



Quality Standard Position Statements for Health System Policy Changes in Diagnosis and Management of COPD: A Global Perspective

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ABSTRACT

Introduction: Despite being a leading cause of death worldwide, chronic obstructive pulmonary disease (COPD) is underdiagnosed and underprioritized within healthcare systems. Existing healthcare policies should be revisited to include COPD prevention and management

as a global priority. Here, we propose and describe health system quality standard position statements that should be implemented as a consistent standard of care for patients with COPD.

Methods: A multidisciplinary group of clinicians with expertise in COPD management together with patient advocates from eight countries participated in a quality standards review meeting convened in April 2021. The principal objective was to achieve consensus on global health system priorities to ensure

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consistent standards of care for COPD. These quality standard position statements were either evidence-based or reflected the combined views of the panel.

Results: On the basis of discussions, the experts adopted five quality standard position statements, including the rationale for their inclusion, supporting clinical evidence, and essential criteria for quality metrics. These quality standard position statements emphasize the core elements of COPD care, including (1) diagnosis, (2) adequate patient and caregiver education, (3) access to medical and nonmedical treatments aligned with the latest evidence-based recommendations and appropriate management by a respiratory specialist when required, (4) appropriate management of acute COPD exacerbations, and (5) regular patient and caregiver follow-up for care plan reviews.

Conclusions: These practical quality standards may be applicable to and implemented at both local and national levels. While universally applicable to the core elements of appropriate COPD care, they can be adapted to consider differences in healthcare resources and priorities, organizational structure, and care delivery capabilities of individual healthcare systems. We encourage the adoption of these global quality standards by policymakers and healthcare practitioners alike to inform national and regional health system policy revisions to improve the quality and consistency of COPD care worldwide.

Keywords: COPD; Global quality standard position statements; Management; Policy

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Key Summary Points

Quality standards that encompass the entire care pathway in COPD and acknowledge the different organizational architecture of healthcare systems across countries and regions are lacking.

Independent global experts in COPD management, including clinicians and patient advocates from eight countries, achieved a consensus on global standards of care for COPD.

The quality standard position statements proposed in this publication emphasize the core elements of COPD detection and treatment, including (1) diagnosis, (2) adequate patient and caregiver education, (3) access to medical and nonmedical treatments aligned with the latest evidence-based recommendations and appropriate management by a respiratory specialist when required, (4) appropriate management of acute COPD exacerbations, and (5) regular patient and caregiver follow-up to review individualized COPD care plans.

While these quality standard position statements are ambitious and intentionally broad in scope, we believe provisions for customization make them measurable and achievable within a regional or national healthcare system.

These quality standards should be adopted by health systems globally to ensure the consistent delivery of optimal care across all stages of COPD.

DIGITAL FEATURES

This article is published with digital features, including an infographic, to facilitate understanding of the article. To view digital features

for this article go to <https://doi.org/10.6084/m9.figshare.19368125>.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a common, preventable, and progressive condition characterized by persistent respiratory symptoms [1]. In 2016, the Global Burden of Disease Study reported that 251 million people were living with COPD [2], with the disease becoming the third leading cause of death worldwide in 2019 [3]. In addition to the hallmark symptoms of exacerbations, COPD is also associated with a range of extrapulmonary disease manifestations [4–8]. Therefore, mitigating symptom severity and future risk of exacerbations, preserving functional status and quality of life (QoL), and reducing disease-related mortality constitute key objectives of COPD management and can be achieved by taking a holistic approach to care, consistent with the latest evidence-based treatment recommendations [1].

Treatment regimens aligned with the latest Global Initiative for Chronic Obstructive Lung Disease (GOLD) recommendations have been shown to reduce the risk of exacerbations, COPD-related healthcare resource utilization (HCRU), and medical cost offsets [9]. However, while treatment guidelines and recommendations [1, 10, 11] are intended to optimize case management, their global implementation remains inadequate [12–18], resulting in substantial gaps in the standard of clinical care. The dissemination and adaptation of guidelines is particularly lacking in low- and middle-income countries where the feasibility of implementing integrated disease management approaches remains limited [19–21]. Although guideline-directed treatment may afford clinical benefits to patients with COPD, guidelines rarely drive systemic policy change, or change practice across primary, secondary, and tertiary care. Moreover, despite being a leading cause of death, COPD is underdiagnosed and underprioritized within healthcare systems [22]. Therefore, COPD should be considered an integral part of global health agendas, and existing

healthcare priorities revisited to include COPD prevention and management as a worldwide, public health imperative. A number of initiatives, including the Global Noncommunicable Diseases (NCDs) Action Plan of the World Health Organization (WHO) [23] and the Decade of Healthy Ageing program of the United Nations (UN) [24], aim to improve the accessibility, affordability, and consistency of COPD care on a global scale.

Quality standards are sets of concise statements which recognize and address unmet diagnostic and treatment needs in a particular disease state and are designed to assist healthcare practitioners in delivering optimal disease management based on objective, high-quality levels of evidence [25]. Quality standards usually complement guidelines and help to reinforce the appropriate behaviors outlined therein. Existing quality standards for COPD are available at a national level in the United Kingdom (UK), the United States (USA), Spain, Germany, and provincially in Canada [25–31]; however, quality standards spanning the entire COPD care pathway are lacking. Although performance improvement tools, such as the Healthcare Effectiveness Data and Information Set (HEDIS), are widely used by healthcare systems and payers in the USA for the evaluation of the effectiveness of COPD care, they require significant updating. Thus, it is essential that any local or country COPD quality standards remain up-to-date and aligned with the latest evidence-based recommendations to maximize their effectiveness. Moreover, global quality standards in COPD that consider, and are amendable to, the different organizational structures of healthcare systems and data sharing networks across countries and regions are urgently required. Here, we describe the quality standard position statements that have been developed to ensure that an actionable standard of care reflecting global diagnosis and treatment recommendations is received by all patients with COPD. These quality standard position statements target a broad audience, comprising policymakers (health system administrators and leaders), healthcare practitioners, primary care physicians, and patient groups to ensure consistent delivery of care across all stages of COPD

through a multipronged, multidisciplinary collaboration.

METHODS

At a virtual meeting on April 22, 2021, quality standard position statements emerged after a review and debate of the available evidence by internationally recognized, independent experts in COPD management, who were invited on the basis of their relevant publication history, presence and leadership at national and international policy revision initiatives, and clinical expertise. Through this group interaction, the multidisciplinary group of clinicians and patient advocates from eight countries achieved consensus on global, quality standard position statements for COPD care. Most of the proposed quality standard position statements were formulated following a review of previously defined patient charter principles [32]. However, these were refined further to foster meaningful changes in policy with the primary goal of reducing the burden of COPD based on the following, fundamental considerations: (1) policy revisions should be patient-centric, recognizing the individual patient, needs, preferences, values, and cultural diversity; (2) they should be practical, adaptable, and ambitious, yet realistically achievable with predefined quality indicators and metrics to ensure broad uptake and measurable improvement; and (3) they should be easily implemented by various healthcare systems across geographies and healthcare contexts, thereby catalyzing partnerships with patients, clinicians, healthcare administrators, and professional organizations worldwide. Importantly, these quality standard position statements are based on contemporary, objectively categorized evidence and recently updated clinical strategies, such as GOLD [1], while also reflecting the clinical experience and professional expertise of their contributors. This article is based on consensus of a steering group and does not contain any studies with human participants or animals performed by any of the authors.

Following discussion and debate, the experts agreed upon five quality standard position

statements, including the rationale for their inclusion, discriminating clinical evidence, and the essential criteria for their implementation. These five quality standard position statements define the core elements that can improve the quality and consistency of COPD care: (1) accurate diagnosis; (2) adequate patient and caregiver education; (3) access to medical and nonmedical therapies aligned with the latest evidence-based recommendations and appropriate management by a respiratory specialist, when required; (4) effective management of acute exacerbations; and (5) regular patient and caregiver follow-up for review of an individualized care plan (Fig. 1). Finally, quality indicators and metrics were proposed for each of the quality standard position statements to track their progress with adoption by individual healthcare systems.

RESULTS

An overview of the core elements of the quality standard position statements across the COPD care pathway is presented in Fig. 2.

Quality Standard Position Statement 1 (Diagnosis)

Individuals at risk and healthcare practitioners should recognize risk factors and early symptoms of COPD. Clinicians should have access to and select the most appropriate tools with which they can make an informed, timely, and accurate diagnosis.

Rationale

The clinical probability of a diagnosis of COPD hinges on a combination of medical history and physical examination, including exposure to risk factors, symptoms, exacerbations, and comorbidities [1]. Diagnosis of COPD is confirmed by spirometry, which confirms the presence of poorly reversible airflow limitation [1]. However, results from a database study of more than 5000 patients reported that only approximately one-third of those with a clinical suspicion of COPD had undergone spirometry

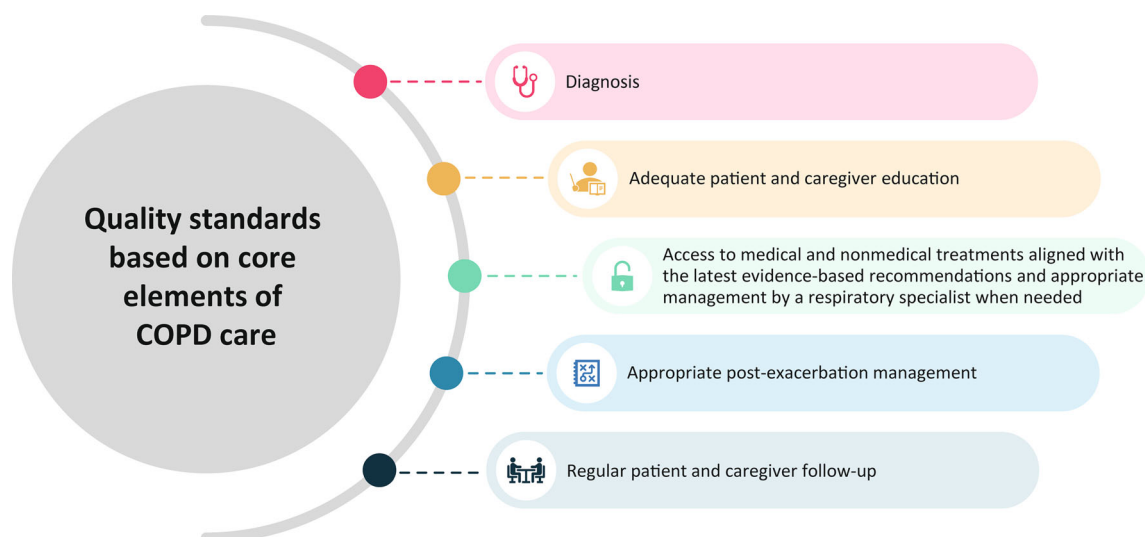


Fig. 1 Core elements of COPD care. *COPD* chronic obstructive pulmonary disease

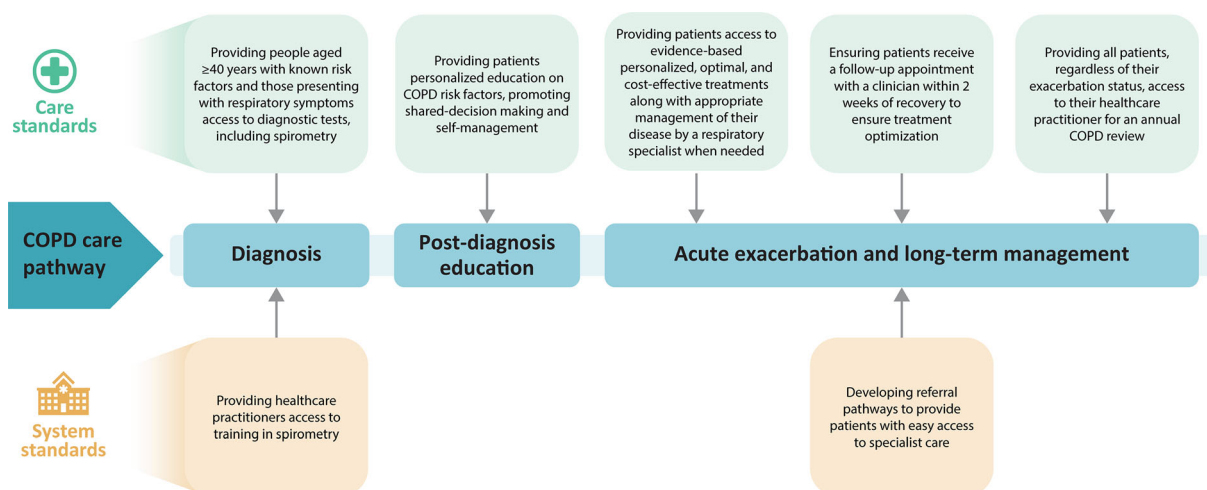


Fig. 2 Specific gaps in the COPD care pathway addressed by the proposed quality standards. *COPD* chronic obstructive pulmonary disease

[33]. To ensure a timely and accurate diagnosis, spirometry should be performed in the primary care setting, where patients may present with early symptoms of or risk factors for COPD. Therefore, the role of multidisciplinary primary care personnel, including nurses who often interact directly with patients, is particularly important in ensuring diagnostic confirmation [34]. However, many primary care physicians,

nurses, and other healthcare professionals receive little formal training in the proper administration and interpretation of spirometry [35] with cost and access to spirometry devices being additional barriers. Crucially, the use of spirometry in primary care may continue to be challenging unless it is tied to reimbursement. Indeed, it has been reported that countries that provide reimbursement for spirometry and

extra financial incentives for primary care physicians to perform spirometry have higher rates of spirometry testing [34, 36]. Consequently, healthcare systems should ensure that their providers are adequately trained, compensated, and experienced in performing spirometry in cases with a strong suspicion of COPD, and are proactive in repeating lung function tests in at-risk patients with borderline FEV₁ values.

The use of a machine learning/artificial intelligence framework that integrates lung function with clinical variables may improve the accuracy of the American Thoracic Society/European Respiratory Society (ATS/ERS) spirometry interpretation algorithm [37]. However, spirometry may lack the sensitivity to diagnose COPD in its incipient stages and therefore other diagnostic procedures, such as chest computed tomography (CT) scans, body plethysmography, and diffusion capacity, may be required [38]. Healthcare practitioners also should recognize that while 17–24% of patients with preserved lung function may not fulfill the spirometry criterion for a diagnosis of COPD [39], they may nonetheless experience respiratory symptoms, exacerbation-like events, and activity limitations with some evidence of airway disease [40]. Notably, a subset of patients with preserved ratio impaired spirometry (PRISm) eventually progress to meet the spirometric criterion for COPD and are at increased risk of respiratory symptoms, respiratory exacerbations, and mortality [41–43]. Currently, however, GOLD recommendations do not address the therapeutic management of patients with PRISm, who represent a heterogeneous population, that is possibly underdiagnosed and underappreciated. Therefore, further research is required to examine a diagnostic approach that will help identify the underlying diseases or conditions associated with PRISm and potential treatment options to improve overall prognosis. Finally, not all individuals with post-bronchodilator airflow obstruction have COPD, particularly among those residing in low- and middle-income regions which, in 2020, accounted for 98% of reported cases of tuberculosis (TB) globally [44].

Importantly, a positive diagnosis of a chronic, progressive disease such as COPD should be communicated to patients with educational materials that are culturally appropriate and available in their native languages, recognizing varying degrees of health literacy. Such an endeavor may require modified content and formats to accommodate specific regional or local healthcare systems. In accomplishing this ambitious goal, the education of primary care physicians, nurses, and allied health professionals will contribute importantly to patient instruction and facilitate a physician–patient partnership in COPD care.

COPD is generally diagnosed in middle-aged or older adults, who may be asymptomatic in the early stages of the disease or manifest mild symptoms that may overlap those of other respiratory or extrapulmonary conditions, resulting in underreporting [45]. In addition, the social stigma of symptoms often ascribed to ageing, smoking, or exposure to other environmental irritants may deter patients from seeking timely medical intervention [32]. Consequently, 65–80% of COPD cases remain undiagnosed [46]. Although there is limited evidence of the disease-modifying effects of treatment in the early stages of disease [47, 48], smoking cessation can retard the progression of mild COPD [48]. Additionally, early and accurate diagnosis, as well as appropriate pharmacological and/or nonpharmacological treatment, may attenuate deterioration [26]. Therefore, all patients should have access to necessary resources, including education on COPD risk factors and symptoms, and clinical consultation, to enable timely evaluation and confirmatory diagnosis of COPD [32]. Case-finding strategies, which target individuals or groups at risk of COPD, are practical means by which to identify patients in the initial stages of disease [49]. As an example, tools such as the COPD Assessment in Primary Care To Identify Undiagnosed Respiratory Disease and Exacerbation Risk (CAPTURE™) may prove useful in identifying symptomatic patients with mild-to-moderate airflow obstruction who might benefit from a comprehensive assessment for COPD [50].

Essential Criterion 1A

Individuals should have access to spirometry performed by healthcare professionals trained in conducting and interpreting pulmonary function tests to facilitate an accurate diagnosis of COPD.

Essential Criterion 1B

All individuals aged over 40 years with known risk factors for COPD, such as smoking, environmental and occupational exposures to organic and inorganic dusts, chemical agents, and fumes identified through case-finding approaches [51], and those presenting with respiratory symptoms, should have access to diagnostic pulmonary function testing, as-needed imaging tests for lung cancer screening and biomarker assessments.

Quality Indicators/Metrics

1. Proportion of individuals who present with respiratory symptoms and/or exposures to risk factors who are suspected of having or considered to be at risk of COPD.
2. Proportion of individuals who have undergone timely and accurate spirometry to confirm or exclude a diagnosis of COPD following clinical suspicion or considered at risk of COPD.
3. Proportion of patients classified with COPD with documented evidence of quality-assured spirometry [52].
4. Time from first symptom presentation to spirometry-confirmed diagnosis.

**Quality Standard Position Statement 2
(Adequate Patient and Caregiver
Education)**

Patients should be educated on the risk factors for COPD, symptom manifestations, exacerbations, and the importance of active engagement in their self-management plan. Caregivers also should be included in educational initiatives to improve clinical outcomes.


Rationale

COPD is a heterogeneous disease in terms of symptom presentation, characterized by daily, weekly, and seasonal variability as one common factor [53]. Patients tend to experience the worst symptoms of dyspnea, cough, and sputum production in the morning hours [54]. However, nocturnal symptoms and ensuing sleep disturbances, which are often underrecognized, may be associated with alterations in lung function, increased exacerbation frequency, and the development or worsening of other comorbidities, such as cardiometabolic diseases and depression in the long term [55, 56].

Over the years, a number of risk factors for COPD have been identified, including tobacco smoke exposure, occupational exposure to noxious particles and gases, ambient and household air pollution, lower socioeconomic status, congenital lung abnormalities, and genetic predisposition [1, 57–60]. Notably, although tobacco history is only informed by cigarette use in the GOLD recommendations as tobacco cigarette smoking is the most frequently encountered risk factor for COPD [1], other modes of tobacco consumption (e.g., pipes, cigars, hookahs) also significantly increase the risk for COPD [61, 62]. Additionally, in utero and early-life exposure to tobacco, low birth weight, lower respiratory tract infections, and childhood asthma are also known risk factors for the subsequent development of COPD [63]. Therefore, it is essential that patients receive education on the types, onset, frequency, and severity of COPD symptoms [32]. To this end, national awareness campaigns may assist patients to identify signs and symptoms of the disease and encourage evaluation without fear of stigma.

COPD self-management strategies, particularly those which focus on an individualized action plan (Fig. 3) to prevent exacerbations together with structured patient education, tailored case management, and timely access to a healthcare network, are of critical importance [64, 65]. However, the extent of healthcare practitioner engagement with patients can influence the impact of action plans, which may require modification to accommodate

A COPD SELF-MANAGEMENT ACTION PLAN*



Name:	Doctor:
Age:	Doctor's phone:
Date:	Next check-up date:
Emergency contact:	Relationship:

Personal peak inspiratory flow rate: _____

- Use maintenance medications
- Continue taking maintenance medications and use quick-relief medications when needed
- Seek immediate medical help

GO

Use daily maintenance medications

- ✓ Usual cough and phlegm
- ✓ Can work and be physically active without difficulty
- ✓ Able to sleep well at night

Medicine	Dose	Frequency/timing

- Use oxygen as prescribed
- Continue regular exercise
- Avoid exposure to cigarette smoke
- Adhere to the diet plan

CAUTION

Use quick-relief medications and continue daily maintenance medications

- ✓ More breathless than usual
- ✓ More cough and increased/thicker phlegm
- ✓ Need to use quick-relief inhaler more often
- ✓ Symptoms interfering with sleep
- ✓ My medicine is not helping

Medicine	Dose	Frequency/timing

- Avoid exposure to cigarette smoke
- Rest more and use pursed-lip breathing
- Start antibiotic treatment as prescribed
- Start an oral steroid as prescribed

EMERGENCY

Seek immediate medical attention

- ✓ Severe shortness of breath even at rest
- ✓ Chest pains/coughing up blood
- ✓ Not able to sleep because of difficulty in breathing
- ✓ Feeling confused or drowsy

- Call for emergency department visit to seek immediate medical help
- While getting help, immediately do the following.
 - _____
 - _____

Treatment goals

Until your next check-up visit, treatment goals are to:

- Take your medication as prescribed by your clinician for the next 3 months
- Control COPD well enough to restrict the need to use quick-relief medications for ≤2 times/week
- Exercise three times a week as taught in pulmonary rehabilitation

*Written COPD action plan is adapted from American Lung Association; © American Lung Association, 2021

Fig. 3 An example of a COPD action plan. COPD chronic obstructive pulmonary disease

country-specific health literacy levels and healthcare access [66, 67]. In addition, action plans should be ideally personalized with treatment goals that are specific, measurable, achievable, realistic, and time bound. Other COPD self-management strategies include smoking cessation, reducing exposure to environmental irritants and infections, and improving exercise and physical activity levels, medication adherence, and proper nutrition. Furthermore, personal coping skills, increased vaccine uptake, breathing and airway clearance

techniques (e.g., pursed-lip breathing, huff cough), and promoting safe supplemental oxygen therapy in cases of hypoxemia or during exercise training can also help patients manage their condition [1, 64, 68]. Overall, such self-management interventions among patients with COPD have been associated with a reduction in symptoms and hospital admissions and improved patient-reported health-related quality of life (HRQoL) [69]. Patients should receive personalized education and training on how COPD may interact with or exacerbate

comorbid conditions, to empower them as partners in their own care and report any changes to their clinicians to prevent symptom exacerbation and further disease progression [32]. In addition, caregivers of patients with COPD contribute significantly to optimizing patient care. Results from a systematic review of seven studies reported that educational sessions for patients with COPD and their caregivers delivered by healthcare practitioners were effective in improving a broad range of clinical outcomes [70]. Given the importance of educational and training initiatives, healthcare systems could reimburse these activities to encourage uptake.

Shared decision-making among healthcare practitioners, patients, and caregivers will enable patients to play a pivotal role in their healthcare management, which in turn may improve treatment compliance. This is particularly important for older patients, many of whom have multiple comorbidities, to ensure that they achieve their therapeutic goals with minimum treatment-related adverse effects and disruption to their daily lives [71]. Indeed, the importance of shared decision-making and patient engagement (SDM-PE) was reported in a randomized controlled trial in patients hospitalized for acute COPD exacerbations. In this study, patients who received standard treatment and individualized SDM-PE experienced significant improvement in perceived health status at discharge. In addition, COPD knowledge, medication adherence, and general functionality were significantly better at the 3-month follow-up among those who received standard treatment combined with individualized SDM-PE compared with those assigned to standard treatment alone [72]. Consequently, it is crucial that patients, caregivers, and clinicians actively engage in shared and informed decision-making and that patients develop confidence in their self-management plan to maximize its clinical benefits.

Essential Criterion 2

Patients should receive personalized education appropriate to their individual needs and abilities in terms of risk factors, diagnosis, treatment, and follow-up, and be involved in the

decision-making process and their self-management plans.

Quality Indicators/Metrics

1. Proportion of patients with confirmed COPD who have evidence of receiving education on risk factors, identification of symptoms, and overall disease management.
2. Proportion of patients with a confirmed diagnosis of COPD who have evidence of a self-management plan, including an action plan.

Quality Standard Position Statement 3 (Treatment Aligned with the Latest Evidence-Based Recommendations)

Patients should have access to evidence-based, personalized treatments and receive appropriate management of their disease by a respiratory specialist when required.

Rationale

While the GOLD strategy report is widely recognized, its dissemination and implementation remain suboptimal across global primary and specialist care settings [12–18], and it does not provide resource-stratified recommendations. Moreover, many patients with COPD are managed in primary care settings, which presents unique challenges. Family physicians, nurse practitioners, physician assistants, and others report a lack of awareness and application of COPD guidelines, as well as limited knowledge of the potential, clinical benefits of pharmacologic and non-pharmacologic interventions including pulmonary rehabilitation [73]. Additionally, primary care physicians are limited in their time allocation to the individual patient [74]. Consequently, misdiagnosis and misclassification of patients with COPD occur more commonly in primary than in specialist care settings [75]. Indeed, results from a global survey of more than 50,000 physicians reported that respiratory specialists devoted greater attention to spirometry or the trajectory of disease, while primary care physicians primarily

focused on treatment history and symptoms for diagnosis and determination of treatment [76]. The National Asthma and Chronic Obstructive Pulmonary Disease Audit Program reported that in the UK, receipt of specialist care for COPD within 24 h of hospitalization was associated with reduced inpatient mortality and increased smoking cessation initiatives [77]. Thus, streamlined referral pathways should be developed to ensure effective, timely, and appropriate transfer of patients through the respective healthcare system. To that effect, respiratory therapists who work in a variety of settings from critical and acute care to primary and home care can make a substantial contribution to respiratory care, by addressing the cardiorespiratory health needs of the community, providing health education, improving respiratory care policies and protocols, and developing respiratory treatment protocols [78]. Pharmacists also may support individuals with COPD by addressing questions on appropriate medication usage, frequency of administration, and treatment-emergent adverse effects, as well as redirecting them to pulmonary specialists, when required [79]. In terms of access to specialist care, distance to healthcare services may present challenges, with important consequences for health and well-being. Indeed, results from a study which assessed country-level geographic accessibility to pulmonologists for adults with COPD in the USA reported that only 34.5% of patients living in rural areas had access to at least one pulmonologist available within a 10-mile radius of their residence in 2013 [80]. Although telehealth consultations can overcome geographical barriers, virtual diagnostic testing has its own limitations [81]. For instance, although smart phone-connected spirometry equipment may be useful for monitoring patients with an existing diagnosis of COPD, its application in the diagnosis of new cases of COPD has not been fully investigated [82]. In addition, it may not be a viable, long-term option for all patients with severe disease. Nevertheless, it is essential that patient care is not restricted by digital exclusions irrespective of geography or socioeconomic background.

The management of COPD includes both pharmacological and nonpharmacological

treatment options [1]. However, several notable gaps exist in patient access to appropriate and affordable care. Despite the GOLD recommendations for inhaled bronchodilator-based maintenance therapy [1], approximately two-thirds of all patients were not prescribed maintenance, inhalation therapy based on a retrospective analysis of medical and pharmacy claims data in more than 50,000 US patients [83]. Results from an analysis of UK patients with both established COPD and those initiating maintenance therapy reported that up to three-quarters of patients who experienced at least two exacerbations were undertreated [13] according to GOLD 2019 recommendations. Importantly, patients should have access not only to evidence-based treatments but also to the most cost-effective therapies, which facilitate effective COPD management within often limited healthcare budgets [84]. Correct inhaler technique is also essential to the optimal management of COPD. Therefore, patients should receive training in proper inhaler technique, which should be regularly re-evaluated by a healthcare practitioner. The choice of inhaler device should be tailored to the needs of the individual patient, acknowledging a number of factors, such as the cost of the drug, patient preference, and ensuring freedom of choice for inhalation therapy [1]. Nonpharmacological interventions complement pharmacological treatments and should be recommended to patients as part of their comprehensive COPD management plan [1]. In particular, post-discharge pulmonary rehabilitation has been reported to reduce mortality in patients hospitalized for a recent exacerbation [85]. As limited access to support with smoking cessation, pulmonary rehabilitation, and immunizations impedes effective COPD management [86], such nonpharmacological treatments should be made more readily accessible to patients.

Essential Criterion 3A

Patients should have access to timely assessment, diagnosis, and medical intervention, either in institutional or community settings, and healthcare systems should have established and reliable referral systems in place to

transition patients from primary care to secondary or tertiary care when required.

Essential Criterion 3B

Patients should have access to the most cost-effective and optimal, evidence-based pharmacological and non-pharmacological treatments informed by clinical guidelines.

Quality Indicators/Metrics

1. Proportion of patients who have consulted a respiratory specialist or practitioner with expertise in respiratory medicine (including those in primary care) in accordance with local or national guidelines.
2. Time from clinical suspicion of COPD to a spirometry-confirmed diagnosis of COPD.
3. Time from confirmation of a COPD diagnosis to review by a specialist (as defined above) as soon as the need for referral to specialist care is established in accordance with local or national guidelines.
4. Proportion of patients with COPD whose care conforms to the latest evidence-based treatment recommendations, including access to smoking cessation programs, vaccinations, pulmonary rehabilitation, and inhaled or oral pharmacotherapy.

Quality Standard Position Statement 4 (Post-exacerbation Management)

Patients should undergo timely review of their management plan following recovery from an acute COPD exacerbation to prevent or mitigate recurrent exacerbations and/or disease progression.

Rationale

Patients report exacerbations, which often result in hospital admissions or emergency department visits, as the most disruptive aspect of living with COPD [87]. Furthermore, COPD exacerbations increase the risk of cardiovascular events, including myocardial infarction, stroke [88], and mortality [89], and accelerate decline in lung function, which is often irreversible [89, 90]. In addition, a history of exacerbations

strongly predicts future exacerbations [91]. Indeed, results from a large database claims study including more than 70,000 plan members hospitalized for the first time for a coded diagnosis of COPD and followed for up to 17 years found that the risk of a subsequent, severe exacerbation increased three-fold after the second exacerbation and 24-fold after the tenth exacerbation versus the first exacerbation [92]. However, medical reviews of both patients with COPD and their management plans remain suboptimal [32], with only one-quarter of patients with an exacerbation history estimated to receive adequate follow-up reassessment [93]. Whenever and wherever possible, patients hospitalized following a COPD exacerbation should receive care from a respiratory specialist team and at discharge be provided with a personalized written and/or digital management plan [94]. As the results from a population-based cohort study reported that over one in every five patients with COPD died within a year of their discharge [95], patients also should be re-evaluated within 2 weeks of discharge with the objective of optimizing their therapeutic regimen to improve clinical outcomes [26]. Although exacerbations often require treatment with systemic corticosteroids or antibiotics [1], both drug classes increase the risk of adverse effects. Long-term use of systemic corticosteroids is linked to osteoporosis, hyperglycemia, susceptibility to infections, ocular complications, and cardiovascular events [96], while inappropriate use of antibiotics may promote bacterial resistance [97]. Therefore, patients should be educated on the importance of both preventing and managing an exacerbation, and the need for adequate follow-up to minimize their negative impacts [90].

Essential Criterion 4

Following a COPD exacerbation, patients should be reviewed within 2 weeks of onset of treatment of a non-hospitalized exacerbation or following an exacerbation-related hospital discharge to ensure treatment optimization.

Quality Indicator/Metrics

1. Proportion of patients receiving a review within 2 weeks of onset of treatment of a non-hospitalized exacerbation or 2 weeks following an exacerbation-related hospital discharge and overall time from onset of an exacerbation to a post-exacerbation review.
2. Proportion of patients referred for pulmonary rehabilitation after an exacerbation.

Quality Standard Position Statement 5 (Regular Patient Review)

All patients with COPD should be evaluated annually regardless of their exacerbation history, and more frequently with the occurrence of exacerbations, to ensure the appropriateness and adequacy of their tailored care plan.

Rationale

COPD exacerbations are often a portal into the healthcare system, with patients directly interacting with healthcare practitioners during those events. However, healthcare systems also should accommodate and assist patients who do not experience exacerbations or those whose symptoms overlap with other respiratory diseases [98]. Even patients with seemingly stable disease require regular re-evaluation to proactively assess current levels of symptom control, the presence of comorbidities, physical activity levels and exercise capacity, and requirements for adjusted, different or additional treatment [1]. Healthcare practitioners also should assess therapeutic effectiveness and potential treatment-related adverse effects to determine whether any modifications to pharmacological treatment or the introduction of nonpharmacological modalities are warranted. Accordingly, patient action plans should be reviewed and updated as needed [1]. Patients with COPD should be reevaluated at least annually for treatment adherence, inhalation technique, treatment side effects, mild (self-treated) exacerbations and their management, follow-up spirometry (if appropriate), and a risk assessment according to GOLD. In addition, healthcare practitioners should facilitate

caregiver attendance at follow-up appointments, so that their unique perception of the health of the patient can be discussed [99]. As COPD is associated with substantial cognitive, mobility, and auditory disability [100], a holistic approach to preventive care, smoking cessation, pulmonary rehabilitation, and patient and caregiver education that extends beyond exacerbation management should be considered.

Essential Criterion 5

Regardless of exacerbation status, all patients with COPD should have access to a suitably trained practitioner for an annual review.

Quality Indicator/Metrics

1. Proportion of patients with a confirmed diagnosis of COPD who receive a review at least annually.

DISCUSSION

Despite the availability of several, published, evidence-based guidelines, including the GOLD recommendations, significant gaps remain in the prevention and identification of COPD and the subsequent care of patients with this chronic disease. Therefore, this group of clinicians and patient advocates drawn from different global healthcare systems convened to co-develop five quality standard position statements, with the aim of improving care for all patients with COPD. These quality standards retain patient-centricity as defined in the previously published COPD patient charter principles [32]; however, they are refined further to provide healthcare practitioners, policymakers, patients, and caregivers an overview of high-quality, priority COPD care to drive meaningful improvements in disease management worldwide based on the best available evidence.

While these quality standard position statements are ambitious and broad in scope, we believe provisions for customization make them measurable and achievable within a regional or national healthcare system. To that effect, all quality standards must be tailored to the specific needs of individual healthcare systems and



Fig. 4 Key features of COPD quality standards. *COPD* chronic obstructive pulmonary disease

indicators measured in the context of local healthcare infrastructures (Fig. 4). The extent of their implementation can be monitored by measuring each quality indicator with the most appropriate method for individual healthcare systems. This could range from case-finding tools, validated questionnaires or interviews, electronic medical records (EMRs), insurance claims and local databases to clinical audits. However, it is essential that the inherent limitations of each method are considered while interpreting findings. For example, the use of an EMR as a measurable and auditable practice-based quality improvement tool is based on the assumption that healthcare professionals routinely and accurately record data in the EMRs [101]. Although patient surveys and questionnaires may complement EMRs, they may be impacted by self-reporting and recall bias [102]. The use of a clinical audit, which consists of measuring a clinical outcome or a process

against well-defined standards set on the principles of evidence-based medicine [52], overcomes some of the limitations of both EMRs and patient surveys and questionnaires. Nevertheless, we have refrained from making specific recommendations for the measurement of each quality indicator to enable their adaptation in line with the infrastructure and resources available within individual healthcare systems. We also acknowledge that not every position statement will apply to all target groups. Primary, community, secondary, and tertiary care services should ensure that reliable and efficient referral pathways are firmly established to facilitate the smooth transition of patients from one level of care to the next, when required. The existing knowledge gap among primary care clinicians in navigating referral pathways potentially could be bridged by appropriate continuing medical education (CME) that focuses on the parameters, which warrant

referral of patients with COPD to pulmonary specialists in a timely manner. In addition, healthcare practitioners should ensure that they receive adequate training and pursue CME in the conduct and interpretation of spirometry and correct inhaler technique. They also should improve their awareness, adoption, and application of the most recent evidence-based treatment guidelines COPD case management. Policymakers should ensure that adequate provisions and incentives are established at a national level and create a framework by which to optimize COPD care with expanded educational programs specifically designed for healthcare practitioners, patients, and caregivers; improve patient access to specialist care and treatments; and prioritize the management of COPD to a level proportionate with its public health importance. Patients with COPD should receive ongoing instructions on risk factors, earlier recognition of symptoms and onset of exacerbations, self-management strategies, and active engagement in shared decision-making as informed partners with their healthcare practitioners to optimize treatment outcomes.

To date, several global initiatives have been undertaken to improve the accessibility, affordability, and quality of COPD care. The WHO Global NCDs Action Plan (2013–2020) aims to reduce the preventable and avoidable burden of morbidity, mortality, and disability due to NCDs, including COPD, through multi-sector cooperation at global, national, and regional levels so that NCDs no longer present a barrier to overall patient well-being or socio-economic development [23]. The Breathe Vision publication from the European Lung Health Group envisions that by 2030, diagnosis, cure, and disease management should be central to respiratory health policy decisions [103]. The UN Decade of Healthy Ageing (2021–2030) program represents a global collaboration that links governments, civil societies, international agencies, professionals, academia, the media, and the private sector with the goal of improving the lives of older persons, their families, and the communities in which they live [24]. This objective is particularly relevant to COPD as the condition most commonly affects middle-aged or older adults, with increasing age being a

specific risk factor for development of the disease [1]. The US COPD National Action Plan describes practical ways by which to educate the public about COPD and improve its prevention, diagnosis, and treatment, aligning policy and program recommendations with actionable opportunities [104]. The Collaboration on Quality Improvement Initiative for Achieving Excellence in Standards of COPD Care (CONQUEST) program, the first collaborative “interventional” COPD registry with an integrated quality improvement program, mobilizes targeted, risk-based management through enhanced, patient-centric clinical assessment [29]. CONQUEST will also demonstrate that quality standards can be integrated into the healthcare system, necessitating fundamental improvements in clinical practice patterns [29]. We anticipate that the development of these global quality standard position statements together with the aforementioned ongoing global initiatives will ensure that this disease is better understood and positioned as a public health priority with global implications and target goals to reduce COPD mortality.

We acknowledge that a number of factors may impede the widespread implementation of these COPD quality standard position statements, specifically the disparity between well-resourced, robust healthcare systems and those with limited resources and infrastructure. Therefore, the innate differences in healthcare infrastructure and delivery systems, health literacy, and cultural norms across countries may command certain adaptations [105]. With low- and middle-income countries confronting different healthcare priorities, a “one size fits all” approach to timely, accurate COPD diagnosis and optimal treatment and sustained control will not succeed. As such, further refinements to the quality standard position statements may be required on the basis of local healthcare needs, models, and resources. We believe that these global quality standard position statements lend themselves to regional or national adaptation. Thus, healthcare systems could modify and implement these quality standard position statements, measure the quality indicators, determine the degree of alignment with or departure from a model standard of care, revise

the quality improvement plan as needed, remeasure the indicators, and identify a trajectory of quality improvement to establish further aspirational goals.

We acknowledge that this publication represents a first step toward awareness and subsequent policy revisions. It is essential that further strategies are launched to ensure the dissemination and long-term implementation of these global quality standards. In this regard, we have proposed quality indicators for each quality standard position statement. For active dissemination of these global quality standards, a practical yet adaptable “tool kit” should be developed with a variety of platforms and programs, including print media, social media, and multichannel awareness, to maximize its outreach among patients, caregivers, healthcare practitioners, and policymakers. These platforms may be leveraged to disseminate simple, educational infographics with intuitive visual elements that can be shared with patients and healthcare practitioners, through both post-graduate CME courses and social media. Finally, as governments and healthcare systems recover from the COVID-19 global pandemic, prioritizing COPD as a public health issue may support the recovery and sustainability of healthcare systems by reducing the unnecessary burden on emergency services and the overall HCRU associated with chronic respiratory diseases.

CONCLUSION

In summary, the global quality standard position statements put forth in this publication aim to provide the core elements of essential, universal care for patients with COPD, based on high-quality evidence that should be embedded in global health systems to foster improvements in clinical outcomes. We urge policymakers and healthcare practitioners alike to identify COPD as a global public health priority and to consider these global quality standard position statements as a critical step ensuring consistent delivery of care for patients with COPD across all stages of the disease.

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