

Module 11: Antimicrobial Stewardship in the Management of Acute Pharyngitis



Learning Objectives

By the end of this session, you should be able to:

1. Describe the epidemiology and causes of acute pharyngitis.
2. Differentiate between viral and bacterial pharyngitis using clinical prediction tools like the Modified Centor Score.
3. Apply microbiological testing (e.g., rapid antigen tests) to guide appropriate use of antibiotics.
4. Educate patients on their diagnosis and the appropriate use of antibiotics.
5. Implement antimicrobial stewardship by avoiding unnecessary antibiotics and applying evidence-based management in case scenarios.



Background

- Management of acute pharyngitis is prone to antimicrobial misuse due to its high incidence in the community and lack of knowledge in differentiating the case definitions of viral and bacterial infections.
- Training of health workers will improve appropriate management of acute pharyngitis by increasing the index of suspicion on the causative organisms hence reducing irrational use of antibiotics.



Acute Pharyngitis

Definition

- Pharyngitis is defined as an infection or irritation of the pharynx or tonsils.
- The etiology is usually infectious and can be viral, bacterial and less commonly fungal.



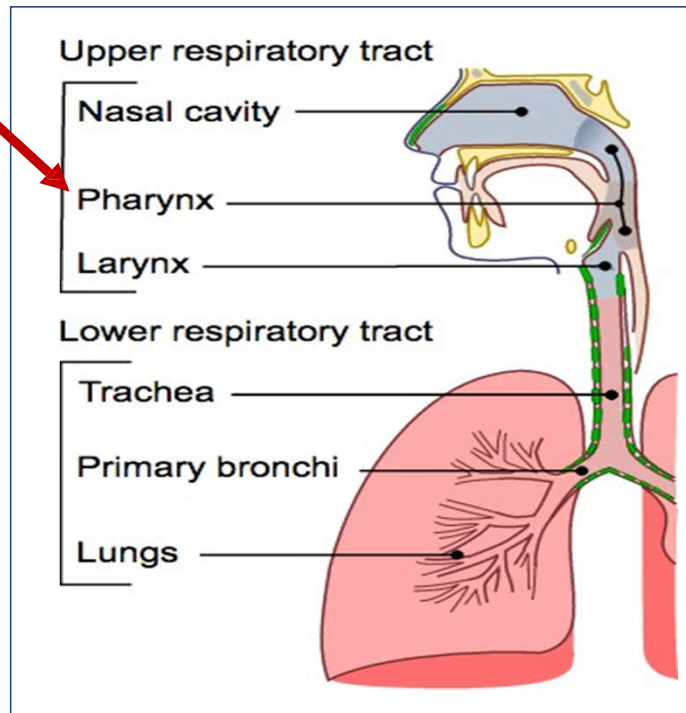
<https://emedicine.medscape.com/article/764304-overview?form=fpf>

Epidemiology

- Acute pharyngitis is common worldwide, with variations by region and population.
- In Kenya, it is frequent during rainy seasons, mainly affecting children in rural and peri-urban areas.
- Most cases are caused by viral infections.
- Over prescription of antibiotics is a major challenge, contributing to antimicrobial resistance (AMR).
- Improving diagnosis helps reduce unnecessary antibiotic use and prevents complications like rheumatic fever.



Acute Pharyngitis as a Target for AMS



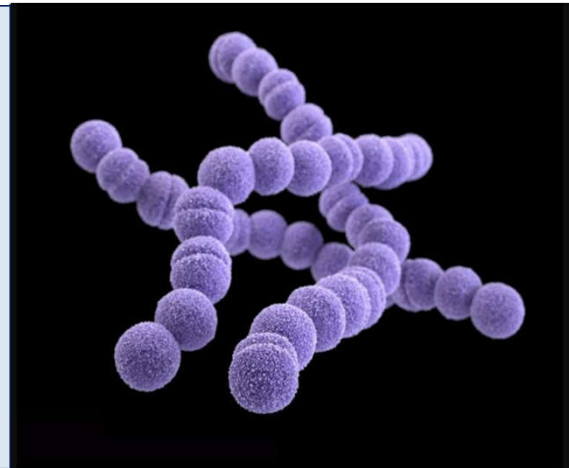
- Pharyngitis is a common target for antimicrobial stewardship
- Majority due to viral infections
- Broad-spectrum antimicrobials used inappropriately

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Lord Akryl (<http://cancer.gov>) [Public domain], via Wikimedia Commons

Etiology and Prevalence of Acute Pharyngitis

- **Viral pathogens** are the predominant cause of pharyngitis overall
- *Streptococcus pyogenes*, Group A Streptococcus, is the most common **bacterial** etiology of pharyngitis and is most common in children causing between 20 to 30% of all pharyngitis cases
- It causes **5-15%** of cases of sore throat in adults



U.S. Centers for Disease Control
and Prevention – Medical
Illustrator

Clinical Manifestations of Viral Upper Respiratory Tract Infection

- Signs and symptoms suggestive of a viral upper respiratory tract infection, include
 - Conjunctivitis
 - Coryza
 - Cough
 - Diarrhea
 - Hoarseness
 - Viral exanthema
 - Oral ulcers



https://microbiologysociety.org/resource_library/knowledge-search/best-of-the-blog-mycobacteria.html

Clinical Manifestations of Bacterial Pharyngitis

Bacterial pharyngitis, commonly caused by Streptococcus bacteria (strep throat), has several signs and symptoms:

- Sore Throat: Severe and sudden onset.
- Painful Swallowing: Difficulty and discomfort when swallowing.
- Fever: Often high, especially in children.
- Red and Swollen Throat: Sometimes with white patches or streaks of pus.
- Swollen Lymph Nodes: Typically in the neck.
- Headache: Common and may accompany other symptoms.
- Rash: In some cases, a characteristic rash (scarlet fever) may develop.
- Nausea or Vomiting: More common in children.
- Body Aches: General feeling of malaise or discomfort.



Modified Center Score

- Modified Center Score is a clinical tool used to assess the likelihood of streptococcal pharyngitis (strep throat) in patients with sore throat. It helps guide decisions about the need for testing and treatment.
- The Modified Center Score assigns points based on the patient's presentation then predict the risk of Group A Strep pharyngitis for that patient.
- It's important to remember that these scores **do not** take into account patients with a **history of acute rheumatic fever** who are at the greatest risk of complications of recurrent strep pharyngitis.



Modified Center Score...

Parameters

The score is based on four criteria:

- Fever: A temperature of 38°C (100.4°F) or higher.
- Tonsillar Exudate: Presence of white or yellowish spots on the tonsils.
- Tender Anterior Cervical Adenopathy: Painful swelling of the lymph nodes in the front of the neck.
- Absence of Cough: The patient does not have a cough.



Modified Center Score...

Criteria	Point
Temperature >38C	1
No cough	1
Tender anterior cervical adenopathy	1
Tonsillar swelling or exudate	1
Age 3 -14 years	1
Age 15 - 44 years	0
Age > 44 years	-1



Total Score	Risk of group A streptococcal pharyngitis
≥ 4	38 – 63%
3	27 – 28%
2	10 – 12%
1	4 – 6%
0	2 – 3%



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Modified Centre Score...

Limitations

- Less reliable in **children**, as non-Group A Strep infections may present with similar symptoms.
- A **high score does not confirm** Group A Streptococcal (GAS) pharyngitis; further testing is still needed.
- Only about **57% of patients with a score of 4** test positive for GAS.
- May help identify patients **who do not need testing**, but not definitively diagnose those who do.
- A **positive microbiologic test may reflect carriage** rather than active infection.



Diagnosis of GAS using Rapid Antigen Testing

- A rapid antigen diagnostic tests that is negative for Group A Streptococcal pharyngitis provides reassurance that a antibiotics are unlikely to be needed.
- Clinicians in stewardship programs should examine the evidence and decide which is a better approach in their setting, taking into account surveillance and epidemiologic data, microbiologic data and other resources.



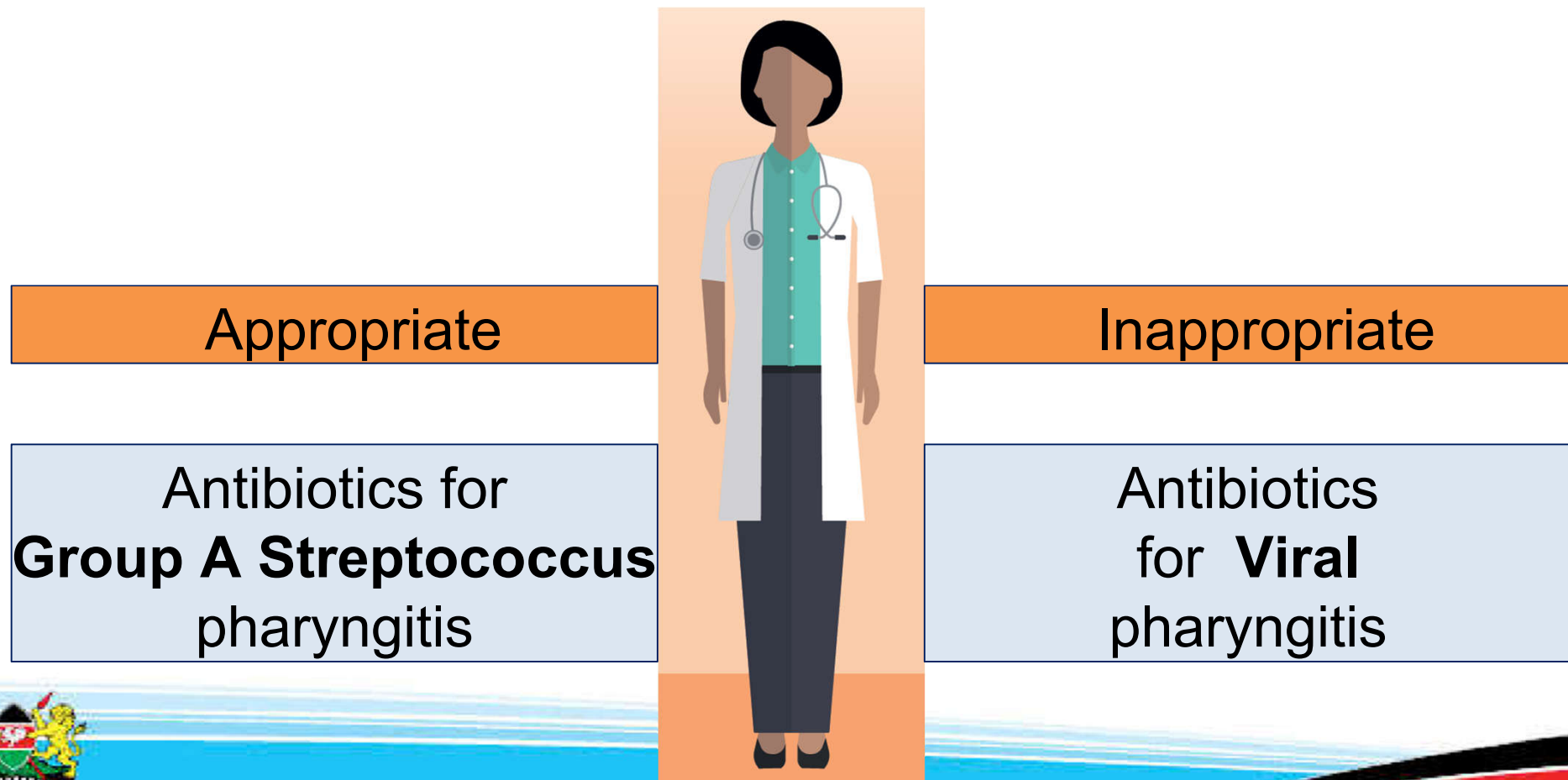
Management of Pharyngitis

Depends on the underlying cause, whether Viral or Bacterial

Viral Pharyngitis	Bacterial Pharyngitis
<u>Supportive management</u> ● Analgesics/Antipyretics ● Adequate hydration ● Throat lozenges ● Rest ● Avoid antibiotics	● First-line antibiotics- should be oral Penicillins if no allergies ● Cephalosporins (with caution) or Macrolides if allergic to Penicillins ● Analgesics/Antipyretics ● Adequate hydration ● Rest ● Complete the full course of antibiotics to prevent complications like RF and reduce risk of AMR



Treatment of Acute Pharyngitis



Challenges of Overuse of Antimicrobial Agents

- Using a broader spectrum agent than is necessary exposes the patient to undue harm and violates the principles of appropriate antimicrobial use highlighted throughout this course.
- Avoidable harm include:
 - Adverse events
 - *Clostridium difficile* infection and pseudomembranous colitis
 - Cost
 - Emergence of AMR



Case Scenario I

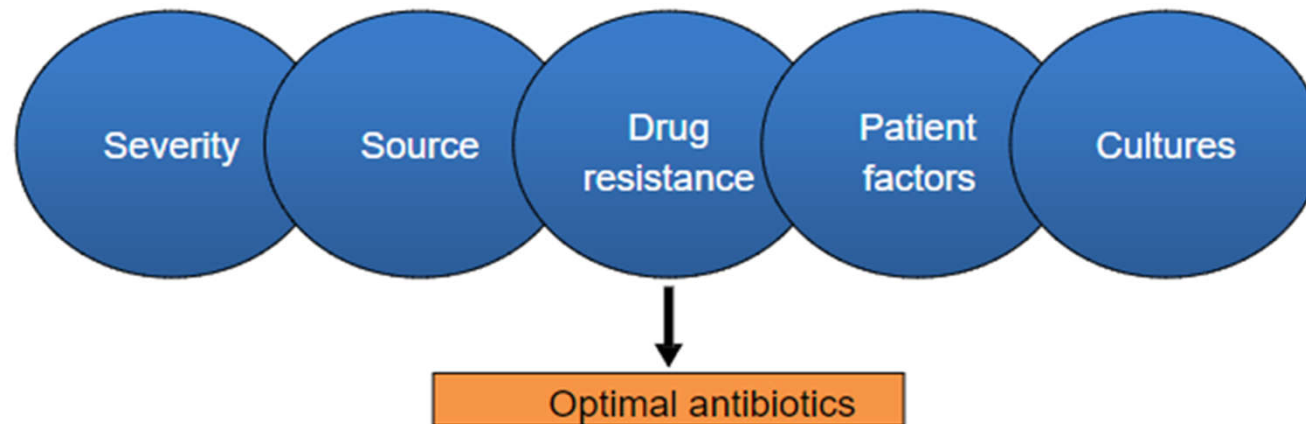
An otherwise healthy 14-year-old male presents with a 2-day history of sore throat and fever. He has had no rhinorrhea or cough on physical exam. His temperature is 38.5 **degrees Celsius** with normal vital signs and he is in no acute distress. He has an erythematous posterior pharynx, with small amounts of exudate and two small palatal petechiae. He also has bilateral non-tender cervical lymphadenopathy. He has no rash, has no signs to suggest dehydration and has not recently taken antibiotics. How would you manage this patient?



Principles of empiric antibiotics use for patients with Pharyngitis

When determining the most effective empiric therapy you must consider:

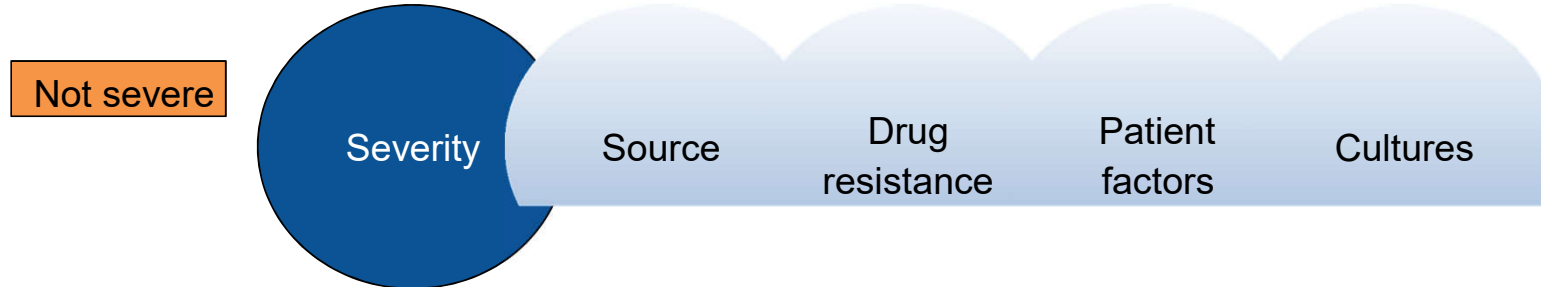
- Severity of illness
- Source of infection
- Drug Resistance
- Patient Factors like history of drug allergies, comorbidities etc.
- Cultures



1. Severity

How severe is the patient's condition?

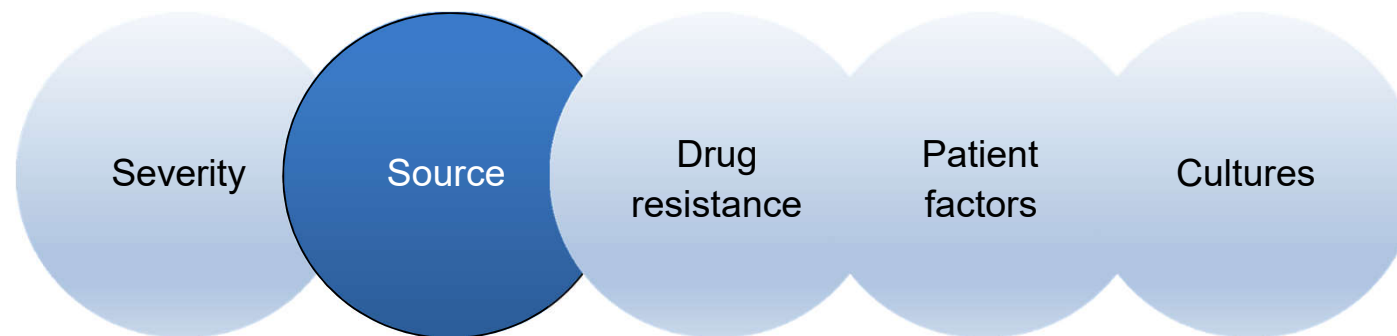
- **Not severe.** His appearance is non-toxic with no signs suggestive of a life-threatening condition including, but not limited to, vital signs instability, drooling, inability to swallow or unilateral swelling. He can be managed without hospitalization



2. Source

What is the likely source & pathogens?

- Given his presenting signs and symptoms, his age and the time of the year, you considered the diagnosis of Group A Strep pharyngitis. He has no signs or symptoms suggestive of a viral upper respiratory tract infection.



- Group A Streptococcus pharyngitis?
- No signs of viral URI

2. Source...

Criteria	Point
Temperature >38C	1
No cough	1
Tender anterior cervical adenopathy	-
Tonsillar swelling or exudate	1
Age 3 -14 years	1
Age 15 - 44 years	-
Age > 44 years	-
TOTAL	4

Total Score	Risk of group A streptococcal pharyngitis	Further Testing Recommended (Yes/No)
≥ 4	38 – 63%	Yes
3	27 – 28%	Yes
2	10 – 12%	Yes
1	4 – 6%	No
0	2 – 3%	No



2. Source...

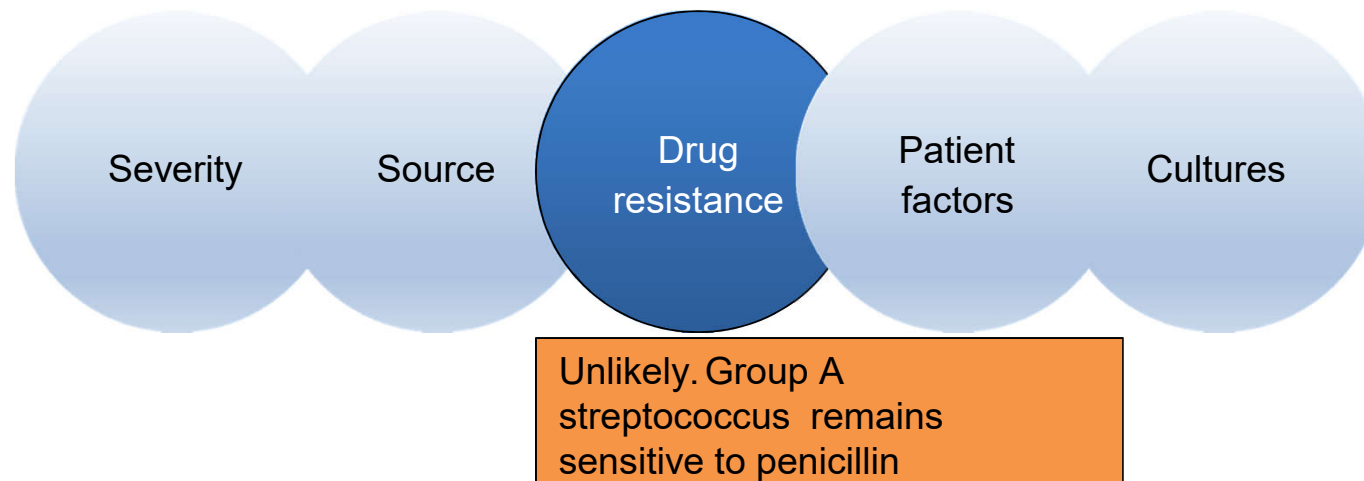
His modified Center score equals 4, indicating that his risk of Group A Strep pharyngitis is relatively high - at 38 to 63%. Recognizing that a high Center score is not equivalent to an unequivocal diagnosis of Group A Strep pharyngitis, you decide to pursue further microbiologic testing.



3. Drug Resistance

How likely is resistance?

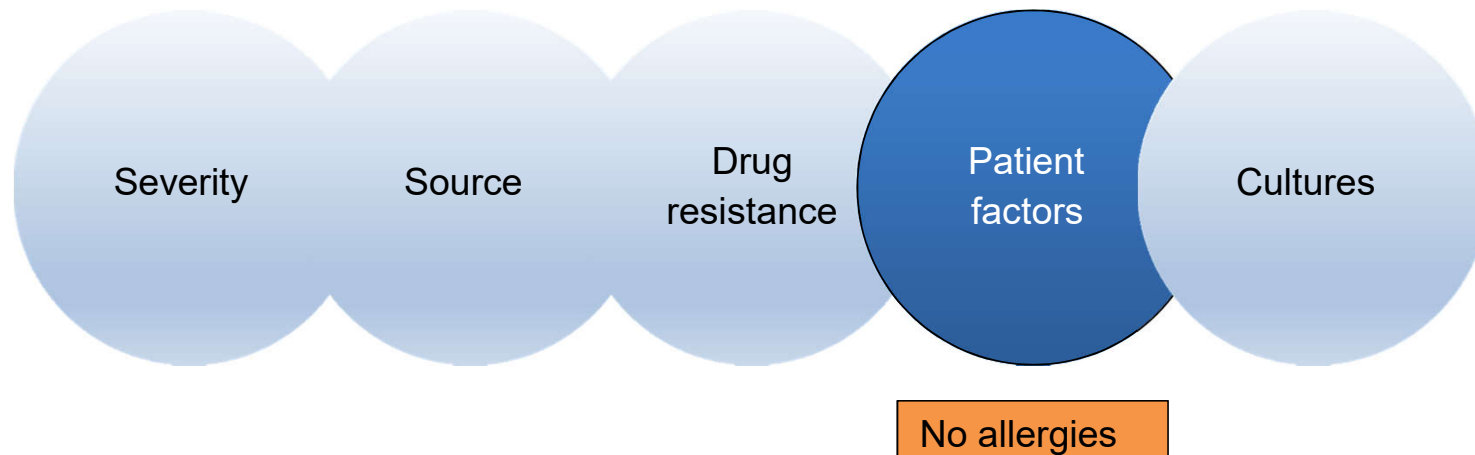
- If this patient does have Group A Strep pharyngitis, resistance is unlikely as this organism remains sensitive to penicillin - the recommended first-line antimicrobial for this infection.



4. Patient Factors

Other considerations?

- The patient denies any history of allergies to antibiotics.



5. Cultures

Do I need cultures?

- Recognizing that a high Centor score is not equivalent to a diagnosis of Group A Strep pharyngitis, you decide to pursue further microbiological testing.
- If available, rapid antigen testing (RAT) is preferred given its quick turnaround time and excellent performance characteristics.
- If RAT is unavailable, take cultures and give empiric antibiotic and wait to review within 48-72 hours.
- If the RAT is negative, there is no need for confirmatory culture test.

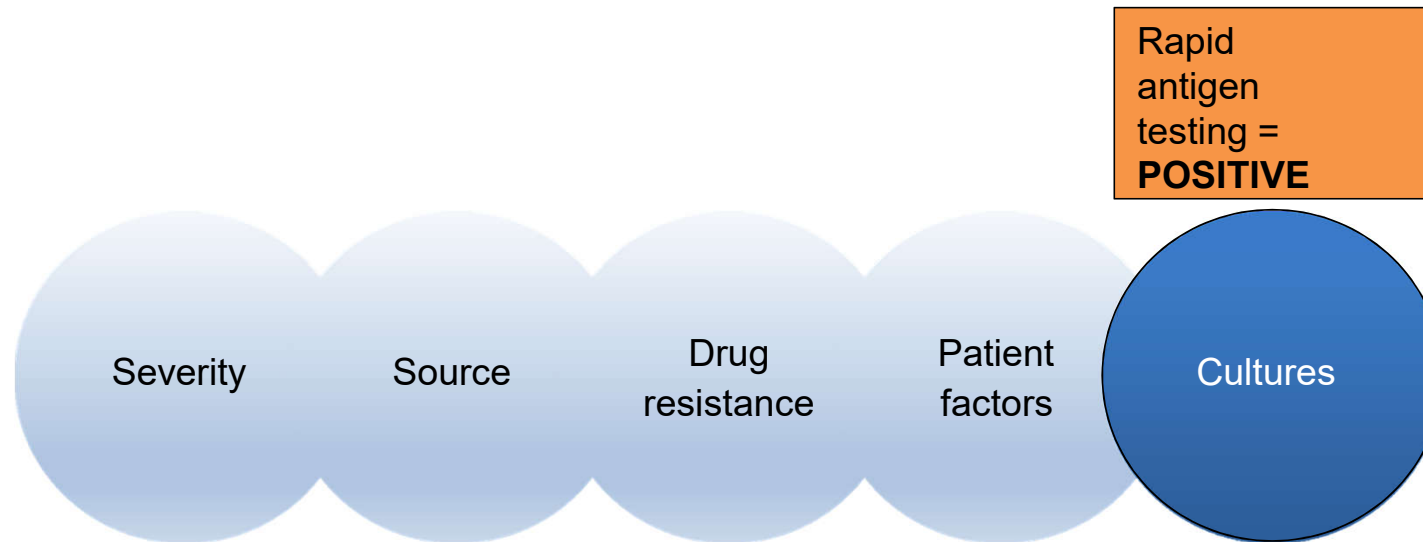


Rapid antigen testing



5. Cultures...

- For this patient's case the rapid antigen test is positive.



5. Cultures...

Throat culture is the gold standard for diagnosing Group A Streptococcus (GAS) pharyngitis and identifying other bacterial causes.

Confirmation: Suspected GAS colonies can be confirmed with further testing, such as susceptibility to bacitracin or by using specific anti-streptococcal antibodies in agglutination tests.

Advantages of culture

- High sensitivity and specificity
- Can identify non-GAS bacteria, such as Group C and G Streptococcus, *Arcanobacterium haemolyticum*, and other pathogens.

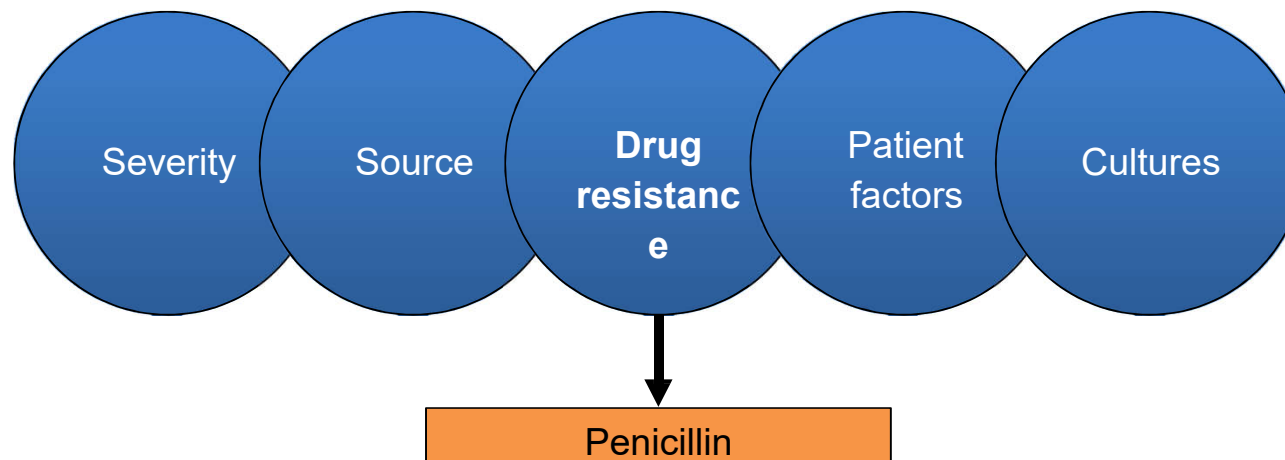
Disadvantages of culture:

- Results take 24-48 hours, which delays diagnosis and treatment compared to RADT.



Therapeutic Choice

- You do recognize that this test may reflect asymptomatic carriage instead of infection.
- However, you do prescribe a 5-7 day course of penicillin per treatment guidelines
- Now let's move on to case two



Case Scenario 2

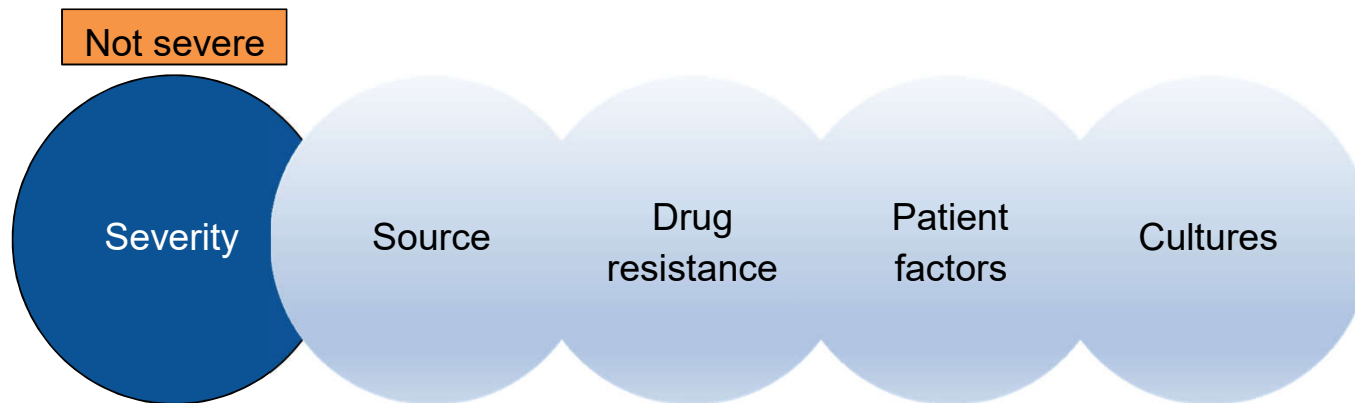
- An otherwise healthy 55-year-old male with a 2-day history of sore throat and fever. He reports some rhinorrhea and mild cough that preceded his sore throat but denies diarrhea.
- On exam, his temperature is 38.2 degrees Celsius with otherwise normal vital signs and he is in no acute distress.
- He has an erythematous posterior pharynx with small amounts of exudate. He has no rash, has no signs to suggest dehydration and he has not recently taken antibiotics.



1. Severity

How severe is the patient's condition?

- **Not severe.** His appearance is non-toxic, with no signs suggestive of a life-threatening infection including, but not limited to, vital signs instability, drooling, inability to swallow or unilateral swelling.

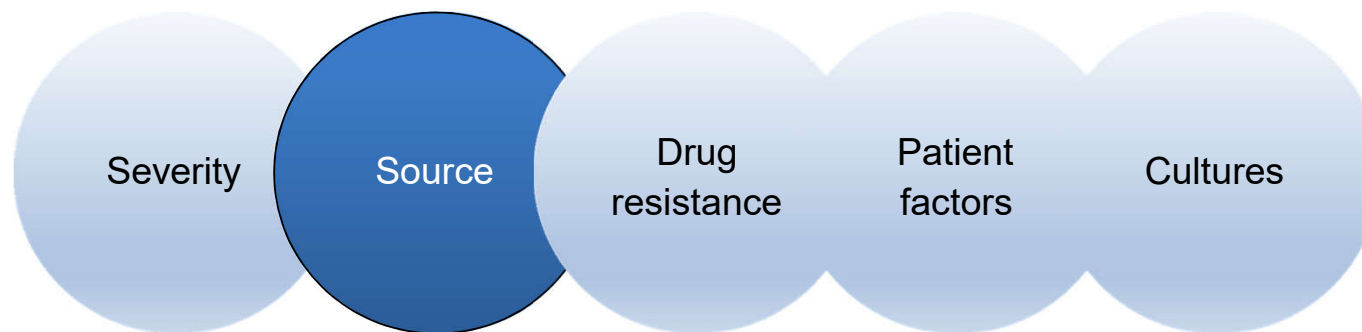


2. Source

What is the likely source & pathogens?

- Given his presenting signs and symptoms, his age and the time of year you feel a viral process is most likely. This is supported by the mild cough and rhinorrhea he had prior to the onset of his sore throat.

Viral upper respiratory
tract infection most likely



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2. Source...

Criteria	Point
Temperature >38C	1
No cough	-
Tender anterior cervical adenopathy	-
Tonsillar swelling or exudate	1
Age 3 -14 years	-
Age 15 – 44 years	-
Age > 44 years	-1
TOTAL	1

Total Score	Risk of group A streptococcal pharyngitis
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0	2 – 3%

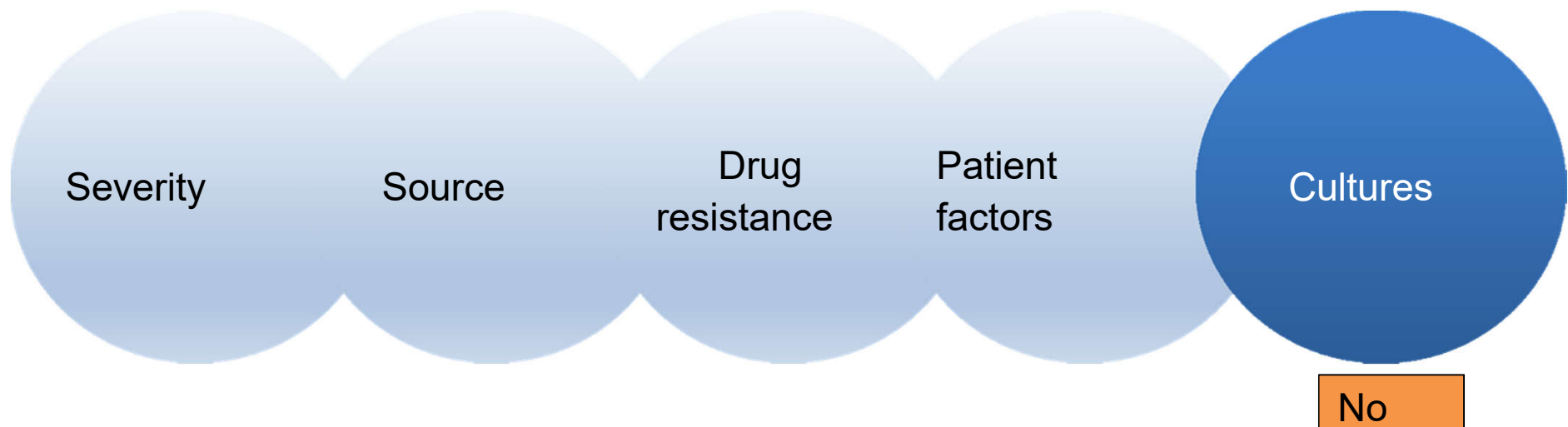
His Modified Center Score equals 1, indicating his risk of Group A Strep pharyngitis is '**low**'.



3. Cultures

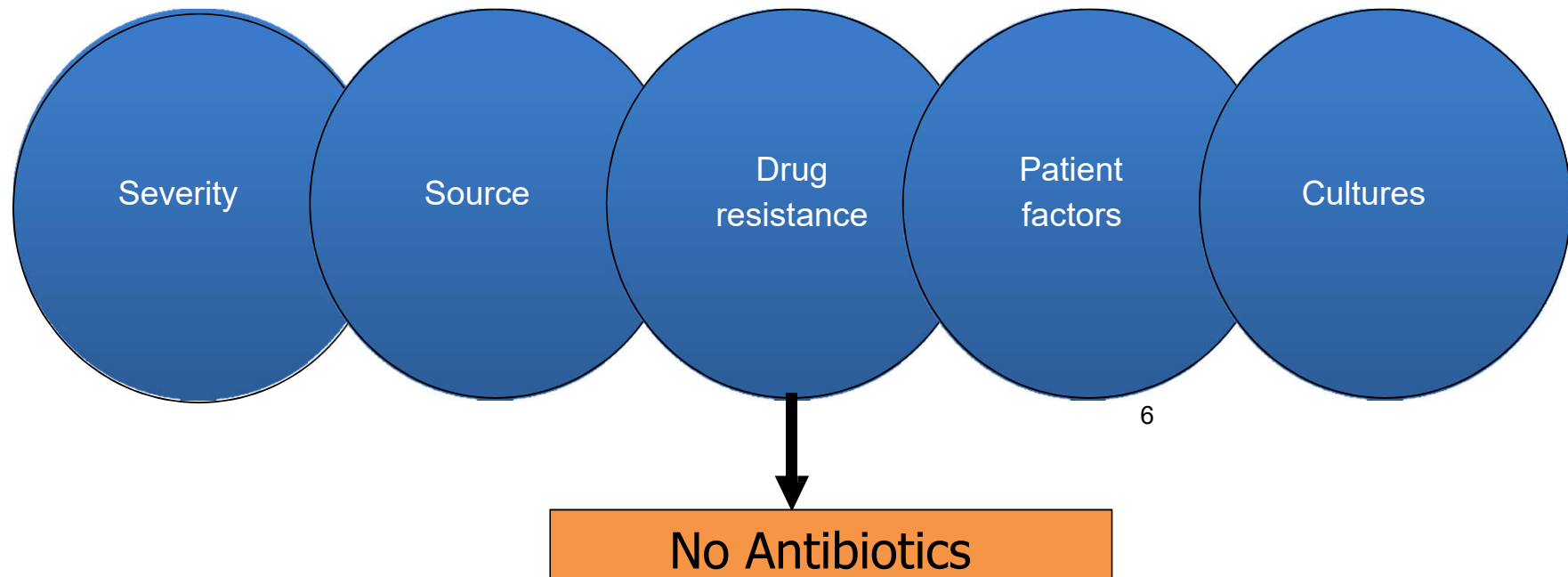
Do I need cultures?

- Guidelines recommend against microbiologic testing in patients with a low likelihood of Group A Streptococcus pharyngitis



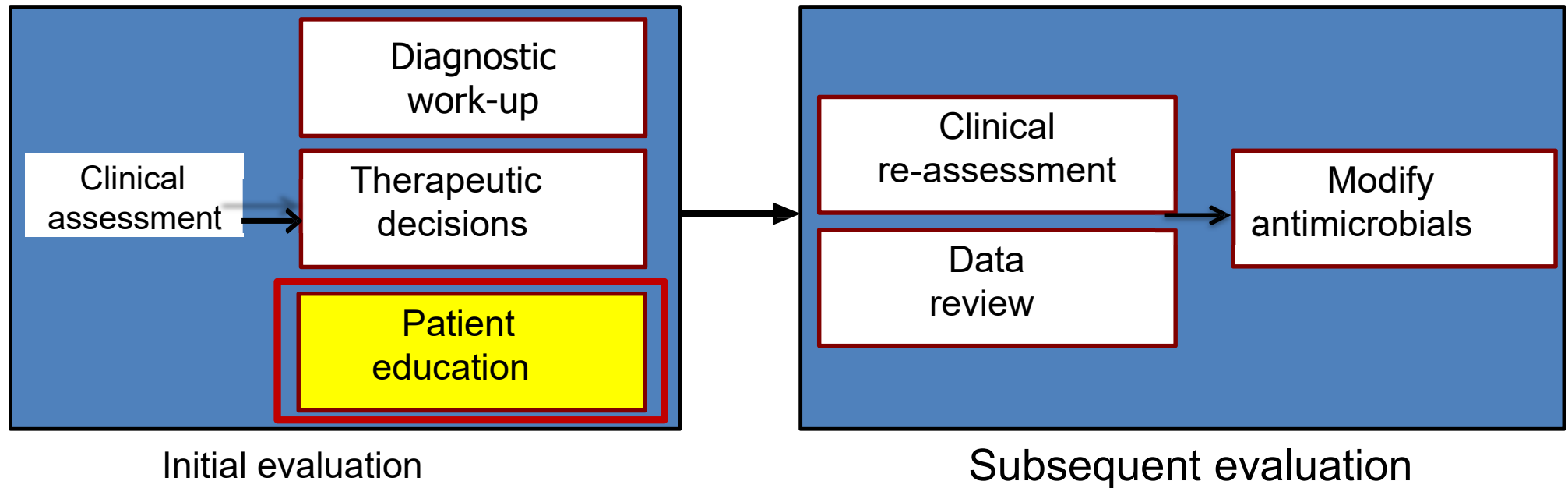
Therapeutic Choice

You decide not to prescribe empiric antimicrobials.

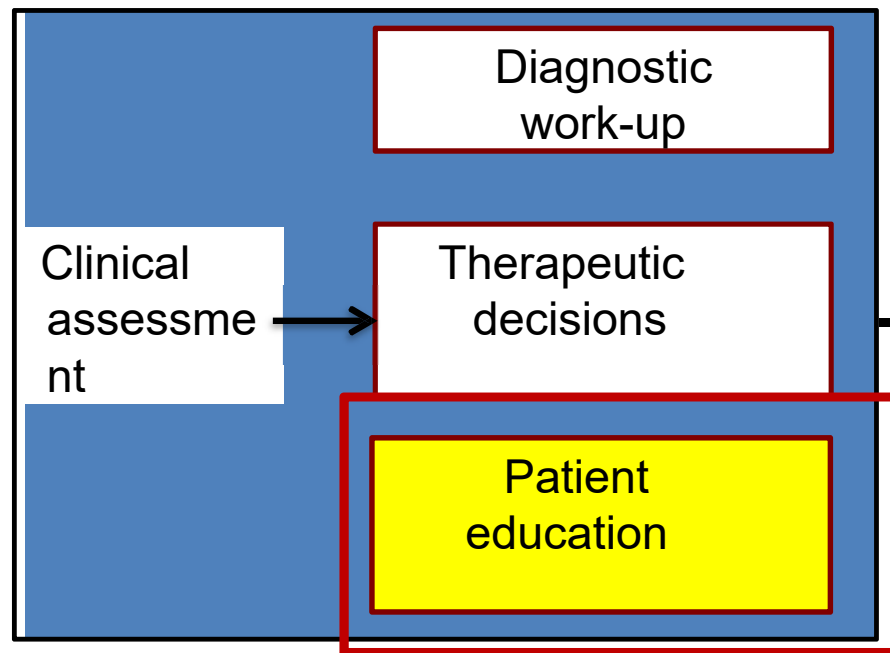


Patient Education

You tell your patient that he most likely has sore throat as part of a viral upper respiratory syndrome.



Patient Education...



Initial evaluation

- Give specific diagnosis
- Provide reassurance
- Symptomatic therapy
- Advise against acquiring antibiotics by other means
- Offer follow-up visit (safety net)

Patient Education.....

- Important to educate patients that the majority of patients with sore throat do well without antibiotics
- Patients may recall episodes of Group A Strep pharyngitis treated as children and requests similar management as adults. It's important to educate adult patients regarding the epidemiology of Group A Strep pharyngitis and inform them of their overall low risk of this infection and its complications
- Large cohort studies of adults with sore throats show that only 2% developed complications (commonly otitis media and sinusitis) provides reassurance to clinicians that almost all patients with acute sore throat do well without taking antibiotics



Key Points

1. Most cases of acute pharyngitis are viral, not requiring antibiotics.
2. Group A Streptococcus (GAS) is the main bacterial cause, particularly in children.
3. The Modified Centor Score and microbiologic testing help identify patients who may benefit from antibiotics.
4. Penicillin is the first-line treatment for confirmed GAS pharyngitis in non-allergic patients.
5. Educating patients reduces pressure to prescribe antibiotics unnecessarily and helps combat antimicrobial resistance (AMR).



The End



You have come to the end of this module. Kindly attempt module 11 quiz before proceeding to module 12