

# EPINEPHrine (Oral Inhalation) (Firelands Health Formulary)

## Medication Safety Issues

### Sound-alike/look-alike issues:

EPINEPHrine may be confused with ePHEDrine

### Brand Names: U.S.

Asthmanefrin Refill [OTC]; S2 (Racpinephrine) [OTC]

### Pharmacologic Category

Alpha/Beta Agonist

### Firelands Health Dosage Forms

Excipient information presented when available (limited, particularly for generics); consult specific product labeling.

Nebulization Solution, Inhalation [preservative free]:

S2 (Racpinephrine): 2.25% (1 ea) [sulfite free; contains edetate (edta) disodium]

### Index Terms

Primatene Mist; Racemic Epinephrine; Racpinephrine; Racpinephrine HCL

### Warnings/Precautions

#### *Disease-related concerns:*

- Cardiovascular disease: Use with caution in patients with heart disease and/or hypertension.
- Diabetes: Use with caution in patients with diabetes mellitus.
- Increased intraocular pressure/glaucoma: Use with caution in patients with increased intraocular pressure or glaucoma.
- Prostatic hyperplasia/urinary obstruction: Use with caution in patients with prostatic hyperplasia and/or GU obstruction.
- Psychiatric conditions: Use with caution in patients with psychiatric or emotional conditions.

- Seizures: Use with caution in patients with a history seizure disorder
- Thyroid disease: Use with caution in patients with thyroid disease.

**Dosage form specific issues:**

- Nebulization solution: Do not use if product is brown in color or cloudy.

**Other warnings/precautions:**

- Self-medication (OTC use): When used for self-medication (OTC), notify health care provider if symptoms are not relieved in 20 minutes or become worse; if >8 inhalations of Primatene Mist, >12 inhalations of Asthmanefrin, S2 are needed in 24 hours; if >9 inhalations in 24 hours for  $\geq 3$  days a week of Asthmanefrin, S2 are needed, or if >2 asthma attacks have occurred within a week. Discontinue use and notify health care provider if your asthma is getting worse, or if difficulty sleeping, rapid heartbeat, tremors, nervousness, or seizure occur. The product should not be used more frequently or at higher doses than recommended.

**FDA Date**

June 08, 1951

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Expert opinion. Senior Renal Editorial Team: Bruce Mueller, PharmD, FCCP, FASN, FNKF; Jason A. Roberts, PhD, BPharm (Hons), B App Sc, FSHP, FISAC; Michael Heung, MD, MS.

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Refer to manufacturer's labeling.

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## EPINEPHrine (Oral Inhalation) (Firelands Health Formulary)

### Epinephrine (Oral Inhalation) (Patient Education - Adult Medication)

You must carefully read the "Consumer Information Use and Disclaimer" below in order to understand and correctly use this information

### Pronunciation

(ep i NEF rin)

### Brand Names: US

Asthmanefrin Refill [OTC]; S2 (Racepinephrine) [OTC]

### Brand Names: Canada

S2 (Racepinephrine) [DSC]

### What is this drug used for?

- It is used to treat asthma.

### What do I need to tell my doctor BEFORE I take this drug?

- If you are allergic to this drug; any part of this drug; or any other drugs, foods, or substances. Tell your doctor about the allergy and what signs you had.
- If you have taken certain drugs for depression or Parkinson's disease in the last 14 days. This includes isocarboxazid, phenelzine, tranylcypromine, selegiline, or rasagiline. Very high blood pressure may happen.
- If you are taking any of these drugs: Linezolid or methylene blue.

This is not a list of all drugs or health problems that interact with this drug.

Tell your doctor and pharmacist about all of your drugs (prescription or OTC, natural products, vitamins) and health problems. You must check to make sure that it is safe for you to take this drug with all of your drugs and health problems. Do not start, stop, or change the dose of any drug without checking with your doctor.

### What are some things I need to know or do while I take this drug?

#### For all patients taking this drug:

- Tell all of your health care providers that you take this drug. This includes your doctors, nurses, pharmacists, and dentists.
- Call your doctor right away if your normal dose does not work well, if your signs get worse, or if you need to use this drug more often than normal.
- High blood pressure or fast heartbeat may happen with this drug. This could raise the chance of heart attack or stroke. These could be deadly. If you have questions, talk with the doctor.
- Avoid use of caffeine (for example, tea, coffee, cola) and chocolate. Use with this drug may cause high blood pressure, nervousness, shakiness, a fast heartbeat, and anxiety.

- If you are taking this drug and have high blood pressure, talk with your doctor before using OTC products that may raise blood pressure. These include cough or cold drugs, diet pills, stimulants, non-steroidal anti-inflammatory drugs (NSAIDs) like ibuprofen or naproxen, and some natural products or aids.
- Tell your doctor if you are pregnant, plan on getting pregnant, or are breast-feeding. You will need to talk about the benefits and risks to you and the baby.

**Children:**

- Different forms of this drug may be for use in different ages of children. Talk with the doctor before giving this drug to a child.

**What are some side effects that I need to call my doctor about right away?**

**WARNING/CAUTION:** Even though it may be rare, some people may have very bad and sometimes deadly side effects when taking a drug. Tell your doctor or get medical help right away if you have any of the following signs or symptoms that may be related to a very bad side effect:

- Signs of an allergic reaction, like rash; hives; itching; red, swollen, blistered, or peeling skin with or without fever; wheezing; tightness in the chest or throat; trouble breathing, swallowing, or talking; unusual hoarseness; or swelling of the mouth, face, lips, tongue, or throat.
- Signs of high blood pressure like very bad headache or dizziness, passing out, or change in eyesight.
- Chest pain or pressure, a fast heartbeat, or an abnormal heartbeat.
- Weakness on 1 side of the body, trouble speaking or thinking, change in balance, drooping on one side of the face, or blurred eyesight.
- Seizures.

**What are some other side effects of this drug?**

All drugs may cause side effects. However, many people have no side effects or only have minor side effects. Call your doctor or get medical help if any of these side effects or any other side effects bother you or do not go away:

- Feeling nervous and excitable.
- Shakiness.
- Trouble sleeping.

These are not all of the side effects that may occur. If you have questions about side effects, call your doctor. Call your doctor for medical advice about side effects.

You may report side effects to your national health agency.

**How is this drug best taken?**

Use this drug as ordered by your doctor. Read all information given to you. Follow all instructions closely.

**Inhaler:**

- For breathing into the lungs.

- You will need to prime the pump before first use. You may also need to prime the pump if it has not been used for some time. Be sure you know when you need to prime the pump and how to do it. Talk with the doctor or pharmacist if you have questions.
- Shake well and spray 1 time into the air before each dose.
- Do not get this drug in the eyes.
- Do not breathe out into the inhaler. Put the cap back on after you use your dose.
- Follow how to clean carefully.

**Liquid for breathing in:**

- For breathing in only as a liquid (solution) by a special machine (nebulizer) into the lungs.
- Do not use if the solution is cloudy, leaking, or has particles.
- Do not use if solution changes color.

**What do I do if I miss a dose?**

- If you use this drug on a regular basis, use a missed dose as soon as you think about it.
- If it is close to the time for your next dose, skip the missed dose and go back to your normal time.
- Do not use 2 doses at the same time or extra doses.
- Many times this drug is used on an as needed basis. Do not use more often than told by the doctor.

**How do I store and/or throw out this drug?****All products:**

- Store at room temperature. Do not freeze.
- Keep all drugs in a safe place. Keep all drugs out of the reach of children and pets.
- Throw away unused or expired drugs. Do not flush down a toilet or pour down a drain unless you are told to do so. Check with your pharmacist if you have questions about the best way to throw out drugs. There may be drug take-back programs in your area.

**Inhaler:**

- Protect from heat or open flame. Do not puncture or burn even if it seems empty.

**Liquid for breathing in:**

- Protect from heat and light.

**General drug facts**

- If your symptoms or health problems do not get better or if they become worse, call your doctor.
- Do not share your drugs with others and do not take anyone else's drugs.
- Some drugs may have another patient information leaflet. If you have any questions about this drug, please talk with your doctor, nurse, pharmacist, or other health care provider.
- If you think there has been an overdose, call your poison control center or get medical care right away. Be ready to tell or show what was taken, how much, and when it happened.

**Last Reviewed Date**

2022-09-12

Consumer Information Use and Disclaimer: This generalized information is a limited summary of diagnosis, treatment, and/or medication information. It is not meant to be comprehensive and should be used as a tool to help the user understand and/or assess potential diagnostic and treatment options. It does NOT include all information about conditions, treatments, medications, side effects, or risks that may apply to a specific patient. It is not intended to be medical advice or a substitute for the medical advice, diagnosis, or treatment of a health care provider based on the health care provider's examination and assessment of a patient's specific and unique circumstances. Patients must speak with a health care provider for complete information about their health, medical questions, and treatment options, including any risks or benefits regarding use of medications. This information does not endorse any treatments or medications as safe, effective, or approved for treating a specific patient. UpToDate, Inc. and its affiliates disclaim any warranty or liability relating to this information or the use thereof. The use of this information is governed by the Terms of Use, available at <https://www.wolterskluwer.com/en/know/clinical-effectiveness-terms>.

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## EPINEPHrine (Oral Inhalation) (Firelands Health Formulary)

### EPINEPHrine (Oral Inhalation) (Patient Education - Pediatric Medication)

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### Pronunciation

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### Brand Names: US

Asthmanefrin Refill [OTC]; S2 (Racpinephrine) [OTC]

### Brand Names: Canada

S2 (Racpinephrine) [DSC]

### What is this drug used for?

- It is used to treat asthma.

### What do I need to tell the doctor BEFORE my child takes this drug?

- If your child is allergic to this drug; any part of this drug; or any other drugs, foods, or substances. Tell the doctor about the allergy and what signs your child had.
- If your child has taken certain drugs for depression or certain other health problems in the last 14 days. This includes isocarboxazid, phenelzine, or tranlycypromine. Very high blood pressure may happen.
- If your child is taking any of these drugs: Linezolid or methylene blue.

This is not a list of all drugs or health problems that interact with this drug.

Tell the doctor and pharmacist about all of your child's drugs (prescription or OTC, natural products, vitamins) and health problems. You must check to make sure that it is safe to give this drug with all of your child's other drugs and health problems. Do not start, stop, or change the dose of any drug your child takes without checking with the doctor.

### What are some things I need to know or do while my child takes this drug?

- Tell all of your child's health care providers that your child is taking this drug. This includes your child's doctors, nurses, pharmacists, and dentists.
- Call the doctor right away if your child's normal dose does not work well, if your child's signs get worse, or if your child needs to use this drug more often than normal.
- High blood pressure or fast heartbeat may happen with this drug. This could raise the chance of heart attack or stroke. These could be deadly. If you have questions, talk with the doctor.
- Have your child avoid use of caffeine (for example, tea, coffee, cola) and chocolate. Use with this drug may cause high blood pressure, nervousness, shakiness, a fast heartbeat, and anxiety.

- If your child is taking this drug and has high blood pressure, talk with the doctor before giving OTC products that may raise blood pressure. These include cough or cold drugs, diet pills, stimulants, non-steroidal anti-inflammatory drugs (NSAIDs) like ibuprofen or naproxen, and some natural products or aids.
- Different forms of this drug may be for use in different ages of children. Talk with the doctor before giving this drug to a child.

**If your child is pregnant or breast-feeding a baby:**

- Talk with the doctor if your child is pregnant, becomes pregnant, or is breast-feeding a baby. You will need to talk about the benefits and risks to your child and the baby.

**What are some side effects that I need to call my child's doctor about right away?**

**WARNING/CAUTION:** Even though it may be rare, some people may have very bad and sometimes deadly side effects when taking a drug. Tell your child's doctor or get medical help right away if your child has any of the following signs or symptoms that may be related to a very bad side effect:

- Signs of an allergic reaction, like rash; hives; itching; red, swollen, blistered, or peeling skin with or without fever; wheezing; tightness in the chest or throat; trouble breathing, swallowing, or talking; unusual hoarseness; or swelling of the mouth, face, lips, tongue, or throat.
- Signs of high blood pressure like very bad headache or dizziness, passing out, or change in eyesight.
- Chest pain or pressure, a fast heartbeat, or an abnormal heartbeat.
- Weakness on 1 side of the body, trouble speaking or thinking, change in balance, drooping on one side of the face, or blurred eyesight.
- Seizures.

**What are some other side effects of this drug?**

All drugs may cause side effects. However, many people have no side effects or only have minor side effects. Call your child's doctor or get medical help if any of these side effects or any other side effects bother your child or do not go away:

- Feeling nervous and excitable.
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- Trouble sleeping.

These are not all of the side effects that may occur. If you have questions about side effects, call your child's doctor. Call your child's doctor for medical advice about side effects.

You may report side effects to your national health agency.

**How is this drug best given?**

Give this drug as ordered by your child's doctor. Read all information given to you. Follow all instructions closely.

**Inhaler:**

- For breathing into the lungs.

- You will need to prime the pump before first use. You may also need to prime the pump if it has not been used for some time. Be sure you know when you need to prime the pump and how to do it. Talk with the doctor or pharmacist if you have questions.
- Shake well and spray 1 time into the air before each dose.
- Do not get this drug in the eyes.
- Do not let your child breathe out into the inhaler. Put the cap back on after giving a dose.
- Follow how to clean carefully.

**Liquid for breathing in:**

- For breathing in only as a liquid (solution) by a special machine (nebulizer) into the lungs.
- Do not use if the solution is cloudy, leaking, or has particles.
- Do not use if solution changes color.

**What do I do if my child misses a dose?**

- If your child uses this drug on a regular basis, give a missed dose as soon as you think about it.
- If it is close to the time for your child's next dose, skip the missed dose and go back to your child's normal time.
- Do not give 2 doses at the same time or extra doses.
- Many times this drug is given on an as needed basis. Do not give to your child more often than told by the doctor.

**How do I store and/or throw out this drug?****All products:**

- Store at room temperature. Do not freeze.
- Keep all drugs in a safe place. Keep all drugs out of the reach of children and pets.
- Throw away unused or expired drugs. Do not flush down a toilet or pour down a drain unless you are told to do so. Check with your pharmacist if you have questions about the best way to throw out drugs. There may be drug take-back programs in your area.

**Inhaler:**

- Protect from heat or open flame. Do not puncture or burn even if it seems empty.

**Liquid for breathing in:**

- Protect from heat and light.

**General drug facts**

- If your child's symptoms or health problems do not get better or if they become worse, call your child's doctor.
- Do not share your child's drug with others and do not give anyone else's drug to your child.
- Some drugs may have another patient information leaflet. If you have any questions about this drug, please talk with your child's doctor, nurse, pharmacist, or other health care provider.

- If you think there has been an overdose, call your poison control center or get medical care right away. Be ready to tell or show what was taken, how much, and when it happened.

**Last Reviewed Date**

2022-09-12

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## EPINEPHrine (Oral Inhalation) (Firelands Health Formulary)

### EPINEPHrine (Oral Inhalation) (Lexi-Drugs)

#### Pronunciation

(ep i NEF rin)

#### Brand Names: US

Asthmanefrin Refill [OTC]; S2 (Racepinephrine) [OTC]

#### Brand Names: Canada

S2 (Racepinephrine) [DSC]

#### Pharmacologic Category

Alpha-/Beta- Agonist

#### Dosing: Adult

##### Asthma, mild intermittent symptoms

**Asthma, mild intermittent symptoms: Note:** Primary utility is in acute anaphylaxis with edema; nonselective beta agonists (eg, epinephrine) are not recommended for the routine management and treatment of asthma due to their potential for excessive cardiac stimulation, especially in high doses (<sup>Ref</sup>).

Metered-dose inhaler: Oral inhalation: 1 inhalation (0.125 mg) once; if symptoms not relieved after 1 minute, may repeat; wait  $\geq 4$  hours between additional doses (maximum dose: 8 inhalations per 24 hours).

Nebulization solution: Hand-bulb nebulizer: 1 to 3 inhalations of 2.25% (1 vial); may repeat dose after  $\geq 3$  hours as needed (maximum dose: 12 inhalations per 24 hours).

**Dosage adjustment for concomitant therapy:** Significant drug interactions exist, requiring dose/frequency adjustment or avoidance. Consult drug interactions database for more information.

#### Dosing: Older Adult

Refer to adult dosing.

## Dosing: Altered Kidney Function: Adult

The renal dosing recommendations are based upon the best available evidence and clinical expertise. Senior Editorial Team: Bruce Mueller, PharmD, FCCP, FASN, FNKF; Jason A. Roberts, PhD, BPharm (Hons), B App Sc, FSHP, FISAC; Michael Heung, MD, MS.

**Altered kidney function: Oral inhalation:** No dosage adjustment likely to be necessary for any degree of kidney impairment (limited excretion in urine as unchanged drug) <sup>(Ref)</sup>.

**Hemodialysis, intermittent (thrice weekly): Oral inhalation:** Not significantly dialyzed <sup>(Ref)</sup>; No supplemental dose or dosage adjustment necessary <sup>(Ref)</sup>.

**Peritoneal dialysis: Oral inhalation:** No dosage adjustment necessary <sup>(Ref)</sup>.

**CRRT: Oral inhalation:** Unlikely to be significantly dialyzable <sup>(Ref)</sup>; No dosage adjustment necessary <sup>(Ref)</sup>.

**PIRRT (eg, sustained, low-efficiency diafiltration): Oral inhalation:** No dosage adjustment necessary <sup>(Ref)</sup>.

## Dosing: Altered Liver Function: Adult

There are no dosage adjustments provided in the manufacturer's labeling.

## Dosing: Pediatric

### Bronchospasm, relief of mild asthma symptoms

**Bronchospasm, relief of mild asthma symptoms: Note:** Not recommended for routine management and treatment of asthma <sup>(Ref)</sup>.

Nebulization solution: Children  $\geq 4$  years and Adolescents: Handheld bulb nebulizer: Add 0.5 mL (1 vial) of 2.25% solution to nebulizer; 1 to 3 inhalations; may repeat dose after at least 3 hours if needed. Maximum daily dose: 12 inhalations/24 hours.

Metered-dose inhaler: Children  $\geq 12$  years and Adolescents: Oral inhalation: 1 inhalation once; if symptoms not relieved after 1 minute, may repeat 1 inhalation; wait  $\geq 4$  hours between additional doses; maximum daily dose: 8 inhalations/24 hours.

### Croup, moderate to severe

**Croup, moderate to severe:** Limited data available: **Note:** Symptom improvement usually occurs within 10 to 30 minutes and lasts 2 to 3 hours; patients should be observed for 2 to 3 hours after initial treatment for symptom recurrence and possible need for repeat treatment (<sup>Ref</sup>).

Infants and Children:

Racemic epinephrine (2.25% inhalation solution): Nebulization: 0.05 to 0.1 mL/kg (maximum dose: 0.5 mL/dose) diluted in 2 to 3 mL NS, may repeat dose every 15 to 20 minutes; others have reported use of 0.5 mL as a fixed dose for all patients; use lower end of dosing range for younger infants (<sup>Ref</sup>).

L-epinephrine (using parenteral 1 mg/mL solution): Nebulization: 0.5 mL/kg (maximum dose: 5 mL/dose) diluted in NS, may repeat dose every 15 to 20 minutes; **Note:** 5 mL of L-epinephrine (1 mg/mL) is equivalent to 0.5 mL of 2.25% racemic epinephrine (<sup>Ref</sup>).

**Dosage adjustment for concomitant therapy:** Significant drug interactions exist, requiring dose/frequency adjustment or avoidance. Consult drug interactions database for more information.

### **Dosing: Altered Kidney Function: Pediatric**

There are no dosage adjustments provided in the manufacturer's labeling.

### **Dosing: Altered Liver Function: Pediatric**

There are no dosage adjustments provided in the manufacturer's labeling.

### **Use: Labeled Indications**

**Asthma, mild intermittent symptoms:** Temporary relief of mild symptoms of intermittent asthma (ie, shortness of breath, tightness of chest, wheezing).

**Note:** Primary utility is in acute anaphylaxis with edema; clinical practice guidelines do not recommend nonselective beta agonists (eg, epinephrine) for routine management and treatment of asthma due to their potential for excessive cardiac stimulation, especially in high doses (GINA 2024; NAEPP 2007).

### **Clinical Practice Guidelines**

#### **Asthma:**

GINA, "Global Strategy for Asthma Management and Prevention," [May 2024](#)

NHLBI/NAEPP The Expert Panel Report 3: "Guidelines for the Diagnosis and Management of Asthma," Full Report 2007

NHLBI/NAEPPCC, "Focused Updates to the Asthma Management Guidelines," 2020

## **Administration: Inhalation**

Oral inhalation:

Metered-dose inhaler: Before first use, shake inhaler then spray into the air 4 separate times. Before each inhalation, shake then spray into the air 1 time. Wash inhaler after each day of use by running water through the mouthpiece for 30 seconds; shake off excess water and air-dry overnight.

Nebulization solution: For use in a hand-held rubber bulb nebulizer. Add contents of one vial (0.5 mL) of solution to nebulizer.

## **Administration: Pediatric**

Nebulization solution:

*Asthma symptoms:* Hand-held rubber bulb nebulizer. Add contents of 1 vial (0.5 mL) of solution to nebulizer; dilution not required.

*Croup:* Dilute prior to nebulization (<sup>Ref</sup>).

Metered-dose inhaler: Shake canister prior to each use. Prime inhaler prior to first use with 4 test sprays into the air (away from face). Before each use, shake inhaler and then spray into the air 1 time. Wash inhaler after each day of use by running water through the mouthpiece for 30 seconds.

## **Dietary Considerations**

Avoid food or beverages that contain caffeine.

## **Storage/Stability**

Nebulization solution: Store between 2°C to 25°C (36°F to 77°F). Protect from light and freezing; avoid excessive heat.

Metered-dose inhaler: Store between 15°C and 25°C (59°F to 77°F). Do not store near open flame or heat >49°C (120°F). Do not puncture or incinerate.

## **Preparation for Administration: Adult**

Nebulization solution: Dilute in 2 to 3 mL NS in the treatment of croup (<sup>Ref</sup>).

## **Preparation for Administration: Pediatric**

Nebulization solution:

*Asthma symptoms:* Dilution not required if using handheld rubber bulb nebulizer.

*Croup:* Dilute dose in 2 to 3 mL NS (Ref).

## Patient Counseling Points

### What is this drug used for?

- It is used to treat asthma.

**All drugs may cause side effects. However, many people have no side effects or only have minor side effects. Call your doctor or get medical help if any of these side effects or any other side effects bother you or do not go away:**

- Feeling nervous and excitable
- Shakiness
- Trouble sleeping

**WARNING/CAUTION: Even though it may be rare, some people may have very bad and sometimes deadly side effects when taking a drug. Tell your doctor or get medical help right away if you have any of the following signs or symptoms that may be related to a very bad side effect:**

- High blood pressure like very bad headache or dizziness, passing out, or change in eyesight
- Chest pain or pressure, a fast heartbeat, or an abnormal heartbeat
- Weakness on 1 side of the body, trouble speaking or thinking, change in balance, drooping on one side of the face, or blurred eyesight
- Seizures
- Signs of an allergic reaction, like rash; hives; itching; red, swollen, blistered, or peeling skin with or without fever; wheezing; tightness in the chest or throat; trouble breathing, swallowing, or talking; unusual hoarseness; or swelling of the mouth, face, lips, tongue, or throat.

**Note:** This is not a comprehensive list of all side effects. Talk to your doctor if you have questions.

**Consumer Information Use and Disclaimer:** This information should not be used to decide whether or not to take this medicine or any other medicine. Only the healthcare provider has the knowledge and training to decide which medicines are right for a specific

patient. This information does not endorse any medicine as safe, effective, or approved for treating any patient or health condition. This is only a limited summary of general information about the medicine's uses from the patient education leaflet and is not intended to be comprehensive. This limited summary does NOT include all information available about the possible uses, directions, warnings, precautions, interactions, adverse effects, or risks that may apply to this medicine. This information is not intended to provide medical advice, diagnosis or treatment and does not replace information you receive from the healthcare provider. For a more detailed summary of information about the risks and benefits of using this medicine, please speak with your healthcare provider and review the entire patient education leaflet.

## Medication Safety Issues

### Sound-alike/look-alike issues:

EPINEPHrine may be confused with ePHEDrine

## Contraindications

OTC labeling: When used for self-medication, do not use with or within 2 weeks of discontinuing an MAOI or in patients without a diagnosis of asthma.

Significant drug interactions exist, requiring dose/frequency adjustment or avoidance. Consult drug interactions database for more information.

## Warnings/Precautions

### *Disease-related concerns:*

- Cardiovascular disease: Use with caution in patients with heart disease and/or hypertension.
- Diabetes: Use with caution in patients with diabetes mellitus.
- Increased intraocular pressure/glaucoma: Use with caution in patients with increased intraocular pressure or glaucoma.
- Prostatic hyperplasia/urinary obstruction: Use with caution in patients with prostatic hyperplasia and/or GU obstruction.
- Psychiatric conditions: Use with caution in patients with psychiatric or emotional conditions.
- Seizures: Use with caution in patients with a history seizure disorder

- Thyroid disease: Use with caution in patients with thyroid disease.

***Dosage form specific issues:***

- Nebulization solution: Do not use if product is brown in color or cloudy.

***Other warnings/precautions:***

- Self-medication (OTC use): When used for self-medication (OTC), notify health care provider if symptoms are not relieved in 20 minutes or become worse; if >8 inhalations of Primatene Mist, >12 inhalations of Asthmanefrin, S2 are needed in 24 hours; if >9 inhalations in 24 hours for ≥3 days a week of Asthmanefrin, S2 are needed, or if >2 asthma attacks have occurred within a week. Discontinue use and notify health care provider if your asthma is getting worse, or if difficulty sleeping, rapid heartbeat, tremors, nervousness, or seizure occur. The product should not be used more frequently or at higher doses than recommended.

**Pregnancy Considerations**

Epinephrine crosses the placenta following injection (Sandler 1964).

Uncontrolled asthma is associated with adverse events on pregnancy (increased risk of perinatal mortality, preeclampsia, preterm birth, low birth weight infants, cesarean delivery, and the development of gestational diabetes). Poorly controlled asthma or asthma exacerbations may have a greater fetal/maternal risk than what is associated with appropriately used asthma medications. Maternal treatment improves pregnancy outcomes by reducing the risk of some adverse events (eg, preterm birth, gestational diabetes). Maternal asthma symptoms should be monitored every 4 to 6 weeks during pregnancy. However, epinephrine inhalation is not recommended for routine management and treatment of asthma (ERS/TSANZ [Middleton 2020]; GINA 2024).

**Breastfeeding Considerations**

Use of epinephrine is generally considered acceptable with breastfeeding (WHO 2002).

**Briggs' Drugs in Pregnancy & Lactation**

- Epinephrine

**Adverse Reactions**

There are no adverse reactions listed in the manufacturer's labeling.

**Metabolism/Transport Effects**

**Substrate** of COMT;

## Drug Interactions

### Open Interactions

**Note:** Interacting drugs may **not be individually listed below** if they are part of a group interaction (eg, individual drugs within "CYP3A4 Inducers [Strong]" are NOT listed). For a complete list of drug interactions by individual drug name and detailed management recommendations, use the drug interactions program by clicking on the "Open Interactions" button above.

Alpha1-Blockers: May decrease therapeutic effects of Alpha-/Beta-Agonists. *Risk C: Monitor*

Atomoxetine: May increase hypertensive effects of Sympathomimetics. Atomoxetine may increase tachycardic effects of Sympathomimetics. *Risk C: Monitor*

Beta-Blockers (Beta1 Selective): May decrease therapeutic effects of EPINEPHrine (Oral Inhalation). *Risk C: Monitor*

Beta-Blockers (Nonselective): May increase hypertensive effects of EPINEPHrine (Oral Inhalation). *Risk C: Monitor*

Beta-Blockers (with Alpha-Blocking Properties): May decrease therapeutic effects of EPINEPHrine (Oral Inhalation). *Risk C: Monitor*

Bornaprine: Sympathomimetics may increase anticholinergic effects of Bornaprine. *Risk C: Monitor*

Bromocriptine: May increase hypertensive effects of Alpha-/Beta-Agonists. Management: Consider alternatives to this combination when possible. If combined, monitor for hypertension and tachycardia, and do not coadminister these agents for more than 10 days. *Risk D: Consider Therapy Modification*

Cannabinoid-Containing Products: May increase tachycardic effects of Sympathomimetics. *Risk C: Monitor*

Chloroprocaine (Systemic): May increase hypertensive effects of Alpha-/Beta-Agonists. *Risk C: Monitor*

Cocaine (Topical): May increase hypertensive effects of Sympathomimetics. Management: Consider alternatives to use of this combination when possible. Monitor closely for substantially increased blood pressure or heart rate and for any evidence of myocardial ischemia with concurrent use. *Risk D: Consider Therapy Modification*

COMT Inhibitors: May increase serum concentration of COMT Substrates. *Risk C: Monitor*

Dihydralazine: Sympathomimetics may decrease therapeutic effects of Dihydralazine. *Risk C: Monitor*

Doxofylline: Sympathomimetics may increase adverse/toxic effects of Doxofylline. *Risk C: Monitor*

Ergot Derivatives (Vasoconstrictive CYP3A4 Substrates): May increase vasoconstricting effects of Alpha-/Beta-Agonists. *Risk X: Avoid*

Esketamine (Injection): May increase adverse/toxic effects of Sympathomimetics. Specifically, the risk for elevated heart rate, hypertension, and arrhythmias may be increased. *Risk C: Monitor*

Guanethidine: May increase hypertensive effects of Sympathomimetics. Guanethidine may increase arrhythmogenic effects of Sympathomimetics. *Risk C: Monitor*

Hexoprenaline: May increase adverse/toxic effects of Alpha-/Beta-Agonists. *Risk X: Avoid*

Inhalational Anesthetics: May increase arrhythmogenic effects of EPINEPHrine (Oral Inhalation). *Risk C: Monitor*

Kratom: May increase adverse/toxic effects of Sympathomimetics. *Risk X: Avoid*

Levothyroxine: May increase therapeutic effects of Sympathomimetics. Sympathomimetics may increase therapeutic effects of Levothyroxine. Levothyroxine may increase adverse/toxic effects of Sympathomimetics. Specifically, the risk of coronary insufficiency may be increased in patients with coronary artery disease. *Risk C: Monitor*

Lisuride: May increase hypertensive effects of Alpha-/Beta-Agonists. *Risk X: Avoid*

Monoamine Oxidase Inhibitors: May increase hypertensive effects of EPINEPHrine (Oral Inhalation). *Risk X: Avoid*

Pergolide: May increase hypertensive effects of Alpha-/Beta-Agonists. *Risk C: Monitor*

Serotonin/Norepinephrine Reuptake Inhibitor: May increase tachycardic effects of Alpha-/Beta-Agonists. Serotonin/Norepinephrine Reuptake Inhibitor may increase vasopressor effects of Alpha-/Beta-Agonists. Management: If possible, avoid coadministration of direct-acting alpha-/beta-agonists and serotonin/norepinephrine reuptake inhibitors. If coadministered, monitor for increased sympathomimetic effects (eg, increased blood pressure, chest pain, headache). *Risk D: Consider Therapy Modification*

Solriamfetol: Sympathomimetics may increase hypertensive effects of Solriamfetol. Sympathomimetics may increase tachycardic effects of Solriamfetol. *Risk C: Monitor*

Spironolactone: May decrease vasoconstricting effects of Alpha-/Beta-Agonists. *Risk C: Monitor*

Sympathomimetics: May increase adverse/toxic effects of Sympathomimetics. *Risk C: Monitor*

Tedizolid: May increase adverse/toxic effects of Sympathomimetics. Specifically, the risk for increased blood pressure and heart rate may be increased. *Risk C: Monitor*

Tricyclic Antidepressants: May increase vasopressor effects of Alpha-/Beta-Agonists.  
Management: Avoid, if possible, the use of alpha-/beta-agonists in patients receiving tricyclic antidepressants. If combined, monitor for evidence of increased pressor effects and consider reductions in initial dosages of the alpha-/beta-agonist. *Risk D: Consider Therapy Modification*

## Food Interactions

Avoid food or beverages that contain caffeine.

## Monitoring Parameters

FEV<sub>1</sub>, peak flow, and/or other pulmonary function tests; blood pressure, heart rate; CNS stimulation; serum glucose, serum potassium; asthma symptoms

## Nursing Practice Points

Monitor for hypertension, CNS excitability, urinary retention, dysrhythmias, and respiratory depression.

## Dosage Forms: US

Excipient information presented when available (limited, particularly for generics); consult specific product labeling.

Nebulization Solution, Inhalation:

Asthmanefrin Refill: 2.25% (1 ea) [contains edetate disodium]

Nebulization Solution, Inhalation [preservative free]:

S2 (Racpinephrine): 2.25% (1 ea) [sulfite free; contains edetate disodium]

## Dosage Forms: Canada

Excipient information presented when available (limited, particularly for generics); consult specific product labeling. [DSC] = Discontinued product

Nebulization Solution, Inhalation:

S2 (Racpinephrine): 2.25% ([DSC])

## Anatomic Therapeutic Chemical (ATC) Classification

- R03AA01

## Generic Available (US)

No

## Pricing: US

### Nebulization (Asthmanefrin Refill Inhalation)

2.25% (per each): \$2.50

### Nebulization (S2 (Racepinephrine) Inhalation)

2.25% (per each): \$2.50

**Disclaimer:** A representative AWP (Average Wholesale Price) price or price range is provided as reference price only. A range is provided when more than one manufacturer's AWP price is available and uses the low and high price reported by the manufacturers to determine the range. The pricing data should be used for benchmarking purposes only, and as such should not be used alone to set or adjudicate any prices for reimbursement or purchasing functions or considered to be an exact price for a single product and/or manufacturer. Medi-Span expressly disclaims all warranties of any kind or nature, whether express or implied, and assumes no liability with respect to accuracy of price or price range data published in its solutions. In no event shall Medi-Span be liable for special, indirect, incidental, or consequential damages arising from use of price or price range data. Pricing data is updated monthly.

## Mechanism of Action

Stimulates alpha-, beta<sub>1</sub>-, and beta<sub>2</sub>-adrenergic receptors resulting in relaxation of smooth muscle of the bronchial tree, cardiac stimulation (increasing myocardial oxygen consumption), and dilation of skeletal muscle vasculature; small doses can cause vasodilation via beta<sub>2</sub>-vascular receptors; large doses may produce constriction of skeletal and vascular smooth muscle

## Pharmacokinetics (Adult Data Unless Noted)

Onset of action: Bronchodilation: Inhalation: ~1 minute

Distribution: Does not cross blood-brain barrier

Metabolism: Taken up into the adrenergic neuron and metabolized by monoamine oxidase and catechol-o-methyltransferase; circulating drug hepatically metabolized

Excretion: Urine (as inactive metabolites, metanephrine, and sulfate and hydroxy derivatives of mandelic acid, small amounts as unchanged drug)

## Dental Use

Emergency drug for treatment of anaphylactic reactions; used as vasoconstrictor to prolong local anesthesia

### **Dental: Local Anesthetic/Vasoconstrictor Precautions**

No information available to require special precautions

### **Dental: Effects on Dental Treatment**

Key adverse event(s) related to dental treatment: Xerostomia (normal salivary flow resumes upon discontinuation) and dry throat.

### **Dental: Effects on Bleeding**

No information available to require special precautions

### **Related Information**

- [Description of Fields](#)

### **Index Terms**

Primatene Mist; Racemic Epinephrine; Racepinephrine; Racepinephrine HCL

### **FDA Approval Date**

June 08, 1951

### **Brand Names: International**

**Find brand name(s) by country (for United States and Canada see separate Brand Names sections)**

🔍 Enter a Country or Country Code

For country code abbreviations (  [show table](#) )

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Expert opinion. Senior Renal Editorial Team: Bruce Mueller, PharmD, FCCP, FASN, FNKF; Jason A. Roberts, PhD, BPharm (Hons), B App Sc, FSHP, FISAC; Michael Heung, MD, MS.

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