

10. ULUSAL



ATUDER
Acil Tıp Uzmanları Derneği

ACIL TIP KONGRESİ

1st INTERNATIONAL

EMERGENCY MEDICINE CONGRESS

COPD

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COPD

Global Initiative for Chronic Obstructive Lung Disease



**GLOBAL STRATEGY FOR THE DIAGNOSIS,
MANAGEMENT, AND PREVENTION OF
CHRONIC OBSTRUCTIVE PULMONARY DISEASE**

UPDATED 2014

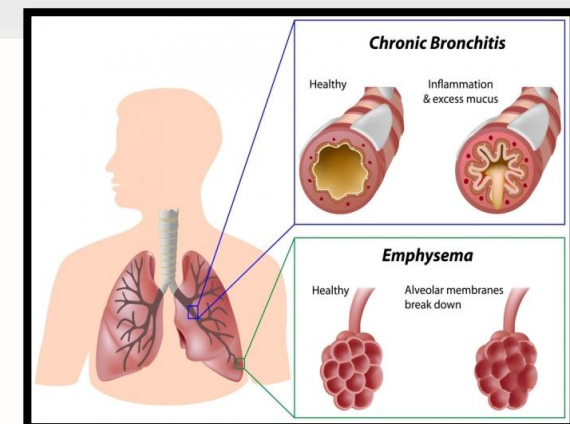
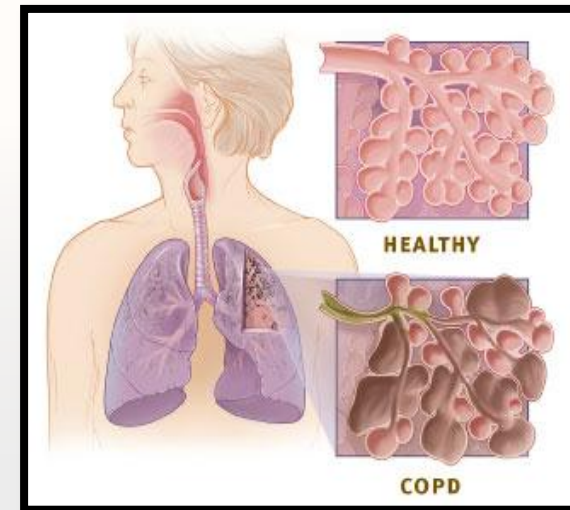
COPD

Chronic Obstructive Pulmonary Disease

- a common preventable and treatable disease
- progressive disease
- characterized by persistent airflow limitation
- associated with chronic inflammatory response

COPD is a leading cause of morbidity and mortality

COPD results in an economic and social burden



RISK FACTORS

➤ Tobacco smoke



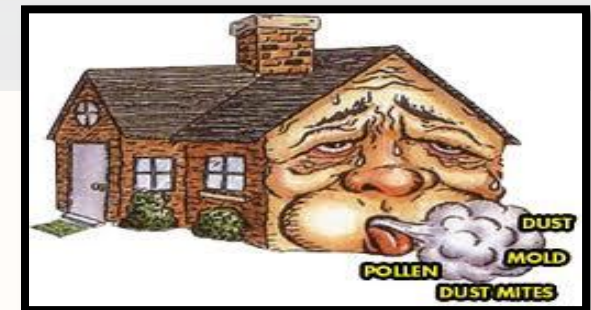
➤ Indoor air pollution

➤ Occupational dusts and chemicals



➤ Outdoor air pollution

➤ Hereditary deficiency of alpha-1 antitrypsin



➤ Any factor that affects lung growth during gestation and childhood

Diagnosis

Key indicators

- *Dyspnea*
progressive, worse with exercise, persistent
- *Chronic cough*
may be intermittent or unproductive
- *Chronic sputum*
any pattern
- History of exposure to risk factors
- Family history of COPD



DIAGNOSIS

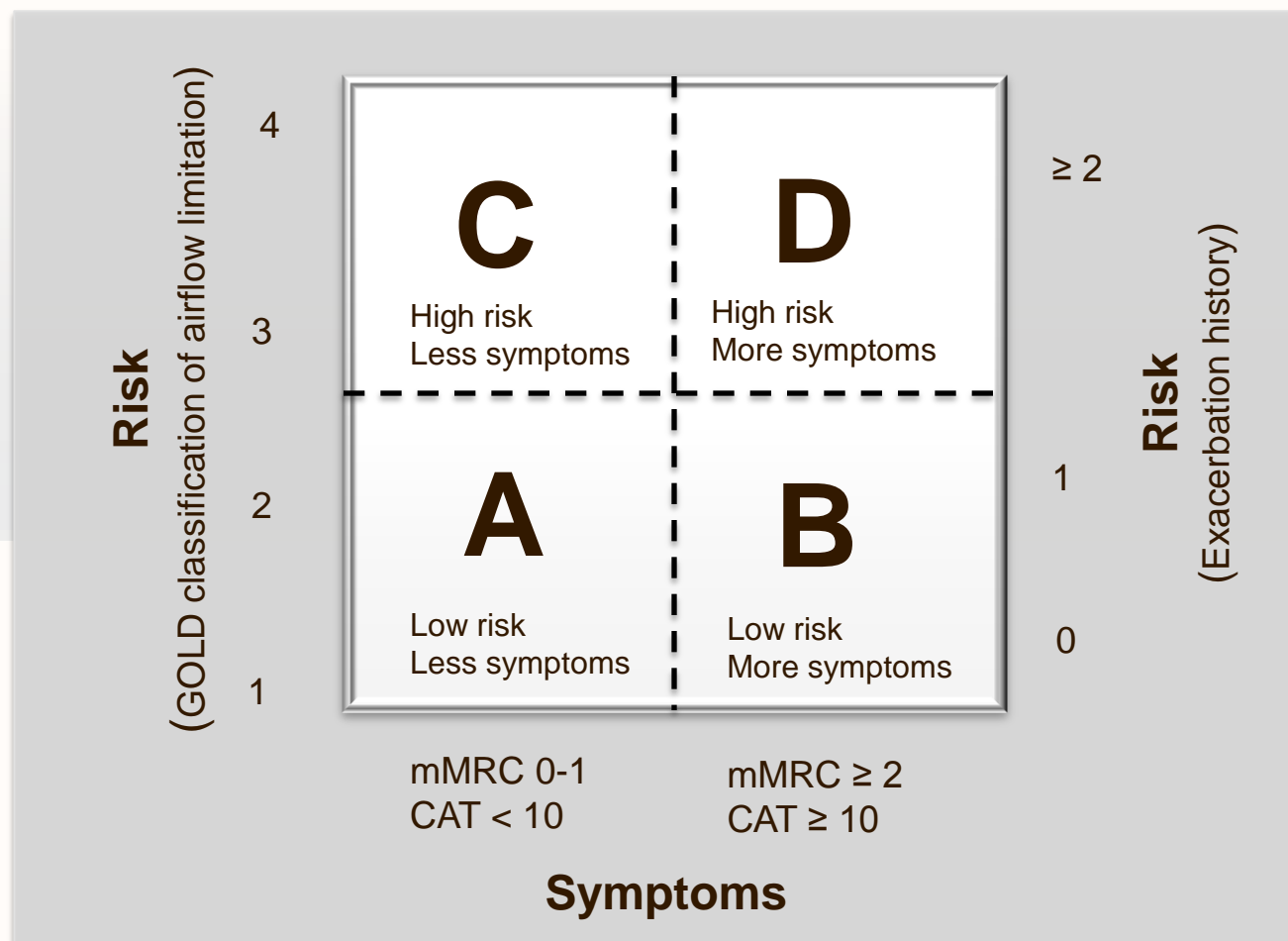
- Spirometry is required to make clinical diagnosis of COPD
- The presence of post-bronchodilator $FEV1/FVC < 0.70$

Classification of Severity of Airflow Limitation (Post-bronchodilator FEV1)

GOLD 1	Mild	$FEV1 \geq 80\%$ predicted
GOLD 2	Moderate	$50\% \leq FEV1 < 80\%$ predicted
GOLD 3	Severe	$30\% \leq FEV1 < 50\%$ predicted
GOLD 4	Very severe	$FEV1 < 30\%$ predicted

ASSESSMENT

Combined assessment of COPD



DIFFERENTIAL DIAGNOSIS



COPD

- Onset in mid-life
- Symptoms slowly progressive
- History of tobacco smoking or exposure to other types of smoke

Asthma

- Onset early in life
- Symptoms worse at night/early morning
- Allergy, rhinitis and/or eczema also present
- Family history of asthma



Congestive Heart Failure

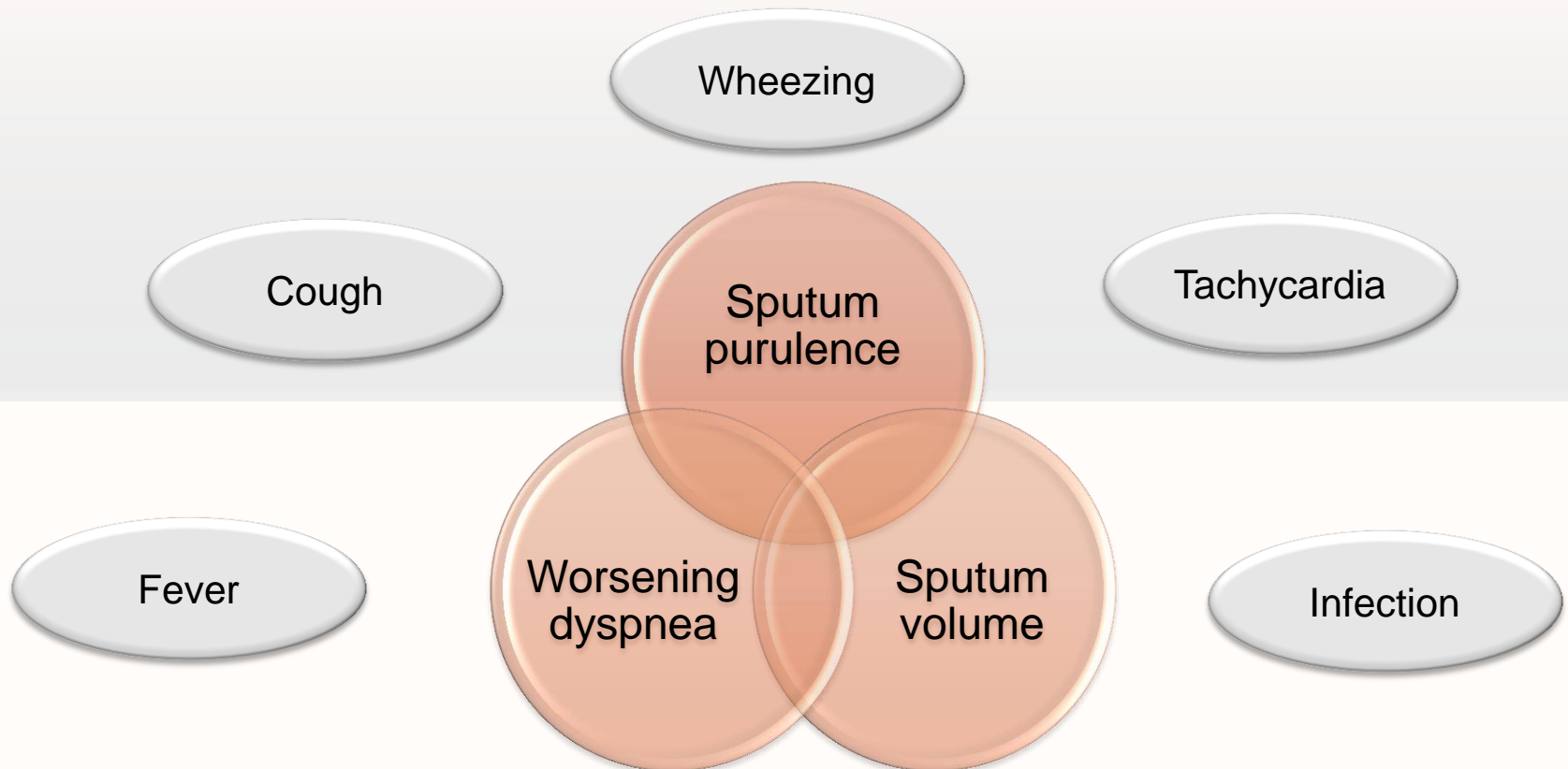
- Dilated heart on chest x-ray
- Pulmonary function tests indicate volume restriction



EXACERBATION

COPD exacerbation

- An acute event characterized by a worsening of the patient's respiratory symptoms





EXACERBATION SEVERITY

Medical History

Severity of COPD based on degree of airflow limitation

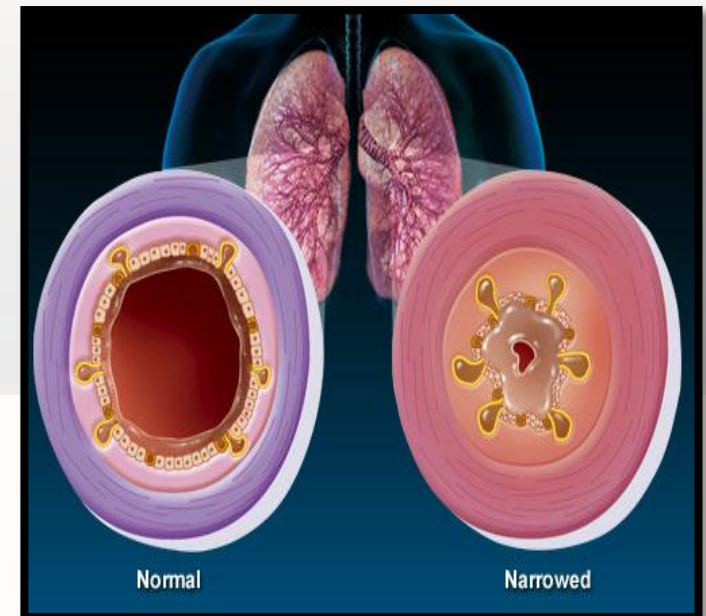
➤ Duration of worsening or new symptoms

➤ Number of previous episodes

➤ Comorbidities

➤ Present treatment regimen

➤ Previous use of mechanical ventilation

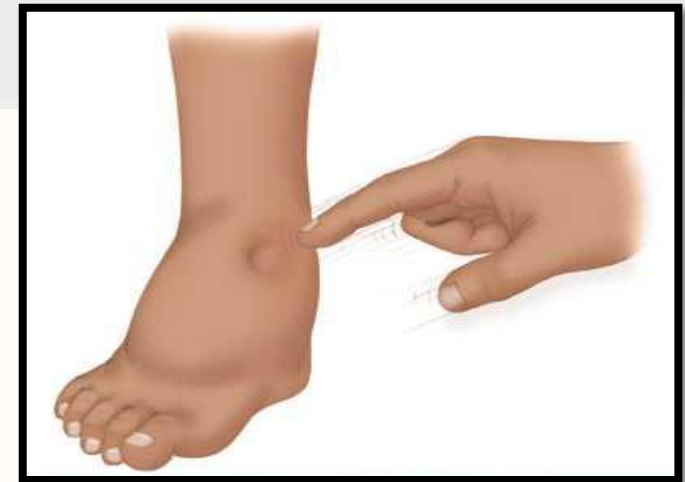




EXACERBATION SEVERITY

Signs of Severity

- Use of accessory respiratory muscles
- Paradoxical chest wall movements
- Worsening or new onset central cyanosis
- Development of peripheral edema
- Hemodynamic instability
- Deteriorated mental status



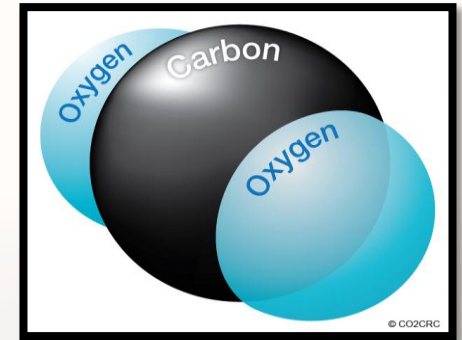
EXACERBATION SEVERITY

Laboratory



➤ $\text{PaO}_2 < 60 \text{ mmHg}$

➤ $\text{PaCO}_2 > 50 \text{ mmHg}$



➤ **CBC** may show polycythemia, anemia, leukocytosis

➤ **Biochemical tests** may show electrolyte disturbances, hyperglycemia

➤ **Chest radiographs** are useful in excluding alternative diagnosis

➤ **ECG** may aid in diagnosis of coexisting cardiac problems



EXACERBATION SEVERITY

Laboratory

- The presence of purulent sputum can be sufficient indication for starting empirical antibiotic treatment

Most common bacterial pathogens

- *Hemophilus influenzae*,
- *Streptococcus pneumoniae*,
- *Moraxella catarrhalis*

- In GOLD 3 and GOLD 4 patients
- *Pseudomonas aeruginosa* becomes important

- Spirometry is not recommended during an exacerbation



EXACERBATIONS TREATMENT

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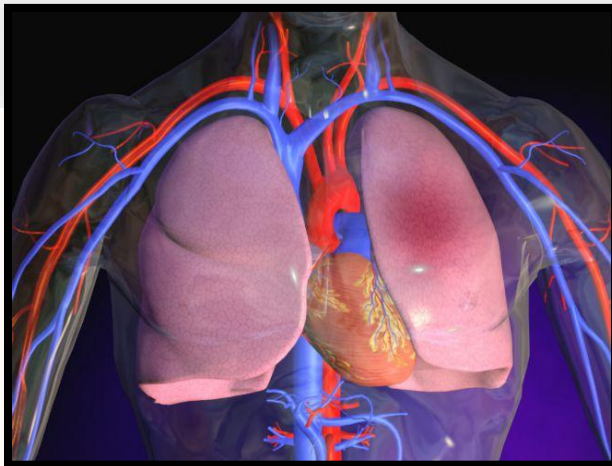
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Treatment goals for COPD exacerbations

- Minimize the impact of the current exacerbation
- Prevent the development of subsequent exacerbations



EXACERBATIONS TREATMENT

Pharmacologic Treatment

Bronchodilators

Corticosteroids

Antibiotics

Adjunct therapies

Respiratory support

Oxygen therapy

Ventilatory support

NIV

Invasive MV

EXACERBATIONS BRONCHODILATORS

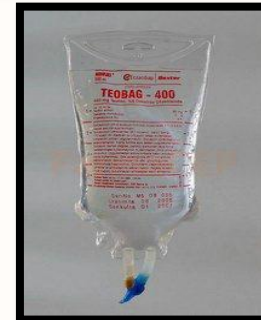
Short-acting inhaled beta-2 agonists with/without anticholinergics (*Evidence C*)

- Increase doses and/or frequency of short-acting bronchodilators
- Combine short-acting beta-2 agonists and anticholinergics
- Use spacers or air-driven nebulizers

➤ No clinical studies about the use of long-acting bronchodilators with or without inhaled corticosteroids

Intravenous methylxanthines (theophylline or aminophylline)

➤ Second-line therapy, only to be used in selected cases (*Evidence B*)



EXACERBATIONS CORTICOSTEROIDS

- Systemic corticosteroids in COPD exacerbations
 - ✓ shorten recovery time (*Evidence A*)
 - ✓ improve lung function, arterial hypoxemia (*Evidence A*)
 - ✓ reduce the risk of early relapse, treatment failure, length of hospital stay

- Oral or intravenous corticosteroids

- 30-40 mg prednisolone per day for 10-14 days (*Evidence D*)



EXACERBATIONS ANTIBIOTICS



Antibiotics should be given to patients with exacerbations of COPD

- Have three cardinal symptoms increase in dyspnea, sputum volume, and sputum purulence (*Evidence B*)
- Have two of cardinal symptoms if increased purulence of sputum is one of the two symptoms (*Evidence C*)
- Require mechanical ventilation (noninvasive or invasive) (*Evidence B*)
- The recommended length of antibiotic therapy is 5-10 days (*Evidence D*)

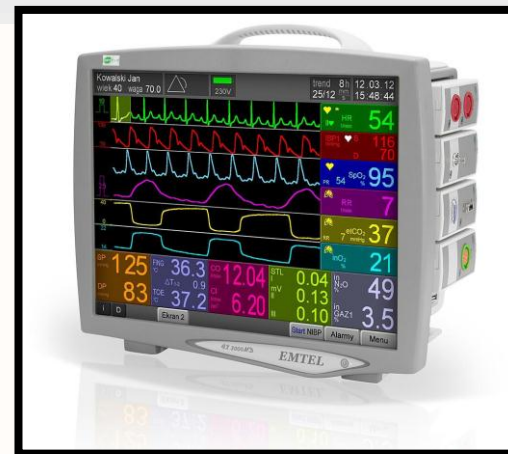
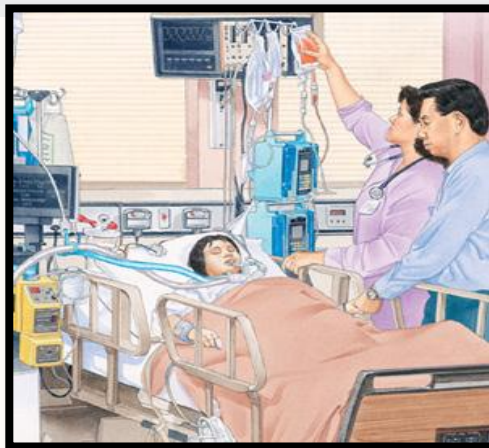
EXACERBATIONS RESPIRATORY SUPPORT

- Supplemental oxygen should be titrated with a target saturation of **88-92%**
- Arterial blood gases should be checked 30-60 minutes later
 - to ensure satisfactory oxygenation without carbon dioxide retention or acidosis
- Assess the patient for requirement of mechanical ventilation (*Evidence B*)



EXACERBATIONS TREATMENT

- Monitor fluid balance and nutrition
- Consider subcutaneous heparin or LMWH
- Identify and treat associated conditions
- Closely monitor condition of the patient



EXACERBATIONS RESPIRATORY SUPPORT

INDICATIONS FOR NONINVASIVE MV

➤ Respiratory acidosis (arterial pH < 7.35 and/or PaCO₂ > 45 mmHg)

➤ **Severe dyspnea** with clinical signs suggestive of

- ✓ Respiratory muscle fatigue
- ✓ Increased work of breathing
 - ✓ Use of respiratory accessory muscles
 - ✓ Paradoxical motion of the abdomen
 - ✓ Retraction of the intercostal spaces



➤ Randomized controlled trials showing a success rate of 80-85%

EXACERBATIONS RESPIRATORY SUPPORT

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INDICATIONS FOR INVASIVE MV

➤ Unable to tolerate NIV or NIV failure

➤ Respiratory or cardiac arrest

➤ Massive aspiration

➤ Respiratory pauses with loss of consciousness or gasping for air

➤ Diminished consciousness, psychomotor agitation inadequately controlled by sedation



EXACERBATIONS RESPIRATORY SUPPORT

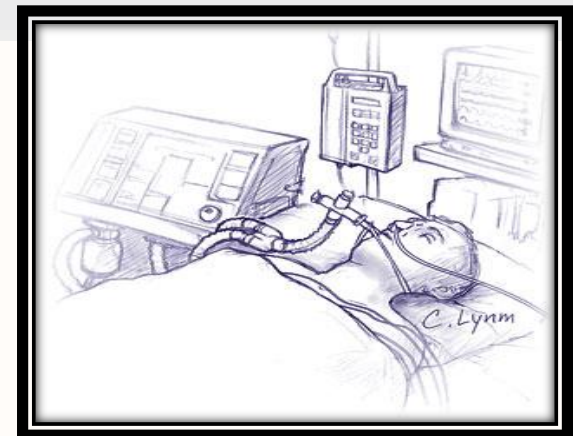
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INDICATIONS FOR INVASIVE MV

- Persistent inability to remove respiratory secretions
- Heart rate < 50/min with loss of alertness
- Severe ventricular arrhythmias
- Severe hemodynamic instability without response to fluids and vasoactive drugs
- Life-threatening hypoxemia in patients unable to tolerate NIV



EXACERBATIONS



INDICATIONS FOR HOSPITAL ASSESSMENT OR ADMISSION

- Marked increase in intensity of symptoms
- Severe underlying COPD
- Frequent exacerbations
- Onset of new physical signs, e.g cyanosis
- Older age, serious comorbidities
- Insufficient home support
- Failure of an exacerbation to initial medical management



EXACERBATIONS RESPIRATORY SUPPORT

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INDICATIONS FOR ICU ADMISSION

- Severe dyspnea that responds inadequately to initial emergency therapy
- Persistent or worsening hypoxemia ($\text{PaO}_2 < 40 \text{ mmHg}$)
- Severe/worsening respiratory acidosis ($\text{pH} < 7.25$)
- Need for invasive ventilation
- Changes in mental status
- Hemodynamic instability/need for vasopressors



EXACERBATIONS



DISCHARGE CRITERIA

- Able to use long-acting bronchodilators
- Inhaled short-acting beta2-agonists required no more frequently than every 4 hours
- Patient is able to across room
- Stable arterial blood gases for 12-24 hour
- Clinically stable patient for 12-24 hours



EXACERBATIONS

DISCHARGE CRITERIA

- Patient is able to eat and sleep without frequent awakening by dyspnea
- Patient/home caregiver fully understands correct use of medications
- Follow-up and home care arrangement have been completed
- Patient, family, and physician are confident that the patient can manage successfully at home



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