decongestion compared with INCS in a 28-day AR study.[398] However, intranasal decongestants are not routinely recommended for continuous use because of the potential development of alpha-receptor tachyphylaxis and subsequent rhinitis medicamentosa.[399] The development of rhinitis medicamentosa is highly variable; it may develop within 3 days of use or fail to develop after 6 weeks of daily use.[399-404] Intranasal decongestants have no effect on itching, sneezing, or nasal secretion and can be associated with local stinging or burning, sneezing, and dryness of the nose and throat.

Concomitant administration of intranasal decongestants and corticosteroids

Recent placebo-controlled studies of PAR and SAR demonstrated that concurrent administration of INCS and intranasal decongestants provided additional efficacy both subjectively in rapidity of onset compared with the corticosteroid alone and in magnitude of nasal congestion symptom score improvement compared with oxymetazoline alone and objectively as measured by acoustic rhinometry increases in volume. Furthermore, when the decongestant was given along with the intranasal steroid once a day for up to 4 weeks, the development of rhinitis medicamentosa did not occur.[405,406] (Also see Recommendation 24 for related recommendation about combined use of intranasal decongestants and corticosteroids.)

Safety concerns about use of intranasal decongestants in pregnancy are discussed in the later section on rhinitis in pregnancy.

Oral decongestants

Recommendation 18. *CBS:* We suggest that oral decongestant agents be used with caution in older adults and children younger than 4 years old, and in patients of any age who have a history of cardiac arrhythmia, angina pectoris, cerebrovascular disease, uncontrolled hypertension, bladder outlet obstruction, glaucoma, hyperthyroidism, or Tourette syndrome.

Strength of recommendation: Conditional

Certainty of evidence: Low

Recommendation 19. *CBS:* We recommend that oral decongestants be avoided during the first trimester of pregnancy.

Strength of recommendation: Strong

Certainty of evidence: Low

The oral decongestant pseudoephedrine, an alpha-adrenergic agonist, is effective at relieving nasal congestion. It is indicated for nasal congestion due to AR, rhinosinusitis, and the common cold.[407] For the management of concomitant SAR and mild/moderate asthma, the combination of an oral decongestant and a second-generation oral antihistamine, compared with placebo, significantly reduced both rhinitis and asthma symptoms.[408]

Pseudoephedrine is a key ingredient used in making methamphetamine. In an effort to reduce illicit production of methamphetamine, restrictions have been placed on the sale of pseudoephedrine in the United States.[409] This has promoted substitution of oral phenylephrine for pseudoephedrine in many allergy and cold and cough remedies. However, oral phenylephrine has been demonstrated to be ineffective at reducing nasal congestion at doses up to 40 mg.[410-412]

Pseudoephedrine can result in adverse effects such as insomnia, loss of appetite, irritability, and palpitations.[413] Elevation of blood pressure after taking an oral decongestant is very rarely noted in normotensive patients and only occasionally in patients with controlled hypertension. A meta-analysis of 24 trials showed a statistically significant elevation of systolic blood pressure in both patients who are normotensive and those with controlled hypertension, but these small values, 0.99 mm Hg and 1.2 mm Hg, respectively, are unlikely to be clinically significant in most patients.[414] However, because of the variation in patient response, patients receiving oral decongestants should be followed for changes in blood pressure. Because of the potential for drug interactions, oral decongestants should be avoided in patients taking monoamine oxidase inhibitors,[415] used for psychiatric disorders and Parkinson's disease. Oral decongestants should be used with caution in patients with rhinitis with certain conditions, such as cerebrovascular or cardiovascular disease, hyperthyroidism, closed-angle glaucoma, bladder outlet obstruction, and Tourette syndrome. The problem of rebound congestion is not a factor with the use of orally administered nasal decongestants.[407]

Oral decongestants, when used in appropriate doses, are usually well tolerated in children over the age of 6 years of age. However, use in infants and young children has been associated with agitated psychosis, ataxia, hallucinations, and even death.[416-418] At times, even at recommended doses, these agents may cause increased stimulatory effects resulting in tachyarrhythmias, insomnia, and hyperactivity, especially when combined with other stimulants.[419] Therefore, the risks and benefits should be carefully considered before using oral decongestants in both adults and children.

Safety concerns about use of oral decongestants in pregnancy are discussed in the later section on rhinitis in pregnancy.

Intranasal ipratropium

Recommendation 20. *CBS:* We suggest that in patients with PAR and NAR who have rhinorrhea as their main nasal symptom be offered intranasal ipratropium.

Certainty of evidence: Low for PAR, moderate for NAR.

Ipratropium bromide at either 0.03% or 0.06% concentrations is safe, well-tolerated, and is effective for the treatment of rhinorrhea related to PAR (0.03%) and NAR (0.03%), as well as for the common cold (0.06%).[420-422] While ipratropium bromide 0.06% is FDA-approved for the treatment of SAR in both children and adults, no randomized controlled trials have been completed to study its effectiveness.[423] Rhinorrhea is significantly reduced in chronic perennial rhinitis, VMR, gustatory rhinorrhea, and cold-induced rhinorrhea (eg, skiers nose), but with no significant effect on congestion or sneezing.[420,424-428] When ipratropium bromide was administered prior to nasal methacholine challenge in patients with AR and NAR there was reduced rhinorrhea and sneezing but there was no significant effect on airway resistance.[422,429] Rhinorrhea was significantly reduced not only in cold air exposure but also following ingestion of hot soup, leading the investigators to suggest that the nasal discharge is reflex-mediated.[430] In PAR, ipratropium bromide was effective in reducing rhinorrhea for 1 year when used on a continuous basis.[427] The efficacy of ipratropium appears to especially benefit anterior rhinorrhea. It has not been shown to be of significant value when postnasal drainage is the dominant complaint. The most common adverse effects reported are nasal dryness and epistaxis, although these are usually mild and rarely lead to discontinuation of treatment.[427,428] As discussed under the section on combination therapy, when ipratropium bromide is