

# Airway Obstruction Case

A Self-Directed Learning Module

Department of Otolaryngology – Head & Neck Surgery  
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[Click to Begin](#)

## Case Presentation



Two parents have brought their 4-year-old daughter to the emergency room.

She had a sudden onset of difficulty breathing, fever, and painful swallowing.

*You are the emergency room physician, click through the module to treat this patient.*

Obtain a history from the parents

# History from Parents

“This morning we noticed that she feels warm and was not quite herself. She started complaining about a sore throat about 2 hours ago.

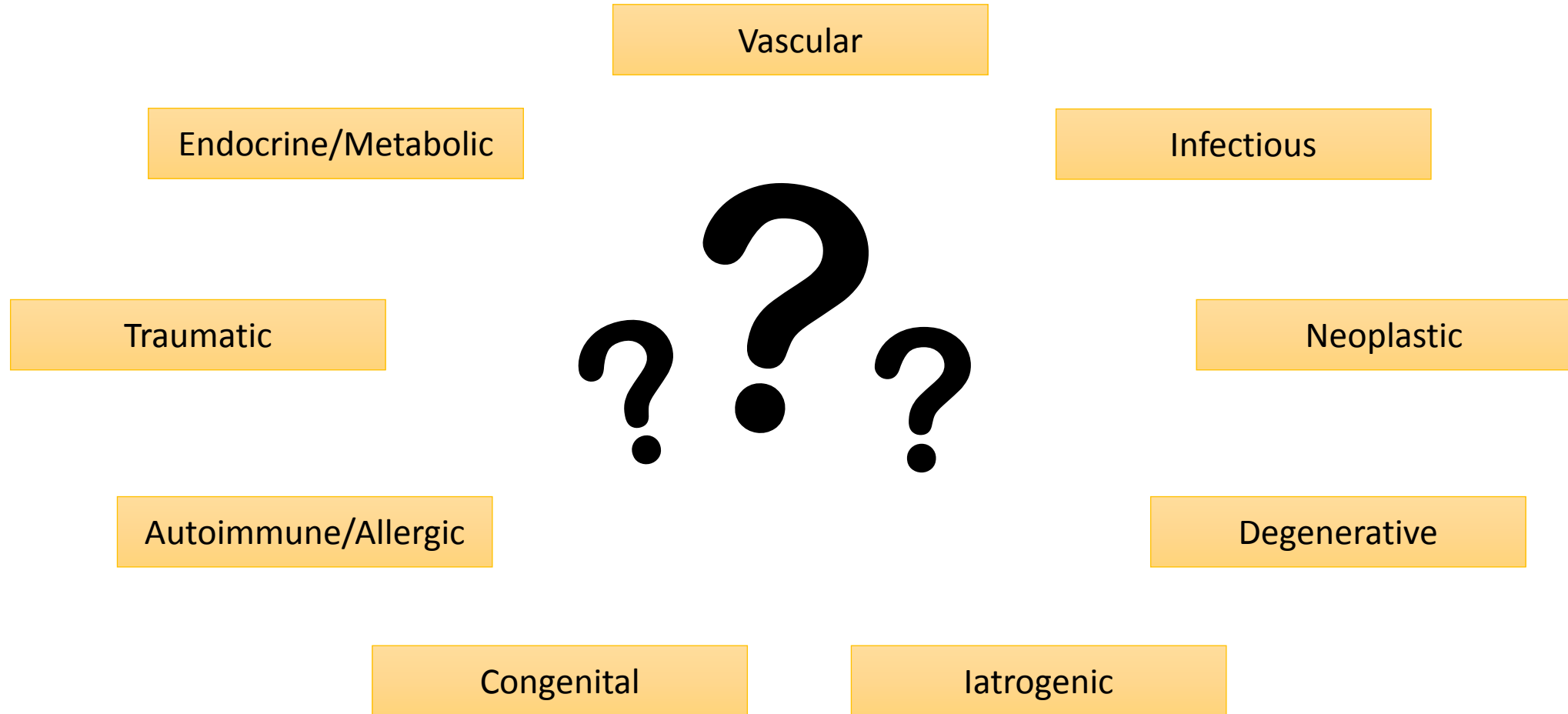
We also noticed that she started drooling for the past hour, saying it hurts too much to swallow. But it’s the breathing that is really worrying us... it sounds really noisy. It’s been like that for about 15 minutes now.

She is generally healthy. She has never been in the hospital. I think she has had all of her vaccinations, but I’m not sure. We travel overseas quite often for work, so she may have missed a vaccination. She has no medical diagnoses to date.”

What is on your differential diagnosis so far?

# What diagnoses are coming to mind?

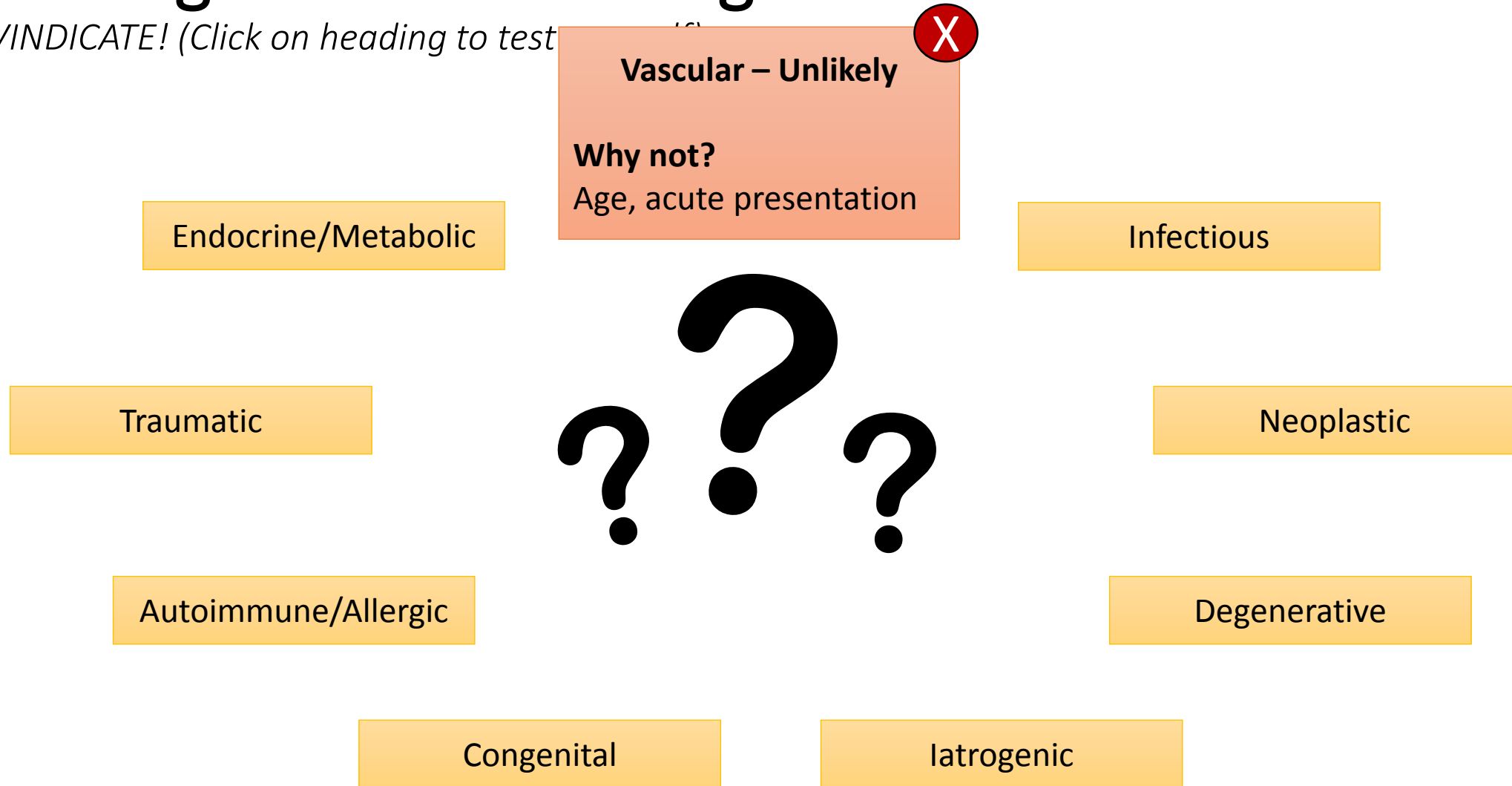
*Think VINDICATE! (Click on heading to test yourself)*



With your DDx in mind, proceed to focused physical exam.

# What diagnoses are coming to mind?

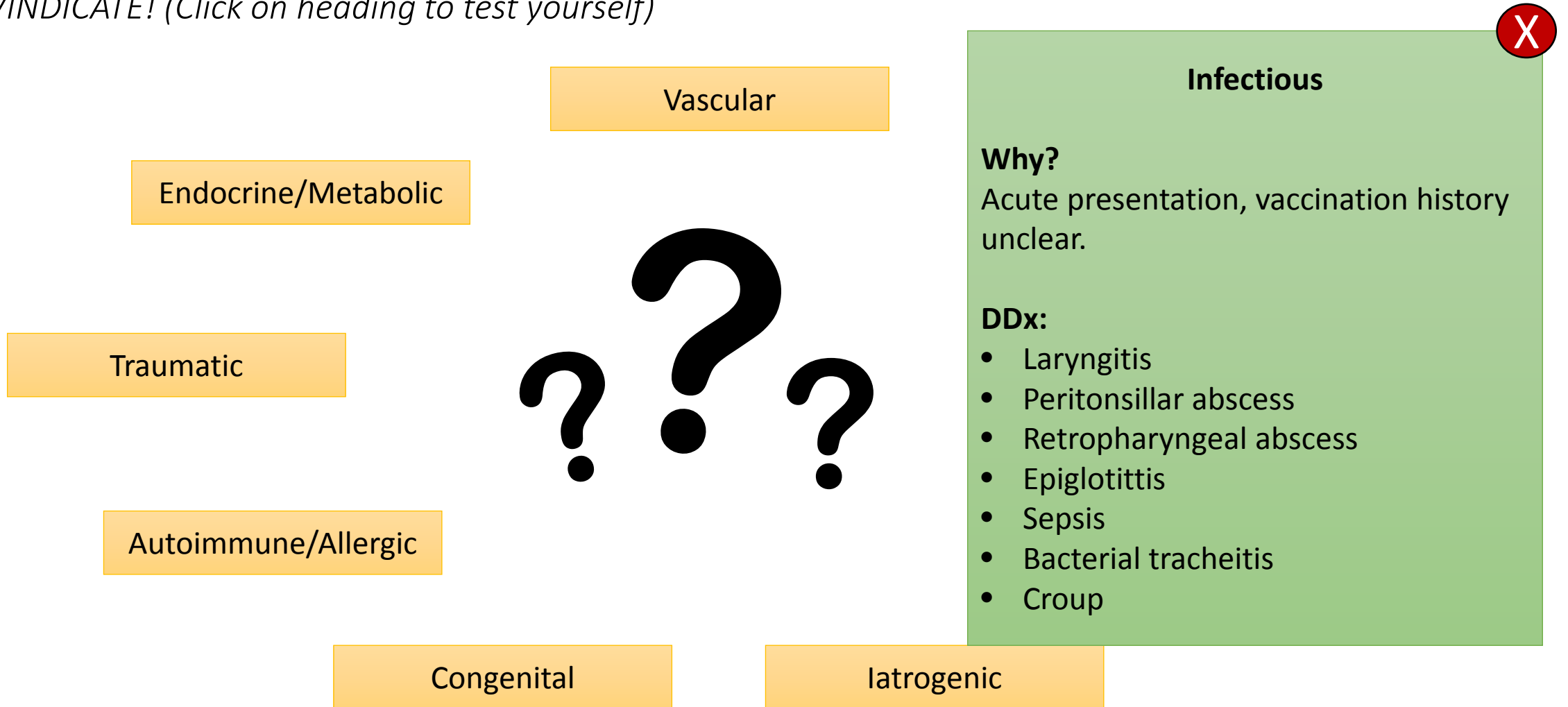
Think VINDICATE! (Click on heading to test)



With your DDx in mind, proceed to focused physical exam.

# What diagnoses are coming to mind?

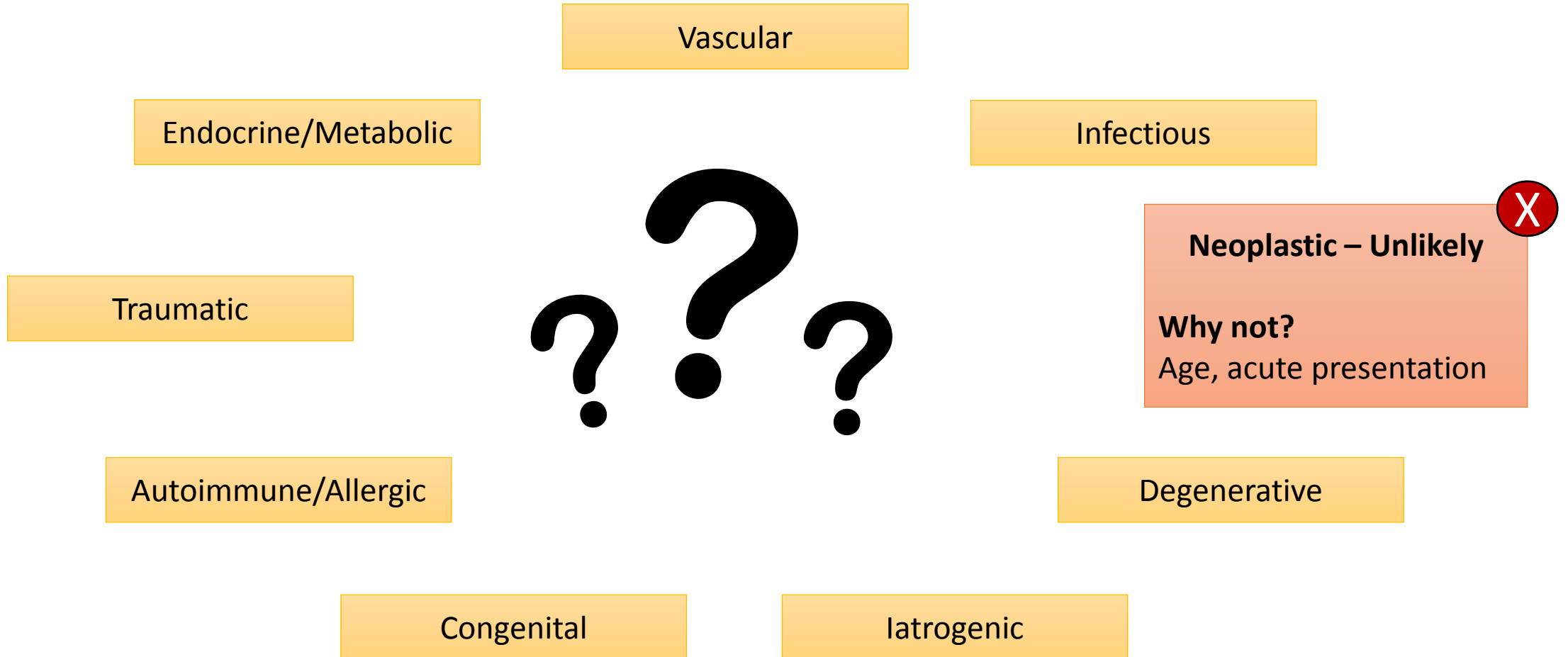
Think VINDICATE! (Click on heading to test yourself)



With your DDx in mind, proceed to focused physical exam.

# What diagnoses are coming to mind?

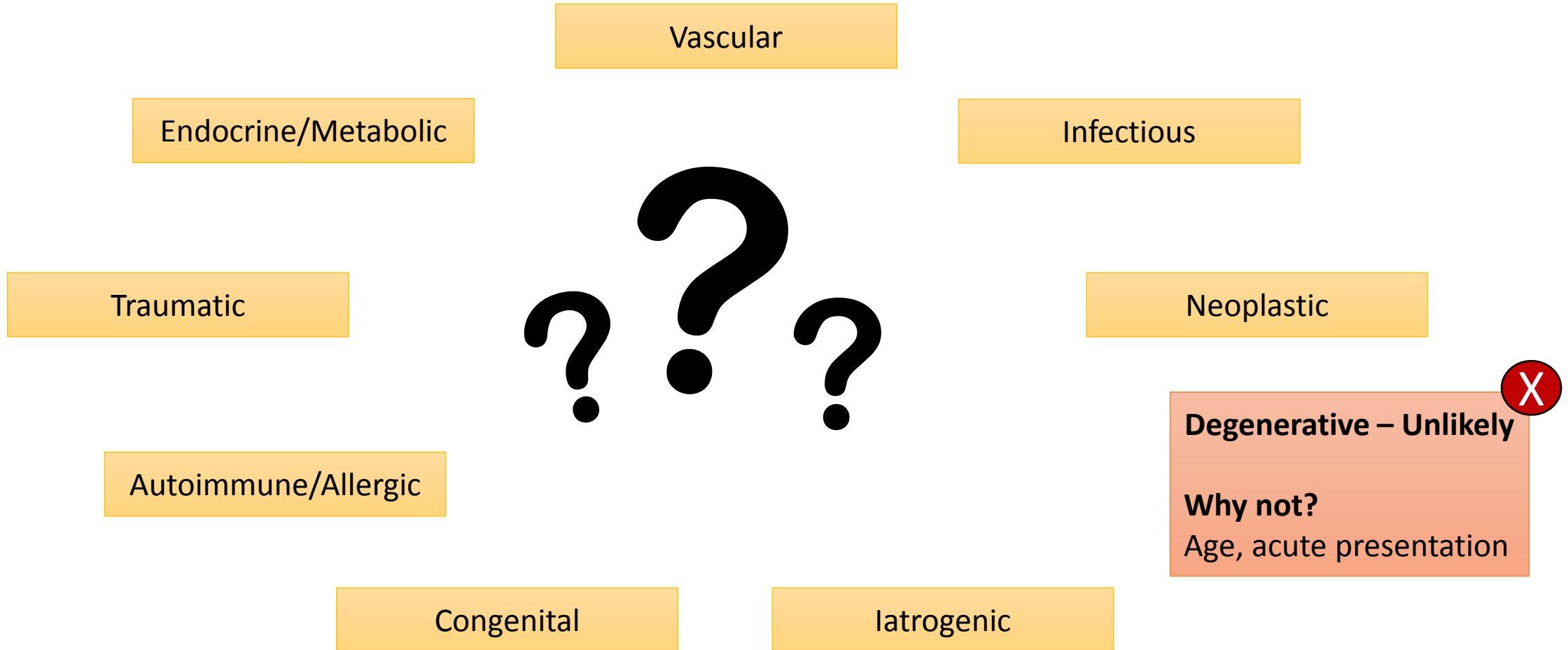
*Think VINDICATE! (Click on heading to test yourself)*



With your DDx in mind, proceed to focused physical exam.

# What diagnoses are coming to mind?

*Think VINDICATE! (Click on heading to test yourself)*

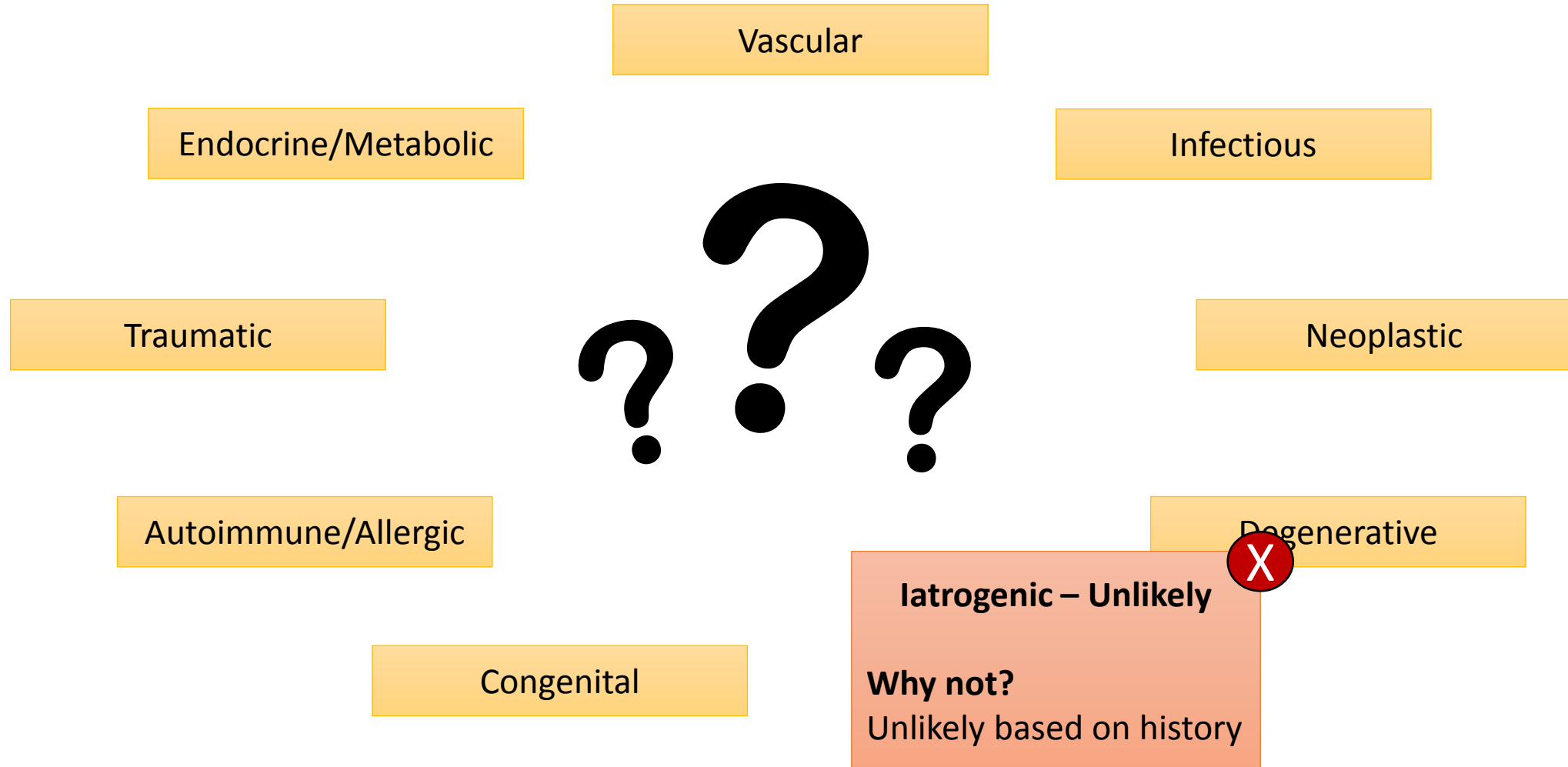


With your DDx in mind, proceed to focused physical exam.



# What diagnoses are coming to mind?

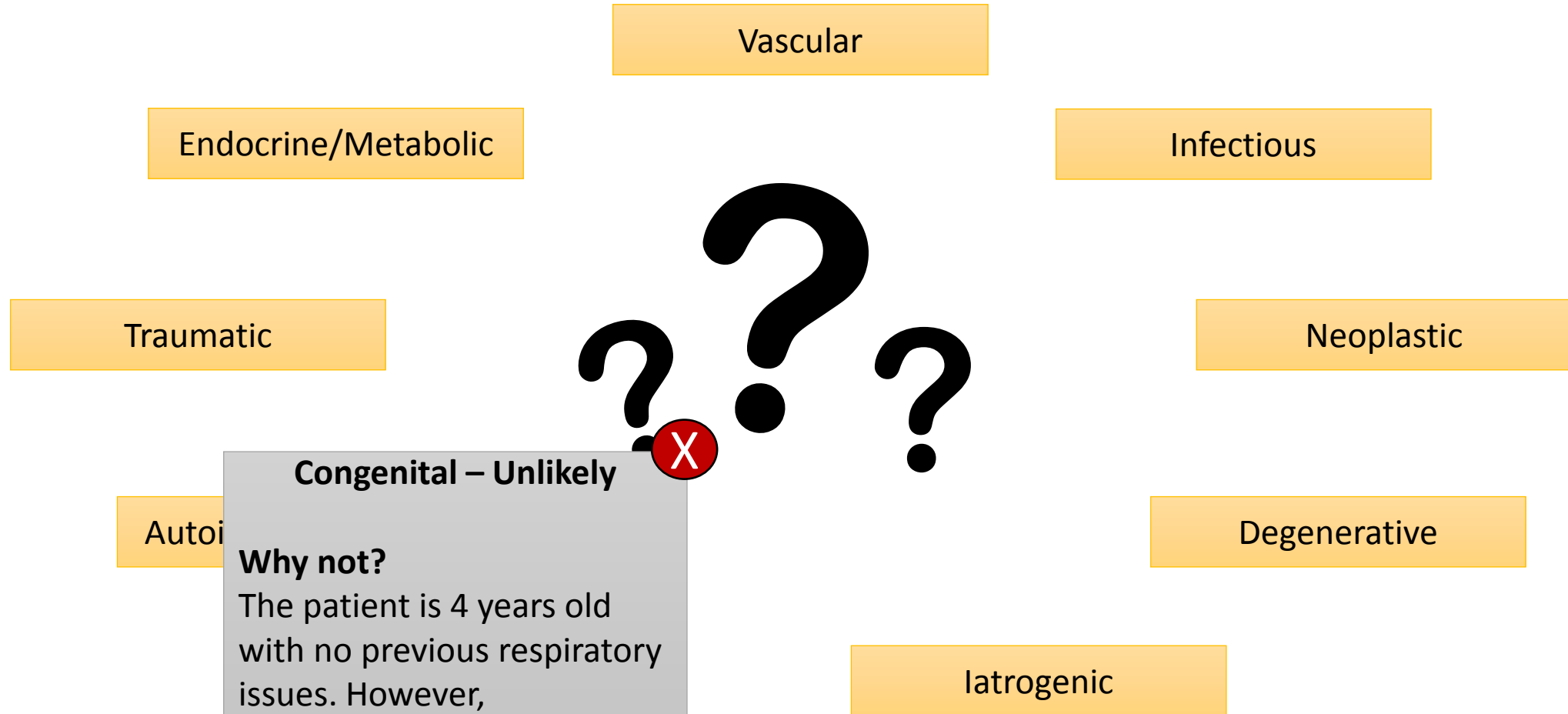
*Think VINDICATE! (Click on heading to test yourself)*



With your DDx in mind, proceed to focused physical exam.

# What diagnoses are coming to mind?

*Think VINDICATE! (Click on heading to test yourself)*



With your DDx in mind, proceed to focused physical exam.

# What diagnoses are coming to mind?

*Think VINDICATE! (Click on heading to test yourself)*

Vascular

Endocrine/Metabolic

Infectious

Traumatic

Neoplastic

**Autoimmune/Allergic**

**Why?**

Acute presentation

**DDx:**

- Acute angioedema
- Allergic reaction

genital

Iatrogenic

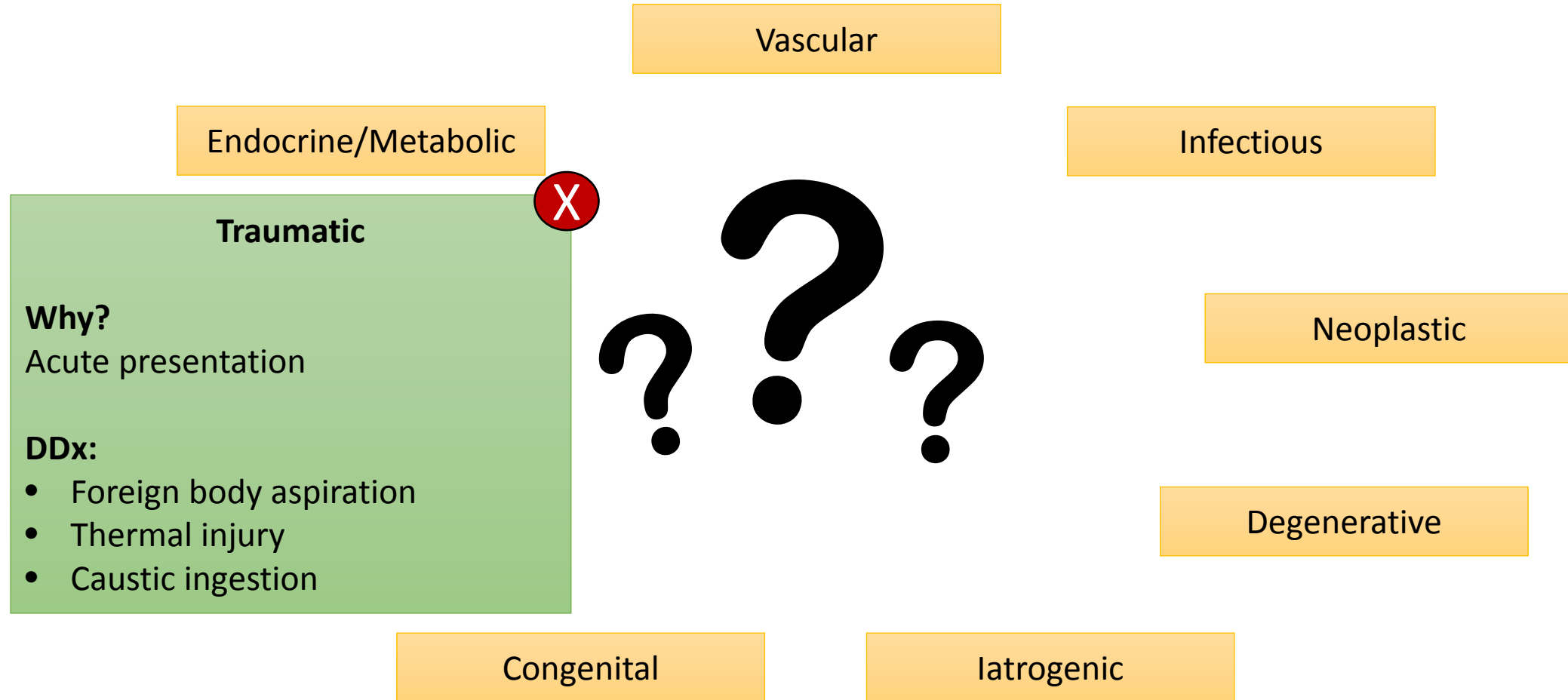
Degenerative



With your DDx in mind, proceed to focused physical exam.

# What diagnoses are coming to mind?

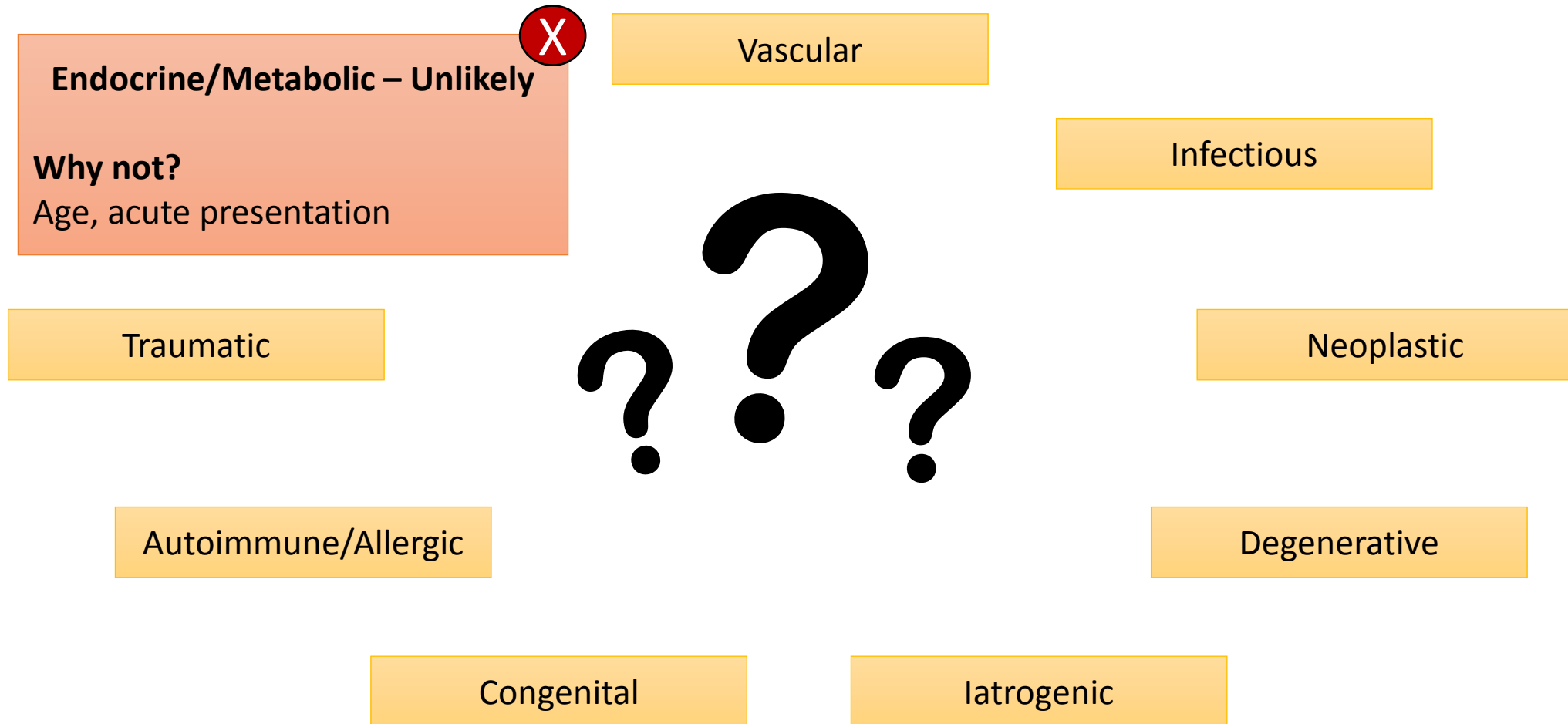
Think VINDICATE! (Click on heading to test yourself)



With your DDx in mind, proceed to focused physical exam.

# What diagnoses are coming to mind?

*Think VINDICATE! (Click on heading to test yourself)*



With your DDx in mind, proceed to focused physical exam.

# Physical Exam

*Click on the appropriate physical examinations.*

General inspection

Vitals

Oral Cavity Exam

Laryngoscopy

CVS Exam

Respiratory Exam

[Proceed to investigations](#)



# Physical Exam

*Click on the appropriate physical examinations.*

General inspection

Vitals

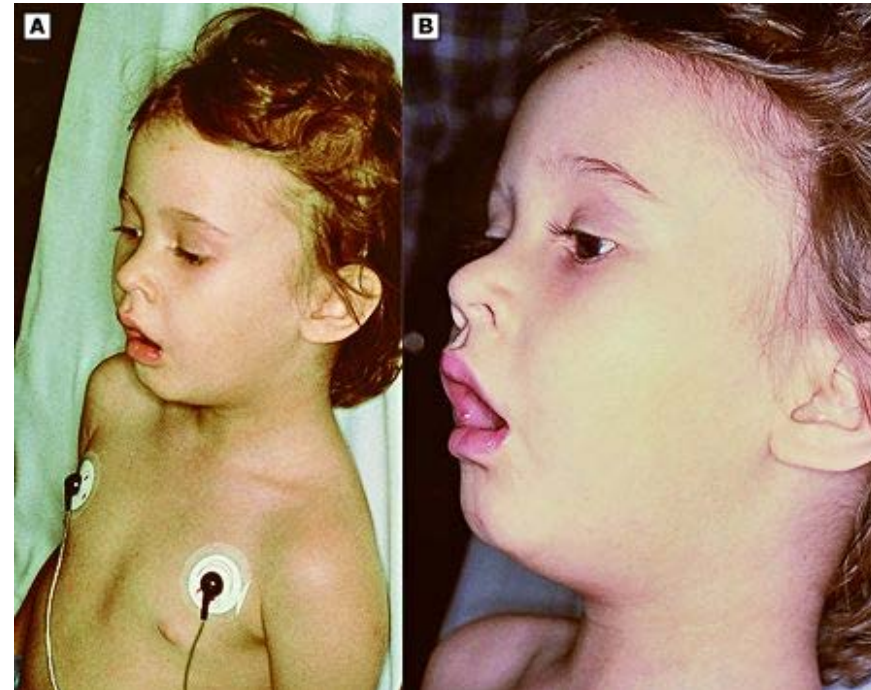
Oral Cavity Exam

Laryngoscopy

CVS Exam

Respiratory Exam

She is having labored breathing and drooling.  
She looks unwell with inspiratory stridor.



Proceed to investigations



# Physical Exam

*Click on the appropriate physical examinations.*

General inspection

Vitals

Oral Cavity Exam

Laryngoscopy

CVS Exam

Respiratory Exam

Temperature: 39.2 °C  
BP: 100/65  
HR: 140  
RR: 28



[Proceed to investigations](#)



# Physical Exam

*Click on the appropriate physical examinations.*

General inspection

Vitals

Oral Cavity Exam

Deferred for fear of agitating a child with urgent airway concern.

Laryngoscopy

CVS Exam

Respiratory Exam

Proceed to investigations

# Physical Exam

*Click on the appropriate physical examinations.*

General inspection

Vitals

Oral Cavity Exam

Laryngoscopy

CVS Exam

Respiratory Exam

While nasopharyngoscopy can be used to visualize the airway, given this particular pediatric clinical situation with significant stridor, you're worried that doing so may provoke anxiety, agitation, and in turn airway obstruction.

Proceed to investigations

# Physical Exam

*Click on the appropriate physical examinations.*

General inspection

Vitals

Oral Cavity Exam

Laryngoscopy

CVS Exam

Respiratory Exam

Not warranted given clinical picture.

[Proceed to investigations](#)

# Physical Exam

*Click on the appropriate physical examinations.*

General inspection

Vitals

Oral Cavity Exam

Laryngoscopy

CVS Exam

Respiratory Exam

Deferred for fear of agitating a child with urgent airway concern.

Proceed to investigations

# Investigations *(Click on appropriate investigations.)*

CT scan

MRI

Ultrasound of neck

Lateral neck X-ray

Nasopharyngeal swab

Biopsy

# Investigations *(Click on appropriate investigations.)*

CT scan

MRI

Ultrasound of neck

Lateral neck X-ray

Nasopharyngeal swab

Biopsy

Contraindicated in this case due to the emergent nature of the diagnosis.

[Continue to Diagnosis](#)

# Investigations *(Click on appropriate investigations.)*

CT scan

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Contraindicated in this case due to the emergent nature of the diagnosis.

# Investigations *(Click on appropriate investigations.)*

CT scan

MRI

Ultrasound of neck

Lateral neck X-ray

Nasopharyngeal swab

Biopsy

Not warranted given clinic picture.





[Back to Case Presentation](#)

# Investigations *(Click on appropriate investigations.)*

CT scan

MRI

Ultrasound of neck

Lateral neck X-ray

Nasopharyngeal swab

Biopsy



A **portable** X-ray was arranged to avoid transport to radiology suite.

[Continue to Diagnosis](#)

# Investigations *(Click on appropriate investigations.)*

CT scan

MRI

Ultrasound of neck

Lateral neck X-ray

Nasopharyngeal swab

Biopsy

Contraindicated at this time, due to the emergent nature of the diagnosis.

# Investigations *(Click on appropriate investigations.)*

CT scan

MRI

Ultrasound of neck

Lateral neck X-ray

Nasopharyngeal swab

Biopsy

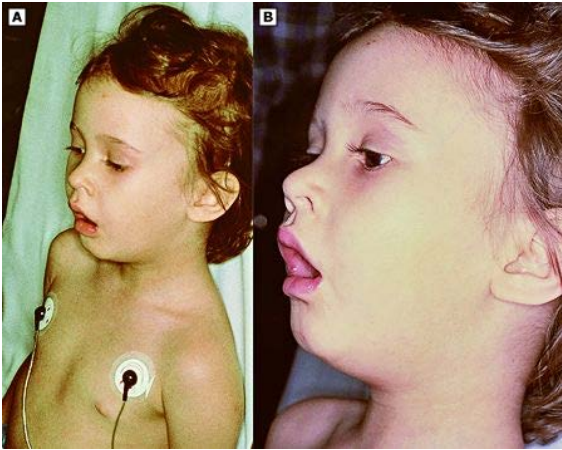
Not applicable to this case.

# Summary of findings

## Chief complaints:

- Difficulty breathing (15 min), painful swallowing (2 hours), drooling (1 hour), anxious

## General inspection:



## Vitals:

Temperature: 39.2 °C  
BP: 100/65  
HR: 140  
RR: 28

## Lateral neck X-ray:



Based on your findings,  
choose the most likely diagnosis:

[a. Peritonsillar abscess](#)

[b. Epiglottitis](#)

[c. Foreign body](#)

[d. Allergic reaction](#)

[e. Caustic ingestion](#)

[f. Croup](#)

# Diagnosis

**Correct!** This is a case of **epiglottitis** (more accurately called supraglottitis). It is a cellulitis of the supraglottic structures associated with profound edema, most noticeably of the epiglottis.

On further question of vaccination history, this child was not immunized against *Haemophilus Influenza B*, a bacterial cause of epiglottitis.

Now that you have made the correct diagnosis, choose the best treatment for this patient.

# Diagnosis

**Incorrect.** The patient's fever, lack of coughing, and findings on the lateral neck X-ray make a foreign body unlikely. There was also no mention of a choking episode or coughing on patient history.

# Diagnosis

**Incorrect.** The clinical picture does not match peritonsillar abscess. The findings on the X-ray points to another diagnosis.

# Diagnosis

**Incorrect.** Allergic reaction can cause dyspnea and laryngeal edema. However, there are no other typical signs of allergic reaction in this patient (hives, pruritis, facial edema, etc.). Further, the patient's fever and findings on the lateral neck X-ray point to a more likely diagnosis.



# Diagnosis

**Incorrect.** Caustic ingestion could cause drooling, dysphagia, and laryngeal edema. However, the fever, lack of mouth pain or evidence of caustic ingestion, and history do not support this diagnosis.

# Diagnosis

**Incorrect.** Croup can cause a low-grade fever, voice changes, and stridor. However, the sudden onset, drooling, high-grade fever, and lack of “barking” cough make this diagnosis unlikely. The history and findings on the lateral neck X-ray point to another diagnosis.

Choose the best initial treatment for this patient.

- [Discharge with antibiotics](#)
- [Treatment with corticosteroids](#)
- [Immediately transfer to OR for airway management](#)
- [Watchful waiting](#)

## Discharge with antibiotics

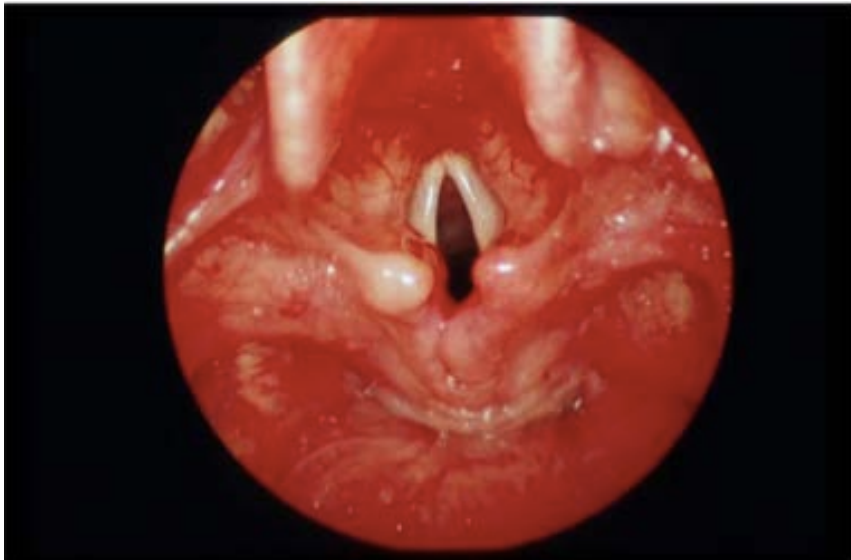
**Incorrect.** A child who presents with epiglottitis is at immediate risk of obstructing their airway. Intravenous antibiotics, such as ceftriaxzone, would be important in management of epiglottitis, but it is not the initial treatment. Please choose again.

## Treatment with corticosteroids

**Incorrect.** A child who presents with epiglottitis is at immediate risk of losing their airway. Corticosteroids have a role in management of epiglottitis, but are not the initial treatment. Please choose again.

# Immediate transfer to OR for airway management

**Correct!** Management of a child with epiglottitis requires immediate cooperation between otolaryngology, anesthesiology, and pediatrics critical care. Primarily, avoid aggravating the child, as anxiety may precipitate complete obstruction of the airway. The child must be transferred to the OR, and given inhalational anesthesia. Various airway adjuncts (including preparation for possible tracheostomy) should be readied in event of difficult airway. Under anesthesia, the supraglottis is inspected for erythema and edema, which confirm diagnosis (see picture). The child is given endotracheal intubation. After the airway has been secured, blood cultures, and swabs of the epiglottis may be obtained. The child is started on parenteral antibiotics. Parenteral corticosteroids may also be used. Often, epiglottitis responds quickly to treatment, and the child may be considered for extubation in 2-3 days.



Normal larynx on nasopharyngoscopy

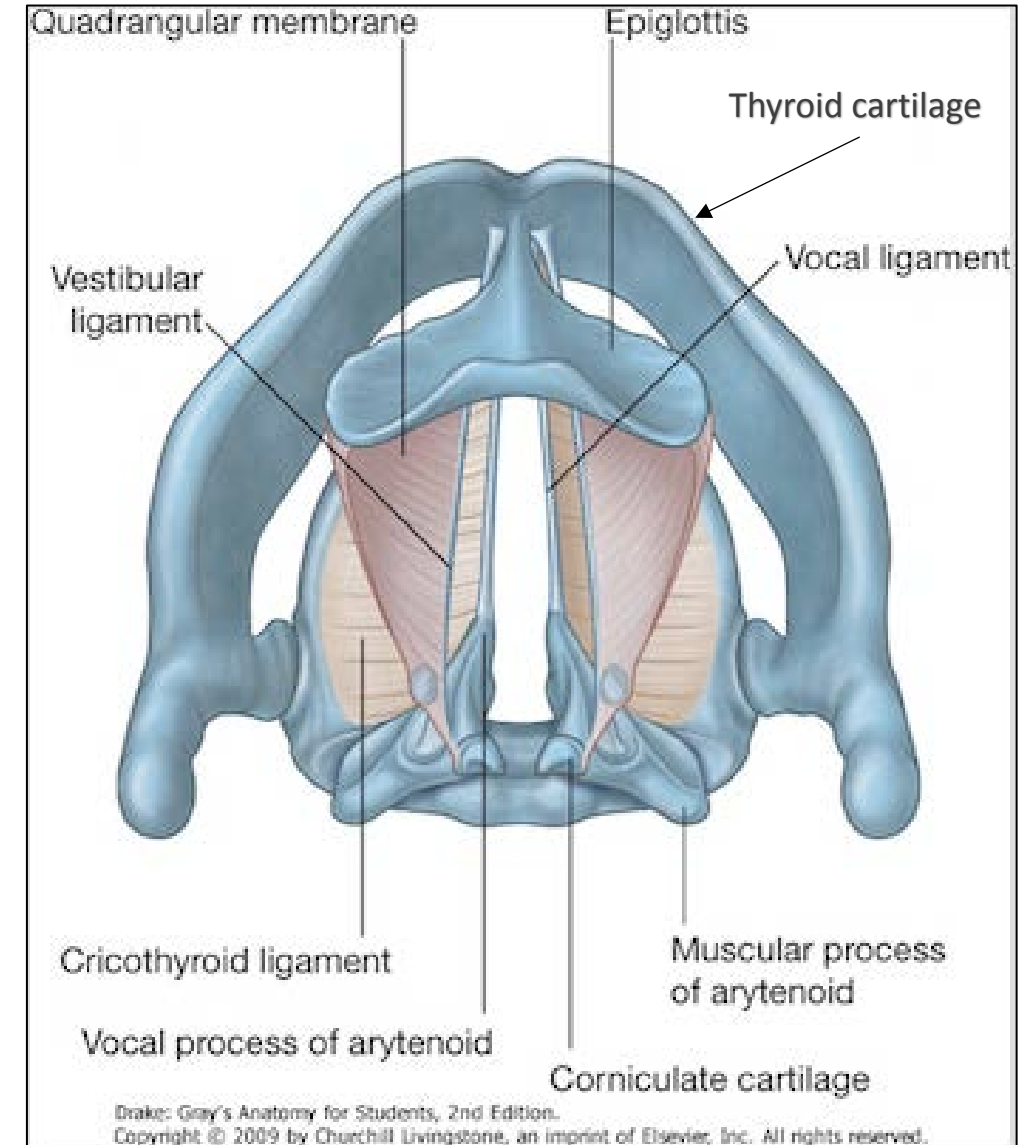
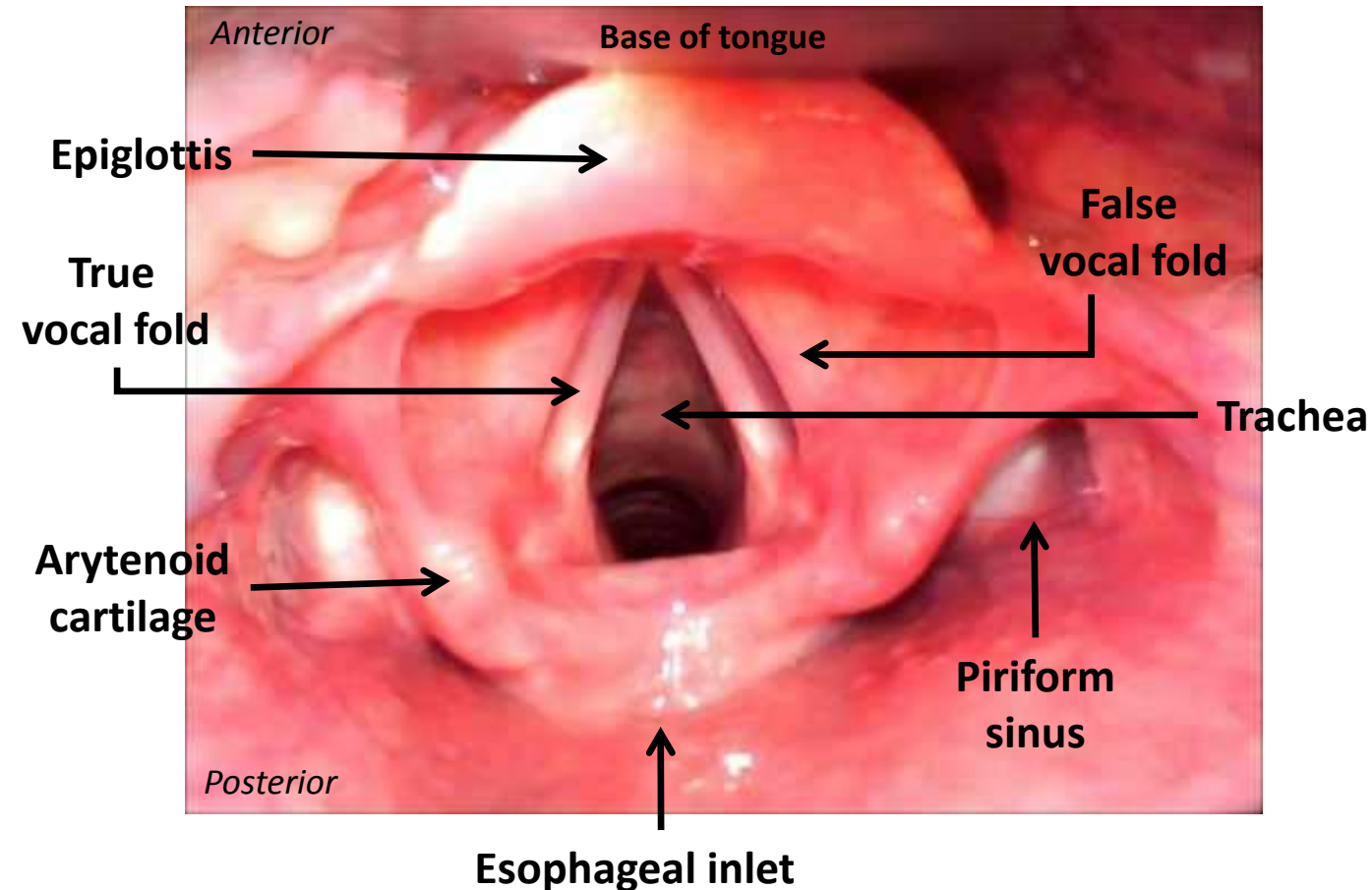


Epiglottitis on nasopharyngoscopy

# Watchful waiting

**Incorrect.** A child who presents with epiglottitis is at immediate risk of losing their airway. Please choose again.

*View of larynx on nasopharyngoscopy*

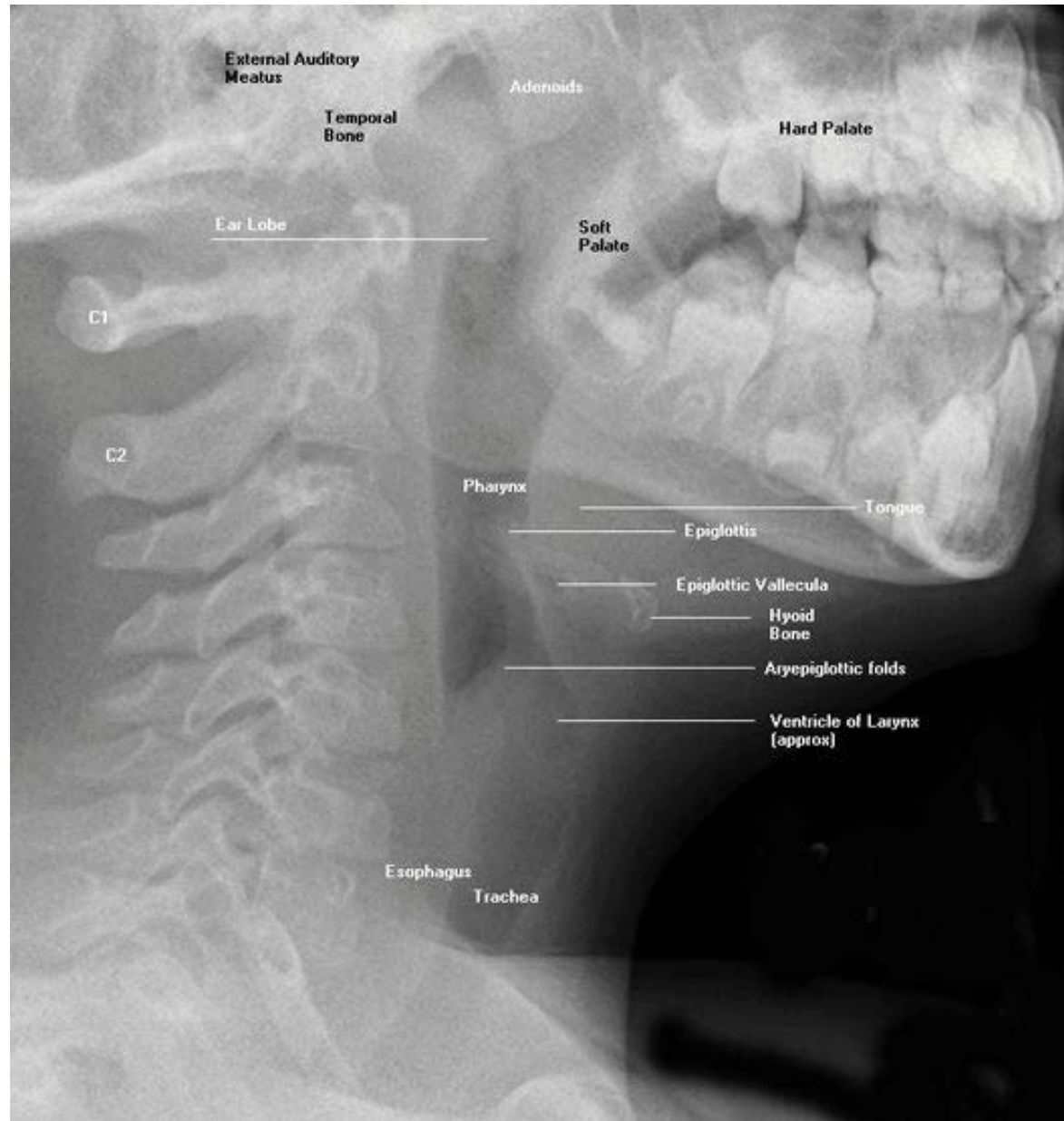




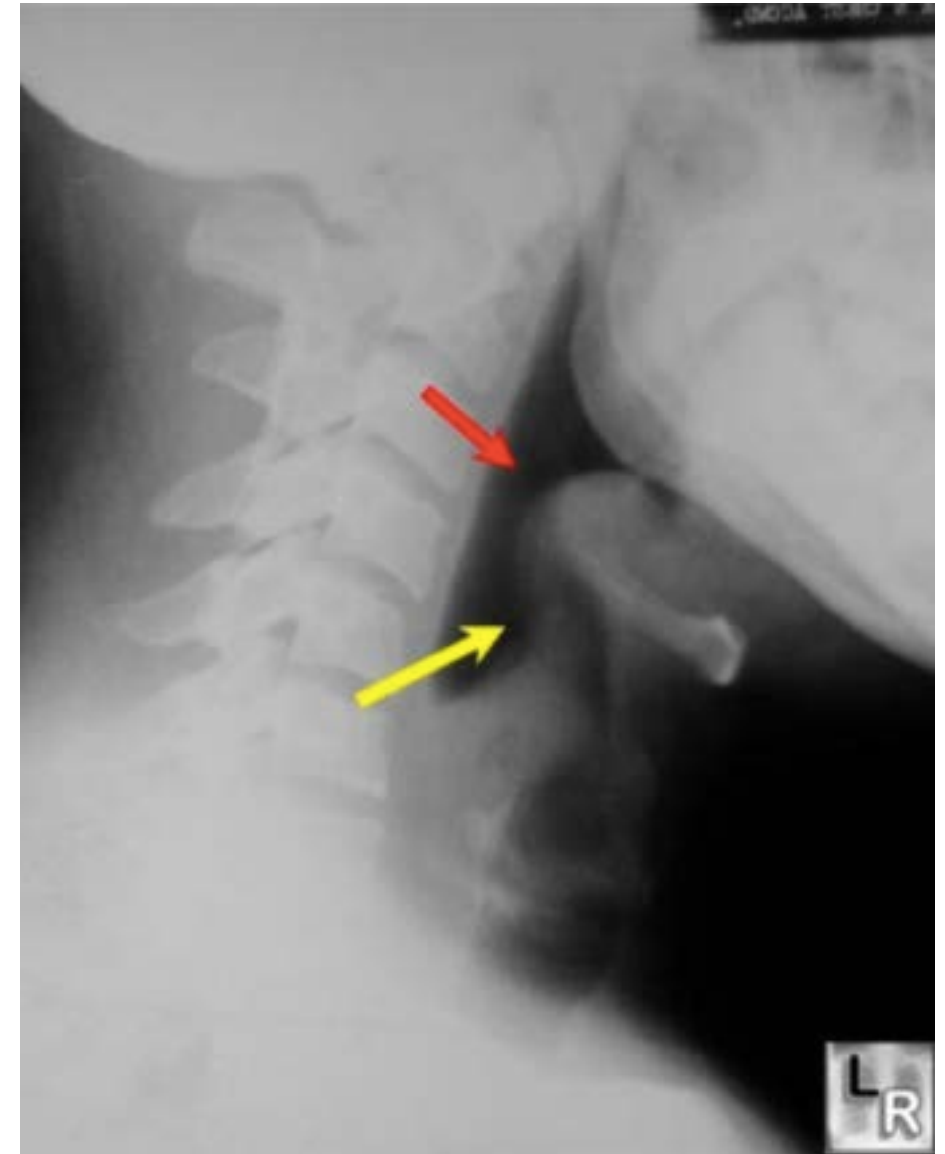
# Anatomy Review

## Lateral Neck X-ray

[Back to Case Presentation](#)



Epiglottitis “thumbprint sign”



[Previous](#)

[Quiz](#)

# Quiz

A 5-year-old boy presents to the ER with fever, muffled voice, and stridor. You suspect epiglottitis.

Which of the following can cause epiglottitis?

- a. [\*Streptococcus pneumoniae\*](#)
- b. [Foreign object](#)
- c. [Caustic ingestion](#)
- d. [Trauma](#)
- e. [\*Haemophilus influenza b\*](#)
- f. [A and E](#)
- g. [All of the above](#)

# Quiz

A 5-year-old boy presents to the ER with fever, muffled voice, and stridor. You suspect epiglottitis.

1. Which of the following can cause epiglottitis?

- a. *Streptococcus pneumoniae*
- b. Foreign object
- c. Caustic ingestion
- d. Trauma
- e. *Haemophilus influenza b*
- f. A and E
- g. All of the above

**Incorrect.** *Streptococcus pneumoniae* can cause epiglottitis, however it is not the only correct answer.

Please

[Try Again](#)

# Quiz

A 5-year-old boy presents to the ER with fever, muffled voice, and stridor. You suspect epiglottitis.

1. Which of the following can cause epiglottitis?

- a. *Streptococcus pneumoniae*
- b. Foreign object
- c. Caustic ingestion
- d. Trauma
- e. *Haemophilus influenza b*
- f. A and E
- g. All of the above

**Incorrect.** Trauma from a foreign body can cause epiglottitis, however it is not the only correct answer.

Please

[Try Again](#)

# Quiz

A 5-year-old boy presents to the ER with fever, muffled voice, and stridor. You suspect epiglottitis.

1. Which of the following can cause epiglottitis?

- a. *Streptococcus pneumoniae*
- b. Foreign object
- c. **Caustic ingestion**
- d. Trauma
- e. *Haemophilus influenza b*
- f. A and E
- g. All of the above

**Incorrect.** Caustic ingestion can cause epiglottitis, however it is not the only correct answer.

Please

**Try Again**

# Quiz

A 5-year-old boy presents to the ER with fever, muffled voice, and stridor. You suspect epiglottitis.

1. Which of the following can cause epiglottitis?

- a. *Streptococcus pneumoniae*
- b. Foreign object
- c. Caustic ingestion
- d. Trauma
- e. *Haemophilus influenza b*
- f. A and E
- g. All of the above

**Incorrect.** Trauma can cause epiglottitis, however it is not the only correct answer.

Please

[Try Again](#)

# Quiz

A 5-year-old boy presents to the ER with fever, muffled voice, and stridor. You suspect epiglottitis.

1. Which of the following can cause epiglottitis?

- a. *Streptococcus pneumoniae*
- b. Foreign object
- c. Caustic ingestion
- d. Trauma
- e. *Haemophilus influenza b*
- f. A and E
- g. All of the above

**Incorrect.** *Haemophilus influenza b* can cause epiglottitis, however it is not the only correct answer.

Please

[Try Again](#)

# Quiz

A 5-year-old boy presents to the ER with fever, muffled voice, and stridor. You suspect epiglottitis.

1. Which of the following can cause epiglottitis?

- a. *Streptococcus pneumoniae*
- b. Foreign object
- c. Caustic ingestion
- d. Trauma
- e. *Haemophilus influenza b*
- f. **A and E**
- g. All of the above

**Incorrect.** *Streptococcus pneumoniae* and *haemophilus influenza b* can cause epiglottitis, however they are not the only correct answers.

Please

[Try Again](#)



# Quiz

A 5-year-old boy presents to the ER with fever, muffled voice, and stridor. You suspect epiglottitis.

1. Which of the following can cause epiglottitis?

- a. *Streptococcus pneumoniae*
- b. Foreign object
- c. Caustic ingestion
- d. Trauma
- e. *Haemophilus influenza b*
- f. A and E
- g. All of the above

**Correct!** All of the options listed can cause epiglottitis. Prior to widespread vaccination, *Haemophilus influenza B* (Hib) was the most common cause of epiglottitis. Currently, the predominant causative organisms are *Streptococcus pneumoniae*, *S. pyogenes*, *Staphylococcus aureus*, and other *H. influenzae* serotypes

# Quiz

A 5-year-old girl presents to the ER with fever, muffled voice, and stridor. You suspect epiglottitis.

2. What is/are the most appropriate initial investigations?

- a. [CT scan](#)
- b. [Ultrasound](#)
- c. [MRI](#)
- d. [Lateral Neck X-ray](#)
- e. [Nasopharyngeal Swab](#)
- f. [A and E](#)

# Quiz

A 5-year-old girl presents to the ER with fever, muffled voice, and stridor. You suspect epiglottitis.

2. What is/are the most appropriate initial investigations?

- a. CT scan
- b. Ultrasound
- c. MRI
- d. Lateral Neck X-ray
- e. Nasopharyngeal Swab
- f. A and E

Incorrect. Epiglottitis is an emergency, a CT scan would be inappropriate.

# Quiz

A 5-year-old girl presents to the ER with fever, muffled voice, and stridor. You suspect epiglottitis.

2. What is/are the most appropriate initial investigations?

- a. CT scan
- b. **Ultrasound**
- c. MRI
- d. Lateral Neck X-ray
- e. Nasopharyngeal Swab
- f. A and E

Incorrect. Epiglottitis is an emergency, an ultrasound would be inappropriate.

# Quiz

A 5-year-old girl presents to the ER with fever, muffled voice, and stridor. You suspect epiglottitis.

2. What is/are the most appropriate initial investigations?

- a. CT scan
- b. Ultrasound
- c. MRI
- d. Lateral Neck X-ray
- e. Nasopharyngeal Swab
- f. A and E

Incorrect. Epiglottitis is an emergency, an MRI would be inappropriate.

# Quiz

A 5-year-old girl presents to the ER with fever, muffled voice, and stridor. You suspect epiglottitis.

2. What is/are the most appropriate initial investigations?

- a. CT scan
- b. Ultrasound
- c. MRI
- d. Lateral Neck X-ray
- e. Nasopharyngeal Swab
- f. A and E

Correct!

A lateral neck X-ray can be used to quickly diagnose epiglottitis via a positive “thumbprint sign”.

Need for radiograph should be based on acuity of disease. **\*If symptoms are severe,** patient should proceed directly to OR.



# Quiz

A 5-year-old girl presents to the ER with fever, muffled voice, and stridor. You suspect epiglottitis.

2. What is/are the most appropriate initial investigations?

- a. CT scan
- b. Ultrasound
- c. MRI
- d. Lateral Neck X-ray
- e. **Nasopharyngeal Swab**
- f. A and E

Incorrect. Epiglottitis is an emergency, a nasopharyngeal swab wouldn't be an appropriate initial investigation. However, after the patient's airway is secured, a nasopharyngeal swab can aid in determining the cause of the epiglottitis.

# Quiz

A 5-year-old girl presents to the ER with fever, muffled voice, and stridor. You suspect epiglottitis.

2. What is/are the most appropriate initial investigations?

- a. CT scan
- b. Ultrasound
- c. MRI
- d. Lateral Neck X-ray
- e. Nasopharyngeal Swab
- f. A and E

Incorrect. Epiglottitis is an emergency, a CT scan and nasopharyngeal swab would be inappropriate initial investigations. However, after the patient's airway is secured, a culture swab can aid in the diagnosis of the cause of epiglottitis.



# Quiz

A 5-year-old girl presents to the ER with fever, muffled voice, and stridor. You suspect epiglottitis.

3. What is the initial management for epiglottitis?

- a. [Antibiotics](#)
- b. [Watchful Waiting](#)
- c. [Steroids](#)
- d. [Immediate transfer to the OR](#)

# Quiz

A 5-year-old girl presents to the ER with fever, muffled voice, and stridor. You suspect epiglottitis.

3. What is the initial management for epiglottitis?

- a. Antibiotics
- b. Watchful Waiting
- c. Steroids
- d. Immediate transfer to the OR

Incorrect. A child who presents with epiglottitis is an airway emergency, therefore the airway must be secured first. Intravenous antibiotics, such as ceftriaxone, would be an important secondary management in cases of bacterial epiglottitis.

# Quiz

A 5-year-old girl presents to the ER with fever, muffled voice, and stridor. You suspect epiglottitis.

3. What is the initial management for epiglottitis?

- a. Antibiotics
- b. Watchful Waiting
- c. Steroids
- d. Immediate transfer to the OR

Incorrect. Watchful waiting could be fatal, as a child who presents with epiglottitis is an airway emergency

# Quiz

A 5-year-old girl presents to the ER with fever, muffled voice, and stridor. You suspect epiglottitis.

3. What is the initial management for epiglottitis?

- a. Antibiotics
- b. Watchful Waiting
- c. Steroids
- d. Immediate transfer to the OR

Incorrect. A child who presents with epiglottitis is an airway emergency. Corticosteroids can be used as secondary management.

# Quiz

A 5-year-old girl presents to the ER with fever, muffled voice, and stridor. You suspect epiglottitis.

3. What is the initial management for epiglottitis?

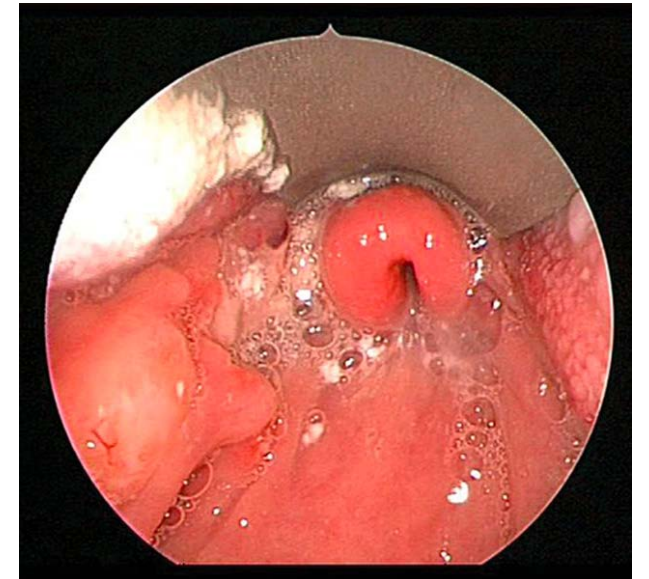
- a. Antibiotics
- b. Watchful Waiting
- c. Steroids
- d. Immediate transfer to the OR

**Correct!** A child who presents with epiglottitis is an airway emergency. As such, they must be immediately transferred to the OR in order to properly secure their airway.

# Congratulations! You have finished the airway obstruction module.

## Key points to remember:

- Epiglottitis is a potential life-threatening **medical emergency** that can affect children and adults. Prodromal symptoms may be absent in pediatric presentations.
- Causes: **bacterial**, burns from hot or caustic liquids, direct trauma
- Presenting signs and symptoms may include:
  - **Sudden onset high-grade fever**
  - **Stridor**
  - **Drooling**
  - **Dysphagia**
  - Dyspnea
  - Sore throat
  - Anxious, restless behaviour
  - Greater comfort when sitting up or leaning forward
- In children, suspected supraglottitis should undergo airway management **in the OR** with appropriate anesthesia, otolaryngology staff, and airway adjuncts
  - **Avoid aggravating the patient** with unnecessary examinations and investigations



# Module Authors

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- *Module adapted from: Jason Beyea, MD PhD FRCSC*