

COPD-an evidence based approach to treatment

Prof. Saiyeedur Rahman

Professor of Medicine

Mymensingh Medical College

Introduction

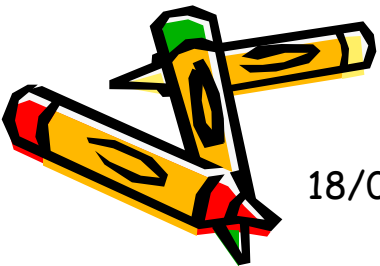
- ▶ COPD is a major cause of chronic morbidity & mortality.
- ▶ COPD is a preventable & treatable disease
- ▶ WHO → 2000: 4th leading cause of death
- ▶ Global burden disease study
1990: 6th leading cause of death
2020: 3rd leading cause of death.

COPD : Goals of management

- **Ultimate Goal: Disease prevention.**
- **Goals of diagnosed COPD management**
 - **Relieve symptoms**
 - **Prevent disease progression**
 - **Improve exercise tolerance & health status**

...COPD: Goals of management

- ▶ **Prevent and treat complications.**
- ▶ **Prevent and treat exacerbations**
- ▶ **Reduce mortality**
- ▶ **Accomplishment of all these in cost effective manner**



COPD : Management Plan



Four components:

- ▶ **Assess & Monitor Disease**
- ▶ **Reduce Risk Factors**
- ▶ **Manage Stable COPD**
- ▶ **Manage Exacerbations**



Assess & Monitor disease:



1. Diagnosis :

Key indicators - Dyspnoea

Chronic cough

Sputum production

H/O exposure to risk factor

Confirmation- Spirometry (Gold standard)

Post bronchodilator FEV1/FVC <0.70



Assess & Monitor disease

2. Assessment of severity

- ▶ level of symptoms
- ▶ Severity of Spirometric abnormality
- ▶ Presence of complication

COPD: Assess & Monitor disease

3. Identification of co-morbidities

4. Additional Investigations :

- ▶ Bronchodilator reversibility testing**
- ▶ CXR**
- ▶ Arterial blood gas measurements**
- ▶ α -1 anti trypsin screening**

...COPD: Assess & Monitor disease

5. Ongoing Monitoring and Assessment

A. Disease progression & complication

i. CIF

- ▶ any new/ worsening symptom
- ▶ Physical examination.

ii. Spirometry

iii. Arterial blood gas measurement

COPD: Assess & Monitor disease



...Ongoing Monitoring and Assessment

B. Pharmacotherapy & other medical treatment

C. Exacerbation

D. Comorbidity

COPD Management :

Reduce Risk factor



- **Smoking cessation**
- **Occupational dust & chemicals**
- **Indoor & outdoor air Pollution.**



Smoking cessation

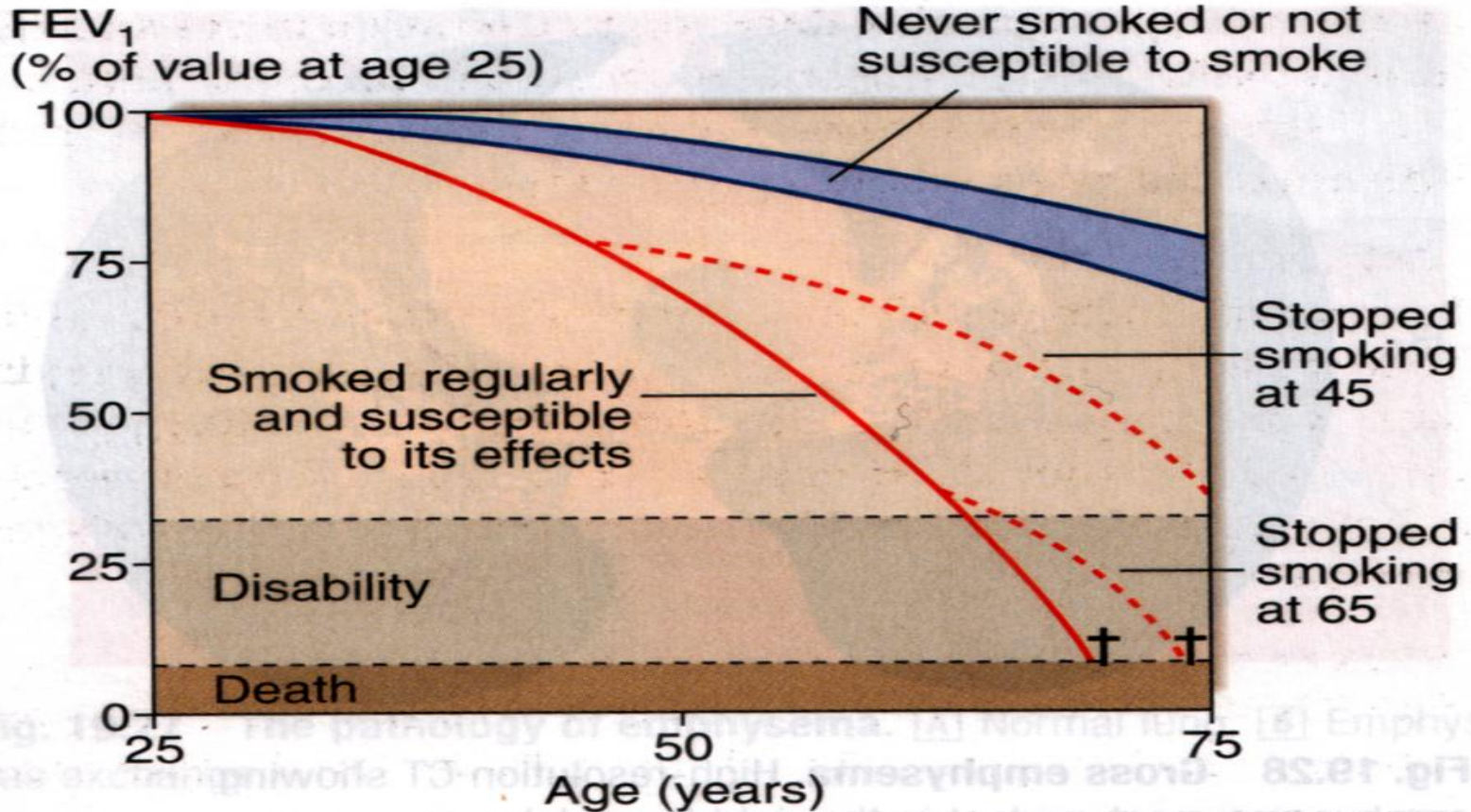


Fig. 19.30 Model of annual decline in FEV₁ with accelerated decline in susceptible smokers. When smoking is stopped, subsequent loss is similar to that in healthy non-smokers.

...Smoking cessation

- ▶ **Single most effective and cost-effective step towards prevention & control reduce the risk of developing COPD. (Evidence-A)**
- ▶ **Five steps program to help the patient to quit**
 - **ask about tobacco use**
 - **advised to quit**
 - **assess willingness to make a quit attempt**
 - **assist in quit attempt**
 - **arrange follow up**

...Smoking cessation



Pharmacotherapy :

1. Nicotine replacement therapy :
2. Bupropion- Nicotine receptor antagonist
3. Varenicline



Occupational exposure



Primary prevention by

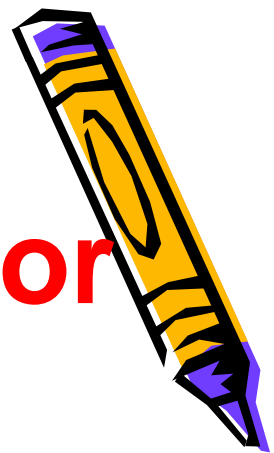
- ▶ Elimination/ reduction of exposure to various substances in workplace.

2ndary prevention through

- ▶ Surveillance & early case detection.



COPD : Indoor and outdoor Air pollution



Reduce/avoid air pollution from

- **Biomass fuel**
- **Cooking & heating in poorly ventilated dwellings.**

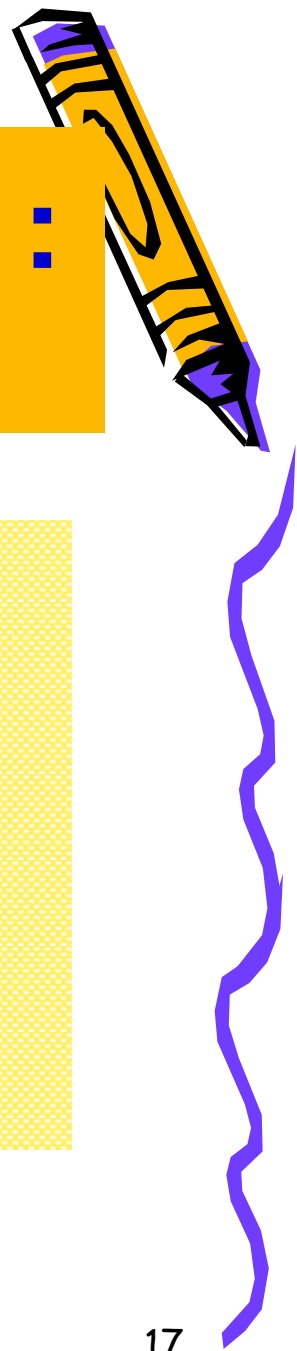


Modalities of management : Stable COPD

A. **Medical** –

1. Nonpharmacologic
2. Pharmacologic

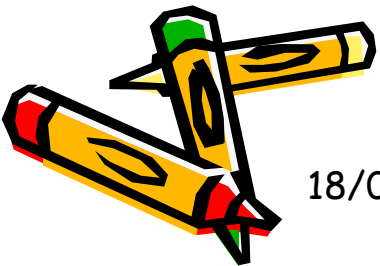
B. **Surgical**





Non-pharmacological treatment: ***Stable COPD***

- ◆ ***Pulmonary rehabilitation***
- ◆ ***O₂ therapy***
- ◆ ***Ventilatory support***



Stable COPD : Pulmonary rehabilitation



- **Ideal programme consist of**
 - **Exercise training**
 - **Education**
 - **Nutritional counselling**



Stable COPD : Exercise training



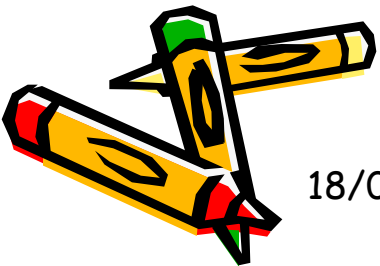
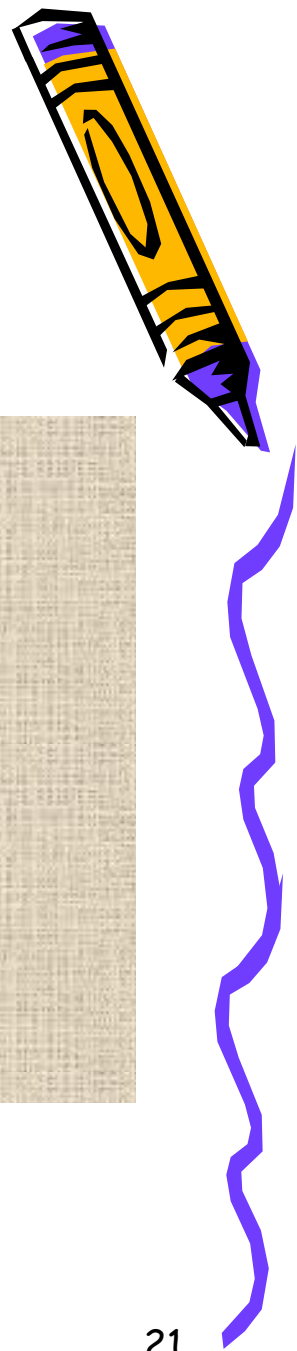
Exercise training can improve (Evidence-A)

- ▶ exercise tolerance,
- ▶ symptoms of dyspnoea,
- ▶ fatigue



Education: Stable COPD

- ▶ **Topics of education programme :**
 - ▶ **Smoking cessation**
 - ▶ **Basic information about COPD**
 - ▶ **General approach to therapy**
 - ▶ **Self management skills**



O₂ therapy: Stable COPD

- ▶ **Improve survival in COPD with chronic respiratory failure (Evidence-A)**
- ▶ **Prevent progression of PH**
- ▶ **O₂ is provided by nasal prongs for a minimum of 15 hrs/day.**



Stable COPD: O₂ therapy

Long term O₂ therapy is generally introduced in stage IV :

- ▶ PaO₂ ≤ 7.3 KPa (Evidence B)
- ▶ PaO₂ ≤ 7.3 – 8.0 KPa (Evidence D)
- ▶ Pulmonary hypertension
- ▶ Peripheral oedema (Suggestive CCF)



Stable COPD: Pharmacological management

- ▶ **Prevent & control symptoms.**
- ▶ **Reduce the frequency & severity of exacerbations.**
- ▶ **None of the medication modifies the long term decline in lung function (Evidence-A)**

Stable COPD: Pharmacological management:



A. Bronchodilators

**Central to symptomatic management
(Evidence A)**

B. Glucocorticoids

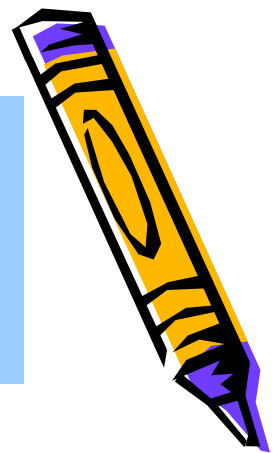


Pharmacological management: Stable COPD

C. Others

- ▶ Vaccines
- ▶ Alpha-1 antitrypsin augmentation therapy
- ▶ Antibiotics
- ▶ Mucolytic agents
- ▶ Anti-oxidant agents
- ▶ Immunoregulation
- ▶ Anti-tussives
- ▶ Narcotics (morphine)

Bronchodilators : Stable COPD



Common used bronchodilators

- ▶ **β -2 agonists**
- ▶ **Anticholinergics**
- ▶ **Methyl xanthines**



...Bronchodilators : Stable COPD

A. β -2 agonists

- Short acting : Salbutamol, Terbutaline
- Long Active- Salmeterol, formoterol

B. Anti cholinergic

- ▶ Short acting : Ipratropium Bromide, Oxitropium bromide,
- ▶ Long acting : Tiotropium bromide

C. Methyl xanthine

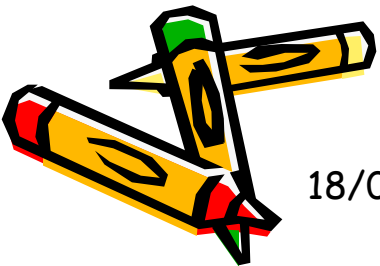
- ▶ Aminophylline, Theophylline

...Bronchodilators : Stable COPD

- ▶ Inhaled therapy is preferred
- ▶ Regular treatment with long acting bronchodilators are more effective and convenient (Evidence-A)
- ▶ Combining bronchodilators may improve the efficacy and decrease the risk of side effects

Anti- cholinergics: Stable COPD

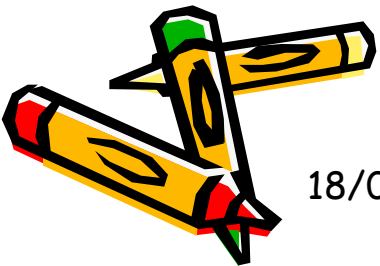
- ▶ Improves health status.
- ▶ Reduces the rate of COPD exacerbations.
- ▶ Improves the effectiveness of pulmonary rehabilitation.



Stable COPD : Theophylline

Beneficial effects:

- **Bronchodilation & Bronchoprotection**
- **Immunomodulation**
- **Reduce diaphragmatic muscle fatigue.**
- **Increase mucociliary clearance**



Glucocorticoids : Stable COPD

A. Inhaled glucocorticoids

- ▶ **Beclomethasone**
- ▶ **Budesonide**
- ▶ **Fluticasone**
- ▶ **Triamcinolone**

B. Systemic glucocorticoids

- ▶ **Prednisolone**
- ▶ **Methyl prednisolone**

...Glucocorticoids : Stable COPD

- ▶ Addition of inhaled glucocorticosteroids to bronchodilators is appropriate for
 - ▶ **Stage iii & iv COPD** (Evidence A)
 - ▶ **Repeated exacerbations** (Evidence A)



Others Pharmacological management : Stable COPD

▶ Vaccines

A. Influenzae vaccines (Evidence A)

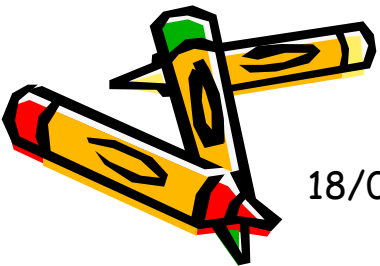
- ▶ reduce serious illness & death by 50%

B. Pneumococcal vaccine (Evidence-B)

- ▶ recommends for COPD patients 65 yrs older
- ▶ reduce CAP

...Others Pharmacological management : Stable COPD

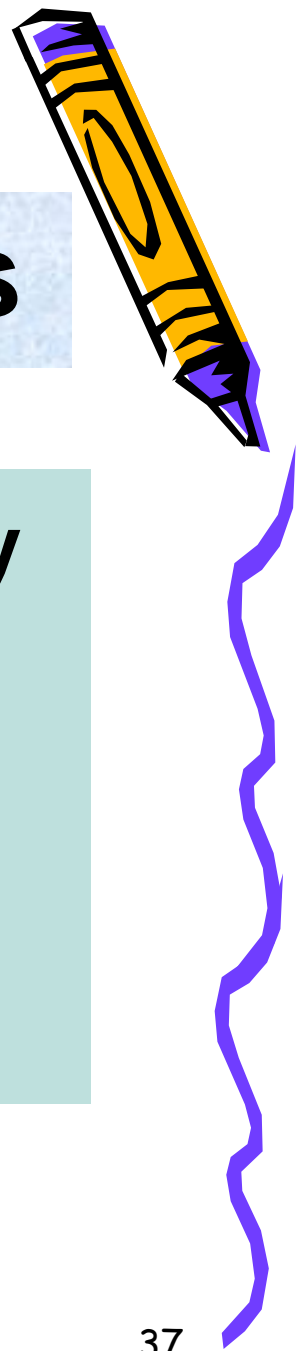
- ▶ Alpha-1 antitrypsin augmentation therapy
 - ▶ In severe hereditary α -1 antitrypsin deficiency
 - ▶ very expensive



Stable COPD: Antibiotics

- For treating infectious exacerbations of COPD (Evidence-A)
- Recommended for patients reporting an increase in
 - Sputum purulence
 - Sputum volume
 - Breathlessness

Stable COPD : Mucolytics



- Patients with viscous sputum may benefit from mucolytics
- Widespread use is not recommended (Evidence D)



Stable COPD : Other Pharmacological agents

▶ Anti-oxidant agents

▶ N-acetyl cysteine

- ▶ Could have a role in the treatment of recurrent exacerbation (Evidence-B)

▶ Immunoregulators


- ▶ Decrease severity & frequency of exacerbation



...Others Pharmacological management : Stable COPD



▶ Anti-tussive

- 
- ▶ Regular use is not recommended in COPD (Evidence-B)



Stable COPD: Other Pharmacological agents

- ▶ **Narcotics (morphine)**
 - ▶ Effective for treating dyspnoea in COPD patients with advanced disease.



COPD : Stepwise approach

I. Mild

II. Moderate

III. Severe

IV. Very severe

Reduce risk factors ; Influenza vaccination

Add short acting bronchodilator

Add one/more long acting bronchodilator

Add Rehabilitation

Add inhaled Glucocorticoids

Add long term O₂

Consider surgery

Stable COPD: Surgical Treatment



- Bullectomy
- Lung volume reduction surgery (LVRS)
- Lung transplantation



Management of Exacerbations

A. Home Management :

- ▶ Bronchodilator therapy
- ▶ Glucocorticoid
- ▶ Antibiotic

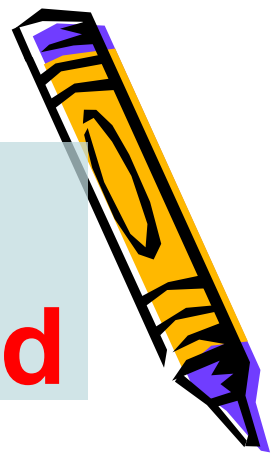
B. Hospital Management:

- ▶ Controlled O₂ therapy (corner stone)
- ▶ Bronchodilator therapy
- ▶ Glucocorticoid

...Hospital Management of Exacerbations

- ▶ **Antibiotic**
- ▶ **Respiratory stimulants**
- ▶ **Ventilator support**
- ▶ **Other measures**
 - ▶ **Fluid administration**
 - ▶ **Nutrition**
 - ▶ **DVT prophylaxis**
 - ▶ **Sputum clearance**

Management of Exacerbations: **Corticosteroid**



- ▶ Short course are recommended as addition to other therapy (Evidence-A)
- ▶ Effective and safe dose of prednisolone is 30-40 mg/d for 7-10 days. (Evidence-C)



Management of Exacerbations: Antibiotic

► Indication

- Exacerbation with three cardinal symptoms (Evidence-B)
- Exacerbation of two cardinal symptoms (Evidence-C)
- Severe exacerbation requiring mechanical ventilation (Evidence-B)

Management of Exacerbations: Respiratory stimulant

- ❖ Not recommended for acute resp. failure.
- ❖ Doxapram : Should be used only when NIV is not available/
recommended

Management of Exacerbations : NIV



NIV has revolutionized the management and survival of patients with an acidotic exacerbation of COPD

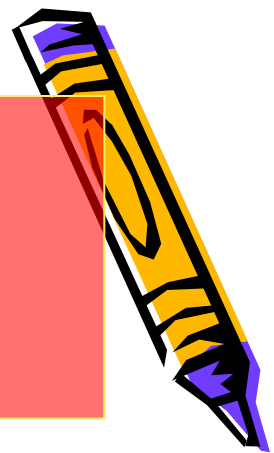


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Prof. Saiyeedur Rahman

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Management of Exacerbations: NIIV



NIIV provides two level form of respiratory support :

- 1. Inspiratory positive airway pressure**
- 2. Expiratory positive airway pressure**

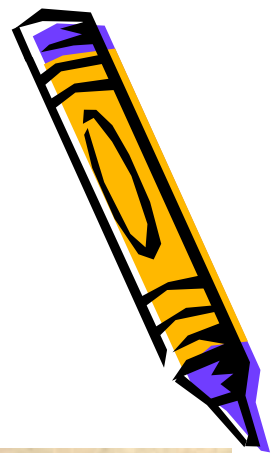


Management of Exacerbations: NIV Indication

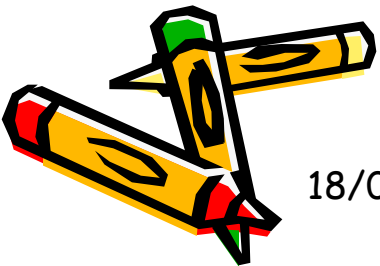
1. Moderate to severe dyspnoea with use of accessory muscle & paradoxical abdominal motion.
2. Moderate to severe acidosis.



Conclusion



- ▶ *COPD is usually a progressive disease*
- ▶ *Lung function worsen over time even with the best available care*
- ▶ *There is not yet a cure for COPD.*
- ▶ *But its progress can be slowed.*



...Conclusion

Evidence based medicine shows:

Most patients can regain some lung function with

- ▶ Smoking cessation
- ▶ Proper medication
- ▶ Appropriate supplementation
- ▶ Consistent physical activity
- ▶ The right attitude

With above all patient can enjoy a happier & more productive life



Thank You All