

CENTER FOR DRUG EVALUATION AND RESEARCH

APPLICATION NUMBER: 20-121/S009

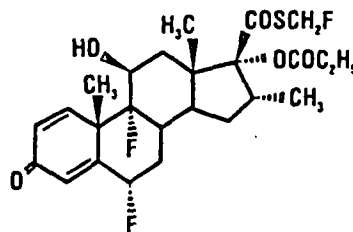
FINAL PRINTED LABELING

**FLONASE®**  
**(fluticasone propionate)**  
**Nasal Spray, 50 mcg**

**For Intranasal Use Only.**

**SHAKE GENTLY  
 BEFORE USE.**

**DESCRIPTION:** Fluticasone propionate, the active ingredient of FLONASE Nasal Spray, is a synthetic corticosteroid with the chemical name of S-fluoromethyl 6 $\alpha$ ,9 $\alpha$ -difluoro-11 $\beta$ -hydroxy-16 $\alpha$ -methyl-3-oxo-17 $\alpha$ -propionyloxyandrosta-1,4-diene-17 $\beta$ -carbothioate and the following chemical structure:



Fluticasone propionate is a white to off-white powder with a molecular weight of 500.6. It is practically insoluble in water, freely soluble in dimethyl sulfoxide and dimethylformamide, and slightly soluble in methanol and 95% ethanol.

FLONASE Nasal Spray 50 mcg is an aqueous suspension of microfine fluticasone propionate for topical administration to the nasal mucosa by means of a metering, atomizing spray pump. FLONASE Nasal Spray also contains microcrystalline cellulose and carboxymethylcellulose sodium, dextrose, 0.02% w/w benzalkonium chloride, polysorbate 80, and 0.25% w/w phenylethyl alcohol, and has a pH between 5 and 7.

It is necessary to prime the pump before first use or after a period of non-use (1 week or more). After initial priming (six actuations), each actuation delivers 50 mcg of fluticasone propionate in 100 mg of formulation through the nasal adapter. Each bottle of FLONASE Nasal Spray provides 120 metered sprays. After 120 metered sprays, the amount of fluticasone propionate delivered per actuation may not be consistent and the unit should be discarded.

**CLINICAL PHARMACOLOGY:** Fluticasone propionate is a synthetic, trifluorinated corticosteroid with anti-inflammatory activity. In vitro dose response studies on a cloned human glucocorticoid receptor system involving binding and gene expression afforded 50% responses at 1.25 and 0.17 nM concentrations, respectively. Fluticasone propionate was threefold to fivefold more potent than dexamethasone in these assays. Data from the McKenzie vasoconstrictor assay in man also support its potent glucocorticoid activity.

In preclinical studies, fluticasone propionate revealed progesterone-like activity similar to the natural hormone. However, the clinical significance of these findings in relation to the low plasma levels (see Pharmacokinetics) is not known.

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37 The precise mechanism through which fluticasone propionate affects allergic rhinitis symptoms is  
38 not known. Corticosteroids have been shown to have a wide range of effects on multiple cell types  
39 (e.g., mast cells, eosinophils, neutrophils, macrophages, and lymphocytes) and mediators (e.g.,  
40 histamine, eicosanoids, leukotrienes, and cytokines) involved in inflammation. In seven trials in adults,  
41 FLONASE Nasal Spray has decreased nasal mucosal eosinophils in 66% (35% for placebo) of  
42 patients and basophils in 39% (28% for placebo) of patients. The direct relationship of these findings to  
43 long-term symptom relief is not known.

44 FLONASE Nasal Spray, like other corticosteroids, is an agent that does not have an immediate  
45 effect on allergic symptoms. A decrease in nasal symptoms has been noted in some patients 12 hours  
46 after initial treatment with FLONASE Nasal Spray. Maximum benefit may not be reached for several  
47 days. Similarly, when corticosteroids are discontinued, symptoms may not return for several days.

48 **Pharmacokinetics: Absorption:** The activity of FLONASE Nasal Spray is due to the parent drug,  
49 fluticasone propionate. Indirect calculations indicate that fluticasone propionate delivered by the  
50 intranasal route has an absolute bioavailability averaging less than 2%. After intranasal treatment of  
51 patients with allergic rhinitis for 3 weeks, fluticasone propionate plasma concentrations were above  
52 the level of detection (50 pg/mL) only when recommended doses were exceeded and then only in  
53 occasional samples at low plasma levels. Due to the low bioavailability by the intranasal route, the  
54 majority of the pharmacokinetic data was obtained via other routes of administration. Studies using  
55 oral dosing of radiolabeled drug have demonstrated that fluticasone propionate is highly extracted  
56 from plasma and absorption is low. Oral bioavailability is negligible, and the majority of the circulating  
57 radioactivity is due to an inactive metabolite.

58 **Distribution:** Following intravenous administration, the initial disposition phase for fluticasone  
59 propionate was rapid and consistent with its high lipid solubility and tissue binding. The volume of  
60 distribution averaged 4.2 L/kg. The percentage of fluticasone propionate bound to human plasma  
61 proteins averaged 91% with no obvious concentration relationship. Fluticasone propionate is weakly  
62 and reversibly bound to erythrocytes and freely equilibrates between erythrocytes and plasma.  
63 Fluticasone propionate is not significantly bound to human transcortin.

64 **Metabolism:** The total blood clearance of fluticasone propionate is high (average, 1093 mL/min),  
65 with renal clearance accounting for less than 0.02% of the total. The only circulating metabolite  
66 detected in man is the 17 $\beta$ -carboxylic acid derivative of fluticasone propionate, which is formed  
67 through the cytochrome P450 3A4 pathway. This inactive metabolite had approximately 2000 times  
68 less affinity than the parent drug for the glucocorticoid receptor of human lung cytosol in vitro and  
69 negligible pharmacological activity in animal studies. Other metabolites detected in vitro using  
70 cultured human hepatoma cells have not been detected in man.

71 In a multiple-dose drug interaction study, coadministration of orally inhaled fluticasone propionate  
72 (500 mcg twice daily) and erythromycin (333 mg three times daily) did not affect fluticasone  
73 propionate pharmacokinetics.

74 In a drug interaction study, coadministration of orally inhaled fluticasone propionate (1000 mcg,  
75 5 times the maximum daily intranasal dose) and ketoconazole (200 mg once daily) resulted in

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76 increased fluticasone propionate concentrations, a reduction in plasma cortisol AUC, and no effect on  
77 urinary excretion of cortisol.

78 **Excretion:** Following intravenous dosing, fluticasone propionate showed polyexponential kinetics  
79 and had a terminal elimination half-life of approximately 7.8 hours. Less than 5% of a radiolabeled  
80 oral dose was excreted in the urine as metabolites, with the remainder excreted in the feces as  
81 parent drug and metabolites.

82 **Special Populations:** Fluticasone propionate was not studied in any special populations, and no  
83 gender-specific pharmacokinetic data have been obtained.

84 **Pharmacodynamics:** In a trial to evaluate the potential systemic and topical effects of FLONASE  
85 Nasal Spray on allergic rhinitis symptoms, the benefits of comparable drug blood levels produced by  
86 FLONASE Nasal Spray and oral fluticasone propionate were compared. The doses used were  
87 200 mcg of FLONASE Nasal Spray, the nasal spray vehicle (plus oral placebo), and 5 and 10 mg of  
88 oral fluticasone propionate (plus nasal spray vehicle) per day for 14 days. Plasma levels were  
89 undetectable in the majority of patients after intranasal dosing, but present at low levels in the majority  
90 after oral dosing. FLONASE Nasal Spray was significantly more effective in reducing symptoms of  
91 allergic rhinitis than either the oral fluticasone propionate or the nasal vehicle. This trial demonstrated  
92 that the therapeutic effect of FLONASE Nasal Spray can be attributed to the topical effects of  
93 fluticasone propionate.

94 In another trial, the potential systemic effects of FLONASE Nasal Spray on the  
95 hypothalamic-pituitary-adrenal (HPA) axis were also studied in allergic patients. FLONASE Nasal  
96 Spray given as 200 mcg once daily or 400 mcg twice daily was compared with placebo or oral  
97 prednisone 7.5 or 15 mg given in the morning. FLONASE Nasal Spray at either dose for 4 weeks did  
98 not affect the adrenal response to 6-hour cosyntropin stimulation, while both doses of oral prednisone  
99 significantly reduced the response to cosyntropin.

100 **Clinical Trials:** A total of 13 randomized, double-blind, parallel, multicenter, vehicle-controlled clinical  
101 trials were conducted in the United States in adults and pediatric patients (4 years of age and older)  
102 with seasonal or perennial allergic rhinitis. The trials included 2633 adults (1439 men and 1194  
103 women) with a mean age of 37 years (range, 18 to 79). A total of 440 adolescents (405 boys and 35  
104 girls), mean age of 14 (range, 12 to 17), and 500 children (325 boys and 175 girls), mean age of 9  
105 (range, 4 to 11) were also studied. The overall racial distribution was 89% white, 4% black, and 7%  
106 other. These trials evaluated the total nasal symptom scores (TNSS) that included rhinorrhea, nasal  
107 obstruction, sneezing, and nasal itching in known allergic patients who were treated for 2 to 24 weeks.  
108 Subjects treated with FLONASE Nasal Spray exhibited significantly greater decreases in TNSS than  
109 vehicle placebo-treated patients. Nasal mucosal basophils and eosinophils were also reduced at the  
110 end of treatment in adult studies; however, the clinical significance of this decrease is not known.

111 There were no significant differences between fluticasone propionate regimens whether  
112 administered as a single daily dose of 200 mcg (two 50-mcg sprays in each nostril) or as 100 mcg (one  
113 50-mcg spray in each nostril) twice daily in six clinical trials. A clear dose response could not be  
114 identified in clinical trials. In one trial, 200 mcg/day was slightly more effective than 50 mcg/day during  
115 the first few days of treatment; thereafter, no difference was seen.

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116 Three randomized, double-blind, parallel, vehicle-controlled trials were conducted in 1191 patients  
117 with perennial nonallergic rhinitis. These trials evaluated the patient-rated total nasal symptom scores  
118 (nasal obstruction, postnasal drip, rhinorrhea) in patients treated for 28 days of double-blind therapy  
119 and in one of the 3 trials for 6 months of open-label treatment. Two of these trials demonstrated that  
120 patients treated with FLONASE Nasal Spray at a dose of 100 mcg twice daily exhibited statistically  
121 significant decreases in total nasal symptom scores compared with patients treated with vehicle.  
122 **Individualization of Dosage:** Adult patients may be started on a 200-mcg once-a-day regimen (two  
123 50-mcg sprays in each nostril once-a-day). An alternative 200-mcg/day dosage regimen can be given  
124 as 100 mcg twice daily (one 50-mcg spray in each nostril twice-a-day).

125 Individual patients will experience a variable time to onset and different degree of symptom relief. In  
126 4 randomized, double-blind, placebo-controlled, parallel group allergic rhinitis studies and 2 studies of  
127 patients in an outdoor "park" setting (park studies), a decrease in nasal symptoms in treated subjects  
128 compared to placebo was shown to occur as soon as 12 hours after treatment with a 200-mcg dose of  
129 FLONASE Nasal Spray. Maximum effect may take several days. Patients who have responded may be  
130 able to be maintained (after 4 to 7 days) on 100 mcg/day (one spray in each nostril once daily).

131 Pediatric patients (4 years of age and older) should be started with 100 mcg (one spray in each  
132 nostril once-a-day). Treatment with 200 mcg (two sprays in each nostril once daily or one spray in each  
133 nostril twice daily) should be reserved for pediatric patients not adequately responding to 100 mcg  
134 daily. Once adequate control is achieved, the dosage should be decreased to 100 mcg (one spray in  
135 each nostril) daily.

136 Maximum total daily doses should not exceed two sprays in each nostril (total dose, 200 mcg/day).  
137 There is no evidence that exceeding the recommended dose is more effective.

138

139 **INDICATIONS AND USAGE:** FLONASE Nasal Spray is indicated for the management of the nasal  
140 symptoms of seasonal and perennial allergic and nonallergic rhinitis in adults and pediatric patients 4  
141 years of age and older.

142 Safety and effectiveness of FLONASE Nasal Spray in children below 4 years of age have not been  
143 adequately established.

144

145 **CONTRAINDICATIONS:** FLONASE Nasal Spray is contraindicated in patients with a hypersensitivity  
146 to any of its ingredients.

147

148 **WARNINGS:** The replacement of a systemic corticosteroid with a topical corticosteroid can be  
149 accompanied by signs of adrenal insufficiency, and in addition some patients may experience  
150 symptoms of withdrawal, e.g., joint and/or muscular pain, lassitude, and depression. Patients  
151 previously treated for prolonged periods with systemic corticosteroids and transferred to topical  
152 corticosteroids should be carefully monitored for acute adrenal insufficiency in response to stress. In  
153 those patients who have asthma or other clinical conditions requiring long-term systemic corticosteroid  
154 treatment, too rapid a decrease in systemic corticosteroids may cause a severe exacerbation of their  
155 symptoms.

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156 The concomitant use of intranasal corticosteroids with other inhaled corticosteroids could increase  
157 the risk of signs or symptoms of hypercorticism and/or suppression of the HPA axis.

158 Patients who are on immunosuppressant drugs are more susceptible to infections than healthy  
159 individuals. Chickenpox and measles, for example, can have a more serious or even fatal course in  
160 patients on immunosuppressant doses of corticosteroids. In such patients who have not had these  
161 diseases, particular care should be taken to avoid exposure. How the dose, route, and duration of  
162 corticosteroid administration affects the risk of developing a disseminated infection is not known. The  
163 contribution of the underlying disease and/or prior corticosteroid treatment to the risk is also not  
164 known. If exposed to chickenpox, prophylaxis with varicella zoster immune globulin (VZIG) may be  
165 indicated. If exposed to measles, prophylaxis with pooled intramuscular immunoglobulin (IG) may be  
166 indicated. (See the respective package inserts for complete VZIG and IG prescribing information). If  
167 chickenpox develops, treatment with antiviral agents may be considered.

168

### 169 **PRECAUTIONS:**

170 **General:** Rarely, immediate hypersensitivity reactions or contact dermatitis may occur after the  
171 administration of FLONASE Nasal Spray. Rare instances of wheezing, nasal septum perforation,  
172 cataracts, glaucoma, and increased intraocular pressure have been reported following the intranasal  
173 application of corticosteroids, including fluticasone propionate.

174 Use of excessive doses of corticosteroids may lead to signs or symptoms of hypercorticism,  
175 suppression of HPA function, and/or reduction of growth velocity in children or teenagers. Physicians  
176 should closely follow the growth of children and adolescents taking corticosteroids, by any route, and  
177 weigh the benefits of corticosteroid therapy against the possibility of growth suppression if growth  
178 appears slowed.

179 Although systemic effects have been minimal with recommended doses of FLONASE Nasal Spray,  
180 potential risk increases with larger doses. Therefore, larger than recommended doses of FLONASE  
181 Nasal Spray should be avoided.

182 When used at higher than recommended doses, or in rare individuals at recommended doses,  
183 systemic corticosteroid effects such as hypercorticism and adrenal suppression may appear. If such  
184 changes occur, the dosage of FLONASE Nasal Spray should be discontinued slowly consistent with  
185 accepted procedures for discontinuing oral corticosteroid therapy.

186 In clinical studies with fluticasone propionate administered intranasally, the development of  
187 localized infections of the nose and pharynx with *Candida albicans* has occurred only rarely. When  
188 such an infection develops, it may require treatment with appropriate local therapy and discontinuation  
189 of treatment with FLONASE Nasal Spray. Patients using FLONASE Nasal Spray over several months  
190 or longer should be examined periodically for evidence of *Candida* infection or other signs of adverse  
191 effects on the nasal mucosa.

192 FLONASE Nasal Spray should be used with caution, if at all, in patients with active or quiescent  
193 tuberculous infection; untreated local or systemic fungal or bacterial, or systemic viral infections or  
194 parasitic infection; or ocular herpes simplex.

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195 Because of the inhibitory effect of corticosteroids on wound healing, patients who have experienced  
196 recent nasal septal ulcers, nasal surgery, or nasal trauma should not use a nasal corticosteroid until  
197 healing has occurred.

198 **Information for Patients:** Patients being treated with FLONASE Nasal Spray should receive the  
199 following information and instructions. This information is intended to aid them in the safe and effective  
200 use of this medication. It is not a disclosure of all possible adverse or intended effects.

201 Patients should be warned to avoid exposure to chickenpox or measles and, if exposed, to consult  
202 their physician without delay.

203 Patients should use FLONASE Nasal Spray at regular intervals as directed since its effectiveness  
204 depends on its regular use. A decrease in nasal symptoms may occur as soon as 12 hours after  
205 starting therapy with FLONASE Nasal Spray. Results in several clinical trials indicate statistically  
206 significant improvement within the first day or two of treatment; however, the full benefit of FLONASE  
207 Nasal Spray may not be achieved until treatment has been administered for several days. The patient  
208 should not increase the prescribed dosage but should contact the physician if symptoms do not  
209 improve or if the condition worsens. For the proper use of the nasal spray and to attain maximum  
210 improvement, the patient should read and follow carefully the accompanying patient's instructions.

211 **Drug Interactions:** In a placebo-controlled, crossover study in eight healthy volunteers,  
212 coadministration of a single dose of orally inhaled fluticasone propionate (1000 mcg, 5 times the  
213 maximum daily intranasal dose) with multiple doses of ketoconazole (200 mg) to steady state resulted  
214 in increased mean fluticasone propionate concentrations, a reduction in plasma cortisol AUC, and no  
215 effect on urinary excretion of cortisol. This interaction may be due to an inhibition of the cytochrome  
216 P450 3A4 isoenzyme system by ketoconazole, which is also the route of metabolism of fluticasone  
217 propionate. No drug interaction studies have been conducted with FLONASE Nasal Spray; however,  
218 care should be exercised when fluticasone propionate is coadministered with long-term ketoconazole  
219 and other known cytochrome P450 3A4 inhibitors.

220 **Carcinogenesis, Mutagenesis, Impairment of Fertility:** Fluticasone propionate demonstrated no  
221 tumorigenic potential in mice at oral doses up to 1000 mcg/kg (approximately 20 times the maximum  
222 recommended daily intranasal dose in adults and approximately 10 times the maximum recommended  
223 daily intranasal dose in children on a mcg/m<sup>2</sup> basis) for 78 weeks or in rats at inhalation doses up to  
224 57 mcg/kg (approximately 2 times the maximum recommended daily intranasal dose in adults and  
225 approximately equivalent to the maximum recommended daily intranasal dose in children on a mcg/m<sup>2</sup>  
226 basis) for 104 weeks.

227 Fluticasone propionate did not induce gene mutation in prokaryotic or eukaryotic cells in vitro. No  
228 significant clastogenic effect was seen in cultured human peripheral lymphocytes in vitro or in the  
229 mouse micronucleus test when administered at high doses by the oral or subcutaneous routes.  
230 Furthermore, the compound did not delay erythroblast division in bone marrow.

231 No evidence of impairment of fertility was observed in reproductive studies conducted in male and  
232 female rats at subcutaneous doses up to 50 mcg/kg (approximately 2 times the maximum  
233 recommended daily intranasal dose in adults on a mcg/m<sup>2</sup> basis). Prostate weight was significantly  
234 reduced at a subcutaneous dose of 50 mcg/kg.

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235 **Pregnancy: Teratogenic Effects:** Pregnancy Category C. Subcutaneous studies in the mouse and rat  
236 at 45 and 100 mcg/kg, respectively (approximately equivalent to and 4 times the maximum  
237 recommended daily intranasal dose in adults on a mcg/m<sup>2</sup> basis, respectively) revealed fetal toxicity  
238 characteristic of potent corticosteroid compounds, including embryonic growth retardation,  
239 omphalocele, cleft palate, and retarded cranial ossification.

240 In the rabbit, fetal weight reduction and cleft palate were observed at a subcutaneous dose of  
241 4 mcg/kg (less than the maximum recommended daily intranasal dose in adults on a mcg/m<sup>2</sup> basis).

242 However, no teratogenic effects were reported at oral doses up to 300 mcg/kg (approximately 25  
243 times the maximum recommended daily intranasal dose in adults on a mcg/m<sup>2</sup> basis) of fluticasone  
244 propionate to the rabbit. No fluticasone propionate was detected in the plasma in this study, consistent  
245 with the established low bioavailability following oral administration (see CLINICAL  
246 PHARMACOLOGY).

247 Fluticasone propionate crossed the placenta following oral administration of 100 mcg/kg to rats or  
248 300 mcg/kg to rabbits (approximately 4 and 25 times, respectively, the maximum recommended daily  
249 intranasal dose in adults on a mcg/m<sup>2</sup> basis).

250 There are no adequate and well-controlled studies in pregnant women. Fluticasone propionate  
251 should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

252 Experience with oral corticosteroids since their introduction in pharmacologic, as opposed to  
253 physiologic, doses suggests that rodents are more prone to teratogenic effects from corticosteroids  
254 than humans. In addition, because there is a natural increase in corticosteroid production during  
255 pregnancy, most women will require a lower exogenous corticosteroid dose and many will not need  
256 corticosteroid treatment during pregnancy.

257 **Nursing Mothers:** It is not known whether fluticasone propionate is excreted in human breast milk.  
258 When tritiated fluticasone propionate was administered to rats at a subcutaneous dose of 10 mcg/kg  
259 (less than the maximum recommended daily intranasal dose in adults on a mcg/m<sup>2</sup> basis), radioactivity  
260 was excreted in the milk. Because other corticosteroids are excreted in human milk, caution should be  
261 exercised when FLONASE Nasal Spray is administered to a nursing woman.

262 **Pediatric Use:** Five hundred (500) patients aged 4 to 11 years of age and 440 patients aged 12 to 17  
263 years were studied in US clinical trials with fluticasone propionate nasal spray. The safety and  
264 effectiveness of FLONASE Nasal Spray in children below 4 years of age have not been established.

265 Oral and, to a less clear extent, inhaled and intranasal corticosteroids have been shown to have the  
266 potential to cause a reduction in growth velocity in children and adolescents with extended use. If a  
267 child or adolescent on any corticosteroid appears to have growth suppression, the possibility that they  
268 are particularly sensitive to this effect of corticosteroids should be considered (see PRECAUTIONS).

269 **Geriatric Use:** A limited number of patients above 60 years of age (n = 275) have been treated with  
270 FLONASE Nasal Spray in US and non-US clinical trials. While the number of patients is too small to  
271 permit separate analysis of efficacy and safety, the adverse reactions reported in this population were  
272 similar to those reported by younger patients.

273



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274 **ADVERSE REACTIONS:** In controlled US studies, more than 3300 patients with seasonal allergic,  
275 perennial allergic, or perennial nonallergic rhinitis received treatment with intranasal fluticasone  
276 propionate. In general, adverse reactions in clinical studies have been primarily associated with  
277 irritation of the nasal mucous membranes, and the adverse reactions were reported with  
278 approximately the same frequency by patients treated with the vehicle itself. The complaints did not  
279 usually interfere with treatment. Less than 2% of patients in clinical trials discontinued because of  
280 adverse events; this rate was similar for vehicle placebo and active comparators.

281 Systemic corticosteroid side effects were not reported during controlled clinical studies up to 6  
282 months' duration with FLONASE Nasal Spray. If recommended doses are exceeded, however, or if  
283 individuals are particularly sensitive, or taking FLONASE Nasal Spray in conjunction with  
284 administration of other corticosteroids, symptoms of hypercorticism, e.g., Cushing's syndrome, could  
285 occur.

286 The following incidence of common adverse reactions (>3%, where incidence in fluticasone  
287 propionate-treated subjects exceeded placebo) is based upon seven controlled clinical trials in which  
288 536 patients (57 girls and 108 boys aged 4 to 11 years, 137 female and 234 male adolescents and  
289 adults) were treated with FLONASE Nasal Spray 200 mcg once daily over 2 to 4 weeks and two  
290 controlled clinical trials in which 246 patients (119 female and 127 male adolescents and adults) were  
291 treated with FLONASE Nasal Spray 200 mcg once daily over 6 months. Also included in the table are  
292 adverse events from two studies in which 167 children (45 girls and 122 boys aged 4 to 11 years) were  
293 treated with FLONASE Nasal Spray 100 mcg once daily for 2 to 4 weeks.

294  
295 **Overall Adverse Experiences With >3% Incidence on Fluticasone Propionate**  
296 **In Controlled Clinical Trials With FLONASE Nasal Spray**  
297 **in Patients ≥4 Years With Seasonal or Perennial Allergic Rhinitis**  
298

	Vehicle Placebo (n = 758) %	FLONASE 100 mcg Once Daily (n = 167) %	FLONASE 200 mcg Once Daily (n = 782) %
Headache	14.6	6.6	16.1
Pharyngitis	7.2	6.0	7.8
Epistaxis	5.4	6.0	6.9
Nasal burning/nasal irritation	2.6	2.4	3.2
Nausea/vomiting	2.0	4.8	2.6
Asthma symptoms	2.9	7.2	3.3
Cough	2.8	3.6	3.8

299  
300 Other adverse events that occurred in ≤3% but ≥1% of patients and that were more common with  
301 fluticasone propionate (with uncertain relationship to treatment) included: blood in nasal mucus, runny  
302 nose, abdominal pain, diarrhea, fever, flu-like symptoms, aches and pains, dizziness, bronchitis.

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303 **Observed During Clinical Practice:** In addition to adverse events reported from clinical trials, the  
304 following events have been identified during postapproval use of fluticasone propionate in clinical  
305 practice. Because they are reported voluntarily from a population of unknown size, estimates of  
306 frequency cannot be made. These events have been chosen for inclusion due to either their  
307 seriousness, frequency of reporting, causal connection to fluticasone propionate, occurrence during  
308 clinical trials, or a combination of these factors.

309 **General:** Hypersensitivity reactions, including angioedema, skin rash, edema of the face and  
310 tongue, pruritus, urticaria, bronchospasm, wheezing, dyspnea, and anaphylaxis/anaphylactoid  
311 reactions, which in rare instances were severe.

312 **Ear, Nose, and Throat:** Alteration or loss of sense of taste and/or smell and, rarely, nasal septal  
313 perforation, nasal ulcer, sore throat, throat irritation and dryness, cough, hoarseness, and voice  
314 changes.

315 **Eye:** Dryness and irritation, conjunctivitis, blurred vision, glaucoma, increased intraocular pressure,  
316 and cataracts.

317

318 **OVERDOSAGE:** Chronic overdosage with FLONASE Nasal Spray may result in signs/symptoms of  
319 hypercorticism (see PRECAUTIONS). Intranasal administration of 2 mg (10 times the recommended  
320 dose) of fluticasone propionate twice daily for 7 days to healthy human volunteers was well tolerated.  
321 Single oral doses up to 16 mg have been studied in human volunteers with no acute toxic effects  
322 reported. Repeat oral doses up to 80 mg daily for 10 days in volunteers and repeat oral doses up to  
323 10 mg daily for 14 days in patients were well tolerated. Adverse reactions were of mild or moderate  
324 severity, and incidences were similar in active and placebo treatment groups. Acute overdosage with  
325 this dosage form is unlikely since one bottle of FLONASE Nasal Spray contains approximately 8 mg of  
326 fluticasone propionate.

327 The oral and subcutaneous median lethal doses in mice and rats were >1000 mg/kg (>20000 and  
328 >41000 times, respectively, the maximum recommended daily intranasal dose in adults and >10000  
329 and >20000 times, respectively, the maximum recommended daily intranasal dose in children on a  
330 mg/m<sup>2</sup> basis).

331

332 **DOSAGE AND ADMINISTRATION:** Patients should use FLONASE Nasal Spray at regular intervals as  
333 directed since its effectiveness depends on its regular use.

334 **Adults:** The recommended starting dosage in adults is two sprays (50 mcg of fluticasone propionate  
335 each) in each nostril once-a-day (total daily dose, 200 mcg). The same dosage divided into 100 mcg  
336 given twice-a-day (e.g., 8 a.m. and 8 p.m.) is also effective. After the first few days, patients may be  
337 able to reduce their dosage to 100 mcg (one spray in each nostril) once daily for maintenance therapy.

338 **Adolescents and Children (4 Years of Age and Older):** Patients should be started with 100 mcg  
339 (one spray in each nostril once-a-day). Patients not adequately responding to 100 mcg may use  
340 200 mcg (two sprays in each nostril). Once adequate control is achieved, the dosage should be  
341 decreased to 100 mcg (one spray in each nostril) daily.

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342 The maximum total daily dosage should not exceed two sprays in each nostril (200 mcg/day). (See  
343 Individualization of Dosage and Clinical Trials sections.)

344 FLONASE Nasal Spray is not recommended for children under 4 years of age.

345 **Directions for Use:** Illustrated patient's instructions for proper use accompany each package of  
346 FLONASE Nasal Spray.

347

348 **HOW SUPPLIED:** FLONASE Nasal Spray 50 mcg is supplied in an amber glass bottle providing 120  
349 actuations, net fill weight 16 g (NDC 0173-0453-01). Each actuation delivers 50 mcg of fluticasone  
350 propionate in 100 mg of formulation through the nasal adapter. The bottle should be discarded when  
351 the labeled number of actuations has been reached even though the bottle is not completely empty.  
352 Each bottle is fitted with a white metering atomizing pump, white nasal adapter, and green dust cover  
353 in a box of one with patient's instructions for use.

354 **Store between 4° and 30°C (39° and 86°F).**

355

356

357 **GlaxoWellcome**

358 Glaxo Wellcome Inc.

359 Research Triangle Park, NC 27709

360

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362

363 U.S. Patent 4,335,121

364

365 INSEAL™ is covered by the following Inprint Systems patent applications:

366 European 94916311.7, Canada 2140025, USA 08/373,213.

367

368 November 1998

RL-645

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(product illustration)

**FLONASE®**  
(fluticasone propionate)  
Nasal Spray, 50 mcg

Please read this leaflet carefully before you start to take your medicine. It provides a summary of information on your medicine. *For further information ask your doctor or pharmacist.*

**WHAT YOU SHOULD KNOW ABOUT RHINITIS**

Rhinitis is a word that means inflammation of the lining of the nose. If you suffer from rhinitis, your nose becomes stuffy and runny. Rhinitis can also make your nose itchy, and you may sneeze a lot. Rhinitis can be caused by allergies to pollen, animals, molds, or other materials—or it may have a nonallergic cause.

**WHAT YOU SHOULD KNOW ABOUT FLONASE NASAL SPRAY**

Your doctor has prescribed FLONASE Nasal Spray, a medicine that can help treat your rhinitis. FLONASE Nasal Spray contains fluticasone propionate, which is a synthetic corticosteroid. Corticosteroids are natural substances found in the body that help fight inflammation. When you spray FLONASE into your nose, it helps to reduce the symptoms of allergic reactions and the stuffiness, runniness, itching, and sneezing that can bother you.

**THINGS TO REMEMBER ABOUT FLONASE NASAL SPRAY**

1. Shake gently before using.
2. Use your nasal spray as directed by your doctor. The directions are on the pharmacy label.
3. Keep your nasal spray out of the reach of children.

37

38

### BEFORE USING YOUR NASAL SPRAY

39

❖ If you are pregnant (or intending to become pregnant),

40

❖ If you are breast-feeding a baby,

41

❖ If you are allergic to FLONASE Nasal Spray or any other nasal

42

corticosteroid,

43

### TELL YOUR DOCTOR BEFORE STARTING TO TAKE THIS

44

**MEDICINE.** In some circumstances, this medicine may not be suitable

45

and your doctor may wish to give you a different medicine. Make sure

46

that your doctor knows what other medicines you are taking.

47

48

### USING YOUR NASAL SPRAY

49

❖ Follow the instructions shown on the next few pages. If you have any problems, tell your doctor or pharmacist.

50

51

❖ It is important that you use it as directed by your doctor. The

52

pharmacist's label will usually tell you what dose to take and how

53

often. If it doesn't, or you are not sure, ask your doctor or pharmacist.

54

55

### DOSAGE

56

❖ For **ADULTS**, the usual starting dosage is **two sprays in each**

57

**nostril once daily.** Sometimes your doctor may recommend using

58

one spray in each nostril twice a day (morning and evening). You

59

should not use more than a total of two sprays in each nostril daily.

60

After you have begun to feel better, one spray in each nostril daily

61

may be adequate for you.

62

63

For **ADOLESCENTS and CHILDREN** (4 years of age and older), the

64

usual starting dosage is **one spray in each nostril once daily.**

65

Sometimes your doctor may recommend using two sprays in each

66

nostril daily. Then, after you have begun to feel better, one spray in

67

each nostril daily may be adequate for you.

68

69

❖ **DO NOT** use more of your medicine or take it more often than your doctor advises.

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71

72

❖ FLONASE may begin to work within 12 hours of the first dose, but it

73

takes several days of regular use to reach its greatest effect. It is

74

important that you use FLONASE Nasal Spray as prescribed by your

75

doctor. Best results will be obtained by using the spray on a regular

- 76 basis. If symptoms disappear, contact your doctor for further  
77 instructions.  
78
- 79 ❖ If you also have itchy, watery eyes, you should tell your doctor. You  
80 may be given an additional medication to treat your eyes. Be careful  
81 not to confuse them, particularly if the second medication is an eye  
82 drop.  
83
- 84 ❖ If you miss a dose, just take your regularly scheduled next dose when  
85 it is due. DO NOT DOUBLE the dose.

### HOW TO USE YOUR NASAL SPRAY

86  
87  
88 Read the complete instructions carefully and use only as directed.

#### BEFORE USING

- 89
- 90  
91
- 92 1. Shake the bottle gently and then remove the dust  
93 cover (Figure 1).  
94
- 95 2. It is necessary to prime the pump into the air the  
96 first time it is used, or when you have not used it  
97 for a week or more. To prime the pump, hold the  
98 bottle as shown with the nasal applicator pointing  
99 away from you and with your forefinger and  
100 middle finger on either side of the nasal applicator  
101 and your thumb underneath the bottle. When you  
102 prime the pump for the first time, press down and  
103 release the pump six times (Figure 2). The pump  
104 is now ready for use. If the pump is not used for  
105 7 days, prime until a fine spray appears.

#### USING THE SPRAY

- 106
- 107  
108
- 109 3. Blow your nose to clear your nostrils.  
110
- 111 4. Close one nostril. Tilt your head forward slightly  
112 and, keeping the bottle upright, carefully insert the  
113 nasal applicator into the other nostril (Figure 3).  
114
- 115 5. Start to breathe in through your nose, and WHILE  
116 BREATHING IN press firmly and quickly down

117 once on the applicator to release the spray. To  
118 get a full actuation, use your forefinger and  
119 middle finger to spray while supporting the base  
120 of the bottle with your thumb. Avoid spraying in  
121 eyes. Breathe gently inwards through the  
122 nostril (Figure 4).

122 Figure 4

- 123
- 124 6. Breathe out through your mouth.  
125
- 126 7. If a second spray is required in that nostril, repeat  
127 steps 4 through 6.  
128
- 129 8. Repeat steps 4 through 7 in the other nostril.  
130
- 131 9. Wipe the nasal applicator with a clean tissue and  
132 replace the dust cover (Figure 5).

132 Figure 5

- 133
- 134 10. Do not use this bottle for more than the labeled number of sprays  
135 even though the bottle is not completely empty. Before you throw the  
136 bottle away, you should consult your doctor to see if a refill is needed.  
137 Do not take extra doses or stop taking FLONASE Nasal Spray  
138 without consulting your doctor.

#### CLEANING

141 Your nasal spray should be cleaned at least once a week. To do this:

- 142
- 143 1. Remove the dust cover and then gently pull upwards to free the nasal  
144 applicator.  
145
- 146 2. Wash the applicator and dust cap under warm tap water. Allow to dry  
147 at room temperature, then place the applicator and dust cover back  
148 on the bottle.  
149
- 150 3. If the nasal applicator becomes blocked, it can be removed as above  
151 and left to soak in warm water. Rinse with cold tap water, dry, and  
152 refit. **Do not try to unblock the nasal applicator by inserting a pin  
153 or other sharp object.**

#### STORING YOUR NASAL SPRAY

- 154
- 155
- 156 ❖ Keep your FLONASE Nasal Spray out of the reach of children.  
157
- 158 ❖ Avoid spraying in eyes.  
159

- 160 ❖ Store between 4° and 30°C (39° and 86°F).  
161  
162 ❖ Do not use your FLONASE Nasal Spray after the date  
163 shown as "EXP" on the label or box.  
164

165 **REMEMBER: This medicine has been prescribed for you by your**  
166 **doctor. DO NOT give this medicine to anyone else.**

167

168 **FURTHER INFORMATION**

169 This leaflet does not contain the complete information about your  
170 medication. *If you have any questions, or are not sure about something,*  
171 *then you should ask your doctor or pharmacist.*  
172

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

175

176

177 **GlaxoWellcome**

178 Glaxo Wellcome Inc.

179 Research Triangle Park, NC 27709

180

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182 U.S. Patent No. 4,335,121

183

184 November 1998

RL-645



DEC - 8 1998

## LABELING REVIEW

Application # 20-121/S-009

Products Flonase (fluticasone propionate) Nasal Spray, 50 mcg

Applicant GlaxoWellcome, Inc.

## Submissions Reviewed:

Glaxo submitted proposed labeling for the package insert only in the original application. Following review of the supplement, FDA provided a revised package insert via facsimile on November 5, 1998, and requested that Glaxo include a revised patient package insert as well as a package insert in a labeling amendment to the application. Glaxo provided amended labeling to the application on November 12, 1998, including additional changes. These additional changes were verified or revised, and Glaxo submitted amended labeling on December 1, 1998.

The December 1, 1998, package insert and patient package insert were reviewed against the October 1, 1998, approved labeling for S-010.

## Review:

1. The product name was revised to "Flonase (fluticasone propionate) Nasal Spray, 50 mcg,"
2. The following changes were proposed for the CLINICAL PHARMACOLOGY, Pharmacokinetics subsection of the package insert to be consistent with Flovent Rotadisk labeling.
  - a. Under "**Distribution**," the 1<sup>st</sup> sentence was revised to read, "Following intravenous administration, **the initial disposition phase for fluticasone propionate was rapid and consistent with its high lipid solubility and tissue binding. The volume of distribution averaged 4.2 L/kg.**"
  - b. Under "**Metabolism**," the 1<sup>st</sup> paragraph was revised to read, "The total blood clearance of fluticasone propionate is **high (average, 1093 mL/min), with renal clearance accounting for less than 0.02% of the total.** The only circulating metabolite detected in man is the 17 $\beta$ -carboxylic acid derivative of fluticasone propionate, **which is formed through the cytochrome P450 3A4 pathway. This inactive metabolite had approximately 2000 times less affinity than the parent drug for the glucocorticoid receptor of human lung-cytosol in vitro and negligible pharmacological activity in animal studies.** Other metabolites detected **in vitro** using cultured human hepatoma cells have not been detected in man."

- c. Under "**Excretion**," the first sentence was revised to read, "Following intravenous dosing, fluticasone propionate showed **polyexponential kinetics and had a terminal** elimination half-life of approximately 7.8 hours."

These revisions were approved per Ramana Uppoor, Clinical Pharmacology & Biopharmaceutics Team Leader.

3. Under CLINICAL PHARMACOLOGY, Clinical Trials subsection, the following revisions have been made.

- a. The word [redacted] has been deleted from the first sentence in accordance with an October 13, 1998, FDA letter regarding final printed labeling submitted for S-005.
- b. The term "total nasal symptoms scores" has been revised to "total nasal **symptom score**," in agreement with the November 5, 1998, recommended FDA labeling.
- c. [redacted] has been deleted, in accordance with the October 1, 1998, approved labeling for S-010.
- d. The third paragraph has been added and reads, "Three randomized, double-blind, parallel, vehicle-controlled trials were conducted in 1191 patients with perennial nonallergic rhinitis. These trials evaluated the patient-rated total nasal symptom scores (nasal obstruction, postnasal drip, rhinorrhea) in patients treated for 28 days of double-blind therapy and in one of the 3 trials for 6 months of open-label treatment. **Two of these trials demonstrated** that patients treated with FLONASE Nasal Spray at a dose of 100 mcg twice daily exhibited statistically significant decreases in total nasal symptom scores compared with patients treated with vehicle." This language was approved (October 21, 1998, medical officer review) with revisions [boldface] which were proposed in accordance with the November 5, 1998, recommended FDA labeling.

4. Under CLINICAL PHARMACOLOGY, Individualization of Dosage subsection, the 2<sup>nd</sup> sentence has been replaced. The previous sentence read, [redacted] The proposed sentence reads, "In 4 randomized, double-blind, placebo-controlled, parallel group allergic rhinitis studies and 2 studies of patients in an outdoor 'park' setting (park studies), a decrease in nasal symptoms in treated subjects compared to placebo was shown to occur as soon as 12 hours after treatment with a 200 mcg dose of

FLONASE Nasal Spray." This change is in accordance with the November 5, 1998, proposed FDA labeling.

5. Under INDICATIONS AND USAGE, the following revisions were proposed in the December 17, 1997, draft labeling.

a. The 1<sup>st</sup> paragraph was revised to read, "FLONASE Nasal Spray is indicated for the management of nasal symptoms of seasonal and perennial allergic **and nonallergic** rhinitis in adults and pediatric patients 4 years of age and older."

b. The 1<sup>st</sup> sentence of the 2<sup>nd</sup> paragraph, indicating that [redacted] has been deleted.

Both of these revisions were acceptable per the October 21, 1998, medical review.

6. Under PRECAUTIONS, Pregnancy: Teratogenic Effects subsection, the dose correlation to human exposure has been changed from [redacted] to "less than," in accordance with November 5, 1998, recommended FDA labeling.

7. Under PRECAUTIONS, Nursing Mothers subsection, the 2<sup>nd</sup> sentence was revised to read, "When tritiated fluticasone propionate was administered to rats at a subcutaneous dose of 10 mcg/kg (less than the maximum recommended daily intranasal dose in adults on a mcg/m<sup>2</sup> basis), radioactivity was excreted in the milk." The revised sentence differs from recommended FDA language contained in the November 5, 1998, correspondence, but was acceptable to Lawrence Sancilio, Preclinical Reviewer, and Joseph Sun, Preclinical Team Leader, as of November 20, 1998.

8. Under PRECAUTIONS, Geriatric Use subsection, the number of treated patients was changed to n=275. The revision was acceptable per the October 21, 1998, medical officer review.

9. Under ADVERSE REACTIONS, the 1<sup>st</sup> sentence has been revised to read, "In controlled US studies, **more than 3300 patients with seasonal allergic, perennial allergic, and perennial nonallergic rhinitis** received treatment with intranasal fluticasone propionate." This proposed revision was acceptable to Alexandra Worobec, Medical Officer, in verbal communications on November 30, 1998, and per the October 21, 1998, medical officer review.

10. Under ADVERSE REACTIONS, [redacted] has been removed from the 4<sup>th</sup> paragraph and combined in the table with "nasal burning." This change was acceptable per the October 21, 1998, medical officer review.

11. Under DOSAGE AND ADMINISTRATION, Adolescents and Children subsection, the [redacted] was deleted. This revision is acceptable upon approval of this supplement for the indication for nonallergic rhinitis.
12. In the Patient's Instructions for Use, under "HOW TO USE YOUR NASAL SPRAY," item #2, third sentence, the phrase [redacted] has been deleted. Additionally, the fifth sentence has been revised to read, "If the pump is not used for 7 days, **prime** until a fine spray appears." Both of these revisions are in accordance with the October 1, 1998, approval letter for S-010.

**CONCLUSIONS:** All of the proposed revisions are acceptable and labeling for this supplemental application should be approved based on the December 1, 1998, submitted draft labeling.

David Hilfiker  
Project Manager  
Division of Pulmonary Drug Products

[Handwritten signature: /S/ 12-8-98]

Concurrences: HFD-570/Worobec  
HFD-570/Himmel  
HFD-570/Sancilio  
HFD-570/Sun  
HFD-570/Uppoor

[Handwritten signature: /S/ 12/08/98]

[Handwritten signature: /S/ 12/9/98] [Handwritten signature: /S/ 120998]

Cc: Original NDA 20-121/S-009  
HFD-570/division file  
HFD-570/Hilfiker, Schumaker

[Handwritten signature: /S/ 12-8-98]

**APPEARS THIS WAY  
ON ORIGINAL**

ADDENDUM TO LABELING REVIEW

Date: October 29, 1998

By: David Hilfiker, Project Manager

For: 20-121/S-009 Flonase (fluticasone propionate) Nasal Spray  
Efficacy supplement which provides for addition of perennial nonallergic rhinitis (PNAR) as an indication

Due: December 18, 1998

Reference to labeling comments on page 267 of the October 21, 1998, clinical review, and revisions to those labeling recommendations on page 4 of the October 20, 1998, clinical team leader memo.

Under CLINICAL PHARMACOLOGY, Individualization of Dosage subsection, the clinical review recommended language referring to 2 "park studies" that were conducted in support of this supplement. The term "park study" was questioned as a recognizable term for practicing physicians.

Alternate recommended language was proposed which has been used in other recent package insert in reference to this type of study. The second sentence of the Individualization of Dosage subsection was modified to read: "In 4 randomized, double-blind, placebo-controlled, parallel group allergic rhinitis studies and 2 studies of patients in an outdoor 'park' setting (park studies), a decrease in nasal symptoms in treated subjects compared to placebo was shown to occur as soon as 12 hours after treatment with a 200 mcg dose of FLONASE Nasal Spray."

David Hilfiker  
Project Manager

**/S/**  
10-29-98

**/S/**  
10-30-98

Cc: Original NDA 20-121/S-009  
HFD-570/div file, Hilfiker, Schumaker, Worobec, Himmel

APPEARS THIS WAY  
ON ORIGINAL

## 2. LABELING

This section presents a draft package insert incorporating the labeling changes proposed via this supplement. In section 2.I, proposed changes are indicated by underline (additions) and strikethrough (deletions). In section 2.II, these same proposed changes are annotated to the appropriate supporting data. Revisions to accommodate the new indication have been made to the following sections of the package insert:

- final paragraph of the Clinical Trials subsection of Clinical Pharmacology
- Indications and Usage
- Geriatric Use subsection of Precautions
- Adverse Reactions
- Dosage and Administration

This labeling incorporates the most recent changes made to the package insert for Flonase Nasal Spray:

- Special Supplement: Changes Being Effected of October 15, 1997
- Attachment to Approval letter for Supplement S-005 (Pediatric Use) of October 31, 1997.

As noted in the Phase IV commitments for [REDACTED] will be implemented gradually; the draft labeling provided with this supplement includes the change.

The changes proposed via this supplement have no impact on the patient's instructions for use, carton or bottle label for Flonase Nasal Spray.

APPEARS THIS WAY  
ON ORIGINAL

11 Page(s) Redacted

DRAFT

Labeling