

Global Initiative for Chronic
Obst obstructive
Lung
Disease 2006



Description of Levels of Evidence

Evidence Category	Sources of Evidence
A	Randomized controlled trials (RCTs). Rich body of data
B	Randomized controlled trials (RCTs). Limited body of data
C	Nonrandomized trials Observational studies.
D	Panel consensus judgment

GOLD Objectives

- Increase awareness of COPD among health professionals, health authorities, and the general public.
- Improve diagnosis, management and prevention of COPD.
- Stimulate research in COPD.

Global Strategy for Diagnosis, Management and Prevention of COPD

- Definition, Classification
- Burden of COPD
- Risk Factors
- Pathogenesis, Pathology, Pathophysiology
- Management
- Practical Considerations

Definition of COPD

- COPD is a preventable and treatable disease with some significant extrapulmonary effects that may contribute to the severity in individual patients.
- Its pulmonary component is characterized by airflow limitation that is not fully reversible.
- The airflow limitation is usually progressive and associated with an abnormal inflammatory response of the lung to noxious particles or gases.

Classification of COPD Severity by Spirometry

Stage I: Mild

$FEV_1/FVC < 0.70$

$FEV_1 \geq 80\%$ predicted

Stage II: Moderate

$FEV_1/FVC < 0.70$

$50\% \leq FEV_1 < 80\%$ predicted

Stage III: Severe

$FEV_1/FVC < 0.70$

$30\% \leq FEV_1 < 50\%$ predicted

Stage IV: Very Severe

$FEV_1/FVC < 0.70$

$FEV_1 < 30\%$ predicted *or*
 $FEV_1 < 50\%$ predicted *plus*
chronic respiratory failure

"At Risk" for COPD

- COPD includes four stages of severity classified by spirometry.
- A fifth category--*Stage 0: At Risk*--that appeared in the 2001 report is no longer included as a stage of COPD, as there is incomplete evidence that the individuals who meet the definition of "At Risk" (chronic cough and sputum production, normal spirometry) necessarily progress on to *Stage I: Mild COPD*.
- The public health message is that chronic cough and sputum are not normal remains important - their presence should trigger a search for underlying cause(s).

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Burden of COPD: Key Points

- COPD is a leading cause of morbidity and mortality worldwide and results in an economic and social burden that is both substantial and increasing.
- COPD prevalence, morbidity, and mortality vary across countries and across different groups within countries.
- The burden of COPD is projected to increase in the coming decades due to continued exposure to COPD risk factors and the changing age structure of the world's population.

Burden of COPD: Key Points

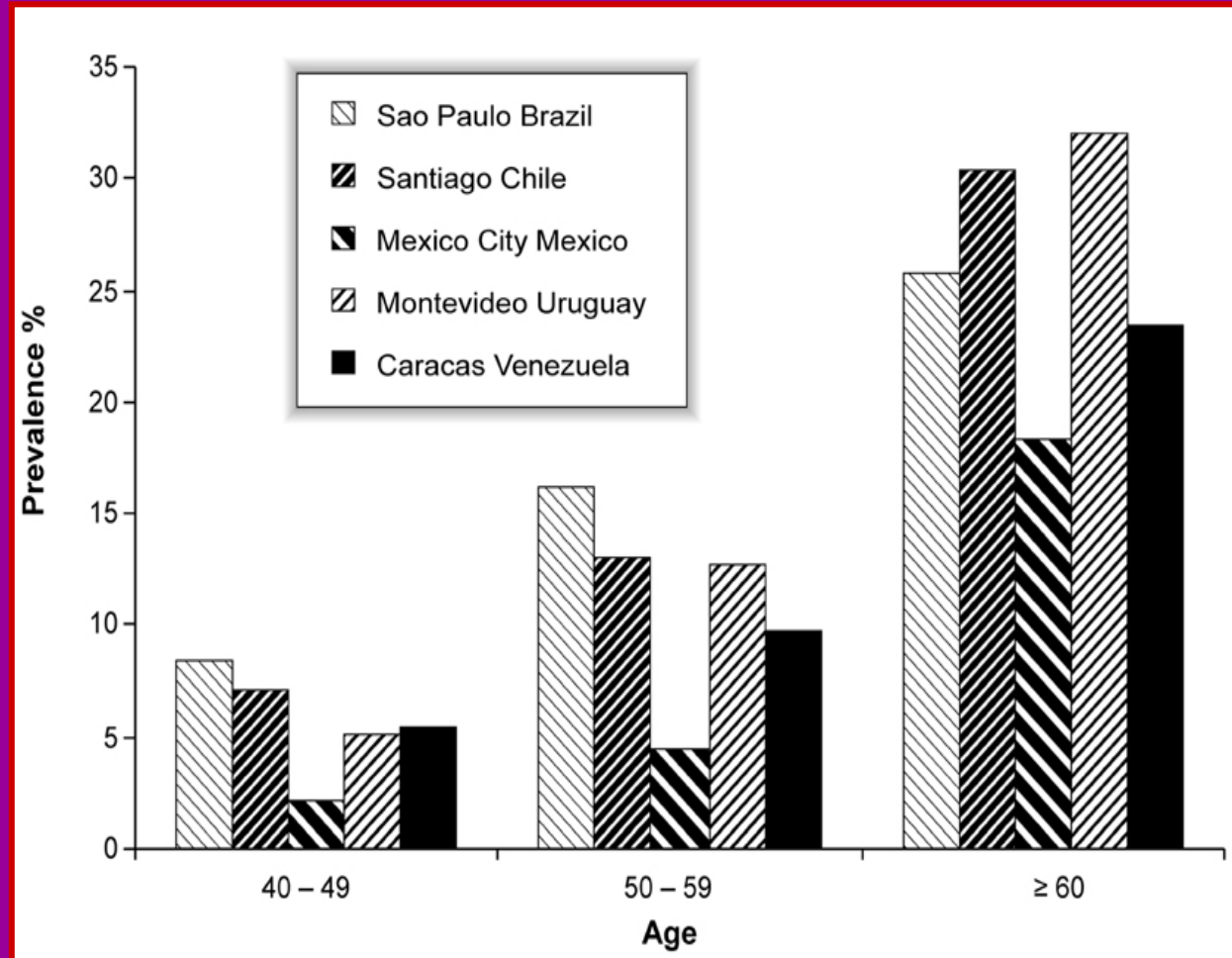
- COPD is a costly disease with both direct costs and indirect costs.
- COPD will be fifth leading cause of DALY, which signifies its impact on society.

Burden of COPD: Prevalence

- Many sources of variation can affect estimates of COPD prevalence, including e.g., sampling methods, response rates and quality of spirometry.
- Data are emerging to provide evidence that prevalence of *Stage I: Mild COPD* and higher is appreciably higher in:
 - smokers and ex-smokers
 - people over 40 years of age
 - males

COPD Prevalence Study in Latin America

The prevalence of post-bronchodilator $FEV_1/FVC < 0.70$ increases steeply with age in 5 Latin American Cities

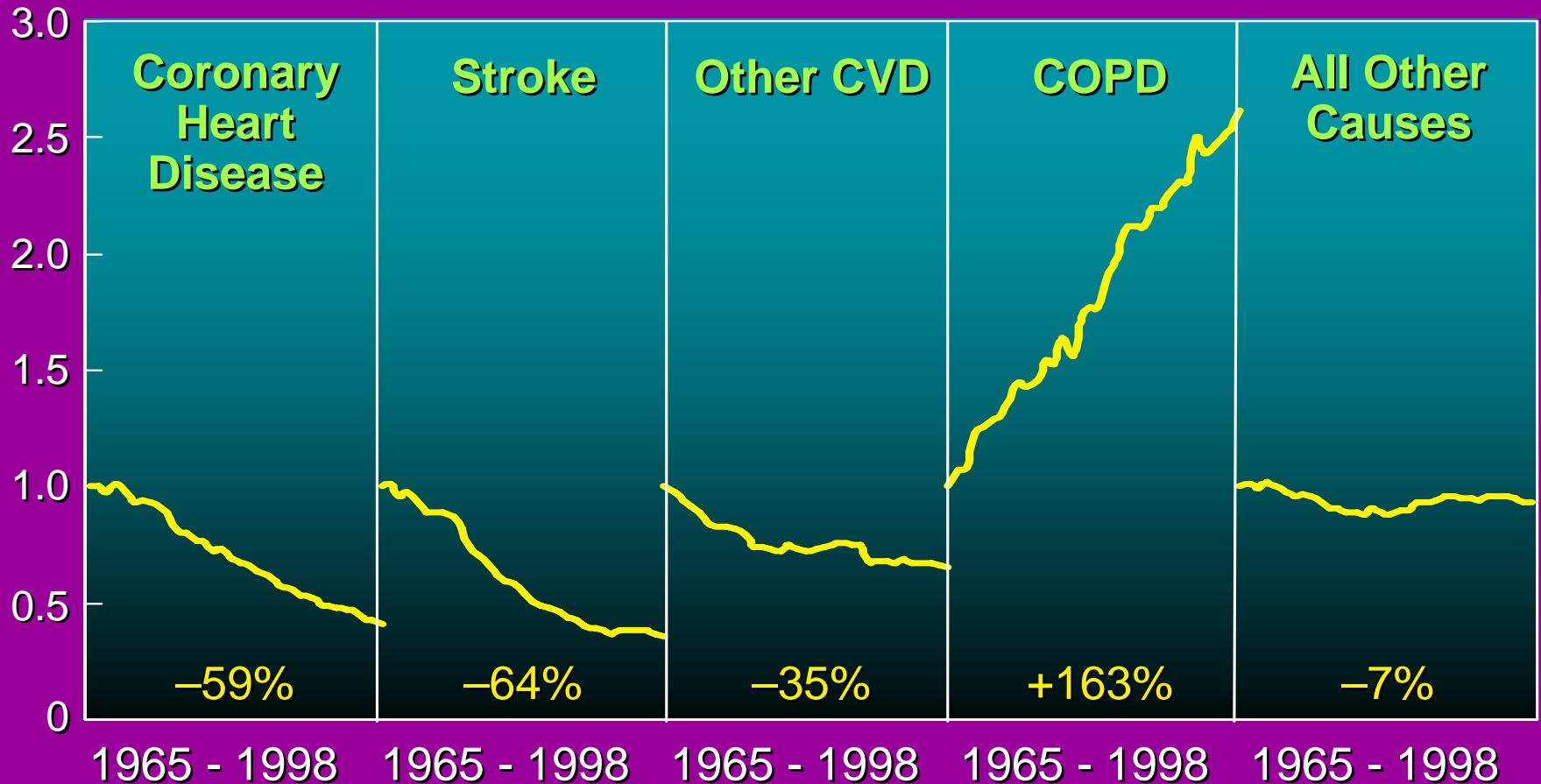


Burden of COPD: Mortality

- COPD is a leading cause of mortality worldwide and projected to increase in the next several decades.
- COPD mortality trends generally track several decades behind smoking trends.
- In the US and Canada, COPD mortality for both men and women have been increasing.
- In the US in 2000, the *number* of COPD deaths was greater among women than men.

Percent Change in Age-Adjusted Death Rates, U.S., 1965-1998

Proportion of 1965 Rate



Source: NHLBI/NIH/DHHS

Global Strategy for Diagnosis, Management and Prevention of COPD

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- **Risk Factors**
- Pathogenesis, Pathology, Pathophysiology
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Risk Factors for COPD

Genes

Exposure to particles

- Tobacco smoke
- Occupational dusts, organic and inorganic
- Indoor air pollution from heating and cooking with biomass in poorly ventilated dwellings
- Outdoor air pollution

Lung growth and development

Oxidative stress

Gender

Age

Respiratory infections

Socioeconomic status

Nutrition

Comorbidities

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INFLAMMATION IN COPD

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graph TD; A[INFLAMMATION IN COPD] --> B[Small airway disease]; A --> C[Parenchymal destruction]; B --> D[AIRFLOW LIMITATION]; C --> D;
```

Small airway disease

Airway inflammation
Airway remodeling

Parenchymal destruction

Loss of alveolar attachments
Decrease of elastic recoil

AIRFLOW LIMITATION

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Four Components of COPD Management

1. Assess and monitor disease
2. Reduce risk factors
3. Manage stable COPD
 - Education
 - Pharmacologic
 - Non-pharmacologic
4. Manage exacerbations

GOALS of COPD MANAGEMENT

VARYING EMPHASIS WITH DIFFERING SEVERITY

- Relieve symptoms
- Prevent disease progression
- Improve exercise tolerance
- Improve health status
- Prevent and treat complications
- Prevent and treat exacerbations
- Reduce mortality
- minimize side effects from T/t

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Management of Stable COPD

Assess and Monitor COPD: Key Points

- A clinical diagnosis of COPD should be considered in any patient who has dyspnea, chronic cough or sputum production, and/or a history of exposure to risk factors for the disease.
- The diagnosis should be confirmed by spirometry, which is the gold standard for diagnosis and assessment. A post-bronchodilator $FEV_1/FVC < 0.70$ and $FEV_1 < 80\%$ predicted confirms the presence of airflow limitation that is not fully reversible.
- Comorbidities are common in COPD and should be actively identified.

Management of Stable COPD

Assess and Monitor COPD: Key Points

- Assessment of COPD severity is based on the patient's level of symptoms, the severity of spirometric abnormality, and the presence of complication
- Measurement of arterial blood gas tensions should be considered in all pt's with $FEV_1 < 50\%$ predicted or clinical sign suggestive of respiratory failure or right heart failure

Diagnosis of COPD

SYMPTOMS

cough
sputum
shortness of breath

EXPOSURE TO RISK FACTORS

tobacco
occupation
indoor/outdoor pollution

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graph TD; A[SYMPTOMS] --- B[EXPOSURE TO RISK FACTORS]; B --- C[SPIROMETRY];
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SPIROMETRY

Management of Stable COPD

Assess and Monitor COPD: Spirometry

- Spirometry should be performed after the administration of an adequate dose of a short-acting inhaled bronchodilator to minimize variability.
- A post-bronchodilator $FEV_1/FVC < 0.70$ confirms the presence of airflow limitation that is not fully reversible.
- Where possible, values should be compared to age-related normal values to avoid overdiagnosis of COPD in the elderly.

Differential Diagnosis: COPD and Asthma

COPD

- Onset in mid-life
- Symptoms slowly progressive
- Long smoking history
- Dyspnea during exercise
- Largely irreversible airflow limitation

ASTHMA

- Onset early in life (often childhood)
- Symptoms vary from day to day
- Symptoms at night/early morning
- Allergy, rhinitis, and/or eczema also present
- Family history of asthma
- Largely reversible airflow limitation

COPD and Co-Morbidities

COPD patients are at increased risk for:

- Myocardial infarction, angina
- Osteoporosis
- Respiratory infection
- Depression
- Diabetes
- Lung cancer

COPD and Co-Morbidities

COPD has significant extrapulmonary (systemic) effects including:

- Weight loss
- Nutritional abnormalities
- Skeletal muscle dysfunction

Monitor COPD progression and development of complication

- Pulmonary function: by periodic spirometry measurements
- ABG: for development of respiratory failure and its type
- Assessment of pulmonary art. Pressure
- Diagnosis of right heart failure and cor pulmonale
- Hematocrit :for polycythemia
- Exercise testing to measure exercise capacity
- Monitor comorbidities

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Management of Stable COPD

Reduce Risk Factors: Key Points

- Reduction of total personal exposure to tobacco smoke, occupational dusts and chemicals, and indoor and outdoor air pollutants are important goals to prevent the onset and progression of COPD.
- Smoking cessation is the single most effective — and cost effective — intervention in most people to reduce the risk of developing COPD and stop its progression (**Evidence A**).

Brief Strategies to Help the Patient Willing to Quit Smoking

- **ASK** Systematically identify all tobacco users at every visit.
- **ADVISE** Strongly urge all tobacco users to quit.
- **ASSESS** Determine willingness to make a quit attempt.
- **ASSIST** Aid the patient in quitting.
- **ARRANGE** Schedule follow-up contact.

Management of Stable COPD

Reduce Risk Factors: Smoking Cessation

- Counseling delivered by physicians and other health professionals significantly increases quit rates over self-initiated strategies. Even a brief (3-minute) period of counseling to urge a smoker to quit results in smoking cessation rates of 5-10%.
- Numerous effective pharmacotherapies for smoking cessation are available and pharmacotherapy is recommended when counseling is not sufficient to help patients quit smoking.

Management of Stable COPD

Reduce Risk Factors: Indoor/Outdoor Air Pollution

- Reducing the risk from indoor and outdoor air pollution is feasible and requires a combination of public policy and protective steps taken by individual patients.
- Reduction of exposure to smoke from biomass fuel, particularly among women and children, is a crucial goal to reduce the prevalence of COPD worldwide.

Four Components of COPD Management

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Management of Stable COPD

Manage Stable COPD: Key Points

- The overall approach to managing stable COPD should be individualized to address symptoms and improve quality of life.
- For patients with COPD, health education plays an important role in smoking cessation (**Evidence A**) and can also play a role in improving skills, ability to cope with illness and health status.
- None of the existing medications for COPD have been shown to modify the long-term decline in lung function that is the hallmark of this disease (**Evidence A**). Therefore, pharmacotherapy for COPD is used to decrease symptoms and/or complications.

Management of Stable COPD

Pharmacotherapy: Bronchodilators

- Bronchodilator medications are central to the symptomatic management of COPD (**Evidence A**). They are given on an as-needed basis or on a regular basis to prevent or reduce symptoms and exacerbations.
- The principal bronchodilator treatments are β_2 -agonists, anticholinergics, and methylxanthines used singly or in combination (**Evidence A**).
- Regular treatment with long-acting bronchodilators is more effective and convenient than treatment with short-acting bronchodilators (**Evidence A**).

Management of Stable COPD

Pharmacotherapy: Glucocorticosteroids

- The addition of regular treatment with inhaled glucocorticosteroids to bronchodilator treatment is appropriate for symptomatic COPD patients with an FEV₁ < 50% predicted (*Stage III: Severe COPD and Stage IV: Very Severe COPD*) and repeated exacerbations (**Evidence A**).
- An inhaled glucocorticosteroid combined with a long-acting β_2 -agonist is more effective than the individual components (**Evidence A**).

Management of Stable COPD

Pharmacotherapy: Glucocorticosteroids

- The dose-response relationships and long-term safety of inhaled glucocorticosteroids in COPD are not known.
- Chronic treatment with systemic glucocorticosteroids should be avoided because of an unfavorable benefit-to-risk ratio (**Evidence A**).

Management of Stable COPD

Pharmacotherapy: Vaccines

- In COPD patients influenza vaccines can reduce serious illness (**Evidence A**).
- Pneumococcal polysaccharide vaccine is recommended for COPD patients 65 years and older and for COPD patients younger than age 65 with an $FEV_1 < 40\%$ predicted (**Evidence B**).

Management of Stable COPD

All Stages of Disease Severity

- Avoidance of risk factors
 - smoking cessation
 - reduction of indoor pollution
 - reduction of occupational exposure
- Influenza vaccination

Therapy at Each Stage of COPD

I: Mild

II: Moderate

III: Severe

IV: Very Severe

- $FEV_1/FVC < 70\%$
- $FEV_1 \geq 80\%$

- $FEV_1/FVC < 70\%$
- $50\% \leq FEV_1 < 80\%$ predicted

- $FEV_1/FVC < 70\%$
- $30\% \leq FEV_1 < 50\%$ predicted

- $FEV_1/FVC < 70\%$
- $FEV_1 < 30\%$ predicted
or $FEV_1 < 50\%$ predicted plus chronic respiratory failure

Active reduction of risk factor(s); influenza vaccination

Add short-acting bronchodilator (when needed)

Add regular treatment with one or more long-acting bronchodilators (when needed); **Add** rehabilitation

Add inhaled glucocorticosteroids if repeated exacerbations

Add long term oxygen if chronic respiratory failure.
Consider surgical treatments

Management of Stable COPD

Other Pharmacologic Treatments

- **Antibiotics:** Only used to treat infectious exacerbations of COPD
- **Antioxidant agents:** No effect of n-acetylcysteine on frequency of exacerbations, except in patients *not* treated with inhaled glucocorticosteroids
- **Mucolytic agents, Antitussives, Vasodilators:** Not recommended in stable COPD

Management of Stable COPD

Non-Pharmacologic Treatments

- **Rehabilitation:** All COPD patients benefit from exercise training programs, improving with respect to both exercise tolerance and symptoms of dyspnea and fatigue (**Evidence A**).
- **Oxygen Therapy:** The long-term administration of oxygen (> 15 hours per day) to patients with chronic respiratory failure has been shown to increase survival (**Evidence A**).

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Management COPD Exacerbations

Key Points

An exacerbation of COPD is defined as:

“An event in the natural course of the disease characterized by a change in the patient’s baseline dyspnea, cough, and/or sputum that is beyond normal day-to-day variations, is acute in onset, and may warrant a change in regular medication in a patient with underlying COPD.”

Management COPD Exacerbations

Key Points

- The most common causes of an exacerbation are infection of the tracheobronchial tree and air pollution, but the cause of about one-third of severe exacerbations cannot be identified (**Evidence B**).
- Patients experiencing COPD exacerbations with clinical signs of airway infection (e.g., increased sputum purulence) may benefit from antibiotic treatment (**Evidence B**).

Manage COPD Exacerbations

Key Points

- Inhaled bronchodilators (particularly inhaled β_2 -agonists with or without anticholinergics) and oral glucocorticosteroids are effective treatments for exacerbations of COPD (**Evidence A**).

Management COPD Exacerbations

Key Points

- Noninvasive mechanical ventilation in exacerbations improves respiratory acidosis, increases pH, decreases the need for endotracheal intubation, and reduces PaCO₂, respiratory rate, severity of breathlessness, the length of hospital stay, and mortality (**Evidence A**).
- Medications and education to help prevent future exacerbations should be considered as part of follow-up, as exacerbations affect the quality of life and prognosis of patients with COPD.

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KEY POINTS

- Better dissemination of COPD guidelines and their effective implementation in a variety of health care settings is urgently required.
- In many countries, primary care practitioners treat the vast majority of patients with COPD and may be actively involved in public health campaigns and in bringing messages about reducing exposure to risk factors to both patients and the public.

KEY POINTS

- Spirometric confirmation is a key component of the diagnosis of COPD and primary care practitioners should have access to high quality spirometry.
- Older patients frequently have multiple chronic health conditions. Comorbidities can magnify the impact of COPD on a patient's health status, and can complicate the management of COPD.

Global Strategy for Diagnosis, Management and Prevention of COPD: Summary

- COPD is increasing in prevalence in many countries of the world.
- COPD is a preventable and treatable disease with some significant extrapulmonary effects that may contribute to the severity in individual patients.
- Its pulmonary component is characterized by airflow limitation that is not fully reversible
- The airflow limitation is usually progressive and associated with an abnormal inflammatory response of the lung to noxious particles or gases

Summary

- COPD includes four stages of severity classified by spirometry.
- A fifth category--*Stage 0: At Risk*--that appeared in the 2001 report is no longer included as a stage of COPD, as there is incomplete evidence that the individuals who meet the definition of “At Risk” (chronic cough and sputum production, normal spirometry) necessarily progress on to *Stage I: Mild COPD*.
- The public health message is that chronic cough and sputum are not normal remains important - their presence should trigger a search for underlying cause(s).

Summary

- COPD can be prevented by avoidance of risk factors, the most notable being tobacco smoke.
- Patients with COPD have multiple other conditions (comorbidities) that must be taken into consideration.
- The GOLD program offers a strategy to identify patients and to treat them according to the best medications available.

Summary

- An exacerbation of COPD is defined as:

“An event in the natural course of the disease characterized by a change in the patient’s baseline dyspnea, cough, and/or sputum that is beyond normal day-to-day variations, is acute in onset, and may warrant a change in regular medication in a patient with underlying COPD.”

Summary

- In many countries, primary care practitioners treat the vast majority of patients with COPD and may be actively involved in public health campaigns and in bringing messages about reducing exposure to risk factors to both patients and the public. Hence identification of effective health care system depends on identification of effective local health care system.

All the best..