

## FINAL Key Questions and Background

### Imaging for Rhinosinusitis

#### Introduction

Rhinosinusitis, typically referred to as *sinusitis*, describes a condition characterized by inflammation of the mucous membranes in the nose as well as one or more of the paranasal sinuses. Common symptoms include pain in the head and neck area, thick mucosal secretions, stuffy nose, and a feeling of fullness in the face. According to 2012 data for the United States, approximately 12% of adults have chronic rhinosinusitis. The condition is most common in the southern United States. Sinusitis can be classified as acute (lasting up to 4 weeks), subacute (lasting 4 to 12 weeks), chronic (lasting more than 12 weeks), and recurrent (several attacks within a year). Causes include colds that lead to bacterial infection, allergic rhinitis, asthma, and other respiratory or immunological conditions. Treatment options include antimicrobial medications, topical treatments, and surgery.

Major guidelines recommend diagnosis of both acute and chronic rhinosinusitis on the basis of symptoms and signs, with nasal endoscopy sometimes offered as an optional aid to visualization. For acute bacterial rhinosinusitis, radiological imaging is recommended only after empiric antibiotic treatment has failed. Imaging does not distinguish between bacterial sinusitis and viral upper respiratory infection. Rather, the purpose of radiological imaging in acute rhinosinusitis is to confirm diagnosis in cases of recurrent acute episodes or to detect sinusitis-related complications that are suspected because of unresponsive symptoms or particular signs. Bacterial culture is reserved for unusual cases or cases where radiological imaging has revealed complications. The gold standard for diagnosis of acute bacterial rhinosinusitis is aspiration and culture, but this is avoided wherever possible because of the invasive nature of the procedure. Alternatives to aspiration include maxillary tap and endoscopy-guided culture. For chronic rhinosinusitis, radiological imaging is recommended for confirmation of the clinical diagnosis and images are to be interpreted in light of symptoms and signs. CT appears to be the preferred imaging modality. There is some variation across guidelines and across indications regarding the role of magnetic resonance imaging (MRI).

Antibiotics are recommended for treatment of clinically diagnosed acute bacterial rhinosinusitis, with some sources suggesting that antibiotics for children be reserved for severe or worsening symptoms. Oral or topical steroids with or without antibiotics, as well as a number of adjunctive therapies, are recommended for chronic rhinosinusitis. Surgery is an option for chronic rhinosinusitis that has not responded to conservative treatment.

#### Policy Context

Radiological imaging for evaluation of rhinosinusitis, especially chronic sinusitis, represents an area of substantial utilization in plans managed by the Washington HCA. Since imaging is insufficiently accurate to serve as the gold standard for diagnosis of rhinosinusitis, an understanding of its appropriate role is important. An evidence-based assessment of the accuracy of different imaging modalities for confirming

or refining a diagnosis of rhinosinusitis and the impact on outcomes and cost is warranted to guide coverage policy.

### **Scope of This HTA**

**Populations:** Adults and children diagnosed with or suspected of having chronic, acute, or recurrent rhinosinusitis

**Interventions:** Imaging technologies, including computed tomography (CT), magnetic resonance imaging (MRI), x-ray, and ultrasound (US)

**Comparators:** Clinical diagnosis without imaging; another imaging modality.

**Outcomes:** Diagnostic performance (accuracy) in terms of sensitivity/specificity, positive/negative predictive value, and positive/negative likelihood ratios; change in clinical management decisions or utilization; health outcomes such as improvement in symptoms, reduced incidence of episodes, improved quality of life (QOL), and prevention of disease-related complications; adverse events associated with imaging (e.g., radiation exposure); cost and cost-effectiveness

### **Key Questions**

1. What is the clinical performance (accuracy) of imaging technologies such as CT, MRI, x-ray, and US for evaluation of rhinosinusitis or related complications?
  - a. Does the clinical performance vary by imaging modality or technique?
2. What is the clinical utility of imaging for rhinosinusitis, i.e., what is the impact
  - a. On clinical management decisions and utilization?
  - b. On health outcomes?
  - c. According to different imaging modalities?
3. What are the safety issues associated with different forms of imaging technologies?
4. Does the diagnostic performance, impact on clinical management, impact on health outcomes, or incidence of adverse events vary by clinical history or patient characteristics (e.g., comorbidities, subtypes of rhinosinusitis)?
5. What are the cost and cost-effectiveness of imaging modalities in the diagnosis of sinusitis, including comparative costs and incremental cost-effectiveness when comparing modalities?

### **Public Comment & Response**

See separate document published on the [HTA web site](#).