

# Hoarseness Case

A Self-Directed Learning Module

Department of Otolaryngology – Head & Neck Surgery  
Schulich School of Medicine & Dentistry, Western University

[Click to Begin](#)

## Case Presentation

A 55-year-old male mechanic presents to your clinic with a four week history of hoarseness.



*You are the otolaryngologist, click through the module to diagnose and treat this patient.*

Obtain a history



# Patient History

## ***What brings you in today?***

My voice has gotten progressively hoarse over the past month. The hoarseness is constant, and nothing makes it better or worse. I haven't tried any medications or therapies. This has never happened to me before. I have always had a bit of a cough, but it has gotten worse over the past month. Recently, there has been some blood on the tissue.

## ***Past medical history?***

My overall health is ok besides some heartburn. I don't take any medications or have any allergies. I have not had any radiation exposure, head and neck surgeries, or recent injuries or trauma.

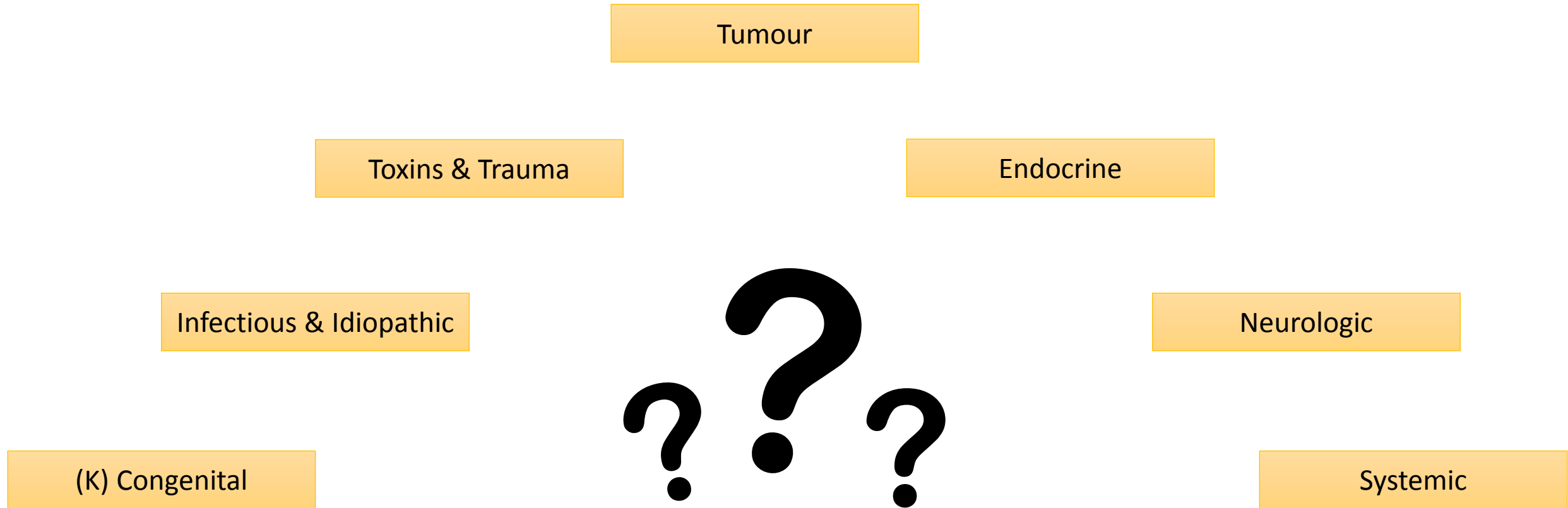
## ***Social history?***

I work full time as a mechanic, and live alone in an apartment downtown. I am divorced, and have a son who lives in California. I have smoked about a pack of cigarettes each day since I was 18 years old. I have 1-2 beers/night on weekdays, and 8-10/night on weekends. I don't do any recreational drugs. I rarely exercise and eat a lot of takeout food.

What is on your differential diagnosis so far?

# What diagnoses are coming to mind?

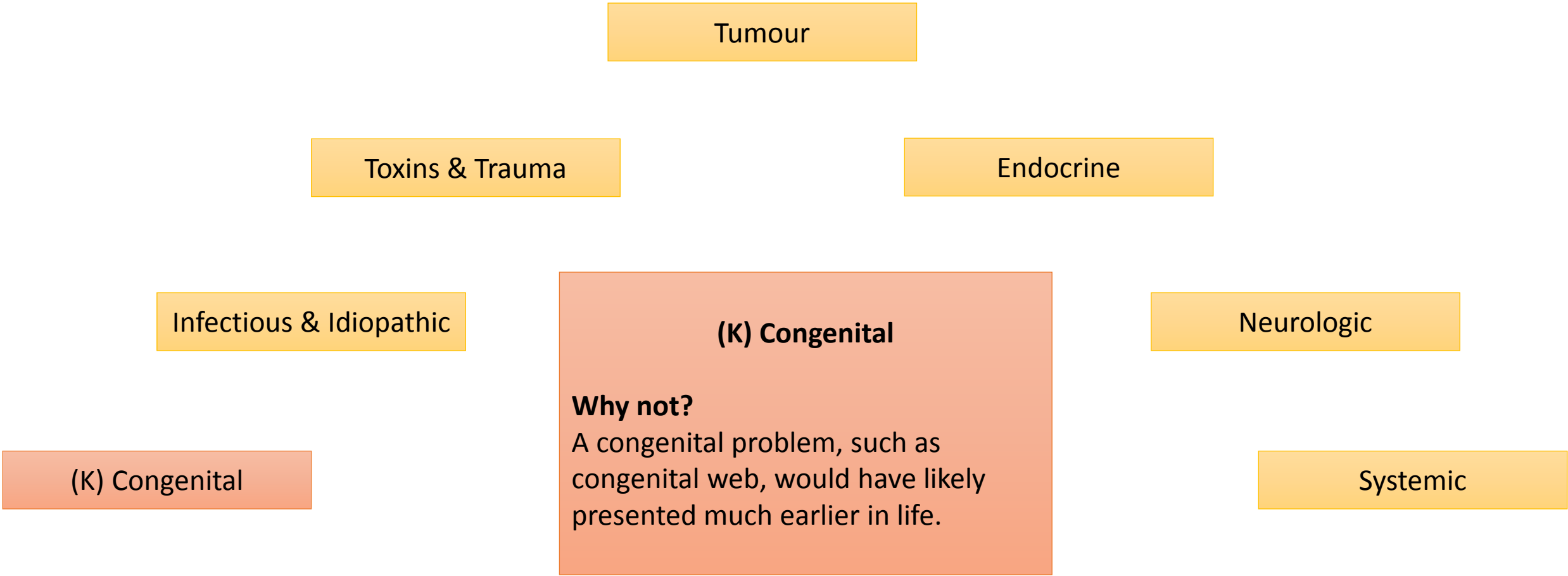
*Think KITTENS! (Click on heading to test yourself)*



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

# What diagnoses are coming to mind?

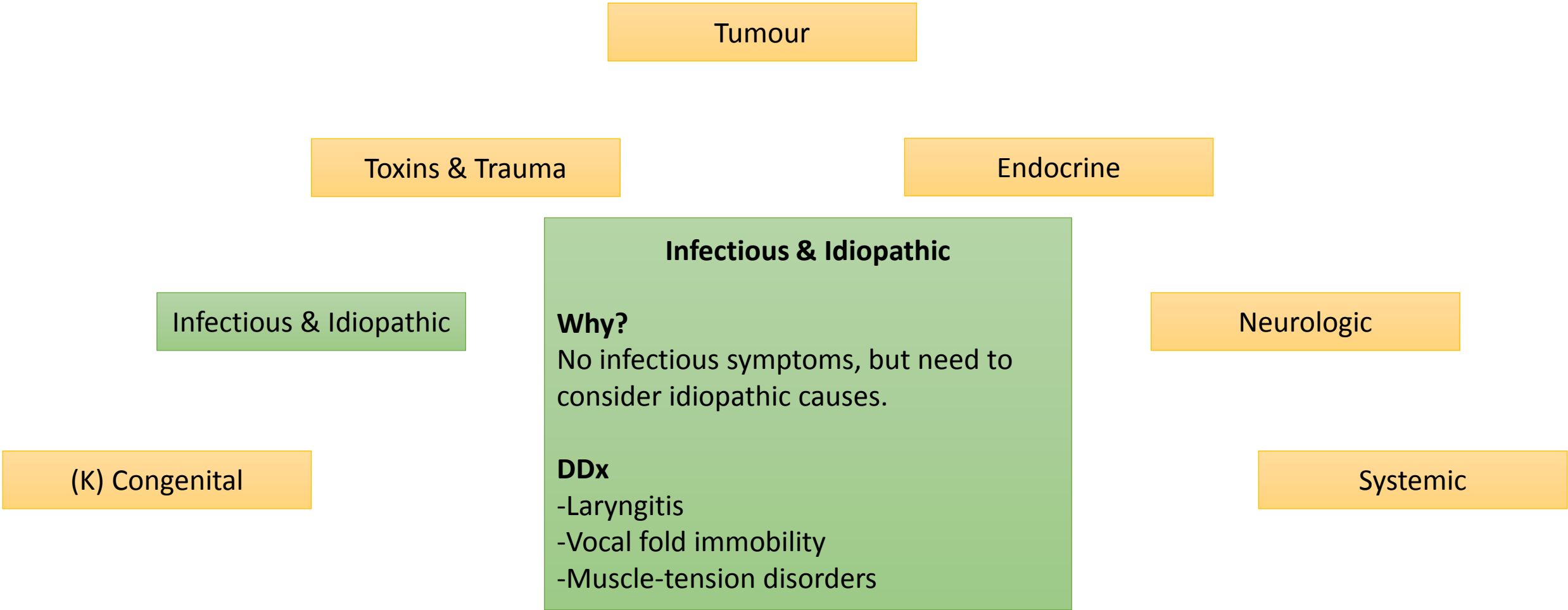
Think KITTENS! (Click on heading to test yourself)



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

# What diagnoses are coming to mind?

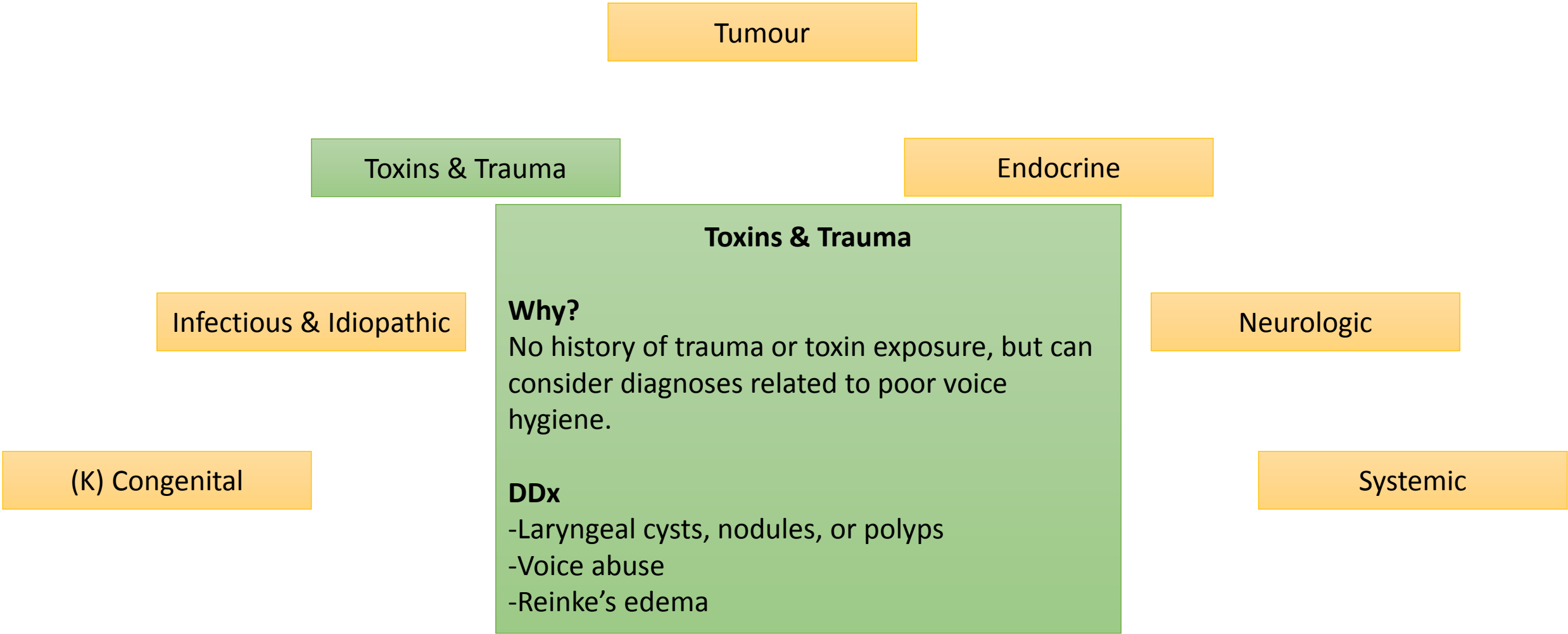
Think KITTENS! (Click on heading to test yourself)



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

# What diagnoses are coming to mind?

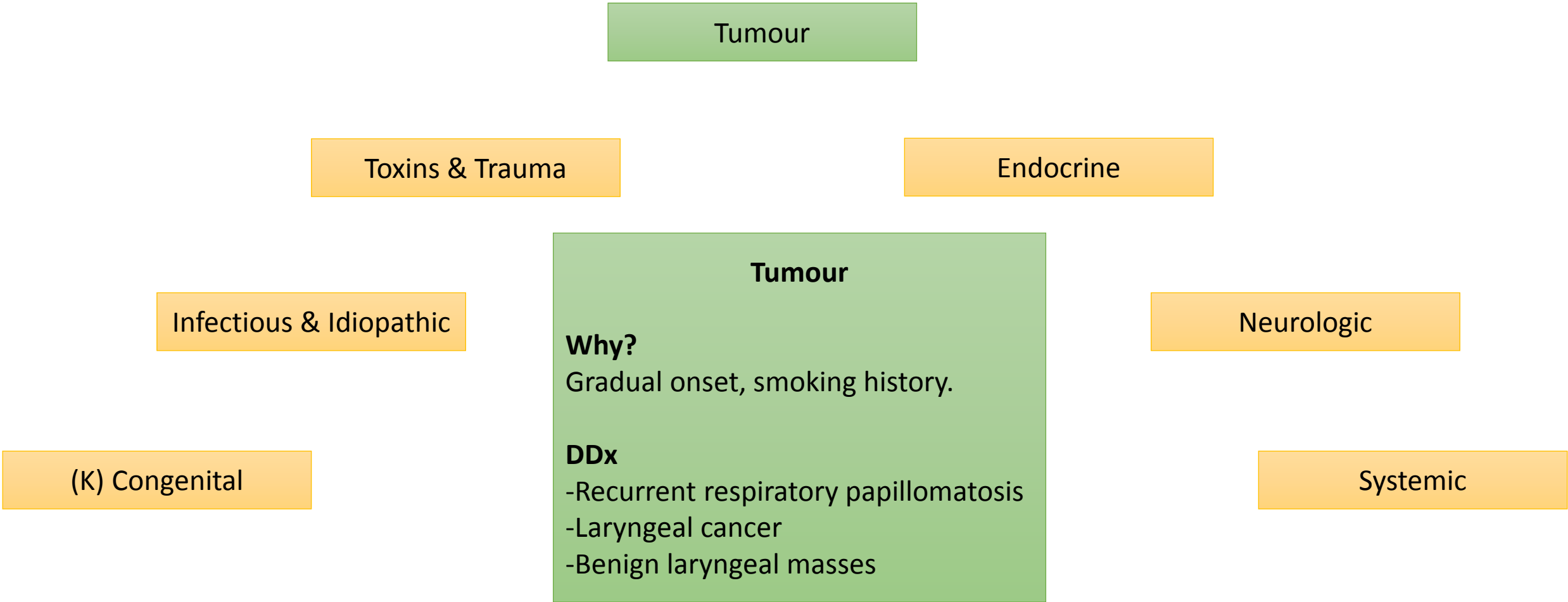
Think KITTENS! (Click on heading to test yourself)



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

# What diagnoses are coming to mind?

Think KITTENS! (Click on heading to test yourself)

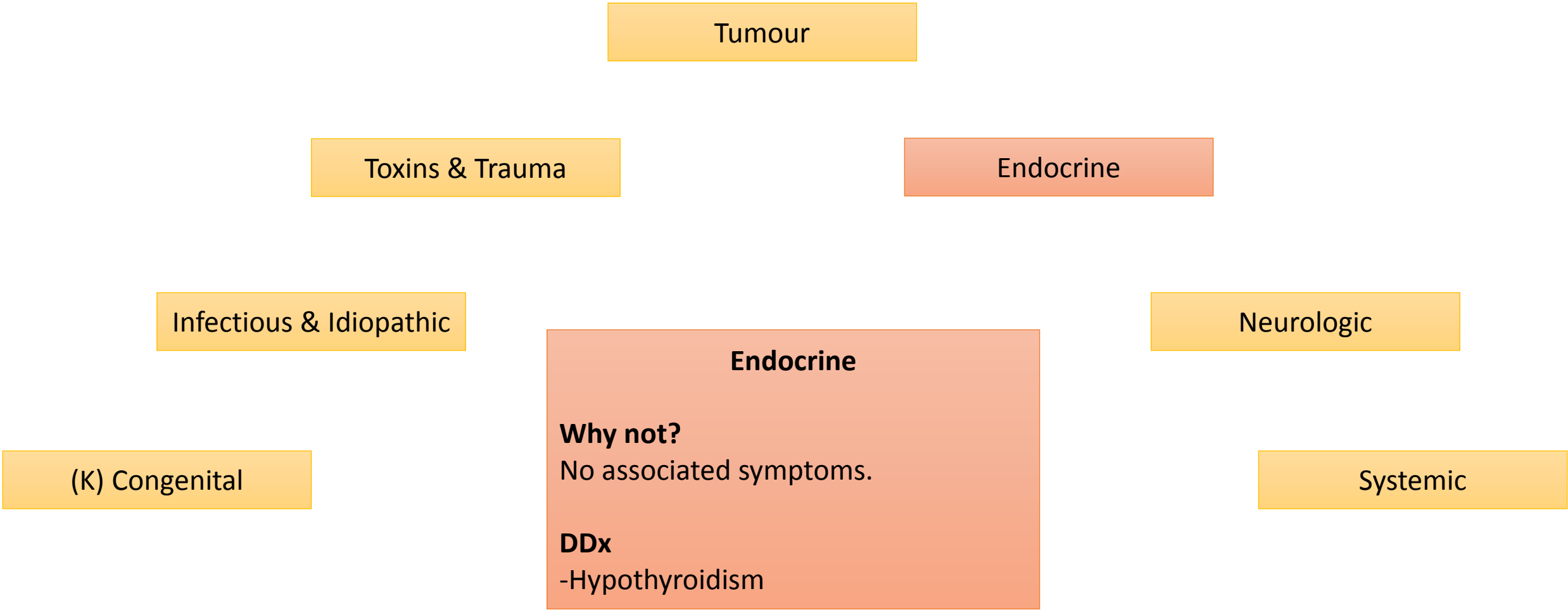


With your DDx in mind, proceed to focused physical exam.



# What diagnoses are coming to mind?

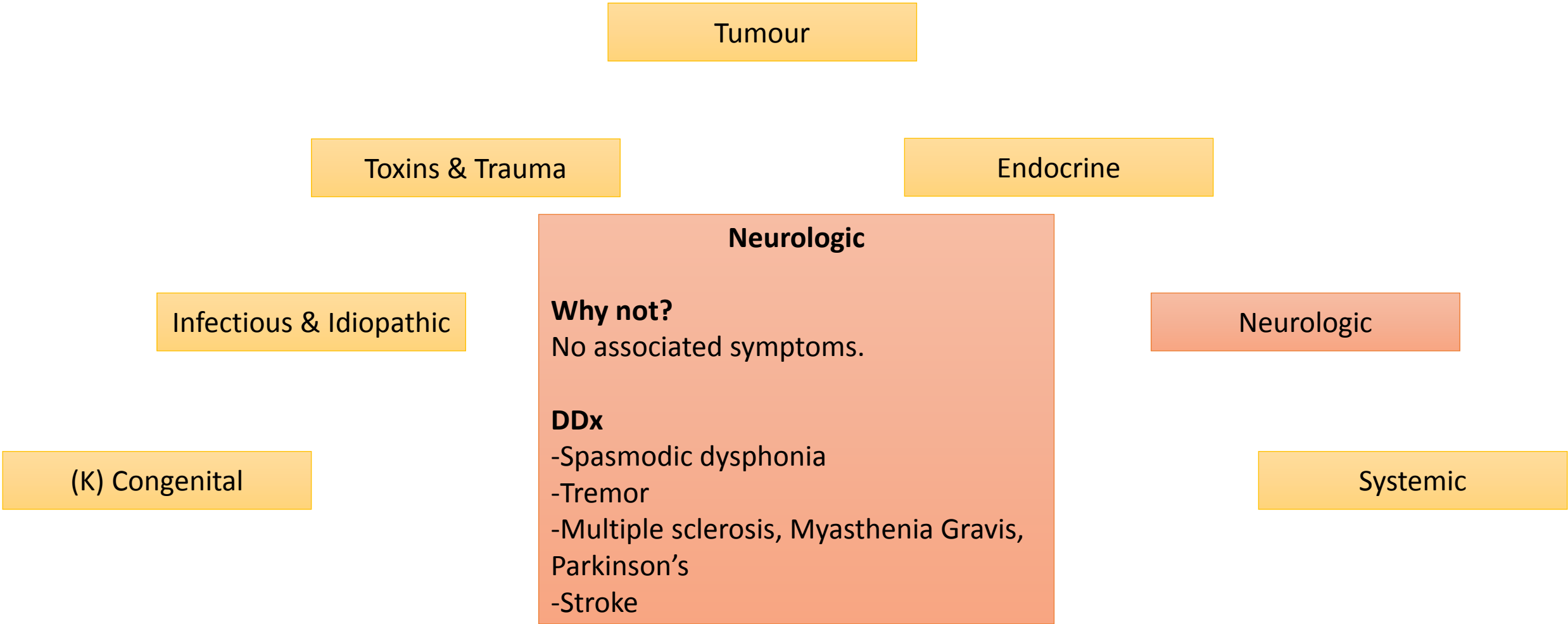
Think KITTENS! (Click on heading to test yourself)



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

# What diagnoses are coming to mind?

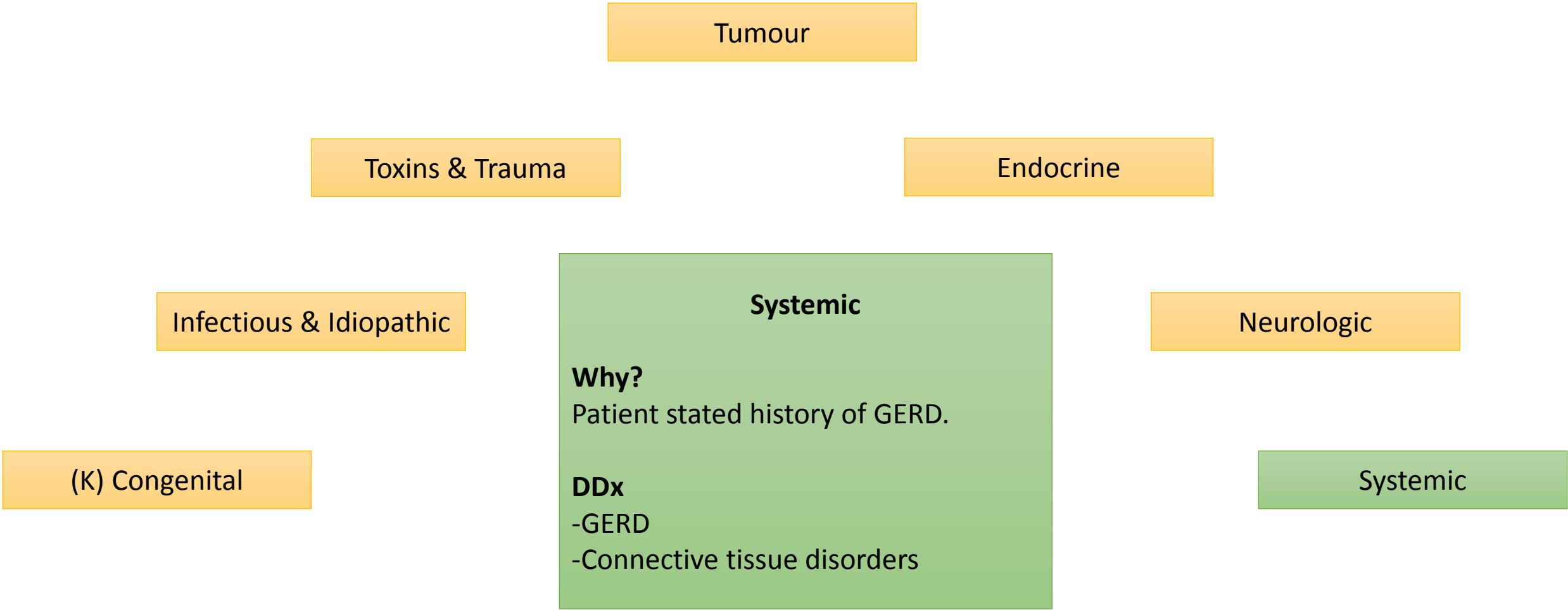
Think KITTENS! (Click on heading to test yourself)



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

# What diagnoses are coming to mind?

Think KITTENS! (Click on heading to test yourself)



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

# Physical Exam

*(Click on the physical examinations.)*

General inspection & vitals

Cranial nerve exams

Head & neck exam

[Proceed to investigations](#)

# Physical Exam

*(Click on the physical examinations.)*

General inspection & vitals

Cranial nerve exams

Head & neck exam

Patient looks comfortable with a hoarse and strained voice. There is no stridor.

**Vitals:**

**HR:** 90 bpm

**RR:** 16 breaths/minute

**BP:** 150/90 mmHg

**Temperature:** 37°C

Proceed to investigations

# Physical Exam

*(Click on the physical examinations.)*

General inspection & vitals

Cranial nerve exams

Head & neck exam

Cranial nerve exams:

**CN II – XII:** Intact

[Proceed to investigations](#)

# Focused Head & Neck Exam

## General:

### Inspection

- No distress
- No scars, asymmetry, masses, enlarged thyroid, or skin lesions

### Palpation

- No palpable lymph nodes
- Salivary glands palpable
- Thyroid not palpable

## Anterior rhinoscopy exam:

- Normal

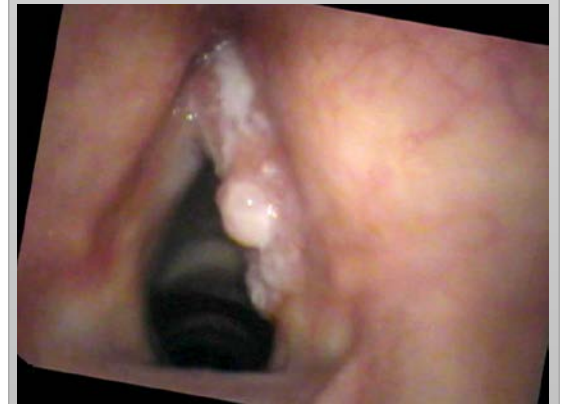
## Otoscopy:

- Normal

## Oral Cavity Exam:



## Nasolaryngoscope:

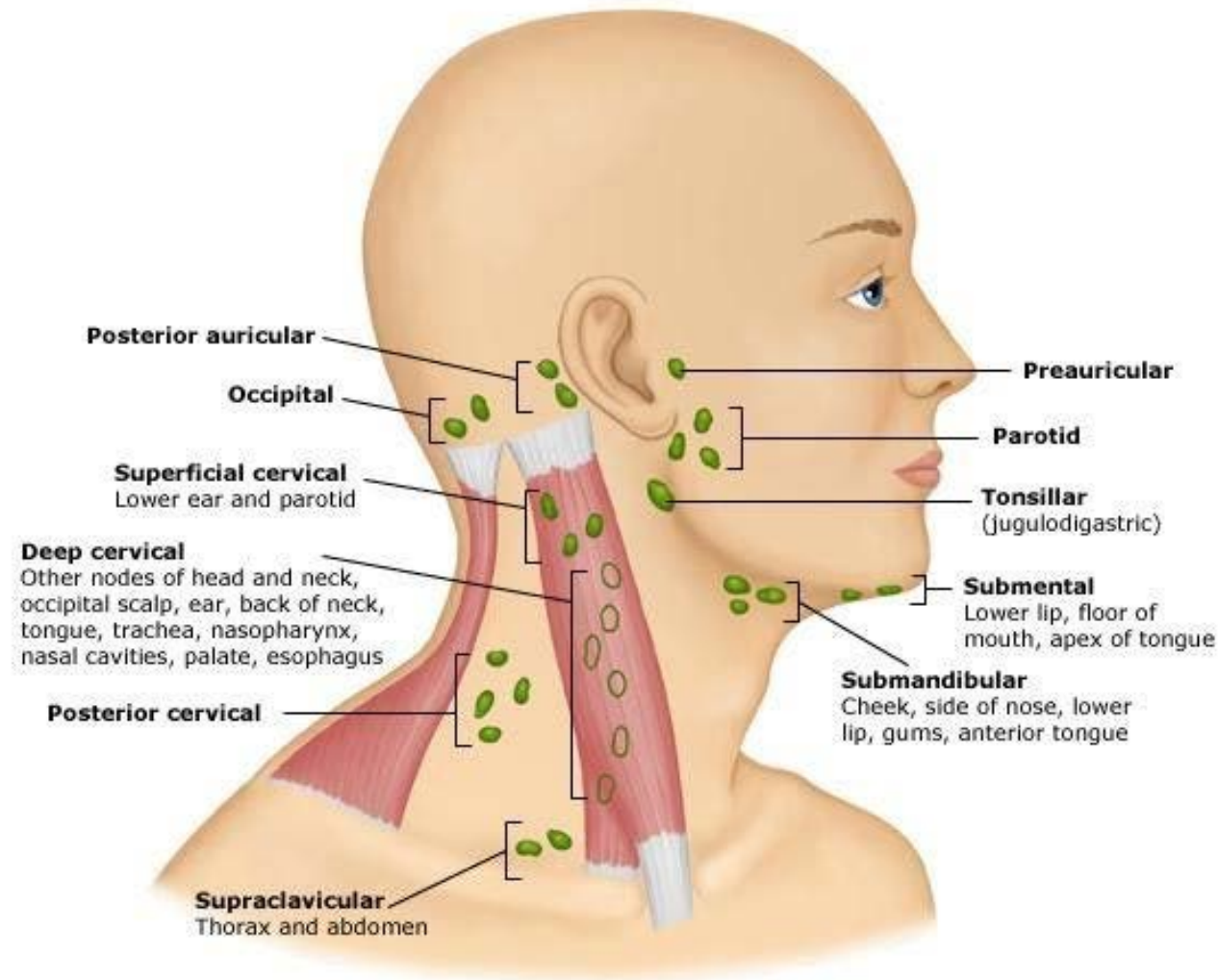


- Vocal cords are mobile

**Review:** Cervical lymph nodes

**Review:** Laryngeal anatomy

# Review: Cervical lymph nodes



www.PainNeck.Com 2010

## *Distinguishing palpable LNs:*

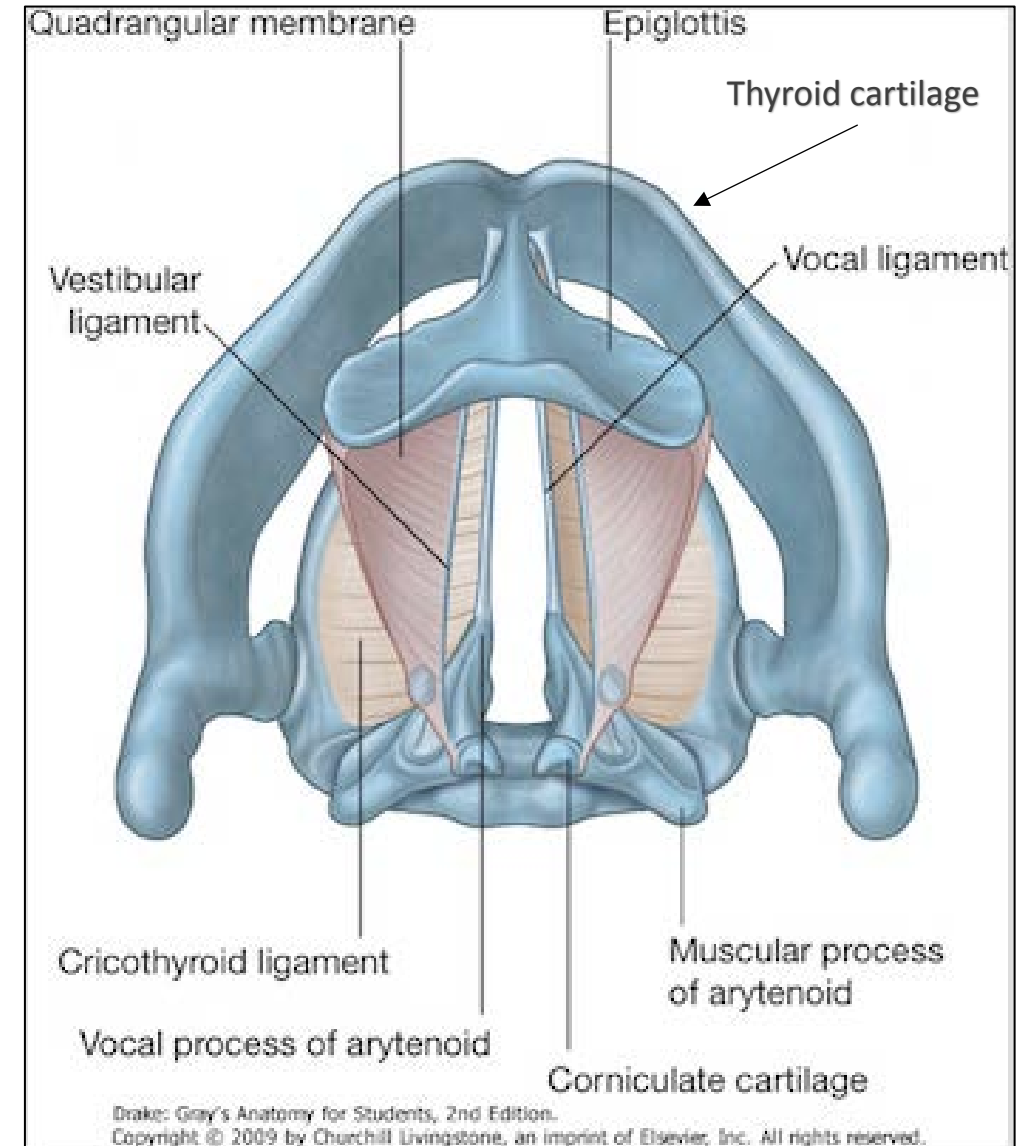
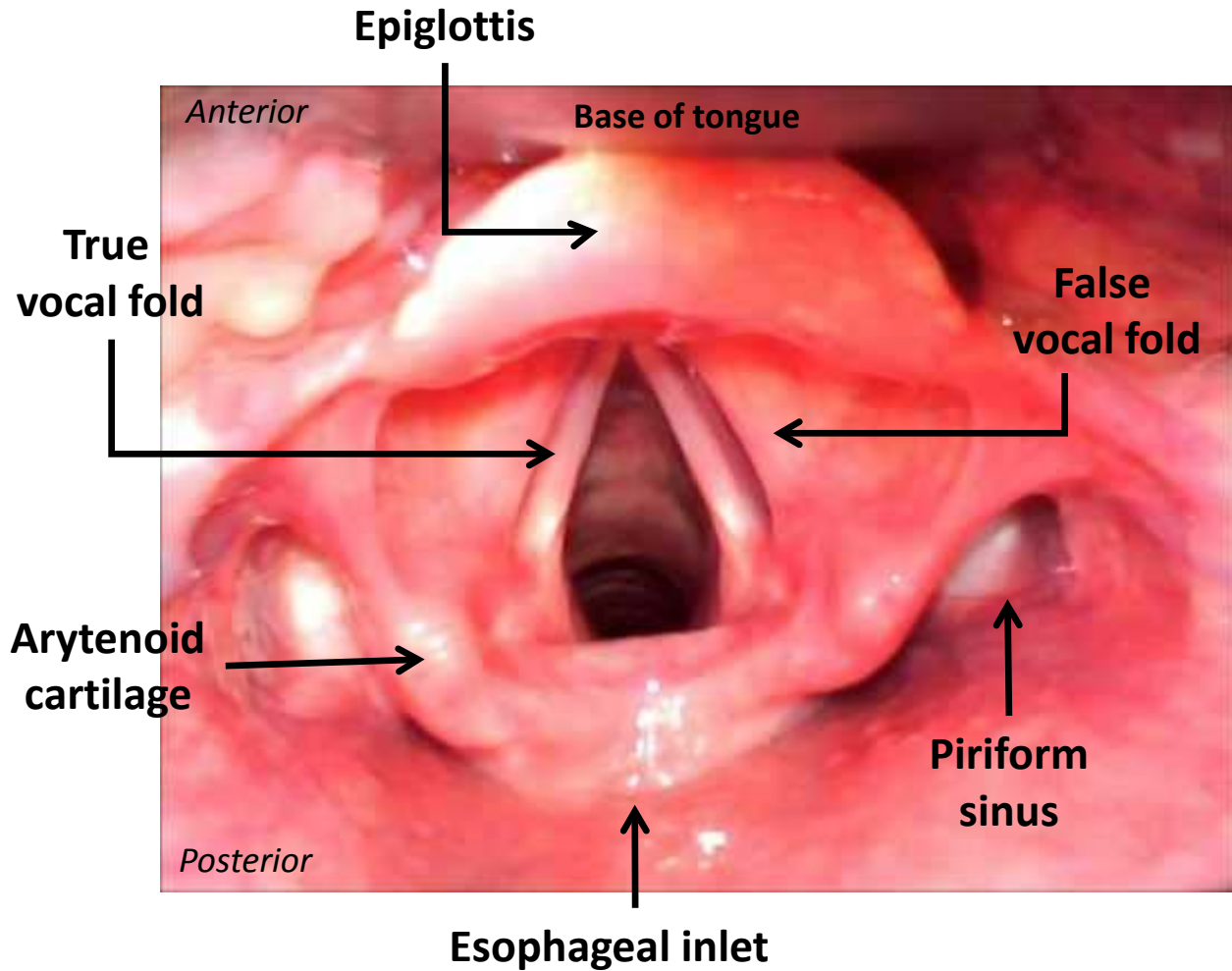
- **Infected LNs**
  - Firm, tender, enlarged and warm.  
Overlying skin can appear reddened.
- **Malignant LNs**
  - Firm, non-tender, matted, fixed, and increase in size over time.



# Review: Laryngeal anatomy

## Superior Views of Larynx

[Back to Case Presentation](#)



[Back](#)



# Investigations

*(Click on the buttons to see investigation results.)*

CT Neck

U/S of neck

Biopsy

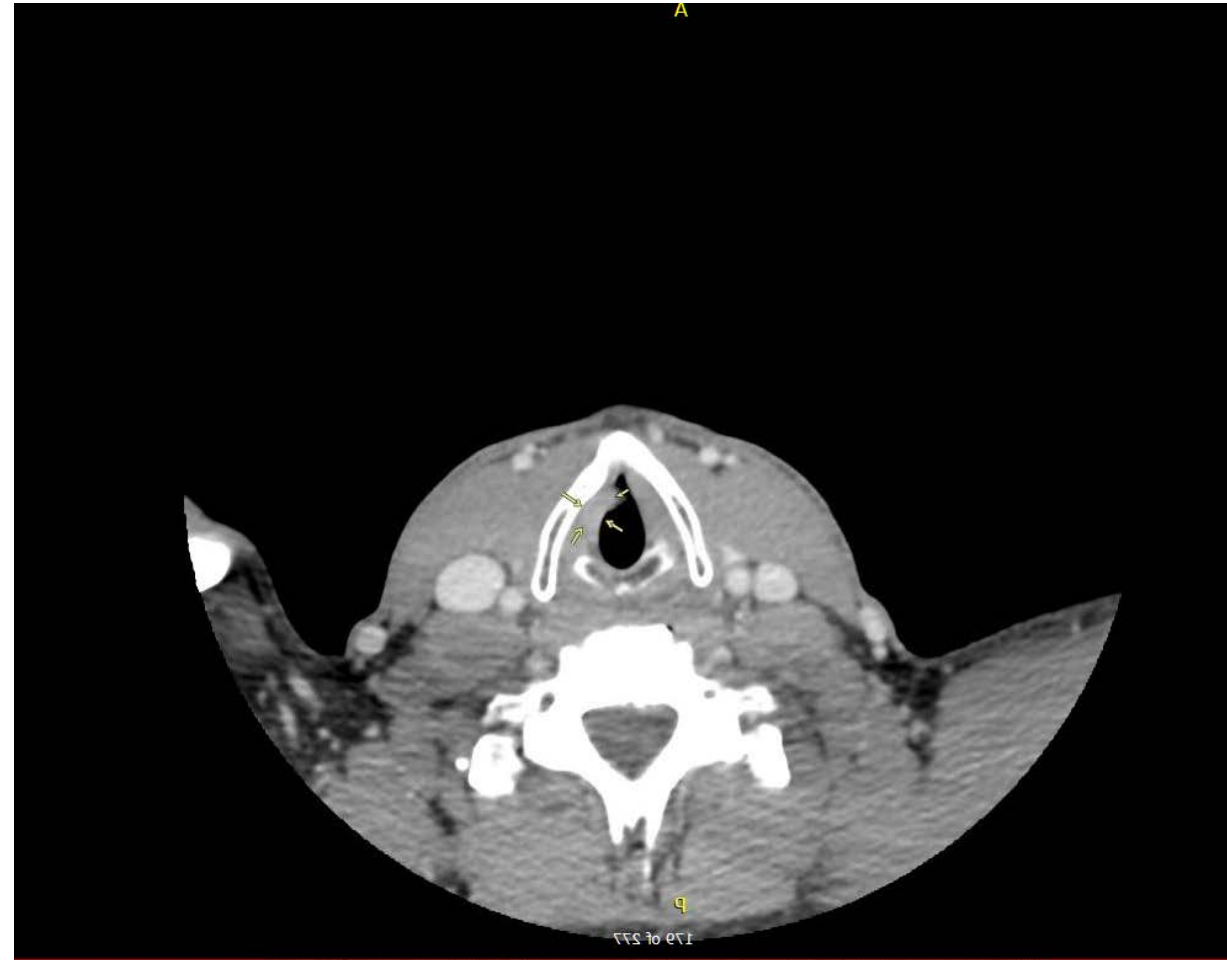


# Investigations *(Click on the buttons to see investigation results.)*

CT Neck

U/S of neck

Biopsy



[Continue to Diagnosis](#)

# Investigations *(Click on the buttons to see investigation results.)*

CT Neck

U/S of neck

Biopsy

An U/S of the neck is not necessary as it will not add information to the diagnosis.

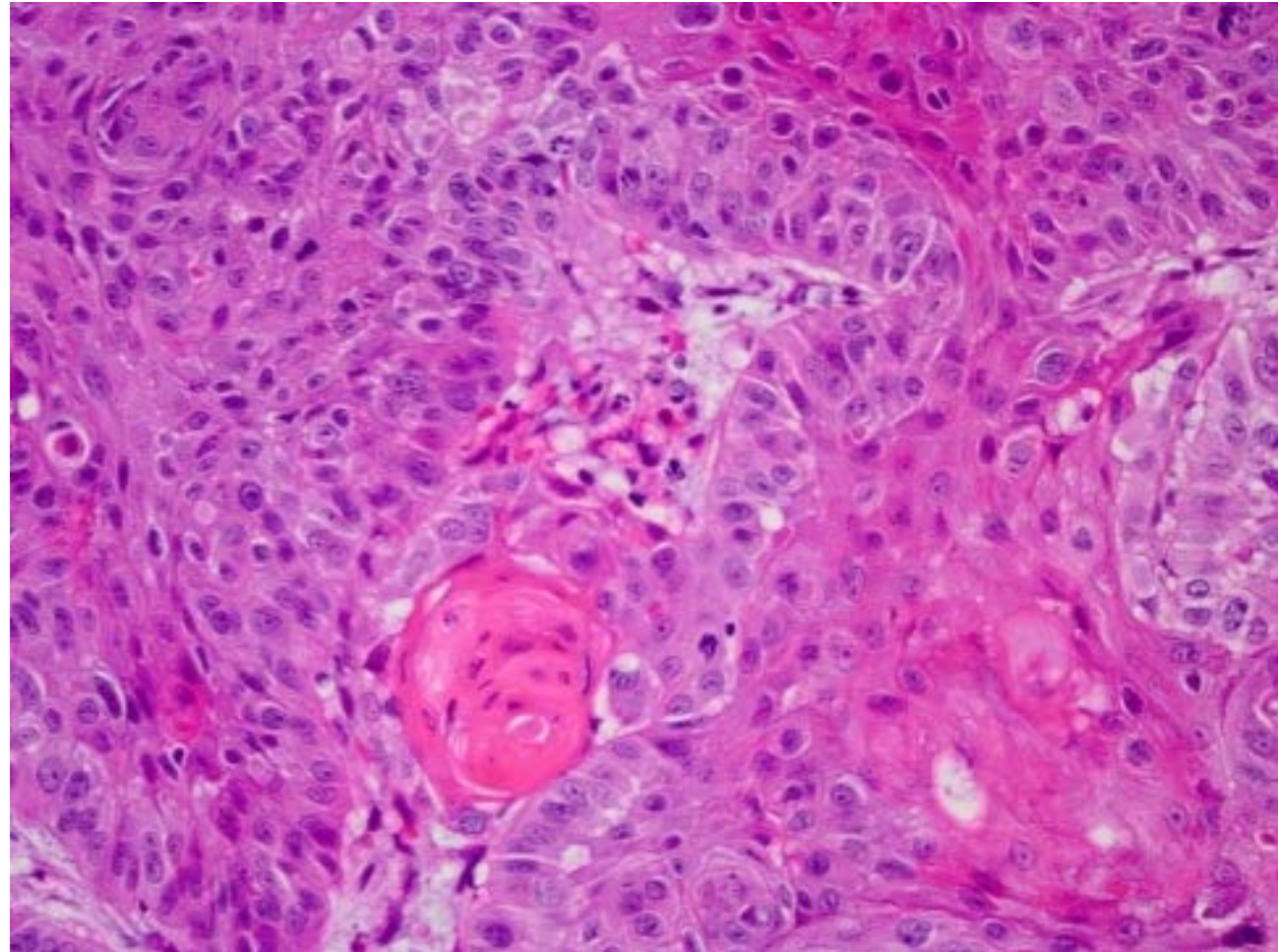
# Investigations (Click on the buttons to see investigation results.)

CT Neck

U/S of neck

Biopsy

*Biopsy of vocal cord lesion: squamous cell carcinoma*



[https://openi.nlm.nih.gov/imgs/512/140/2807541/PMC2807541\\_12105\\_2008\\_93\\_Fig1\\_HTML.png](https://openi.nlm.nih.gov/imgs/512/140/2807541/PMC2807541_12105_2008_93_Fig1_HTML.png)

Continue to Diagnosis

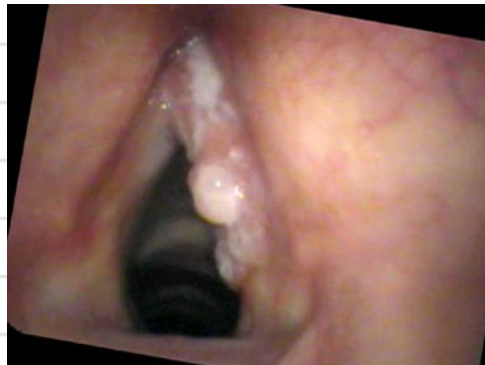
## Summary of findings

### Chief Complaints:

- 55 year old man with 4 week history of progressive hoarseness and intermittent hemoptysis
- 37 pack year smoking history

### Physical Exam:

- Vitals: hypertensive
- Cranial nerve exams: normal
- Head and neck exam: no enlarged cervical lymph nodes
- Nasolaryngoscope: lesion on R vocal cord. Vocal cords mobile.



voicedoctor.net

### Investigations:

- Head & neck CT scan: lesion on R vocal cord, no enlarged cervical lymph nodes
- Biopsy: positive for squamous cell carcinoma

Based on your findings,  
choose the most likely diagnosis:

[a. Hypopharyngeal cancer](#)

[b. Laryngeal cancer](#)

[c. Recurrent respiratory papillomatosis](#)

[d. Vocal fold polyp](#)

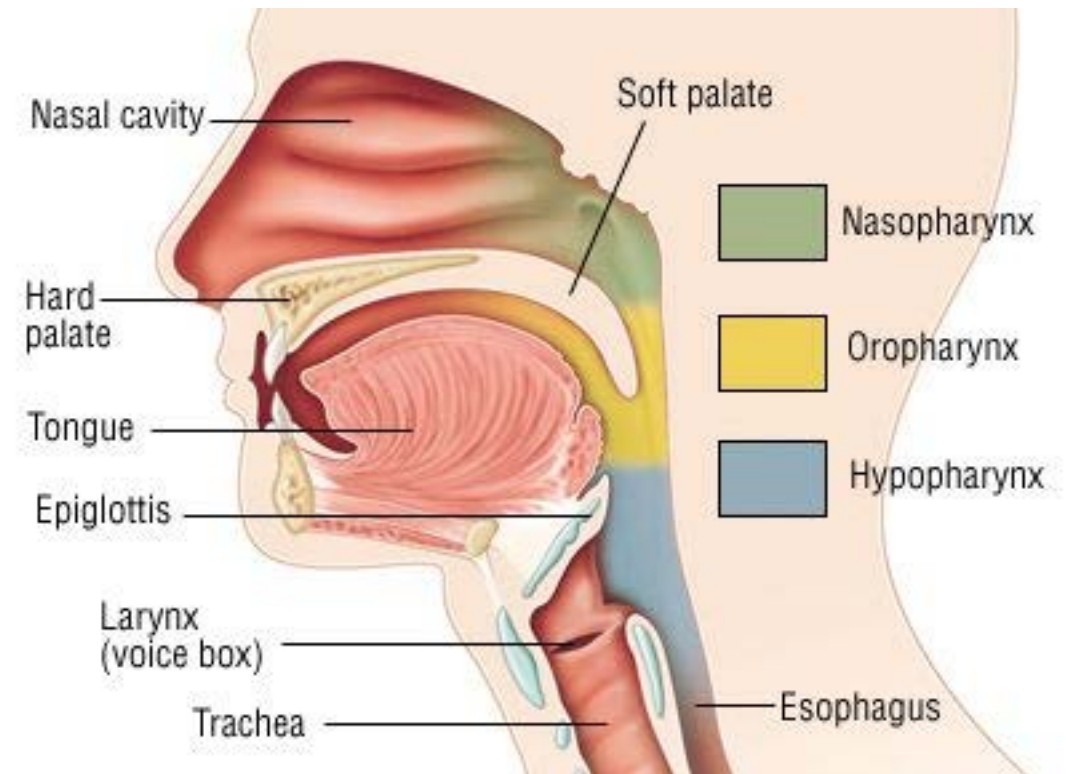


# Diagnosis

**Incorrect.** Anatomically, the hypopharynx is defined as the area from the level of the hyoid bone to cricopharyngeus (upper esophageal sphincter). In this patient, the lesion was located on the vocal fold, classifying it as a laryngeal cancer.

Most hypopharyngeal cancers are squamous cell in origin. Risk factors include: smoking, alcohol, GERD, and Barrett's esophagus. Hypopharyngeal cancers can be classified based on location: piriform sinus (most common), posterior pharyngeal wall, and the post-cricoid region.

Please choose again.



# Diagnosis

**Correct!** This is a case of laryngeal cancer, specifically of the glottis. Major risk factors for laryngeal cancer include smoking and alcohol.

Signs and symptoms include: hoarseness, dysphagia, odynophagia, sore throat, hemoptysis, stridor, referred otalgia, weight loss, and globus sensation.

Since laryngeal cancer treatment is based on staging, click on “staging” below to review the staging for glottic cancer before you decide on a treatment.

[Staging](#)



# Glottic Cancer Staging

T Category	T Criteria	N Category	Clinical N Criteria <i>ENE – extranodal extension</i>	M Category	M Criteria
T1	Tumour limited to the vocal cord(s) with normal mobility. <b>T1a:</b> Limited to 1 vocal cord. <b>T1b:</b> Limited to 2 vocal cords.	N0	No regional LN metastasis.	M0	No distant metastases
T2	Tumour extends to supraglottis and/or subglottis with impaired vocal cord mobility.	N1	Single ipsilateral LN ≤ 3 cm and ENE (-).	M1	Distant metastases
T3	Tumour limited to larynx with vocal cord fixation and/or invasion of paraglottic space and/or inner cortex of the thyroid cartilage.	N2	<b>N2a:</b> Single ipsilateral LN > 3 cm but ≤ 6 cm & ENE (-). <b>N2b:</b> Multiple ipsilateral LNs ≤ 6 cm & ENE (-). <b>N2c:</b> Bilateral or contralateral LNs ≤ 6 cm & ENE (-).		
T4	<b>T4a:</b> Moderately advanced local disease. Tumour invades through the outer cortex of the thyroid cartilage and/or invades tissue beyond the larynx. <b>T4b:</b> Very advanced local disease. Tumour invades prevertebral space, encases carotid artery, or invades mediastinal structures.	N3	<b>N3a:</b> Any LN > 6 cm & ENE (-) <b>N3b:</b> Any LN with clinically overt ENE (+)		

Patient in this case: **T1aN0M?**

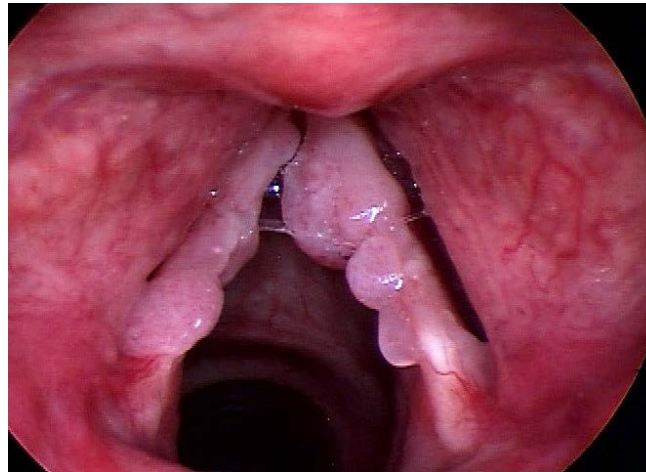
- T1a: One vocal fold involved (Based on nasopharyngoscopy and CT).
- N0: Neck is free of lymph nodes (Based on palpation of cervical lymph nodes and confirmed by CT scan).
- M?: Would need CT head, neck, and chest to determine if metastases are present in the lungs.

[Treatments](#)

# Diagnosis

**Incorrect.** The appearance of the lesion on the vocal cord and biopsy findings point to a different diagnosis.

Recurrent respiratory papillomatosis (RRP) is caused by the human papilloma virus (HPV), most commonly HPV 6 & 11. RRP presents with progressive hoarseness, stridor, or dyspnea. RRP can be diagnosed via nasolaryngoscopy. The lesions tend to recur, therefore treatment includes repeated endoscopic excisions. HPV vaccination is important for prevention of RRP.



[www.massgeneral.org](http://www.massgeneral.org)



[www.chicagovoicecare.com](http://www.chicagovoicecare.com)

Please choose again.

[Back to diagnosis](#)

# Diagnosis

**Incorrect.** The appearance of the lesion on the vocal cord and biopsy findings point to a different diagnosis.

Vocal fold polyps develop due to chronic vocal fold irritation. Risk factors include: smoking, GERD, and muscle tension dysphonia. Polyps tend to be unilateral and are usually treated conservatively. Surgical excision is considered if the polyp is symptomatic and conservative treatment failed.

Please choose again.



<http://voicehealth101.com>

[Back to diagnosis](#)

There are three main treatment categories for laryngeal cancer.  
Please select the two most appropriate for this particular case.

Chemotherapy

Radiation

Surgery

There are three main treatment categories for laryngeal cancer.  
Please select the two most appropriate for this particular case.

Chemotherapy

Radiation

Surgery

Incorrect. Chemotherapy is only indicated for advanced stage laryngeal cancer. Since the patient in this case is presenting early in the disease, chemotherapy is not indicated.

Please choose another treatment.

There are three main treatment categories for laryngeal cancer.  
Please select the two most appropriate for this particular case.

Chemotherapy

Radiation

Surgery

Correct!

Early glottic carcinoma is treated with either radiation therapy or surgery. This decision is center specific and requires a multidisciplinary discussion.

There are three main treatment categories for laryngeal cancer.  
Please select the two most appropriate for this particular case.

Chemotherapy

Radiation

Surgery

Correct!

Early glottic carcinoma is treated with either radiation therapy or surgery (such as a cordectomy). This decision is center specific and requires a multidisciplinary discussion.

## Quiz – Q1

**What is/are the most important risk factor(s) for head and neck cancers?**

- a. [Tobacco](#)
- b. [Alcohol](#)
- c. [HPV](#)
- d. [a & c](#)
- e. [All of the above](#)



## Quiz – Q1

**What is/are the most important risk factor(s) for head and neck cancers?**

- a. [Tobacco](#)
- b. [Alcohol](#)
- c. [HPV](#)
- d. [a & c](#)
- e. [All of the above](#)

**Incorrect.** While tobacco is a major risk factor for head and neck cancers, it is not the only one.

Please try again.

## Quiz – Q1

**What is/are the most important risk factor(s) for head and neck cancers?**

- a. [Tobacco](#)
- b. [Alcohol](#)
- c. [HPV](#)
- d. [a & c](#)
- e. [All of the above](#)

**Incorrect.** While alcohol is a major risk factor for head and neck cancers, it is not the only one.

Please try again.

## Quiz – Q1

**What is/are the most important risk factor(s) for head and neck cancers?**

- a. [Tobacco](#)
- b. [Alcohol](#)
- c. [HPV](#)
- d. [a & c](#)
- e. [All of the above](#)

**Incorrect.** While HPV infection is a major risk factor for head and neck cancers, it is not the only one.

Please try again.

## Quiz – Q1

**What is/are the most important risk factor(s) for head and neck cancers?**

- a. [Tobacco](#)
- b. [Alcohol](#)
- c. [HPV](#)
- d. [a & c](#)
- e. [All of the above](#)

**Incorrect.** While tobacco and HPV infection are major risk factors for head and neck cancers, they are not the only ones.

Please try again.

## Quiz – Q1

**What is/are the most important risk factor(s) for head and neck cancers?**

- a. [Tobacco](#)
- b. [Alcohol](#)
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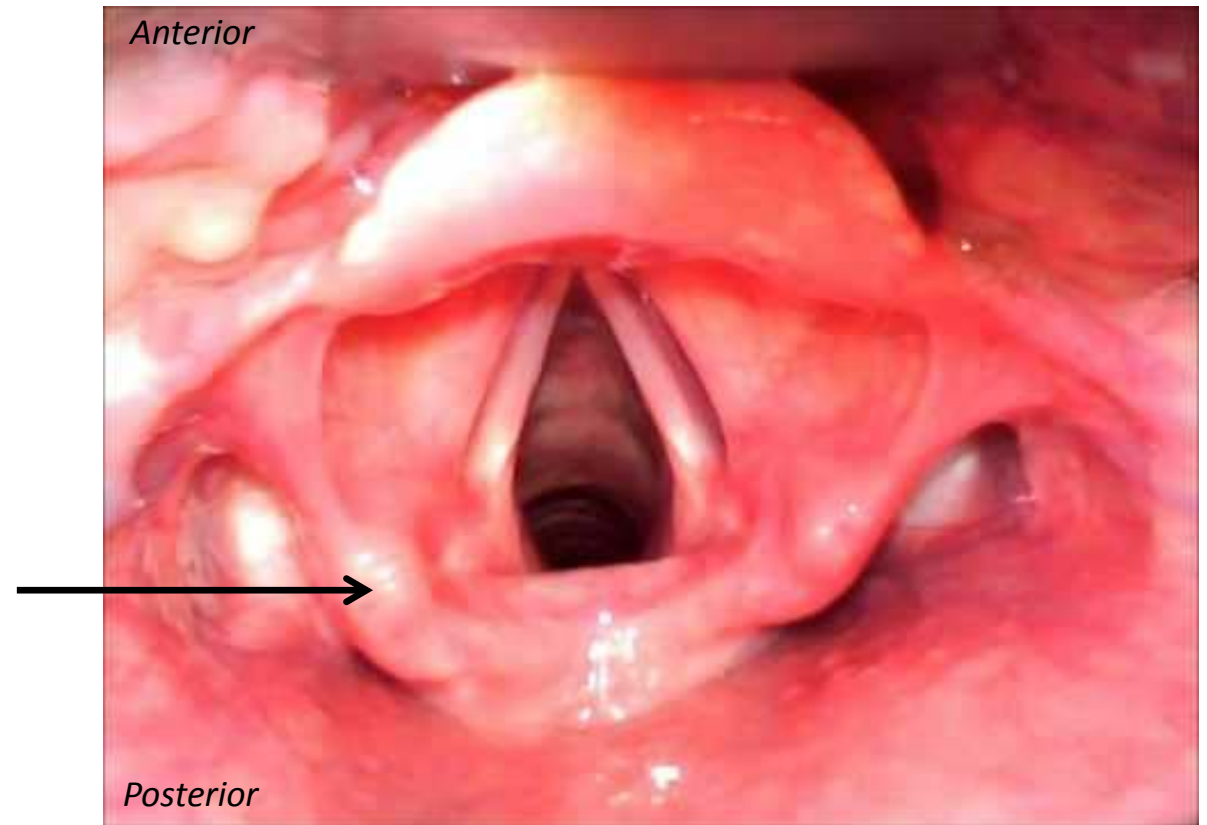
**Correct!** Tobacco, alcohol, and HPV infection are the major risk factors for head and neck cancers.

**Proceed to Q2**

## Quiz – Q2

Identify the structure indicated by the arrow.

- a. [Cricoid cartilage](#)
- b. [Piriform sinus](#)
- c. [Epiglottis](#)
- d. [Arytenoid cartilage](#)

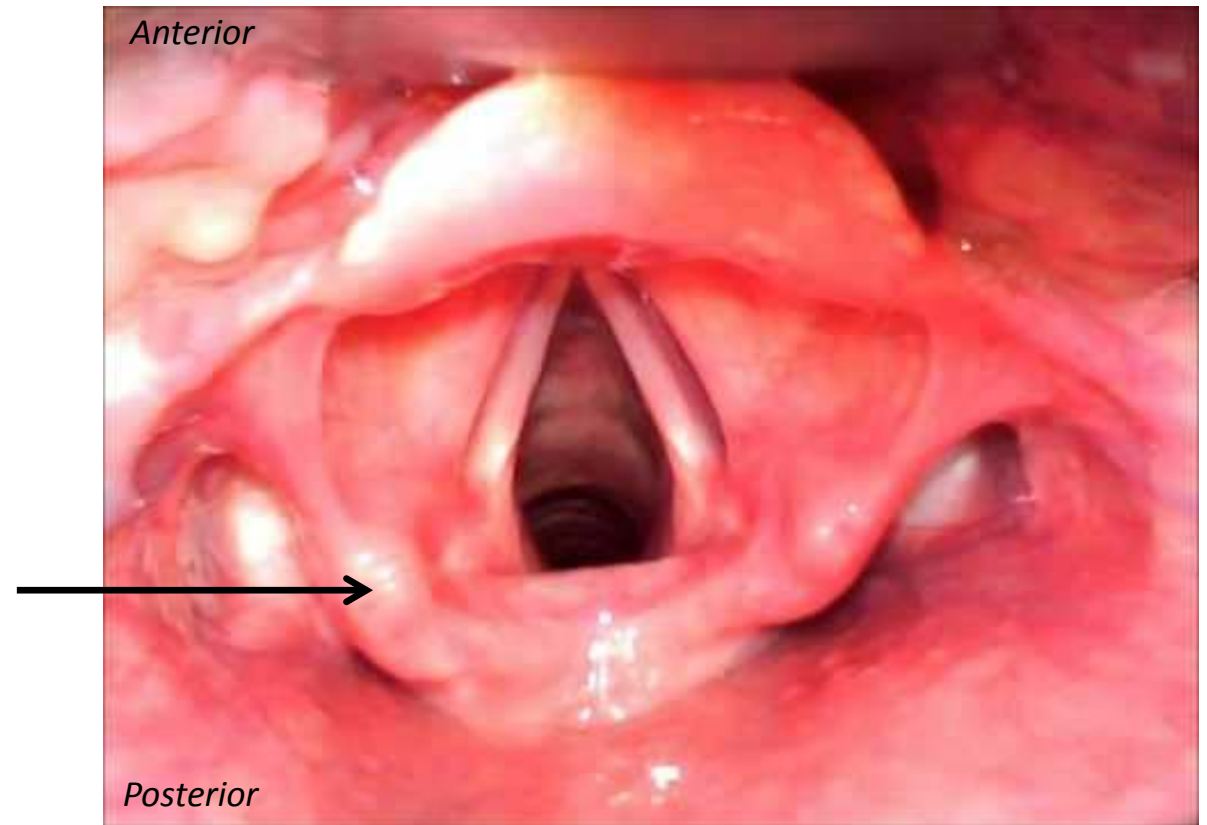


## Quiz – Q2

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Incorrect. Please try again.

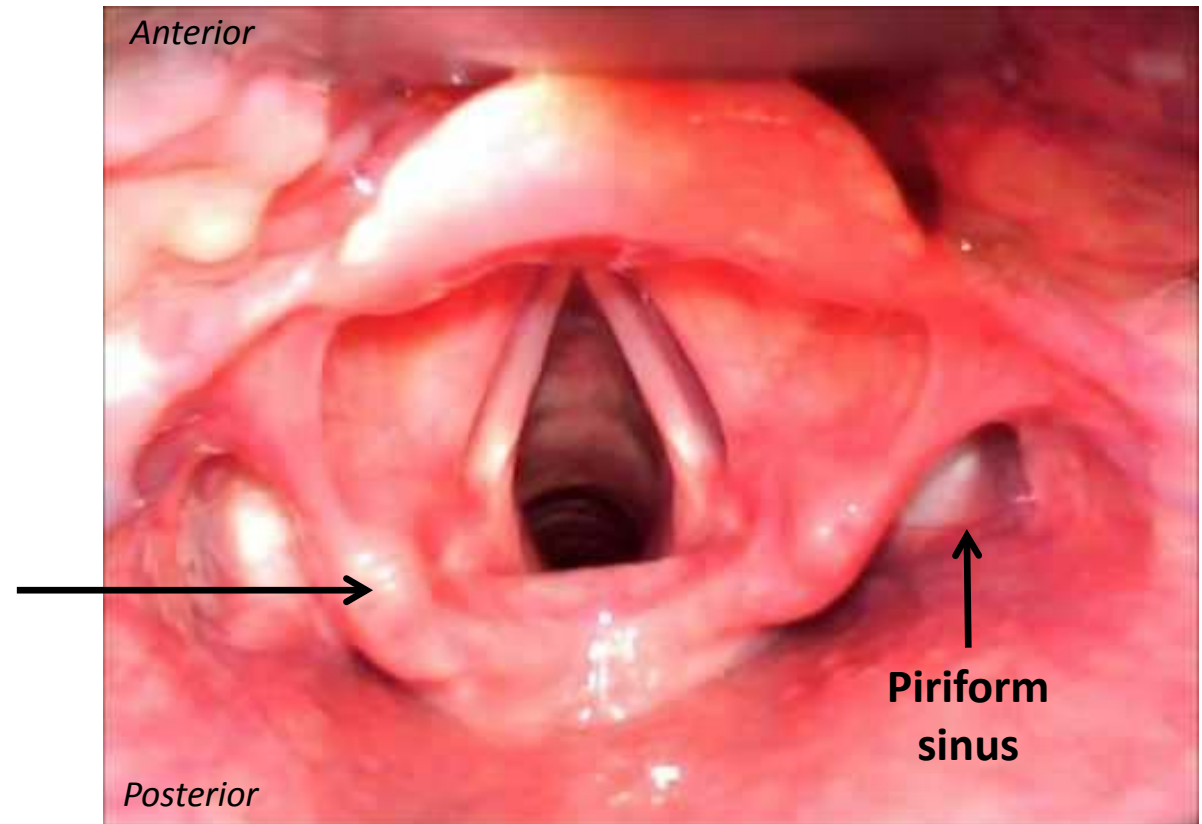


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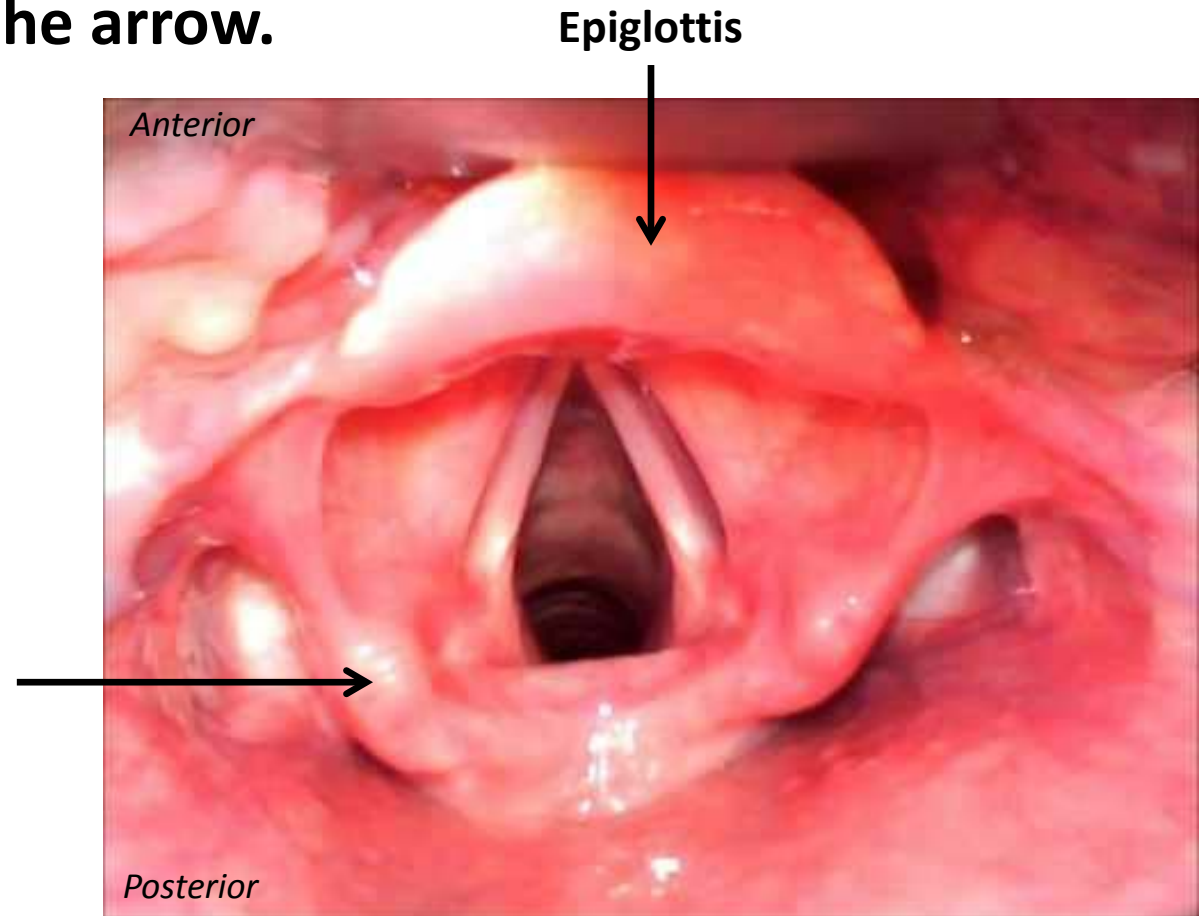


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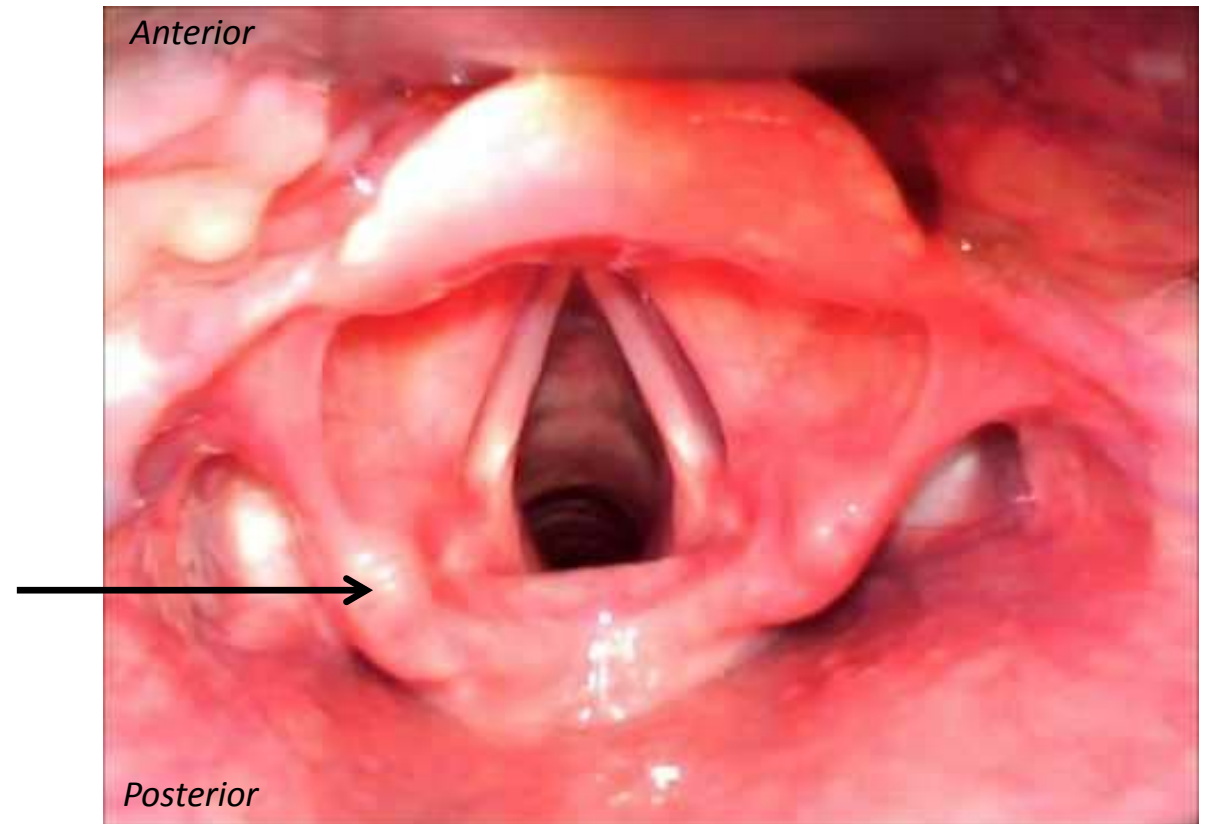


## Quiz – Q2

Identify the structure indicated by the arrow.

- a. [Cricoid cartilage](#)
- b. [Piriform sinus](#)
- c. [Epiglottis](#)
- d. [Arytenoid cartilage](#)

Correct!



Proceed to Q3

## Quiz – Q3

**What is the first-line treatment for early glottic cancer?**

- a. [Chemotherapy](#)
- b. [Radiation](#)
- c. [Surgery](#)
- d. [b & c](#)

## Quiz – Q3

**What is the first-line treatment for early glottic cancer?**

- a. [Chemotherapy](#)
- b. [Radiation](#)
- c. [Surgery](#)
- d. [b & c](#)

**Incorrect.** Chemotherapy is indicated in advanced laryngeal cancer, where multimodal therapy can include surgery, radiation, and chemotherapy.

Please choose again.

## Quiz – Q3

**What is the first-line treatment for early glottic cancer?**

- a. [Chemotherapy](#)
- b. [Radiation](#)
- c. [Surgery](#)
- d. [b & c](#)

**Incorrect.** While radiation is a first-line treatment for early glottic cancer, it is not the only one.

Please choose again.

## Quiz – Q3

**What is the first-line treatment for early glottic cancer?**

- a. [Chemotherapy](#)
- b. [Radiation](#)
- c. [Surgery](#)
- d. [b & c](#)

**Incorrect.** While surgery is a first-line treatment for early glottic cancer, it is not the only one.

Please choose again.

## Quiz – Q3

**What is the first-line treatment for early glottic cancer?**

- a. [Chemotherapy](#)
- b. [Radiation](#)
- c. [Surgery](#)
- d. [b & c](#)

**Correct!** Both surgery and radiation are first-line treatments for early glottic cancer. This decision is based on many factors and requires a multidisciplinary discussion.

## Congratulations! You have finished the hoarseness module.

### Key points to remember:

- The larynx is the **2<sup>nd</sup> most common site** for head and neck malignancy
  - >90% are **squamous cell carcinomas**
- **Signs and symptoms** of laryngeal cancer:
  - Hoarseness, dysphagia, odynophagia, sore throat, hemoptysis, stridor, referred otalgia, weight loss, globus sensation
- **Risk factors** for head and neck cancers:
  - Smoking
  - Alcohol
  - HPV
  - Radiation exposure
- Treatments for laryngeal cancer include **radiation, chemotherapy, and surgery**.
  - Treatment choice depends on staging
  - Primary treatment of early stages = surgery or radiation therapy





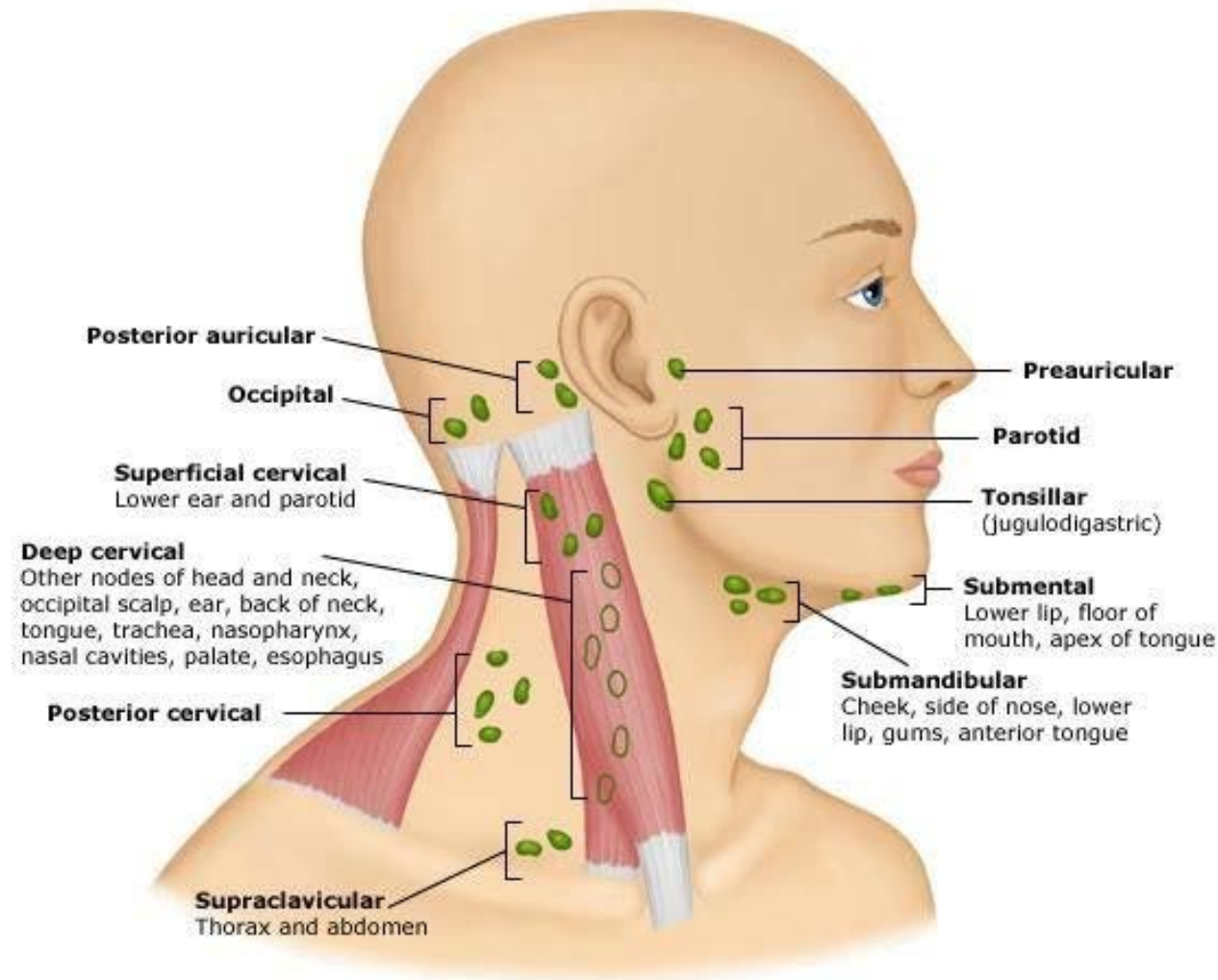
# Module Review Sections

## Anatomy:

Review: Cervical lymph nodes

Review: Laryngeal anatomy

# Review: Cervical lymph nodes



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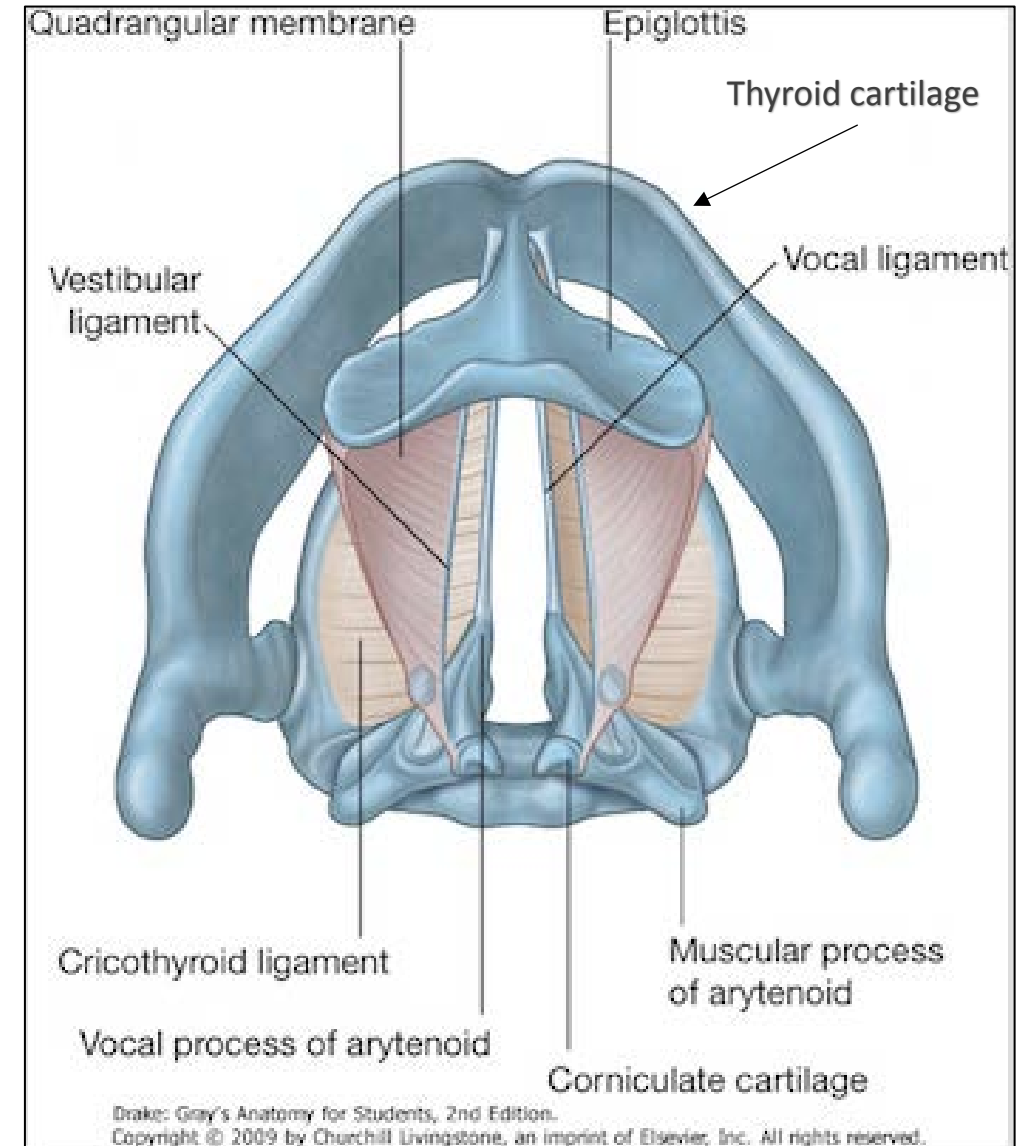
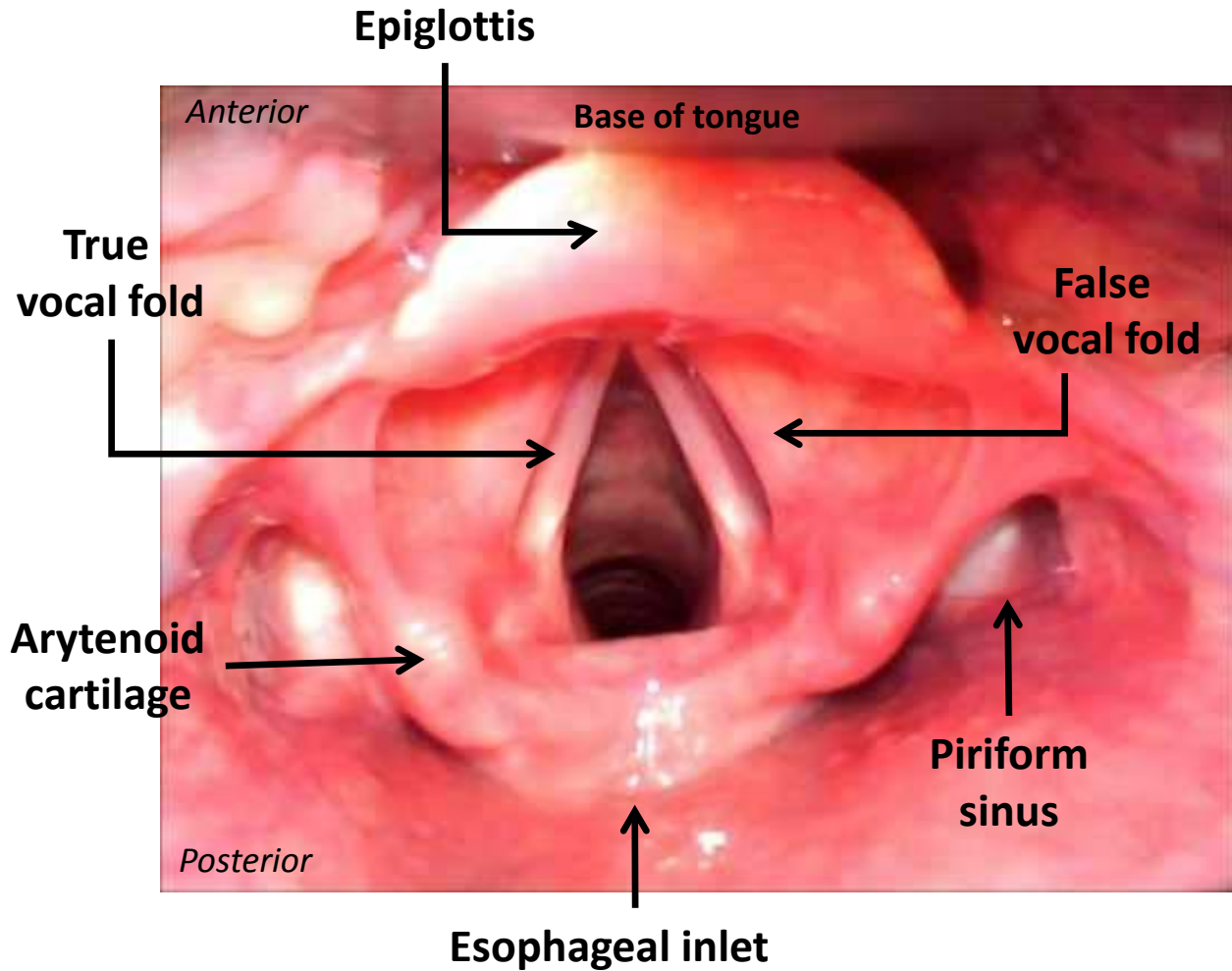
## *Distinguishing palpable LNs:*

- **Infected LNs**
  - Firm, tender, enlarged and warm.  
Overlying skin can appear reddened.
- **Malignant LNs**
  - Firm, non-tender, matted, fixed, and increase in size over time.

# Review: Laryngeal anatomy

## Superior Views of Larynx

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# Module Authors

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