WHO Package of Essential NCD Interventions (PEN)

Management of Chronic Respiratory Diseases.

Centre for Community Medicine
All India Institute of Medical Sciences
New Delhi, India
Training Manual

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Management of Chronic Respiratory Diseases

1. Asthma
2. Chronic Obstructive Pulmonary Diseases (COPD)
ACKNOWLEDGEMENT

This manual was prepared under the leadership and guidance of Cherian Varghese, Department of Management of Noncommunicable Diseases, Disability, Violence and Injury Prevention WHO, Geneva. Staff from WHO regional offices provided valuable inputs and feedback.

The manual was developed through the WHO Collaborating Centre for Capacity Building and Research in Community-based Noncommunicable Disease Prevention and Control, All India Institute of Medical Sciences (AIIMS), New Delhi, India.

Dr Baridalyne Nongkynrih, Professor, Centre for Community Medicine, developed the draft and revised based on comments and feedback. Design and layout was provided by Mr Ramachandra B Pokale, Chief Artist, Centre for Community Medicine.

Professor Shashi Kant, Head of the Department, Centre for Community Medicine, All India Institute of Medical Sciences, New Delhi is acknowledged for his support in the development of this manual.
CHRONIC RESPIRATORY DISEASES

Chronic respiratory diseases (CRDs) are chronic diseases of the airways and other structures of the lung. It includes many chronic respiratory ailments such as COPD, asthma, occupational lung diseases, interstitial lung disease and others. PEN focuses particularly on bronchial asthma and chronic obstructive pulmonary disease (COPD), which are major public health problems accounting for a significant burden in low- and middle-income countries.

Asthma

1. ASSESS

Risk factors of Asthma

<table>
<thead>
<tr>
<th>Non-modifiable risk</th>
<th>Modifiable risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age: Onset of asthma is more common in younger age group</td>
<td>Indoor allergens: house dust mites, animal proteins (eg, mouse, cat, and dog allergens), cockroaches, and fungi</td>
</tr>
<tr>
<td>History of atopy: eczema, recurrent sneezing, itchy/watery eyes</td>
<td>Tobacco smoke</td>
</tr>
<tr>
<td>Family history of asthma or atopy</td>
<td>Outdoor and indoor air pollution</td>
</tr>
<tr>
<td>Genetic</td>
<td>Respiratory viral infections</td>
</tr>
<tr>
<td></td>
<td>Occupational dust (industrial) exposure</td>
</tr>
</tbody>
</table>

Symptoms of asthma

- Cough
  - Difficult breathing
  - Chest tightness
  - Wheezing

2. DIAGNOSE

The following features make a diagnosis of ASTHMA more likely:

- previous diagnosis of asthma;
- symptoms since childhood or early adulthood;
- history of hay fever, eczema and/ or allergies;
- symptoms triggered by respiratory infection, exercise, weather changes or stress;
- intermittent symptoms with asymptomatic periods in between;
- symptoms worse at night or early morning;
- symptoms respond to salbutamol.
3. TREATMENT
Pharmacological Treatment
A stepwise approach is recommended as follows

i. Inhaled salbutamol prn (when necessary)
ii. Inhaled salbutamol prn plus low-dose inhaled beclometasone, starting with 100ug twice daily for adults
iii. Add low-dose oral theophylline to Step 3 treatment (assuming long-acting beta agonists and leukotriene antagonists are not available)
iv. Add oral prednisolone, but in the lowest dose possible to control symptoms (nearly always less than 10mg daily)

IMPORTANT: Check the patient’s adherence to treatment and observe their inhaler technique

4. REFER
The patient should be referred in the following conditions:

- When asthma is poorly controlled
- When the diagnosis of asthma is uncertain
- When regular oral prednisolone is required to maintain control

5. FOLLOW UP
Patient and family education should be provided

- Advise the patient to carry the device always
- Emphasize the need for adherence to drugs.
- Advice regarding dealing with triggers

6. ACUTE EXACERBATION OF ASTHMA
The following patients have a high risk of future exacerbations and may have a poor asthma outcome.

Risks for exacerbation
- Uncontrolled asthma symptoms
- One or more severe exacerbation in previous year
- Start of the patient’s usual ‘flare-up’ season
- Exposures: tobacco smoke; indoor or outdoor air pollution; indoor allergens
- Major psychological or socio-economic problems for child or family
- Poor adherence with controller medication, or incorrect inhaler technique

Management of Asthma exacerbation
- Prednisolone 30–40mg for five days for adults and 1mg per kg for three days for children, or longer, if necessary, until they have recovered;
- Salbutamol in high doses by metered dose inhaler and spacer (e.g. four puffs every 20 minutes for one hour) or by nebulizer;
- Oxygen, if available, if O2 saturation levels are below 90%
Chronic Obstructive Pulmonary Disease (COPD)

1. ASSESS

Risk factors for COPD
- Tobacco smoking in all forms
- Environmental tobacco smoke
- Exposure to biomass fuel smoke
- Occupational exposure
- Outdoor air pollution
- Pulmonary TB
- Poorly treated asthma

Symptoms of COPD

The initial suspicion of COPD is based on the presence of risk factors and symptoms. Based on this, further investigations may be required to confirm the diagnosis of COPD and to refute other possible alternate diagnosis (eg. Pulmonary TB, bronchiectasis)

<table>
<thead>
<tr>
<th>Symptoms suggestive of COPD</th>
<th>Symptoms suggesting alternate diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Progressive difficulty in breathing</td>
<td>Chest pain</td>
</tr>
<tr>
<td>Chronic cough (&gt; 8 weeks)</td>
<td>Fever</td>
</tr>
<tr>
<td>Chronic sputum production</td>
<td>Significant weight loss</td>
</tr>
<tr>
<td>Exposure to risk factors</td>
<td>Orthopnoea</td>
</tr>
<tr>
<td>- Tobacco smoke</td>
<td>Symptoms worsening at night</td>
</tr>
<tr>
<td>- Biomass fuel</td>
<td></td>
</tr>
<tr>
<td>- Occupational exposure</td>
<td>Haemoptysis</td>
</tr>
</tbody>
</table>
2. **DIAGNOSE**

Diagnosis of COPD is made based on the following symptoms

<table>
<thead>
<tr>
<th>Features suggestive of COPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>The following features make a diagnosis of COPD more likely:</td>
</tr>
<tr>
<td>■ previous diagnosis of COPD;</td>
</tr>
<tr>
<td>■ symptoms start in middle age or later (usually after 40);</td>
</tr>
<tr>
<td>■ history of heavy and prolonged exposure to burning fossil fuels in an enclosed space, or high exposure to dust in an occupational setting; heavy smoking, i.e. &gt;20 cigarettes per day for &gt;15 years;</td>
</tr>
<tr>
<td>■ symptoms worsen slowly over a long period of time;</td>
</tr>
<tr>
<td>■ symptoms that are persistent with little day-to-day variation.</td>
</tr>
<tr>
<td>■ long history of daily or frequent cough and sputum production; starting before shortness of breath;</td>
</tr>
</tbody>
</table>

3. **TREATMENT**

Pharmacological
- Inhaled salbutamol, two puffs as required, up to four times daily;
- if symptoms are still troublesome, consider low-dose oral theophylline;
- if ipratropium inhalers are available, they can be used instead of, or added to, salbutamol, but they are more expensive.

4. **REFER**

Patient should be referred in the following conditions
- If the symptoms are severe i.e. breathlessness at rest
- Non responding to treatment or worsening of respiratory symptoms

5. **FOLLOW UP**

Patient and family education should be provided. Ensure that the patients and their family understand that smoking and indoor air pollution are the major risk factors for COPD
6. ACUTE COPD EXACERBATION
An exacerbation of COPD is an acute event characterized by a worsening of the patient’s respiratory symptoms that is beyond normal day-to-day variations and leads to a change in medication.

A. Common symptoms of Acute Exacerbation of COPD
   • Cough
   • Increase in breathlessness
   • Increase in sputum production and increase in sputum purulence
   • Chest tightness, wheezing

B. Management of exacerbation of COPD
   • Antibiotics should be given for all exacerbations;
   • For severe exacerbations, give oral prednisolone 30–40mg for around seven days;
   • Give high doses of inhaled salbutamol by nebulizer or metered dose inhaler with spacer; or by nebulizer;
   • Oxygen, if available, should be given by a mask that limits the concentration to 24% to 28%
Activity

Demonstration of use of a peak flowmeter

Notes

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Case study 1

A 69 year old male, chronic smoker presented to the primary health center with complaints of progressive breathlessness and wheezing associated with cough with expectoration for the last 8 years. He is fatigued most of the time and has started to avoid going out for walks. He also complains of cough with mucoid expectoration on most days, especially more during the winter seasons.

HISTORY
- He reports that previously, he used to experience breathlessness only on strenuous exercise and did not face any difficulty in going to his room on the second floor.
- However since the past one year, it has progressed to such a state that now while climbing a flight of stairs, he has to often halt to catch his breath.

EXAMINATION
- RR is 18/minute, HR is 90/minute (regular), BP is 138/74mmHg.
- SpO2 is 93%. There is no cyanosis, clubbing or pedal oedema.
- On respiratory system examination:
  - he has a barrel shaped chest
  - auscultation revealed bilateral polyphonic wheezing.

Q. What is the probable diagnosis? How will you manage the patient?

Notes
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Case study 2

An 18-year-old college student has history of episodic attacks of shortness of breath, dry cough and wheezing for the past 5 years. These symptoms usually occur during change of weather or whenever she catches cold and tend to worsen during night and early morning. She also has history of recurrent sneezing, runny nose and itchy eyes.

- She was advised some inhaler medications by a local health practitioner 2 years ago which she used to take on ‘as needed’ basis, but has discontinued after few months due to fear of inhaler addiction. Since then, she has been taking cough syrups during these attacks with partial improvement. She has never been hospitalized because of these respiratory complaints.

PERSONAL HISTORY

- Patient does not have fever, hemoptysis or loss of weight. She is unmarried and lives with her parents. Her father is a chronic smoker who smokes around 10 cigarettes per day for 15 years often at home.

- She sometimes helps her mother in kitchen after returning home from college. They frequently use dry wood for cooking. Her mother also had similar problems during childhood.
Case study 3

A 25 year old female with known asthma for 10 years is on inhaler treatment. She was doing well till one year of her last follow up visit.

- One Sunday morning, she started to have dry cough and runny nose associated with low grade fever and generalized body ache. On the same day evening, she also had increasing breathlessness and audible wheeze associated with chest tightness.

- She took two puffs of levosalbutamol inhaler (with spacer) and two teaspoons of cough syrup. As her condition didn’t improve by next day, she was taken to a primary health centre,

- The medical officer in the PHC examines her and tells that she has an acute attack of asthma.

- Her vital parameters were: Pulse 106/min, BP 140/90, RR 22/min, Temperature 100.6 F. Her SPO2 level was 95% in room air. She was having clear nasal discharge with congested pharynx. She was not using accessory muscles for respiration. The doctor could hear extensive wheezes over bilateral lung fields.

Q. What are the points in favour of the diagnosis? How will you manage the patient?
**Case studies with solutions**

**Case study 1**

**Solution**

The features of this case are suggestive of COPD

- He had breathlessness for the last 8 years
- He had history of cough with mucoid expectoration
- He is a current smoker. He has been smoking ~ 20 cigarettes /day for about 50 years.

<table>
<thead>
<tr>
<th>COPD and its Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diagnosis</strong></td>
</tr>
</tbody>
</table>
| COPD | Onset in mid-life.  
Symptoms slowly progressive.  
History of tobacco smoking or exposure to other types of smoke. |
| Asthma | Onset early in life (often childhood).  
Symptoms vary widely from day to day.  
Symptoms worse at night/early morning.  
Allergy, rhinitis, and/or eczema may also be present.  
Family history of asthma may be present |
| Pulmonary Tuberculosis | Sputum AFB +ve  
Onset at any age  
Hemoptysis may be present  
Chest X-ray may show abnormalities. |
| Bronchiectasis | Large volumes of purulent sputum.  
Hemoptysis may be present  
Commonly associated with bacterial infection.  
Chest X-ray/CT shows bronchial dilation, bronchial wall thickening. |
• In the absence of spirometry, based on the presence of risk factors, clinical findings and absence of atypical features of COPD, after ruling out alternative diagnosis, a provisional diagnosis of COPD may be made.

• Spirometry remains the Gold standard and should be performed in all patients suspected of having COPD.

TREATMENT
• Inhaled salbutamol, two puffs as required, up to four times daily;
• if symptoms are still troublesome, consider low-dose oral theophylline;

FOLLOW UP
Once treatment has been optimised, the patient may be asked to follow up at primary health care level at least

• every 3-6 month (mild to moderate disease) or
• every 1-3 month (severe disease).

The points to be assessed during follow up visits should be:
• Inhaler technique and compliance to medications
• Smoking status / efforts at cessation
• Management of symptoms and their impact on daily activities
• Frequency of exacerbations
• Presence of comorbidities and complications
• Efficacy of medications and need to modify the therapy
• Assess for hypoxia using pulse oximetry

Case study 2
Solution

Patient has cardinal symptoms of asthma which are of variable frequency and intensity along with a strong family history

• These features support the diagnosis of asthma
• TREATMENT
• Step 1. Inhaled salbutamol prn
• Step 2. Inhaled salbutamol prn plus low-dose inhaled beclometasone, starting with 100ug twice daily for adults
• Step 3. Same as step 2, but give higher doses of inhaled beclometasone, 200ug or 400ug twice daily
Case study 3

Solution

Diagnosis: A case of acute exacerbation of asthma.

What does the doctor mean by acute asthma attack?

- The patient’s clinical presentation is suggestive of acute exacerbation of asthma which is characterized by acute worsening of one or more of the asthma symptoms (cough, wheezing, chest tightness, dyspnea), leading either to increased need for rescue medications or hospitalization.

How severe is her asthma exacerbation?

- The patient has a non-severe (mild) exacerbation, likely precipitated by viral upper respiratory tract infection.

Management of asthma exacerbation

- Salbutamol in high doses by metered dose inhaler and spacer (e.g. four puffs every 20 minutes for one hour) or by nebulizer;
- Prednisolone 30–40mg for five days for adults or longer until they have recovered;
- Oxygen, if available, if O2 saturation levels are below 90%

(Follow the protocol discussed)
Chronic respiratory diseases (CRD)

ASTHMA & COPD

Chronic respiratory diseases
- Chronic respiratory diseases (CRDs) are chronic diseases of the airways and other structures of the lung.
- It includes many chronic respiratory ailments such as COPD, asthma, occupational lung diseases, interstitial lung disease and others.
- PEN focuses on bronchial asthma and COPD (chronic obstructive pulmonary disease) which are major public health problems in low- and middle-income countries.

Distinguish between Asthma and COPD

Asthma

1. Assess, diagnose, treat, follow up
2. Acute exacerbation of asthma

What is asthma?

- Asthma is a disease characterized by recurrent attacks of breathlessness and wheezing, which vary in severity and frequency from person to person.
- During an asthma attack, the lining of the bronchial tubes swell, causing the airways to narrow and reducing the flow of air in and out of the lungs.

How to manage a case of asthma

Assess
- Ability to breathe
- Symptoms
- Signs
- Tests

Diagnose
- Establish a diagnosis

Treat
- Use pharmacy
- Diagnoses
- Rule
- Emergencies

Follow-up
- Compliance
- Check for complications
Exacerbation of asthma

- Acute exacerbation of asthma is generally defined as "acute worsening of one or more of the asthma symptoms (cough, wheezing, chest tightness, dyspnea), leading either to increased need for rescue medications or hospitalization."

Risk factors for exacerbation:
- Uncontrolled asthma symptoms
- Exposure to triggers or allergens
- Environmental factors
- Exertion or stress

Symptoms of exacerbation:
- Increased cough
- More frequent or severe nocturnal symptoms
- Increased mucus production
- Need for rescue medication more than expected

Management of Exacerbation of asthma

First-line treatment:
- Increase in rescue medication
- Use of reliever inhalers

Second-line treatment (if necessary):
- Add controller medication
- Review and adjust management plan

Advice:
- Avoid trigger factors
- Reduce exposure as much as possible
Points to remember:
- Asthma is a chronic disease of the air passages of the lungs which inflames and narrows them.
- The strongest risk factors for developing asthma are inhaled allergens.
- Medication (salbutamol) can control asthma.
- Avoiding asthma triggers can also reduce the severity of asthma.
- Appropriate management of asthma can enable people to enjoy a good quality of life.

**Chronic obstructive pulmonary disease (COPD)**
1. Assess, diagnose, treat, follow up
2. Acute exacerbation of COPD

**What is COPD?**
- Chronic obstructive pulmonary disease (COPD) is a progressive life-threatening lung disease that causes breathlessness (initially with exertion) and predisposes to exacerbations and serious illness.

**How to manage a case of COPD**

**Assess**
- Risk factors
- Symptoms
- Signs
- Tests

**Diagnose**
- Risk factors
- Symptoms
- Signs
- Tests

**Treat**
- Non-pharmaceutical
- Pharmacological
- Inhalators for relief

**Follow-up**
- Compliance
- Check for complications

**Establish a diagnosis**
- History
- Symptoms and signs
- FEV1 (if available)
- Differentiate between asthma & COPD

**Assess the severity**
- Moderate - breathlessness with normal activity
- Severe - if breathless at rest
- Measure FVC in longer intervals, if possible

**TREATMENT LOCAL: relieving symptoms improving exercise capacity and quality of life**
- Exposure prevention
- Patients with COPD must stop smoking and avoid dust and tobacco smoke.
- Protecting use of safer fuels instead of biomass fuels.
- Avoid working in areas with occupational pollution or high air pollution.
- Inhaled bronchodilators (e.g., salbutamol) may be used as needed up to four times daily.
- If symptoms are still troublesome, consider long-acting bronchodilators.
- If prescribed oral steroids are available, they can be used instead of or in addition to inhaled bronchodilators.
- If the symptoms are severe, a bronchodilator at rest.
- Nonresponse to treatment or worsening of respiratory symptoms.

**Patient and family education**
- Stop smoking and avoid dust and tobacco smoke.
- Keep the area around the house aired and well ventilated.
- Cook with wood or charcoal outside the house, if indoor cooking cause smoke.
- If possible, stop working in areas with occupational dust or high air pollution.

**Important:** Check and observe the patient's inhaler technique.
**Acute Exacerbation of COPD**

- An exacerbation of COPD is an acute event characterized by a worsening of the patient’s respiratory symptoms that is beyond normal day-to-day variations and leads to a change in medication.

**Assess**

- **Symptoms**
  - Cough
  - Increase in sputum or phlegm
  - Cough or sputum production increases in volume
  - Chest tightness, wheezing

- **Triggers**
  - Poorly controlled asthma
  - Air pollution
  - Smoking
  - Occupational exposure

**Treat**

- Individualized care: tailor to patient’s needs and circumstances
- Symptoms and breathlessness: consider bronchodilators and inhaled corticosteroids
- Severe exacerbations: hospital admission may be needed

**Advice**

- Ensure they understand that smoking and indoor air pollution are the major risk factors for COPD. Therefore, patients with COPD must stop smoking and avoid indoor air pollution.
- Keep the area where patients are treated well ventilated by opening windows.
- Avoid foods and drinks that trigger asthma symptoms.
- Use technology to monitor and detect changes in respiratory function.

**Treatment of Acute Exacerbation of COPD**

- Antistatics should be given for all exacerbations.
- For severe exacerbations, give oral prednisolone 30-40 mg for around seven days.
- Give high doses of inhaled beclometasone or beclometasone or fluticasone.
- Oxygen therapy may be given by mask.

**Points to remember**

- **COPD** is a common, preventable lung disorder characterized by progressive, poorly reversible airflow limitation.
- The primary cause of COPD is exposure to tobacco smoke (either active smoking or second-hand smoke).
- For women: exposure to Indoor air pollution (such as solid fuel used for cooking and heating).
- Many cases of COPD are preventable by avoidance or early cessation of smoking.

**Drugs used for Asthma & COPD**

**Short-Acting Beta-Agonists (SABAs):**
- Are typically used as “rescue” medications to provide quick relief of asthma symptoms.
- Includes: salbutamol, terbutaline, levosalbutamol
- Effect of inhaled form: Onset: 1-5 minutes, Duration: 3-6 hours

**Long-Acting Beta-Agonists:**
- Includes: Theophylline

**Side effects of common drugs**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Possible side effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salbutamol</td>
<td>Tachycardia, Tachypnoea</td>
</tr>
<tr>
<td>Theophylline</td>
<td>Nausea, Vomiting, Tachycardia</td>
</tr>
<tr>
<td>Prednisolone</td>
<td>Gabstics, high blood glucose, high blood pressure, swelling of face and obesity</td>
</tr>
<tr>
<td>Inhaled steroids</td>
<td>Oral thrush, hoarseness</td>
</tr>
</tbody>
</table>
Activities and case studies

Peak flow meter
- A peak flow meter is a small device that helps to monitor respiratory conditions such as asthma.
- It measures maximum airflow out of the lungs.
- Peak flow meters are most helpful in assessing moderate to severe persistent asthma.
- It is helpful to distinguish between asthma and COPD.

How to use a peak flow meter
- Move the marker to the bottom of the numbered scale.
- Stand up straight. Take a deep breath.
- Hold your breath while you place the mouthpiece in your mouth, between your teeth. Close your lips around it. DO NOT put your tongue against or inside the hole.
- Blow out as hard and fast as you can in a single blow.
- Write down the number you get.
- Move the marker back to the bottom and repeat all these steps 2 more times.
- The highest of the 3 numbers is your peak flow number. Write it down in your log chart.

If you coughed or did not do the steps right, do not write down the number. Instead, do the steps over again.

Case study – 1
- A 69-year-old male, chronic smoker presented to the primary health center with complaints of progressive breathlessness and wheezing associated with cough with expectoration for the last 8 years.
- He is fatigued most of the time and has started to avoid going out for walks. He also complains of cough with mucoid expectoration on most days, especially more during the winter seasons.

**WHAT IS YOUR PROBABLE DIAGNOSIS?**

Case study – 1 (contd)

HISTORY
- He reports that previously, he used to experience breathlessness only on strenuous exercise and did not face any difficulty in going to his room on the second floor.
- However, since the past one year, it has progressed to such a state that now while climbing a flight of stairs, he has to often halt to catch his breath.
- Examination
  - RR is 18/minute, HR is 90/minute (regular), BP is 138/74mmHg.
  - SpO2 is 93%. There is no cyanosis, audible or pedal oedema.
  - On respiratory system examination:
    - He has a prolonged expiratory phase.
    - The lungs reveal bilateral polyphonic wheezing.

Case study – 1 (contd)

<table>
<thead>
<tr>
<th>Symptoms suggestive of COPD</th>
<th>COPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Progressive Dyspnea</td>
<td>He had breathlessness for the last 8 years.</td>
</tr>
<tr>
<td>Chronic cough</td>
<td>He had history of cough with mucoid expectoration.</td>
</tr>
<tr>
<td>Chronic sputum production</td>
<td></td>
</tr>
<tr>
<td>Risk factors: Tobacco smoke</td>
<td>He is a current smoker. He has been smoking 40 cigarettes/day for about 50 years.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**The features of this case are suggestive of COPD.**

Case study – 1 (contd)

CONFIRMING THE DIAGNOSIS
- In the absence of spirometry, based on the presence of risk factors, clinical findings and absence of atypical features of COPD, after ruling out alternative diagnosis, a **provisional diagnosis** of COPD may be made.
- **Spirometry remains the Gold standard** and should be performed in all patients suspected of having COPD.
**Case study – 1 (contd)**

**Treatment**
- Inhaled salbutamol, two puffs as required, up to four times daily;
- If symptoms are still troublesome, consider low-dose oral theophylline;

(see protocol attached)

**FOLLOW UP**
Once treatment has been optimised, the patient may be asked to follow up at primary health care level at least every 3-6 month (mild to moderate disease) or every 1-3 month (severe disease).

The points to be assessed during follow up visits should be:
- Inhaler technique and compliance to medications
- Smoking status / efforts at cessation
- Management of symptoms and their impact on daily activities
- Frequency of exacerbations
- Presence of comorbidities and complications
- Efficacy of medications and need to modify the therapy
- Assess for hypoxia using pulse oximetry

**Points to remember...**
- Even in the presence of cardinal signs and symptoms, features that suggest an alternative diagnosis should also be actively asked or sought for and in presence of these features
- Diagnosis of COPD cannot be made/excluded on the basis of a chest radiograph
- Spirometry is needed for confirming the diagnosis of COPD and staging the severity of COPD

**Case study – 2**

**PERSONAL HISTORY**
- Patient does not have fever, hemoptysis or loss of weight.
- She is unmarried and lives with her parents. Her father is a chronic smoker who smokes around 10 cigarettes per day for 15 years often at home.
- She sometimes helps her mother in kitchen after returning home from college. They frequently use dry wood for cooking. Her mother also had similar problems during childhood

WHAT IS YOUR PROBABLE DIAGNOSIS?

**Case study – 2**

Patient has **cardinal symptoms of asthma** which are of variable frequency and intensity along with a **strong family history**

These features support the diagnosis of asthma

WHAT IS YOUR PROBABLE DIAGNOSIS?

**Case study – 2**

**Features suggestive of asthma or alternative diagnosis**

<table>
<thead>
<tr>
<th>Features suggestive of asthma</th>
<th>Features that may suggest alternative diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age: Peak of the second decade</td>
<td>Blood dyscrasias with no other respiratory symptoms</td>
</tr>
<tr>
<td>Exacerbations</td>
<td>Idiopathic pulmonary fibrosis</td>
</tr>
<tr>
<td>Increased airway hyperresponsiveness</td>
<td>Fever and significant constitutional symptoms</td>
</tr>
<tr>
<td>Personal and family history of atopy, allergic rhinitis</td>
<td>Localised nasal polyps</td>
</tr>
<tr>
<td>History of asthma, eczema, food/latex allergy</td>
<td>Infarction</td>
</tr>
<tr>
<td>Personal history of episodic wheeze, frequent upper respiratory infections</td>
<td></td>
</tr>
</tbody>
</table>

**TREATMENT**

- **Step 1.** Inhaled salbutamol prn
- **Step 2.** Inhaled salbutamol prn plus low-dose inhaled beclomethasone, starting with 100μg twice daily for adults
- **Step 3.** Same as step 2, but give higher doses of inhaled beclomethasone, 200μg or 400μg twice daily
Case study – 3

A 24-year-old female with known asthma for 10 years is on inhaled treatment. She was doing well till one year of her last follow-up visit.

One Sunday morning, she started to have dry cough and runny nose associated with low-grade fever and generalized body ache. On the same day evening, she also had increasing breathlessness and audible wheeze associated with chest tightness.

She took two puffs of levosalbutamol inhaler (with spacer) and two teaspoons of cough syrup. As her condition didn’t improve by next day, she was taken to a primary health centre.

The medical officer in the PHC examined her and told that she has an acute attack of asthma.

Her vital parameters were: Pulse 106/min, BP 140/90, RR 22/min. Temperature 100.6°F. Her SPO2 level was 98%. In room air, she was having clear nasal discharge with congested pharynx. She was not using accessory muscles for respiration. The doctor could hear extensive wheezes over bilateral lung fields.

Case study – 3 (contd)

Diagnosis: A case of acute exacerbation of asthma.

What does the doctor mean by acute asthma attack?

- The patient’s clinical presentation is suggestive of acute exacerbation of asthma which is characterized by acute worsening of one or more of the asthma symptoms (cough, wheezing, chest tightness, dyspnea), leading either to increased need for rescue medications or hospitalization.
- *How severe is her asthma exacerbation?*
- The patient has a non-severe (mild) exacerbation, likely precipitated by viral upper respiratory tract infection.

Case study – 3 (contd)

Management of asthma exacerbation

- Salbutamol in high doses by metered dose inhaler and spacer (e.g., four puffs every 20 minutes for one hour) or by nebulizer;
- Prednisolone 30-40mg for five days for adults or longer until they have recovered;
- Oxygen, if available, if O2 saturation levels are below 90% (Follow the protocol discussed)

Notes

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WHO Package of Essential NCD Interventions (PEN)

Management of Chronic Respiratory Diseases.