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1. In a patient with a new presentation of shortness of breath take a sufficient history to avoid inappropriately or prematurely limiting the diagnosis to respiratory and cardiac causes

Now this is extremely important to keep in mind, because for many of us our brains immediately jump to cardiorespiratory causes. The most important thing as always is to obtain a thorough history in which you could utilize the OPQRST mnemonic to get an understanding of the timing and presentation and ask about associated symptoms.

While you're taking your history, or after you have done so. You should try to brainstorm a few potential causes for the shortness of breath. To try to keep your differential broad you can use mnemonics such as VITAMIN D or VINDICATE or even just try to think of other causes which you can inquire about during your history taking or look for them during the physical exam.

Aside from the run of the mill bacterial and viral cardiorespiratory causes, some other ones would include:

- foreign body aspiration,
- epiglottitis, and
- abscesses.
- Neuromuscular diseases such as myasthenia gravis and ALS.
- Gastrointestinal issues and abdominal bloating from IBS, celiac disease, ileus, bowel obstruction may also cause shortness of breath as one of their many symptoms.

Hematological causes such as:

- hemorrhage,
- anemia,
- carbon monoxide poisoning.

Psychogenic causes which are often diagnoses of exclusion but can include:

- anxiety disorder,
- panic disorder and
- hyperventilation.

And finally even patients experiencing pain can have shortness of breath.
We've included a great little table from EBmedicine that breaks down the differential diagnosis for dyspnea in the show notes.

As important as it is to have a broad differential, there is another aspect that is arguably even more important to consider.

And this brings us to our second objective:

Objective Two:

Regardless of where you assess the patient who presents with shortness of breath consider life threatening conditions

There are many of these conditions, they all present with shortness of breath along with other symptoms. Such conditions can include but are not limited to:

1. Pneumothorax
   caused by a blunt or penetrating chest injury, medical procedures, or damage from underlying lung disease or may happen without an obvious reason presenting with chest pain, shortness of breath, tachypnea, tachycardia,hypoxia, cough. On lung exam, you may find cyanosis, unequal breath sounds, hyperresonance on percussion, or a tracheal deviation in the instance of a tension pneumothorax.
2. Pulmonary embolism,
   patients often have risk factors such as cancer, history of heart disease or clotting disorders, recent travel or OCP use. These individuals have a similar presentation to penumothorax along with pluritic chest pain, pre-syncope or syncope, s3 or s4 heart sounds, or limb edema suggestive of DVT.
3. Myocardial infarction
   usually in older patients with cardiovascular risk factors, metabolic syndromes, autoimmune conditions or a previous history. It usually presents with chest pain that may feel like pressure, tightness, pain, squeezing or aching which may radiate to shoulder, jaw, teeth, or even abdomen. Along with this, they may be nauseous, pre-syncopal, diaphoretic. On exam you may find, cyanosis, edema, pallor, diminished pulses,and delayed capillary refill may indicate vasoconstriction, diminished cardiac output, and right ventricular dysfunction or failure.
4. Epiglottitis
   patients often have a severe sore throat, hoarse voice, drooling, dysphagia and odynophagia which may improve when leaning forwards. You may also notice a stridor, cyanosis and the patient may be febrile.
5. Foreign body aspiration,
   you may or may not be able to get a history depending on the age of your patient. And presentation can vary from coughing, wheezing and dyspnea to hemoptysis and choking.
6. Anaphylaxis
   usually develops suddenly and gets worse very quickly, with a history of an interaction with a trigger such as an allergen. Sign and symptoms include presyncope, shortness of

breath, tachypnea, tachycardia, wheeze,clammy hands and even allergy symptoms such as pruritus, hives, and angioedema.

For many of these conditions your patient will likely have acute dyspnea and a worsening status and vitals but not always.

It can be very easy to overlook these conditions especially when patients present with minimal symptoms. So it's crucial to always have these on your differential and to rule them out. If you do suspect any of these, urge or facilitate transport of your patient to the nearest Emergency department.

So we've covered what you should do for a patient presenting with shortness of breath, but there is more to the story.

Objective 3:
When a patient with a diagnosed cause of dyspnea presents with worsening symptoms or treatment failure:

a) Ask about other factors that might have exacerbated their symptoms
b) Re-evaluate your primary diagnosis
c) Consider co-existing diagnoses

a) Ask about other factors that might have exacerbated their symptoms

A solid first step is to circle back and ask more questions for a more detailed history. Consider asking about things such as:

- treatment adherence and/or technique,
- physical exertion
- environmental changes,
- recent travel,
- new pets,
- dietary changes,
- drastic changes in lifestyle or recent illnesses
- certain thoughts or life events.

Most of these can contribute to exacerbation of symptoms of COPD and asthma, physical exertion for CHF, dietary changes for potential anaphylaxis, and thoughts and negative life events for anxiety.
Along with this, there are also some signs of symptoms that can help you tie the story together, such as chest pain, pedal edema, shortness of breath, etc.

Now if you've asked further questions and nothing sticks out. You could start considering a coexisting diagnosis for example a bacterial pneumonia infection on top of asthma or COPD with pulmonary hypertension or CHF with COPD or even asthma and COPD.

Many diseases can present the same way especially if they are within the same body system, so redoing a thorough physical examination and running some general labs or imaging may help confirm your primary diagnosis or shed light on a new one. These could include CBCd, renal function, liver enzymes and function, BNP, troponin, ECG, electrolytes, lipids, CRP, thyroid function, PFT, chest xray, ECHO.

For example, the CFP has recently published an article which we have listed in the show notes about distinguishing asthma and COPD, and essentially differentiating the two and the management will be based on medical and family history, signs and symptoms, and spirometry.

Objective 4:
In an anxious patient with shortness of breath don't assume anxiety is the cause of their symptoms.

This objective loops back to the first one we covered today, once again highlighting the importance of having a broad differential and not making assumptions.

Exactly! So a patient with anxiety or an anxious patient presenting with dyspnea, you want to keep in mind that the symptom could be due to cardiac, pulmonary, gastrointestinal, neurological or environmental causes and you still want to consider life threatening conditions.

For this you first want to start off with a history, a mini mental status exam, ask the patient to fill out an anxiety questionnaire such as GAD 7 or PHQ9, followed by a complete physical exam.

It is also a good idea to order some tests to rule out the other causes that we mentioned, and if those return negative and the patient has signs and symptoms that meets DSM5 criteria for generalized anxiety disorder or panic disorder you can then give them that diagnosis.

It's important to take these measures to ensure that we don't miss anything and to provide proper management.

Table 1. Common Causes Of Dyspnea.

Upper Airway
Foreign body
Allergic reaction
Mass
Airway stenosis
Tracheomalacia

Lung/Lower Airway
Pneumonia
Pneumothorax
Pleural effusion
Pulmonary embolism
Pulmonary hypertension
Interstitial lung disease
Adult respiratory distress syndrome
Chronic obstructive pulmonary disease
Asthma
Mass

Cardiac
Myocardial ischemia
Congestive heart failure
Pericardial effusion
Valvular disease
Arrhythmia

Metabolic/Hematologic
Thyrotoxicosis
Abnormal hemoglobins (CO or methemoglobin)
Anemia
Disorders of phosphate, potassium, or calcium
Sepsis/Fever
Acidosis

Neuromuscular
Guillain-Barré
Myasthenia gravis
Myopathy
Neuropathy

Psychogenic
Panic disorder
Hyperventilation
Deconditioning

Other
Massive ascites
Drug withdrawal

Table 2. Respiratory Sensations Associated With Various Conditions.

Sensation	Condition
Rapid breathing	Congestive heart failure, pulmonary vascular disease
Incomplete breathing	Asthma
Shallow breathing	Asthma, neuromuscular and chest-wall disease
Increased work or effort	COPD, interstitial lung disease, asthma, neuromuscular and chest-wall disease
Feeling of suffocation	COPD, congestive heart failure
Air hunger	COPD, congestive heart failure, pregnancy
Chest tightness	Asthma
Heavy breathing	Asthma

Adapted from: Manning HL, Schwartzstein RM. Mechanisms of disease: Pathophysiology of dyspnea. *N Engl J Med* 1995;333(23):1547-1553.

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