Acute Exacerbation of COPD: Beyond Antibiotics and Steroids

Robert Dachs, MD, FAAFP (Conference Chair)
Director of Graduate Medical Education
Department of Emergency Medicine
Ellis Hospital, Clinical Associate Professor
Family Residency Program
Albany Medical College
Schenectady, NY

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Disclosure

I have no financial interests or relationships to disclose.

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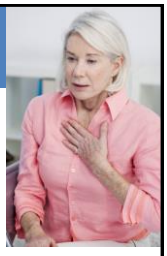
Learning Objectives

1. Develop an organized approach to patients with dyspnea that may be experiencing an exacerbation of COPD (AECOPD)
2. Recognize common and uncommon causes of AECOPD
3. Introduce tools such as the Ottawa COPD risk score, CRP, and eosinophia counts in the management of patients with AECOPD
4. Develop appropriate discharge plans for patients with AECOPD

3

Case 1:



- 67 yo female presents to you with **CC: *SOB/DOE, productive cough with whitish sputum.***
- Was initially seen by MD one week ago for above.
- Expiratory wheeze noted at that time.
- PMHx: HTN
- SHx: Does not smoke, husband does. Works as short-order cook x20yrs, continues to work
- **Dx: Asthmatic bronchitis.**
- D/C on: 1) albuterol inhaler, 2) Medrol-Dos Pak and 3) Z-Pak

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Case 1:

- **Returns 7 days later:** Patient notes initial mild improvement in symptoms, but seeks care because symptoms have not improved/persist.
- In office/UC/ED: **(+)** expiratory wheeze, prolonged expiratory phase, mid-sentence cough.
- **(-)** Fever, No JVD, no clubbing, no edema.
- Vitals: **120/60, 105, 24, 37.5, 95%**

Would you have done something different at initial visit OR at this second visit?

A. Evaluation?? ***B. Therapy??***

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Case 1:

Would you do something different at initial visit or current?

A. Evaluation?? ***B. Therapy??***

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%)**
Does ***"wheezing = asthma"?***

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Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%)**
Does ***"wheezing = asthma"?***

Differential DX:
COPD, Asthma, URI/bronchitis, CHF

Allergic rxn, foreign body, GERD, Bronchiectasis, Tumors: tracheal/lung, mesothelioma, interstitial lung dz, vocal cord dysfunction, Meds, TB, parasitic infections.....

Condition	Signs, Symptoms, and Diagnostic Testing
COPD (1,43,44)	• Mid-life onset • Symptoms slowly progress • History of tobacco smoking/ occupational exposure • Hyperinflation, bronchial thickening, and increase in basilar markings confirmed by CXR • Postbronchodilator $FEV_1/FVC < 0.70$ • Reversibility < 200 mL or < 12% of baseline FEV_1
Asthma (44,45)	• Early onset (often childhood) • Symptoms vary during the day and worsen during the night • Triggered by allergens • Family history • Postbronchodilator $FEV_1/FVC \geq 0.70$ • Reversibility ≥ 200 mL and ≥ 12% of baseline FEV_1
Cardiac failure (46)	• Physical signs may include third cardiac sound, wheezing, murmur • CXR shows venous congestion, cardiomegaly, and interstitial edema • BNP ≥ 100 pg/mL
Bronchitis (1)	• Associated with longer exacerbations • Not associated with accelerated decline in lung function and airflow limitation • Mucus hypersecretion with chronic productive cough is commonly observed • Large volumes of purulent sputum • Associated with bacterial infection • CXR shows bronchial dilation and bronchial wall thickening

COPD = chronic obstructive pulmonary disease; CXR = chest X-ray; FEV_1, = forced expiratory volume in 1 second; FVC = forced vital capacity; BNP = brain natriuretic peptide.

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Does ***"wheezing = asthma"?***

Differential DX:
COPD, Asthma, URI/bronchitis, CHF

Historical clues to dx?

- ***Age? 67***
- ***Occupation? Short-order cook***
- ***Smoker? Second-hand*** *(RR = 1.7, 95% CI: 1.4–2.0)*

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Illness script- 67 yo, New Onset, Dyspnea, Cough, Wheeze

Assign weight to each Box: 2+ to 2-

Key findings	COPD	Asthma	URI/ Bronchitis	CHF
wheeze	+2	+2	+2	+2
age	+2	-2	0	+2
Risk factors	+2	-2	0	?
No fever	c/w	c/w	+/-	c/w

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COPD, Asthma, URI/bronchitis, CHF

Historical clues to dx?

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- ***Occupation? Short-order cook***
- ***Smoker? Second-hand***

Physical Exam clues?

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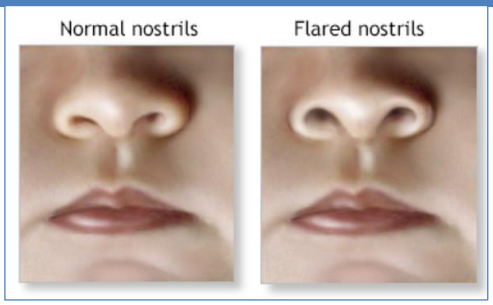
Signs of COPD: Non-specific

- Nasal flaring
- Pursed lip breathing on exhale
- Hollowing of supraclavicular fossa *(on inspiration)*
- Inspiratory descent of trachea
- Use of accessory muscles



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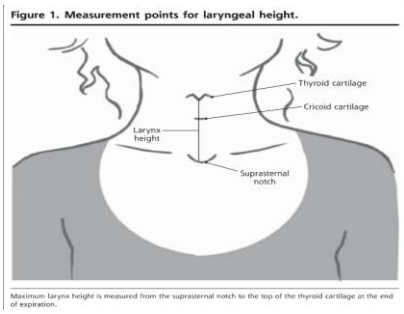
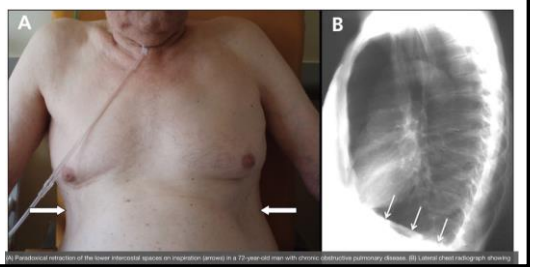
Signs of COPD: More Specific

- Nasal flaring
- Pursed lip breathing on exhale
- Hollowing of supraclavicular fossa *(on inspiration)*
- Inspiratory descent of trachea
- Use of accessory muscles

Maximum laryngeal height at end of expiration

Hoover's sign





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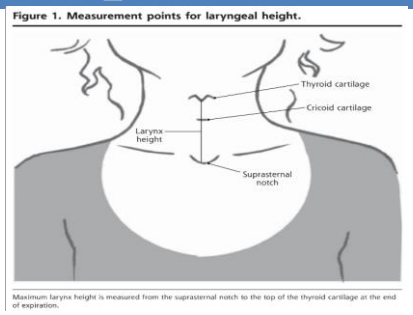

[1,2]maximum height of ≤4 cm → LR of 3.6- 5.2 for dx COPD

[1]Straus SE, et al . JAMA 2000; 283: 1853-7
[2]Casado V, et al. Ann Fam Med 2015; 13: 49-52

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Maximum Laryngeal Height ≤ 4cm

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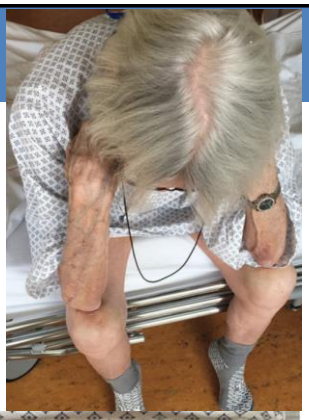
Signs of COPD: Late Signs



- Nasal flaring
- Pursed lip breathing on exhale
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- Use of accessory muscles

Maximum laryngeal height at end of expiration

Hoover's sign

Harrison's sulcus

Tripod position

Thinker's sign/Dahl sign

Barrel-shaped chest

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Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%)**
Does ***"wheezing = asthma"?***

Historical clues to dx?

- Age? older

- ***Occupation? Short-order cook***
- ***Smoker? Second-hand***

Illness script suggests COPD

.....spirometry is needed for confirmation!

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Asthma – COPD Overlap Syndrome

- First described in 2009
- useful descriptor for a patient who has clinical features ***and*** spirometry results consistent with both asthma and COPD
- However, GOLD had not accepted as a distinct condition because there is no exact definition

2016, a global expert panel stated patients must meet all 3 below:

- *40 years old with chronic airflow obstruction (post-bronchodilator FEV1/FVC 0.70 or the lower limit of normal)*
- *have at least 10 pack-years of tobacco use*
- *have a hx of asthma before age 40 (or more than 400 milliliters (mL) increase in FEV1 after bronchodilator use)*

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A. Evaluation?? ***B. Therapy??***

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Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%).....**

I'm thinking AECOPD

But why now?
What is behind the exacerbation?

EKG
Troponin
BNP
CXR
D-dimer
CBC
CMP
Viral panel
CRP
Procalcitonin

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Case 1:

A. Evaluation??

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- ACS/ischemia

20

Case 1:

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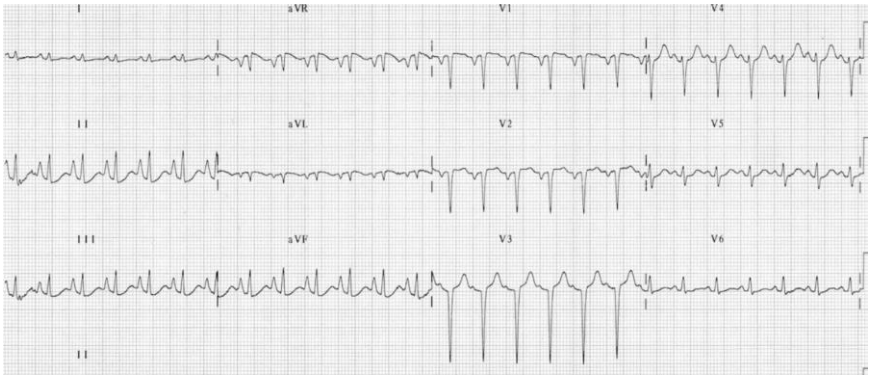

Cor pulmonale....
R axis deviation, peaked P, Absent R V1-3, low voltage L side

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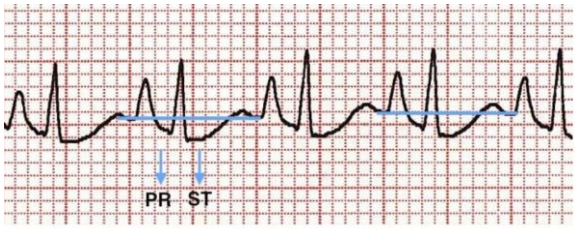

Sagging of the PR and ST segments below the TP baseline

Mutlifocal atrial tachycardia

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EKG ✓
Troponin ✓
BNP ✓
CXR ✓
D-dimer
CBC
CMP
Viral panel
CRP
Procalcitonin

- ACS/ischemia
- Infection/pneumonia
  +/- hyperinflation

23

Case 1:

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What is behind the exacerbation?

EKG ✓
Troponin ✓
BNP ✓
CXR ✓
D-dimer **?**
CBC
CMP
Viral panel
CRP
Procalcitonin

- ACS/ischemia
- Infection/pneumonia
- Pulmonary embolism

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AECOPD and PE

The prevalence and clinical features of pulmonary embolism in patients with AE-COPD: A meta-analysis and systematic review

Fu X, et al. PLoS One ***2021***

- 17 studies, 3170 patients
  - *5 high quality, 12 medium*
- **Prevalence= 17.7%**
  (Range: 3.3 – 36.1%)

CLINICAL TRIAL REPORT

Prevalence, Risk Factor and Clinical Characteristics of Venous Thrombus Embolism in Patients with Acute Exacerbation of COPD: A Prospective Multicenter Study

Kiu X, et al. Int J COPD ***2023***

- 1580 AECOPD pts, all get CTPA
  - *within 48 hours of admit*
- **Prevalence= 16.8%, DVT = 7.7%**

25

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CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Should pulmonary embolism be suspected in exacerbation of chronic obstructive pulmonary disease?

Rutschmann OT, et al. Thorax ***2007***

- 123 AECOPD pts, to be admitted
- *All evaluated for PE in ED-*
- **Prevalence= 3.3%**

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Case 1:

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EKG ✓
Troponin ✓
BNP ✓
CXR ✓
D-dimer ? ✓
CBC
CMP
Viral panel
CRP
Procalcitonin

- ACS/ischemia
- Infection/pneumonia
- Pulmonary embolism

➔***Age-adjusted or YEARS Criteria (<1000ng/ml)***

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D-dimer ? ✓
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CMP
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CRP
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➔Age-adjusted or YEARS Criteria

- ACS/ischemia
- Infection/pneumonia
- Pulmonary embolism
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But why now?
What is behind the exacerbation?

- ACS/ischemia
- Infection/pneumonia
- Pulmonary embolism
- Anemia/blood loss

- Environmental factors
- Non-compliance? Meds?

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Procalcitonin??

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But why now?
What is behind the exacerbation?

Fine Pollutants From 'New Normal' of Wildfires Affects Much of US

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8.3 Million Deaths Worldwide/yr Due to Air Pollution[1]

- **Particulate matter < 2.5 micrometers enter alveoli (PM 2.5)**
- **90% of the world population lives above WHO level of 10ug/cubic meter**
- **exposure to fine (PM2.5) and coarse (PM10) matter ➔ ↑ hospitalizations, ER visits, and outpatient visits[2]**

[1]Lelieveld J, et al. BMJ 2023;383:e077784 | doi: 10.1136/bmj-2023-077784
[2] Li N,et al. COPD 2022' 19: 243-54

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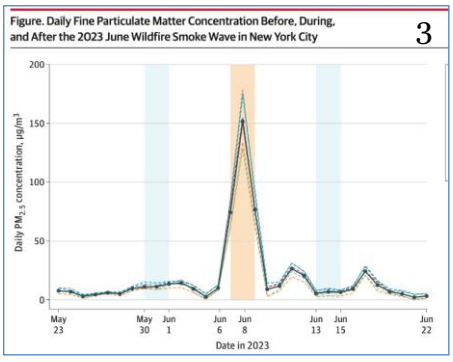

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- BNP ✓
- CXR ✓
- D-dimer ✓ → Age-adjusted or YEARS Criteria
- CBC ✓
- CMP ✓
- Viral panel ✓
- CRP ?
- Procalcitonin ?

- ACS/ischemia
- **Infection**/pneumonia
- Pulmonary embolism
- Anemia/blood loss
- Environmental factors
- **Non-compliance? Meds?**

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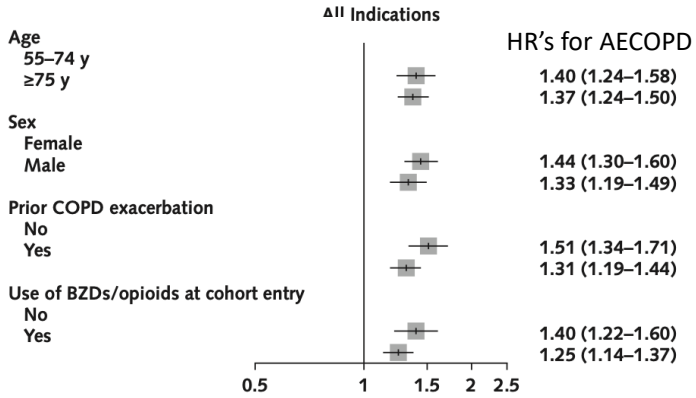
Annals of Internal Medicine ORIGINAL RESEARCH

Gabapentinoids and Risk for Severe Exacerbation in Chronic Obstructive Pulmonary Disease

A Population-Based Cohort Study

Rahman AA, et al. Feb 2024; 177: 144-54



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FDA warns about serious breathing problems with seizure and nerve pain medicines gabapentin (Neurontin, Gralise, Horizant) and pregabalin (Lyrica, Lyrica CR)

When used with CNS depressants or in patients with lung problems 2019

% of Americans prescribed:

Johansen ME, et al.
Ann Fam Med
2024; 22: 45-49

1.2% in 2002
4.0% in 2015
4.7% in 2021

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Table 1. Gabapentinoid Users by Medical Condition, 2017-2021

	CCSR and (ICD-10-CM) Codes	Adult Population With the Medical Condition Reported, %	Adult Population With Condition and Gabapentinoid, %	Individuals With Condition That Reported Gabapentinoid, %	Odds Ratio of Gabapentinoid With Condition[a]
Polyneuropathies	NVS015 (ICD10: G62)	1.2 (1.1-1.3)	0.8 (0.7-0.9)	69.5 (66.1-72.8)	59.2 (50.4-69.6)
Low back pain or spondylopathies/spondyloarthropathy (including infective)	MUS011 or MUS038 (ICD10: M43, M47, M48, M50, M511, M53, M54, M62)	6.0 (5.8-6.3)	1.1 (1.0-1.2)	21.0 (19.6-22.6)	6.9 (6.3-7.6)
Nervous system pain and pain syndromes	NVS019 (ICD10: G89)	1.5 (1.4-1.7)	0.4 (0.3-0.5)	25.9 (22.9-29.1)	8.0 (6.8-9.4)
Musculoskeletal pain, not low back pain	MUS010 (ICD10: M25, M54, M79)	12.4 (12.0-12.7)	1.5 (1.4-1.7)	12.4 (11.5-13.3)	4.0 (3.7-4.4)
Fibromyalgia	ICD10 M79 and MUS025 (ICD10: M71, M72, M75, M79)	2.4 (2.2-2.5)	0.9 (0.8-1.0)	36.9 (34.1-40.0)	15.2 (13.4-17.2)
Mononeuropathy (nerve and nerve root disorders)	NVS017 (ICD10: G56, G57, G58)	1.5 (1.4-1.6)	0.4 (0.4-0.5)	29.0 (25.9-32.4)	9.5 (8.0-11.2)
Zoster	ICD10: B02	0.5 (0.5-0.6)	0.1 (0.1-0.1)	15.8 (12.2-20.1)	4.0 (3.0-5.4)
Seizure disorder	NVS009 (ICD10: G40, R56)	1.0 (0.9-1.0)	0.2 (0.1-0.2)	19.4 (15.9-23.4)	5.3 (4.1-6.8)
Anxiety disorder	MBD005 (ICD10: F41)	9.7 (9.3-10.0)	1.1 (1.0-1.2)	11.4 (10.5-12.2)	3.3 (3.0-3.6)
Headache, including migraine	NVS010 (ICD10: G43, G44, R51)	3.4 (3.2-3.6)	0.5 (0.4-0.5)	13.1 (11.7-14.8)	3.5 (3.0-4.0)
Insomnia	NVS016 (ICD10: F51, G47)	5.7 (5.4-6.0)	1.0 (0.9-1.1)	17.5 (16.2-18.8)	5.5 (4.9-6.0)
Diabetes	Self-report of diabetes	11.1 (10.7-11.5)	1.6 (1.4-1.7)	14.0 (13.1-15.0)	4.7 (4.3-5.2)

CCSR = Clinical Classifications Software Refined; ICD-10-CM = *International Classification of Diseases, Tenth Revision, Clinical Modification.*

Note: Medical conditions were identified from the 2017-2021 Medical Expenditure Panel Survey (MEPS). Percentage of the population is the percent of the adult population reporting a medical

Johansen ME, et al.
Ann Fam Med
2024; 22: 45-49

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Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%).....**

I'm thinking AECOPD

EKG ✓
Troponin ✓
BNP ✓
CXR ✓
D-dimer ✓ → Age-adjusted or YEARS Criteria
CBC ✓
CMP ✓
Viral panel ✓
CRP ?
Procalcitonin ?

Q1: Can this patient go home?

Q2: If so, what meds?

- ACS/ischemia
- **Infection**/pneumonia
- Pulmonary embolism
- Anemia/blood loss

- Environmental factors
- Non-compliance; other drugs

37

Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%).....**

I'm thinking AECOPD

EKG ✓
Troponin ✓
BNP ✓
CXR ✓
D-dimer ✓
CBC ✓
CMP ✓
Viral panel ✓
CRP ?
Procalcitonin ?

Q1: Can this patient go home?

Answer: Ottawa COPD risk score

Clinical validation of a risk scale for serious outcomes among patients with chronic obstructive pulmonary disease managed in the emergency department

Ian G. Stiell MD MSc, Jeffrey J. Perry MD MSc, Catherine M. Clement RN, Robert J. Brison MD MPH, Brian H. Rowe MD MSc, Shawn D. Aaron MD, Andrew D. McRae MD PhD, Bjug Borgundvaag MD PhD, Lisa A. Calder MD MSc, Alan J. Forster MD MSc, Jennifer Brinkhurst BAH, George A. Wells PhD MSc

CMAJ 2018 December 3;190:E1406-13. doi: 10.1503/cmaj.180232

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Ottawa COPD Risk Score

Total the points for the following items:

Items	Points
1. Initial assessment	
a) History of CABG	(1) ____
b) History of intervention for PVD	(1) ____
c) History of intubation for respiratory distress	(2) ____
d) Heart rate on ED arrival > 110	(2) ____
2. Investigations	
a) ECG has acute ischemic changes	(2) ____
b) Chest x-ray has any pulmonary congestion	(1) ____
c) Hemoglobin < 100 g/L	(3) ____
d) Urea 12 mmol/L	(1) ____
e) Serum CO_2 35 mmol/L	(1) ____
3. Re-Assessment after ED treatment	
a) SaO_2 < 90% on room air or usual O_2, or HR 120	(2) ____
Total score (0–16):	____

COPD risk categories for serious adverse events

Total score	Risk, %	Category
0	2.2	Low
1	4.0	Medium
2	7.2	Medium
3	12.5	High
4	20.9	High
5	32.9	Very high
6	47.5	Very high
7	62.6	Very high
8	75.6	Very high
10	91.4	Very high

Available on mdcalc.com

39

Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%).....**

I'm thinking AECOPD

EKG ✓
Troponin ✓
BNP ✓
CXR ✓
D-dimer ✓
CBC ✓
CMP ✓
Viral panel ✓
CRP ?
Procalcitonin ?

Q1: Can this patient go home? **YES**

Q2: If so, what meds?

Does this patient need antibiotics?

40

Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%).....**

I'm thinking AECOPD

EKG ✓
Troponin ✓
BNP ?
CXR ✓
D-dimer ✓
CBC ✓
CMP ✓
Viral panel ✓
CRP ?
Procalcitonin ?

Q1: Can this patient go home? **YES**

Q2: If so, what meds?

Does this patient need antibiotics?

Global Initiative for Chronic Obstructive Lung Disease **2023 REPORT**

Antibiotics should be given:
➔increased sputum volume and sputum purulence

41

ESTABLISHED IN 1812 JULY 11, 2019 VOL. 381 NO. 2

C-Reactive Protein Testing to Guide Antibiotic Prescribing for COPD Exacerbations

The NEW ENGLAND JOURNAL of MEDICINE

Methods: Multicenter, open-label, pts with AECOPD @ PCP visit randomized to CRP vs. no CRP
Clinicians were guided (not required) on CRP results:
a) < 20 antibiotics unlikely to be beneficial
b) 20-40: antibiotics may be beneficial
c) > 40 antibiotics likely to be beneficial

Results:	CRP group (n= 325)	Usual care (n= 324)
1) Antibiotic use	57%	77%
2) COPD Questionnaire @ 2 weeks	*Slightly better in CRP group and no evidence of harm*	

Butler CC, et al. NEJM 2019; 381: 111-20

42

CRP-guided antibiotic treatment in acute exacerbations of COPD in hospital admissions

Methods: Multicenter, open-label, pts with AECOPD ***hospitalized*** randomized to CRP vs. no CRP
Clinicians were ~~guided (not~~ **required** on CRP results:
~~**a) < 20**~~ **< 50 NO antibiotics** unlikely to be beneficial
b) 20-40: antibiotics may be beneficial
~~**c) > 40**~~ **> 50 (+) antibiotics** likely to be beneficial

Results:	CRP group (n= 101)	GOLD (n= 119)
1) Antibiotic use	31%	46%

No difference in treatment failure
No difference in 30 day outcome

Prins HJ, et al. Eur Resp 2019; 219: (53) 5

43

Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%).....**

I'm thinking AECOPD

EKG ✓
Troponin ✓
BNP ?
CXR ✓
D-dimer ✓
CBC ✓
CMP ✓
~~Viral panel~~ ✓
CRP ✓
Procalcitonin??

Q1: Can this patient go home? **YES**

Q2: If so, what meds?

Does this patient need antibiotics?

44

Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%).....**

I'm thinking AECOPD

EKG ✓
Troponin ✓
BNP ?
CXR ✓
D-dimer ✓
CBC ✓
CMP ✓
Viral panel ✓
CRP ✓
Procalcitonin??

Q1: Can this patient go home? **YES**

Q2: If so, what meds?

Does this patient need antibiotics?

Procalcitonin for Antibiotic Prescription in Chronic Obstructive Pulmonary Disease Exacerbations: Systematic Review, Meta-Analysis, and Clinical Perspective *Chen K, et al. Pulm Ther 2020; 6: 201-14*

$p = 0.19$, respectively). Our review and analysis does not support the use of PCT to guide antibiotic prescription in COPD exacerbations.

45

What Does GOLD Say About Procalcitonin?

2020 GOLD: PCT **"may be"** of value …whether Abx are worth administering

2023 GOLD: "**we cannot recommend** … the use of PCT-based Protocols to make the decision on using antibiotics in patients with COPD exacerbations…"

"…in an ICU setting, the use of a PCT-based algorithm for initiating or stopping antibiotics was associated with a higher mortality rate when compared to those receiving standard antibiotic regimens

Daubin C, et al. Procalcitonin algorithm to guide initial antibiotic therapy in acute exacerbations of COPD admitted to the ICU: a randomized multicenter study. *Intensive Care Med* 2018; **44**(4): 428-37

46

ARS Q1: The 2023 GOLD Report States Which of the Following Regarding the Use of Procalcitonin:

A. "**We Recommend** …The Use Of Pct-based Protocols To Make The Decision On Using Antibiotics In Patients With COPD Exacerbations…"

B. B. Pct-based Protocols "**May Be Of Use..**" When Deciding To Use Antibiotics

C. C. "**We Cannot Recommend** … The Use Of Pct-based Protocols To Make The Decision On Using Antibiotics In Patients With COPD Exacerbations…"

D. D. Pct-based Protocols For Managing Antibiotic Use In ICU Patients With COPD "**… Decrease ICU LOS**".

47

Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%)……**

I'm thinking AECOPD

EKG ✓
Troponin ✓
BNP ✓
CXR ✓
D-dimer ✓
CBC ✓
CMP ✓
Viral panel ✓
CRP ✓
Procalcitonin

=42

Q1: Can this patient go home? **YES**

Q2: If so, what meds?

Does this patient need antibiotics?

What antibiotic are you choosing?

48

Microbiology of CAP: The Classics

#1: Strep pneumoniae: **26%**
#2: Haemophilus influenza:..... **26%**
#3: Mor. catarrhalis: 2-5%
#4: Mycoplasma pneumoniae.....
#5: Chlamydophilia pneumoniae....
#6: Legionella sp.....
#7: Staph aureus.....
Pseudomonas aeruginosa ⟷

- **Who** *(are the patients)*?
- **Where** *(are they studied)*?
- **When** *(were they studied)*?

COPD

Study of 1200 pts with CAP and COPD

Braecken DC, et al. Int J Tuberc Lung Dis 2017

49

Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%).....**

I'm thinking AECOPD

EKG ✓
Troponin ✓
BNP ✓
CXR ✓
D-dimer ✓
CBC ✓
CMP ✓
Viral panel ✓
CRP ✓ **=42**
Procalcitonin

Q1: Can this patient go home? **YES**

Q2: If so, what meds?

Amox/clavulanate
+/- doxycycline

OR

Resp Quinolone
levofloxacin 750 mg qd
moxifloxacin 400 mg qd
gemifloxacin 320 mg qd

ATS/IDSA CAP Guideline 2019

50

Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%).....**

I'm thinking AECOPD

EKG ✓
Troponin ✓
BNP ✓
CXR ✓
D-dimer ✓
CBC ✓
CMP ✓
Viral panel ✓
CRP ✓
Procalcitonin

=42

Q1: Can this patient go home? **YES**

Q2: If so, what meds?

Amox/clavulanate
+/- doxycycline

OR

Resp Quinolone
levofloxacin 750 mg qd
moxifloxacin 400 mg qd
gemifloxacin 320 mg qd

What duration? 5,7,10,14 days?

Metanalysis: ≤ 5 days of antibiotic treatment = longer Rx (clinical/bacteriological efficacy) in outpt with AECOPD

Llor C, Moragas A, et al. *Pulm Pharmacol Ther* 2022; **72**: 102111

51

Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%).....**

I'm thinking AECOPD

EKG ✓
Troponin ✓
BNP ✓
CXR ✓
D-dimer ✓
CBC ✓
CMP ✓
Viral panel ✓
CRP ✓
Procalcitonin

=42

Q1: Can this patient go home? **YES**

Q2: If so, what meds?

Amox/clavulanate
+/- doxycycline

OR

Resp Quinolone
levofloxacin 750 mg qd
moxifloxacin 400 mg qd
gemifloxacin 320 mg qd

Duration → 5-7 days

GOLD Guideline 2023

52

Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%).....**

I'm thinking AECOPD

EKG ✓
Troponin ✓
BNP ✓
CXR ✓
D-dimer ✓
CBC ✓
CMP ✓
Viral panel ✓
CRP ✓
Procalcitonin

=42

Q1: Can this patient go home? **YES**

Q2: If so, what meds?

Amox/clavulanate
+/- doxycycline

OR

Resp Quinolone
levofloxacin 750 mg qd
moxifloxacin 400 mg qd
gemifloxacin 320 mg qd

What about a Z-pak?

53

Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%).....**

I'm thinking AECOPD

EKG ✓
Troponin ✓
BNP ✓
CXR ✓
D-dimer ✓
CBC ✓
CMP ✓
Viral panel ✓
CRP ✓
Procalcitonin

=42

Q1: Can this patient go home? **YES**

Q2: If so, what meds?

A. Amox/clavulanate
+/- doxycycline

OR

Resp Quinolone

X 5 days

B. **Steroid**

What dose?
What duration?

54

Death to the Medrol Dos-Pak

Image Wikipedia

55

Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%).....**

I'm thinking AECOPD

EKG ✓
Troponin ✓
BNP ✓
CXR ✓
D-dimer ✓
CBC ✓
CMP ✓
Viral panel ✓
CRP ✓
Procalcitonin

=42

Q1: Can this patient go home? **YES**

Q2: If so, what meds?

A. Amox/clavulanate +/- doxycycline ***OR*** Resp Quinolone ***X 5 days***

B. **Prednisone**

What dose?
What duration?

56

Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%).....**

I'm thinking AECOPD

EKG ✓
Troponin ✓
BNP ✓
CXR ✓
D-dimer ✓
CBC ✓
CMP ✓
Viral panel ✓
CRP ✓
Procalcitonin

=42

Q1: Can this patient go home? **YES**

Q2: If so, what meds?

A. Amox/clavulanate +/- doxycycline ***OR*** Resp Quinolone ***X 5 days***

B. **Prednisone**

What dose? 40mg x 5 days

GOLD Guideline 2023

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Steroids for AECOPD

- Shorten recovery time
- Improve FEV1
- Improve oxygenation
- Decrease early relapse

- **Longer courses increase: a) pneumonia, b) mortality**

BMJ Open Respiratory Research

COPD exacerbations: the impact of long versus short courses of oral corticosteroids on mortality and pneumonia: nationwide data on 67 000 patients with COPD followed for 12 months

Methods: Observational study
5 day vs. 10 days

Table 3 Pneumonia hospitalisation and all-cause mortality (separate endpoints)

Time from exposure	Adjusted HR (95% CI)
Pneumonia hospitalisation	
1 month	1.4 (1.0 to 2.2)
3 months	1.2 (1.0 to 1.6)
6 months	1.2 (1.0 to 1.4)
1 year	1.2 (1.0 to 1.3)
All-cause mortality	
1 month	5.1 (1.7 to 15.6)
3 months	2.5 (1.5 to 4.3)
6 months	2.0 (1.5 to 2.6)
1 year	1.8 (1.5 to 2.2)

Sivapalan P, et al, BMJ Open Resp Res2019;6:e000407

58

Steroids for AECOPD

- Shorten recovery time
- Improve FEV1
- Improve oxygenation
- Decrease early relapse

ONLINE FIRST
Short-term vs Conventional Glucocorticoid Therapy in Acute Exacerbations of Chronic Obstructive Pulmonary Disease
The REDUCE Randomized Clinical Trial

- **Longer courses increase: a) pneumonia, b) mortality**
- **Shorter courses are non-inferior *(short-term outcomes)***

Methods: 314 pts, (92% hospitalized) Double-blind RCT, 5 vs 14 days

Results: 5 days non-inferior -36% both groups had AECOPD within 6 months

Leuppi JD, et al JAMA. 2013;309(21):2223-2231

59

Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%).....**

I'm thinking AECOPD

EKG ✓
Troponin ✓
BNP ✓
CXR ✓
D-dimer ✓
CBC ✓
CMP ✓
Viral panel ✓
CRP ✓
Procalcitonin

=42

Q1: Can this patient go home? **YES**

Q2: If so, what meds?

A. Amox/clavulanate +/- doxycycline ***OR*** Resp Quinolone ***X 5 days***

B. **Prednisone** ***40mg x 5 days***

Q1: Should I "load" with IV steroids?

60

Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%).....**

I'm thinking AECOPD

EKG ✓
Troponin ✓
BNP ✓
CXR ✓
D-dimer ✓
CBC ✓
CMP ✓
Viral panel ✓
CRP ✓
Procalcitonin

=42

Q1: Can this patient go home? **YES**

Q2: If so, what meds?

A. Amox/clavulanate +/- doxycycline ***OR*** Resp Quinolone ***X 5 days***

B. **Prednisone** ***40mg x 5 days***

Q1: Should I "load" with IV steroids?

RCT shows "no benefit"

De JongYP, et al Chest 2007; GOLD Guideline 2023

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Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%).....**

I'm thinking AECOPD

EKG ✓
Troponin ✓
BNP ?
CXR ✓
D-dimer ✓
CBC ✓
CMP ✓
Viral panel ✓
CRP ✓
Procalcitonin?

=42

Q1: Can this patient go home? **YES**

Q2: If so, what meds?

A. Amox/clavulanate +/- doxycycline ***OR*** Resp Quinolone ***X 5 days***

B. **Prednisone** ***40mg x 5 days***

Q2: Should every patient get steroids?

62

Eosinophilia and the Era of Precision Medicine?

Concepts:

#1: Steroids increase the risk of pneumonia and mortality[1]

#2: Inhaled corticosteroids ==> limited benefit [2,3]

- modest to no short-term improvements in lung function,
- minimal effect on long-term decline associated with ongoing smoking.

☐ ***guidelines recommended against the regular use of high doses of inhaled steroids in most patients with COPD.***

[1]Sivapalan P, et al, BMJ Open Respir Res 2019 [2]European Respiratory Society Study on COPD, [3]Copenhagen Lung Health Study

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Eosinophilia and the Era of Precision Medicine?

Concepts:

#1: Steroids increase the risk of pneumonia and mortality[1]

#2: Inhaled corticosteroids ==> limited benefit [2,3]

- modest to no short-term improvements in lung function,
- minimal effect on long-term decline associated with ongoing smoking.

➔ ***guidelines recommended against the regular use of high doses of inhaled steroids in most patients with COPD.***

#3: COPD is a heterogenous disease.

#4: 1/3 have Type 2 inflammation

IL activation➔ recruit eosinophils

[1]Sivapalan P, et al, BMJ Open Respir Res 2019 [2]European Respiratory Society Study on COPD, [3]Copenhagen Lung Health Study

64

Eosinophilia and the Era of Precision Medicine?

Concepts (cont)

#5: **Blood eosinophil count** can predict response to ICS

- **< 100 cells/µL,➔** little or no effect clinically (hold ICS)
- ***And***.... < 100 cells/uL ➔ poor prognosis
  *Increased bacterial infections and pneumonia (notably haemophilus)

- **≥ 300 cells/µL** identifies patients with the greatest likelihood of treatment benefit with ICS.

Higher blood eosinophil counts suggest presence of higher levels of markers of type-2 inflammation in the airways

References: GOLD 2023

65

ARS Q2: The 2023 GOLD Report States Which of the Following Regarding the Use of Peripheral Eosinophilia Counts?

A. < 100 cells/µL identifies patients with greatest likelihood of treatment benefit with ICS

B. < 100 cells/uL have the best long-term prognosis

C. ≥ 300 cells/µL identifies patients with the greatest likelihood of treatment benefit with ICS.

D. > 300 cells/uL have the worst long-term prognosis

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Can Blood Eosinophils Guide Oral Steroid Rx in AECOPD?

Answer: 3 studies suggest "YES"

Study #1 (2012): double-blind study, British pulm clinics

Eosinophil directed (n=86) Vs. Standard care (n=80)
< 2% no steroids, > 2% (+) steroids — all (+) steroids

Outcome: No difference in chronic resp questionnaire or treatment failure

Study #2: (2019): randomized, controlled, open-label, Danish hospitalized

Eosinophil directed (n=159) Vs. Standard care (n=159)
< 300 no steroids, > 300 (+) steroids — all (+) steroids

Outcome: no difference in hospital days

1.Bafadhel M, et al. *Am J Respir Crit Care Med* 2012; **186:** 48–55. 2. Sivapalan P, et al.. *Lancet Respir Med* 2019; **7:** 699–709.

67

Can Blood Eosinophils Guide Oral Steroid Rx In AECOPD?

Methods: 14 primary care offices, UK

Blood eosinophil-guided oral prednisolone for COPD exacerbations in primary care in the UK (STARR2): a non-inferiority, multicentre, double-blind, placebo-controlled, randomised controlled trial

Sanjay Ramakrishnan, Helen Jeffers, Beverly Langford-Wiley, Joanne Davies, Samantha J Thulborn, Mahdi Mahdi, Christine A'Court, Ian Binnian, Stephen Bright, Simon Cartwright, Victoria Glover, Alison Law, Robin Fox, Adam Jones, Christopher Davies, David Copping, Richard EK Russell, Mona Bafadhel

Eosinophil directed (n=73) Vs. Standard care (n=71)
< 2% no steroids, > 2% (+) steroids — all (+) steroids

1º Outcome: treatment failure @ 30days

N=14 (19%) N=23 (32%)

Bio-directed therapy is non-inferior to standard therapy and appears to safely decreases steroid use

Lancet Respir Med 2024; 12: 67–77

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Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%).....**

I'm thinking AECOPD

EKG ✓
Troponin ✓
BNP ✓
CXR ✓
D-dimer ✓
CBC ✓
CMP ✓
Viral panel ✓
CRP ✓
Procalcitonin

=42

Q1: Can this patient go home? **YES**

Q2: If so, what meds?

A. Amox/clavulanate +/- doxycycline ***OR*** Resp Quinolone ***X 5 days***

B. **Prednisone** ***40mg x 5 days***

C. **Bronchodilator:**

1) **no high-quality evidence from RCTs, +/- anticholinergic**
2) **1-2 puffs q1hr, (2-3 doses), then q2-4 hrs**
3) **If already on LABA, continue. Start after hospitalization**

69

Case 1:

A. Evaluation??

Vitals, pulse O2 **(120/60, 105, 24, 37.5, 95%).....**

I'm thinking AECOPD

EKG ✓
Troponin ✓
BNP ✓
CXR ✓
D-dimer ✓
CBC ✓
CMP ✓
Viral panel ✓
CRP ✓
Procalcitonin

=42

Q1: Can this patient go home? **YES**

Q2: If so, what meds?

A. Amox/clavulanate +/- doxycycline ***OR*** Resp Quinolone ***X 5 days***

B. **Prednisone** ***40mg x 5 days***

C. **Bronchodilator - SABA**

Important: Assess correct use!!

D. **Refer for spirometry!!**

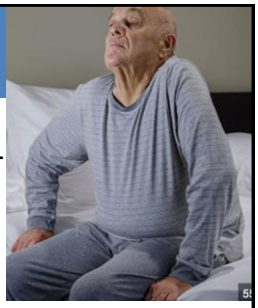
70

Case #2:

- 73-year-old man with a hx of COPD and multiple visits for exacerbations presents to the UC/ED with cough and shortness of breath, typical of his exacerbations.
- He smokes 1ppk/d, 50+ pack/yrs
- Uses albuterol inhaler and nebulizer….
  – was Rx'ed other meds, could not afford, moved to area 3 weeks ago.
- Tripoding, breathing➔ pursed lips, speaks 1-2 words, anxious
- VS: 110/65, P= 115, RR=32, 02 sat 86%. BMI = 16
- Decreased breath sounds throughout, moving little air. Barrel chested.
- Subcostal retractions

71

Case #2: AECOPD with Respiratory Distress

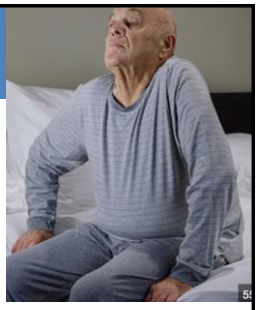


- VS: 110/65, P= 115, RR=32, 02 sat 86%. BMI = 24

What is your first step?

72

Case #2: AECOPD with Respiratory Distress



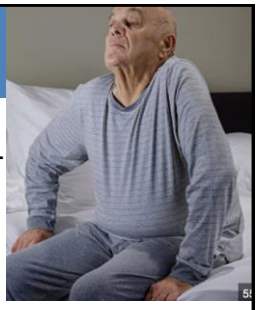
- VS: 110/65, P= 115, RR=32, 02 sat 86%. BMI = 24

What is your first step?

"Albuterol"

73

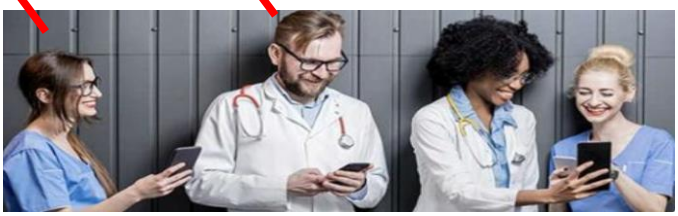
Case #2: AECOPD with Respiratory Distress



- VS: 110/65, P= 115, RR=32, 02 sat 86%. BMI = 24

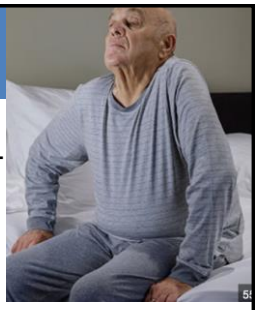
What is your first step?

"Albuterol" *"Antibiotics"*



74

Case #2: AECOPD with Respiratory Distress



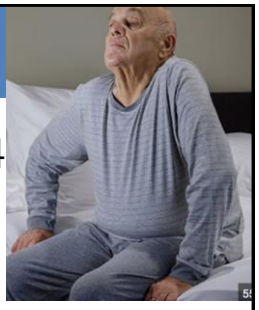
- VS: 110/65, P= 115, RR=32, 02 sat 86%. BMI = 24

What is your first step?

"Albuterol" ***"Antibiotics"*** ***"Steroids"***

75

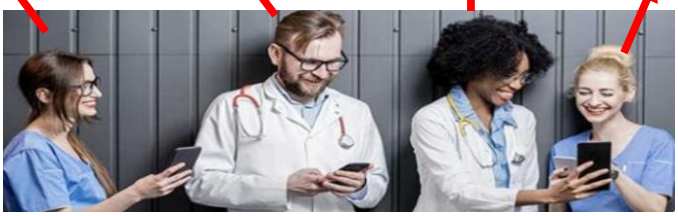
Case #2: AECOPD with Respiratory Distress



- VS: 110/65, P= 115, RR=28, 02 sat 86%. BMI = 24

What is your first step?

"Albuterol" ***"Antibiotics"*** ***"Steroids"*** ***"Oxygen"***



Decrease the work of breathing.....BiPAP

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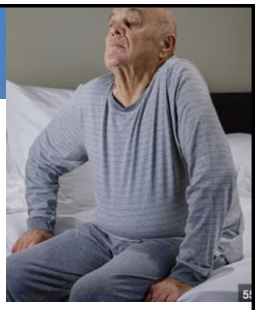
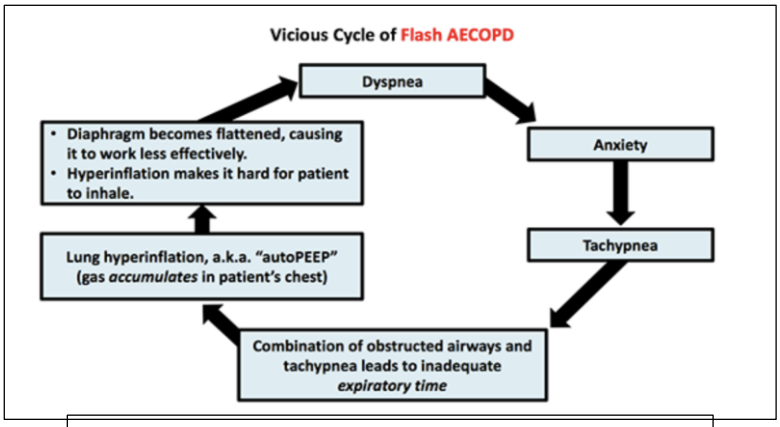
Case #2: AECOPD with Respiratory Distress





Result: diaphragmatic exhaustion

Decrease the work of breathing…..BiPAP

77

Case #2: BiPAP Is First-line Non-invasive Tool

- ***Reduce*** death (RR 46%, NNT = 12)*
- ***Reduce*** intubation (RR 65%, NNT = 5)*
- ***Reduce*** treatment complications (RR 74%)*

•Indications
- Respiratory distress or tachypnea (respiratory rate >~30/min)
- Hypercapnic encephalopathy, as a result of COPD exacerbation

•Contraindications
- Vomiting or increased risk of vomiting (e.g. bowel obstruction).
- Copious secretions, difficulty with secretion management

*Cochrane Review 2017. 17 trials, 1264 patients

78

Case #2: BiPAP Is First-line Non-invasive Tool

•BiPAP settings Start at 10cm iPAP/5 cm ePAP.
- If tolerated, may up-titrate as needed to ~18 cm iPAP/8 cm ePAP.
- Monitor tidal volume & minute ventilation on the BiPAP monitor.

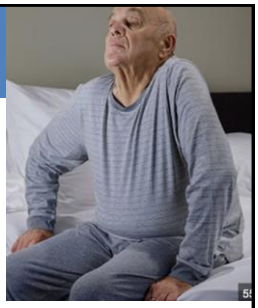
*Low tidal volumes (e.g. <300-400 ml) and low minute ventilation (e.g. <5-6 L/min) ***suggest inadequate ventilation.***

*try up-titrating the pressures and widening the driving pressure
(with a rough maximum support level around ~20cm iPAP/5 cm ePAP)

Note: May need sedation. Dexmedetomidine (Precedex)
- Start 1-1.4 mcg/kg/hr, then titrate down

79

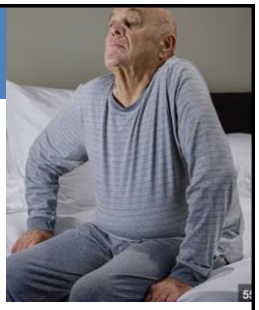
Case #2: AECOPD with Respiratory Distress



- BIPAP
- O2
- Albuterol/ipratropium neb
- Steroids
- Antibiotics
- IV Magnesium?

80

Case #2: AECOPD with Respiratory Distress



- BIPAP
- O2
- Albuterol/ipratropium neb
- Steroids
- Antibiotics

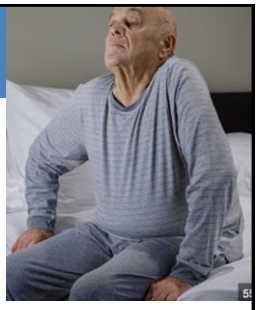
- IV Magnesium?

3 studies: to avoid hospitalization, NNT = 7 (170pts, low-level evidence)
2 studies: decrease LOS = 2.7 days (101 pts, low-level evidence)

Cochrane Review 2022

81

Case #2: AECOPD with Respiratory Distress



- BIPAP
- O2
- Albuterol/ipratropium neb
- Steroids
- Antibiotics

- IV Magnesium

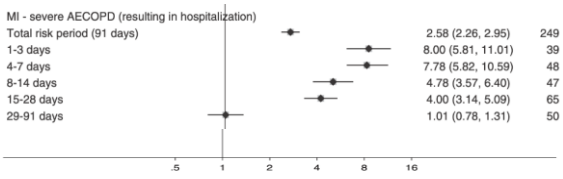
Case continues....
2 hours later....The patient feels better and wants to go home....

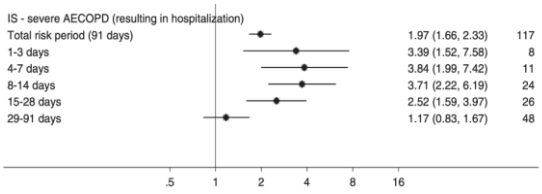
82

Nothing Good Happens After AECOPD

- Increased rehospitalization
- Increased 28- day MI

Increased 28-day CVA

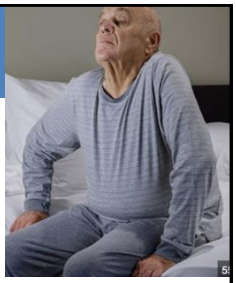




Rothnie KJ, et al Ann Am Thorac Soc 2018, 15: 935–946

83

Case #2: AECOPD with Respiratory Distress



- BIPAP
- O2
- Albuterol/ipratropium neb
- Steroids
- Antibiotics

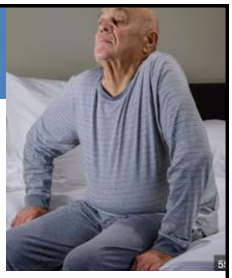
- IV Magnesium

Case continues....
2 hours later....The patient feels better and wants to go home....

It may take 24-48 hrs for the diaphragm to recover... recommend continuing BiPAP overnight.

84

Case #2: Patient Signs Out "AMA"



- BIPAP
- O2
- Albuterol/ipratropium neb
- Steroids
- Antibiotics

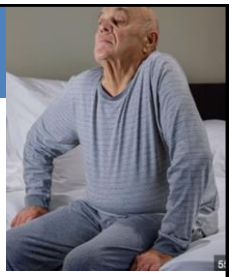
- IV Magnesium

Case continues....
2 hours later....The patient feels better and wants to go home....

With AMA, you must develop a "second-best" plan

85

Case #2: Patient Signs Out "AMA"



- BIPAP
- O2
- Albuterol/ipratropium neb ✓ **SABA**
- Steroids ✓
- Antibiotics ✓

- IV Magnesium

? LABA
? LAMA
? LABA/LAMA
? ICS
? LABA/LAMA/ICS

With AMA, you must develop a "second-best" plan

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GOLD 2023 Recommends

1) LABA's and LAMA's significantly improve lung function dyspnea, health status and reduce AECOPD rates (Grade A)

2) LAMA's have a greater effect on AECOPD rates than LABA's (Grade A) **and decrease hospitalization** (Grade B)

3) Combination LABA + LAMA increases FEV1 and reduce Symptoms compared to monotherapy (Grade A)

4) Combination LABA + LAMA reduces AECOPD better than monotherapy alone (Grade B)

SABA

? LABA

? LAMA

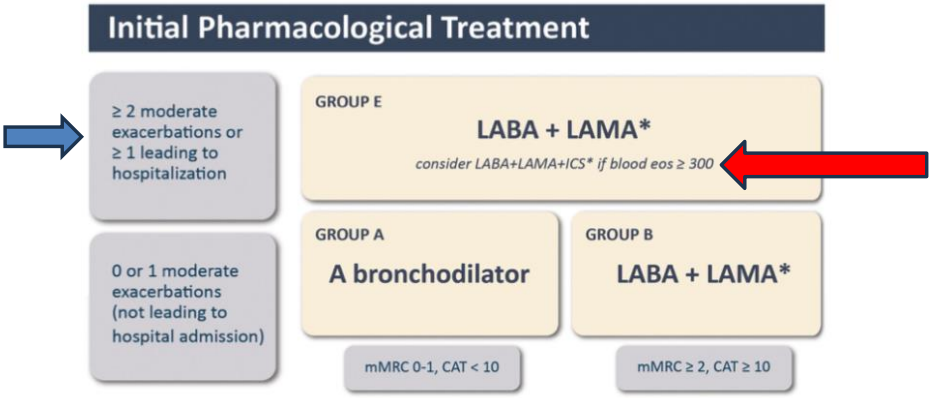
? LABA/LAMA

? ICS

? LABA/LAMA/ICS

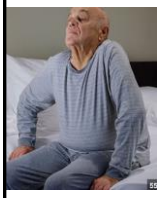
87

GOLD 2023 Recommends



88

GOLD 2023 Recommends



Initial Pharmacological Treatment

≥ 2 moderate exacerbations or ≥ 1 leading to hospitalization

GROUP E
LABA + LAMA*
consider LABA+LAMA+ICS if blood eos ≥ 300*

0 or 1 moderate exacerbations (not leading to hospital admission)

GROUP A
A bronchodilator
mMRC 0-1, CAT < 10

GROUP B
LABA + LAMA*
mMRC ≥ 2, CAT ≥ 10

Formoterol/aclidinium	...Tudorza, Duaklir,	BID	$$$$$$
Formoterol/glycopyrronium	...Breztri	BID	$$$$$$
Indacaterol/glycopyrronium	...Ultibro Breezhaler	qd	*Canada
Vilanterol/umeclidinium	...Anoro Ellipta	qd	$$$$$$
Olodaterol/tiotropium	...Stiolto Respimat	qd	$$$$$$

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ARS Q3: Your Patient with AECOPD Wants to Leave AMA. He/She Only Uses a Rescue Inhaler (Albuterol). The CBC Reveals an Eosinophilia Count of 100. According to GOLD 2023, Ideally the Patient Should Use Which of the Following:

A. LABA + ICS

B. LAMA + ICS

C. LABA + LAMA

D. LABA + LAMA + ICS

90

Devices

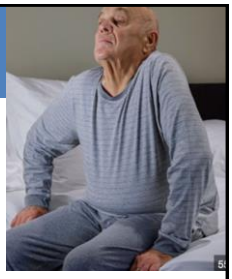
- 33 different inhaled therapies (SABA, LABA, SAMA, LAMA, ICS)
- 22 different inhaler devices are available
  - nebulizers
  - metered-dose inhalers (MDIs) (+/- spacer)
  - breath-actuated MDIs (BAIs)
  - soft mist inhalers (SMIs)
  - dry powder inhalers (DPIs)

* multi-dose DPIs, the powder is contained in a reservoir or in individual blisters

References: GOLD 2023

91

Case #2: Patient signs out "AMA"

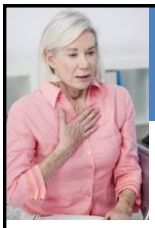


- BIPAP
- O2
- Albuterol/ipratropium neb ✓
- Steroids ✓
- Antibiotics ✓
- IV Magnesium

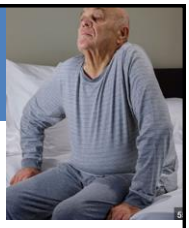
SABA
? LABA
? LAMA
? LABA/LAMA
? ICS
? LABA/LAMA/ICS

With AMA, you must develop a "second-best" plan

92



Conclusion



- **Have an organized approach to the evaluation of patients with dyspnea that may be experiencing an (AECOPD)**
- **Consider the use of the Ottawa COPD risk score, CRP, and eosinophil counts in the management of patients with AECOPD**
- **Use antibiotics and steroids in the appropriate dose and in the appropriate patient**
- **Think BiPAP in (impending) respiratory failure**

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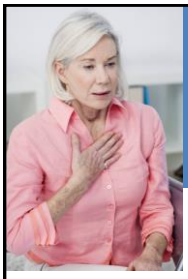
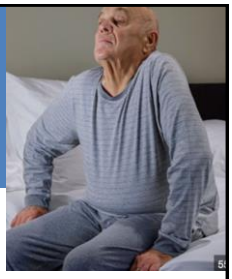


Thank You for Your Time and Attention



Post –Lecture ARS Questions.....

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ARS Q1: The 2023 GOLD Report States Which of the Following Regarding the Use of Procalcitonin?

A. "We recommend … the use of PCT-based Protocols to make the decision on using antibiotics in patients with COPD exacerbations…"
B. PCT-based protocols "may be of use …" when deciding to use antibiotics
C. "we cannot recommend … the use of PCT-based Protocols to make the decision on using antibiotics in patients with COPD exacerbations…"
D. PCT-based protocols for managing antibiotic use in ICU patients with COPD "… decrease ICU LOS".

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95

ARS Q2: The 2023 GOLD Report States Which of the Following Regarding the Use of Peripheral Eosinophilia Counts?

A. < 100 cells/µL identifies patients with greatest likelihood of treatment benefit with ICS
B. < 100 cells/uL have the best long-term prognosis
C. ≥ 300 cells/µL identifies patients with the greatest likelihood of treatment benefit with ICS.
D. > 300 cells/uL have the worst long-term prognosis

CONTINUING EDUCATION COMPANY

96

ARS Q3: Your Patient with AECOPD Wants to Leave AMA. He/She Only Uses a Rescue Inhaler (Albuterol). The CBC Reveals an Eosinophilia Count of 100. **According to GOLD 2023, Ideally the Patient Should Use Which of the Following?**

A. LABA + ICS
B. LAMA + ICS
C. LABA + LAMA
D. LABA + LAMA + ICS

CONTINUING EDUCATION COMPANY

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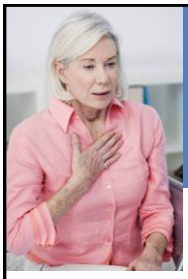

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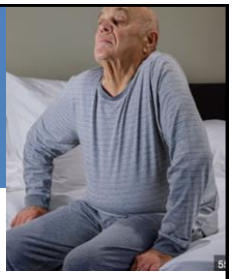
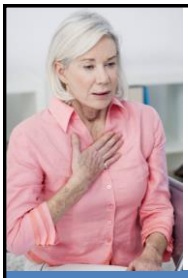
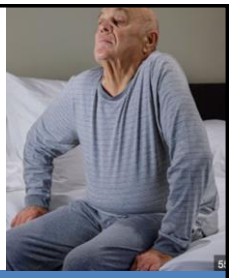


Questions?

98





Supplemental Slides

99

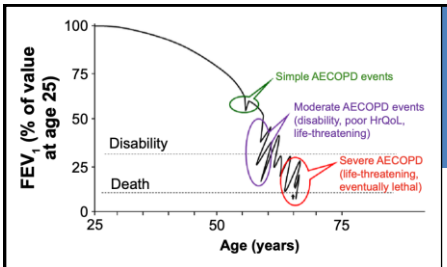


Figure 1 Fletcher–Peto diagram modified: lung function decline is not a constant, stable process.
Notes: It is the accumulated result of mild losses during steady state and sharp losses, due to acute exacerbations that accelerate as exacerbations become more frequent and more severe over time, during the natural course of the disease.
Abbreviations: AECOPD, acute exacerbation of chronic obstructive pulmonary disease; FEV_1, forced expiratory volume in 1 second; HrQoL, health-related quality of life.

AECOPD: Is It the "MI" of the Lungs?

- AECOPD=➔ decreased FEV1
- 28% increase in mortality for every 10% decrease in FEV1

Table 1 Similarities in the catastrophic pathophysiologic cascade triggered by acute myocardial infarctions and acute COPD exacerbations

Diseases	More symptoms	Higher hospitalization rates	Lower quality of life	Lower exercise capacity	Poorer prognosis
Coronary disease (myocardial infarctions)	√[30]	√[31]	√[32]	√[31]	√[33]
COPD (acute exacerbation)	√[14, 15]	√[35, 36]	√[37]	√[34]	√[38, 39]

Hillas G,et al. International Journal of COPD 2016:11 1579–1586

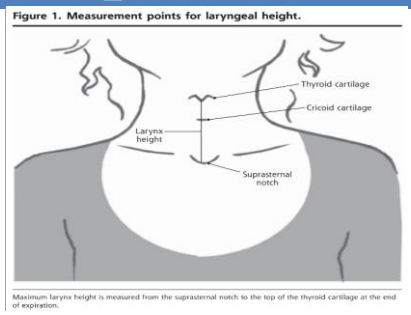
100

Signs of COPD: More Specific

- Nasal flaring
- Pursed lip breathing on exhale
- Hollowing of supraclavicular fossa *(on inspiration)*
- Inspiratory descent of trachea
- Use of accessory muscles

Maximum laryngeal height at end of expiration

Hoover's sign



[1,2]maximum height of ≤4 cm ➔ LR of 3.6- 5.2 for dx COPD

[2]Add Lung Function questionnaire➔ Score ≤18 + ≤ 4cm ➔ LR of 29

[1]Straus SE, et al . JAMA 2000; 283: 1853-7
[2]Casado V, et al. Ann Fam Med 2015; 13: 49-52

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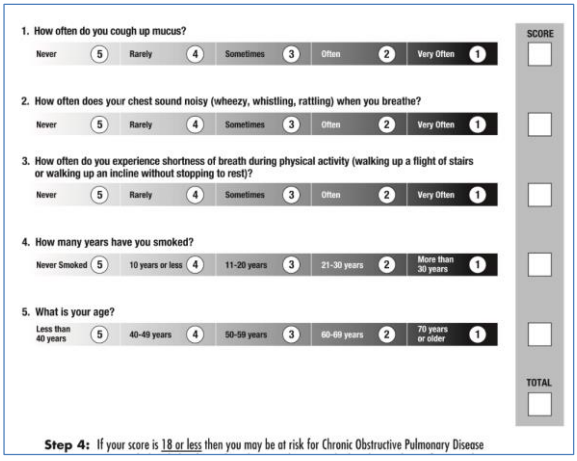
Lung Function Questionnaire ≤ 18 + Laryngeal Height ≤ 4cm



Predicting risk of airflow obstruction in primary care: Validation of the lung function questionnaire (LFQ) Hanania NA, et al . doi:10.1016/j.rmed.2010.02.009

Laryngeal Measurements and Diagnostic Tools for Diagnosis of Chronic Obstructive Pulmonary Disease

Casado V, et al. Ann Fam Med 2015; 13: 49-52

RESULTS For laryngeal height, we found a positive likelihood ratio of 5.21, and for the Lung Function Questionnaire, we found a negative likelihood ratio of 0.10. Combining a maximum laryngeal height of ≤4 cm with Lung Function Questionnaire findings of ≤18 yielded a positive likelihood ratio of 29.06, and a negative likelihood ratio of 0.26.

CONCLUSIONS The intrinsic validity of the lung function questionnaire makes it useful for screening. Combining Lung Function Questionnaire results and laryngeal height can help confirm or dismiss COPD.

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Harrison's Sulcus: Non-specific

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A systematic review and Bayesian meta-analysis of the antibiotic treatment courses in AECOPD

frontiers | Frontiers in Pharmacology

Yu, H, et al

TYPE Systematic Review
PUBLISHED 20 January 2023
DOI 10.3389/fphar.2023.1024807

Methods: 22 studies, 14 used in Bayesian meta-analysis
- 18 studies" Outpatient; 4 studies: In-patient
- Total number of patients: 7934
- Risk of bias: median to low

Results:

- No difference in success rate between a super short course (1–3 days) to a long course (≥10 days).

"Considering adverse events, short course (4–6 days) might be the safest"

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Procalcitonin for Antibiotic Prescription in Chronic Obstructive Pulmonary Disease Exacerbations: Systematic Review, Meta-Analysis, and Clinical Perspective

Methods: Meta-analysis, 14 studies: 12 in-pt, 2 out-pt.
- 9 RCT's, 2 observational
- 9 studies used FDA cutoff (< 0.25ug/L)

Results: (+) PCT decrease antibiotic use ➔ 2 days
BUT

removal of 2 studies with high-risk of bias=➔
- no antibiotic use difference is noted
- PCT had longer hospital LOS
- 2 ICU studies reported higher mortality with PCT use

Chen K, et al. Pulm Ther 202; 6: 201-14

105

Potential of serum procalcitonin in predicting bacterial exacerbation and guiding antibiotic administration in severe COPD exacerbations: a systematic review and meta-analysis Ni W, et al. Infectious Dis 2019; 51: 639-50

23 studies: all in-pt
- ????
- mean cutoff < 0.35ug/L)

(+) PCT decrease antibiotic use ➔ 2 days
(+) decrease LOS 2.6 days*
BUT
- *with high heterogeneity
- only 60% sensitivity (due various cut-off's)
- 1 ICU study (+) higher mortality with PCT

Procalcitonin for Antibiotic Prescription in Chronic Obstructive Pulmonary Disease Exacerbations: Systematic Review, Meta-Analysis, and Clinical Perspective Chen K, et al. Pulm Ther 2020; 6: 201-14

14 studies: 12 in-pt, 2 out-pt.
- 9 RCT's, 2 observational
- 9 studies used FDA cutoff (< 0.25ug/L)

(+) PCT decrease antibiotic use ➔ 2 days
BUT
- remove 2 studies with high-risk of bias=➔
- no antibiotic use difference is noted
- PCT had longer hospital LOS
- 2 ICU studies (+) higher mortality with PCT

106

Methylprednisolone is stronger than prednisone:
- prednisone is four times as potent as cortisol,
- methylprednisolone is five times as potent as cortisol

References:

107

Prophylactic Antibiotics for Prevention of AECOPD

Prophylactic antibiotics vs controls: reduced AECOPD (OR: 0.57, 95% CI 0.42- 0.78)
(participants = 2716; studies = 8; moderate-quality evidence).

- **= reduction from 61% (controls) to 47% in ABx group (95% CI 39% to 55%).**
- **NNT (for 3 to 12 months) = was 8 (95% CI 5 to 17).**

References: Database Syst Rev. 2018 Oct 30;10(10):CD009764.

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