CLINICAL DECISION GUIDE FOR BIOLOGICS IN COPD

Candidate ID → Eosinophil phenotype → Evidence Snapshot → Alternatives

Candidate Identification - The Biologic Candidate

Clinical Profile
Persistent exacerbations despite optimized single inhaler triple therapy with a clear Type 2 inflammatory signal.

Prerequisite
Patient still exacerbating despite optimal single inhaler triple therapy and "eosinophilic phenotype" before biologics are considered.

Eosinophil Phenotype- Identification and Interpretation of Blood Eosinophil Count (BEC)

Intermittent eosinophilia in COPD may be missed by a single BEC screening. Three BEC assessments over 12 months increases detection, and combining historical and prospective BEC values may improve biologic eligibility assessment.

⩾300 cells/µL - High Response Likelihood:
BEC **⩾300 cells/µL** is a strong indicator of Type 2 inflammation and is associated with a higher likelihood of response to biologic therapy. Even a single measurement at this level may help identify COPD patients likely to benefit from biologics.

100-299 cells/µL - Possible Response: Patients in this range may also respond to biologic therapy, although the association is less pronounced. Because BEC can fluctuate due to exacerbations and corticosteroid use, repeat measurements may be considered.

Biologics Evidence Snapshot - Approved Agents & Trial Data

Dupilumab: BOREAS and NOTUS enrolled patients with chronic bronchitis; MATINEE enrolled patients with COPD regardless of chronic bronchitis status.

Dupilumab - BOREAS & NOTUS Phase III Trials
up to 52 weeks
⬇️ Reduction in moderate/severe exacerbations: BOREAS 0.70 [95% CI 0.58, 0.86] | NOTUS 0.66 [95% CI 0.54, 0.82].
📈 **Lung function:** FEV_1 statistically significant improvement in both trials.
🫀 **Quality of life (QoL):** SGRQ
BOREAS: Statistically significant improvement. LS mean difference, −3.4; 95% CI, −5.5 to −1.3; P=0.002.
NOTUS: LS mean difference, −3.4; 95% CI, −5.8 to −0.9.

Mepolizumab - MATINEE Phase III Trial
up to 104 weeks
⬇️ Reduction in moderate/severe exacerbations 0.79 [95% CI: 0.66, 0.94] and exacerbations. leading to emergency department visit and/or hospitalization 0.65 [95% CI: 0.43, 0.96].
📈 **Lung function**: FEV_1 no significant difference between treatment groups.
🫀 **Quality of life (QoL)**: SGRQ reduction not statistically significant −2.3 [95 % CI −4.6, 0.1].

In the absence of comparative effectiveness trials, biologic therapy can only be individualized using indirect data comparisons. Shared decision-making should consider T2 biomarkers, injection frequency, administration route, patient preference, adverse effects, and potential outcomes.

📍 **Dupilumab:** 300 mg subcutaneous injection every 2 weeks.
📍 **Mepolizumab:** 100 mg subcutaneous injection every 4 weeks.

🗓️ **Monitoring and reassessment**
Monitor early for adherence, injection support, symptoms, rescue inhaler use, exacerbations, and safety. Assess response over 6 to 12 months, guided by disease stability and local criteria.

GOLD 2026 Clinical Alternatives - For Patients Not Meeting Biologic Criteria

Macrolides: Long-term macrolide therapy for patients with frequent exacerbations and non-eosinophilic profile.

Roflumilast: PDE-4 inhibitor for chronic bronchitis phenotype with FEV_1 <50% and frequent exacerbations.

✅ **Important to combine pharmacotherapy with non-pharmacotherapy, pulmonary rehabilitation as a key adjunctive therapy.**

References: Canadian Thoracic Society. Pharmacotherapy in Stable COPD. 2023; Global Initiative for Chronic Obstructive Lung Disease (GOLD). 2026 Report.

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