

COPD 2024 GOLD Guideline Report updates

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Objective

- Review COPD standard of care
 - Definition and purpose
- Testing used to diagnose COPD
 - Pre- Bronchodilator Spirometry
 - Staging A,B,E
- ILA- Interstitial Lung Abnormalities
- Current treatment practice
 - Smoking cessation
 - Vaccinations
 - Nonpharmacologic treatment for COPD
 - When to use ICS
 - When is home oxygen required

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Disclosure

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Definition and purpose

- What is COPD?

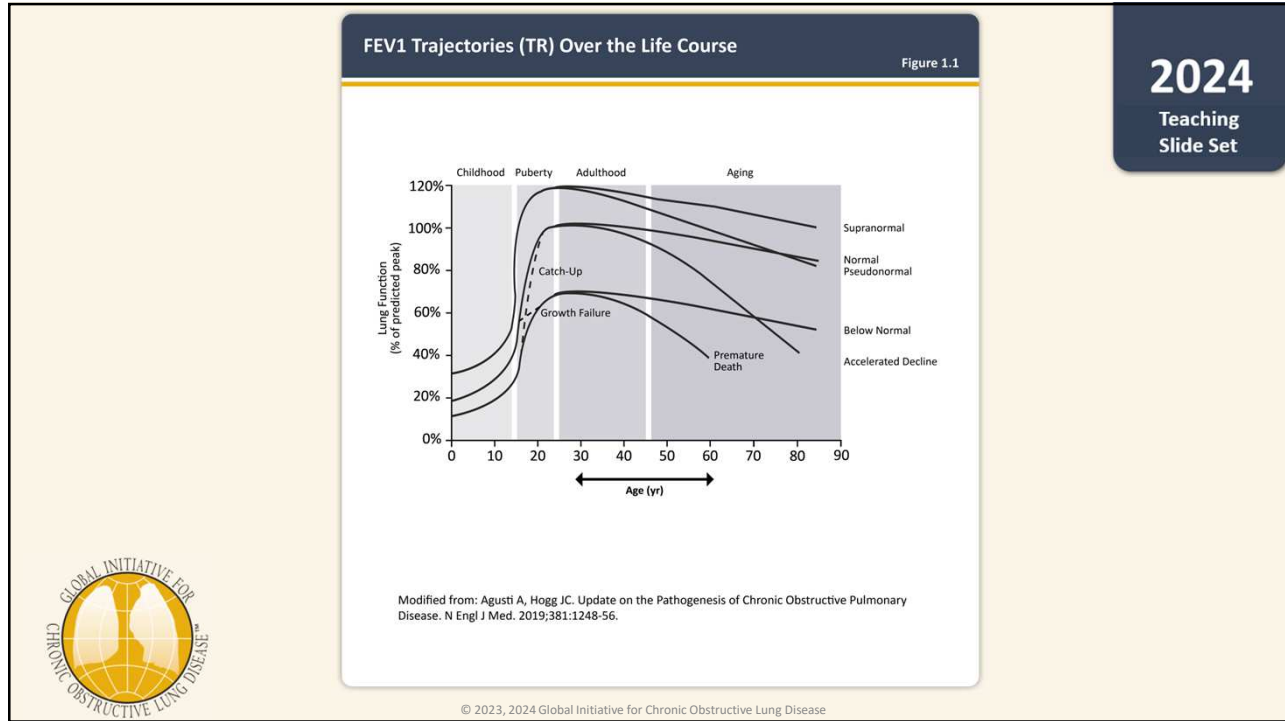
Definition:

“A heterogeneous lung condition characterized by chronic respiratory symptoms (dyspnea, cough, expectoration, exacerbations) due to abnormalities of the airways (bronchitis, bronchiolitis) and/or alveoli (emphysema) that cause persistent, often progressive, airflow obstruction.”

- The Purpose of the GOLD Guidelines:

The Global Initiative for Chronic Obstructive lung Disease work with healthcare professional and public health official to raise awareness of COPD and to improve prevention and treatment. Updated yearly to produce evidence-based strategies to diagnose, manage and prevent COPD

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Proposed Taxonomy (Etiotypes) for COPD

Figure 1.2

Classification	Description
Genetically determined COPD (COPD-G)	Alpha-1 antitrypsin deficiency (AATD) Other genetic variants with smaller effects acting in combination
COPD due to abnormal lung development (COPD-D)	Early life events, including premature birth and low birthweight, among others
Environmental COPD	
Cigarette smoking COPD (COPD-C)	<ul style="list-style-type: none"> • Exposure to tobacco smoke, including <i>in utero</i> or via passive smoking • Vaping or e-cigarette use • Cannabis
Biomass and pollution exposure COPD (COPD-P)	Exposure to household pollution, ambient air pollution, wildfire smoke, occupational hazards
COPD due to infections (COPD-I)	Childhood infections, tuberculosis-associated COPD, HIV-associated COPD
COPD & asthma (COPD-A)	Particularly childhood asthma
COPD of unknown cause (COPD-U)	

*Adapted from Celli et al. (2022) and Stolz et al. (2022)

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Clinical indicators

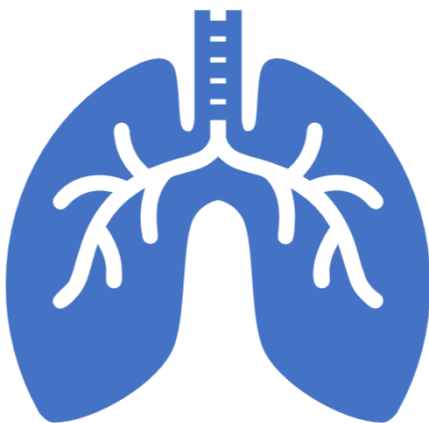
Consider COPD if patient has

- Dyspnea
- Chronic cough
- Sputum production
- History of exposure factors

FEV1/FVC $<.7$ is mandatory to establish the diagnosis of COPD

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Diagnostic Criteria



“A diagnosis of COPD should be considered in any patient who has dyspnea, chronic cough or sputum productions, a history of recurrent lower respiratory tract infection and/or a history of exposure to risk factors for the disease, but spirometry showing the presence of post-bronchodilator FEV1/FVC <0.7 is mandatory to establish the diagnosis of COPD.”

Role of spirometry:

Diagnosis and assessment of severity of airflow obstruction for prognosis.

- Pre bronchodilator spirometry can be used as an initial test
- Post bronchodilator is not essential if pre is normal unless there is a high clinical suspicion of decreased FEV1/FVC $<.7$
- Pre bronchodilator obstruction noted—confirm diagnosis with a post test

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CT and X-rays

Computed Tomography (CT)

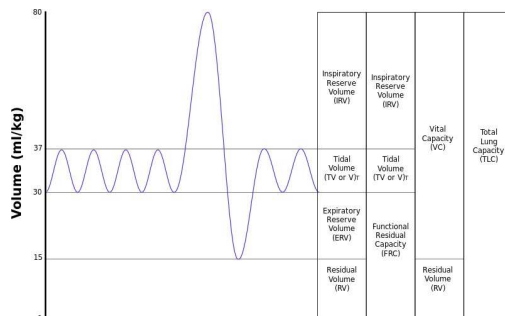
- **Detect Structural Changes:** CT scans are valuable for identifying structural abnormalities in the lungs associated with COPD, such as emphysema.
- **Evaluate Emphysema:** CT imaging helps assess the presence and extent of emphysema, a common component of COPD characterized by lung tissue destruction. Evaluate for lung resection surgery.
- **Assess Bronchial Wall Thickening:** CT can visualize bronchial wall thickening, providing insights into airway changes associated with COPD (Bronchiectasis).
- **Quantify Lung Damage:** CT scans allow for a quantitative assessment of lung damage, helping healthcare professionals understand the severity of COPD.

X-ray: Chest x-ray is not useful in establishing a diagnosis, but rather used to exclude alternative diagnosis

- **General Overview:** Chest X-rays are commonly used in initial assessments but may have limitations compared to CT scans.
- **Detect Hyperinflation:** X-rays can reveal signs of hyperinflation, which is an indicator of air trapping in the lungs commonly seen in COPD.
- **Rule Out Other Conditions:** X-rays can help rule out other respiratory conditions or complications that may mimic COPD symptoms.
- **Limited Sensitivity:** X-rays may have limited sensitivity in detecting early or subtle changes associated with COPD compared to CT scans.

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PRISm



- Preserved ratio impaired spirometry
- Introduced to the GOLD guidelines 2023
- $FEV_1/FVC > 0.7$ with impaired $FEV_1 < 80\%$ after bronchodilator
- Prevalence 7.1-11.3% in the general population
- PRISM is associated increased risk of cardiopulmonary disease, hospitalizations and increased risk of developing airway obstruction.
- 20-30% of patient will transition to obstructive spirometry over time

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Hyperinflation

Hyperinflation: Occurs when gas volume in the lungs are increased and trapped. Caused by loss of recoil and expiratory flow

Symptoms:

- Dyspnea
- Impaired exercise tolerance
- Increased number of hospitalizations
 - Respiratory failure
 - Increased mortality

Treatment:

- bronchodilators
- Supplemental oxygen
- Heliox
- Pulmonary rehab
- Pursed lip breathing
- Inspiratory muscle training
- In severe cases lung reduction surgery or bronchoscopic lung reduction techniques



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GOLD Grades and Severity of Airflow Obstruction in COPD
(based on post-bronchodilator FEV1) Figure 2.7

In COPD patients (FEV1/FVC < 0.7):

GOLD 1:	Mild	FEV1 ≥ 80% predicted
GOLD 2:	Moderate	50% ≤ FEV1 < 80% predicted
GOLD 3:	Severe	30% ≤ FEV1 < 50% predicted
GOLD 4:	Very Severe	FEV1 < 30% predicted

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MMRC/CAT Score

PLEASE TICK IN THE BOX THAT APPLIES TO YOU (ONE BOX ONLY)

mMRC Grade 0. I only get breathless with strenuous exercise.

mMRC Grade 1. I get short of breath when hurrying on the level or walking up a slight hill.

mMRC Grade 2. I walk slower than people of the same age on the level because of breathlessness, or I have to stop for breath when walking on my own pace on the level.

mMRC Grade 3. I stop for breath after walking about 100 meters or after a few minutes on the level.

mMRC Grade 4. I am too breathless to leave the house or I am breathless when dressing or undressing.



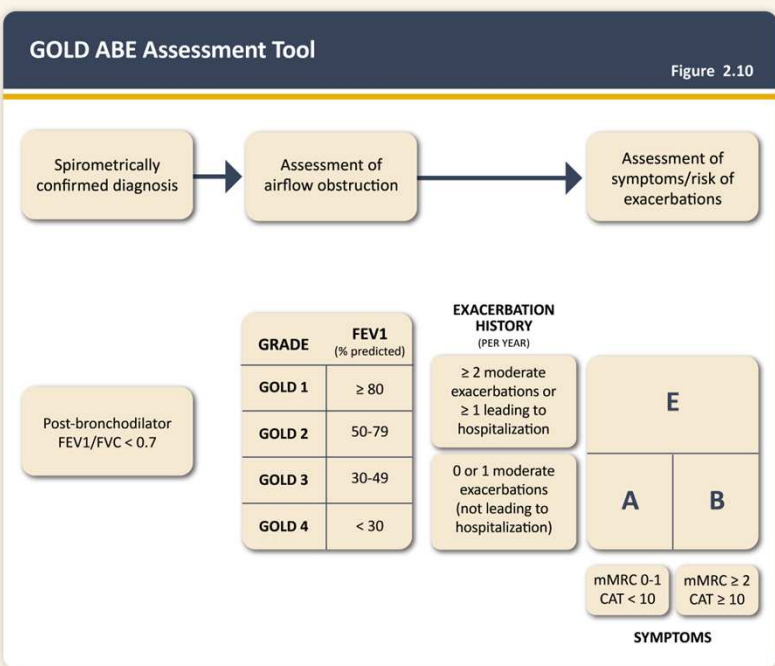
I never cough	0 1 2 3 4 5	I cough all the time	<input type="checkbox"/>
I have no phlegm (mucus) in my chest at all	0 1 2 3 4 5	My chest is completely full of phlegm (mucus)	<input type="checkbox"/>
My chest does not feel tight at all	0 1 2 3 4 5	My chest feels very tight	<input type="checkbox"/>
When I walk up a hill or one flight of stairs I am not breathless	0 1 2 3 4 5	When I walk up a hill or one flight of stairs I am very breathless	<input type="checkbox"/>
I am not limited doing any activities at home	0 1 2 3 4 5	I am very limited doing activities at home	<input type="checkbox"/>
I am confident leaving my home despite my lung condition	0 1 2 3 4 5	I am not at all confident leaving my home because of my lung condition	<input type="checkbox"/>
I sleep soundly	0 1 2 3 4 5	I don't sleep soundly because of my lung condition	<input type="checkbox"/>

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GOLD ABE Assessment Tool

Figure 2.10

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Initial Pharmacological Treatment

Figure 3.7

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≥ 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

*Single inhaler therapy may be more convenient and effective than multiple inhalers; single inhalers improve adherence to treatment

Exacerbations refers to the number of exacerbations per year; eos: blood eosinophil count in cells per microliter; mMRC: modified Medical Research Council dyspnea questionnaire; CAT™: COPD Assessment Test™.

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Follow-up Pharmacological Treatment

Figure 3.9

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1 IF RESPONSE TO INITIAL TREATMENT IS APPROPRIATE, MAINTAIN IT.

2 IF NOT:

- Check adherence, inhaler technique and possible interfering comorbidities
- Consider the predominant treatable trait to target (dyspnea or exacerbations)
 - Use exacerbation pathway if both exacerbations and dyspnea need to be targeted
- Place patient in box corresponding to current treatment & follow indications
- Assess response, adjust and review
- These recommendations do not depend on the ABE assessment at diagnosis

DYSPNEA

LABA or LAMA

↓

LABA + LAMA*

↓

- Consider switching inhaler device or molecules
- Implement or escalate non-pharmacological treatment(s)
- Investigate (and treat) other causes of dyspnea

EXACERBATIONS

LABA or LAMA

↓

if blood eos < 300 → LABA + LAMA*

if blood eos ≥ 300 → LABA + LAMA + ICS*

if blood eos < 100 → LABA + LAMA*

if blood eos ≥ 100 → LABA + LAMA + ICS*

↓

Roflumilast

FEV1 < 50% & chronic bronchitis

Azithromycin

Preferentially in former smokers

*Single inhaler therapy may be more convenient and effective than multiple inhalers; single inhalers improve adherence to treatment

**Consider de-escalation of ICS if pneumonia or other considerable side-effects. In case of blood eos ≥ 300 cells/μl de-escalation is more likely to be associated with the development of exacerbations

Exacerbations refers to the number of exacerbations per year

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Using Blood Eosinophils

- Used to predict the effectiveness of ICS treatment in patient
- What are eosinophils?
 - Type of white blood cell or leukocytes that helps support the immune system
- Patient with persistent exacerbation while using LABA+LAMA are suggested to escalate to LABA+LAMA+ICS. Benefits may be observed with eosinophil counts $>/ 100$ but will have a greater response with higher eosinophil counts.
- Patients treated with <100 eos still having exacerbations consider
 - Adding Roflumilast
 - Adding Macrolide
 - Withdrawing ICS
 - If eos are $>/ 300$ withdrawal is associated with increased development of exacerbations
- Side effects of ICS
 - Adverse effect on glycemic control
 - Oral candidiasis
 - Skin thinning
 - PNA
 - Cataracts
 - Osteoporosis

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Factors to Consider when Initiating ICS Treatment

Figure 3.21

Factors to consider when adding ICS to long-acting bronchodilators:
(note the scenario is different when considering ICS withdrawal)


STRONGLY FAVORS USE	History of hospitalization(s) for exacerbations of COPD* ≥ 2 moderate exacerbations of COPD per year* Blood eosinophils ≥ 300 cells/ μ L History of, or concomitant asthma
FAVORS USE	1 moderate exacerbation of COPD per year* Blood eosinophils 100 to < 300 cells/ μ L
AGAINST USE	Repeated pneumonia events Blood eosinophils < 100 cells/ μ L History of mycobacterial infection

*despite appropriate long-acting bronchodilator maintenance therapy (see Figures 3.7 & 3.18 for recommendations); *note that blood eosinophils should be seen as a continuum; quoted values represent approximate cut-points; eosinophil counts are likely to fluctuate.

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SABA	LABA	LAMA	LABA/LAMA	LABA/ICS
Ventolin MDI puff puffs (61.50) (Salbutamol 100mcg)	Formoterol Easyhaler 1 puff bd (€11.88) (Formoterol 12mcg)	Seebri Breezhaler 1 puff od (€27.50) (Glycopyrronium 44mcg)	Ultrabreathaler 1 puff od(€32.50) (Indacaterol/Glycopyrronium 110/50mcg)	Fostair MDI / Nexthaler 2 puff bd (€29.32) (Formoterol/Becometasone 6/100mcg)
Ventolin Accuhaler puff puffs (€3.00) (Salbutamol 200mcg)	Atimos Modulite 1 puff bd (€18.02) (Formoterol 12mcg)	Eklira Genair 1 puff od (€28.80) (Acetaminophen 320mcg)	Duakir Genair 1 puff od (€32.50) (Acetaminophen/Formoterol 340/12mcg)	Duoresp Spiromax 320/9 1 puff bd (€28.97) (Formoterol/Budesonide 12/400mcg)
Inhaler Easi-Breathe puff puffs (€8.30) (Salbutamol 100mcg)	Oasis Turbohaler 1 puff bd (€24.80) (Formoterol 12mcg)	Spiriva Respimat 2 puff od (€23.00) (Tiotropium 2.5mcg)	Spiolto Respimat 2 puff od (€32.50) (Tiotropium/Oxycodone 2.5/2.5mcg)	Symbicort Turbohaler 1-2 puff od (€8.00) (Formoterol/Budesonide 200/6 - 40/10mcg)
Icanyl Turbohaler 1 puff qds (€8.52) (Terbutaline 0.5mcg)	Stiverdi Respimat 2 puff bd (€28.38) (Clodinate 2.5mcg)	Incruse Ellipta 1 puff od (€27.50) (Umeclidinium 55mcg)	Anoro Ellipta 1 puff od (€32.50) (Umeclidinium/Vandeterol 55/2.2mcg)	Relvar Ellipta 22/92 1 puff od (€22.00) (Vandeterol/Futicasone 22/92mcg)
Serevent Easyhaler 2 puff bd (€29.28) (Salmeterol 25mcg)	Spiriva Handihaler 1 puff od (€33.50) (Tiotropium 18mcg)	AEROCHAMBER		Aeroflux Forspino 1 puff bd (€32.74) (Fluticasone/Salmeterol 500/50mcg)
		VOLUMATIC		
Serevent Accuhaler 1 puff bd (€29.28) (Salmeterol 50mcg)	Aerochamber plus (€4.79) (MDI/Adult)	VOLUMATIC Spacer (€3.80) (MDI/Adult)		Serevide Accuhaler 1 puff bd (€49.82) (Salmeterol/Futicasone 50/50mcg)

Images for 30-day treatment from The Way Prescribing Entry Database (PAD) 2016

may not be a complete list of inhalers COPD.

list to BNF when writing, prescribe by full name.

Managing Inhaler Therapy

- Choosing the Appropriate device
- Providing education
- Check technique
- Suboptimal technique with DPIs are associated with higher COPD admissions and healthcare costs
- No evident that supports superiority of nebulized medications use over proper inhaler technique

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Smoking cessation

- Smoking cessation is the leading intervention for COPD management
 - Approximately 40% of patient diagnoses with COPD continue to smoke
 - Evidence showed greater success with a combination therapy of counseling and pharmacotherapy
- Pharmacotherapies – There are 7 FDA approved medications to treat nicotine addiction. Nicotine replacement gum, patches, lozenges, nasal sprays, oral inhalers, Varenicline, Bupropion
- “Bases on the available evidence, and lack of knowledge about the long-term effects of e-cigarettes on respiratory health, we believe that it’s not possible to recommend this intervention for smoking cessation”.

Brief Strategies to Help the Patient Willing to Quit
Figure 3.4

ASK	Systematically identify all tobacco users at every visit <i>Implement an office-wide system that ensures that, for EVERY patient at EVERY clinic visit, tobacco-use status is queried and documented</i>
ADVISE	Strongly urge all tobacco users to quit <i>In a clear, strong, and personalized manner, urge every tobacco user to quit</i>
ASSESS	Determine willingness and rationale of patient’s desire to make a quit attempt. <i>Ask every tobacco user if he or she is willing to make a quit attempt at this time (e.g., within the next 30 days)</i>
ASSIST	Aid the patient in quitting <i>Help the patient with a quit plan; provide practical counseling; provide intra-treatment social support; help the patient obtain extra-treatment social support; recommend use of approved pharmacotherapy except in special circumstances; provide supplementary materials</i>
ARRANGE	Schedule follow-up contact <i>Schedule follow-up contact, either in person or via telephone</i>

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Treating Tobacco Use and Dependence

Figure 3.5


Major Findings & Recommendations from the Tobacco Use & Dependence Clinical Practice Guideline Panel:


- Tobacco dependence is a chronic condition that warrants repeated treatment until long-term or permanent abstinence is achieved
- Effective treatments for tobacco dependence exist and all tobacco users should be offered these treatments
- Clinicians and health care delivery systems must operationalize the consistent identification, documentation, and treatment of every tobacco user at every visit
- Brief smoking cessation counseling is effective and every tobacco user should be offered such advice at every contact with health care providers
- There is a strong dose-response relation between the intensity of tobacco dependence counseling and its effectiveness
- Three types of counseling have been found to be especially effective: practical counseling, social support of family and friends as part of treatment, and social support arranged outside of treatment
- First-line pharmacotherapies for tobacco dependence — varenicline, nortriptyline, bupropion sustained release, nicotine gum, nicotine inhaler, nicotine nasal spray, and nicotine patch— are effective and at least one of these medications should be prescribed in the absence of contraindications
- Financial incentive programs for smoking cessation may facilitate smoking cessation
- Tobacco dependence treatments are cost effective interventions


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Vaccinations Recommendation



Influenza



Covid-19


One Dose

20-Valent Pneumococcal conjugate vaccine (PCV20) or
 15-valent pneumococcal conjugate vaccine (PCV15) followed by
 23-valent pneumococcal polysaccharide vaccine (PPSC23)


New Respiratory Syncytial virus (RSV) for individuals over 60 years and or with chronic heart or lung disease


Tdap (dTabp/dTPA) – (whooping cough) for those not vaccinated in adolescence


Zoster vaccine (shingles) COPD patient over 50

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