

# SHORTNESS OF BREATH

## DDX

EM FLAME: 12

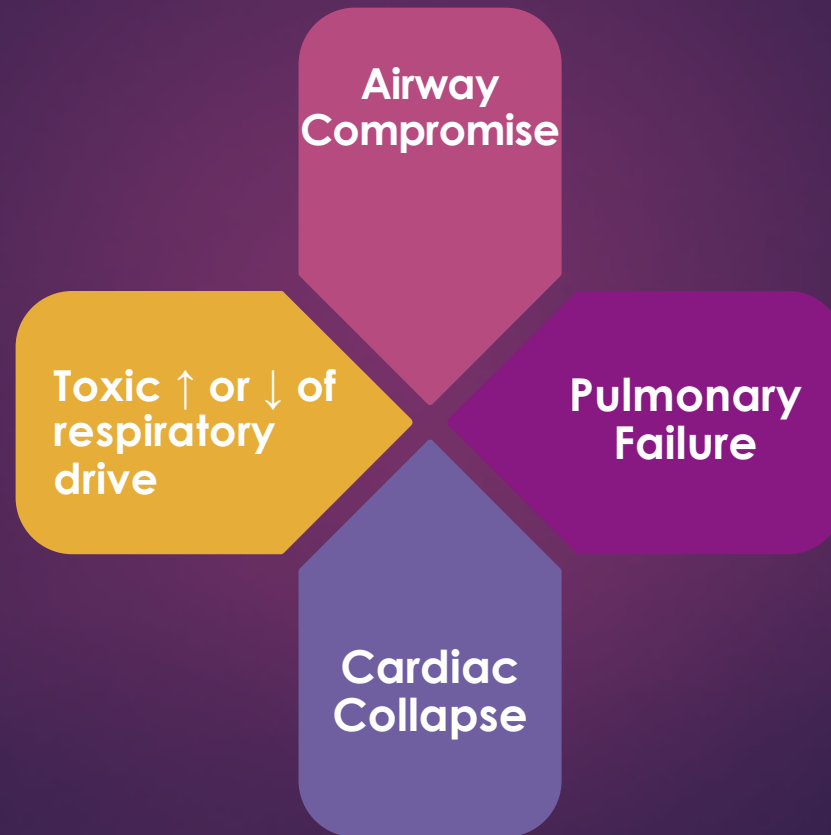
COLLINS 10.5.20

# LEARNING OBJECTIVES

By the end of this talk learners will be able to...

- ▶ Understand differential diagnosis for the chief complaint of shortness of breath (dyspnea)
- ▶ Recognize life threats associated with shortness of breath and identify appropriate treatment
- ▶ Describe the workup for dyspnea in the Emergency Department
- ▶ See also – for closely related topics
  - ▶ [FLAME LECTURE 54 - PNEUMONIA](#)
  - ▶ [FLAME LECTURE 05 - CHEST PAIN](#)

# THE “CAN’T MISS” DIAGNOSES



# THE “CAN’T MISS” DIAGNOSES

## ▶ AIRWAY COMPROMISE

- ▶ Whatever the cause, **stabilization** comes first!
- ▶ *Immediate actions:* IV, O<sub>2</sub>, Pulse Ox, Prepare for intubation → Intubate if possible, Cricothyrotomy if unable to intubate

- ▶ **ANAPHYLAXIS** → immediate Epinephrine 0.3- 0.5 mg IM

## Possible Causes

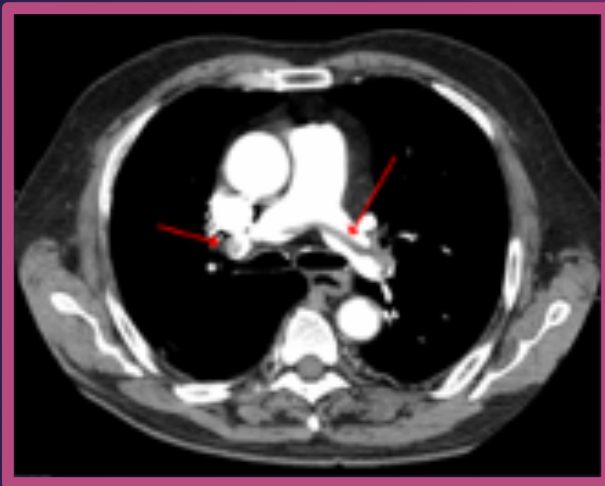
- ▶ Anaphylaxis
- ▶ Foreign body obstruction
- ▶ Epiglottitis
- ▶ Altered mental status



Epiglottitis on lateral X-ray

# THE “CAN’T MISS” DIAGNOSES

## PULMONARY FAILURE



Saddle Pulmonary Embolism

### ▶ **PULMONARY EMBOLISM**

- ▶ Suspect when there are signs or hx suggestive of
  - ▶ DVT
  - ▶ Hypercoagulable condition (cancer, pregnancy)
- ▶ Immediate actions:
  - ▶ Bedside US for R Heart strain
  - ▶ CTA PE or VQ Scan
  - ▶ IV Heparin if strong suspicion of PE

# THE “CAN’T MISS” DIAGNOSES

## PULMONARY FAILURE



Flash Pulmonary Edema with bilateral infiltrates

### ▶ SEVERE/FLASH PULMONARY EDEMA

#### ▶ Suspect with

- ▶ History of CHF or ESRD

- ▶ Clinically fluid-overloaded patient (plump IVC on ultrasound, pedal edema)

#### ▶ Immediate Actions:

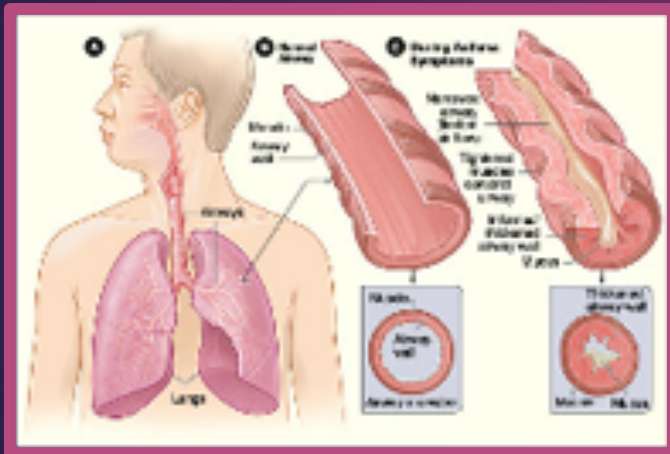
- ▶ Positive Pressure Ventilation (BiPAP or intubation with PEEP)

# THE “CAN’T MISS” DIAGNOSES

## PULMONARY FAILURE

### ▶ **STATUS ASTHMATICUS**

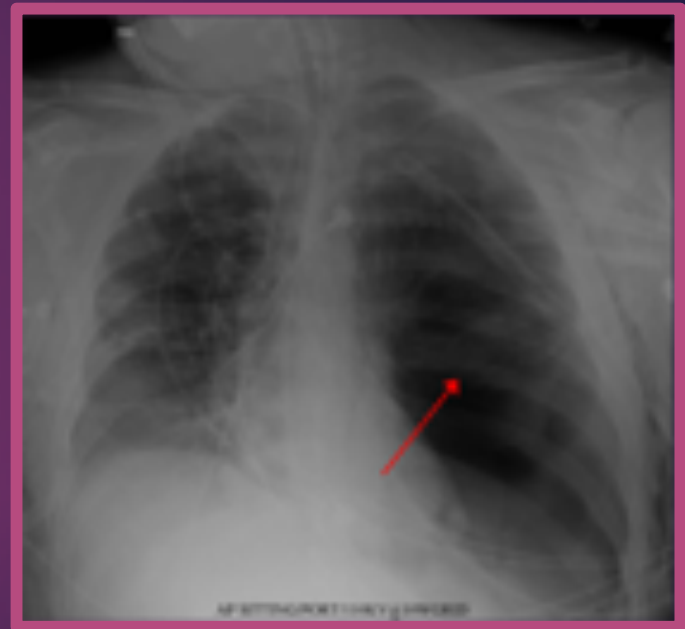
- ▶ Suspect in patients with history of asthma
- ▶ Immediate Actions:
  - ▶ Oxygen supplementation
  - ▶ Nebulized albuterol and ipratropium
  - ▶ IV Mg
  - ▶ Corticosteroids
  - ▶ Consider IM Epinephrine



# THE “CAN’T MISS” DIAGNOSES

## CARDIAC COLLAPSE

- ▶ **TENSION PNEUMOTHORAX**
  - ▶ Suspect when there is
    - ▶ Hx of recent trauma
    - ▶ Decreased breath sounds on one side
    - ▶ Deviated trachea
  - ▶ Immediate actions:
    - ▶ Bedside US
    - ▶ Needle thoracostomy to restore cardiac function





# THE “CAN’T MISS” DIAGNOSES

## CARDIAC COLLAPSE

### ▶ **CARDIAC TAMPONADE**

- ▶ Suspect when there is
  - ▶ History of trauma
  - ▶ JVD
  - ▶ Poor perfusion (hypotension, shock)
- ▶ Immediate actions:
  - ▶ Bedside US
  - ▶ Pericardiocentesis or to the OR for pericardial window



RV Bowing due to pericardial effusion

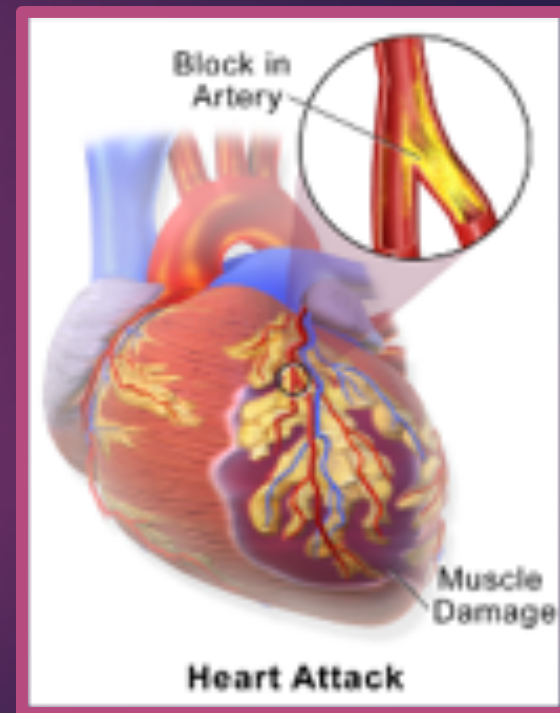


# THE “CAN’T MISS” DIAGNOSES

## CARDIAC COLLAPSE

### ▶ **Acute Coronary Syndrome**

- ▶ Suspect if
  - ▶ Chest pain
  - ▶ History of CAD/MI
- ▶ Immediate actions:
  - ▶ EKG
  - ▶ CXR
  - ▶ Consider STEMI activation (cath lab)



# THE “CAN’T MISS” DIAGNOSES

## SEVERE METABOLIC DERANGEMENT

- ▶ **DKA** or any other severe acidosis can induce compensatory tachypnea
  - ▶ Suspect with history of diabetes
  - ▶ Immediate Action:
    - ▶ Get fingerstick glucose
    - ▶ Start fluids
    - ▶ Start insulin bolus and drip + potassium if confirmed DKA

# THE “CAN’T MISS” DIAGNOSES

## SEVERE METABOLIC DERANGEMENT

- ▶ **Toxic Ingestion**
  - ▶ Immediate Action:
    - ▶ Decontamination
    - ▶ Call Poison Control
- ▶ Consider **Carbon Monoxide Poisoning** if history of being in a fire or also presenting with altered mental status
  - ▶ PulseOx will read normal
  - ▶ Immediate action: put on 100% O<sub>2</sub> via NRB

# THE COMMON LESS URGENT CAUSES

## ▶ CHF Exacerbation

- ▶ Consider in patients with **history of CHF**, **crackles** on lung exam, afebrile, and **insidious onset**

## ▶ COPD/Asthma Exacerbation

- ▶ Consider in patients with prior COPD or Asthma diagnosis with **moderate wheezing on exam** and clear CXR

## ▶ Pneumonia

- ▶ Consider in **febrile** patients or patients with recent history of URI or viral illness

# OTHER POSSIBLE CAUSES



Cor Pulmonale  
Aspiration  
Pleural Effusion  
Neoplasm



Pericarditis  
Congenital heart disease  
Valvular disease  
Cardiomyopathy



Anemia  
CO poisoning  
Acute Chest Syndrome  
Electrolyte abnormalities  
Thyroid Disease  
Renal Failure



Panic Attack  
Guillain-Barre  
ALS  
Multiple Sclerosis  
CVA  
Herniation



Ascites  
Obesity  
Hypoventilation  
Syndrome  
GERD



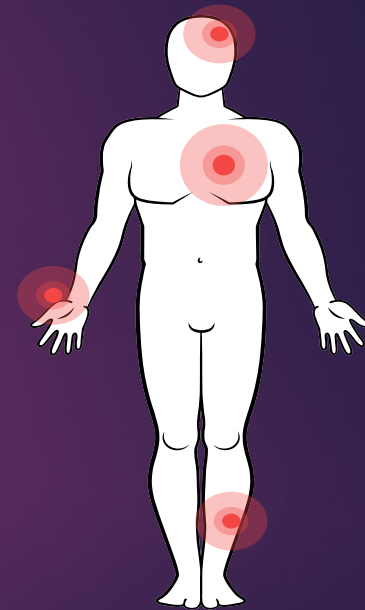
Rib fracture  
Flail Chest  
Hemothorax  
Diaphragmatic Rupture

# RELEVANT HISTORY

- ▶ Onset: rapid, over a day, over a week? Trauma?
- ▶ Provocation: is it positional? do your usual medications help?
- ▶ Quality: is it painful to breathe? Do you feel like you cannot take a full breath in?
- ▶ Radiation: Do you have chest pain? Abdominal pain? Pain in your shoulder?
- ▶ Severity: How does this compare to your chronic breathing problems?
- ▶ Timing: acute or chronic? stable? worsening?

# RELEVANT PHYSICAL EXAM

- ▶ Critical:
  - ▶ Airway assessment
  - ▶ Breathing assessment
- ▶ Urgent:
  - ▶ Lung and heart sounds
- ▶ Must also include:
  - ▶ Extremity assessment for edema/erythema
  - ▶ Peripheral pulses
  - ▶ Neurologic Status





# INITIAL WORK UP



- ▶ CBC - anemia, leukocytosis
- ▶ BMP w/ Mg, Ph - acidosis, electrolyte derangement
- ▶ Consider: proBNP, ABG, D-dimer, troponin



- ▶ CXR
- ▶ EKG
- ▶ Bedside US
- ▶ Consider: CTA PE, CT Chest

# SUMMARY

CHIEF COMPLAINT	CAN'T MISS	MOST COMMON	OTHER DX	WORK UP
<p><b>Shortness of Breath</b></p>	<p>Airway compromise                      -Anaphylaxis                      -Foreign Body Obstruction                      -Epiglottitis                      -Severe AMS</p> <p>Cardiac Collapse                      -Tamponade                      -ACS                      -Tension PTX</p> <p>Pulmonary Failure                      -Flash Edema                      -Status Asthmaticus                      -PE</p>	<p>Asthma                      COPD                      CHF                      PNA                      URI                      Panic Attack</p>	<p>Cor Pulmonale                      Aspiration                      Pleural Effusion                      Neoplasm                      Pericarditis                      Congenital heart disease                      Valvular disease                      Cardiomyopathy                      Anemia                      CO poisoning                      Acute Chest Syndrome                      Electrolyte abnormalities                      Thyroid Disease                      Renal Failure                      Panic Attack                      Guillain-Barre                      ALS                      Multiple Sclerosis                      CVA                      Herniation                      Ascites                      Obesity Hypoventilation Syndrome                      GERD                      Rib fracture                      Flail Chest                      Hemothorax                      Diaphragmatic Rupture</p>	<p>CBC                      BMP                      CXR                      EKG                      Bedside US</p> <p>Consider:                      BNP, Troponin, D-dimer, ABG, CTA                      PE, CT Chest</p>

# IMPORTANT LINKS / REFERENCES

1. Adams JG. Emergency Medicine: Clinical Essentials 2013
2. Welsh L. EMRA EM Fundamentals 2016
3. Marx, JA. Rosen's Emergency Medicine: Concepts and Clinical Practice 8th Edition 2014
4. Schofer JM. Emergency Medicine: A Focused Review of the Core Curriculum
5. Icons provided by SlidesCarnival.com