decided to switch to Ventavis 20 microgram/ml.

Ventavis 20 microgram/ml is double the concentration of Ventavis 10 microgram/ml. The active substance can be delivered more rapidly to your lungs. Your doctor will supervise your treatment if switching from Ventavis 10 microgram /ml to Ventavis 20 microgram/ml to monitor how well you tolerate the higher concentration.

You should administer the dose 6 to 9 times per day according to individual needs and tolerability.

Depending on your individual needs, Ventavis can be used for long term treatment.

## If you have kidney or liver problems

There is no need to alter the dose in patients with mild or moderate kidney problems (patients with a creatinine clearance >30 ml/min).

If you have very severe kidney problems and require dialysis or if you have liver problems, your doctor will introduce you to Ventavis gradually and possibly prescribe fewer daily inhalations. Start therapy by inhaling 2.5 microgram iloprost using Ventavis 10 micrograms/ml (1 ml ampoule with white and yellow rings). Use dosing intervals of 3 – 4 hours (this corresponds to a maximum of 6 administrations per day). Thereafter, your doctor may cautiously shorten the dosing intervals depending on how you tolerate the treatment. If your doctor decides to further increase the dose up to 5 microgram, again dosing intervals of 3 - 4 hours should be chosen initially and shortened depending on how you tolerate the treatment.

If you feel that the effect of Ventavis is too strong or too weak, **talk to your doctor or pharmacist**. Ask your doctor to have someone help you become thoroughly familiar with the use of the nebuliser. You should not switch to another nebuliser without consulting the doctor who is treating you.

## How to inhale

For each inhalation session you should use a new ampoule of Ventavis. Just before you start to inhale, break the glass ampoule and pour the solution into the medication chamber following the instructions for use of the nebuliser.

Follow carefully the instructions that come with the nebuliser especially the instructions on hygiene and cleaning of the nebuliser.

Always take Ventavis exactly as your doctor has told you.

- Ventavis 20 microgram/ml nebuliser solution is inhaled using the nebulisers your doctor prescribed (either the Breelib or the I-Neb AAD nebuliser).
- The nebuliser turns Ventavis solution into a mist which you breathe in through your mouth.
- For the inhalation you should use a mouthpiece to prevent Ventavis coming into contact with your skin. Do not use a facial mask.
- Follow carefully any instructions that come with the nebuliser. Check with your doctor or pharmacist if you are unsure.
- Any Ventavis solution remaining in the nebuliser after inhalation must be thrown away (see section 5).

## Room ventilation

Be sure to ventilate or air the room in which you have taken your Ventavis treatment. Other people might accidentally be exposed to Ventavis through the room air. In particular, newborns, infants and pregnant women should not be in the same room while you are inhaling Ventavis.

- **Breelib**

Fill the medication chamber with Ventavis immediately before use. For filling please follow the instructions for use of the nebuliser.

Device	Drug product	Dose of iloprost at mouthpiece	Estimated inhalation time
Breelib	Ventavis 20 mcg/ml (1 ml ampoule with yellow and red rings)	5 mcg	3 minutes

- **I-Neb AAD**

1. Just before you start to inhale, take the yellow-red colour coded ampoule of Ventavis 20 microgram/ml, break the glass ampoule and pour the complete contents of 1 ml into the nebuliser medication golden chamber.
2. The pre-set dose provided by the I-Neb AAD nebuliser is controlled by the medication chamber in combination with a control disc.  
For Ventavis **20 microgram/ml (5 microgram dose)**, the medication chamber with **the golden coloured latch is used together with the golden control disc**.
3. To ensure that you receive the prescribed dose, check the colour of the medication chamber and the colour of the control disc. They should both have the same colour.

Since the I-Neb AAD nebuliser can be used for Ventavis 10 microgram/ml and Ventavis 20 microgram/ml, the table below provides a summary of the user instructions of the I-Neb for the 2 concentrations of Ventavis:

Drug product	Ampoule coloured rings	Dosage	I-Neb AAD	
			Medication chamber latch	Control disc
Ventavis 10 mcg/ml	1 ml ampoule white-yellow ring	2.5 mcg	red	red
		5 mcg	purple	purple
Ventavis 20 mcg/ml	1 ml ampoule yellow-red ring	5 mcg	golden	golden

For further details please refer to the instruction manual of the nebuliser device or ask your doctor.

**If you use more Ventavis than you should**

Using more Ventavis than you should may lead to dizziness, headache, flushing (reddening of the face), nausea (feeling sick), jaw pain or back pain.

You may also experience a decrease or an increase in blood pressure, bradycardia (reduced heart rate), tachycardia (increased heart rate), vomiting, diarrhoea or limb pain. If any of these happen when you have used more Ventavis than you should:

- stop the inhalation session
- talk to your doctor

Your doctor will monitor you and treat any resulting symptoms. A specific antidote is not known.

**If you forget to use Ventavis**

Do not take a double dose to make up for a forgotten dose. Please ask your doctor what you should do.

**If you stop taking Ventavis**

If you stop or wish to stop treatment, discuss it with your doctor first.

If you have any further questions on the use of this medicine, ask your doctor, pharmacist or nurse.

**4. Possible side effects**

Like all medicines, this medicine can cause side effects, although not everybody gets them.

The following **serious side effects** may occur. In this case talk to your doctor immediately.

**Very common** (may affect more than 1 in 10 people):

- Bleeding events (mostly nosebleed (epistaxis) and coughing up blood (haemoptysis)) may very commonly occur, especially if you are also taking blood-thinning medicines (anticoagulants). The risk of bleeding may be increased in patients when inhibitors of platelet aggregation or anticoagulants are given at the same time (see also section 2). Very rarely, fatal cases including bleeding in the brain (cerebral and intracranial haemorrhage) have been reported.

**Common** (may affect up to 1 in 10 people):

- Fainting (syncope) is a symptom of the illness itself but can also occur during treatment with Ventavis (see also section 2 “Warnings and precautions”, for advice on what you can do to avoid this).
- Low blood pressure (hypotension)

**Not known** (cannot be estimated from the available data):

- Bronchospasm (sudden constriction of the muscles in the walls of the small airways) and wheezing (see also section 2 “Warnings and precautions”)

Below we list other possible side effects by how likely they are:

**Very common:** may affect more than 1 in 10 people

- widening of the blood vessels (vasodilatation). Symptoms can be flushing or reddening of the face.
- chest discomfort / chest pain
- coughing
- headache
- nausea
- pain in jaw/spasm of the jaw muscles (trismus)
- swelling of the limbs (peripheral oedema)

**Common:** may affect up to 1 in 10 people

- breathing difficulties (dyspnoea)
- dizziness
- vomiting
- diarrhoea
- pain when swallowing (pharyngolaryngeal irritation)
- throat irritation
- mouth and tongue irritation including pain
- rash
- fast heartbeat (tachycardia)
- awareness of fast or hard heartbeat (palpitations)

**Not known:** frequency cannot be estimated from the available data.

- reduction in the number of blood platelets (thrombocytopenia)
- hypersensitivity (i.e. allergy)
- disturbed sense of taste (dysgeusia)

**Other possible effects**

- Swelling, mainly of the ankles and legs, due to fluid retention (peripheral oedema) is a very common symptom of the illness itself but can also occur during treatment with Ventavis.

## Reporting of side effects

If you get any side effects talk to your doctor. This includes any possible side effects not listed in this leaflet. You can also report side effects directly via the national reporting system listed in [Appendix V](#). By reporting side effects, you can help provide more information on the safety of this medicine.

## 5. How to store Ventavis

Keep this medicine out of the sight and reach of children.

Do not use this medicine after the expiry date which is stated on the carton and ampoule.

This medicine does not require any special storage conditions.

Any Ventavis solution remaining in the nebuliser must be thrown away.

Do not throw away any medicines via wastewater or household waste. Ask your pharmacist how to throw away medicines you no longer use. These measures will help protect the environment.

## 6. Contents of the pack and other information

### What Ventavis contains:

- **The active substance** is iloprost.  
1 ml solution contains 20 microgram iloprost (as iloprost trometamol).  
Each ampoule with 1 ml contains 20 microgram iloprost.
- **The other ingredients** are trometamol, ethanol, sodium chloride, hydrochloric acid for pH adjustment, and water for injections.

### What Ventavis looks like and content of the pack:

Ventavis is a clear, colourless to slightly yellowish nebuliser solution for inhalation with the Breelib or the I-Neb nebuliser.

Ventavis 20 microgram/ml is provided in colourless ampoules, containing 1 ml nebuliser solution.

*Ventavis 20 microgram/ml is available in the following packs:*

- Pack containing 30 ampoules or 42 ampoules for use with the Breelib and I-Neb nebuliser.
- Multipack containing 168 (4x42) ampoules for use with the Breelib and I-Neb nebuliser.
- Multipack containing 168 (4x42) ampoules with Breelib consumables set (containing 1 mouthpiece and 1 medication chamber).

The ampoules containing 1 ml are marked with two coloured rings (yellow-red).

Not all pack-sizes may be marketed.

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### Manufacturer:

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**This leaflet was last revised in**

Detailed information on this medicine is available on the European Medicines Agency website:  
<http://www.ema.europa.eu>. There are also links to other websites about rare diseases and treatments.

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**The following information is intended for healthcare professionals only:**

**Instructions for use and handling**

Patients stabilised on one nebuliser should not switch to another nebuliser without close supervision by the treating doctor as different nebulisers have been shown to produce aerosols with slightly different physical characteristics and may have faster delivery of the solution (see section 5.2 of the Summary of Product Characteristics).

To minimize accidental exposure, it is recommended to keep the room well ventilated.

- **Breelib**

When using the Breelib nebuliser please follow the instructions for use provided with the device. Fill the medication chamber with Ventavis immediately before use.

<b>Device</b>	<b>Drug product</b>	<b>Dose of iloprost at mouthpiece</b>	<b>Estimated inhalation time</b>
Breelib	Ventavis 20 mcg/ml (1 ml ampoule with yellow and red rings)	5 mcg	3 minutes

- **I-Neb AAD**

The I-Neb AAD System is a portable, hand-held, vibrating mesh technology nebuliser system. This system generates droplets by ultrasound, which is forcing the solution through a mesh. This nebuliser monitors the breathing pattern to determine the aerosol pulse time required to deliver the pre-set dose of 5 micrograms iloprost of the Ventavis 20 microgram/ml nebuliser solution (1 ml ampoule with yellow and red rings).

The nebulising device delivers 5 microgram iloprost at the mouthpiece. The Mass Median Aerodynamic Diameter (MMAD) of the aerosol is between 1 and 5 micrometers.

When using the I-Neb AAD system the following instructions need to be followed.

The dose delivered by the I-Neb AAD system is controlled by the medication chamber in combination with a control disc. For each medication chamber there is a corresponding colour coded control disc.

For each inhalation session with the I-Neb AAD, the content of one 1-ml ampoule of Ventavis 20 microgram/ml, showing two coloured rings (–yellow-red), will be transferred into the appropriate nebuliser medication chamber with **golden coloured latch together with the golden colour disc** immediately before use.



Since the I-Neb AAD system can be used for Ventavis 10 microgram/ml and Ventavis 20 microgram/ml, the table below provides a summary of the user instructions of the I-Neb for the 2 concentrations of Ventavis:

Drug product	Ampoule coloured rings	Dosage	I-Neb AAD	
			Medication chamber latch	Control disc
Ventavis 10 mcg/ml	1 ml ampoule white-yellow ring	2.5 mcg	red	red
		5 mcg	purple	purple
Ventavis 20 mcg/ml	1 ml ampoule yellow-red ring	5 mcg	golden	golden

The efficacy and tolerability of inhaled iloprost when administered with other nebulising systems, which provide different nebulisation characteristics of iloprost solution, have not been established.