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PHARMACOECONOMIC EVALUATION OF SINGLE-INHALER TRIPLE THERAPY (ICS/LABA/LAMA) IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE: A GLOBAL EVIDENCE REVIEW

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Abstract

Chronic obstructive pulmonary disease (COPD) imposes a significant clinical and economic burden worldwide. Single-inhaler triple therapy (SITT), combining an inhaled corticosteroid (ICS), a long-acting β2-agonist (LABA), and a long-acting muscarinic antagonist (LAMA), has emerged as a therapeutic option for patients with persistent symptoms or frequent exacerbations. Global evidence from clinical trials, health economic models, and systematic reviews indicates that SITT improves exacerbation outcomes, quality of life, and lung function while demonstrating cost-effectiveness or even cost savings compared with dual therapies or monotherapies. Key cost drivers include exacerbation frequency, adherence, and drug pricing. SITT is recommended for high-risk COPD patients, with cost-effectiveness dependent on local healthcare system parameters.

INTRODUCTION

COPD is a progressive respiratory disease responsible for high morbidity, mortality, and healthcare costs. Exacerbations, particularly severe ones requiring hospitalization, are major cost drivers. Pharmacologic management involves bronchodilators (LABA, LAMA) and ICS, with triple therapy indicated for symptomatic patients or those with frequent exacerbations. Single-inhaler triple therapy (SITT) improves adherence, simplifies treatment, and reduces exacerbations. Pharmacoeconomic evaluations are crucial to determine the value of SITT in resource allocation and formulary decisions.

METHODS

This review synthesized evidence from 2019–2025 on SITT pharmacoeconomics, including:

- Phase III RCTs (IMPACT, FULFIL, ETHOS)
- Cost-effectiveness and cost-utility analyses
- Markov and decision-analytic models
- Health Technology Assessment reports (NICE, CADTH, ICER)

• Systematic reviews

Outcomes included incremental cost-effectiveness ratios (ICER), quality-adjusted life years (QALYs), exacerbation costs, hospitalizations, and adherence.

CLINICAL EVIDENCE

Major Trials

• IMPACT: FF/UMEC/VI reduced annual exacerbation rates versus dual therapy.

• FULFIL: FF/UMEC/VI improved symptom control and reduced exacerbations.

• ETHOS: ICS/LABA/LAMA reduced mortality risk in moderate-to-severe COPD.

Clinical benefits of SITT (fewer exacerbations, improved lung function, QALY gains) form the basis of pharmacoeconomic models.

PHARMACOECONOMIC FINDINGS

1. Cost-Effectiveness

Global evaluations consistently found SITT cost-effective:

• UK (NICE model): ICER below £20,000–£30,000/QALY; in some scenarios, SITT was dominant.

• Spain: ICER ≈ €6,000–€8,000/QALY, below willingness-to-pay threshold.

• Canada & USA: SITT either cost-saving or highly cost-effective due to reduced hospitalizations.

• China: Dominant strategy in models due to fewer severe exacerbations.

SITT remained favorable in sensitivity analyses, with key cost drivers including drug price, exacerbation frequency, and adherence.

2. Budget Impact

• Medication costs increase slightly (+5–12%), but hospitalization costs decrease significantly (–15–40%).

• Societal benefits include fewer missed workdays and reduced caregiver burden.

DISCUSSION

SITT demonstrates both clinical and economic advantages:

• Exacerbation reduction: Reduces the highest-cost events in COPD.

• Adherence improvement: Single-inhaler delivery enhances compliance and outcomes.

• International consistency: Cost-effectiveness observed across high- and middle-income countries.

• Policy relevance: Supports inclusion of SITT in guidelines for high-risk COPD patients.

Limitations

• Many analyses are industry-funded.
• Variability in drug costs and healthcare resources affects ICERs.
• Long-term projections rely on extrapolated clinical trial data.
• Real-world cost-effectiveness data remain limited.

CONCLUSION

Global evidence indicates that single-inhaler triple therapy is cost-effective or dominant in managing symptomatic or high-risk COPD. Economic and clinical benefits are primarily driven by reduced exacerbations, improved adherence, and increased QALYs. Adoption decisions should consider local costs, healthcare infrastructure, and patient populations. Future research should incorporate real-world data and country-specific economic parameters.

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