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WHITE PAPERS

Facing the challenges of COPD:

A review of the state of COPD care in the U.S.

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COPD management costs are on the rise

Although medical diagnostics, therapeutics, and care guidelines have been developed to treat chronic obstructive pulmonary disease (COPD), the costs of managing and treating these patients continue to rise. The challenges of treatment are complex.

An estimated 29 million Americans are living with COPD, but only 13 million Americans have been diagnosed with this obstructive lung disease that compromises quality of life and longevity[1]. Many who have been diagnosed do not know the specifics of their disease or understand its severity. Patients struggle not only with the disease itself, but also with the challenges of obtaining care. These difficulties are compounded by socioeconomic disparities.

Significant barriers to delivering optimal care for this patient population include the high rate of underdiagnosis and challenges in accessing specialty care and critical medications[1].

COPD is also characterized by exacerbations that are a significant driver of morbidity, mortality, and cost.

COPD exacerbations accounted for 1.8 million emergency department visits in 2012; an estimated 20% of those became hospitalizations[1]. **The COPD burden in the US is estimated at around $49 billion a year[2]. Exacerbations of COPD account for up to 75% of total direct disease cost.** Private insurance paid 18% of those costs; Medicare and Medicaid paid 51% and 25% respectively[2].

The COVID-19 pandemic has introduced new risks for COPD members and additional management challenges to maintain treatment while avoiding exposure to the virus.

CHAPTER 1

Challenges of COPD Care Management

Many COPD members do not access care

Managing the medical and emotional complexities of (COPD) has always been burdensome and is increasingly costly. The benefits of treatment are not available to COPD members who cannot afford them. Individual member access and adherence to care remains challenging. Patients face a variety of hurdles to access medical evaluation and adhere to a COPD care plan, including the following:[3,1]

Mistrust in the medical system or an inability to navigate the complexities of our healthcare system can be a barrier to accessing care.

Late diagnosis combined with little education about the disease presents emotional consequences that cannot be overstated and is often a barrier to initiation of lifestyle modifications and treatment regimens that could slow disease progression.

Perceived stigma of self-inflicted disease is felt by many members, lessening their enthusiasm to advocate for themselves.

High insurance deductibles discourage members from seeing a doctor even when they have health insurance.

Outstanding medical debt may cause members to postpone additional medical treatment.

Medication costs may also be a barrier to symptom management.

Behavioral and mental health issues can exacerbate lack of participation in care. Patients experiencing anxiety, depression, or substance abuse may ignore or postpone medical care.

Underused GOLD guidelines (Global Initiative for Chronic Obstructive Pulmonary Disease) are attributable to the fact that most COPD care is provided in primary care, where it is less likely that GOLD guidelines are followed. Primary care physicians play a prominent role in 80% of COPD diagnosis and management in part because 3.7 million adults in the US live more than 1 hour driving distance from a pulmonologist.

Lack of care coordination remains a challenge, particularly for members who are cared for by both primary care providers and specialists, and who transition frequently between outpatient and inpatient settings. COPD therapy in primary care is often inconsistent with guidelines or evidence, resulting in suboptimal or no treatment for many members. Primary care rarely manages COPD with pulmonary rehabilitation.

COPD members struggle with treatment protocols and positive behavioral changes

Treatment protocols and beneficial behavioral changes can help slow the progression of the disease and improve quality of life, but they can be a struggle for COPD members, many of whom are self-managing their care with limited support and guidance.

- **Smoking cessation** can slow the development and progression of COPD, but smoking is a notoriously difficult habit to break. The National Ambulatory Medical Care Survey and National Health Interview Survey report that 66.6% of patients underwent tobacco use screening at primary care visits, but of current tobacco users, only 26.9% received tobacco counseling and 8.3% were prescribed tobacco cessation medication. Barriers included time constraints, lack of treatment reimbursement, lack of institutional support for screening and treatment, and lack of physician knowledge.[1]

- **Breathing exercises** can be challenging to maintain without coaching and support. Four weeks of exercise training improves dyspnea, fatigue, and functional exercise capacity, as well as reducing readmission rates and healthcare utilization. However, only 19% of primary care physicians and 54% of pulmonologists regularly refer patients to pulmonary rehabilitation. Barriers include cost, poor insurance coverage, unclear understanding of benefits, local absence of programs, and lack of transportation for members in rural areas.

  Two studies did find that telerehabilitation initiatives were comparable in effectiveness to standard out-patient pulmonary rehabilitation programs.[1]

- **Pneumococcal and influenza vaccinations** reduce COPD-related hospital admissions and morbidity, however, these vaccination rates are significantly below optimal rates.[3]

A recent study showed that just 23% of COPD patients had their annual influenza vaccination and 10% their pneumococcal vaccination. [5]

- **Medication adherence** can also be a struggle without coaching and accountability. Factors affecting medication adherence include side effects, member understanding of disease, and treatment complexity. [4]

- **Poor inhaler technique** commonly contributes to poor disease control, as inhalers are the foundation of optimal medical management of COPD members. Additionally, inhaler cost is a significant burden and barrier to compliance for many members. Annual out-of-pocket cost for just one inhaler can exceed $900; members needing 2 to 3 inhalers for more severe COPD have average annual out-of-pocket costs of $1600–$2800.[1]

- **Healthy eating** is beneficial but making and maintaining nutritious choices is difficult without guidance and support. [3]

- **Financial toxicity,** which is well documented in patients with cancer and cardiovascular disease, is also common in patients with COPD. Many worry about maintaining their standard of living and covering their medical bills. COPD is already a frequent cause of financial toxicity, a problem likely to increase in light of rising drug costs and deductibles. [4]

Barriers to treatment compliance

The American Journal of Managed Care (AJMC) published the results of interviews conducted to better understand patient struggles to adhere to COPD care guidelines. The investigators found that this multimodal disease requires the multidisciplinary involvement of a comprehensive, knowledgeable healthcare team able to implement best practice strategies for COPD management. Study investigators identified prominent barriers to treatment compliance. Overcoming these barriers is essential to stabilizing these members and reducing emergency department visits and hospitalization.[6]

- **Knowledge:** Patients lack awareness about national COPD guidelines and about online resources. The resulting confusion could be rectified by continuing education programs.
- **Skills:** Many medical personnel lack skills and experience to teach respiratory management and member education. Some personnel are tasked with teaching inhaler techniques to members—without having had any training themselves.
- **Assessment:** Time constraints on medical personnel make it difficult to provide member assessments, referrals, and member education that could improve COPD care and prevent complications.
- **Disease awareness:** Healthcare staff do not always understand COPD management. Training supported by checklists and resources could improve the guidance given to COPD members.
- **Environmental context and resources:** COPD-related emergency visits increase during winter months but staffing and funding is not adjusted to meet the higher need.
- **Social professional role identity:** Lack of role clarification causes confusion about whether ED staff or respiratory specialists should be conducting COPD tests.
- **Emotion:** Confusion about whether primary care or specialty teams have responsibility for teaching guideline adherence creates emotional barriers. As a result, members are discharged without appropriate follow-up.

Comorbidities complicate COPD care and increase health costs

The chronic inflammation that characterizes COPD also affects the functioning of other organs, including the heart, blood vessels, muscles, kidneys, liver, digestive system, and brain. Research shows that up to 90% of COPD patients have one or more comorbidities.[7] Researchers also note the importance of recognizing and treating comorbidities in COPD patients early because as COPD becomes more severe, the number of comorbidities increases proportionally. The most common comorbidities in COPD members include the following: [7,8,9]

COPD members who also have cardiovascular disease, hypertension, and or diabetes had higher hospitalization rates compared to those without these comorbid conditions.[1]

Consequences to health systems can be dire

The combination of members disengaged from healthcare resources, barriers to compliance with treatment protocols, and the resultant development of COPD comorbidities that complicate treatment is driving the rise of poor outcomes and related healthcare costs. The United States is experiencing a steady rise in the cost of caring for COPD members which is attributed to the following factors[1]:

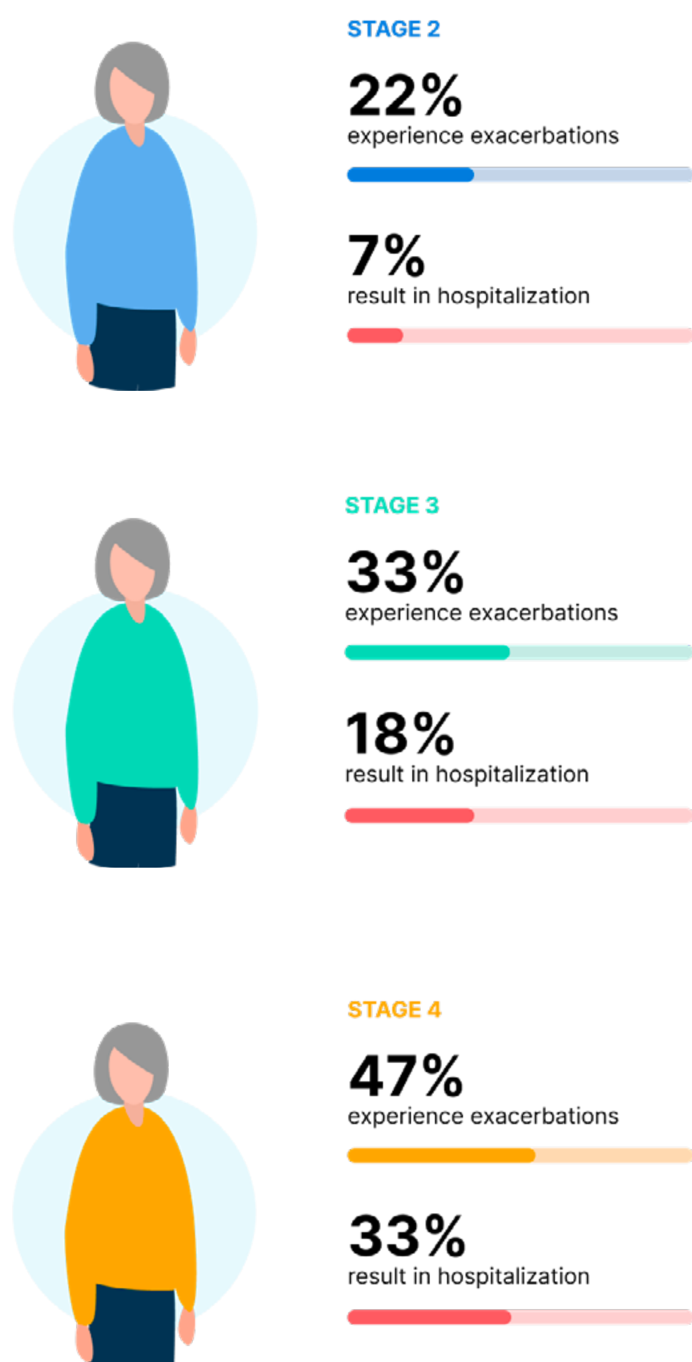
- Hospitalizations result from **unchecked deterioration** of member condition.
- **Care delays** increase costs and reduce member survival. Exacerbations account for **62.5% of COPD hospital admissions**, and recurrent exacerbations account for **27.6% of readmissions.**
- Avoidable respiratory health deteriorations are attributed to **failures in early COPD symptom management**.
- Recurrent exacerbations result from **failure to understand and adhere to appropriate treatment protocols**.

Our healthcare system's inability to engage isolated COPD members in their care means excessive spiraling costs for health plans. Without the ability to recognize warning symptoms, a member's health can be eroded by exacerbations: acute worsening of symptoms that can accelerate the decline in lung function. As COPD severity increases, exacerbations become more frequent and more severe. The consequences of exacerbations can include worsening lung function and greater impairment in health, leading to reduced physical activity, a decline in quality of life, and an increased risk of death.[1]

Exacerbations become more frequent and more severe as a member's COPD condition becomes more severe, and they trigger a significant portion of the health care costs attributable to COPD. An unchecked cycle of exacerbations and rising disease severity increases the proportion of members hospitalized.

Adherence to COPD diagnosis and treatment protocols remains elusive

In 1998, the National Heart, Lung, and Blood Institute (National Institutes of Health) and the World Health Organization created the GOLD guidelines to increase COPD awareness and standardize COPD diagnosis and treatment.



However, primary care physicians face significant barriers to incorporating GOLD guidelines into their practices. Barriers include time constraints caused by management of multiple comorbid conditions, lack of access to spirometry for standard diagnosis, unfamiliarity with pulmonary function test interpretation, and unawareness of GOLD guidelines.[1]

These barriers contribute to underdiagnosis and undertreatment of COPD members. Stages of COPD severity are defined in accordance with Global Initiative for Chronic Obstructive Lung Disease (GOLD) stages 1–4; with Stage 4 being the most severe.

A 2010 article in the New England Journal of Medicine reports that frequent exacerbations are experienced by **22%** of patients with stage 2 disease—sending 7% to the hospital, **33%** with stage 3 (resulting in hospitalization for 18%), and **47%** with stage 4 disease, at which stage 33% of COPD patients are hospitalized. The single best predictor of exacerbations, across all GOLD stages, was a history of exacerbations.[1]

The cost of chronic obstructive pulmonary disease among managed care members varies depending on the state providing care, the care site, and the severity of the member's condition.

Complex inpatient admissions are estimated in a range between $21,098 and $46,160, or $27,597 per event.[1]

The cost to payors

In the absence of effective
COPD care management

Health plans find it difficult to engage these members

The U.S. burden of COPD continues to grow without effective implementation of care and without patient access to care. In addition, Medicare's complicated coverage and reimbursement structure pose unique challenges for members who might need access to several types of services. Recurring challenges include poor guideline implementation among health-care providers and poor member access to key treatments such as affordable maintenance drugs and pulmonary rehabilitation.[3]

There are no easy solutions, but engaging members and innovative thinkers in the development of solutions is crucial. Financial incentives might be important in raising engagement of providers and health systems. Lowering co-pays for maintenance drugs could result in improved adherence and, ultimately, decreased overall healthcare spending. Given the substantial geographical diversity, health systems will need to find their own solutions to improve care coordination and integration, until better data for interventions that are universally effective become available.[3]

The high cost of treatment is a deterrent to care access

We have medical treatment to improve quality of life and avert exacerbations for COPD members. Studies demonstrate that the regularity, availability, and continuity of primary care may help avert hospitalizations[3]. Treatments include:

- Inhaled long-acting bronchodilators and steroids improve lung function, reduce symptoms, prevent exacerbations, and possibly lower mortality.
- Other therapies—including chronic macrolides and nocturnal noninvasive ventilation—may prevent exacerbations.
- Oxygen therapy reduces mortality in those with advanced disease.

However, treatment—especially inhaled medications—is expensive. Failures to treat early due to high-deductible health plans and challenges of member self-management have serious ramifications for COPD member health and financial well-being as well as the cost of caring for these members. Diagnostic tools and treatments are available, but they have no value if members are not proactively engaged and using them. When members are dissuaded from seeking care by high deductibles and medication costs, and when active engagement requires time and resources that health plans are unable to offer, COPD member conditions deteriorate and become more costly to treat.[3]

Barriers posed by high deductible health plans

High-deductible health plans pose cost-related barriers to care. The results are more frequent emergency room visits and hospitalizations.[4] Research found that patients with high-deductible health plans more frequently delay or did not seek care, were non-adherent to expensive medications, and reported annual out-of-pocket expenses in excess of $5000, which created financial strain. Patients with high-deductible health plans were also more likely to report emergency room visits and hospitalizations.[4]

Financial barriers to care continue to rise

The financial burden of healthcare is increasing, particularly for members with chronic disease. Research published in the Annals of the American Thoracic Society shows the following:[4]

- Insurance deductibles for employer-sponsored coverage have risen more than 50% over the past 5 years.
- In the individual market, deductibles are even higher - more than $8000.00 on average.
- These financial barriers adversely contribute to the health and financial well-being of COPD members.
- COPD members in high-deductible health plans tend to forgo outpatient visits or daily medication use, leading to worse disease control and more emergency room visits and hospitalizations.
- Inhaled medicines are a particular concern. Patients are foregoing prescribed inhalers or using them sparingly. The result is worse outcomes and more hospitalization

When members are discharged home without home care after a COPD exacerbation admission, they are more likely to be readmitted for COPD than those discharged to post-acute care including short-term rehab or home care services.[1]

Other readmission risk factors include long initial hospital stays, more comorbidities, presence of specific comorbidities including heart failure, obstructive sleep apnea, vertebral fractures, anemia, anxiety, depression, and electrolyte and acid/base disorders.[1]

Hospital utilization generates the majority of COPD-related health care expenses

As a COPD condition deteriorates, members often need emergency department or hospital care. The COPD Foundation reports that in 2010, U.S. medical costs associated with COPD were 50 billion dollars; hospitalizations accounted for more than 70 percent of these costs. Taking steps to minimize hospitalizations could reduce costs and make more resources available for preventative COPD care.[9]

Improving care means addressing members barriers

Socioeconomic status plays an important role in the risk of developing COPD and in member willingness to seek care. Education level, income, and employment are complex barriers to address. However, research from the Journal of the COPD Foundation suggests an effective starting point by identifying the following factors that are amenable to intervention.[9]

- **Disinclination to use medical resources**—even among patients with health insurance—contributes to the high medical costs of COPD members. Financial difficulties are exacerbated by high insurance deductibles, existing medical debt, and high medical costs. Innovative medication and home health care delivery could address deteriorating COPD health before an emergency room visit becomes necessary.

- **COPD members with comorbidities** have higher proportions of emergency room visits and hospitalizations than COPD members without these complications. Data suggests that obese members are at highest risk of emergency room visits and hospitalization. Cardiovascular disease is another frequent comorbidity among COPD members, with twice the risk of a COPD-related hospitalization compared to members without cardiovascular disease. Better comprehensive and multidisciplinary care for COPD members with comorbidities has the potential to positively impact member health.

- **Low levels of physical activity** are an independent risk factor for emergency department visits and hospitalization.

Care coordinator support has the potential to reduce emergency department visits and hospitalization through the encouragement of medication compliance, pulmonary rehabilitation following hospital discharge, and exercise coaching to improve muscle mitochondrial oxidative capacity and lower CO_2 production.

Without proactive engagement, COPD conditions deteriorate and become more costly

The Lancet Respiratory Medicine Commission concluded its review of U.S. COPD care delivery with a stated goal: to reduce the disease burden of COPD. They recommend new initiatives focused through a patient-centered approach to improve care coordination, patient empowerment, and health outcomes. They also stress the importance of seeking input from members and their caregivers about care delivery.[3]

CHAPTER 3

How patient-centric care can reduce payor costs and improve COPD member outcomes

The challenges of managing COPD are complex, but there is promise for these members. The Lancet Respiratory Medicine Commission reports that to be truly successful, initiatives should be patient centered with a focus on improving care coordination, patient empowerment, and health outcomes. The evolving model envisions care providers who are familiar with clinical guidelines and who have access to personalized data to guide care. Meeting members where they are and supporting them through a defined treatment pathway can positively affect the member's care experience.[3]

Patient-centric engagement and support

The Lancet Respiratory Medicine Commission notes that too often, patients are absent from dialogues about value-based health reforms, stating that patients should be at the center of discussions to better coordinate care and manage transitions of care. The commission further notes that patients need improved access to sophisticated healthcare systems and support.[3]

Patients and their caregivers want their primary care providers and specialists to communicate with each other. And they want easier access to care.[3]

> ***The challenge of caring for COPD members is complicated by the fact that these members have lower income, lower education, more SDOH barriers, low health literacy, low self-efficacy, and higher rates of mental health issues,***" explains NuvoAir Chief Medical Officer Dr. Eric Harker. ***"Often, they just don't have a lot of energy to engage."***

Dr. Eric Harker

NuvoAir Chief Medical Officer

NuvoAir responds to this challenge with a patient-centric model of care. Care coordinators develop relationships of trust and teach members how to upload daily symptom data so that their condition can be independently monitored for early signs of concern. NuvoAir delivers live classes to improve wellness and promote beneficial lifestyle changes. When member data signals early signs of distress, care coordinators guide them to clinical care and manage the member's care pathway across acute hospital care and through post-acute care management. They continue to support member physiotherapy and pulmonary rehabilitation at home.

Biomarkers provide guidance to dedicated care coordinators

Research demonstrates that when protocols are in place to assess and care for patients, patients are more likely to follow and complete their care plan.[3]

> *We understand that incorporating best practice protocols into person-first, relationship-based care, supported by monitoring technology, has the potential to improve COPD care,"* says NuvoAir Chief Medical Officer Dr. Eric Harker.

Dr. Eric Harker

NuvoAir Chief Medical Officer

NuvoAir's member support combines individual technology monitoring with efficient, effective response when concerning changes in respiratory health are detected. This empowers NuvoAir care coordinators to act on potential clinically significant changes at the earliest possible stage.

Regular, reliable data monitoring

A 2014 Chronic Obstructive Pulmonary Experience survey reports that patients experience symptoms for nearly three years before they are diagnosed—and that the emotional impact of delayed diagnosis—with irretrievably lost lung function—cannot be overstated. Patients lack education about their disease, prognosis, treatment options, as well as strategies for self-management that could improve self-management and prevent exacerbations.[3]

Patient conversations on the COPD Foundation patient blog focus on the value of education provided by respiratory therapists in hospitals or during pulmonary rehabilitation—but note the need to expand access to this education outside of these settings. A readily available resource is needed to empower members to spot and respond to early signs of an exacerbation, teach them how to stay active, and help them cope with episodes of anxiety and dyspnea.[9]

> **“**
>
> ***NuvoAir has responded to member needs by bringing best-in-class monitoring technology to the member’s door,”*** states NuvoAir Chief Medical Officer Dr. Eric Harker.

NuvoAir care coordinators work one-on-one with members, teaching them how to use NuvoAir’s award-winning connected spirometer and mobile app, which monitors member readings and alerts care coordinators about early signs of a possible exacerbation. This combination of one-on-one care, personalized education, and easy-to-use technology fits naturally into the member’s daily routine.

A multidisciplinary clinical team

COPD is associated with increased risk of other chronic diseases, yet primary care physicians are typically responsible for management of all conditions under the constraint of short office visits. The Lancet Respiratory Medicine Commission observes that care coordination can improve both processes and outcomes of COPD patient management. Communication between health professionals, members, and caregivers is essential to enable access to needed services as well as care coordination during the critical transitions from hospital to home. Communication and coordination are so important during transitions because this is the time when members are at high risk of medical errors and adverse events.[3]

> ***Our care coordinators become familiar with the health challenges of each COPD member, and share member data with the member's provider when medical attention is indicated,"*** says NuvoAir chief medical officer Dr. Eric Harker. ***"Our services are designed to anticipate, coordinate, and deliver care when it matters most to the member."***

Researchers note that insurers have been examining the concept of patient-centered medical homes using care coordinators to provide multidisciplinary care.[3] Utilization of services like NuvoAir, which are designed to address gaps in COPD care and facilitate access to medical expertise and appropriate medication, are positioned to improve patient outcomes while containing medical costs.

Conclusion

Although the costs of managing and treating COPD members continue to rise - despite available care guidelines, therapeutics, and medications - research has identified patient-centric strategies to simultaneously reduce the disease burden of COPD and improve member outcomes.

Progress requires innovation. For COPD members, innovation means implementing a personal, responsive support system to help them improve their breathing and identify a potential medical problem before it becomes a crisis.

We encourage health plans to consider collaborative medical services focused on optimal patient-focused COPD care.

These services are positioned to deliver success measured by improved member satisfaction, improved health outcomes, and better control of the cost of care.

Resources

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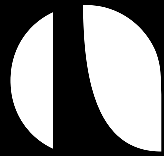

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