

PRODUCT MONOGRAPH

**PrNASACORT<sup>®</sup> AQ**

(Triamcinolone Acetonide Nasal Spray, USP)

Aqueous Nasal Spray 55 mcg/ Metered Spray

Corticosteroid for nasal use

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## PrNASACORT® AQ

(Triamcinolone Acetonide Nasal Spray, USP)

### PART I: HEALTH PROFESSIONAL INFORMATION

#### SUMMARY PRODUCT INFORMATION

Route of Administration	Dosage Form / Strength	Clinically Relevant Nonmedicinal Ingredients
Nasal	Aqueous Nasal Spray 55 mcg/Metered Spray	Benzalkonium chloride <i>For a complete listing, see Dosage Forms, Composition and Packaging section.</i>

#### INDICATIONS AND CLINICAL USE

**Children 4 to 12 years of age:** NASACORT® AQ is indicated for the topical treatment of the symptoms of perennial and seasonal allergic rhinitis unresponsive to conventional treatment. NASACORT AQ is available only by prescription for children 4 to 12 years of age.

Regular usage is essential since maximum relief may not be obtained until after 2 to 3 days of treatment.

#### CONTRAINDICATIONS

Hypersensitivity to any of the ingredients of NASACORT AQ, and in patients with active or quiescent tuberculosis, or untreated fungal, bacterial and viral infection.

#### WARNINGS AND PRECAUTIONS

##### General

The replacement of a systemic steroid with NASACORT AQ has to be gradual and carefully supervised by the physician. The guidelines under "Dosage and Administration" should be followed in all such cases.

Patients should be informed that the full effect of NASACORT AQ therapy is not achieved until 2 to 3 days of treatment has been completed. Treatment of seasonal rhinitis should, if possible, start before the exposure to allergens.

Patients should be advised to inform subsequent physicians of prior use of corticosteroids.

To ensure the proper dosage and administration of the drug, the patient should be instructed to read the consumer package insert (see NASACORT AQ Part III: CONSUMER INFORMATION section).

### **Dependence/Tolerance**

Treatment with NASACORT AQ should not be stopped abruptly but tapered off gradually. In patients previously on prolonged periods or high doses of systemic steroids, the replacement with a topical corticosteroid can be accompanied by symptoms of withdrawal, e.g. joint and/or muscular pain, lassitude, and depression; in severe cases, adrenal insufficiency may occur, necessitating the temporary resumption of systemic steroid therapy. These patients should be carefully monitored for acute adrenal insufficiency in response to stress. Careful attention must be given to patients with asthma or other clinical conditions in whom a rapid decrease in systemic steroids may cause a severe exacerbation of their symptoms.

### **Ear/Nose/Throat**

Because of the inhibitory effect of corticosteroids on wound healing, in patients who have had recent nasal surgery or trauma, a nasal corticosteroid should be used with caution until healing has occurred. As with other nasally inhaled corticosteroids, nasal septal perforations have been reported in rare instances.

The possibility of atrophic rhinitis and/or pharyngeal candidiasis should be kept in mind.

In clinical studies with NASACORT AQ, the development of localized infections of the nose and pharynx with *Candida albicans* has rarely occurred. When such an infection develops it may require treatment with appropriate local or systemic therapy and temporary discontinuation of treatment with NASACORT AQ. Therefore, patients using NASACORT AQ over several months or longer should be examined periodically for evidence of *Candida* infection or other signs of adverse effects on the nasal mucosa.

### **Endocrine and Metabolism**

No apparent evidence of hypothalamic-pituitary-adrenal (HPA) axis suppression was observed in clinical studies following treatment with NASACORT AQ at recommended doses. When intranasal steroids are used at higher than recommended dosages or in susceptible individuals at recommended dosages, systemic corticosteroid effects may occur, such as hypercorticism, suppression of HPA function and/or reduction of growth velocity in children or teenagers. Children should be maintained on the lowest dose which delivers adequate symptom control (see DOSAGE AND ADMINISTRATION section).

A one-year double-blind, placebo-controlled parallel group study in 298 treated pediatric patients (3 to 9 years of age) was conducted to assess the effect of NASACORT AQ (once-daily dose of 110 microgram) on growth velocity using stadiometry. From the primary analysis of evaluable patients (134 NASACORT AQ and 133 placebo), the estimated growth velocity in the NASACORT AQ group was 0.45 cm/year lower than that in the placebo group with 95% CI ranging between 0.11 to 0.78 cm/year lower than placebo. The clinical long-term relevance of

this change in growth velocity associated with nasal corticosteroids is not known. Physicians should closely follow the growth of children and adolescents taking corticosteroids, by any route, and weigh the benefits of corticosteroid therapy against the possibility of growth suppression. Therapy should be managed with the aim of reducing the dose of nasal corticosteroid if possible, to the lowest dose at which effective control of symptoms is maintained.

Osteoporosis is a possible adverse effect associated with a long-term use of large doses of corticosteroids.

### **Immune**

Corticosteroids may mask some signs of infection and new infections may appear. A decreased resistance to localized infections has been observed during corticosteroid therapy; this may require treatment with appropriate therapy or stopping the administration of NASACORT AQ.

Patients who are on immunosuppressant drugs are more susceptible to infections than healthy individuals. Chickenpox and measles, for example, can have a more serious or even fatal course in children or adults on immunosuppressant doses of corticosteroids. In such children, or in adults who have not had these diseases, particular care should be taken to avoid exposure. If exposed, therapy with varicella zoster immune globulin (VZIG) or pooled intravenous immunoglobulin (IVIG), as appropriate, may be indicated. If chickenpox develops, treatment with antiviral agents may be considered.

### **Ophthalmologic**

Glaucoma and/or cataracts have been reported in patients receiving nasal corticosteroids. Therefore, close monitoring is warranted in patients with a change in vision or with a history of increased intraocular pressure, glaucoma, and/or cataracts.

### **Sensitivity/Resistance**

There is an enhanced effect of corticosteroids on patients with hypothyroidism and in those with cirrhosis. Acetylsalicylic acid should be used cautiously in conjunction with corticosteroids in patients with hypotherbinemia.

The use of NASACORT AQ with alternate day systemic prednisone could increase the likelihood of HPA suppression compared to a therapeutic dose of either one alone. Therefore, NASACORT AQ should be used with caution in patients already receiving alternate-day prednisone treatment for any disease.

### **Special Populations**

#### **Pregnant Women**

The safety of NASACORT AQ in pregnancy has not been established. If used, the expected benefits should be weighed against the potential hazard to the fetus, particularly during the first trimester of pregnancy.

Like other glucocorticosteroids, triamcinolone acetonide is teratogenic to rodents and non-human primates (see TOXICOLOGY section). The relevance of these findings to humans has not yet

been established. Infants born of mothers who have received substantial doses of glucocorticosteroids during pregnancy should be carefully observed for hypoadrenalism.

### **Nursing Women**

Glucocorticosteroids are excreted in human milk. It is not known whether triamcinolone acetonide would be secreted in human milk, but it is suspected to be likely. The use of NASACORT AQ in nursing mothers requires that the possible benefits of the drug be weighed against the potential hazards to the infant.

### **Pediatrics**

NASACORT AQ is not presently recommended for children younger than 4 years of age due to limited clinical data in this age group. Oral corticosteroids have been shown to cause growth suppression in children and teenagers, particularly with higher doses over extended periods. If a child or teenager on any corticosteroids appears to have growth suppression, the possibility that they are particularly sensitive to this effect of steroids should be considered.

### **Monitoring and Laboratory Tests**

During long-term therapy, pituitary-adrenal function and hematological status should be assessed.

## **ADVERSE REACTIONS**

### **Adverse Drug Reaction Overview**

Systemic and local corticosteroid use may result in the following:

- Epistaxis, ulcerations, *Candida albicans* infection, nasal septal perforation, impaired wound healing (see WARNINGS AND PRECAUTIONS section)
- Glaucoma and Cataracts (see WARNINGS AND PRECAUTIONS section)
- Immunosuppression (see WARNINGS AND PRECAUTIONS section)
- Hypothalamic-pituitary-adrenal (HPA) axis effects, including reduction of growth velocity (see WARNINGS AND PRECAUTIONS section)

### **Clinical Trial Adverse Drug Reactions**

*Because clinical trials are conducted under very specific conditions, the adverse reaction rates observed in the clinical trials may not reflect the rates observed in practice and should not be compared to the rates in the clinical trials of another drug. Adverse drug reaction information from clinical trials is useful for identifying drug-related adverse events and for approximating rates.*

In placebo-controlled, double-blind and open-label clinical studies, 1483 adults and children 12 years and older received treatment with NASACORT AQ. These patients were treated for an average duration of 50.7 days. In the controlled, seasonal trials (2-5 weeks duration) from which the following adverse reaction data is derived, 1394 patients were treated with NASACORT AQ

Nasal Spray for an average of 18.7 days. In the long-term, open-label study, the 172 patients enrolled received treatment for an average of 286 days duration.

The most commonly reported adverse reactions included those involving mucous membranes of the nose and throat. The three most prevalent adverse reactions considered to be at least possibly drug-related in adults and children 12 years and older were rhinitis (1.5%), headache (0.7%), and pharyngitis (0.3%), and in children 4 to 12 years were epistaxis (3.1%), rhinitis (1.4%) and headache (1.2%).

Children 4 to 12 years of age (n= 622) were studied in 3 controlled clinical trials. Of these, 179 received 110 mcg/day and 215 received 220 mcg/day of NASACORT AQ in two, six, or twelve week trials. The longest average duration of treatment for patients receiving 110 mcg/day was 76.3 days and 79.6 days for those receiving 220 mcg/day.

The incidence of specific nasopharyngeal-related adverse reactions considered drug related is summarized as follows:

**Table 1: Nasopharyngeal Adverse Reactions**

	<b>Placebo (N=176)</b>	<b>Nasacort AQ 110 mcg (N=179)</b>	<b>Nasacort AQ 220 mcg (N=187)</b>	<b>Placebo (N=626)</b>	<b>Nasacort AQ 27.5-440 mcg (N=1068)</b>
<b>Nasal AEs (overall)</b>	<b>15 (8.5%)</b>	<b>8 (4.5%)</b>	<b>12 (6.4%)</b>	<b>20 (3.2%)</b>	<b>31 (2.9%)</b>
<b>Dry mucous membranes</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2 (0.3%)</b>	<b>3 (0.3%)</b>
<b>Epistaxis</b>	<b>9 (5.1%)</b>	<b>6 (3.4%)</b>	<b>6 (3.2%)</b>	<b>3 (0.5%)</b>	<b>17 (1.6%)</b>
<b>Nasal irritation</b>	<b>5 (2.8%)</b>	<b>0</b>	<b>2 (1.1%)</b>	<b>3 (0.5%)</b>	<b>9 (0.8%)</b>
<b>Naso-sinus congestion</b>	<b>0</b>	<b>1 (0.6%)</b>	<b>1 (0.5%)</b>	<b>1 (0.2%)</b>	<b>2 (0.2%)</b>
<b>Sneezing</b>	<b>1 (0.6%)</b>	<b>0</b>	<b>2 (1.1%)</b>	<b>6 (1.0%)</b>	<b>2 (0.2%)</b>
<b>Throat discomfort</b>	<b>1 (0.6%)</b>	<b>1 (0.6%)</b>	<b>1 (0.5%)</b>	<b>6 (1.0%)</b>	<b>3 (0.3%)</b>

These adverse reactions, with the exception of epistaxis (in adults), and the exception of nasal congestion and sneezing (in children) were reported at approximately the same or lower incidence as placebo treated patients. Only 1% of the patients in the controlled trials discontinued treatment (e.g. pharyngitis, headache). In children, no patient receiving 110 mcg/day discontinued due to a serious adverse event and one patient receiving 220 mcg/day discontinued due to a serious event that was considered not drug related. Overall, these studies found the adverse experience profile for NASACORT AQ to be similar to placebo.

The following tables summarize the adverse events (% of patients) present in at least 5% of patients in the double-blind and open label phase studies in adults and in controlled studies in children 4 to 12 years of age.

**Table 2: Adverse Events in Adults**

VARIABLES	STUDIES IN ADULTS		
	Double-Blind		Open Label
	Placebo N=90	Nasacort AQ 220 mcg N=88	Nasacort AQ 220/110 mcg N=172
Flu Syndrome	5 (5.6%)	5 (5.7%)	17 (9.9%)
Headache	12 (13.3%)	6 (6.8%)	38 (22.1%)
Epistaxis	1 (1.1%)	6 (6.8%)	31 (18.0%)
Pharyngitis	5 (5.6%)	13 (14.8%)	55 (32.0%)
Rhinitis	5 (5.6%)	6 (6.8%)	49 (28.5%)
Injury Accident	--	--	20 (11.6%)
Back Pain	--	--	13 (7.6%)
Cough Increased	--	--	14 (8.1%)
Sinusitis	--	--	27 (15.7%)
Pain	--	--	10 (5.8%)
Diarrhea	--	--	10 (5.8%)

**Table 3: Adverse Events in Children**

	STUDIES IN CHILDREN 4-12 YEARS OF AGE			
	Placebo N=202	Nasacort AQ 110 mcg N=179	Nasacort AQ 220 mcg N=215	Nasacort AQ 440 mcg N=26
Fever	11 (5.4%)	8 (4.5%)	12 (5.6%)	2 (7.7%)
Flu syndrome	15 (7.4%)	16 (8.9%)	4 (1.9%)	0
Headache	22 (10.9%)	18 (10.1%)	16 (7.4%)	4 (15.4%)
Infection	15 (7.4%)	13 (7.3%)	16 (7.4%)	0
Injury accidental	3 (1.5%)	3 (1.7%)	4 (1.9%)	2 (7.7%)
Cough increased	13 (6.4%)	15 (8.4%)	15 (7.0%)	0
Epistaxis	14 (6.9%)	8 (4.5%)	10 (4.7%)	1 (3.8%)
Pharyngitis	13 (6.4%)	14 (7.8%)	16 (7.4%)	2 (7.7%)
Rhinitis	18 (8.9%)	18 (10.1%)	18 (8.4%)	0
Sinusitis	16 (6.4%)	7 (3.9%)	7 (3.3%)	0

In addition, the most frequent (frequencies  $\geq 2\%$ ) adverse reactions in adults and children greater than 6 years are: Headache, epistaxis, cough, bronchitis, dyspepsia, rhinitis, pharyngitis, flu syndrome, and tooth disorder.

Additional adverse reactions in pediatric patients:

Reduction of growth velocity (see WARNINGS AND PRECAUTIONS – Endocrine and Metabolism section)



In patients aged 2 to 5 years, the following adverse reactions have been observed (frequency  $\geq 2\%$ ): Headache, pharyngolaryngeal pain, nasopharyngitis, excoriation, diarrhea, and upper abdominal pain.

In the event of accidental overdose, an increased potential for these adverse experiences may be expected, but systemic adverse experiences are unlikely (see OVERDOSAGE section).

Hypersensitivity reactions including skin rash and edema of the face or tongue have been reported with other intranasal corticosteroids.

When patients are transferred to NASACORT AQ from a systemic steroid, allergic conditions such as asthma or eczema may be unmasked (see WARNINGS AND PRECAUTIONS section).

### **Post Marketing Adverse Drug Reactions**

The following additional adverse reactions have been reported during post-marketing experience; they are derived from spontaneous reports and therefore, the frequency of these adverse reactions is not known: nasal irritation, dry mucous membrane, nasal congestion, sneezing alterations of taste and smell, nausea, insomnia, dizziness, fatigue, dyspnea, decreased blood cortisol, cataract, glaucoma, increased ocular pressure, pruritus, rash, and hypersensitivity.

As with other nasally inhaled corticosteroids, nasal septum perforations have been reported in rare instances.

## **DOSAGE AND ADMINISTRATION**

### **Dosing Considerations**

See WARNINGS AND PRECAUTIONS section.

NASACORT AQ is available only by prescription for children between the ages of 4 and 12 years. NASACORT AQ is not recommended for children under 4 years of age.

Careful attention must be given to patients previously treated for prolonged periods with systemic corticosteroids when transferred to NASACORT AQ. Initially, NASACORT AQ and the systemic corticosteroid must be given concomitantly, while the dose of the latter is gradually decreased. The usual rate of withdrawal of the systemic steroid is the equivalent of 2.5 mg of prednisone every four days if the patient is under close supervision. If continuous supervision is not feasible, the withdrawal of the systemic steroid should be slower, approximately 2.5 mg of prednisone (or equivalent) every ten days. If withdrawal symptoms appear, the previous dose of the systemic steroid should be resumed for a week before further decrease is attempted.

### **Recommended Dose and Dosage Adjustment**

It is always desirable to titrate an individual patient to the minimum effective dose to reduce the possibility of side effects. Therefore, when the maximum benefit has been achieved and symptoms have been controlled, reducing the dose to 110 mcg (one spray in each nostril once

daily) has been shown to be effective in maintaining control of the allergic rhinitis symptoms in patients who were initially controlled at 220 mcg/day (see WARNINGS AND PRECAUTIONS, ADVERSE REACTIONS).

Children 4 to 12 years of age:

NASACORT AQ is available only by prescription for children between the ages of 4 and 12 years. The recommended starting dose is 110 mcg per day given as one spray in each nostril once daily. Patients who do not achieve maximum symptom control may benefit from a dose of 220 mcg given as 2 sprays in each nostril once daily. Once symptoms are controlled, patients should be maintained on 110 mcg (1 spray in each nostril) once daily.

**Administration**

The therapeutic effects of corticosteroids, unlike those of decongestants, are not immediate. Since the effect of NASACORT AQ depends on its regular use, patients must be instructed to take the nasal inhalations at regular intervals and not as with other decongestant nasal sprays, as they feel necessary.

In the presence of excessive nasal mucus secretion or edema of the nasal mucosa, the drug may fail to reach the site of action. In such cases it is advisable to use a nasal vasoconstrictor for two to three days prior to NASACORT AQ therapy. Patients should be instructed on the correct method of use, which is to blow the nose, then insert the nozzle firmly into the nostril, compress the opposite nostril and actuate the spray while inspiring through the nose, with the mouth closed.

Children 4 to 12 years of age:

An improvement of symptoms usually becomes apparent within a few days after the start of therapy. However symptomatic relief may not occur in some patients for as long as two weeks. NASACORT AQ should not be continued beyond three weeks in the absence of significant symptomatic improvement.

**OVERDOSAGE**

For the management of a suspected drug overdose, particularly accidental oral ingestion, consult the regional poison control centre.
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Like any other nasally administered corticosteroid, acute overdosing is unlikely in view of the total amount of active ingredient present. In the event that the entire contents of the bottle were administered all at once, via either oral or nasal application, clinically significant systemic adverse events would most likely not result. The patient may experience some gastrointestinal upset if taken orally.

However when used chronically in excessive doses or in conjunction with other corticosteroid formulations, systemic corticosteroid effects such as hypercorticism and adrenal suppression may appear. If such changes occur, the dosage of NASACORT AQ should be discontinued

slowly consistent with accepted procedures for discontinuation of chronic steroid therapy. (See Dosage and Administration)

The restoration of hypothalamic-pituitary axis may be slow; during periods of pronounced physical stress (i.e. severe infections, trauma, surgery) a supplement with systemic steroids may be advisable.

## **ACTION AND CLINICAL PHARMACOLOGY**

### **Mechanism of Action**

Triamcinolone acetonide is a potent anti-inflammatory steroid with strong topical and weak systemic activity. Triamcinolone acetonide is a more potent derivative of triamcinolone. Although triamcinolone itself is approximately one to two times as potent as prednisone in animal models of inflammation, triamcinolone acetonide is approximately 8 times more potent than prednisone.

When administered intranasally in therapeutic doses, it has a direct anti-inflammatory action on the nasal mucosa, the mechanism of which is not yet completely defined. The minute amount absorbed in therapeutic doses has not been shown to exert any apparent clinical systemic effects.

Corticosteroids are very effective. However, when allergic symptoms are very severe, local treatment with recommended doses (microgram) of any available topical corticosteroid are not as effective as treatment with larger doses (milligram) of oral or parenteral formulations. Corticosteroids do not have an immediate effect on allergic signs and symptoms.

### **Children 4-12 years of age:**

An improvement of symptoms may be seen as early as the first day after initiation of treatment and full benefit may be expected in 3 to 4 days. However, symptomatic relief may not occur in some patients for as long as two weeks. NASACORT AQ should not be continued beyond three weeks in the absence of significant symptomatic improvement.

### **Pharmacokinetics**

Based upon intravenous dosing of triamcinolone acetonide phosphate ester, the half-life of triamcinolone acetonide was reported to be 88 minutes. The volume of distribution (Vd) reported was 99.5 L (SD±27.5) and clearance was 45.2 L/ hour (SD ±9.1) for triamcinolone acetonide. The plasma half-life of corticosteroids does not correlate well with the biologic half-life.

Pharmacokinetic characterization of the NASACORT AQ formulation was determined in both normal adult subjects and patients with allergic rhinitis. Single dose intranasal administration of 220 mcg of NASACORT AQ in normal adult subjects and patients demonstrated minimal absorption of triamcinolone acetonide. The mean peak plasma concentration was approximately 0.5 ng/mL (range: 0.1 to 1.0 ng/mL) and occurred at 1.5 hours post dose. The mean plasma drug concentration was less than 0.06 ng/mL at 12 hours and below the assay detection limit at 24 hours. The average terminal half-life was 3.1 hours. Dose proportionality was demonstrated in

normal subjects and in patients following a single intranasal dose of 110 mcg or 220 mcg NASACORT AQ.

Triamcinolone acetonide aqueous administered intranasally has been shown to be minimally absorbed into the systemic circulation in humans. Patients with active rhinitis showed absorption similar to that found in normal volunteers.

In order to determine if systemic absorption plays a role in NASACORT AQ treatment of allergic rhinitis symptoms, a two week double-blind placebo-controlled clinical study was conducted comparing NASACORT AQ, orally ingested triamcinolone acetonide, and placebo in 297 patients with seasonal allergic rhinitis. The study demonstrated that the therapeutic efficacy of NASACORT AQ can be attributed to the topical effects of triamcinolone acetonide.

### **Special Populations and Conditions**

#### **Pediatrics:**

Following multiple doses in pediatric patients ages 6 to 12 years old receiving 440 mcg/day, plasma drug concentration, AUC,  $C_{max}$  and  $T_{max}$  were similar to those values observed in adult patients.

### **Other Studies**

#### **HPA Axis Suppression:**

In order to evaluate the effects of systemic absorption on the Hypothalamic-Pituitary-Adrenal (HPA) axis, a clinical study was performed comparing 220 mcg or 440 mcg NASACORT AQ, or 10 mg prednisone to placebo for 42 days. Adrenal response to a 6-hour cosyntropin stimulation test clearly indicated that NASACORT AQ administered at doses of 220 mcg and 440 mcg had no effect on HPA activity versus placebo. Conversely, oral prednisone at 10 mg/day significantly reduced the response to ACTH.

A six week study was conducted in 80 pediatric patients to evaluate the effect of 220 mcg or 440 mcg of NASACORT AQ versus placebo on HPA function. No evidence of adrenal axis suppression was observed in the pediatric patients exposed to systemic levels of triamcinolone acetonide higher than the systemic levels observed following administration of the maximum recommended dose of NASACORT AQ.

In a 6-week randomized, double-blind, placebo-controlled clinical study evaluating the effect of NASACORT AQ (once-daily dose of 110 micrograms or 220 micrograms) on HPA axis function (as measured by 24-hour serum cortisol AUC) in 140 children (2 to 11 years of age), no statistically significant difference from placebo was observed. The ratio of NASACORT AQ to placebo was 0.966, 95% CI (0.892, 1.045).

### **STORAGE AND STABILITY**

Store at 15-25°C.

## DOSAGE FORMS, COMPOSITION AND PACKAGING

### Composition

NASACORT AQ is an unscented, thixotropic, water-based metered-dose pump spray formulation unit containing a microcrystalline suspension of triamcinolone acetonide (9.075 mg triamcinolone acetonide / bottle) in an aqueous medium. Microcrystalline cellulose and carboxymethylcellulose sodium, polysorbate 80, dextrose, benzalkonium chloride, edetate disodium and purified water (hydrochloric acid or sodium hydroxide may be added to adjust the pH to between 4.5 and 6.0.).

### Dosage forms and packaging

NASACORT AQ is supplied as a non-chlorofluorocarbon (CFC) containing-metered dose pump spray which will provide 120 actuations. It is supplied with a nasal adapter and patient instructions.

Each bottle contains 9.075 mg triamcinolone acetonide. Each actuation releases approximately 55 mcg triamcinolone acetonide from the nasal actuator to the patient (estimated from *in vitro* testing). There are at least 120 actuations in one NASACORT AQ bottle.

The bottle should be discarded after 120 sprays or 2 months after starting treatment.

In the NASACORT AQ Part III: Consumer Information, patients are provided with a check-off form to track usage.

## PART II: SCIENTIFIC INFORMATION

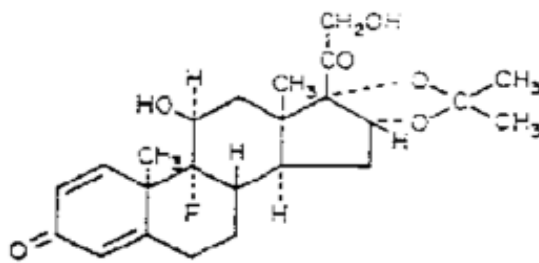
### PHARMACEUTICAL INFORMATION

#### Drug Substance

Proper Name: Triamcinolone acetonide

Chemical Name: Pregna-1,4-diene-3,20-dione, 9-fluoro-11,21-dihydroxy-16,-17-  
[(1-methylethylidene) bis(oxy)] -, (11 $\beta$ ,16 $\alpha$ )-

Structural Formula:



Molecular Formula: C<sub>24</sub>H<sub>31</sub>FO<sub>6</sub>

Molecular Weight: 434.49

Physical Form: white crystalline powder

Solubility: sparingly soluble in methanol, acetone, ethyl acetone

Melting Point: 292 - 294 °C

### CLINICAL TRIALS

The safety and efficacy of NASACORT AQ has been evaluated in 10 double-blind, placebo-controlled clinical trials in adults and children 12 years and older with seasonal or perennial allergic rhinitis. The number of patients treated with NASACORT AQ in these studies was 1204; of these patients, 668 were males and 536 were females.

Overall, in double-blind clinical trials of two to four weeks duration, analysis of the clinical studies has demonstrated that NASACORT AQ 220 mcg once daily (2 sprays in each nostril)

when compared to placebo provides statistically significant relief of nasal symptoms including sneezing, stuffiness, discharge, and itching.

The safety and efficacy of NASACORT AQ, at doses of 110 mcg or 220 mcg once daily, has also been studied in two double blind placebo controlled trials of two and twelve weeks duration in children ages 4 through 12 years with seasonal and perennial allergic rhinitis. These trials included 355 males and 183 females. NASACORT AQ administered at either dose resulted in statistically significant reductions of allergic rhinitis symptoms.

## **DETAILED PHARMACOLOGY**

Pharmacokinetics studies with radiolabelled triamcinolone acetonide have been carried out by the oral, pulmonary, and intravenous routes in several species. The pharmacokinetic behaviour of the triamcinolone acetonide was similar in all species within each route of administration. The results of studies in which triamcinolone acetonide was administered as an aerosol showed rapid disappearance of radioactivity from lungs, comparable to that observed following oral administration.

Peak blood levels occurred in one to two hours. Virtually no radioactivity was present in the lungs and trachea 24 hours after dosing. Three major metabolites of triamcinolone acetonide have been identified. They are 6-hydroxy-triamcinolone acetonide (much less biologically active than triamcinolone acetonide), 21-carboxytriamcinolone acetonide and 21-carboxy-6-hydroxytriamcinolone acetonide. The latter two metabolites would also be expected to be substantially less active than the parent compound due to:

- a) the dependence of anti-inflammatory activity on the presence of the 21-hydroxyl group,
- b) the decreased activity observed upon 6-hydroxylation, and
- c) the markedly increased water solubility that favours rapid elimination.

There appeared to be some qualitative differences in the metabolites among the species. No differences were detected in the metabolic pattern as a function of route of administration.

### Excretion:

Studies completed utilizing radiolabelled triamcinolone acetonide given via oral and intravenous routes in several species show the major portion of the drug is eliminated in the feces, irrespective of the route of administration, with only one species (rabbit) showing significant urinary excretion of radioactivity.

### Glucocorticoid Effects:

Triamcinolone acetonide is a potent derivative of triamcinolone. Although triamcinolone itself is approximately 1-2 times as potent as prednisone in animal models of inflammation, triamcinolone acetonide is much more potent. In cotton oil-induced ear inflammation, triamcinolone acetonide topically applied was 59 times more active than hydrocortisone when

given by mouth in equivalent doses. Comparable effects were obtained in rats with cotton and asbestos pellet induced granuloma.

Thymolytic potency was essentially equivalent, when given by the subcutaneous, intramuscular, intravenous and intraperitoneal routes. It was, however, 3-4 times more potent when given orally. Neither triamcinolone nor triamcinolone acetonide produced sodium retention in adrenalectomized rats or androgenic effects in castrated rats.

#### Human Pharmacology:

The precise mechanism of action of the intranasal drug is unknown. However, clinical studies utilizing nasal administration have demonstrated effective local steroid activity with no evidence of systemic effects. Smears of the nasal mucosa obtained during clinical studies demonstrated marked reductions in nasal eosinophils, which are known to release highly active chemical mediators.

## **TOXICOLOGY**

#### Animal:

Acute toxicity studies in mice and rats and subacute toxicity studies in rats, rabbits and dogs were done by conventional routes of administration. The findings in these studies were typically those seen following the administration of potent glucocorticosteroids. Subacute toxicity studies in rats and dogs and chronic studies in rats and monkeys were conducted by inhalation of aerosolized triamcinolone acetonide. A one-month intranasal toxicity study in dogs with triamcinolone acetonide aqueous nasal formulation revealed no toxicity other than that expected from triamcinolone acetonide. The findings in these studies generally were minimal and the same as in studies carried out by conventional routes of administration, with changes typical of those seen with potent glucocorticoids. There were no gross histopathological or ultrastructural findings suggestive of untoward effects on the respiratory tract.

An eye irritation study conducted in rabbits with triamcinolone acetonide aqueous nasal formulation revealed only a slight reversible irritation of the conjunctiva and iris.

#### Teratogenic Tests:

Teratology studies have been conducted in rats and rabbits by the subcutaneous route and by aerosol inhalation. The known teratogenic effects of glucocorticoids were found to occur following both routes of administration. Triamcinolone acetonide has been shown to be teratogenic in rats and rabbits. Teratogenic effects in both species at 0.02, 0.04 and 0.08 mg/kg/day (approximately 135, 270 and 540 mcg/m<sup>2</sup>/day in the rat and 320, 640 and 1280 mcg/m<sup>2</sup>/day in the rabbit, as calculated on a surface area basis), included low incidence of cleft palate and/or internal hydrocephaly and axial skeletal defects. Teratogenic effects, including CNS and cranial malformation have also been observed in non-human primates at 0.5 mg/kg/day (approximately 6.7 mg/m<sup>2</sup>/day). The doses of 0.02, 0.04, 0.08 and 0.5 mg/kg/day used in these toxicology studies are approximately 12.8, 25.5, 51 and 318.2 times the minimum recommended dose of 110 mcg of NASACORT AQ per day and 6.4, 12.7, 25.5 and 159.1 times the maximum



recommended dose of 220 mcg of NASACORT AQ per day based on a patient body weight of 70 kg.

Administration by aerosol inhalation to pregnant rats and rabbits produced embryotoxic and fetotoxic effects which were comparable to those produced by administration by other routes.

Carcinogenesis, Mutagenesis:

A recent literature report of a chronic bioassay conducted with several corticosteroids (budesonide, prednisolone, triamcinolone acetonide) indicated that all caused slightly increased incidence of liver tumors at toxic doses over a two-year study period. However, no evidence of treatment-related carcinogenicity was demonstrated after two years of once daily oral administration of triamcinolone acetonide at a maximum daily dose of 1.0 mcg/kg/day (6.1 mcg/m<sup>2</sup>/day) in male or female rats and 3.0 mcg/kg/day (12.9 mcg/m<sup>2</sup>/day) in male or female mice.

Impairment of Fertility:

Male and female rats which were administered oral triamcinolone acetonide at doses as high as 15 mcg/kg/day (110 mcg/m<sup>2</sup>/day, as calculated on a surface area basis) exhibited no evidence of impaired fertility. The maximum human dose, for comparison, is 6.3 mcg/kg/day (240 mcg/m<sup>2</sup>/day). However, a few female rats which received maternally toxic doses of 8 or 15 mcg/kg/day (60 mcg/m<sup>2</sup>/day or 110 mcg/m<sup>2</sup>/day, respectively, as calculated on a surface area basis) exhibited dystocia and prolonged delivery. Developmental toxicity, which included increases in fetal resorptions and stillbirths and decreases in pup body weight and survival, also occurred at the maternally toxic doses (2.5-15.0 mcg/kg/day or 20-110 mcg/m<sup>2</sup>/day, as calculated on a surface area basis). Reproductive performance of female rats and effects on fetuses and offspring were comparable between groups that received placebo and nontoxic or marginally toxic doses (0.5 and 1.0 mcg/kg/day or 3.8 mcg/m<sup>2</sup>/day and 7.0 mcg/m<sup>2</sup>/day).

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## IMPORTANT: PLEASE READ

### PART III: CONSUMER INFORMATION

#### **PrNASACORT® AQ (Triamcinolone Acetonide Nasal Spray, USP)**

This leaflet is part III of a three-part “Product Monograph” published when the drug is approved for sale in Canada and is designed specifically for Consumers. This leaflet is a summary and will not tell you everything about NASACORT® AQ. Contact your doctor or pharmacist if you have any questions about the drug.

#### **ABOUT THIS MEDICATION**

##### The Name of Your Medicine:

The name of your medicine is NASACORT AQ (triamcinolone acetonide aqueous nasal spray). This is one of a group of medicines called corticosteroids.

NASACORT AQ can only be obtained on the prescription of a doctor.

##### What the medication is used for:

NASACORT AQ is used to treat seasonal allergic rhinitis (including hay fever) and perennial rhinitis (year-round inflammation of the mucous membrane of the nose). Symptoms of these conditions include itching, blocked up feeling in the nose and excessive sneezing.

##### What it does:

NASACORT AQ reduces the irritation and inflammation in the lining of the nose and nasal passages and so it relieves the blocked up feeling in the nose, the runny nose, itching and sneezing.

##### When it should not be used:

Allergic reaction to any of the ingredients of NASACORT AQ (triamcinolone acetonide aqueous nasal spray) (See What the

nonmedicinal ingredients are) and in patients with active or dormant tuberculosis, or untreated fungal, bacterial and viral infection.

##### What the medicinal ingredient is:

The active ingredient in NASACORT AQ is triamcinolone acetonide.

##### What the nonmedicinal ingredients are:

Benzalkonium chloride, carboxymethylcellulose sodium, dextrose, edetate disodium, microcrystalline cellulose, polysorbate 80 and Purified water.

##### What dosage forms it comes in:

NASACORT AQ is a non-chlorofluorocarbon (non-CFC) containing metered-dose pump spray which will provide 120 actuations. Each actuation releases approximately 55 mcg triamcinolone acetonide through the nasal actuator.

#### **WARNINGS AND PRECAUTIONS**

BEFORE you use NASACORT AQ talk to your doctor or pharmacist if:

- If you have already taken NASACORT AQ or any other corticosteroids and developed an allergy or intolerance to any of them;
- If you are allergic to any other substances, such as food, preservatives or dyes;
- If you are pregnant or breast feeding, or likely to become pregnant or breast feed. Your doctor may decide not to prescribe this medication in these circumstances;
- If you are taking any other prescription or nonprescription (over-the-counter) medicines;
- If you suffer from any other medical problems or if you have had a recent injury, surgery to your nose, or nasal infection with *Candida albicans* (a

## IMPORTANT: PLEASE READ

fungal infection).

Glaucoma (increase in eye pressure that cause visual problem) or cataracts (clouding of the lens of the eye) have been reported in patients receiving nasal corticosteroids. If you notice any visual problems, talk to your doctor.

Slower rate of growth has been reported in some children receiving treatment. You and your doctor should monitor your child's growth.

### **PROPER USE OF THIS MEDICATION**

#### Usual Dose:

Follow the INSTRUCTIONS FOR USE described below. If you have any problems tell your doctor or pharmacist.

- It is important that you inhale each dose through the nose as instructed. The label will usually tell you how many doses to take. If it does not, ask your doctor or pharmacist;
- DO NOT inhale more doses or use your nasal spray more often than your doctor advises.
- It takes a few days for this medicine to work. **IT IS VERY IMPORTANT THAT YOU USE IT REGULARLY. DO NOT STOP** treatment even if you feel better, unless told to do so by your doctor.
- If your symptoms have not improved after three weeks of treatment with NASACORT AQ, tell your doctor.
- Children 4 to 12 years of age: The recommended dose is one spray in each nostril once a day. Patients who are not well controlled may benefit from a dose of 2 sprays in each nostril once daily. Once allergy symptoms improve, you may reduce to 1 spray in each nostril once daily.

- NASACORT AQ is not recommended for children under 4 years of age.

#### Overdose:

If you think you have taken too much NASACORT AQ or accidentally ingested it orally, contact your doctor, nurse, pharmacist, hospital emergency department or regional Poison control Centre immediately, even if there are no symptoms.

#### Missed Dose:

If you miss a dose, do not worry; take a dose if you remember within an hour or so. However, if you do not remember until later, skip the missed dose and go back to your regular dosing schedule. Do not double doses.

#### What to do if you stop your medicine:

If your doctor decides to stop your treatment, do not keep any left-over medicine unless your doctor tells you to.

### **SIDE EFFECTS AND WHAT TO DO ABOUT THEM**

Along with its needed effects, a medicine may cause some unwanted effects. Contact your physician as soon as possible if any of the following occur:

- If you notice that any discharge from your nose is yellow or green; which may be a nasal infection.
- If you experience an unpleasant taste or smell;
- If your nose or throat becomes painful or if you have a severe nose bleed after using the nasal spray;
- If you feel unwell or have any other problems;

Other side effects may occur that usually do not need medical attention. They may go away as your body adjusts to the medicine. However, check with your doctor if any of

## IMPORTANT: PLEASE READ

the following side effects continue or are bothersome:

- Sneezing;
- Headaches;
- Burning, dryness or other irritation inside the nose (lasting only a short time after applying the medication).

NASACORT AQ may have an effect on how fast children grow. If your child is taking Nasacort AQ, your healthcare provider will need to regularly check the height of your child and adjust the dose as appropriate.

Other side effects not listed above may also occur in some patients. If you notice any other effects, check with your doctor.

### Reporting side effects

You can report any suspected side effects associated with the use of health products to Health Canada by:

- Visiting the Web page on Adverse Reaction Reporting (<https://www.canada.ca/en/health-canada/services/drugs-health-products/medeffect-canada/adverse-reaction-reporting.html>) for information on how to report online, by mail or by fax; or
- Calling toll-free at 1-866-234-2345.

NOTE: Contact your health professional if you need information about how to manage your side effects. The Canada Vigilance Program does not provide medical advice.

### HOW TO STORE IT

Keep out of the reach and sight of children. Store at 15 - 25°C.

Do not use NASACORT AQ after the expiry date which is stated on the carton and the bottle after “EXP”.

The bottle should be discarded after 120 sprays or 2 months after starting treatment.

### APPENDIX: INSTRUCTIONS FOR USE

Please see Instructions for Use included.

### MORE INFORMATION

REMEMBER this medicine is for YOU. Only a doctor can prescribe it for you. Never give it to others. It may harm them even if their symptoms are the same as yours.

Keep all medicines out of the reach of children.

If you have questions or are not sure about anything, then you should ask your doctor or pharmacist.

You may want to read this leaflet again. Please DO NOT THROW IT AWAY until you have finished your medicine.

This document plus the full product monograph, prepared for health professionals can be found at [www.sanofi.ca](http://www.sanofi.ca) or by contacting the sponsor, Sanofi Consumer Health Inc. at: 1-800-636-3664

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## **INSTRUCTIONS FOR USE**

It is important to shake the bottle gently before each use. The bottle should be discarded after 120 sprays or 2 months after starting treatment. Do not transfer any remaining liquid to another bottle.

### **PrNASACORT® AQ**

#### **(Triamcinolone Acetonide Nasal Spray, USP)**

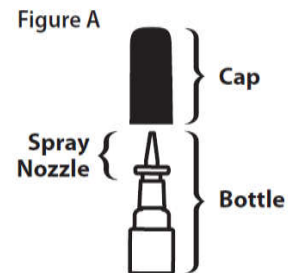
#### **1. IMPORTANT INFORMATION**

- a. **Read this insert** for complete instructions on how to get a bottle ready (primed), how to use the spray bottle and how to clean the spray nozzle.
- b. Keep this insert as it contains important information.
- c. NASACORT AQ is for nasal use only.
- d. Do not use more than directed.
- e. Do not share this bottle with anyone else as this may spread germs.

#### **2. STEPS TO GET A NEW BOTTLE READY FOR USE (PRIMED)**

##### **A. Before first use, a new bottle must be primed.**

- a. Remove purple cap (*Figure A*).
- b. Shake the bottle gently before use.
- c. Hold the bottle upright. Point the spray away from you or other people while doing this. Press and release spray nozzle until a fine mist is produced, taking care not to spray into eyes or face (*as shown in Figure B*). If you get the spray in your eyes, rinse well with water.
- d. The spray is now ready to use.

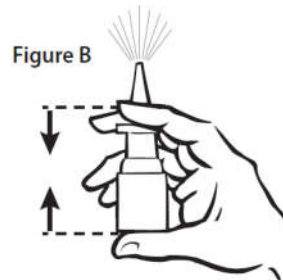


**B. If NASACORT AQ has not been used for more than 2 weeks, prime the bottle again. Repeat steps “a” through “c” above.**

**PrNASACORT® AQ**  
**(Triamcinolone Acetonide Nasal Spray, USP)**

**3. USE INSTRUCTIONS**

- a. Blow nose gently to clear nostrils.
- b. Remove cap, then shake the bottle gently.
- c. Hold the bottle with thumb under bottle and spray nozzle between your fingers (as shown in Figure B).
- d. Close off one nostril with your finger.



- e. Aim nozzle toward back of nose (Figure C).

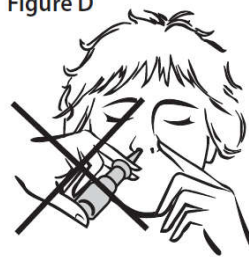
**DO NOT** spray toward nasal septum (the wall between the 2 nostrils) (Figure D).

Figure C



Correct Position

Figure D



Wrong Position

- f. While breathing in gently, press down on the spray nozzle with your fingers to release the spray.
- g. Repeat steps “d” through “f” for the other nostril.
- h. If you have been prescribed two sprays per nostril, repeat steps “d” through “f” again for both nostrils.
- i. After using the nasal spray, wipe nozzle with a tissue and replace cap.

*NOTE: Avoid blowing nose for 15 minutes after use.*

*If nozzle does not spray properly, see cleaning instructions below.*

**PrNASACORT® AQ**  
**(Triamcinolone Acetonide Nasal Spray, USP)**

**4. IF PUMP DOES NOT SPRAY PROPERLY,  
THE NOZZLE MAY BE BLOCKED**

- a. Never try to unblock nozzle or enlarge the tiny spray hole with a pin or other sharp objects. This can stop the spray from working. (*Figure E*).
- b. Clean the nozzle as shown below.

Figure E



**5. CLEANING INSTRUCTIONS**

- a. Remove the cap.
- b. Gently pull off the spray nozzle away from bottle (*Figure F*).
- c. Rinse **SPRAY NOZZLE ONLY** under warm water (*Figure G*).
- d. Shake or tap to remove any water that is left.
- e. Re-attach spray nozzle to bottle.
- f. Press and release spray nozzle until a fine spray is produced, taking care not to spray in your eyes or face. If you get the spray in your eyes, rinse well with water.
- g. Replace the cap over the nozzle.

Figure F



Figure G



NASACORT AQ is now ready to use.

Below is a check-off chart to help you keep track of the number of sprays you have used. This will help assure that you receive the 120 sprays of medication present. The bottle has been filled with extra solution to accommodate the initial priming sprays. Any additional repriming (i.e. other than the initial priming) must be counted below as a spray.



## NASACORT AQ 120 Sprays Check-Off

(Include treatment inhalations and repriming sprays)

Check off one circle for one spray.

The bottle should be discarded after 120 sprays or 2 months after starting treatment.

Do not transfer any remaining liquid to another bottle.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120

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