COPD: Key Factors Supporting Increased Medication Adherence

In this Issue...

COPD is the third leading cause of death and the leading cause of disability in the US. Despite the growing availability of efficacious pharmacotherapy for COPD, patients still experience a significant disease burden, with more than half reporting significant impairment in functioning. Thus, the efficacy of COPD medications in clinical trials stands in stark contrast to the poor outcomes experienced by patients in the real world. One possible explanation for this gap is low rates of medication adherence. Recent research has identified risk factors for poor adherence that should be considered by clinicians. Future research is needed to identify effective interventions to improve medication adherence in COPD.

In this issue, we review the prevalence and impact of medication adherence in COPD, key patient and physician factors associated with medication non-adherence, and potential effective interventions to improve adherence.

LEARNING OBJECTIVES

- Describe the high prevalence of medication non-adherence and its negative impact on clinical outcomes in patients with COPD.
- Identify patient risk factors that are associated with poor medication use in COPD.
- Discuss efficacious interventions to support medication adherence.

GUEST AUTHOR OF THE MONTH

**Commentary & Reviews**

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**Guest Faculty Disclosure**

Dr. Eakin has indicated that she has no financial interests or relationships with a commercial entity whose products or services are relevant to the content of this presentation.

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Dr. Eakin has indicated that there will be no references to unlabeled or unapproved uses of drugs or products.

IN THIS ISSUE

**COMMENTARY**  
**Program Directors**
Chronic obstructive pulmonary disease (COPD) is the third leading cause of death in the US, affects over 24 million Americans, and is the leading cause of disability. Health care costs are projected to reach $50 billion by 2020. The growing availability of efficacious medications stands in stark contrast to the poor health outcomes experienced by COPD patients. One possible explanation for this gap is low rates of medication adherence.

Medication nonadherence is very common in COPD. Some studies report that only 25% of COPD patients take at least 80% of their prescribed medications. In fact, physicians identified medication adherence as the biggest barrier to exacerbation prevention in COPD. Both Sulaiman and Cecere (each reviewed in this issue) demonstrated a high prevalence of medication nonadherence among patients with COPD. Only 6% of patients in Sulaiman’s study achieved 80% adherence when considering both attempts and technique to determine successful adherence. Multiple studies examining retrospective data sources such as pharmacy claims have demonstrated that approximately 25% of patients achieve optimal medication adherence. Poor medication adherence and inhaler technique have been linked to worse morbidity and mortality in patients with COPD. The systematic review by Van Boven et al (also reviewed in this issue) reported that in 12 published studies, medication nonadherence was linked to increased hospitalizations and mortality, decreased quality of life, and loss of productivity.

Given the significant negative impact of medication nonadherence on clinical outcomes, as well as the high prevalence of nonadherence, it is critical to identify which patients may be at-risk for nonadherence. Previous research has demonstrated patients with COPD are at greater risk for cognitive impairment, significant depressive or anxiety symptoms, and multiple comorbidities, and are more likely to blame themselves for their illness in connection with smoking history. Many of these characteristics have also been linked to poor adherence because of difficulty organizing medications, managing complex regimens, and negative medication health beliefs. Clinicians are encouraged to evaluate patients for potential barriers to adherence to identify patients at risk for non-adherence.

The majority of medications available for treatment for COPD are inhaled and require patients to follow specific steps (technique) to achieve optimal delivery. When evaluating patients’ adherence to these inhaled medications, it is critical to consider both their attempts to take medication and their inhaler technique. Sulaiman et al demonstrated this link between technique and adherence: using audio recording devices, they found that among patients with COPD, poor inhaler technique was linked to medication nonadherence because of decreased or absent use among some patients. Among other patients, poor technique was due to low inspiratory flow and airway hyperinflation, despite regular attempts.

Beyond patient characteristics, medication adherence has been shown to be strongly influenced by both the treating physician and by broader health system factors. Clinicians need to be responsible for not only writing the prescription for the medication but also for ensuring that the patient receives appropriate education about the purpose of the medication, effective administration technique, and potential side effects.

Cecere et al demonstrated in a secondary analysis of a randomized clinical trial with...
veterans that patients’ confidence in their treating physician was a common strong predictor of medication adherence to both inhaled corticosteroids and long-acting bronchodilators. Furthermore, Slatore et al, in another study of veterans, demonstrated that the quality of patient/physician communication was associated with patients’ perception of receiving high quality care as well as their self-confidence in managing their illness. In particular, attentiveness, caring for the patient, and listening to patient concerns had the strongest associations with outcomes, demonstrating the necessity of good clinical communication skills to support patient adherence and self-management.

Over the past 20 years, the majority of research on medication adherence in pulmonary diseases has focused on asthma, which has informed the development of effective interventions to improve both adherence\(^1\) and health outcomes.\(^2\) In contrast, there has been surprisingly limited research examining medication adherence in COPD,\(^3,4,5\) resulting in a paucity of available behavioral interventions for this population.\(^6\) Bryant’s review of clinical interventions for COPD identified only seven published adherence promotion intervention studies. Effective patient interventions have used multi-component approaches, including monitoring and feedback on adherence, motivational interviewing, and patient education to address motivation and knowledge and to support adherence behavior. However, research specific to COPD remains limited.

Because of the new CMS COPD readmission financial penalties, many hospitals are developing clinical programs to improve COPD management.\(^7\) Thus — despite an absence of data — medication adherence interventions are being integrated nationwide into hospital clinical programs.\(^8\) Looking forward, however, a number of clinical interventions are being tested to improve medication adherence in COPD, with future interventions applying different/multiple modalities of delivery to ensure sustainability. For example, clinical interventions that are delivered by community pharmacists or using technology/telemedicine approaches show potential for supporting patient self-management.

Until tailored evidence-based adherence promotion interventions for COPD become available, clinicians are urged to assess adherence and inhaler technique, integrate multi-disciplinary team members into clinical care for education and follow-up, and refer patients with possible cognitive impairment and mental health needs to appropriate services to help their patients with COPD achieve better outcomes.

References:

Prevalence of and Contributors to Medication Nonadherence in COPD


In this study, Sulaiman et al investigated medication adherence in a cohort of 179 patients with COPD following hospitalization with complete data for one month. They used an electronic audio recording device (INCA) to assess not only attempted use of medication but also appropriate inhaler technique for salmeterol/fluticasone discus inhalers. Participants had a mean age of 71 years, mean FEV\(_1\) = 1.3 L (52% predicted), and 59% screened positive for mild/moderate cognitive impairment. Results from the INCA devices demonstrated that patients had both intentional (missed doses) and unintentional (critical inhaler technique errors) nonadherence. Combining both attempted use and inhaler technique errors resulted in a calculated actual adherence of 22.6% of expected doses taken on time with adequate technique. In fact, only 6% of patients achieved an actual adherence greater than 80%. Inhaler technique was determined to be adequate at discharge (eight of 10 on the Inhaler Proficiency Scale), but this proficiency was not demonstrated at home. The most common error made was low inhalation flow (peak inspiratory flow < 35 L/min) that occurred in 24.5% of inhalations. Poor lung function and having multiple comorbidities present were significant predictors of inadequate technique. Analysis of the time of inhaler use revealed that 6% of patients never attempted to use their inhaler and another 13% used it less than 20% of the time. Cognitive impairment was strongly associated with fewer attempted uses, demonstrating the potential impact of patients’ ability to remember and organize their medications on attempted use.

This study highlights the importance of looking not only at attempted medication use but also inhaler technique to get an accurate measure of how much medication is actually being taken among patients with COPD. Use of the INCA device highlighted that many patients with poor lung function may not be able to generate adequate inhalation flow to use dry powder inhalers appropriately. In addition, more than half of patients with COPD had evidence of cognitive impairment, which was strongly associated with their attempted medication use. It is important for clinicians to assess both of these key patient factors to appropriately address medication adherence in COPD.

Impact of Medication Adherence on Outcomes in COPD


This systematic review of original research examined the impact of medication adherence on clinical and economic outcomes in COPD. Using established methodology, the authors identified 12 studies that reported on the association between medication adherence and outcomes. Outcomes included clinical symptoms (eg, dyspnea, cough), hospitalizations, ED visits, mortality, loss of productivity, and costs.

Results demonstrated that medication adherence was associated with significantly lower hospitalization rates (\(P < .05\))\(^1\) and severe exacerbations (\(P < .001\))\(^2\). In a large claims database, a 5% increase in medication adherence led to a 2.6% reduction in hospitalizations and a 1.8% reduction in ED visits.\(^3\) Costs analyses in these studies demonstrated that adherent patients had a pattern of higher prescription drug costs but lower expenditures on utilizations, with lower total healthcare costs overall. A secondary data analysis of the TORCH study (evaluating 6112 patients with COPD randomized to salmeterol/fluticasone, salmeterol, fluticasone, or placebo) demonstrated that medication adherence was associated with a 11.3% mortality rate compared to a 26.4% mortality rate among nonadherent patients (\(P < .001\)).\(^2\)
The association between medication adherence and health-related quality of life was mixed, with some studies finding a negative association between health-related quality of life and adherence \(^4\) and others finding a positive association.\(^5\) This mixed pattern of results has been seen in other diseases, since patients may decide to be more adherent because of poor health-related quality of life, or a burdensome treatment may lower quality of life. Further, in one study of administrative health care claims,\(^6\) medication adherence was associated with fewer days absent from work and fewer dates of short-term disability.

Overall, this review found a strong body of literature supporting an association between medication adherence and improved morbidity, mortality, economic productivity, and reduced costs. More research is needed to more fully understand the interplay between medication adherence and quality of life.

References:

severity, higher self-efficacy, and not currently smoking were also associated with higher adherence to LABAs, indicating some additional patient risk factors for nonadherence.

Patient-Clinician Communication in COPD


In this cross-sectional study, Slatore et al examined the association of patient-clinician communication with participant-reported quality of clinician care, confidence to manage disease, and general self-rated health among 342 veterans with COPD. Patient-clinician communication was measured using the general communication domain of the quality of the communication questionnaire that scored each item on a 0 to 10 Likert scale with 0 = “worst imagined” and 10 = “best imagined” among six attributes:

1. Using words you understand  
2. Looking you in the eye  
3. Answering all your questions  
4. Listening to what you have to say  
5. Caring about you as a person  
6. Giving you their full attention

Outcomes included three patient-reported items on the quality of care, confidence to deal with breathing problems, and overall rating of health. Nearly half (46.6%) of patients reported that their clinicians gave the best-imagined quality of care. Overall, 28.7% of patients reported confidence in dealing with breathing problems, and 14.7% reported very good or excellent health. Overall communication scores were excellent (mean 9.2 ± 1.2 on a scale from 1 to 10). Quality of communication was associated with quality of care ($P < .001$) and confidence to self-manage ($P < .001$), but there was no association with overall rating of health. The three communication attributes associated with outcomes included eye contact, listening, and attentiveness.

These results indicated that good communication between patients and clinicians is an important component of high quality care and may be an important facilitator of patients’ confidence in their ability to self-manage their disease. Patient-centered communication may not only improve the quality of care delivered, but it also may help patients better manage their disease.
Given the negative impact of medication nonadherence on clinical outcomes, it is important to understand and identify effective interventions to promote and support medication adherence. Bryant et al conducted a systematic review of interventions to address nonadherence in COPD patients. The review identified seven papers that evaluated a clinical intervention with variable methodological quality across studies. These studies evaluated three intervention formats: brief counseling, monitoring and feedback about medication use, and multicomponent interventions. Outcomes included either blood serum values, observations of inhaler technique, self-report measures, pharmacy data, or device counters/weights. Five of the studies found positive results suggesting that patient-focused interventions were effective in improving medication adherence for COPD. Brief counseling was found effective when delivered by pharmacists. Using electronic devices to monitor adherence and provide feedback and support also significantly improved adherence ($P < .001$).

Multicomponent interventions combined strategies for maximal treatment effect. One study combined patient education, care coordination, and nurse visits with weekly phone calls. Adherence significantly increased (intervention 71%; control 37%; $P = .009$) as well as correct inhaler technique ($P < .001$). Other studies had similar findings using motivational interviewing, smoking cessation, and education with follow-up calls. However, two other studies using combined multicomponent approaches of patient counseling, pharmacist education, and follow-up care did not have a significant effect on adherence. Recent studies not included in this review have shown improvements in adherence using pharmacy education and follow-up calls, suggesting that auxiliary providers outside the clinic may be an important avenue for implementing adherence interventions.

Overall methodological quality was variable, with many studies not reporting key information. In fact, a recent Cochrane review on medication adherence in COPD determined that it was difficult to provide recommendations for interventions because of the poor quality of research. One key criticism is that many of these studies relied on self-report measures of medication adherence, which have been shown to be biased. Current studies are ongoing that will use electronic monitors as the outcome as well as to provide feedback and support to patients. To help facilitate dissemination and sustainability of these interventions, it is important to not only identify efficacious interventions but to also identify appropriate venues for implementation for broad public health impact.

References:

KEY TAKEAWAYS

- Medication nonadherence is very common among COPD patients and is associated with worse clinical outcomes.
- Patient characteristics associated with medication adherence in COPD include cognitive impairment, health beliefs, multiple coexisting comorbidities, and the patient-physician relationship and communication.
- Effective interventions that involve multiple components and use multidisciplinary teams have the most promising evidence for efficacy in improving medication adherence in COPD patients.

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