# Evaluation of Intranasal Corticosteroid Sensory Attributes and Patient Preference for Fluticasone Furoate for the Treatment of Allergic Rhinitis

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## ABSTRACT

**Purpose:** Allergic rhinitis (AR) is a highly prevalent disease, affecting the quality of life of millions of Americans. Intranasal corticosteroids (INCs) are widely recommended as first-line therapy for moderate to severe AR. Although these drugs exhibit similar safety and efficacy, a potentially differentiating factor within this class is the varying sensory attributes associated with each INC. The objective of this literature review was to evaluate product characteristics, sensory attributes, and patient preferences of fluticasone furoate intranasal spray (FFNS) compared with other INCs.

**Methods:** A narrative literature search for studies evaluating FFNS was performed in MEDLINE and Google Scholar. Key terms included "allergic rhinitis," "anti-allergic agents," "intranasal administration," "fluticasone furoate," and "patient preference." Studies published from 2007 to present were included. Nine trials met the search criteria, each evaluating FFNS versus placebo or other INCs for efficacy, safety, and/or preference, and were included. Approximately 2400 patients with AR were enrolled across varying study protocols.

**Findings:** In 4 placebo-controlled trials, FFNS showed significant efficacy in relieving symptoms of AR and a tolerable safety profile. Three trials evaluating FFNS and fluticasone propionate nasal spray (FPNS) found that FFNS was significantly preferred over FPNS regarding scent, aftertaste, and leakage down the throat/nose. The results of 2 trials found that FFNS was preferred overall over mometasone furoate nasal spray (MFNS).

**Implications:** INCs are effective first-line treatments for AR and show significant reduction in nasal and ocular symptoms. Patients preferred the scent, aftertaste, and mist gentleness of FFNS ~2:1 over the same sensory attributes of FPNS. Patients experienced less negative sensory characteristics with FFNS compared with MFNS, preferring FFNS to MFNS overall. Selecting an INC with favorable attributes in accordance with patient preferences could potentially improve adherence, therapeutic outcomes, and health care costs. (*Clin Ther*. 2019;41:1589–1596) © 2019 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

**Keywords:** allergic rhinitis, antiallergic agents, corticosteroids, fluticasone furoate, intranasal administration, patient preference.

## INTRODUCTION

Allergic rhinitis (AR) is a chronic inflammatory disease affecting 10% to 30% of Americans and >1 billion people worldwide, with increasing prevalence.[1,2] AR can have a significant impact on patient quality of life and health care costs. AR can also cause serious complications and is a risk factor for the development of asthma.[2] AR is an antibody-mediated disorder involving inflammation of the nasal mucosa caused by interaction of allergens with immunoglobulin E antibodies bound to the surface of mast cells.[3] Activated mast cells release a host of inflammatory mediators, resulting in an immediate hypersensitivity reaction and allergic symptoms.[3] Classic presenting symptoms include nasal congestion, rhinorrhea, sneezing, and nasal itching.[2]

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Traditionally, AR is classified as seasonal or perennial. Seasonal allergic rhinitis (SAR), also known as hay fever, occurs during seasons with high counts of outdoor allergens such as pollen or mold.[4] Perennial allergic rhinitis (PAR) generally occurs throughout the year and is triggered by a variety of indoor allergens such as dust mites, animal dander, cockroaches, and mold.[4] Classification is based on symptom severity, categorized as mild or moderate/severe, and the extent of impairment of daily activities and quality of life, as well as the duration of symptoms.[3] Clinical trials and studies generally use SAR and PAR to differentiate types of AR and patients. Overall, guideline recommendations for treatment are made based on symptom frequency, duration, and severity.

Many medication classes are available, by prescription or over-the-counter (OTC). Intranasal corticosteroids (INCs) have become the mainstay of AR therapy and are recommended as first-line treatment for moderate or severe AR.[2] There are multiple INCs, including beclomethasone, budesonide, ciclesonide, flunisolide, fluticasone furoate, fluticasone propionate, mometasone, and triamcinolone.[2] Their potent anti-inflammatory effects lead to a reduction in inflammation, edema, and vascular leakage, and thus improve rhinorrhea and congestion. INCs decrease the number of histamine-containing mast cells in the nasal mucosa, improving pruritus and sneezing.[5] INCs are preferred for persistent AR, defined as >4 days per week or >4 weeks per year,[3] as they are highly effective at preventing and relieving symptoms of both early- and late-phase reactions.

Although systemic steroids have significant side effects, INCs have limited systemic bioavailability, and when used at recommended doses and durations, they have very low rates of systemic adverse events (AEs) such as hypothalamic-pituitary-adrenal axis suppression or growth suppression sometimes reported with oral steroids.[6]

An updated practice parameter, established by the American Academy of Allergy, Asthma & Immunology and the American College of Allergy, Asthma and Immunology, provides recommendations for clinicians, based on quality of evidence, to guide treatment decisions in management of their patients with AR. According to these guidelines, INCs are the most effective monotherapy for relieving and preventing symptoms associated with SAR and PAR, including nasal congestion.[2]

## Adherence and Sensory Attributes

Patient adherence is essential in the treatment of any disease because improved health and optimal outcomes are dependent on patients receiving their medication appropriately. Adherence is imperative in long-term management of AR with INCs, and lack of adherence can be an obstacle to effective treatment. In the setting of AR, most patients should be treated before being exposed to allergens to keep allergy symptoms under control.[7] Patient education is crucial in improving adherence to INC therapy because without education, patients may not understand the need to use their medication regularly for maintenance, instead of using it as needed in an attempt to treat acute symptoms. INCs should be used continually for 3 to 4 weeks to achieve maximum benefit and relief,[8] but if only used when symptomatic, interrupted therapy can lead to suboptimal relief. As a result, patients may believe their AR medication does not work or has fading effectiveness, which may be due to the lack of immediate relief of symptoms when using INCs. If patients do not find relief, the perceived lack of efficacy can lead to continued unresolved symptoms and future nonadherence.

The Allergies in America landmark study surveyed 2500 adults with AR and their health care providers.[9] Patients reported significantly less satisfaction than their providers claimed. Almost one half of patients reported that their medication does not provide 24-hour relief and lost effectiveness after a few months. In another survey, of 860 respondents who had asked a physician to change their allergy medication, 66% reported lack of effectiveness as the reason for the change.[10] Another common reason for nonadherence with nasal allergy medication is bothersome side effects.[9] Such side effects associated with INCs are mainly sensory, largely related to the device and spray attributes. INCs possess several sensory attributes that contribute to patients' acceptance of the medication and willingness to adhere to treatment. These attributes are characteristics of the medication, including the actual device and spray (eg, scent, taste, irritation, or leakage).

A cross-sectional study asked patients to choose between sensory attributes of INCs: smell, taste, throat rundown, nose runout, and feel of spray.[11] According to patients, the most important attribute is taste or

aftertaste. Unpleasant sensory attributes can lead to decreased patient adherence to treatment, leading to suboptimal outcomes in AR management.[11] If instructed to take the medicine daily for 90 days, 77% of patients stated that they would be willing to adhere to the regimen if given an INC containing the lowest level of each sensory attribute. However, willingness to adhere dropped to 4% if patients were given an INC with moderate sensory levels. Furthermore, studies show that patients would be willing to pay more to avoid these unwanted sensory attributes.[12] Being aware of a patient's health-related preferences allows for treatment to be optimized, increasing the likelihood of adherence to an efficacious regimen.[13] Advice can be provided by health care providers, and patient adherence may be improved, by establishing open communication between patients and their health care providers so that adherence barriers can be discussed.[14] Education in terms of disease and potential complications as well as a discussion about available and alternative treatment options are key to helping patients identify their expectations and preferences. Health care providers have the opportunity to improve patient satisfaction with their medication and outcomes of treatment.

## MATERIALS AND METHODS

A comprehensive literature search was conducted to evaluate patient preference for certain sensory characteristics attributed to INCs, specifically fluticasone furoate intranasal spray (FFNS). This review was performed in MEDLINE and Google Scholar, using the keywords "allergic rhinitis," "anti-allergic agents," "intranasal administration," "fluticasone furoate," and "patient preference." Studies published from 2007 to May 2017 were included to account for first availability of drug. A total of 5 trials met the search criteria, each evaluating FFNS versus placebo or other INCs for efficacy, safety, and/or preference, and were included. Approximately 2400 patients with AR were enrolled across varying study protocols.

## RESULTS

### INC Efficacy

An integrated analysis of 5 randomized placebo-controlled trials evaluated the efficacy of FFNS 110 μg once daily for 2 weeks in adult and adolescent patients with SAR. Significant improvements were noted in all individual nasal and ocular symptoms in the FFNS group versus placebo, consistent across different pollen allergy seasons, geographical locations, and patient ethnicity.[15] Nasal symptoms evaluated included pruritus, sneezing, congestion, and rhinorrhea. Ocular symptoms included itching/burning, tearing/watering, and redness. Studies have shown that INCs are more effective than oral antihistamines for reduction of nasal symptoms and exhibit similar effectiveness for associated ocular symptoms.[2,16]

### Safety

Long-term use of corticosteroids with potentially significant systemic exposure can result in dose-related systemic AEs such as hypothalamic-pituitary-adrenal axis suppression, bone metabolism dysfunction, and growth suppression in children. Recognized AEs of corticosteroids include weight gain, osteoporosis, and hyperglycemia. Incidence of psychiatric and cognitive disturbances is rarer.[17] Topical corticosteroids administered intranasally, when used at recommended doses, are generally preferred over oral forms because they can achieve sufficient drug concentrations directly into the nasal mucosa, reducing the risk of AEs while providing effective allergy relief.[18] The most common local side effects include nasal dryness, burning, stinging, and sneezing. Nasal irritation and bleeding can occur, and nasal septal perforation is rare.[2] Temporarily stopping the medication, switching to another device, or counseling the patient on proper administration technique could alleviate these issues.[2] Due to similar efficacy and safety profiles within the INC class, differentiating factors are patient preference, dosing regimen, and delivery device.[19]

### Preference

Many clinical trials that evaluate efficacy and safety of newer formulations of INCs also include evaluations of patient preference of certain sensory attributes. Nine studies compared FFNS with placebo or other INCs for efficacy, safety, and preference.[8,20–26] In 4 placebo-controlled trials, FFNS exhibited significant efficacy in relieving symptoms of AR and a tolerable safety profile. These trials also assessed product and sensory attributes of FFNS, including administration ease, spray tip comfort, mist gentleness, spray leakage, and aftertaste (Figure). The placebo control used during the registrational trials allowed for the evaluation of

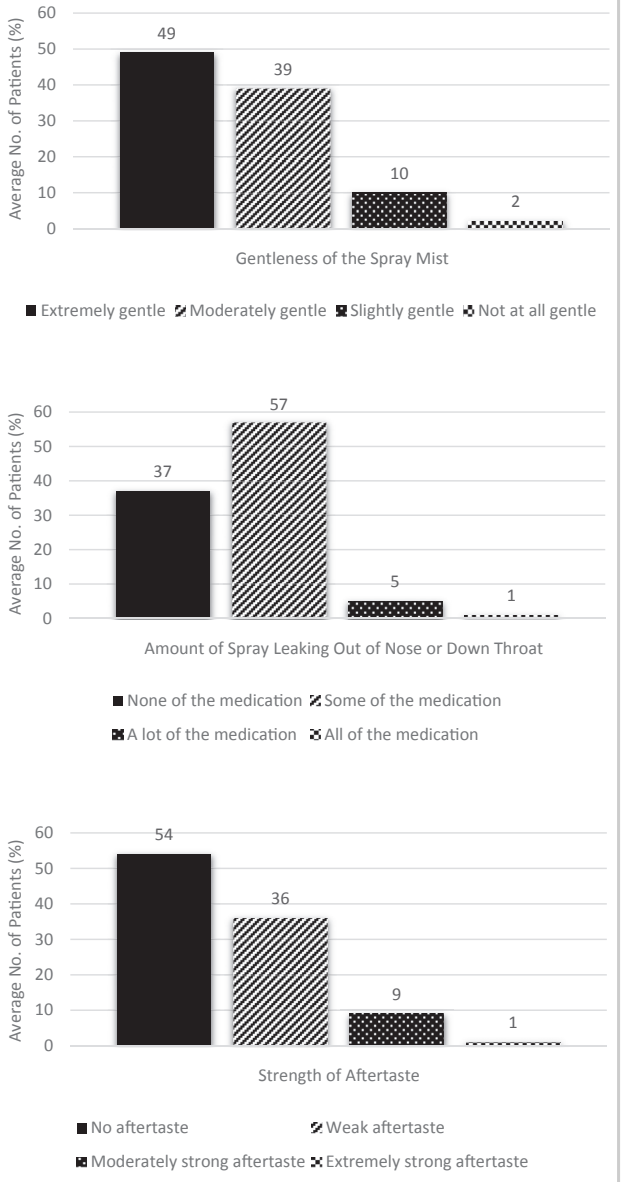


Figure. Product and sensory attributes of fluticasone furoate intranasal spray.[30–32]

product efficacy and safety in a blinded fashion. Because both placebo and active drug recipients used the same delivery device, sensory attribute data were collected from all study participants. Overall, patients found the FFNS device easy to use and comfortable, and the mist to be gentle with little leakage or aftertaste. Of the studies comparing FFNS with an active comparator, 3 studies compared FFNS with fluticasone propionate nasal spray,[20,24,25] and 2 with mometasone furoate nasal spray.[26,27] Overall, FFNS was significantly preferred over the other 2 INCs for a majority of sensory attributes (Table). Regardless of the presence or absence of active ingredient, the device performance in delivering on its design intent, improving upon the sensory attributes, was positively demonstrated. To increase patient compliance and show the efficacy of the product, the nasal spray sensory experience needs to be positive.

## DISCUSSION AND CONCLUSIONS

AR is a significant health problem with economic burdens that impairs patients' quality of life. In 2005, ~22 million Americans reported experiencing AR-related symptoms, visiting a physician, or receiving a prescription medication for AR.[28] A total of $6.1 billion, adjusted for inflation, was spent on health care and treatment of AR in 2000 (excluding OTC medications). By 2005, total expenditures to treat AR almost doubled to $11.2 billion.[28] AR is commonly treated with OTC allergy medications, a direct cost that was as high as $1.5 billion in 2008.[29]

AR is also associated with a large amount of indirect costs, primarily money lost due to decreased productivity and days off work or school. AR symptoms can significantly affect patients' quality of life and are often associated with fatigue, headache, cognitive impairment, and sleep disturbance.[2]

Medication cost should be balanced with effective treatment, resolution of symptoms, and patients' quality of life. Studies have shown that patients are willing to adhere to an effective treatment without adverse sensory attributes. Patient adherence and patient preferences related to medication selection can lead to better treatment outcomes and potentially have a positive effect on total costs to treat AR.

INCs have a well-established role in the treatment of AR. Many of these agents are available OTC. When comparing the sensory attributes of FFNS with those of other INCs, patients preferred FFNS overall. Patients significantly preferred the scent or odor, aftertaste, and gentleness of the mist of FFNS over the same sensory attributes of fluticasone propionate nasal spray. Patients also experienced less unfavorable effects, significantly preferring FFNS to mometasone furoate nasal spray overall. Combined, these factors suggest that FFNS may be associated with improved adherence and decreased health care

Table. Patient preference for specific sensory attributes of fluticasone furoate intranasal spray (FFNS) compared with those of fluticasone propionate nasal spray (FPNS) or mometasone furoate nasal spray (MFNS).

| Study | Design | Patient Population | Sensory Attributes | | | | |
|---|---|---|---|---|---|---|---|
| | | | | FFNS Preferred | FPNS Preferred | *P* | |
| Meltzer et al,[24] 2008 | Randomized, double-blind, single-dose, crossover (N = 127) | PAR and/or SAR<br>Mean age, 39.7 y<br>80% white<br>65% women | Odor | 64% | 29% | <0.001 | No significant differences for soothing, nasal irritation, or sneezing |
| | | | Taste | 47% | 21% | <0.001 | |
| | | | Less aftertaste | 44% | 22% | 0.002 | |
| | | | Drip down the throat | 43% | 27% | 0.004 | |
| | | | Nose runoff | 49% | 19% | <0.001 | |
| | | | Overall preference | 60% | 33% | 0.003 | |
| Mohar et al,[20] 2009 | Randomized, double-blind, crossover, 2-week (N = 377) | SAR<br>Mean age, 39.9 y<br>89% white<br>69% women | Scent/odor | 55% | 25% | <0.001 | No significant differences for delivery of consistent amount and comfort of nose tip |
| | | | Less aftertaste | 68% | 13% | <0.001 | |
| | | | Leaking out of nose/down throat | 58% | 21% | <0.001 | |
| | | | Gentleness of mist | 56% | 20% | <0.001 | |
| | | | Ease of use | 31% | 51% | 0.003 | |
| | | | Spray delivery method | 32% | 50% | 0.014 | |
| Meltzer et al,[25] 2010 | Randomized, double-blind, multidose, crossover, 2-week (N = 360) | SAR<br>Mean age, 38.3 y<br>72% white<br>59% women | Scent/odor | 58% | 27% | <0.001 | No significant differences for ease of use, delivery of consistent amount, delivery method, and device comfort |
| | | | Less aftertaste | 60% | 18% | <0.001 | |
| | | | Leaking out of nose/down throat | 59% | 21% | <0.001 | |
| | | | Gentleness of mist | 57% | 26% | <0.001 | |
| | | | | FFNS Preferred | MFNS Preferred | *P* | |
| Yonezaki et al,[26] 2016 | Randomized, crossover, prospective, 4-week (N = 40) | SAR<br>Mean age, 51.7 y<br>100% Japanese<br>58% men | Bitter taste* | 0.98 | 2.06 | 0.01 | *Patients were asked to score product attributes on a scale from 0–10, with lower scores |
| | | | Run down the throat* | 1.2 | 2.27 | 0.033 | |
| | | | Run out of the nose* | 1.31 | 2.92 | 0.002 | |
| | | | Nasal irritation* | 1.22 | 2.43 | 0.012 | |

(*continued on next page*)

Table. (*Continued*)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Urge to sneeze* | 0.78 | 1.69 | 0.017 | indicating favorable |
| | | | Rhinorrhea* | 1.18 | 2.53 | 0.007 | sensory attributes or |
| | | | Overall preference | 53% | 23% | <0.001 | characteristics |
| | | | | | | | No significant differences for discomfort from the nozzle, ease to operate, and ease to press trigger |
| Yanez et al,[27] 2016 | Randomized, double-blind, single-dose, crossover (N = 300) | Median age, 40.4 y<br>73% white<br>62% women | Scent/odor | 29% | 19% | 0.065 | No significant difference |
| | | | Less drip through throat | 37% | 18% | <0.001 | for taste/aftertaste or |
| | | | Less run out of nose | 34% | 21% | 0.017 | urge to sneeze |
| | | | More soothing | 44% | 30% | 0.046 | |
| | | | Less irritating | 38% | 16% | <0.001 | |
| | | | Overall preference | 56% | 32% | <0.001 | |

PAR = perennial allergic rhinitis; SAR = seasonal allergic rhinitis.

costs, although this factor was not measured directly in these studies. In addition, more studies are needed to compare all of the agents and in nonallergic rhinitis.

These sensory characteristics have been shown to influence patient preference when comparing INCs for prevention and treatment of AR symptoms. Health care providers can be a useful resource, advising patients so that they recognize the importance of sensory attributes. Furthermore, the patient having a clear understanding of how these agents work is essential to their correct usage and should lead to more successful pharmacotherapy. In addition, an understanding of the sensory attributes and potential patient preferences that contribute to adherence will allow health care providers to provide informed treatment recommendations for patients with AR. Discussing the balance of efficacy, tolerance, and cost with the patient should lead to better outcomes that are associated with better compliance.

## CONFLICTS OF INTEREST

The authors have indicated that they have no conflicts of interest regarding the content of this article.

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## REFERENCES

1. Settipane RA, Schwindt C. Chapter 15: allergic rhinitis. *Am J Rhinol Allergy*. 2013;27(Suppl 1):S52–S55.
2. Wallace DV, Dykewicz MS, Bernstein DI, et al. The diagnosis and management of rhinitis: an updated practice parameter. *J Allergy Clin Immunol*. 2008;122(Suppl 2): S1–S84.
3. Bousquet J, Khaltaev N, Cruz AA, et al. Allergic rhinitis and its impact on asthma (ARIA) 2008 update (in collaboration with the World Health Organization, GA(2)LEN and AllerGen). *Allergy*. 2008;63(Suppl 86):8–160.
4. Bauchau V, Durham SR. Epidemiological characterization of the intermittent and persistent types of allergic rhinitis. *Allergy*. 2005;60:350–353.

5. Mygind N, Nielsen LP, Hoffmann HJ, et al. Mode of action of intranasal corticosteroids. *J Allergy Clin Immunol*. 2001;108(Suppl 1): S16–S25.
6. Benninger MS, Ahmad N, Marple BF. The safety of intranasal steroids. *Otolaryngol Head Neck Surg*. 2003;129: 739–750.
7. Bousquet J, Van Cauwenberge P, Khaltaev N, Aria Workshop Group, World Health Organization. Allergic rhinitis and its impact on asthma. *J Allergy Clin Immunol*. 2001;108(Suppl 5):S147–S334.
8. Nathan RA, Berger W, Yang W, et al. Effect of once-daily fluticasone furoate nasal spray on nasal symptoms in adults and adolescents with perennial allergic rhinitis. *Ann Allergy Asthma Immunol*. 2008;100:497 –505.
9. HealthStar Communications, Inc, in partnership with Schulman, Ronca and Bucuvalas, Inc. *Allergies in America: A Landmark Survey of Nasal Allergy Sufferers. Executive Summary*. Florham Park, NJ: Altana Pharma US, Inc; 2006.
10. Valovirta E, Ryan D. Patient adherence to allergic rhinitis treatment: Results from patient surveys. *Medscape J Med*. 2008;10(10):247.
11. Mahadevia PJ, Shah S, Leibman C, Kleinman L, O'Dowd L. Patient preferences for sensory attributes of intranasal corticosteroids and willingness to adhere to prescribed therapy for allergic rhinitis: a conjoint analysis. *Ann Allergy Asthma Immunol*. 2004;93:345–350.
12. Mahadevia P, Shah S, Mannix S, et al. Willingness to pay for sensory attributes of intranasal corticosteroids among patients with allergic rhinitis. *J Manag Care Pharm*. 2006;12(2):143–151.
13. Brennan PF, Strombom I. Improving health care by understanding patient preferences: the role of computer technology. *J Am Med Inform Assoc*. 1998;5:257–262.
14. Sher ER, Ross JA. Intranasal corticosteroids: the role of patient preference and satisfaction. *Allergy Asthma Proc*. 2014;35:24–33.
15. Maspero JF, Walters RD, Wu W, Philpot EE, Naclerio RM, Fokkens WJ. An integrated analysis of the efficacy of fluticasone furoate nasal spray on individual nasal and ocular symptoms of seasonal allergic rhinitis. *Allergy Asthma Proc*. 2010;31: 483–492.
16. Weiner JM, Abramson MJ, Puy RM. Intranasal corticosteroids versus oral H1 receptor antagonists in allergic rhinitis: systematic review of randomised controlled trials. *BMJ*. 1998;317:1624–1629.
17. Ciriaco M, Ventrice P, Russo G, et al. Corticosteroid-related central nervous system side effects. *J Pharmacol Pharmacother*. 2013;4(Suppl 1):S94–S98.
18. Mygind N, Dahl R. The rationale for use of topical corticosteroids in allergic rhinitis. *Clin Exp Allergy*. 1996;26(Suppl 3):2–10.
19. Trangsrud AJ, Whitaker AL, Small RE. Intranasal corticosteroids for allergic rhinitis. *Pharmacotherapy*. 2002;22: 1458–1467.
20. Mohar D, La Force C, Berger W, et al. Efficacy of fluticasone furoate nasal spray in conjunction with patient preference. *Ann Allergy Asthma Immunol*. 2009;102:P334.
21. Fokkens WJ, Jogi R, Reinartz S, et al. Once daily fluticasone furoate nasal spray is effective in seasonal allergic rhinitis caused by grass pollen. *Allergy*. 2007;62:1078–1084.
22. Jacobs R, Martin B, Hampel F, Toler W, Ellsworth A, Philpot E. Effectiveness of fluticasone furoate 110 microg once daily in the treatment of nasal and ocular symptoms of seasonal allergic rhinitis in adults and adolescents sensitized to mountain cedar pollen. *Curr Med Res Opin*. 2009;25:1393–1401.
23. Kaiser HB, Naclerio RM, Given J, Toler TN, Ellsworth A, Philpot EE. Fluticasone furoate nasal spray: a single treatment option for the symptoms of seasonal allergic rhinitis. *J Allergy Clin Immunol*. 2007;119:1430–1437.
24. Meltzer EO, Stahlman JE, Leflein J, et al. Preferences of adult patients with allergic rhinitis for the sensory attributes of fluticasone furoate versus fluticasone propionate nasal sprays: a randomized, multicenter, double-blind, single-dose, crossover study. *Clin Ther*. 2008;30:271–279.
25. Meltzer EO, Andrews C, Journeay GE, et al. Comparison of patient preference for sensory attributes of fluticasone furoate or fluticasone propionate in adults with seasonal allergic rhinitis: a randomized, placebo-controlled, double-blind study. *Ann Allergy Asthma Immunol*. 2010;104:331–338.
26. Yonezaki M, Akiyama K, Karaki M, et al. Preference evaluation and perceived sensory comparison of fluticasone furoate and mometasone furoate intranasal sprays in allergic rhinitis. *Auris Nasus Larynx*. 2016;43: 292–297.
27. Yanez A, Dimitroff A, Bremner P, et al. A patient preference study that evaluated fluticasone furoate and mometasone furoate nasal sprays for allergic rhinitis. *Allergy Rhinol (Providence)*. 2016;7:e183–e192.
28. Soni A. Allergic rhinitis: trends in use and expenditures, 2000 and 2005. Agency for healthcare research and quality (AHRQ). *Med Expenditure Panel Surv (MEPS) Stat Brief #204*. May 2008.
29. Stewart M, Ferguson B, Fromer L. Epidemiology and burden of nasal congestion. *Int J Gen Med*. 2010;3:37 –45.
30. *Effectiveness of Fluticasone Furoate 110 mcg Once Daily in the Treatment of Nasal and Ocular Symptoms of Seasonal Allergic Rhinitis in Adults and Adolescents Sensitized to Mountain Cedar Pollen. FFR30003, Page 452, Table 11.1: Summary of Product Characteristics Questionnaire*; November 17, 2005. GSK Clinical Study Register.

Available at: http://www.gsk-clinicalstudyregister.com/files/FFR30003/5180/gsk-ffr30003-clinical-study-report-redact.pdf.

31. *Effect of Once-Daily Fluticasone Furoate Nasal Spray on Nasal Symptoms in Adults and Adolescents with Perennial Allergic Rhinitis. FFR30002, Page 570, Table 11.1: Summary of Product Characteristics Questionnaire*; September 11, 2008. GSK Clinical Study Register. Available at: http://www.gsk-clinicalstudyregister.com/files/FFR30002/5495/gsk-ffr30002-clinical-study-report-redact.pdf. Accessed February 22, 2017.

## FURTHER READING

1. *Once Daily Fluticasone Furoate Nasal Spray Is Effective in Seasonal Allergic Rhinitis Caused by Grass Pollen. FFR 103184, Page 486, Table 11. 1: Summary of Product Characteristics Questionnaire*; January 6, 2006. GSK Clinical Study Register. Available at http://www.gsk-clinicalstudyregiscer.com/files/FFR103184/3991/gskffrl03184-clinical-scudy-reportredact.pdf. Accessed February 22, 2017.

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