

Asthma

(This article provided by the Academy is a summary from LITTLE AND FALACE'S DENTAL MANAGEMENT OF THE MEDICALLY COMPROMISED PATIENT, NINTH EDITION which is a reference textbook mentioned in the ADC Written Exam resources).

DENTAL MANAGEMENT

- Identification and Prevention

The primary goal in dental management of patients with asthma is to prevent an acute asthma attack. The first step in achieving this goal is to identify patients with asthma by history followed by assessment to elucidate the surrounding details of the problem, along with prevention of precipitating factors.

- Risk Assessment

The dentist, through a good history, should be able to determine the severity and stability of disease. Questions should be asked that ascertain adherence to medication use (especially in the previous 4 weeks), the type of asthma (e.g., allergic versus nonallergic), precipitating substances, frequency and severity of attacks, times of day when attacks occur, whether asthma is a current or past problem, how attacks usually are managed, and whether the patient has received emergency treatment for an acute attack.

- The clinician must be aware of the variability of the disease and indications of severe disease, including frequent exacerbations, exercise intolerance, forced expiratory volume in 1 second (FEV1) less than 80%, use of several medications, and a history of visits to an emergency facility or hospitalization for treatment of acute attacks.

- The stability of the disease can be assessed during the interview component of the history and by clinical examination, as well as understanding the regularity of physician visits and the results of laboratory measures.

Features such as symptoms 2 or more days per week, use of a short-acting β_2 -agonist more than 2 days a week, increased respiratory rate (>50% above

normal), FEV1 that has fallen more than 10% or to below 80% of peak FEV1, an eosinophil count that is elevated to above 50/mm³, poor drug use compliance, and one or more ED visits within the previous 3 months suggest inadequate treatment and poor disease control. Also, the use of more than 1.5 canisters of a β -agonist inhaler per month (>200 inhalations per month) or doubling of monthly use indicates high risk for a severe asthma attack. For severe and unstable asthma, consultation with the patient's physician is advised. Routine dental treatment should be postponed until better control is achieved.

- Recommendations-

1- Appointment, Airway, and Breathing.

Modifications during the preoperative and operative phases of dental management of a patient with asthma can minimize the likelihood of an attack. Patients who have nocturnal asthma should be scheduled for late-morning appointments, when attacks are less likely. Use of operatory odorants (e.g., methyl methacrylate) should be reduced before the patient is treated. Patients should be instructed to regularly use their medications, to bring their inhalers (bronchodilators) to each appointment, and to inform the dentist at the earliest sign or symptom of an asthma attack. Prophylactic inhalation of a patient's bronchodilator at the beginning of the appointment is a valuable method of preventing an asthma attack. Alternatively, patients may be advised to bring their spirometer and daily expiratory record to the office. The dentist may request that the patient exhale into the spirometer and record the expired volume. A significant drop in lung function (to below 80% of peak FEV1 or a greater than 10% drop from previously recorded values) indicates that prophylactic use of the inhaler or referral to a physician is needed.

- The use of a pulse oximeter also is valuable for determining the patient's oxygen saturation level. In healthy patients, this value remains between 97% and 100%; a drop to 91% or below indicates poor oxygen exchange and the need for intervention.

2- Capacity to Tolerate Care.

Because anxiety and stress are implicated as precipitating factors in asthma attacks and dental treatment may result in decreased lung function, all dental staff members should make every effort to identify patients who are anxious and provide a stress free environment through establishment of rapport and openness. Preoperative and intraoperative sedation may be desirable. If sedation is required, nitrous oxide–oxygen inhalation is best. Nitrous oxide is not a respiratory depressant, nor is it an irritant to the tracheobronchial tree. Oral premedication may be accomplished with small doses of a short-acting benzodiazepine. Reasonable alternatives with children are hydroxyzine (Vistaril), for its antihistamine and sedative properties, and ketamine, which causes bronchodilation.

3- Drug Considerations.

- Barbiturates and narcotics, particularly meperidine, are histamine-releasing drugs that can provoke an attack and thus should be avoided.
- Outpatient general anesthesia generally is contraindicated for patients with asthma.
- Selection of local anesthetic may require adjustment. In 1987, the U.S. Food and Drug Administration warned that drugs that contained sulfites were a cause of allergic type reactions in susceptible individuals. Sulfite preservatives are found in local anesthetic solutions that contain epinephrine or levonordefrin, although the amount of sulfite in a local anesthetic cartridge is less than the amount commonly found in an average serving of certain foods. Although rare, at least one case of an acute asthma attack precipitated by exposure to sulfites has been reported. Thus, the use of local anesthetic without epinephrine or levonordefrin may be advisable for patients with moderate to severe disease. Because relevant data remain limited, the dentist should discuss with the patient any past responses to local anesthetics and allergy to sulfites and should consult with the physician on this issue. As an alternative, local anesthetics without a vasoconstrictor may be used in at-risk patients.

- Patients with asthma who are medicated over the long term with high-dose systemic corticosteroids may require supplementation for major surgical procedures if their health is poor. However, long-term use of inhaled corticosteroids rarely causes adrenal suppression unless the daily dosage exceeds 1.5 mg of beclomethasone dipropionate or its equivalent.

- Administration of aspirin-containing medication or other NSAIDs to patients with asthma is not advisable because aspirin ingestion is associated with the precipitation of asthma attacks in a small percentage of patients. Likewise, barbiturates and narcotics are best not used because they also may precipitate an asthma attack.

- Antihistamines have beneficial properties but should be used cautiously because of their drying effects. Patients who are taking theophylline preparations should not be given macrolide antibiotics (i.e., erythromycin and azithromycin) or ciprofloxacin hydrochloride because these agents interact with theophylline to produce a potentially toxic blood level of theophylline. To prevent serious toxicity, the dentist should ask the patient who takes theophylline whether the dosage is being monitored on the basis of serum theophylline levels (recommended to be <10 µg/mL). Approximately 3% of patients who take zileuton exhibit elevated alanine transaminase levels, reflecting liver dysfunction that may affect the metabolism of dentally administered drugs.

-Emergency (Asthma Attack). An acute asthma attack requires immediate therapy. The signs and symptoms should be recognized quickly and an inhaler provided rapidly. A short-acting β_2 -adrenergic agonist inhaler (Ventolin, Proventil) is the most effective and fastest acting bronchodilator. It should be administered at the first sign of an attack. Long-lasting β_2 -agonist drugs such as salmeterol (Serevent) and corticosteroids do not act quickly and are not given for an immediate response, but they may provide a delayed response.

With a severe asthma attack, use of subcutaneous injections of epinephrine (0.3–0.5 mL, 1 : 1000) or inhalation of epinephrine (Primatene Mist) is the most potent and fastest acting method for relieving the bronchial constriction. Supportive treatment includes providing positive-flow oxygenation, repeating bronchodilator doses as necessary every 20 minutes, monitoring vital signs (including oxygen saturation, if possible, which should reach 90% or higher), and activating the emergency medical system, if needed.

4- Oral Complications and Manifestations

- Nasal symptoms, allergic rhinitis, and mouth breathing are common with asthma. Asthmatics who are mouth breathers may have altered nasorespiratory function, which may be associated with increased upper anterior and total anterior facial height, higher palatal vault, greater overjet, and a higher prevalence of crossbite. Severe asthma in children is associated with dental enamel defects; in adults, severe asthma is associated with periodontitis.
- The medications taken by patients who have asthma may contribute to oral disease. For example, β 2-agonist inhalers reduce salivary flow by 20% to 35%, decrease plaque pH, and are associated with increased prevalence of gingivitis and caries in patients with moderate to severe asthma.
- Gastroesophageal acid reflux is common in patients with asthma and is exacerbated by the use of β -agonists and theophylline. This reflux can contribute to erosion of enamel.
- Oral candidiasis (acute pseudomembranous type) occurs in approximately 5% of patients who use inhalation steroids for long periods at high dose or frequency. However, development of this condition is rare if a “spacer” or aerosol-holding chamber is attached to the metered dose inhaler (MDI) and the mouth is rinsed with water after each use. The condition readily responds to local antifungal therapy (i.e., nystatin, clotrimazole, or fluconazole). Patients should receive instructions on the proper use of their inhaler and the need for oral rinsing. Headache is a frequent adverse effect of antileukotrienes and theophylline. The clinician should be aware of this adverse effect when diagnosing disease in patients with orofacial pain complaints.

