Clinical Guidelines for the Treatment of Asthma and COPD

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April 16, 2026

Objectives

1. Review current clinical guidelines related to the diagnosis and management of asthma and COPD.
2. Describe common treatment options and care considerations for patients with asthma and COPD.
3. Discuss strategies to support symptom control and reduce exacerbations in primary care.
4. Identify Key factors that influence treatment selection and ongoing disease monitoring.
5. Outline situations where specialty referral or additional evaluation may be appropriate.

Asthma

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Asthma – GINA definition

- Asthma: ***Chronic*** (long-term) ***respiratory disease*** with many ***variations (phenotypes),*** usually characterized by ***chronic airway inflammation***. Asthma causes ***respiratory symptoms*** that ***vary*** over time. Symptoms include ***wheezing, difficulty breathing, chest tightness and cough***. The symptoms can be ***mild or severe, frequent or infrequent***. When a person with asthma has symptoms the ***flow of air out of their lungs is reduced***. It is difficult to breathe out because the ***airway becomes narrow were (bronchoconstriction)***, the ***airway walls become thicker***, and there is ***more mucus***. In people with untreated asthma expiratory flow decreases more often and much more than in people without asthma.

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Asthma diagnosis - Approach

- Does the patient have ***chronic*** or ***recurrent*** symptoms.
- Are the symptoms typical of asthma?
- Do history and examination support the diagnosis of asthma?
- Obtain spirometry.
- If spirometry is normal repeat during symptoms.
- I recommend concurrent lung volumes, diffusion capacity, and fraction of exhaled nitric oxide (FENO).

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Asthma diagnosis - Symptoms

- Typical symptoms of asthma:
  - Wheeze
  - Cough (often worse at night)
  - Shortness of breath
  - Chest tightness

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Asthma diagnosis - History

- History
  - Are symptoms episodic?
  - Are there characteristic triggers (exercise, cold air, aeroallergens, smoke, aerosols).
  - Are there work related exposures?
  - Personal or family history of atopic diseases?
  - Is there a history of asthma as a child?
  - Are there concurrent symptoms of cardiovascular disease?
  - Is there a chronic smoking history?

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Asthma diagnosis - Examination

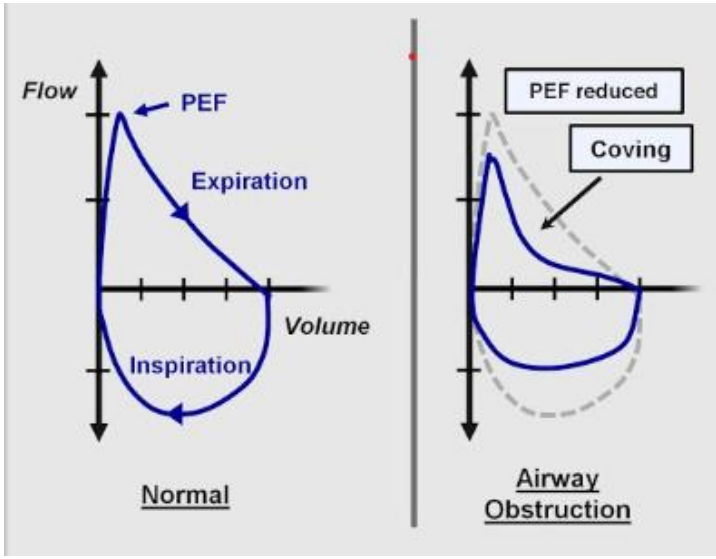
- Examination
  - Wheezing
  - Prolonged expiratory phase (I:E)
  - Poor air movement
  - Tripod position
  - Accessory muscle use
  - Pulsus paradoxus (> 12 pt fall w/inspiration)
  - Pale and swollen nasal mucus membranes
  - Nasal Polyps
  - Atopic dermatitis

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Asthma diagnosis - Spirometry

Spirometry – What to look for

- Gold standard
- Obstruction – FEV1/FVC < LLN
- 10 % improvement in FEV1 or FVC w/BD
- > 10 % improvement in FEV1 or FVC four weeks after ICS.
- > 10% variability in FVC or FEV1 between tests
- Suggestive flow-volume loop
- Hyperinflation or air trapping on Lung volumes
- Elevated Dlco
- Elevated FENO

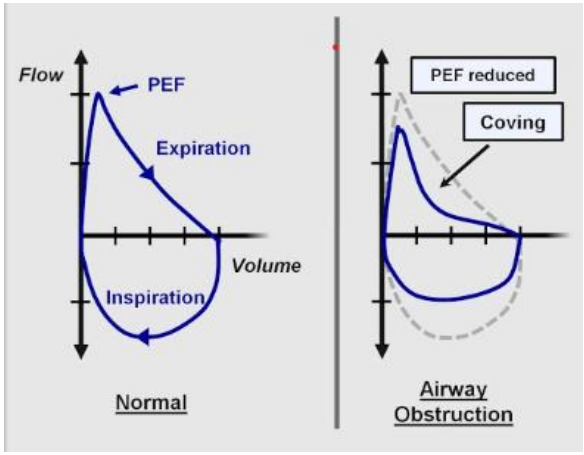


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Asthma diagnosis

Spirometry

- Obstruction
  - FEV1/FVC < 5 th % or LLN
  - FEV1/FVC < 0.7 not recommended.



	Pre-Bronch					Post Bronch	
	Actual	Pred	%Pred	Z Score	LLN	Actual	%Chng
---- SPIROMETRY ----							
FVC (L)	*2.98	4.50	*66	-2.90	3.63	3.89	+20
FEV1 (L)	*1.59	3.79	*41	-4.59	3.04	*2.16	+14
FEV6 (L)	*2.82	4.58	*61	-3.78	3.81	*3.61	+27
FEV1/FVC (%)	*53	84	*63	-3.70	73	*56	+3
FEF 25% (L/sec)	*1.67	7.84	*21	-3.93	5.25	*3.43	+105
FEF 75% (L/sec)	*0.30	1.69	*17	-4.11	0.90	*0.82	+175
FEF 25-75% (L/sec)	*0.70	4.08	*17	-4.67	2.56	*1.60	+129
FEF50%/FIF50% (%)	17	90-100				36	+114
FEF Max (L/sec)	*4.08	9.05	*45	-4.16	7.08	*5.28	+29
FIVC (L)	2.94					4.02	+36
FIF Max (L/sec)	5.21					5.01	-3
PEF (L/min)	244.8					316.5	+29
Expiratory Time (sec)	10.13					11.78	+16

Asthma diagnosis - Spirometry

Spirometry

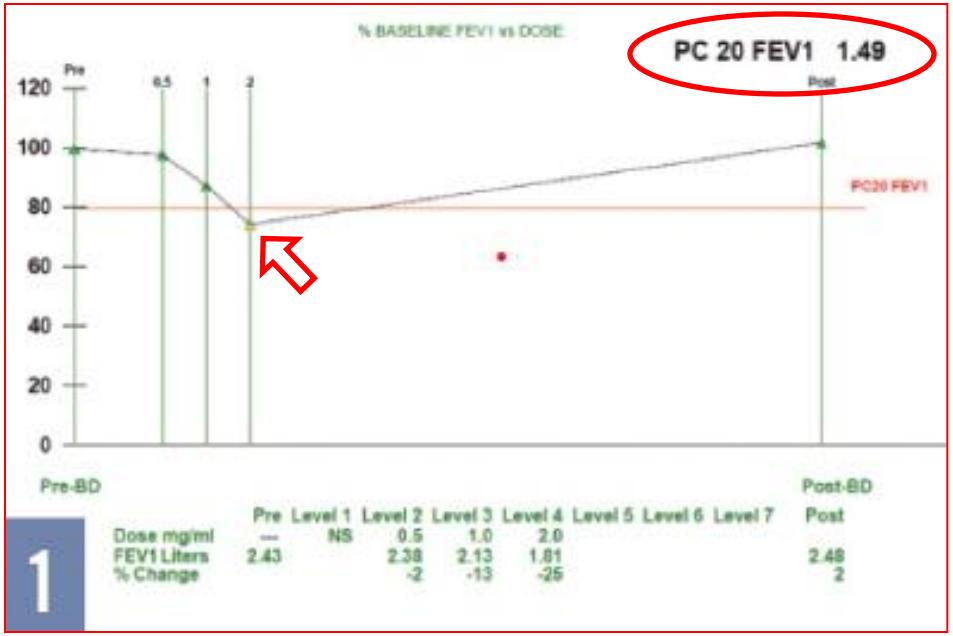
- Obstruction can be masked
  - If there is increased air trapping it may reduce the FVC.
- This reduces the amount of the TLC available for VC and may increase the FEV1/FVC

	Actual	Pred	%Pred	Z Score	LLN		
---- SPIROMETRY ----							
FVC (L)	*2.98	4.50	*66	-2.90	3.63		
FEV1 (L)	*1.59	3.79	*41	-4.59	3.04		
FEV6 (L)	*2.82	4.58	*61	-3.78	3.81		
FEV1/FVC (%)	*53	84	*63	-3.70	73		
---- LUNG VOLUMES ----							
SVC (L)	*3.33	4.50	*73	-2.22	3.63	3.82	+14
IC (L)	3.14	3.09	101			3.37	+7
ERV (L)	0.19	1.42	13			0.45	+137
TGV (L)	*4.01	2.69	*148	+1.83	1.51	3.15	-21
RV (Pleth) (L)	*3.82	1.28	*298	+6.79	0.66	*2.70	-29
TLC (Pleth) (L)	*7.15	5.78	*123	+1.73	4.47	6.52	-8
RV/TLC (Pleth) (%)	*53	23	*235	+7.01	15	*41	-22

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Asthma diagnosis – Bronchoprovocation challenge

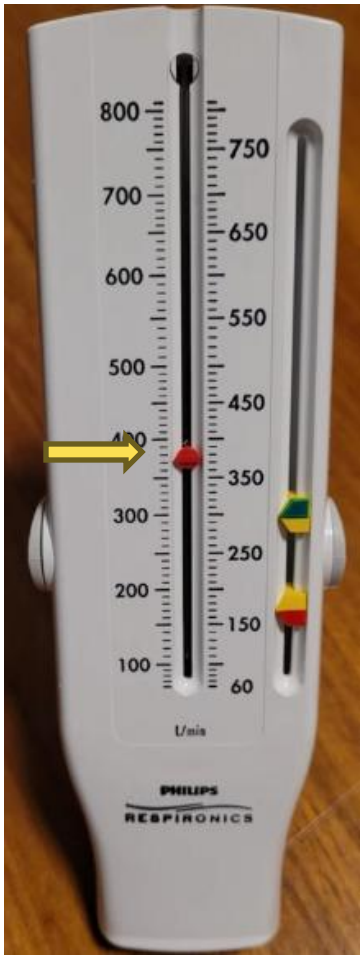
- Bronchoprovocation challenge testing
- Provocative stimulus (methacholine)
- Assess responsiveness of airways
- "Hyperresponsive"
  - 20% drop required
- Positive
  - PC 20 8 mg/mL



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Asthma diagnosis - Cheap

- Peak expiratory flow
  - Peak flow meter
  - Technique
  - Perform 3x
  - Highest value
    - "personal best"
    - Determine by PFM or Spirometry
  - Normals based on height
  - Individual range "Normal"
  - Variability > 10%
  - Bronchodilator response– 20%
  - Under-estimates severity
  - Reduced w/ restriction too



80-100%

50-79%

< 50%

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Asthma diagnosis – tests

Exhaled nitric oxide

- Eosinophilic inflammation
- Helpful if high
  - >50 High inflammation
  - 25-49 Indeterminant
  - < 25 Low level inflam.
- Indeterminant or low levels - Context

Blood tests

- CBC w/differential
  - Absolute Eos
- IgG
  - If elevated regional Allergy panel
  - Aspergillus IgE

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Asthma diagnosis

Mimics of asthma

- COPD
- GERD
- CHF
- Aspiration
- Vocal cord dysfunction syndrome
- Subglottic stenosis
- Allergies
- Bronchiectasis
- Pulmonary embolism
- Lung cancer

Asthma – management

Core Principles in Asthma Management

- All patients w/asthma should receive ICS-containing therapy
  - Regularly vs PRN
- Treatment Goals
  - Minimal or no symptoms
  - No activity limitation
  - Minimal reliever use
  - Normal or Near-normal lung function
  - Prevention of exacerbations, hospitalization, and asthma-related mortality.

Asthma diagnosis

Type 1 inflammation

- Immune response against intracellular pathogens like viruses, certain bacteria, and tumor cells.

Type 2 inflammation

- Immune response that acts against parasitic infections and environmental allergens.

Asthma diagnosis

Type 1 inflammation

- Driven by interactions between specific immune cells and pro-inflammatory in viral or bacterial infections and cytokine, or pollutants.

Type 2 inflammation

- Driven by environmental triggers like pollen, allergens, or pollutants.

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Asthma diagnosis

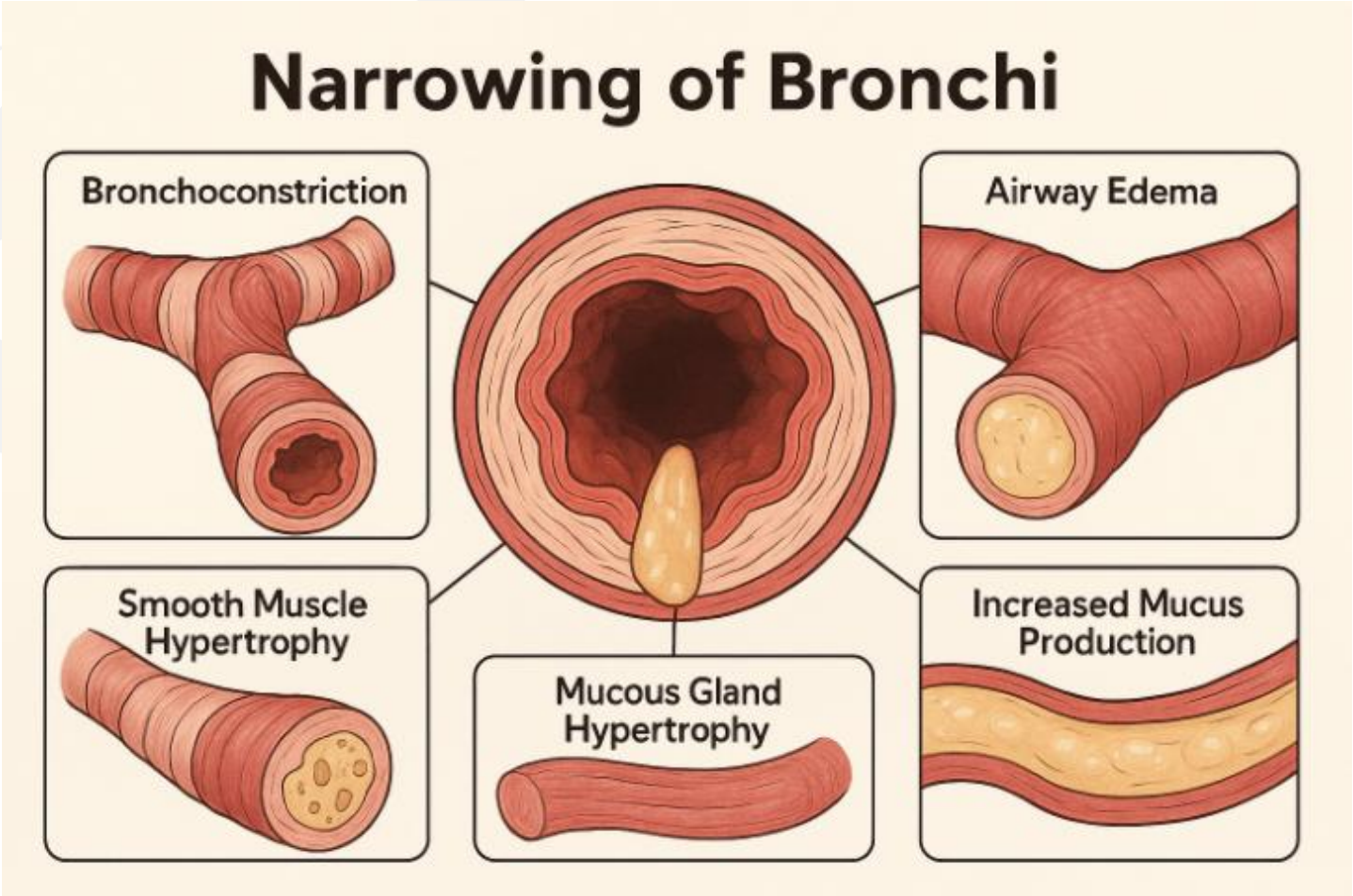
Type 1 inflammation

- Involves Th1 cells (T Helper 1), Macrophages, NK Cells Natural Killer), and Cytotoxic CD8_ T Cells.
- Involves cytokines Interleukin-12 (IL-12), Tumor Necrosis Factor-alpha (TNF-α), and Interleukin-1 (IL-1)

Type 2 inflammation

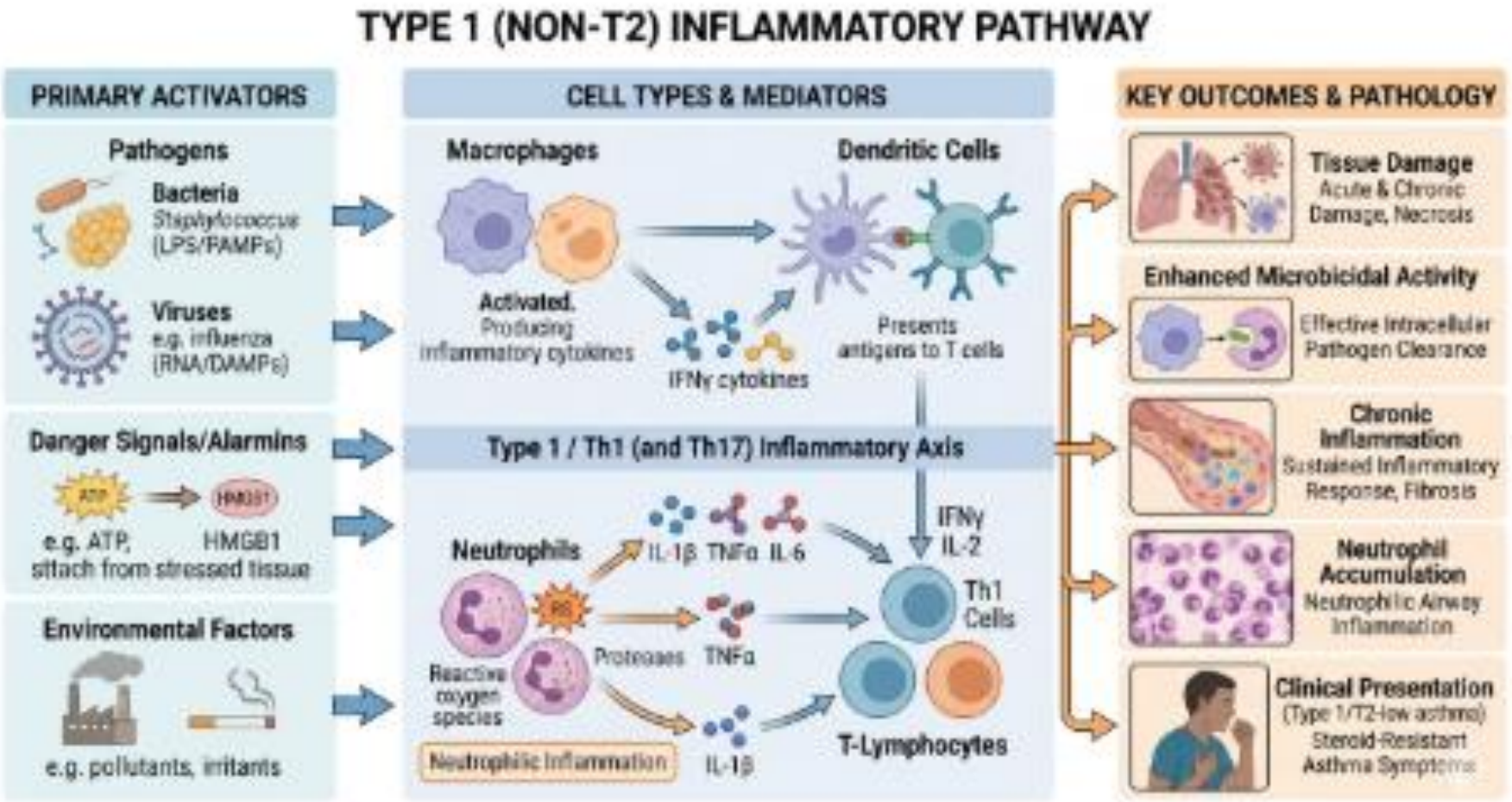
- Th2 cells, type 2 innate lymphoid cells (ILC2s).
- Involves cytokines IL-4, IL-5, IL-13.

Asthma –Airflow Obstruction



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Asthma treatment



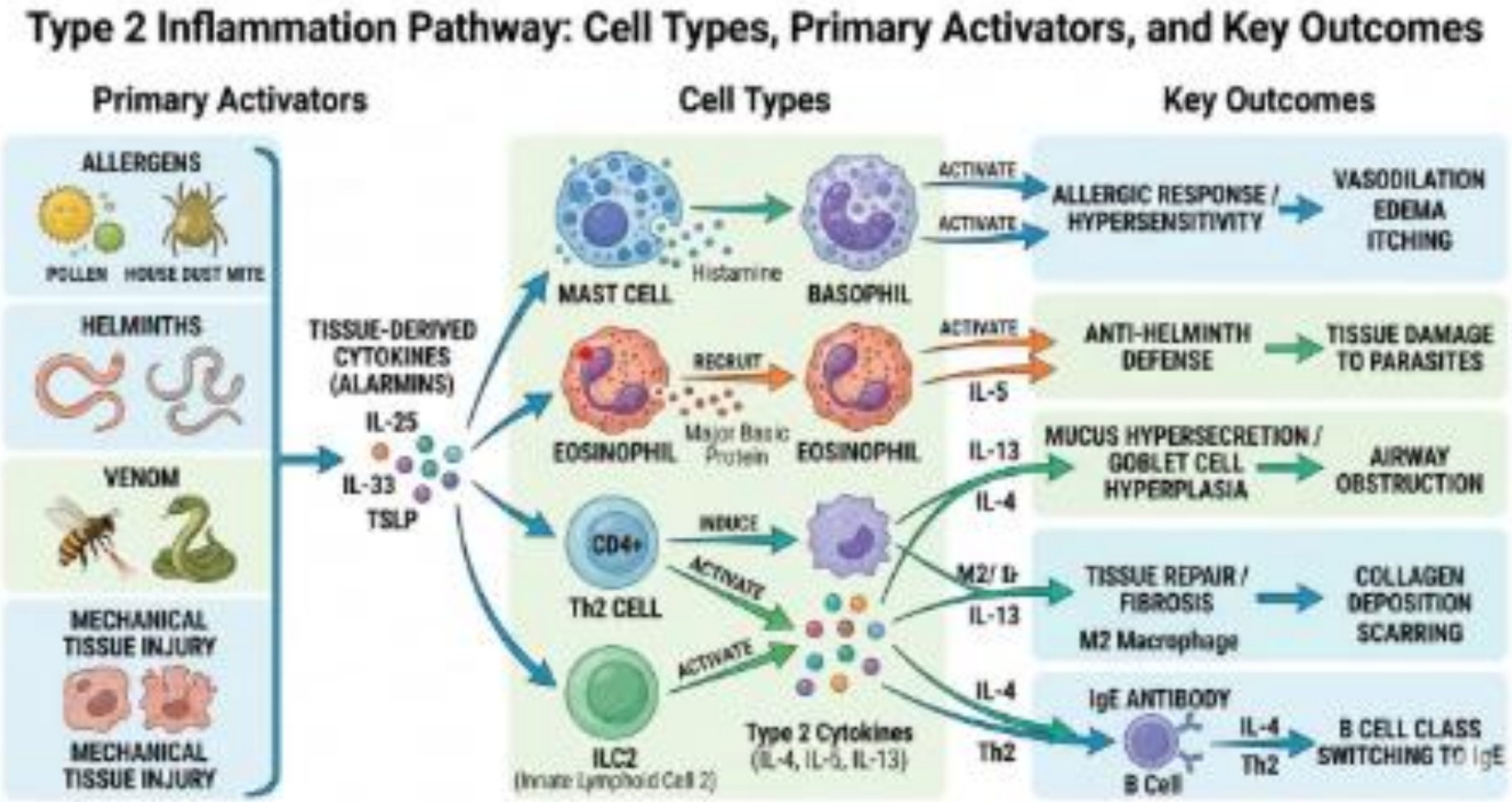
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Asthma treatment

Type 1 Inflammation		
Cell Type	Primary activator (s)	Key outcome
TH1	IL-12 + Antigen (MHC II)	Secretion of IFN –ϒ and TNF-α
CD8+ T	IL-2 + Antigen (MHC I)	Direct killing of infected cells/tumor cells
Macrophage	IFN-ϒ and TNF-α	Enhanced phagocytosis & ROS Production

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Asthma treatment



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Asthma treatment

Type 2 Inflammation		
Cell Type	**Primary activator (s)**	**Key outcome**
Epithelial Cells	Allergens, pollutants, viruses, physical trauma	Release of "alarmins" (**TSLP, IL-25, IL33**) to kick start the response
Th2 Cells	IL-4 + Antigen	Production of **IL-4, IL-5, and IL-13**; coordinates adaptive immunity
ILC2s	TSLP, IL-25, IL-33 (Alarmens)	Rapid production of **IL-5** and **IL-13**; drives innate response amplifying inflammation
B Cells	IL-4, IL-13	Class switching to **IgE antibodies**; leads to allergen sensitization.
Eosinophils	IL-5, Eotaxins	Release of toxic granules; **causes tissue damage** and airway remodeling.
Mast Cells/Basophils	IgE cross-linking, IL-4	**Degranulation** (Histamine; immediate allergic reaction (itching/swelling)
Goblet Cells	IL-13	**Mucus hypersecretion**; leads to airway obstruction.

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Asthma treatment

Maintenance as Reliever Therapy (MART) or Single Inhaler for Maintenance and Reliever (SMART)

- What is it?
  - Uses a single inhaler for maintenance and reliever therapy
  - For mild asthma combines Formoterol-ICS
  - Unlike other LABAs Formoterol has a rapid onset of action similar to albuterol.
  - DOES NOT APPLY TO OTHER LABAS

Asthma treatment

Maintenance as Reliever Therapy (MART)

- Reduces exacerbation risk 40-50% compared to PRN SABA
- Simplified regimen improves adherence.
- Lower total steroid exposure
- Better safety profile → MART ensures “anti-inflammatory delivery”

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Asthma Treatment

Track 1 steps (preferred)

- Steps 1-2 low dose ICS-formoterol prn
- Step 3 MART w/ low dose maintenance & prn ICS-formoterol
- Step 4 MART w/ medium-dose Maintenance & prn ICS-formoterol Step 5 add LAMA.
- Consider trial of high-dose Maintenance & prn ICS-formoterol. Refer to assess phenotype. Consider anti-IgE, IL 4/13 antagonists, anti-IL5 blockers, anti-TSLP.

Track 2 steps

- Step 1 SABA & ICS prn
- Step 2 low dose maintenance ICS w/ prn ICS-SABA or prn SABA
- Step 3 low-dose maintenance ICS-LABA w/prn ICS-SABA or prn SABA
- Step 4 medium dose maintenance ICS-formoterol w/prn ICS-SABA or prn SABA
- Step 5 add LAMA. Consider trial of high-dose maintenance ICS-LABA w/prn ICS-SABA or prn SABA. Refer to assess phenotype. Consider anti-IgE, IL 4/13 antagonists, anti-IL5 blockers, anti-TSLP.
-

Asthma treatment

Type 1 inflammation targets

1. Targeted Biologics

- **Tezepelumab** (Tezspire): This is a first-in-class biologic that blocks TSLP, an "upstream" alarmin (shown as "Danger Signals/Alarmins" in your image). By blocking TSLP, it prevents the activation of dendritic cells and the subsequent Type 1/Th1/Th17 inflammatory axis.
- IL-6 & TNF-Inhibitors: Research is ongoing for biologics like **clazakizumab** (anti-IL-6) or **infliximab** (anti-TNF-) to reduce the high levels of these specific cytokines.

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Asthma treatment

Type 1 inflammation targets

Reducing Neutrophil Accumulation

- Macrolide Antibiotics (e.g., **Azithromycin**): Used for their non-antibiotic, immunomodulatory properties. They help reduce Neutrophil Accumulation and the production of IL-8, a key recruiter of neutrophils in the airway.
- CXCR2 Antagonists: These are experimental drugs designed to block the receptors that draw neutrophils into the lung tissue, directly addressing the "Neutrophil Accumulation."

Asthma treatment

Type 1 inflammation targets

Lifestyle & Environmental Intervention

- Smoking Cessation & Pollution Avoidance: Environmental Factors (pollutants, irritants) as primary activators, removing these triggers is a foundational therapy to stop the inflammatory cascade at its source.

Asthma treatment

Type 2 inflammation targets-Biologics

- **Depemokimab (Exdensur):** Approved in late 2025, this is the first **ultra-long-acting** biologic for asthma, administered only **twice a year** (every 6 months).
- **Mepolizumab (Nucala):** Targets the **IL-5 ligand** directly to prevent eosinophil maturation and is typically injected every 4 weeks.
- **Benralizumab (Fasenra):** Targets the **IL-5 receptor** and induces direct killing of eosinophils via natural killer cells. It is injected every 8 weeks after an initial loading period.
- **Reslizumab (Cinqair):** An intravenous (IV) infusion **targets IL-5** and is given every 4 weeks. It is specifically indicated for adults (18+) with high blood eosinophil counts.
- **Dupilumab (Dupixent):** Targets the **IL-4 receptor alpha**, blocking both IL-4 and IL-13 signaling. It is approved for moderate-to-severe eosinophilic asthma or oral-steroid-dependent asthma. It is also the only biologic indicated for both asthma and **atopic dermatitis** or **COPD** with T2 inflammation.
- **Tezepelumab (Tezspire):** Targets **TSLP**, an "upstream" alarmin. While it effectively reduces Type 2 markers like FeNO and IgE, it is uniquely indicated for severe asthma **regardless of phenotype**, including patients who are T2-low.
- **Omalizumab (Xolair):** The first approved asthma biologic, it targets **circulating IgE** to prevent mast cell activation. It is indicated for moderate-to-severe persistent allergic asthma in patients with a positive skin test or reactivity to perennial allergens.

Asthma treatment

Type 2 inflammation targets-Biologics

Biologic (Brand Name)	Molecular Target	Approved Age(s)	Typical Insurance Requirements
Omalizumab (Xolair)	IgE	6+ years	Positive allergen test; IgE 30-1500 IU/mL
Dupilumab (Dupixent)	IL-4 receptor alpha	6+ years	Eosinophils ≥150 cells/μL or steroid-dependent
Mepolizumab (Nucala)	IL-5	6+ years	Eosinophils ≥150 cells/μL (6mo) or ≥300 (1yr)
Benralizumab (Fasenra)	IL-5 receptor alpha	6+ years	Severe eosinophilic asthma; Eosinophils ≥150 cells/μL
Tezepelumab (Tezspire)	TSLP	12+ years	Severe asthma; any phenotype
Reslizumab (Cinqair)	IL-5	18+ years	Eosinophilic phenotype; IV infusion only
Depomokimab (Exdensur)	IL-5 (Ultra-long)	≥ 12 years	Blood Eosinophils ≥ 150 cells/μL(last screening) OR ≥ 300 $\frac{cells}{\mu L}$ (past year)

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Asthma treatment

Type 2 inflammation targets- Other options

Leukotriene receptor antagonist - monteleukast

- **Step 2 (Alternative Controller):** LTRA can be used as an alternative monotherapy for patients who cannot or will not use inhaled corticosteroids (ICS). However, GINA notes they are **less effective** than low-dose ICS in preventing exacerbations.
- **Steps 3 & 4 (Add-on Therapy):** For patients whose asthma is not controlled on low or medium-dose ICS, an LTRA can be added as a "third controller". While beneficial, GINA specifies that adding a Long-Acting Beta-Agonist (LABA) is generally more effective than adding an LTRA.
- **Specific Phenotypes:** They are recognized as particularly useful for patients with **concomitant allergic rhinitis**, **exercise-induced bronchoconstriction**, or **aspirin-exacerbated respiratory disease** (AERD)

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Asthma treatment

Type 2 inflammation targets- Other options

- **Zafirlukast (Leukotriene Receptor Antagonist):** Primarily considered as an alternative maintenance treatment for patients with mild persistent asthma who cannot or will not use ICS. It is also used as an adjunctive (add-on) therapy for patients whose asthma is not well-controlled on ICS alone.
- **Zileuton (5-Lipoxygenase Inhibitor):** Similar to Zafirlukast, it serves as an alternative second-line treatment for mild persistent asthma or as an add-on at higher treatment steps. However, it is **not a preferred medication** in the GINA guidelines due to its lower efficacy compared to ICS and the need for frequent dosing (e.g., four times daily for immediate-release).

Asthma treatment

Azithromycin -- targets both Type 1 & Type 2 inflammation

- Type 1
  - Neutrophil suppression by inhibiting proinflammatory cytokines like IL-6, IL-8 and IL-1β.
  - Antiviral Boost by enhancing production of type 1 and type III interferons in bronchial epithelial cells.
- Type 2
  - Lowers cytokines IL-4, IL-5, and IL13.
- Other immunomodulatory effects

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Asthma treatment

Role of systemic corticosteroids

- Should be limited to management of acute exacerbations
- Time course should be limited
- In the era of biologics maintenance systemic corticosteroids for asthma should be rare.
- If a patient can’t be weaned off systemic corticosteroids consider other concurrent undiagnosed disease processes or comordities.

Asthma treatment

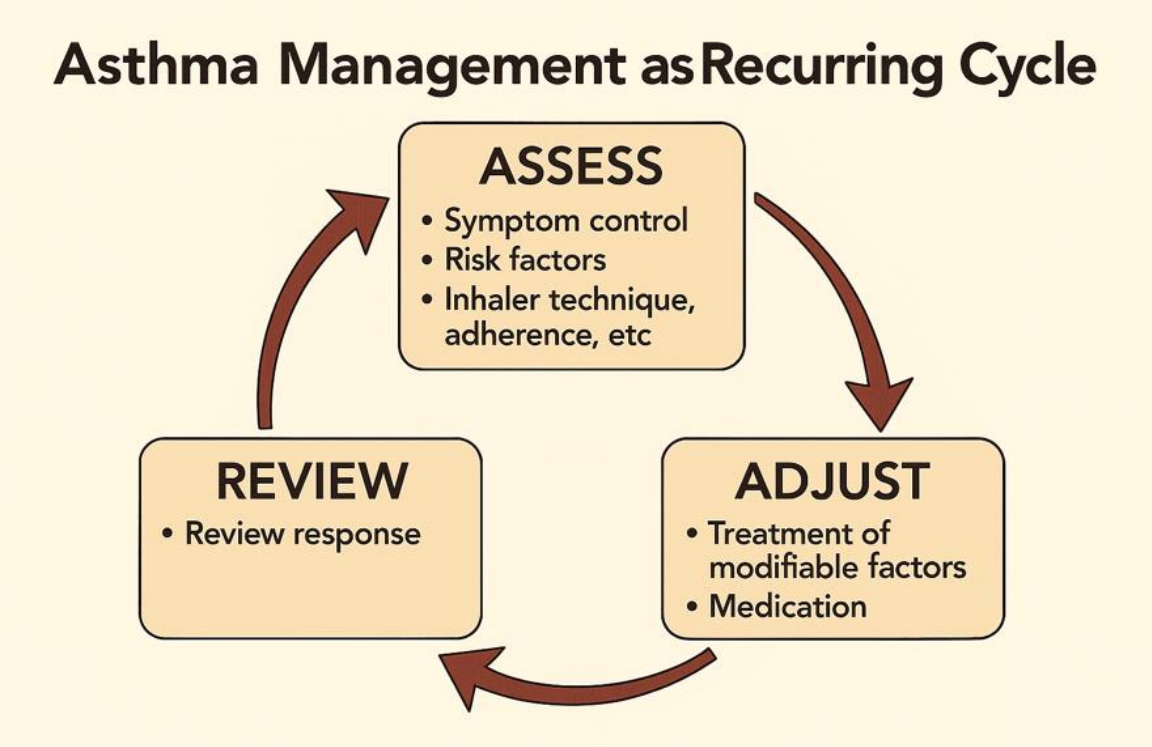
Key Management Strategies beyond medications

- "Individualized Action Plans: a written asthma action plan to recognize and self-manage worsening symptoms.
- Modifiable Risk Factors: Identify and address factors like smoking, obesity, and poor inhaler technique before increasing medication.
- Comorbidity Management: Treat conditions that worsen asthma, such as rhinitis, GERD, and sleep apnea.
- Non-Pharmacological Interventions: Recommendations include smoking/vaping cessation, physical activity, and avoiding triggers (allergens, pollution).
- Regular Review: Treatment should be reviewed at least once a year, or 1–3 months after starting or changing a regimen, including measuring lung function (FEV1).

Asthma treatment

Key Management Strategies beyond medications

- "Assess, Adjust, and Review" cycle to optimize control:



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COPD

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COPD Diagnosis

Global Initiative for Chronic Obstructive Lung Disease (GOLD)

- COPD is a heterogeneous, preventable, and treatable lung condition characterized by chronic respiratory symptoms (dyspnea, cough, sputum) and persistent, often progressive, airflow obstruction.

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COPD diagnosis

Classification

- Genetically determined COPD (COPD-G)
- COPD due to abnormal lung development (COPD-D)
- Environmental COPD
  - Cigarette (COPD-C)
  - Biomass/Polution (COPD-P)
- COPD due to infections (COPD-I)
- COPD & asthma (COPD-A)
- COPD of unknown cause (COPD-U)

Description

- AATD, other genetic variants
- Premature birth, low birthweight
- Exposure to tobacco smoke, vaping or e-cigarette use, Cannabis
- Exposure to household pollution, air pollution, wildfire smoke, occupational hazards
- Child infections, tuberculosis, HIV
- Longstanding asthma

COPD Diagnosis

Consider a diagnosis in any patient with dyspnea, recurrent wheeze, chronic cough, or sputum production, a history of recurrent lower respiratory tract infections, and/or a history of exposure to risk factors :

- Tobacco smoke
- Dusts, vapors, fumes, gases, chemicals.
- Smoke from home cooking or heating fuels
- Host factors (genetic, developmental abnormalities, low birthweight, prematurity, childhood respiratory disease.

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COPD Diagnosis

Mimics of COPD:

- Asthma
- Congestive heart failure
- Bronchiectasis
- Tuberculosis
- Obliterative bronchiolitis
- Diffuse panbronchiolitis

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COPD diagnosis - Spirometry

Measure pre-Bronchodilator FEV1/FVC

FEV1/FVC > 0.7

- Not COPD

FEV1/FVC ≤ 0.7

- Measure post-bronchodilator FEV1/FVC
- FEV1/FVC < 0.7 "confirms" COPD
- FEV1/FVC ≥ 0.7 indicates flow response and repeat assessment is warranted

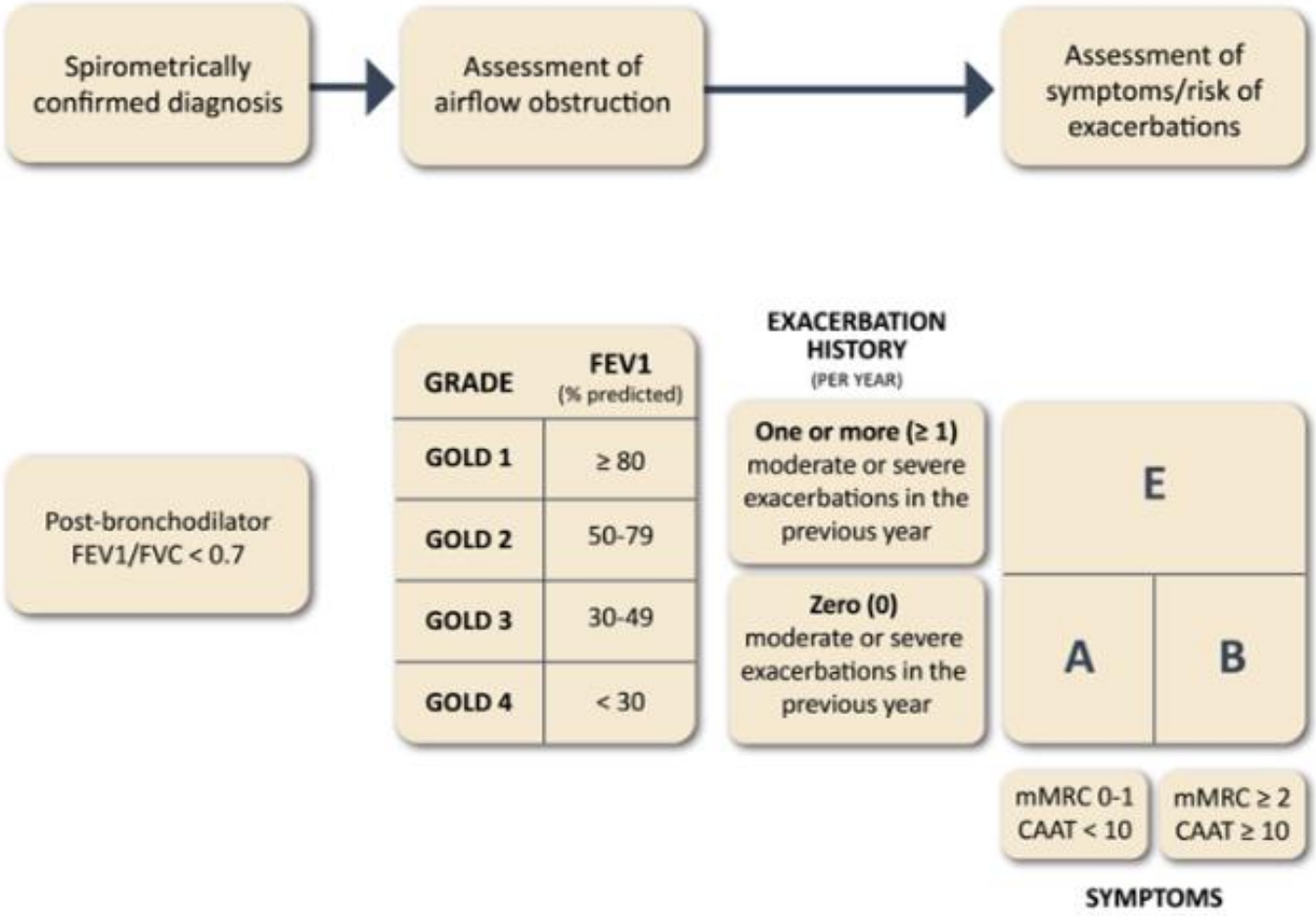
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COPD diagnosis - Spirometry

Why is spirometry important in COPD

- Diagnosis confirmation
- Assessment of severity of airflow obstruction for prognosis
- Follow-up assessment
  - Therapeutic decisions
  - Identifying discrepancy between spirometry and symptom severity → may lead to alternative diagnosis
  - Identify rapid decline & candidates for other therapies

COPD ABE Assessment Tool



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COPD Assessment

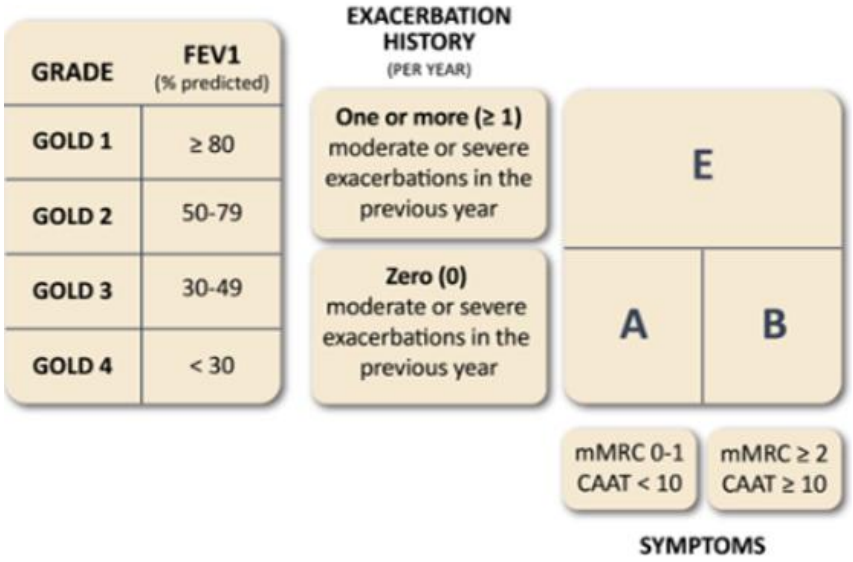
Initial Assessment

- FEV1 – GOLD 1-4
- Symptoms (CAAT or **mMRC**)
- Exacerbation history
- Smoking history and status
- Blood eosinophil count
- A1 – antitrypsin
- Co-morbidities (CAD, CHF, PHTN, OSA, etc)

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COPD ABE Assessment tool

- Takes into account multiple factors
  - Severity of airflow obstruction
  - Exacerbation frequency
  - Symptom severity
  - Helps to better customize therapy for individual patient needs.



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COPD ABE Assessment tool

mMRC Dyspnea Scale Grades

- **Grade 0**: Breathless only with strenuous exercise.
- **Grade 1**: Shortness of breath when hurrying or walking up a slight hill.
- **Grade 2**: Walks slower than people of the same age on the level due to breathlessness, or has to stop for breath when walking at their own pace.
- **Grade 3**: Stops for breath after walking about 100 yards (91 meters) or after a few minutes on the level.
- **Grade 4**: Too breathless to leave the house or breathless when dressing or undressing.

COPD – Therapeutic goals

- Relieve Symptoms
- Improve Exercise Tolerance
- Improve Health Status

REDUCE SYMPTOMS

AND

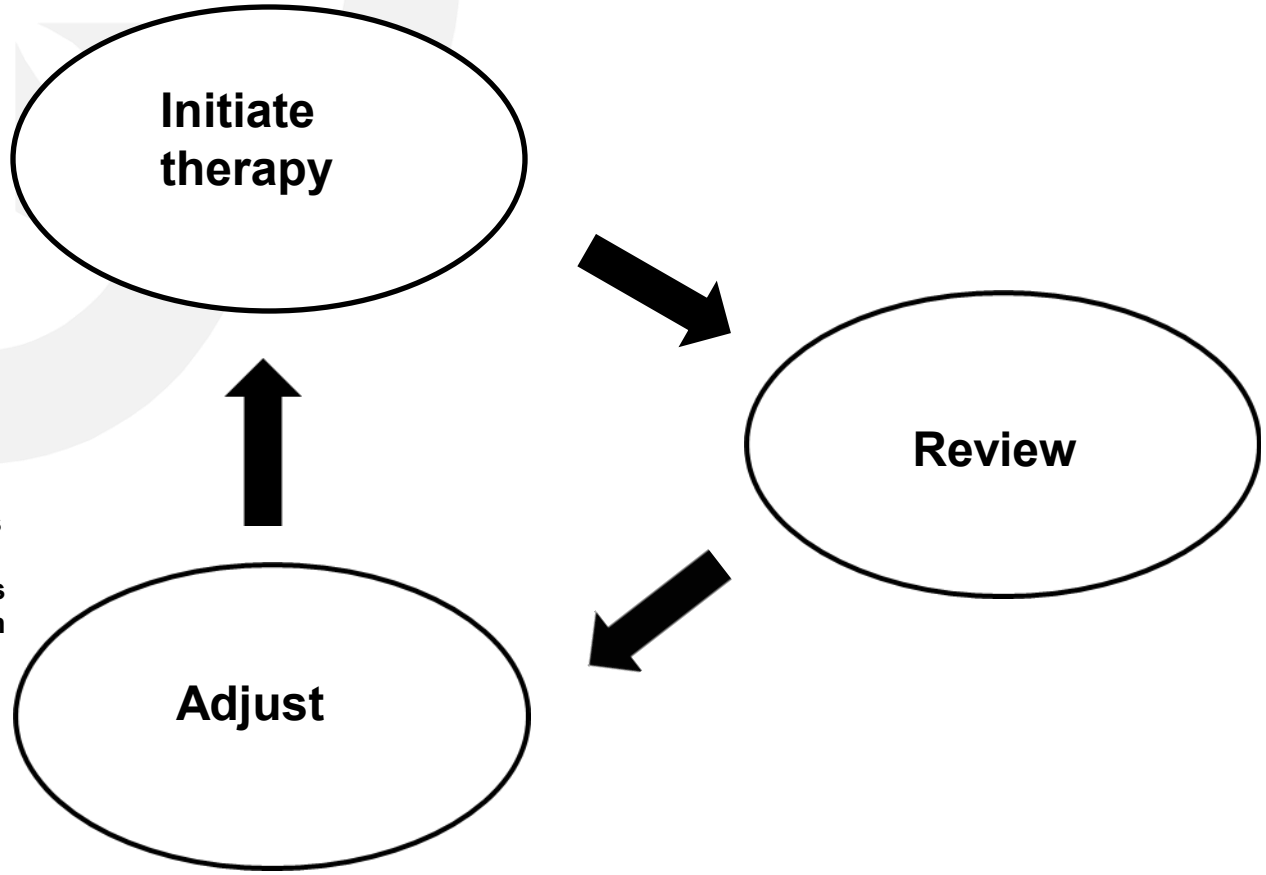
- Prevent Disease Progression
- Prevent and Treat Exacerbations
- Reduce Mortality

REDUCE RISK

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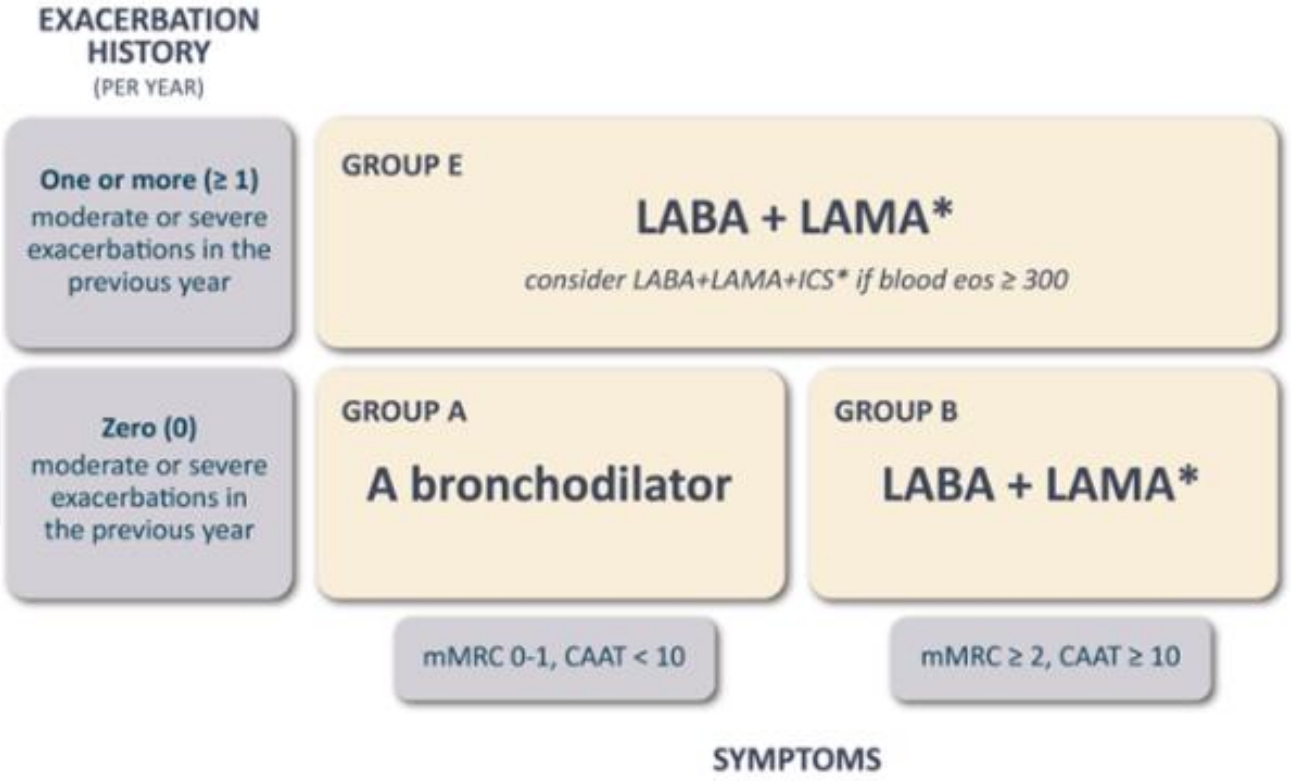
COPD – Therapeutic goals

Pharmacotherapy
Smoking cessation
Inhaler technique
Pulmonary rehab
Inhaler compliance
Physical activity
Exercise
Oxygen needs
NIV
Vaccinations
Manage co-morbidities
Lifestyle changes
Self management skills
Lung volume reduction
Annual spirometry



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COPD Therapy Naive



*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; CAAT™: Chronic Airways Assessment Test™.

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COPD Follow up Pharmacological Treatment

Persistent Dyspnea

LAMA or LABA

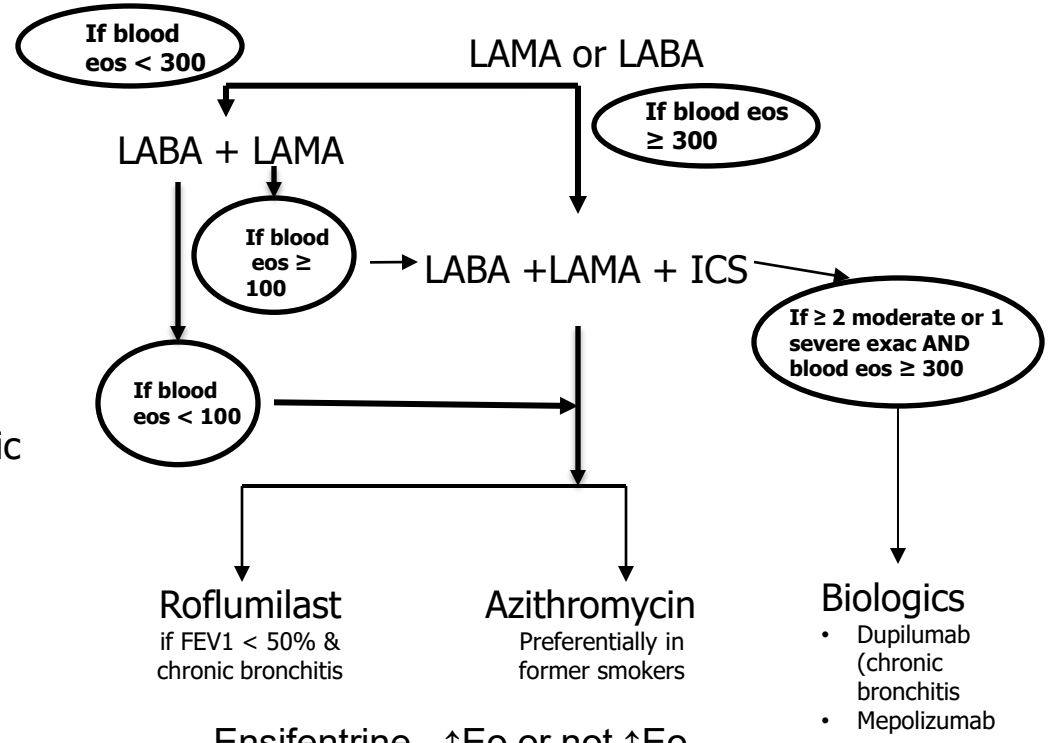
↓

LAMA + LABA

↓

1. Consider switching inhaler
2. Implement or escalate non-pharmacologic treatment
3. Consider adding Ensifentrine
4. Investigate and treat other causes of dyspnea

If One or More Moderate or Severe Exacerbations



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COPD – Recommended Vaccinations

- Yearly influenza vaccination
- SARS-CoV-2 Vaccinations based on WHO & CDC updated recommendations
- PCV21 or PCV 20
  - PCV - 20 preferred w/ tobacco, alcohol, housing instability
- RSV vaccinations for indivuduals > 50 years
- Tdap (dTap/DTPa), tetanus, diptheria if not vaccinated previously
- Zoster vaccine

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COPD – Supplemental Oxygen

- Arterial hypoxemia
  - PaO2 ≤ 55 mmHg or SaO2 < 88%
  - PaO2 > 55 but < 60 mmHg with PHTN, CHF, Hct > 55%
  - Maintain SaO2 ≥ 90%
- Re-evaluate in 60-90 days to assess
  - If supplemental Oxygen still indicated
  - If prescribed supplemental oxygen is effective

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COPD – Interventional Therapy

- Lung Volume Reduction surgery
- Bullectomy
- Transplantation
- Bronchoscopic interventions

- Improves survival in patients with severe emphysema, upper lobe predominant disease, and low post-rehabilitation exercise capacity
- Selected patients may have improvement in dyspnea, exercise tolerance, and lung function
- Selected patients with very severe COPD may improve quality of life and functional capacity. Consider if Hx of hospitalization w/ PCO_2 > 50 mmHg, PHTN despite oxygen, FEV1 < 20%, or homogeneous emphysema
- Endobronchial valves, Lung coils, Vapor Ablation

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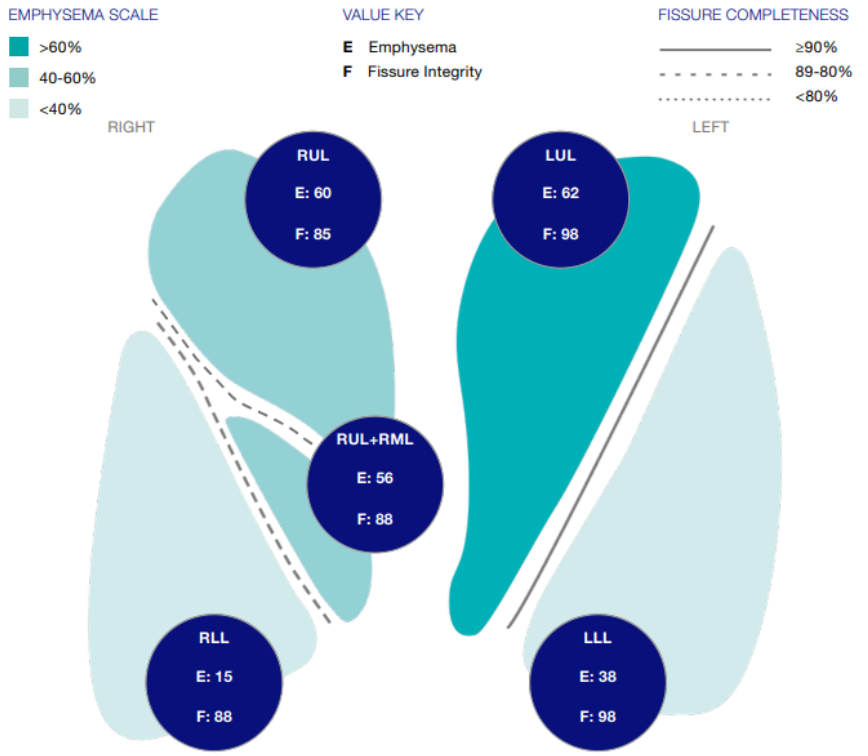
COPD – Spiration Valve criteria

- PD FEV1 15-45%
- RV ≥ 175% pred
- TLC ≥ 100% pred
- Dlco > 20% pred (relative)
- 6MWT 100-500 m
- PaCO2 < 55 mmHg
- PaO2 > 45 mmHg

	Pre-Bronch					Post Bronch	
	Actual	Pred	%Pred	Z Score	LLN	Actual	%Chng
---- SPIROMETRY ----							
FVC (L)	1.96	3.46	56	-3.03	2.64	1.89	-2
FEV1 (L)	0.73	2.74	26	-4.50	2.07	0.62	-4
FEV1/FVC (%)	37	79	47	-4.51	67	33	-12
FEF 25% (L/sec)	0.60	6.42	9	-3.71	3.83	0.48	-20
FEF 75% (L/sec)	0.18	0.71	25	-2.43	0.29	0.13	-26
FEF 25-75% (L/sec)	0.27	2.44	11	-3.65	1.19	0.28	+2
FEF Max (L/sec)	2.35	7.52	31	-4.68	5.70	2.55	+8
FIVC (L)	1.57					1.86	+18
FIF Max (L/sec)	3.14					3.19	+1
Expiratory Time (sec)	8.19					7.18	-12
---- LUNG VOLUMES ----							
SVC (L)	1.94	3.46	55	-3.08	2.64		
IC (L)	1.34	2.31	57				
ERV (L)	0.60	1.15	51				
TGV (L)	5.60	2.68	208	+4.06	1.25		
RV (Pleth) (L)	5.00	1.80	277	+8.54	1.06		
TLC (Pleth) (L)	6.93	5.38	128	+1.96	3.79		
RV/TLC (Pleth) (%)	72	33	220	+9.01	24		
---- DIFFUSION ----							
DLCOunc (ml/min/mmHg)	6.96	21.60	32	-5.52	16.20		
DLCOcor (ml/min/mmHg)	6.37	21.60	29	-5.86	16.20		
DL/VA (ml/min/mmHg/L)	1.99	4.43	44				
VA (L)	3.20	4.87	65	-3.06	3.94		
Hgb (gm/dL)	16.1	12-18					

COPD – Interventional Therapy

- CT uploaded & analyzed
- Minimal collateral ventilation – Target 90% fissural integrity
- Target emphysema score > 60
- No smoking > 4 mo



	RUL	RML	RUL+RML	RLL	LUL	LLL
EMPHYSEMA (% -920 HU)	60	41	56	15	62	38
FISSURE COMPLETENESS	85	NA	88	88	98	98
EMPHYSEMA (% -950 HU)	34	9	29	2	35	12
VOLUME	1659	418	2078	1253	1605	1724

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COPD – Interventional Therapy

The Deployment Catheter

The *valve* is loaded into a long narrow tube called the *deployment catheter*. The deployment catheter (see Figure 4) places the valve in your airway.



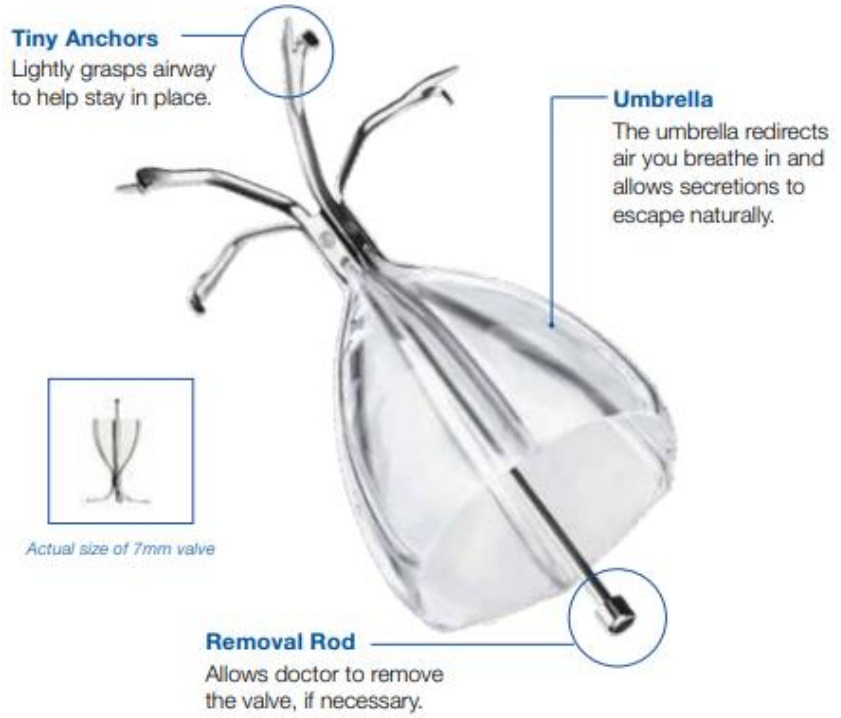


Figure 3. Valve design

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COPD – When to refer

- Recommend referral
  - Uncertain or atypical Dx
  - Persistent symptoms despite optimal therapy
  - Symptoms discordant with disease severity
  - Frequent (> 2/yr) or severe exacerbations (hospitalization)
  - Rapid disease progression
  - Assessment for specialized therapies
  - Chronic hypercapnia
  - Concurrent pulmonary hypertension

COPD – Other considerations

- Alpha-1-antitrypsin screening/replacement
- Smoking cessation counseling
- Pharmacologic assistance with smoking cessation
- Pulmonary rehab
- Palliative care, end of life, hospice care

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The End

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Asthma diagnosis

1. GINA-Summary-Guide-2025-WEB_FINAL-WMS.pdf
2. ERS/ATS Technical Standard on Interpretive Strategies for Routine Lung Function Tests. Eur Resp J. 2022;60(1) Epub 2020 July 13.
3. Use of Peak Expiratory Flow for Assessing Bronchodilator Responsiveness. Aggarwal, et.al. Primary Care Respiratory Journal. 2009:18(1):50-52
4. Gastroesophageal Reflux Disease and Asthma: a Narrative Review. Grades et al. Cureus. 2022;14(5):e24917
5. Mechanisms of Azithromycin in Airway Diseases. Journal of International Medical Research. 2020;48(6):1-10.
6. GOLD-REPORT-2026-v1.3-8Dec2025_WMV2.pdf. https://goldcopd.org/wp-content/uploads/2026/01/GOLD-REPORT-2026-v1.3-8Dec2025_WMV2.pdf
7. Novel Asthma Treatments. Advancing beyond novel step-up therapies for asthma. Seluk, L, et.al. Ann Allergy Asthma Immunol. 2025;134(6):9-19.
8. Inflammation in asthma: Mechanistic Insights and the Role of Biologics in Therapeutic Frontiers. Biomedicines. 2025;13(6):1342:1-32