Management of Common Non Communicable Chronic Respiratory Diseases

Guidelines for Primary Health Care Providers

Non Communicable Disease Unit
Ministry of Health, Nutrition and Indigenous Medicine

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Common Non Communicable Chronic Respiratory Diseases

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Primary Health Care Providers

Prepared by the Non Communicable Disease Unit, Ministry of Health, Nutrition and Indigenous Medicine in collaboration with the Sri Lanka College of Pulmonologists, Sri Lankan Society of Internal Medicine , Ceylon College of Physicians and National Programme for Tuberculosis Control and Chest Diseases, Sri Lanka

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01 List of Abbreviations

AFB	Acid Fast Bacilli
AIP	Acute interstitial pneumonia/ pneumonitis
BA	Bronchial Asthma
COP	Cryptogenic organizing pneumonia
COPD	Chronic Obstructive Pulmonary Diseases
CRD	Chronic Respiratory Disease
DIP	Desquamative interstitial pneumonia/ pneumonitis
ESR	Erythrocyte Sedimentation Rate
FBC	Full Blood Count
GINA	Global Initiative for Asthma
ICS	Inhaler Controlled Steroids
ILD	Interstitial Lung disease
IPF	Idiopathic pulmonary fibrosis
LABA	Long Acting B_2 Agonists
LAM	Lymphangioleiomyomatosis
LIP	Lymphocytic interstitial pneumonia
LTRA	Leukotriene Receptor Antagonists
JVP	Jugular Venous Pressure
MRC	Medical Research Council
NSIP	Nonspecific interstitial pneumonia
Po	Per oral
RB-ILD	Respiratory bronchiolitis associated interstitial lung disease
RTIs	Respiratory Tract Infections
OSA	Obstructive Sleep Apnoea
SOB	Shortness Of Breath

02 Introduction

Burden

Chronic respiratory diseases (CRD) are a group of diseases that affects the airways and other structures of the lungs. The common CRDs include bronchial asthma (BA), chronic obstructive pulmonary disease (COPD), interstitial lung disease (ILD), bronchiectasis, malignancies and occupational lung diseases. In the recent years, chronic respiratory diseases have emerged as one of the major public health problems in the globe causing more than 4 million deaths annually and affecting hundreds of millions of people worldwide.

Chronic non communicable respiratory diseases are also an emerging health problem in developing countries, rapidly overtaking infectious diseases. It is one of the major causes of morbidity and mortality. It is evident that 80% of the deaths due to chronic diseases occur in the low & middle-income countries and these deaths usually occur among younger age groups compared to high income countries.

It is also noted that, the prevalence of chronic respiratory diseases are of increasing trend around the globe and is associated with poverty, pollution, unhealthy life style & behavioural factors .

Among the chronic respiratory diseases, asthma and COPD have the highest burden of disease. According to the estimates of Global Burden of Disease in 2015, 348 million people were affected with asthma while 174 million were affected by COPD[1]. However, mortality from COPD is higher (3.17 million) and is ranked the 4th leading cause of mortality in 2015 in the globe[2].

Obstructive sleep apnoea (OSA) is a sleep related respiratory condition caused by partial or complete obstruction of the upper airways resulting in temporary cessation of breathing[3]

during sleep. It is also a relatively common condition affecting 3-7 % of the general population[4] and more common among male gender, obesity[3] and with old age.

The information on the burden of chronic respiratory diseases is limited in Sri Lanka. Diseases of respiratory system excluding upper respiratory tract infections (RTIs) and pneumonia are the 3rd commonest cause of hospital admissions and the 4th commonest cause of hospital deaths in 2016[5] .

Death and disability caused by chronic respiratory diseases have a tremendous impact on social & psychological wellbeing of families of patients and have a huge economic burden to the patient, family, society and to the country. It is one of the main causes of work absenteeism around the globe.

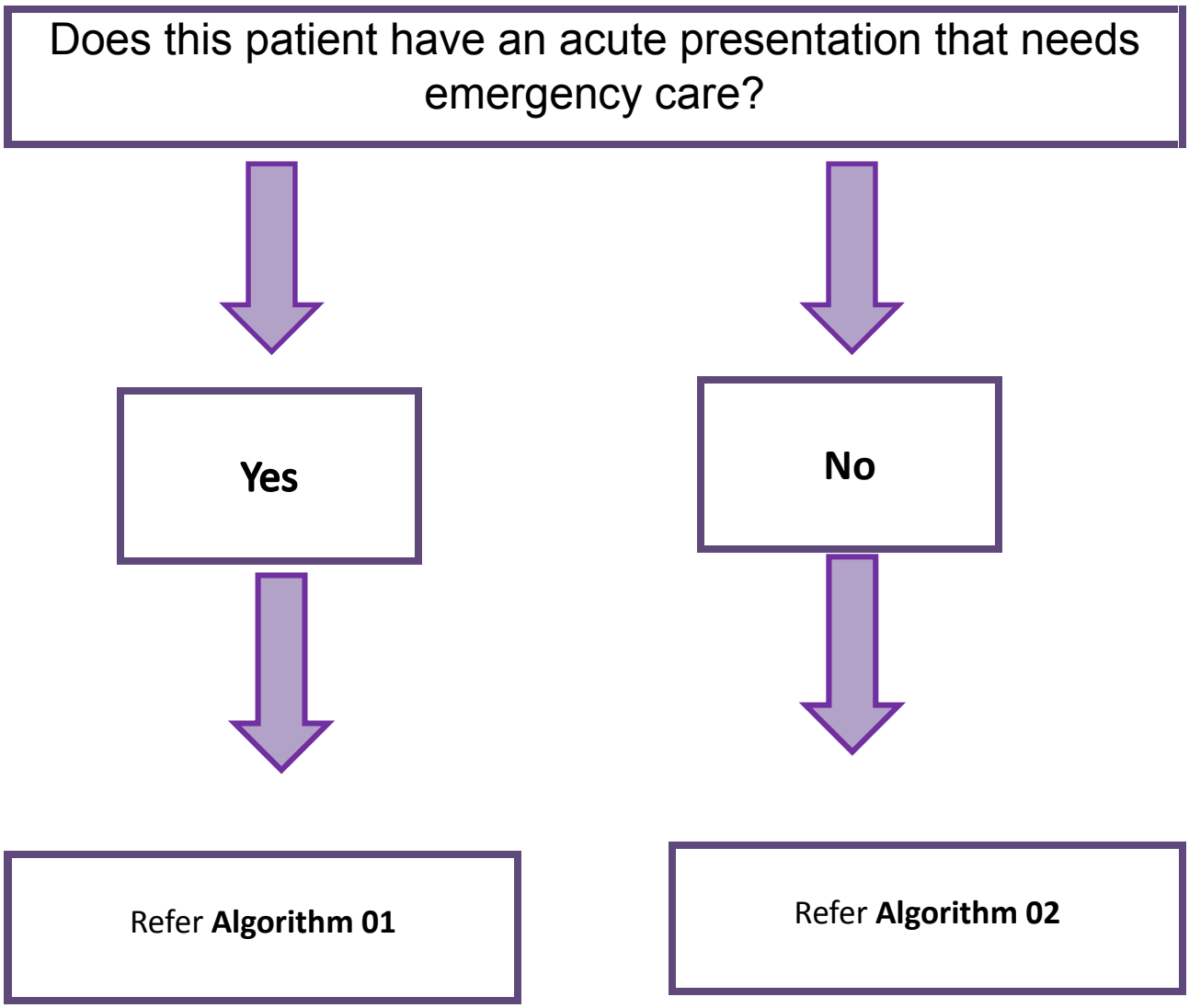
Scope

This guideline is mainly focusing on the management of five commonest chronic non communicable respiratory diseases in a primary care setting, namely:

- Bronchial asthma
- COPD
- Bronchiectasis
- Interstitial lung disease
- Obstructive sleep apnoea

This will provide a clear guidance on diagnosis , treatment , care, follow up & prevention of CRDs at the primary health care institutions in Sri Lanka and serve as a reference material for primary care physicians.

03	Overview


Does this patient have an acute presentation that needs emergency care?
Yes
No
Refer **Algorithm 01**
Refer **Algorithm 02**

Algorithm 01

Patients who need emergency care

Use of accessory muscles of neck , use of intercostal muscles or 'tracheal tug' during inspiration or subcostal recession (abdominal breathing)

Inability to complete a sentence in one breath due to dyspnoea

Obvious respiratory distress

Oxygen saturation 90–94% *

Respiratory rate > 30

Systolic BP <90mmHg or Diastolic BP< 60mmHg

Need immediate hospital admission

**** diagnosed patients with COPD known to have low oxygen saturation on air do not require admission unless there is worsening of their symptoms and/or haemodynamic instability.***

Any patient coming with shortness of breath

and

with reduced or loss of consciousness

Features of anaphylaxis(urticarial rash, generalized flushing , swelling of throat and mouth, abdominal pain, nausea and vomiting)

Exhaustion

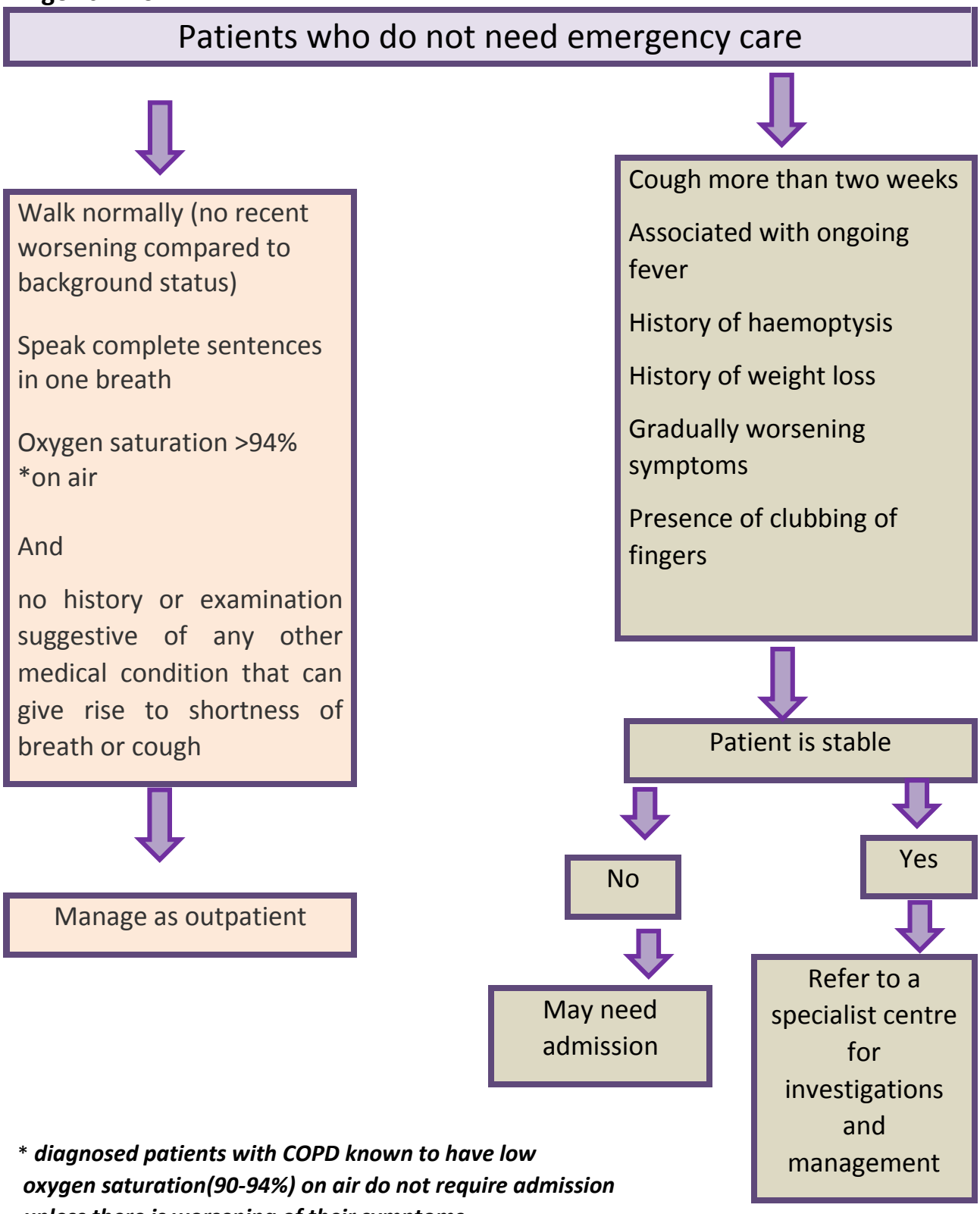
Cyanosis

Oxygen saturation <90% *

Poor respiratory effort, soft/absent breath sounds

Life threating conditions require immediate transfer to a specialist centre

Algorithm 02



* ***diagnosed patients with COPD known to have low oxygen saturation(90-94%) on air do not require admission unless there is worsening of their symptoms and/or haemodynamic instability***.

Causes for exacerbations of chronic respiratory diseases

- Infections
- Withdrawal of prophylaxis treatment
- Complications (eg: pneumothorax, pleural effusion, right heart failure)

Other conditions that require hospital admission and assessment or transfer for specialist opinion

Shortness of breath associated with

Urticarial rash(consider anaphylaxis)

Chest pain.

Basal crepitations

Unilateral wheeze

Elevated JVP

Bilateral ankle oedema

Minimal or clear lungs ---(consider metabolic acidosis, neurological weakness, or pulmonary embolism)

Stridor

Suspected foreign body aspiration.

Anaemia

Clinically suggestive of other lung pathology (pneumonia, pleural effusion, pneumothorax)

Pregnancy

04	Asthma

Introduction

Asthma is a heterogeneous disease which usually occurs due to chronic airway inflammation. It is characterized by a group of respiratory symptoms such as wheeze, breathlessness, chest tightness and cough that vary in intensity over time, together with variable expiratory airflow limitation.

Diagnosis of asthma should be based on characteristic symptom patterns and evidence of variable airflow limitation, which can be demonstrated with bronchodilator reversibility testing by spirometry or peak flow test

History & Examination

When to suspect

Increased probability that symptoms are due to asthma

More than one of following symptoms

- Wheeze
- Shortness of breath
- Cough
- Chest tightness

- Symptoms often worse at night or in early morning
- Symptoms vary over time and intensity
- Onset at young age
- family history of asthma and atopy
- associated conditions (eczema, rhinitis, hay fever)

Examination -

Bilateral wheeze with or without features of increased respiratory effort

Assessment & Investigations

- Peak flow meter

- Full blood count(FBC)

Refer, if indicated for

- Lung function
- Chest radiography

  ** Exclude conditions that may mimic asthma in doubtful cases*

  Eg: heart failure, chronic infections (TB/fungal), bronchiectasis, lung cancer, interstitial lung diseases

Assessment of symptom control

Symptom Control	**Response**	
In the past four weeks, has the patient had:	**YES (1)**	**NO (0)**
Day time asthma symptoms more than twice a week?		
Any night waking due to asthma?		
Reliever needed for symptoms* more than twice a week?		
Any activity limitation due to asthma?		
Total		

Level of asthma control
Well controlled - 0
Partly controlled-1-2
Uncontrolled -3-4

Management

Stepwise Management- up to step 3

	STEP1	STEP 2	STEP 3	STEP 4	STEP 5
Preferred Controller		Low dose ICS	Low dose ICS/LABA	Need a specialist's opinion Med/high dose ICS/LABA	Need to be managed in the specialist's centre
Other Controller	Consider low dose ICS	Leukotrine receptor antagonists(LTRA) Or Low dose Theophylline**	1)Med/high dose ICS 2)Low dose ICS+ LTRA Or Theophylline	High dose ICS+LTRA Or Theophylline (Can add Tiotropium >12)	For add on therapy Eg: Tiotropium Anti IgE Anti ILS
Reliever	As when needed short acting B_2 agonists				

***** not for children.***

- ***ICS inhaled corticosteroids***
- ***LABA long acting beta 2 agonist***
- ***If well controlled>3 months –step down therapy***
- ***If uncontrolled step up therapy***
- ***In step 3 &4 low dose ICS /Formaterol can be used as a reliever(after specialized opinion***

Low, medium and high dose inhaled corticosteroids Adults and adolescents (≥12 years)

	Low dose	Medium dose	High dose
Beclamethasone (CFC)	200- 500	>500-1000	>1000
Beclamethasone dipropionate (HFA)	100-200	>200- 400	>400
Beclamethasone (DPI)	200-400	>400-800	>800
Budesonide (DPI)	200 -400	>400-800	>800
Fluticasone propionate (DPI or HFA)	100- 250	>250-500	>500

This is not a table of equivalence, but of estimated clinical comparability

Most of the clinical benefit from ICS is seen at low doses

High doses are arbitrary, but for most ICS are those that, with prolonged use, are associated with increased risk of systemic side-effects

- Always check and correct the inhaler technique (Annexure 01)
- Avoid risk factors
- Smoking cessation advice

Refer to a specialist if,

- Systemic features (low grade fever , loss of appetite, loss of weight , clubbing)
- Pregnancy
- Poorly controlled Asthma

05	Chronic Obstructive Pulmonary Disease(COPD)

Introduction

Chronic obstructive pulmonary disease is a progressive life-threatening lung disease that is characterized by a persistent reduction of airflow, causing breathlessness (initially with exertion, eventually leading to breathlessness at rest) and predisposes to exacerbations and serious illness.

History & Examination

When to suspect (exclude asthma- refer asthma chapter)

- Progressive exertional breathlessness
- Presence of risk factors
  - Tobacco smoke (including secondhand or passive exposure).
  - Indoor air pollution (bio mass fuel such as Firewood, cow dung used for cooking and heating)
  - Outdoor air pollution
  - Occupational dusts and chemicals (such as vapours, irritants, and fumes)
  - Frequent lower respiratory infections during childhood.

Symptoms

- Chronic cough
- Sputum production
- Dyspnoea

Physical examination

- Barrel shaped chest
- Expiratory wheezing
- Hyperesonant chest on percussion

Assessment and Investigations

Diagnosis of COPD needs specialist confirmation. If suspected please refer for further assessment with

- Spirometer- to confirm the diagnosis (gold standard)
- ECG
- Chest radiography
- Six minute walk test (for assessment of desaturation and walking distance

Early referral (less than one month)

- Patient with two or more exacerbations per year(increased intensity of symptoms-SOB, Sputum production and wheezing needing treatment)
- Resting saturation <90% on air
- Patients with clinical evidence of copulmonale(elevated JVP, bilateral ankle oedema and loud P_2)
- Patients with finger clubbing
- Persistent crepitations despite treatment

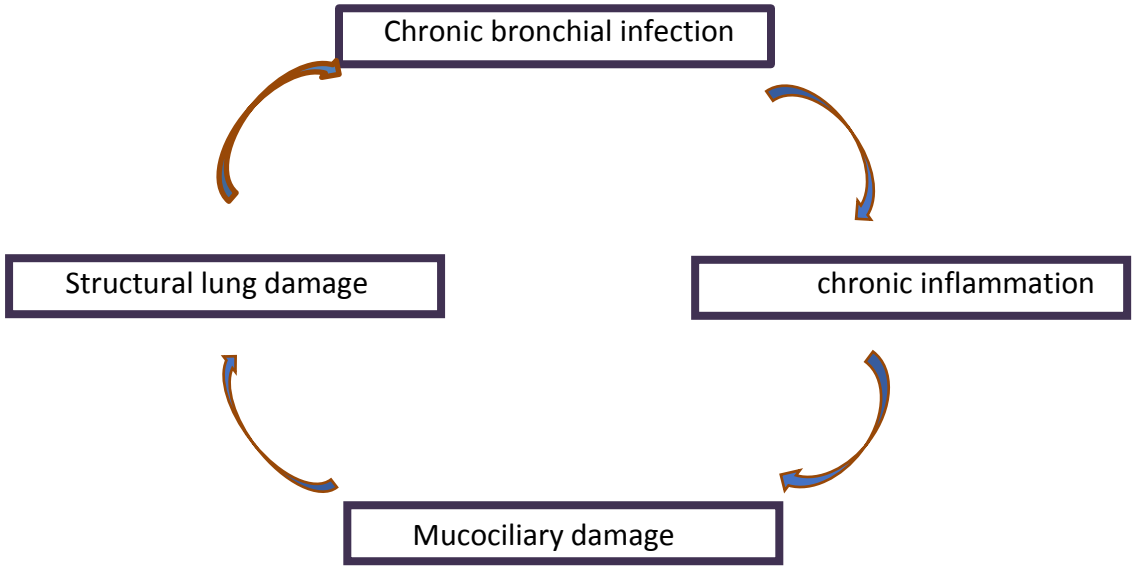
Management

- Advice on smoking cessation
- Symptomatic treatments with salbutamol and steroids inhalers depending on the severity can be started temporarily until proper assessment with lung function at specialist centre
- Advice on avoiding bio mass fuel exposure and other risk factors
- Nutritional advice
- Inhaler technique should be checked & corrected

06	Bronchiectasis

Introduction

Bronchiectasis is a clinical syndrome with chronic cough, sputum production and bronchial infection / inflammation leading to chronic respiratory disease. This is characterized pathologically and radiologically by abnormal and permanent dilatation of airways.



History & Examination

When to suspect

- Chronic disease with cough, sputum production, progressive dyspnoea, haemoptysis, recurrent lower respiratory tract infections, coarse crepitations, clubbing, co-pulmonale
- Unexplained haemoptysis
- Known chronic respiratory diseases – BA, COPD, ILD
- Immunodeficiency
- Connective tissue diseases
- Past Infections – pneumonia, Tuberculos

Investigations

Investigations at primary / secondary care

- Chest radiography
- Basic haematology and biochemistry-FBC, ESR
- Sputum AFB
- Sputum Gram stain and cultures

Refer for following investigations to tertiary care

- Sputum TB cultures, fungal studies
- Spirometry / diffusion studies
- High resolution CT
- Bronchoscopy
- Immunology screen
- Genetic screen
- Ciliary functions

Urgent referral

- Haemoptysis

Early referral (within six weeks)

- Difficult to walk for about 15 min at a stretch or about 100m at own pace. (Refer MRC dyspnoea score below)

MRC dyspnoea scale

Grade 1	Not troubled by breathlessness except on strenuous exercise
Grade 2	Short of breath when hurrying on the level or walking up a hill
Grade 3	Walks slower than most people on the level, stop after a mile or stops after 15 minutes walking at own pace
Grade 4	Stops for breath after walking about 100 yards or after a few minutes on level ground
Grade 5	Too breathless to leave the house, or breathless when undressing

- Recurrent exacerbations
- Co-pulmonale

Routine referral

- Other patients with suspected bronchiectasis may be referred to a consultant unit on a routine basis.

Management

Management at primary care level

1. Attend to any emergencies
- iv fluids in large haemoptysis
- Supplementary oxygen

2. Early symptomatic care
    - Nebulization with salbutamol / ipratropium
    - Short course of bronchodilators and steroids if bronchospasms present
    - Hydration if necessary
    - Most patients would need oral bronchodilators or inhaled bronchodilators / inhaled corticosteroids till further investigations

3. Manage acute exacerbation
    - Course of antibiotics (see below for choice of antibiotics)
    - All patients with significant exacerbation would require a minimum 7-10 day course of antibiotics, in according with national antibiotics guidelines.

<table>
<tr><th colspan="4">Acute infective exacerbation of bronchiectasis</th></tr>
<tr>
<td><u>Clinical symptoms</u>

change in character and severity of cough

change in volume, purulence and increased viscosity of sputum

increasing breathlessness from baseline</td>
<td><u>Out-patient</u>

co-amoxiclav 625mg po 8 hourly

or

cefuroxime 500mg po 12 hourly

<u>In-patient</u>

co-amoxiclav 1.2g IV 8 hourly

Duration : 7-10 days</td>
<td><u>In immediate penicillin or cephalosporin hypersensitivity</u>

clarithromycin 500mg po 12 hourly

or

doxycycline 200mg po loading dose and 100mg daily

Duration: 7-10 days</td>
<td><u>Should not be used in primary care</u>

ciprofloxacin, levofloxacin and moxifloxacin (quinolones)

can mask / promote resistance of Mycobacterium tuberculosis and atypical mycobacterial infections</td>
</tr>
<tr><td colspan="4">Previous microbiologically confirmed or suspected Pseudomonas infection</td></tr>
<tr><td colspan="4">These patients should be referred to a specialized centre for sputum microbiology and initiation of anti-pseudomonal antibiotics</td></tr>
</table>

Management principles and therapeutic options at specialized clinics

1. Airway clearance techniques
    - Breathing techniques
    - postural drainage
    - sputum clearance with chest physiotherapy

2. Health education
    - health education on disease control, inhaler techniques, trigger prevention and action plan during an exacerbation

3. Pulmonary rehabilitation
    - Community based outpatient pulmonary rehabilitation programs should be made available to all patients with moderate to severe bronchiectasis.

4. Vaccination
    - Patients with moderate to severe disease or frequent exacerbations should be offered pneumococcal and influenza immunoprophylaxis.

5. Screening for complications
    - Pulmonary hypertension
    - Co-pulmonale
    - Arterial hypoxaemia

6. Long-term oxygen therapy
    - Patients with exertional desaturation and poor functional status should be referred to a respiratory consultant for assessment for ambulatory oxygen therapy.

7. Home ventilation
    - Patients with bronchiectasis leading to chronic respiratory failure should be referred to a respiratory consultant for assessment for domiciliary non-invasive ventilator support

8. Palliation and decisions on resuscitation
    - Patients with advanced bronchiectasis, recurrent exacerbations and complications with poor functional status should be offered the opportunity to participate in decision making on resuscitation. Such discussion should preferably be attended by patient, immediate family members, care-takers and attending medical team. Patients with end-stage disease should be offered palliative support both during acute admissions and in community.

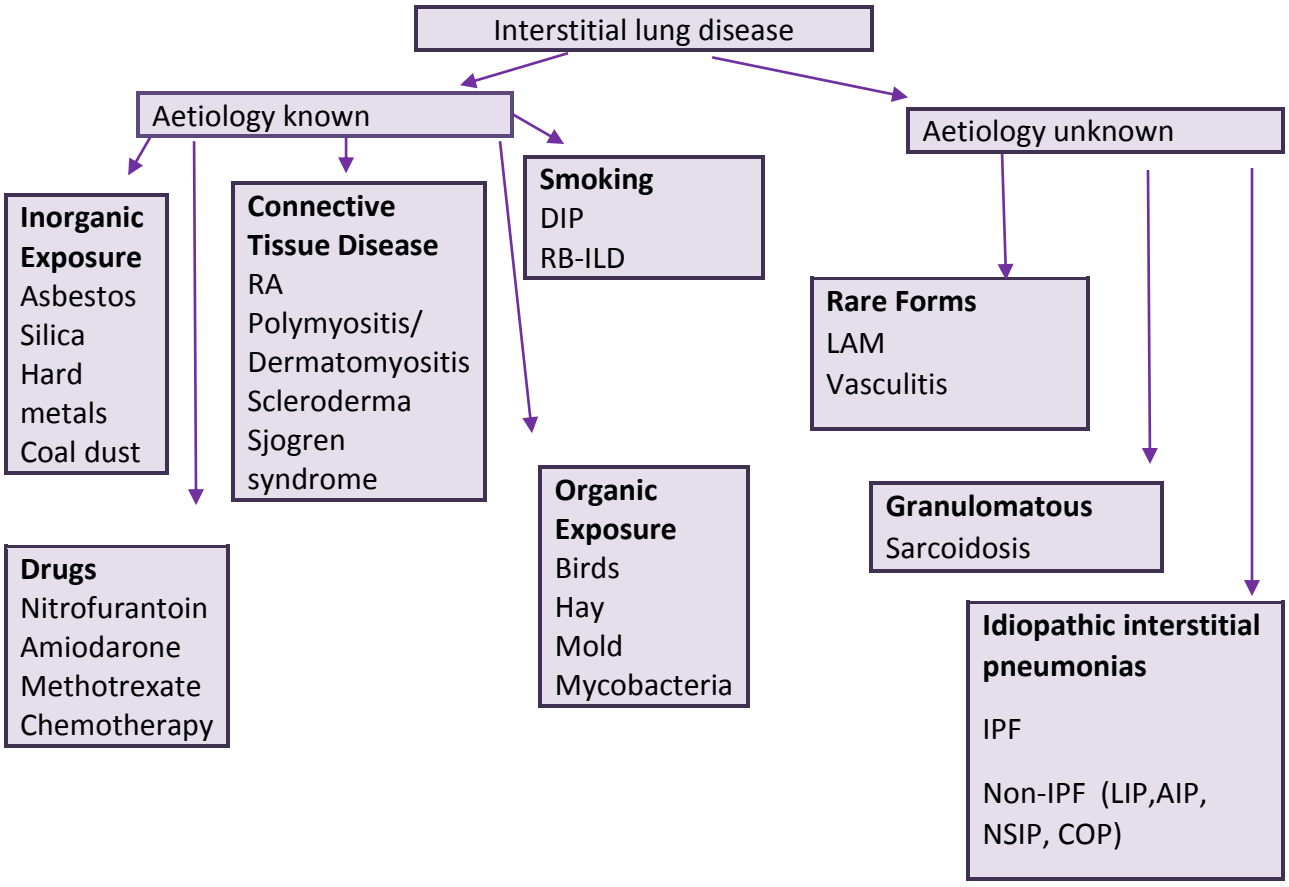
07 Interstitial Lung Diseases

Introduction

These diseases affect the tissue and space around the alveoli (air sacs), called the interstitium. Interstitial lung disease is characterized by five manifestations:

- Respiratory symptoms such as shortness of breath and cough,
- Specific chest radiographic abnormalities
- Hypoxia (at rest when severe and on exertion in the early stages)
- Typical changes on pulmonary function tests in which the lung volume is decreased
- Characteristic microscopic patterns of inflammation and fibrosis.

Classification



History & Examination

When to suspect

Patients with chronic exertional SOB with or without non-productive cough and one or more of the following

- Significant occupational /recreational exposure-(e.g.: Poultry/Farming/ carpentry/bird fanciers, quarry workers…..)
- Smoking
- History of connective tissue disorders (Systemic sclerosis/ Rheumatoid arthritis, etc.)
- Prolonged use of some drugs (e.g. Methotrexate, Amiodarone, Nitrofurantoin, Anti-cancer drugs…..)Ref.
- Physical examination- Fine end inspiratory bibasal crepitation

Investigations

- CXR
- ECG
- Six minute walk test

Refer to a specialist centre for

- lung function
- Serology(Auto immune screen)
- Echo
- HRCT

Management

Identify the probable causative agent and advice on avoidance

Refer to specialist respiratory clinic within two weeks

08	Obstructive Sleep Apnoea(OSA)/ Sleep disordered breathing

Introduction

Obstructive sleep apnoea (OSA) is the commonest form of sleep disordered breathing worldwide. In OSA there is cessation of breathing due to upper airway closure during sleep. The commonest symptoms of OSA are snoring, daytime somnolence and apnoeas.

History & Examination

When to suspect

In any patients with any one of the following

- Snoring
- Obesity (≥30) or overweight(BMI≥25)
- Day time somnolence
- Witnessed apnoeas
- Difficult to control DM/Hypertension
- Polycythemia

Investigations and Management

Screening for Obstructive Sleep Apnoea

Screening tool - Stop Bang Questionnaire

If positive, refer for

- Thyroid function test
- Serum bicarbonate level
- ENT assessment, including a fibre optic laryngoscopy
- Sleep study

If OSA is detected on the sleep study - referral to respiratory physician/ENT surgeon commence on CPAP/upper airway surgery.

STOP		
Do you SNORE loudly (louder than talking or loud enough to be heard through closed doors)?	Yes	No
Do you often feel TIRED, fatigued, or sleepy during daytime?	Yes	No
Has anyone OBSERVED you stop breathing during your sleep?	Yes	No
Do you have or are you being treated for high blood PRESSURE?	Yes	No
BANG		
BMI more than 35kg/m^2?	Yes	No
AGE over 50 years old?	Yes	No
NECK circumference > 16 inches (40cm)?	Yes	No
GENDER: Male?	Yes	No
TOTAL SCORE		

High risk: Yes 5 – 8 **Intermediate risk: Yes 3 - 4** **Low risk: Yes 0 - 2**

If high or intermediate risk (3 or more)

Refer to a Respiratory Physician/ENT Surgeon

Lifestyle modification,

Advice on sleep hygiene

(Annexure 01)

Follow up after 3 months

If persistent symptoms-

Refer to a Respiratory

Physician

In case of obesity - life style modification advice/ weight loss/ refer to obesity guideline

09 Annexes

Annex 1- Inhaler Techniques

How to use MDI inhaler without spacer

- Take off the cap and shake the inhaler well for 5 seconds.
- Hold the inhaler firmly by placing your index finger on top of the canister and thumb on the bottom of the mouth piece
- Tilt your head back slightly
- Exhale away from the inhaler
- Put the inhaler in your mouth in between your teeth and seal with lips. press the inhaler and start breathing at same time
- Keep breathing in slowly, as deeply as you can
- Hold your breath for 10 seconds
- Exhale slowly though your mouth or nose
- Repeat all these steps after 30 to 60 seconds if another dose is required.
- If you are using corticosteroid medications rinse your mouth with water after all doses are completed.

If you are still unable to do the above steps properly it is advisable to use a spacer. Children and elderly persons are usually prescribed a spacer along with MDI inhaler.

How to use a dry powder inhaler

There are several types of dry powder inhaler devices available in the market and you have to refer the instructions given along with particular dry powder inhaler.

The example given below is for Vento haler, which is currently available in government hospitals and clinics

- Remove the safety cap
- Hold the base with one hand and pull the mouth piece with the other hand to open the device.

- Remove a dry powder capsule from the strip. Remember this has to be removed just before your dose in order to maintain the dry and hygienic
- Now insert the capsule vertically with the transparent end first into the special chamber of the device
- Fix the mouth piece back to the bottom part (the part with the button)
- Hold the device up right, (vertically) and press the button twice to pierce the capsule properly.
- Now breathe out fully
- Slightly tilt your head back and insert the mouth piece horizontally to your mouth. Keep the mouth piece in between your teeth and seal with your lips. Now breathe in rapidly and as deep as you can. If the inhaler operates properly, it will make a rattling sound.
- Remove the ventohaler from your mouth while closing your lips and hold your breath for about 10 seconds.
- Now breathe out through your nose.
- Finally rinse your mouth with fresh water.

Annex 2- Sleep Hyegiene

These are habits and practices that are conducive to sleeping well on a regular basis

- Limit napping
- Establish a regular bedtime routine
- Avoid caffeine and other stimulants, especially later in the day
- Get regular exercise
- Avoid foods that may be disruptive before bedtime
- Get exposure to natural light throughout the day
- Make sure the sleep environment is comfortable
- Don’t look at the clock at night
- Stay away from bright screens on your computer or cell phone before bed

10	**Reference**

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