

# Sinarest<sup>®</sup>

## Syrup

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### 1. Generic Name

Paracetamol, Phenylephrine, Chlorpheniramine maleate, Sodium citrate, Menthol

### 2. Qualitative and Quantitative composition

Paracetamol	125 mg
Phenylephrine	5 mg
Chlorpheniramine maleate	1 mg
Sodium citrate	60 mg

Mentholated flavoured syrupy base q.s.

### 3. Dosage form and strength

Oral syrup containing Paracetamol 125 mg, Phenylephrine 5 mg, Chlorpheniramine maleate 1 mg.

### 4. Clinical particulars

#### 4.1 Therapeutic indication

Sinarest Syrup is indicated in children below 40 kg weight for:

- Relief of nasal and sinus congestion.
- Relief of allergic symptoms of the nose or throat due to upper respiratory tract allergies.
- Relief of sinus pain and headache.
- Adjunct with antibacterial in sinusitis, tonsillitis and otitis media.

#### 4.2 Posology and method of administration

Children of age between 2 to 12 years (body weight- 6 - 40 kg): The usual recommended dose is as shown in the table below which will be given to the patient:

Weight	Age	Dose
6 – 22.9	2 – 7 years	5 ml BID
11.9 – 40	7 – 12 years	5 ml TID

#### 4.3 Contraindication

The use of Sinarest syrup is contraindicated in patients with:

- Hypersensitivity to any of the ingredients of the formulation.
- Severe hypertension.

#### 4.4 Special warnings and precautions for use

- In case a hypersensitivity reaction occurs which is rare, Sinarest syrup should be discontinued.
- Sinarest syrup contains Paracetamol and therefore should not be used in conjunction with other Paracetamol containing products.
- Sinarest syrup should be used with caution in patients with renal or hepatic dysfunction, diabetes mellitus, hyperthyroidism, cardiovascular problems, epilepsy and closed angle glaucoma.

#### 4.5 Drug interactions

Clinically significant drug interactions may occur on concomitant administration of Sinarest syrup with monoamine oxidase inhibitors, tricyclic antidepressants, beta-adrenergic agents, and methyl dopa, reserpine and veratrum alkaloids.

#### **4.6 Use in special population**

- Pediatric: Sinarest syrup should be used with caution in children less than 2 years of age.
- Geriatric: Elderly population may be at greater risk for the side-effects.
- Liver impairment: Use with caution.
- Renal failure: Use with caution.
- Pregnancy and lactation: US Food and Drug Administration (FDA) has specified Chlorphenamine maleate as a pregnancy category B drug which indicates that animal and human studies have failed to demonstrate a risk to the fetus in any trimester. Paracetamol has been specified as a pregnancy category C drug which indicates that animal studies show an adverse effect on the fetus but there are no teratogenic studies of Paracetamol in pregnant women. Sinarest syrup is recommended to be taken during pregnancy only under doctor's recommendation.

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

It is advisable not to drive or operate machinery when on treatment with Sinarest syrup.

#### **4.8 Undesirable effects**

Sinarest syrup is generally well tolerated and adverse events are rare. Hypersensitive individuals may display ephedrine-like reactions such as tachycardia, palpitations, headache, dizziness and nausea. Use of sympathomimetics has been associated with fear, anxiety, restlessness, tremor, weakness, dysuria, insomnia, hallucinations and convulsions. Chlorpheniramine in Sinarest syrup may cause sedation.

#### **4.9 Overdose**

There is limited experience of overdose with Sinarest syrup. Initiate general symptomatic and supportive measures in all cases of overdosages where necessary.

## **5. Pharmacological properties**

### **5.1 Mechanism of action**

Paracetamol act primarily in the CNS, increasing the pain threshold by inhibiting both isoforms of cyclooxygenase, COX-1, COX-2, and COX-3 enzymes involved in prostaglandin (PG) synthesis. The antipyretic properties of acetaminophen are likely due to direct effects on the heat-regulating centres of the hypothalamus resulting in peripheral vasodilation, sweating and hence heat dissipation.

Phenylephrine decreases nasal congestion by acting on  $\alpha_1$ -adrenergic receptors in the arterioles of the nasal mucosa to produce constriction; this leads to decreased edema and increased drainage of the sinus cavities.

In allergic reactions an allergen interacts with and cross-links surface IgE antibodies on mast cells and basophils. Once the mast cell-antibody-antigen complex is formed, a complex series of events occurs that eventually leads to cell-degranulation and the release of histamine (and other chemical mediators) from the mast cell or basophil. Once released, histamine can react with local or widespread tissues through histamine receptors. Histamine, acting on  $H_1$ -receptors, produces pruritis, vasodilatation, hypotension, flushing, headache, tachycardia, and bronchoconstriction. Histamine also increases vascular permeability and potentiates pain. Chlorpheniramine maleate binds to the histamine  $H_1$  receptor. This block the action of endogenous histamine, which subsequently leads to temporary relief of the negative symptoms brought on by histamine.

### **5.2 Pharmacodynamic properties**

Paracetamol is a widely used analgesic and antipyretic drug that is used for the relief of fever, headaches, and other minor aches and pains. It is a major ingredient in numerous cold and flu medications and many prescription analgesics. It is extremely safe in standard doses, but because of its wide availability, deliberate or accidental overdoses are not uncommon. Paracetamol, unlike other common analgesics such as aspirin and ibuprofen, has no anti-inflammatory properties or effects on platelet function, and it is not a member of the class of drugs known as non-steroidal anti-inflammatory drugs or NSAIDs. At therapeutic doses Paracetamol does not irritate the lining of the stomach nor affect blood

coagulation, kidney function, or the fetal ductus arteriosus (as NSAIDs can). Like NSAIDs and unlike opioid analgesics, Paracetamol does not cause euphoria or alter mood in any way. Paracetamol and NSAIDs have the benefit of being completely free of problems with addiction, dependence, tolerance and withdrawal. Paracetamol is used on its own or in combination with pseudoephedrine, Dextromethorphan, Chlorpheniramine, diphenhydramine, doxylamine, codeine, hydrocodone, or oxycodone.

Phenylephrine is a powerful vasoconstrictor. It is used as a nasal decongestant and cardiostimulant agent. Phenylephrine is a postsynaptic  $\alpha_1$ -receptor agonist with little effect on  $\beta$ -receptors of the heart. Parenteral administration of Phenylephrine causes a rise in systolic and diastolic pressures, a slight decrease in cardiac output, and a considerable increase in peripheral resistance; most vascular beds are constricted, and renal, splanchnic, cutaneous, and limb blood flows are reduced while coronary blood flow is increased. Phenylephrine also causes pulmonary vessel constriction and subsequent increase in pulmonary arterial pressure. Vasoconstriction in the mucosa of the respiratory tract leads to decreased edema and increased drainage of sinus cavities.

Chlorpheniramine maleate is a histamine H<sub>1</sub> antagonist of the alkylamine class. It competes with histamine for the normal H<sub>1</sub>-receptor sites on effector cells of the gastrointestinal tract, blood vessels and respiratory tract. It provides effective, temporary relief of sneezing, watery and itchy eyes, and runny nose due to hay fever and other upper respiratory allergies.

### **5.3 Pharmacokinetic properties**

Paracetamol is readily absorbed from the gastrointestinal tract with peak plasma concentrations occurring about 10 to 60 minutes after oral doses. Paracetamol is distributed into most body tissues. It crosses the placenta and is present in breast milk. Plasma-protein binding is negligible at usual therapeutic concentrations but increases with increasing concentrations. The elimination half-life of Paracetamol varies from about 1 to 3 hours. Paracetamol is metabolised mainly in the liver and excreted in the urine mainly as the glucuronide and sulfate conjugates. Less than 5% is excreted as unchanged Paracetamol. A minor hydroxylated metabolite (Nacetyl-p-benzoquinoneimine), is usually produced in very small amounts by cytochrome P450 isoenzymes (mainly CYP2E1 and CYP3A4) in the liver

and kidney. It is usually detoxified by conjugation with glutathione but may accumulate after Paracetamol over dosage and cause tissue damage.

Phenylephrine has low oral bioavailability owing to irregular absorption and first-pass metabolism by monoamine oxidase in the gut and liver. When injected subcutaneously or intramuscularly it takes 10 to 15 minutes to act; subcutaneous and intramuscular injections are effective for up to about 1 hour and up to about 2 hours, respectively. Intravenous injections are effective for about 20 minutes. Systemic absorption follows topical application.

Chlorphenamine maleate is absorbed relatively slowly from the gastrointestinal tract, peak plasma concentrations occurring about 2.5 to 6 hours after oral doses. Bioavailability is low, values of 25 to 50% having been reported. Chlorphenamine appears to undergo considerable first-pass metabolism. About 70% of Chlorphenamine in the circulation is bound to plasma proteins. There is wide inter individual variation in the pharmacokinetics of Chlorphenamine; values ranging from 2 to 43 hours have been reported for the half-life. Chlorphenamine is widely distributed in the body, and enters the CNS. Chlorphenamine maleate is extensively metabolised. Metabolites include desmethyl- and didesmethylchlorphenamine. Unchanged drug and metabolites are excreted primarily in the urine; excretion is dependent on urinary pH and flow rate. Only trace amounts have been found in the faeces. Duration of action of 4 to 6 hours has been reported; this is shorter than may be predicted from pharmacokinetic parameters. More rapid and extensive absorption, faster clearance, and a shorter half-life have been reported in children.

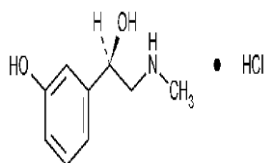
## **6. Nonclinical properties**

### **6.1 Animal Toxicology or Pharmacology**

NA.

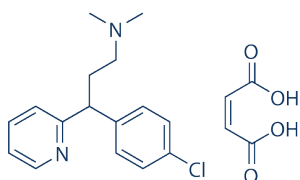
## **7. Description**

Phenylephrine is in a class of medications called nasal decongestants. Its chemical name is hydrogen 3-[(1R)-1-hydroxy-2-(methylamino)ethyl] phenol chloride and its structural formula is:



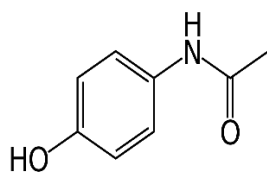
Its empirical formula is  $C_9H_{13}NO_2$ , and its molecular weight is 167.2 g/mol.

Chlorpheniramine maleate is in a class of medications called antihistamines. Its chemical name is (2Z)-but-2-enedioic acid; [3-(4-chlorophenyl)-3-(pyridin-2-yl)propyl] dimethylamine and its structural formula is :



Its empirical formula is  $C_{16}H_{19}ClN_2 \cdot C_4H_4O_4$  or  $C_{20}H_{23}ClN_2O_4$  and its molecular weight is 390.9.

Paracetamol belongs to Non-Steroidal Anti-inflammatory Drugs (NSAIDs). Its chemical name is N-acetyl-para-aminophenol (APAP) and its structural formula is:



Its empirical formula is  $C_8H_9NO_2$  and its molecular weight is 155.19 g/mol.

## 8. Pharmaceutical particulars

### 8.1 Incompatibilities

There are no known incompatibilities.

### 8.2 Shelf-life

36 months.

### **8.3 Packaging Information**

Sinarest syrup is available in bottles of 60 ml and 100 ml.

### **8.4 Storage and handling instructions**

Store below 30 °C in a dark and dry place.

## **9. Patient Counselling Information**

### **9.1 Adverse Reactions**

Refer part 4.8

### **9.2 Drug Interactions**

Refer part 4.5

### **9.3 Dosage**

Refer part 4.2

### **9.4 Storage**

Refer part 8.4

### **9.5 Risk Factors**

Refer part 4.4

### **9.6 Self-monitoring information**

NA

### **9.7 Information on when to contact a health care provider or seek emergency help**

Patient is advised to be alert for the emergence or worsening of the adverse reactions and contact the prescribing physician.

### **9.8 Contraindications**



Refer part 4.3

**10. Manufactured by**

CENTAUR PHARMACEUTICALS PVT. LTD., Drug farm Laboratories and Goa Antibiotics

**11. Details of permission or license number with date**

158(455)/MFG/DFDA/2014/4673 dated. 06.01.2014 for export.

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