



Chapter 20 – Sore Throat

NOTE: CONTENT CONTAINED IN THIS DOCUMENT IS TAKEN FROM ROSEN'S EMERGENCY MEDICINE 9th Ed.

Italicized text is quoted directly from Rosen's.

Key Concepts:

1. *Sore throat is a chief complaint that can represent life-threatening diagnoses and extreme challenges for the emergency clinician, primarily in the form of airway threats and/or deep space infections.*
2. *The five modified Centor criteria award 1 point for each of the following: (1) presence of fever; (2) presence of exudates; (3) presence of anterior cervical adenopathy; and (4) absence of cough, and subtract 1 point for (5) age >45 years. Patients with scores of -1 to 1 are very unlikely to have GAS infection. Scores of 4 or 5 correspond to a 50% likelihood of GAS, which drops to 30% with a score of 3, and below 20% with a score of 2.*
3. *Physical examination is central to detecting airway threats and determining diagnosis.*
4. *The absence of physical findings during oropharyngeal examination in the setting of severe sore throat symptoms suggest that lower structures may be involved, and endoscopic examination of the upper airway is advisable.*
5. *Antibiotics are more harmful than helpful for patients with viral pharyngitis, which is self-limiting.*
6. *For GAS-proven pharyngitis, a single injection of penicillin or a 10-day course of oral penicillin is recommended to decrease the duration of symptoms, transmission to close contacts, and prevention of the rare suppurative and nonsuppurative sequelae.*

Rosen's in Perspective

We can hear all of the sighs being bellowed out by all of our listeners in podcast-land. But, this complaint is often one of Dillan's favorite triage note lines to read. Patients presenting with sore throat to the ED often times need little more than reassurance and NSAID's. However, some can harbour serious pathology that require the clinician to acutely stabilize, investigate, and consult specialty services to get the patient the care they require. To get your blood pumping, let's jump into today's episode with a case:

You are working the afternoon shift at a community ED. You have been inundated with a multitude of CTAS 4's and 5's when you pick up the next chart. The patient, placed in the streaming area of the department, has a note that reads "Sore Throat - CTAS 5 - pain x 48



hours, patient seen 24 hours ago and diagnosed with strep throat. Patient appears ++ anxious.” Triage vitals show the patient is febrile, mildly tachycardic (109 BPM), and tachypneic (RR 25).

You go back and hear the patient before you see them. You turn the corner, and the patient is tripodding, drooling, and stridorous.

What will you do? What are your next steps? How do you find a new pair of pants given that your current pair have been soiled?

Do not despair, listeners. We will be giving you all the tools you need to stabilize this patient. Additionally, we will give you the baseline knowledge you need to investigate the vast majority of patients presenting with sore throat. We will review the anatomy of the area in question, discuss the utility of imaging and antibiotics in the patient with sore throat, and will throw some quick snappers at you to put away for your next on-shift quizzing by the otolaryngologist on-call.

Core Questions:

1. What are the three anatomically-distinct zones of the pharynx, and what structures outline their borders?
2. Describe the utility of the following imaging modalities in the patient with sore throat.
 - a. Ultrasound of the Neck
 - b. Lateral neck radiograph
 - c. Nasopharyngoscopy
 - d. CT Soft Tissues Neck
3. Outline five viral, five bacterial, and five other potential etiologies of sore throat in the ED patient? (Table 20.1)
4. Outline the components of the Modified Centor Score and describe its application.
5. Describe the diagnostic algorithm for the patient with sore throat. (Figure 20.4)
6. Outline the approach to managing a patient with sore throat in the ED. (Figure 20.4)
7. What antibiotics can be used in the patient with suspected or confirmed streptococcal pharyngitis? (Box 20.2)

Wisecracks:

1. In what age groups is streptococcal pharyngitis rarely seen?
2. What is Waldeyer’s Tonsillar Ring?
3. What is the “thumb sign” and what pathology does it point to?



Core Questions:

[1] What are the three anatomically-distinct zones of the pharynx, and what structures outline their borders?

Three zones of the pharynx:

1. Nasopharynx
 - a. Encompasses the area superior to the oral cavity
 - b. Area lies between the base of the skull and the soft palate
 - c. Eustachian tubes open into the nasopharynx
2. Oropharynx
 - a. Area directly behind the oral cavity between the uvula and hyoid bone
 - b. Includes the epiglottis and vallecula
 - c. Bordered laterally by the tonsillar pillars
3. Hypopharynx
 - a. Located inferior to the epiglottis
 - b. Stops at the point at which the aerodigestive tract differentiates into the esophagus and larynx
 - c. Inferior border is vocal cords
 - d. External landmark = look just superior to the thyroid cartilage

[2] Describe the utility of the following imaging modalities in the patient with sore throat.

- a. Ultrasound of the Neck
- b. Lateral Neck Radiograph
- c. Nasopharyngoscopy
- d. CT Soft Tissues Neck

Alright, let's break this down:

Ultrasound of Neck:

- Becoming increasingly useful to detect neck masses, tumors, and hypopharyngeal conditions
- Some studies indicate it has a role in the diagnosis of epiglottitis in males and females
- Not a mainstay in the work up of these pathologies, but stay tuned

Lateral Neck Radiography:

- Not a requirement to diagnose these conditions, but can be useful
- The lateral neck radiograph is very sensitive for pathology related to retropharyngeal abscesses. Look for:



- Widening of the prevertebral space
- Abnormal curve of the C-spine
- Presence of soft tissue air

Nasopharyngoscopy:

- Can be useful at the bedside
- Primarily used to interrogate the pharynx in cases where the physical examination is not necessarily telling (e.g., profound sore throat, no obvious pathology on physical examination).
- Allows for the identification of:
 - Infection
 - Foreign bodies
 - Polyps
 - Angioedema

CT Soft Tissues Neck:

- Very useful imaging modality for serious soft tissue infections of the pharynx
- Definitive evaluation for deep space neck infections
- Consider in children or adults with signs and symptoms of deep space neck infections (e.g., retropharyngeal abscess) and in patients who may need airway management
- Sometimes difficult for CT to delineate between cellulitis and abscess
- Also helpful when trying to differentiate between tumors, hemorrhage, abscesses

[3] Outline five viral, five bacterial, and five other potential etiologies of sore throat in the ED patient? [Table 20.1]

The list below outlines the differential diagnosis for the patient with sore throat. It is adapted from Table 20.1 - Differential Diagnosis for Sore Throat in Rosen's 9th Edition. Please refer to this table for further detail.

Viral Causes of Sore Throat:

- Rhinovirus
- Adenovirus
- Peptostreptococcus spp.
- Coronavirus
- HSV- 1,2
- Influenza A,B
- Parainfluenza
- Cytomegalovirus
- EBV
- VZV
- Hepatitis Virus



Bacterial Causes of Sore Throat:

Common Aerobic Causes:

- Streptococcus pyogenes
- GABHS
- Coccidioides spp.
- Non-GAS
- Neisseria gonorrhoeae
- Neisseria meningitidis
- Mycoplasma pneumoniae
- Arcanobacterium haemolyticum
- Chlamydia trachomatis
- Staphylococcus aureus

Uncommon Aerobic Causes:

- Haemophilus influenzae
- Haemophilus parainfluenzae
- Corynebacterium diphtheriae
- Streptococcus pneumoniae
- Yersinia enterocolitica
- Treponema pallidum
- Francisella tularensis
- Legionella pneumophila
- Mycobacterium spp.

Anaerobic Causes:

- Bacteroides spp.
- Peptococcus spp.
- Clostridium spp.
- Fusobacterium spp.
- Prevotella spp.

Systemic Causes of Sore Throat:

- Kawasaki Disease
- Steven Johnson Syndrome
- Cyclic Neutropenia
- Thyroiditis
- Connective tissue disease



Fungal Causes of Sore Throat:

- Candida spp.

Traumatic/Miscellaneous Causes of Sore Throat:

- Penetrating Injury
- Angioneurotic Edema
- Retained Foreign Body
- Anomalous Aortic Arch
- Laryngeal Fracture
- Calcific Retropharyngeal Tendinitis
- Retropharyngeal Hematoma
- Caustic Exposure

Neoplastic Causes of Sore Throat:

- Tongue cancer
- Larynx cancer
- Thyroid cancer
- Leukemia

[4] Outline the components of the Modified Centor Score and describe its application.

The Modified Centor Score helps to approximate the probability that pharyngitis is caused by *Streptococcus pyogenes*. Its elements are listed below:

Components of the Centor Score:

1. Age
 - a. +1 = 3-14 years
 - b. 0 = 15-44 years
 - c. -1 = \geq 45 years
2. Exudate or Swelling on Tonsils
 - a. +1 = presence
 - b. 0 = absence
3. Tender/Swollen Anterior Cervical Lymph Nodes
 - a. +1 = presence
 - b. 0 = absence
4. Temperature $>$ 38.0 degrees Celsius
 - a. +1 = presence
 - b. 0 = absence



5. Cough
 - a. +1 = absence
 - b. 0 = presence

Probability of Streptococcal Pharyngitis:

- Score 4/5 = 51-53%
- Score 3 = 28-35%
- Score 2 = 11-17%
- Score +1 = 5-10%
- Score -1 to 0 = 1-2.5%

Actions Based on Scores:

- Score 4/5 = perform rapid strep testing and/or culture - consider empiric antibiotics depending on clinical scenario - IDSA does not recommend empiric antibiotics in developed countries
- Score 3 = perform rapid strep testing and/or culture
- Score 2 = optional rapid strep testing and/or culture
- Score -1 to +1= No further testing or antibiotics

[5] Describe the diagnostic algorithm for the patient with sore throat. [Figure 20.4]

The following diagnostic algorithm is taken from Figure 20.4 Rosen's Emergency Medicine, 9th Edition. Please refer to this figure for further details. In the patient presenting to the ED with sore throat:

1. Determine presence of upper airway compromise:
 - a. Stridor
 - b. Drooling
 - c. Muffled voice
 - d. Sniffing position
 - e. Hypoxia
2. If there are signs of upper airway compromise:
 - a. Look for visual mass (e.g., PTA, tongue elevation, angioedema)
 - i. If present, provide disease-focused therapies and consult ENT, Anesthesiology for airway surgical support
 - ii. If not, consult ENT for nasopharyngoscopy
 - iii. Consider one of the imaging modalities mentioned previously
3. If there are no signs of airway compromise:
 - a. Examine the oropharynx to determine presence of pharyngitis
 - i. If present, consider symptomatic treatment, consider antibiotics in high likelihood GABHS in endemic or epidemic settings of rheumatic fever
 - ii. If not present, consider non-pharyngitis causes of sore throat



[6] Outline the approach to managing a patient with sore throat in the ED. [Figure 20.4]

The following diagnostic algorithm is taken from Figure 20.4 in Rosen's Emergency Medicine, 9th Edition. Please refer to this figure for further details.

In the patient presenting to the ED with sore throat:

1. Determine presence of upper airway compromise
 - a. If present, do the following:
 - i. Prepare for potential surgical management
 - ii. Maintain an upright position
 - iii. Insert large-bore IV's, place on cardiac monitors
 - iv. Consider empirical steroids, antibiotics
 - v. Consider surgical service and Anesthesiology consultations for bedside support
 - vi. Closely examine the patient to elucidate the cause of their illness
 - vii. If deterioration occurs, control airway with an advanced airway following the difficult airway algorithm
 1. USE DOUBLE SET UP METHOD
 - b. If not present, proceed to step two
2. Examine the oropharynx to determine if pharyngitis present
 - a. If yes, provide symptomatic treatment and consider antibiotics if severely ill or if practicing in an endemic setting of rheumatic fever
 - b. If not:
 - i. Look for a mass (e.g., PTA, tongue elevation, angioedema)
 1. If present, provide disease-focused therapies and consult ENT/Anesthesiology for airway and surgical support if needed
 2. If not present, consider:
 - a. Nasopharyngoscopy
 - b. Advanced imaging
 - c. Empirical treatment for epiglottitis, if suspected, prior to imaging

[7] What antibiotics can be used in the patient with suspected or confirmed streptococcal pharyngitis? [Box 20.2]

The list below outlines the available antibiotic agents for the patient with proven GAS pharyngitis. It is adapted from Box 20.2 - Antibiotic Regimens for Proven Group A Streptococcal Pharyngitis in Rosen's 9th Edition. Please refer to this table for further detail.



Antibiotic Regimens for Proven Group A Streptococcal Pharyngitis
Benzathine Penicillin G - 600,000 U (<27 kg) and 1.2 million U (>27 kg) x 1 IM Penicillin V - 50 mg/kg/day PO QID x 10 days Amoxicillin - 40 mg/kg/day PO TID x 10 days
If penicillin-allergic:
Clindamycin - 7 mg/kg/dose PO TID (maximum 300 mg/dose) x 10 days Cephalexin - 20 mg/kg/dose PO BID (maximum 500 mg/dose) x 10 days Azithromycin - 12 mg/kg/day PO OD (maximum 500 mg/dose) x 5 days

Wisecracks:

[1] In what age groups is streptococcal pharyngitis rarely seen?

Answer:

Remember, streptococcal pharyngitis is exceedingly rare in persons <3 years of age

Additionally, persons 45 years of age or older are unlikely to have streptococcal pharyngitis

[2] What is Waldeyer's Tonsillar Ring?

Answer:

Waldeyer's tonsillar ring or the pharyngeal lymphoid ring consists of the following:

- Adenoids (also referred to as the pharyngeal tonsils)
- Tubal tonsils
- Palatine tonsils
- Lingual tonsils

[3] What is the "thumb sign" and what pathology does it point to?

Answer:

The thumb sign on lateral neck X ray demonstrates widening of the epiglottic silhouette. Likely indicates EPIGLOTTITIS. See Figure 20.2 to get better idea of the radiographic finding.