Palmetto Vital Care

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Infusion Therapy Gazette

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The following summary was written by the AAAAI Sinusitis Committee in 2002, based on the August 2001 parameters

Special points of interest:

- Palmetto Vital Care is hosting a Continuing Education Seminar at OMH in the new board room on March 30, 2004! Course details and times to be available soon.

Practice Parameters for the Diagnosis and Management of Sinusitis

Definitions

Sinusitis is defined as inflammation of one or more of the paranasal sinuses. It is subclassified according to duration of symptoms and frequency of recurrence.

- **Acute sinusitis** - symptoms for 3-4 weeks consisting of any or all of the following: persistent URI symptoms, purulent rhinorrhea, post nasal drainage, anosmia, nasal congestion, facial pain, headache, fever, cough, and purulent mucus drainage.
- **Chronic sinusitis** – same symptoms as acute sinusitis, of varying severity, for 3-8 weeks or longer. In chronic sinusitis there should be abnormal findings on CT or MRI.
- **Recurrent sinusitis** – three or more episodes of acute sinusitis in a year. Different infectious pathogens may be found at different times.

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Anatomic considerations, sinus physiology, microbiology

Anatomic considerations – the sinuses develop at different ages during childhood.

- The ethmoid bulla cells can occasionally enlarge into the middle turbinate, causing pneumatization (concha bullosa), which can obstruct ventilation of the middle meatus. Frontal recess cells can impinge upon the nasofrontal duct. Blockage of the middle meatus or the nasofrontal duct can lead to sinusitis.
- Nasal and sinus polyps can create obstruction in multiple locations that can lead to sinusitis.
- Septal deviation can predispose to sinusitis if the deviation narrows the middle meatus.
- Infection and tumors in the sphenoid sinuses can progress into the optic nerve, cavernous sinus, carotid artery, and sella turcica.

Sinus physiology – the sinuses are air-filled cavities with pseudostratified ciliated columnar epithelium interspersed with goblet cells. The cilia sweep mucus toward the ostial opening.

- Obstruction of the sinus ostia may lead to mucus impaction and decreased oxygenation in the sinus cavities. During this obstruction, pressure in the sinus cavity may decrease, which may lead to pain, particularly in the frontal region.

Microbiology – predominant organisms vary according to the duration of sinusitis and other considerations.

- **Acute sinusitis:** viral URIs frequently precede bacterial superinfection with *Streptococcus pneumoniae, Haemophilus influenzae, and Moraxella catarrhalis*. All of these organisms may have significant antibiotic resistance.
- **Chronic sinusitis:** all the organisms mentioned above, as well as *Pseudomonas aeruginosa,* Group A streptococcus, *Staphylococcus aureus,* and anaer-

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obes such as *Bacteroides* spp., Fusobacteria, and *Propionibacterium acnes.*

- **Nosocomial sinusitis:** gram negative enterics (such as *P aeruginosa, Klebsiella pneumoniae, Enterobacter* spp, *Proteus mirabilis, Serratia marcescens*) and gram positive cocci (occasionally streptococci and staphylococci).
- **Fungal sinusitis:** in immunocompetent individuals, the most common cause of fungal sinusitis is *Aspergillus fumigatus*. Allergic fungal sinusitis may be caused by *Aspergillus* spp, *Myriodontium keratinophilum, Bipolaris* sp, *Dreschlera* sp, *Curvularia* spp, and *Aternaria* spp. Fungal infection of the sinuses may manifest as fungus "ball" in immunocompetent hosts and invasive fungal sinusitis in imunocompromised hosts.

Diagnosis

Clinical history – acute sinusitis is typically first seen as an upper respiratory infection that has persisted beyond 5-7 days.

- Factors that may predispose to sinusitis include allergic or occupational rhinitis, vasomotor rhinitis, nasal polyps, rhinitis medicamentosa, and immunodeficiency. For many patients, the clinical history should address these factors.

Clinical examination –

- **Symptoms:** nasal congestion, purulent rhinorrhea, postnasal drainage, facial or dental pain, headache, hyposmia, and cough.
- **Signs:** tenderness overlying the sinuses, mucosal erythema, nasal purulent secretions, increased posterior pharyngeal secretions, and periorbital edema.
- Transillumination may be useful if unilateral abnormalities are noted.

Imaging studies – imaging studies may be required when the symptoms are vague, physical findings are equivocal, or there is poor response to initial management.

- Standard radiographs (e.g., Water's view) may be used for detection of acute sinus disease, but are insensitive, especially in ethmoid disease.
- CT is the preferred imaging technique for evaluation of the nose and paranasal sinuses. The preferred CT to obtain is limited numbers of coronal sections, sometimes with added cuts through the osteomeatal complex, without contrast.
- MRI has limitations in the definition of the bony anatomy, but is particularly sensitive for evaluation of soft tissue differentiation as in fungal sinusitis and tumors and in differentiating between inflammatory disease and malignant tumors.

Laboratory tests – laboratory tests are generally most useful in the evaluation of underlying diseases.

- Quantitative sweat chloride tests for the diagnosis of cystic fibrosis should be considered in children with nasal polyps and/or with proven colonization of the nose or sinus with *Pseudomonas* spp.
- Tests for immunodeficiency (e.g., quantitative immunoglobulins, antibody tests, serum IgE, complement components, HIV, and diabetes) may be useful if either congenital or acquired immunodeficiency is suspected in cases of recurrent sinusitis.
- Tests to screen for allergic fungal sinusitis (serum IgE) and granulomatous diseases (e.g. ACE, ANCA, RPR) may be considered as well.

Other studies

- Fiberoptic rhinoscopy permits more detailed examination of nasal and pharyngeal structures.
- Biopsy of the nose and paranasal sinuses may be useful to determine whether a lesion is neoplastic, to confirm the presence of suspected fungal disease or granulomatous disease, and to evaluate ciliary motility.

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- Culture and stains of sinus material (from the middle meatus) for bacteria and fungi may be useful to identify pathogens and assess antimicrobial sensitivity.

Differential diagnosis

- The differential diagnosis of sinusitis includes cystic fibrosis, granulomatous diseases, HIV infection, Kartagener's syndrome, immotile cilia syndrome, and tumors (such as nasopharyngeal angiofibroma).

Associated diseases

- Asthma: the association between sinusitis and asthma is generally stated to range from 40% to 75% and the management of sinusitis often results in improvement in asthma.
- Chronic rhinitis: allergic rhinitis and other forms of rhinitis (e.g. vasomotor rhinitis and NARES) commonly precede the development of recurrent or chronic sinusitis because of the retention of mucopurulent secretions within the sinus cavities.
- Cystic fibrosis: chronic sinusitis is an important source of morbidity in nearly all patients with cystic fibrosis, creating nasal obstruction, post nasal drainage, headache, and potential exacerbation of pulmonary obstruction.

Treatment

Antibiotics – antibiotics are the primary therapy for bacterial sinusitis.

- The most common bacteria observed are polysaccharide encapsulated organisms of which 30% to 40% produce b -lactamase.
- Appropriate duration of therapy is not well defined for acute sinusitis, but a 14-day course is probably adequate for most patients.
- Chronic sinusitis should be treated until the patient is well for 7 days before stopping therapy.
- Choice of antibiotic should be based on predicted effectiveness, cost, and side effects.

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Antihistamines – there are no data presently to recommend the use of antihistamines in acute bacterial sinusitis, but there may be a role for these agents in chronic sinusitis, especially in patients with allergic rhinitis. Furthermore, antihistamines are not detrimental to the treatment of sinusitis.

α -Adrenergic decongestants – both topical and oral decongestants are often used in the therapy of acute and chronic sinusitis, but prospective studies are lacking.

Glucocorticosteroids

- The use of systemic steroid therapy for sinus disease has not been studied in a well-controlled manner.
- Studies suggest that the addition of intranasal steroids as an adjunct to antibiotic therapy is beneficial in the treatment of sinusitis.

Adjunctive therapies, including saline, mucolytics, and expectorants

- There are inadequate data to recommend the use of wetting agents as individual therapy for sinusitis.
- Clinical practice supports the use of wetting agents for symptomatic treatment as part of a pharmacologic regimen.
- There are several studies that imply, but do not confirm, a role for these agents in sinusitis.
- The use of all these agents as prophylaxis for exacerbations of chronic sinusitis is empiric and not supported by clinical data.

Intravenous immune globulin – IVIG is indicated for use in patients with documented impaired humoral immunity.

Allergen immunotherapy – Allergic disease is often a major contributor to the pathogenesis of chronic sinusitis. Allergen immunotherapy often benefits patients with

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- Pain Management
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chronic sinusitis and documented allergies.

Surgical considerations

- Antral puncture and irrigation has a place in the management of acute ethmo-maxillary sinusitis refractory to medical therapy or in an immunosuppressed patient in whom early identification of pathogenic organisms is paramount.
- Functional endoscopic sinus surgery is intended to relieve ostial obstruction and to debride diseased tissue.
- Other surgical procedures that may have a place in the management of chronic sinusitis include adenoidectomy, septoplasty, polypectomy, and turbinate reduction.

When to Refer to an Allergist/Immunologist

- Allergists/immunologists have unique expertise in the evaluation and medical management of sinonasal disorders. Accordingly, patients with chronic or recurrent sinusitis, whose disease is poorly controlled or in whom the nature and cause of the disease remains in question, should be referred to an allergist/immunologist as the primary source of consultation. Furthermore, patients with associated diseases, such as asthma, should be also referred to an allergist/immunologist.

Where to go for Additional Resources

- The American Academy of Allergy, Asthma and Immunology (AAAAI) is the premier source of information about the pathophysiology and management of sinusitis and related diseases. Resources may be obtained from the AAAAI website (http://www.aaaai.org) or by calling (414) 272-6071. The AAAAI also has contact information for allergists/immunologists in practice throughout the world.