



DYSPNEA

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2021

LEARNING OBJECTIVES:

DISORDERS OF THE RESPIRATORY SYSTEM

- Identify the risk factors and aggravating factors specific to patients suffering from asthma or chronic obstructive pulmonary disease (COPD) after conducting a medical history.
- Describe the appropriate investigations to diagnose and treat a patient with asthma or COPD.
- Choose an appropriate pharmacological treatment for a patient on the basis of the latest Canadian Asthma and COPD Consensus Guidelines.
- Interpret pulmonary function test (PFT) values and differentiate asthma from COPD.

LEARNING OBJECTIVES:

UPPER RESPIRATORY TRACT INFECTIONS

- List the various upper respiratory tract infection (URTI) etiologies
 - Viral; Strep
- List the secondary conditions resulting from URTI
 - Sinusitis, otitis media
- Establish the differential diagnosis for URTI
- Describe the appropriate management of an URTI
- List and describe the indications for over-the-counter (OTC) and prescription cough and cold medications.

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*“a subjective experience of **breathing discomfort** that is comprised of qualitatively distinct sensations that vary in intensity. The experience derives from interactions among multiple **physiological, psychological, social, and environmental factors**, and may induce secondary physiological and behavioral responses.”*

DEVELOPING AN APPROACH



FIRST STEP: SICK OR NOT SICK



DYSPNEA APPROACH CONT'D

- Acute vs Chronic
 - Acute: hours to days
 - Chronic >4-8 weeks

Then you develop your own next steps. For ex:

- By age
- By system
- By a mnemonic of your choice

ACUTE DYSPNEA

- Pneumonia
- Congestive heart failure
- Acute asthma or COPD exacerbation
- PE
- Pneumothorax
- Foreign body aspiration
- Hyperventilation
- DKA or other metabolic process

Role of community family physician:

- Call 911
- ABCs
- stabilize airway (bag mask)
- +/- O₂
- Vitals
- Facilitate transfer to acute care

CHRONIC DYSPNEA

- Cardiac causes
- Respiratory causes
- Anemia
- Hyperthyroidism
- Obesity or deconditioning
- Chest wall pathology
- Neuromuscular disease

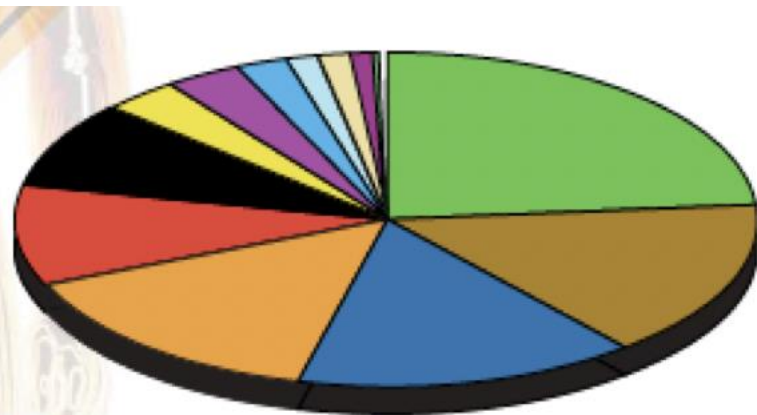
Role of community family physician:

- r/o red flags
- progressive
workup and
management

DYSPNEA BY AGE



Under 45



45 and Older

	AGE	
	Under 45	45 and Older
Asthma	31.80 %	9.90 %
Acute Bronchitis	21.50	14.70
COPD	1.50	23.70
CHF	0.07	15.30
Dyspnea NYD	7.00	8.20
Anxiety	7.80	3.30
URI	6.70	1.50
Pneumonia	2.50	3.30
Acute Laryngitis/Tracheitis	4.70	1.00
Ischemic Heart Disease	0.20	2.30
Lung Malignancy	0.00	1.30
PE	0.30	0.50
Other	16.00	15.00

DYSPNEA BY SYSTEM

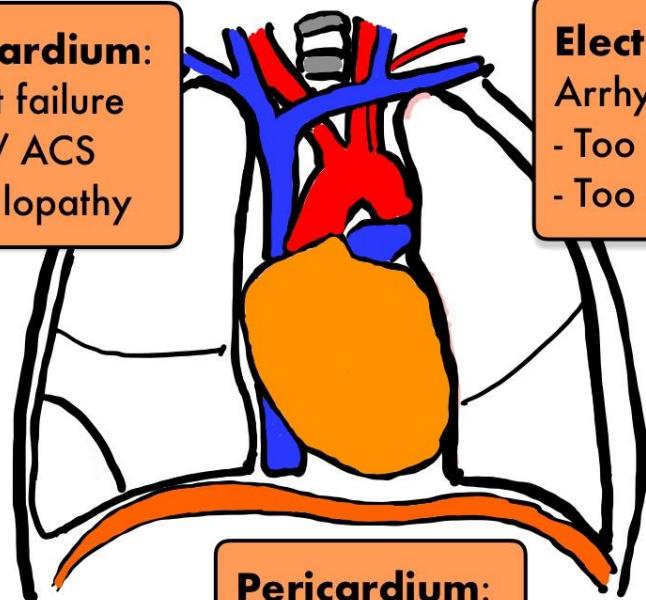
- Cardiac
 - Respiratory
 - Other
 - Chest wall
 - Neuromuscular
 - Hematologic
- } 67% of all causes

DYSPNEA

Cardiovascular

Myocardium:

- Heart failure
- CAD/ ACS
- Valvulopathy



Electrical:

- Arrhythmia
- Too fast
- Too slow

Pericardium:

- Constrictive
- Tamponade

Chest wall:

- Kyphoscoliosis
- Obesity
- Flail chest

Neuromuscular:

- Myasthenia
- Guillan Barre
- ALS
- Transverse myelitis

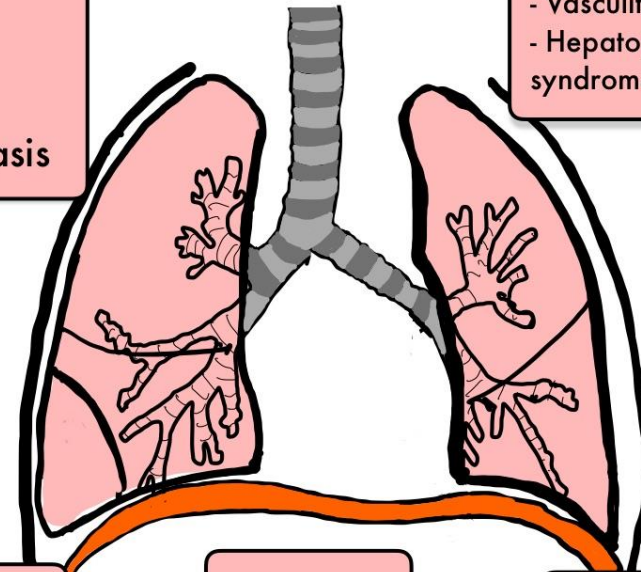
Hematology:

- Anemia

Pulmonary

Airways:

- Asthma
- COPD
- Bronchiectasis



Parenchyma:

- ILD

Alveoli:

- Water
- Pus
- Blood

Pleura

- Effusion
- Pneumothorax

Vasculature:

- PE
- Pulmonary HTN
- Vasculitis
- Hepatopulmonary syndrome

Other:

- Acidosis
- T4
- Anxiety
- Deconditioning
- Pain

LEARNING THROUGH CASES: SMALL GROUPS

Four groups of students: **2 cases each** group.

15 minutes to work through cases.

Each group will have **10 minutes** to present their cases to the rest of the class.

Good luck!

CASE 1

Kimberley is a 68yo female who presents to your family medicine evening clinic with progressive shortness of breath over the past few weeks. She has a past medical history of type 2 diabetes mellitus, depression, hypertension, dyslipidemia, and osteoarthritis. She does not have any COVID risk factors and her recent swab was negative.

1. What approach would you take with this patient?
2. What questions would you ensure you ask on history?
3. What physical exam maneuvers would you perform on this patient?
4. What diagnoses would you consider in this patient?

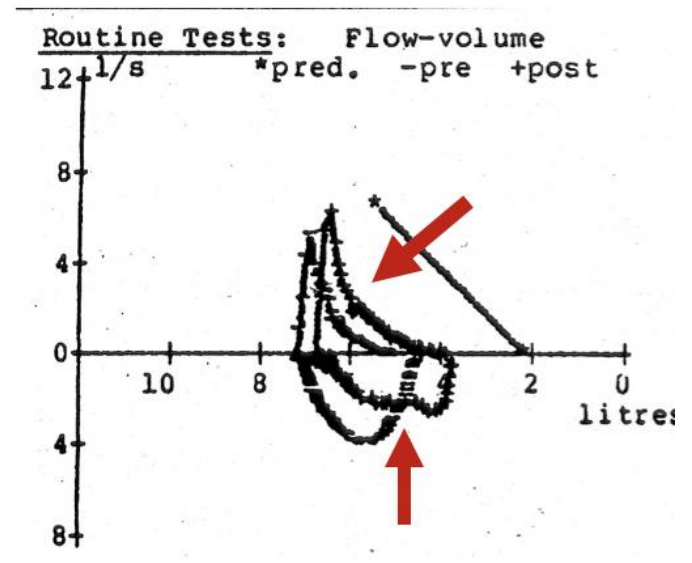
CASE 2

You are on your rural rotation and your preceptor is in charge of PFT's for the clinic this week. She sets you up with two PFTs (see following slides) to interpret. For each of the following, she wants you to categorize as restrictive, normal, or obstructive, comment on reversibility, and suggest possible causes.

CASE 2
PFT 1

Age: 66 Sex: female Height: 170 Weight: 88
Reason for test: shortness of breath on exertion

Test	Pred.	Obs.	%Pred	Post-BD	Change
FEV1/ FVC	72	65			
FEV1	2.4	1.5	62%	1.8	+22%
TLC	5.4	7.2	132%		
RV	2.1	4.6	216%		
Dco	22.6	21.8	96%		

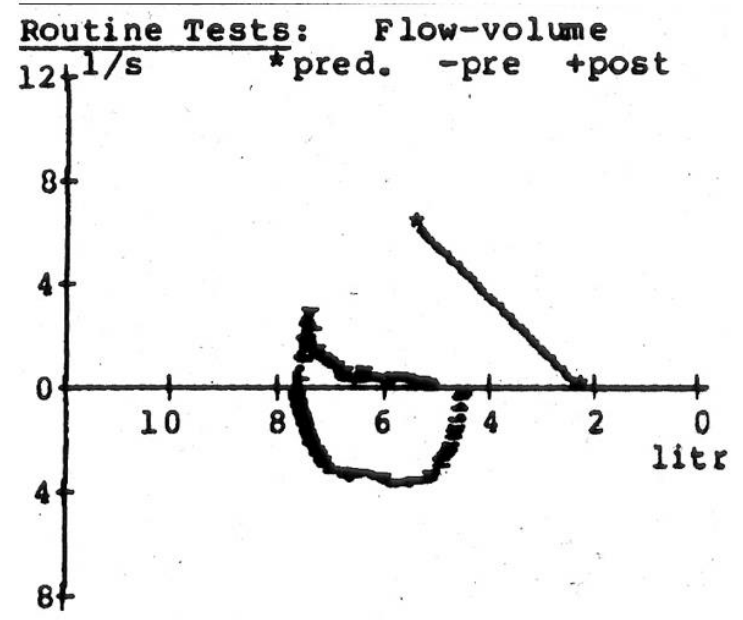


Interpretation: ?

CASE 2
PFT 2

Age: 67 Sex: male Height: 166 Weight: 73
Reason for test: mild SOBOE, smoker x 50yrs

Test	Pred.	Obs.	%Pred	Post-BD	Change
FEV1/ FVC	80	50	62%		
FEV1	2.6	1.4	54%	1.5	+7%
TLC	5.4	7.6	142%		
RV	2.2	4.5	204%		
Dco	27.8	9.4	34%		



Interpretation: ?

CASE 3

Ms. Dunlop is a 65 year old woman who complains of chest tightness and shortness of breath on exertion. She has been smoking 1.5 packs of cigarettes per day for 40 years. She has been having difficulty sleeping.

O/E: BP is 154/88 with no pulsus paradoxus, O₂ sat 91%, HR 89, afebrile, RR 21. There is a tracheal tug and visible use of Sternocleidomastoid. She is speaking in short sentences. Percussion of the chest reveals hyper-resonance. There is no increased area of tactile fremitus. Auscultation reveals diffuse wheezing.

1. What diagnoses would you consider in this patient?
2. You think she may have COPD. How do you go about taking a history, physical exam and diagnosing COPD?
3. Ultimately you diagnose Ms. Dunlop with COPD, what strategies would you include in your management plan, both pharmacological and non-pharmacological?

CASE 4

A father brings in Jack, a 7yo boy, with a several month history of wheeze, shortness of breath with activity, and nighttime cough. Jack's dad is concerned this could be asthma and wants a puffer.

1. What sorts of things would be important to ask on history?
2. What is your approach to finding a diagnosis for this patient?
3. How would your approach to diagnosis change if Jack were 3?
4. If you were to diagnose Jack with asthma, what would you include in your management plan?
5. If you diagnose Jack with asthma, what questions would you ask in follow-up to tell if his disease is under good vs poor control.

CASE 5

70yo F presents to your clinic with increasing shortness of breath over the past 5 days. You are considering pulmonary embolism in your differential.

1. What are the key questions on history that should be asked when considering pulmonary embolism?
2. What are the Wells and PERC score rules and when do you apply them?
3. What is the role of D-dimer in patients with suspected DVT or PE

CASE 6

You are working with your family medicine preceptor in their urgent care after hours clinic. Your preceptor suggests you see a few people and she will touch base in an hour. Here are your first three patients of the evening:

CASE 6

ROOM 1

PATIENT 1: Ms. K.O. is a 74 yo woman with a five-day history of facial pain, fever, night sweats, yellow nasal D/C, no anosmia. There is facial pressure in both maxillae and over forehead. On the day of visit began a cough productive of yellow sputum. No chest pain or SOB. She came to get assessed as she wants to travel to attend brother's funeral in Calgary 4 days.

O/E: T 37, RR 17, BP 153/84, HR 90. Tenderness over the maxillary sinuses and intense facial pain with bending forward.

1. What is the diagnosis: What are the criteria for the diagnosis
2. What is the likely etiology?
3. What treatments would you consider?

CASE 6

ROOM 2

PATIENT 2: Samuel is a 4 yo who comes with his mom. She says he has been up all night crying and c/o ear pain. He has had a temp. of 37.5 axillary at home.

O/E: Temp: 37.7. On palpating his neck you note some lymphadenopathy in the left posterior triangle of the neck. The right TM is grey with the malleus and light reflex visible. The left TM is bulging, angry and no light reflex is visible.

1. What history would you like to ask?
2. How would you manage this patient?
3. If you ultimately prescribe medications, at what doses would you do so?
4. How would your management change if this patient was 5 months old? 18 months old?

CASE 6

ROOM 3

PATIENT 3: Grace, a 8yo female, presents with her mom with a 2 day history of progressive sore throat. She has no cough and has been taking in mostly fluids for the past day. Her friend at school is also sick.

O/E she is well appearing, febrile at 38.3, with tender left-sided anterior cervical chain lymphadenopathy. She has an enlarged left tonsil with white exudate noted.

1. What tool can you use to stratify her risk of having Strep pharyngitis?
2. How would you manage this patient?

CASE 7

In your clinic you go to see Barry Hoffman, a 79yo man, who is brought in by his daughter due to increasing shortness of breath, cough, sputum production for 3 days. He reports chills last night. His past medical history is significant for hypertension and cataract surgery. He is a lifelong nonsmoker and drinks socially.

O/E: Temp 35.4, HR 92, RR 26, BP 127/51. O₂ sat is 92%. He appears short of breath and is using accessory muscles to breathe. He can report his name, and “your clinic” for place but states it’s 1986 and is unsure what season it is which, you and his daughter note is out of character for him.

1. What diagnoses are you considering in this patient?
2. What investigations would you pursue?
3. You perform a CXR that reveals a right lower lobe pneumonia. What treatment would you consider for this patient?
4. How would you decide whether to treat this patient as an outpatient or an inpatient?

CASE 8

Ms. Winter is an 82yo female who presents to your family medicine clinic with a 2 week history of progressive shortness of breath with any activity, including getting dressed. She wonders if could be anxiety as her husband was recently admitted to hospital after a fall and hip fracture. She is coping okay despite this but she finds it difficult to cook, as her husband was the main cook. She finds it difficult to sleep and has started falling asleep in front of the TV in her recliner.

CASE 8 CONT'D

PMHx:

Type 2 DM (last HgA1c 9%)

Hypertension

atrial fibrillation

GERD

Arthritis bilateral knees

Mild cognitive impairment

Iron deficiency anemia

Medications:

hydrochlorothiazide 25mg po daily

ramipril 10mg po daily

amlodipine 7.5mg po daily

metformin 1000mg PO BID

empagliflozin 25mg PO daily

escitalopram 10mg po daily

rivaroxaban 20mg PO daily

atorvastatin 20mg PO qhs

pantoprazole 40mg PO daily

vitamin b12 1000mcg po daily

ferrous gluconate 300mg po daily

O/E: HR: 94, BP 168/96, O2 88%, afebrile, weight 92kg (you note that 3 weeks ago her weight was 85kg). She appears dyspneic and she has pitting edema up to her knee.

Precordial exam reveals a normal S1 and S2 with the presence of an S3. There are no murmurs. Respiratory exam reveals crackles bilaterally, throughout her lung fields.

CASE 8 CONT'D

1. What is the leading diagnosis in this patient?
2. What questions would you want to be sure to ask on history and what do you think are the potential root causes of her presentation today?
3. What investigations would you order for this patient and what would you expect to find?
4. What are the mainstays of long-term management for this patient?

RESOURCES

1. Ponka, D. and M. Kirlew. Canadian Family Physician August 2007, 53 (8) 1333
2. Toward Optimized Practice (TOP) Asthma Working Group. 2018 April. Chronic asthma clinical practice guideline. Edmonton, AB: Toward Optimized Practice. Available from: <http://www.topalbertadoctors.org>.
3. Asthma.ca
4. Jean Bourbeau, Mohit Bhutani, Paul Hernandez, Shawn D. Aaron, Meyer Balter, Marie-France Beaudesne, Anthony D'Urzo, Roger Goldstein, Alan Kaplan, François Maltais, Don D. Sin & Darcy D. Marciniuk (2019): Canadian Thoracic Society Clinical Practice Guideline on pharmacotherapy in patients with COPD – 2019 update of evidence, Canadian Journal of Respiratory, Critical Care, and Sleep Medicine.
5. Peds cases Position Statement AOM:
https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjguaScsrDyAhVJWs0KHRjwBrMQFnoECAIQAAQ&url=https%3A%2F%2Fpedscases.com%2Fsites%2Fdefault%2Ffiles%2FSummary_AOM_EN.pdf&usg=AOvVaw1SCm0e2jY7oFhOXBsClffY
6. RxFiles High Dose Amoxicillin:
<https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjguaScsrDyAhVJWs0KHRjwBrMQFnoECB0QAQ&url=https%3A%2F%2Fwww.rxfiles.ca%2Frfiles%2Fuploads%2Fdocuments%2Famoxicillin-HIGH-DOSE-Infographic.pdf&usg=AOvVaw3n4wKqwm7SnNHDQCjjJsr8>
7. Kline JA, Mitchell AM, Kabrhel C, Richman PB, Courtney DM. Clinical criteria to prevent unnecessary diagnostic testing in emergency department patients with suspected pulmonary embolism. J Thromb Haemost. 2004; 2(8): 1247- 55.
8. 2016 CPS Position Statement Acute Otitis Media. Nicole Le Saux, Joan L Robinson, Jade Chénard-Roy, Peter J Gill.
9. RX Files 2021