PAL

PRACTICAL APPROACH TO LUNG HEALTH

National Programme for Tuberculosis Control & Chest Diseases, Ministry of Health
Public Health Complex, 555/5, Elvitigala Mawatha, Colombo 5, Sri Lanka
Tel: +94112368276, +94112368386. email: dnptccd@gmail.com

Funded by GFATM

Message from Director General of Health Services

Introduction of a new strategy to a country particularly in the context of a disease control sphere is a lengthy and strenuous exercise. Neverth~less, NPTCCD, Ministry of Health has decided to launch PAL strategy in Sri Lanka as a pilot study in identified areM.

This decision was taken following series of discussions, evaluation and deep analysis of the experiences in other country.

Sri Lankan Health System has achieved remarkable progresses in the field of controlling of communicable diseases, including in Tuberculosis in comparison to our neighbor countries as well as in countries in the other regions the World.

With the guidance of WHO/SEARO, it was decided the new strategies are necessary to be integrated in to our TB control activities to achieve our national and millennium development goals, The universal case detection, reduce the defaulting rate ,mortality rate and higher level of urban TB are considered as prime concern by us in this context. The PAL strategy is to identify more and more new Tuberculosis cases, masked among other common respiratory diseases, standardize the identification and management of respiratory diseases including TB by appropriate sensitization of health care workers. As the Director General of Health Services, I sincerely hope that by adoption of PAL, even as a pilot study will bring an additional strength to the activities of NPTCCD and would like to congratulate the Director of NPTCCD and his team for the commitment shown, in introduction of PAL Strategy in Sri Lanka and for their activities in strengthening of TB control services in the country .I am thankful also to SEARO and GF A TM for the assistance rendered in this great endeavor.

Dr. Ajith Mendis
Director General Health Services. Ministry of Health.

Message from Director

PAL along with DOTS in Sri Lanka.

DOTS are considered as a widely accepted strategy for effective Control of Tuberculosis and it was introduced by WHO at the end of last century. DOTS ,brought remarkable successes to the Tuberculosis Control Programmes and saved the lives of millions of People around the World.

DOTS Strategy includes series of interventions in almost all steps of tuberculosis control, from case detection to the Government Commitment The health and socioeconomic benefits and impacts of DOTS to a country therefore, tremendous.

Nevertheless, it is now widely recognized that, low case detection is still remains to be the major obstacle for controlling of Tuberculosis in many countries. One of the key factors behind the low case detection is lack of rational, scientific and comprehensive approach towards Respiratory Diseases in the health system. Clinical vigilance, availability and usage of appropriate diagnostic technology, sufficient knowledge on path physiology and clinical morphology behind individual respiratory condition and its individual variations and adoption of appropriate pharmacological and other medical interventions for management of respiratory diseases and follow up procedures are considered as major components of issue.

In this context, to address these issues, a new scientific strategy called "Practical Approach to Lung Health (PAL) was introduced by WHO, while sustaining the DOTS Strategy as the Key approach in Tuberculosis control.

The NPTCCD, Sri Lanka in Collaboration with WHO/SEARO, attempting to introduce PAL for the first time to the health system of Sri Lanka. There are adequate scientific evidence that in most of the situations, Sri Lanka needs different kinds of health approaches, considering our country specific disease trends, strong Public health and curative care network and socio-economic factors. The integration of fresh thinking, new skills, approaches, policies and Strategies are necessary for our programme and Health System to accomplish our unfinished mission in Tuberculosis Control. The variety of new clinical, strategically and managerial steps have been adopted by the NPTCCD in last few years to achieve this task and the PAL is one of those serious steps forward.

In this regard, I am thankful to SEARO, WHO Sri Lanka office, for Organizing Technical and the OF A TM for the financial assistance rendered in this regards

I am particularly thankful to Dr. M.K. Rezwan of SEARO, Dr. F. R Meh"tha, WHO Representative in Sri Lanka, Dr. Supriya Warusawithana of WHO Sri Lanka office and Dr R. R Abeysinghe, Director of OF A TM Project for assistance extended in this regards.

The Key Technical Person. behind this exercise is Dr. Amitha Fernando, Consultant Chest Physician of Central Chest Clinic, and Colombo. I do highly appreciate his commitment & academic contribution in PAL initiative in Sri Lanka. I am thankful to

Director General of Health Service, Dr. Ajith Mendis, and current Additional Secretary (former DDG-PHS) Dr. P.Mahipala who have encouraged and guided us in all of our activities.

I am appreciating the role played by Dr. Sudath Samaraweera, Consultant Community Physician of NPTCCD, Dr. Oeethal Perera, and Dr.(Ms) Chandani Unambuwage, senior registrars of Colombo Chest Clinic, Dr. Thushara Ambagahage, MO, NPTCCD and all of our team members of PAL initiative in Sri Lanka.

As Director of NPTCCD, I sincerely hope that PAL would contribute a great way to achiev~ our targets in TB Control in Sri Lanka.

Dr. Sunil De Alwis
Director
National Programme for
Tuberculosis Control and Chest Disease.

Introduction

Respiratory diseases are responsible for a considerable burden of suffering and death Worldwide. These diseases account for up to one third or more of the demand of health care services in a primary care settings. The World Health Organization (WHO) estimated that 4.6 million people died prematurely in 2005 due to chronic respiratory diseases. Despite the fact that many of these diseases are preventable, global prevalence is increasing in both the developing and developed world.

The most frequently occurring respiratory diseases that result in significant morbidity and mortality are upper and lower respiratory tract infections, tuberculosis, allergic rhino-sinusitis, asthma, chronic obstructive pulmonary disease (COPD), occupational lung diseases and lung cancer. Constant vigilance is also required to prepare health care systems for emerging influenza pandemics, tuberculosis (and it's multi-and extensively drug resistant forms) and HIV relegated lung diseases.

Despite advances in respiratory care, quality of care delivered to patients particularly in primary care settings needs to be improved. Though National and International guidelines exists for many of these diseases the translation of this into clinical practice in ways that improve patient care leaves much to be desired.

Practical Approach to Lung Health (PAL) intends to identify and address many of the short-comings currently encountered in encountered practice. PAL aims to implement a strategy for a comprehensive, symptom-based approach to manage patients in primary care settings while establishing a hierarchical referral system. It also will address disease classifications and coding in keeping with established international practices which will help plan health care delivery in a more efficient cost-effective manner. The clinical, guideline is indented to impart knowledge develop skills in diagnosing and managing common respiratory diseases. Every effort has been made to make it a symptom based practice guideline addressing local and National needs in keeping with Internationally accepted best practice guidelines.

Sections also proved health education messages, visual aids that will help clinicians communicate better with patients, comprehensive guide on smoking cessation and practical tips on home based **" Pulmonary Rehabilitation"** program which can be implemented in primary health care settings.

I am greatly in debt to Dr. Surath Geethal Perera and Dr. Chandimani Undugodage Senior Registrars in Respiratory Medicine for their valuable contributions in terms of technical input , dialogue and creative skills in developing this Guideline. A very big thank you needs to be extended to Mr. N. Sutharshanan from Glaxo-Smithkline Ltd for volunteering his time and his computer skills in developing the many charts and graphics without which the guideline would not have been a possibility.

DR. Amitha Fernando
Consultant Respiratory Physician

CONTENTS

Annexures

HEALTH EDUCATION MEASSAGE (HEM)

Acutely ill patient

Clinical assessment

Airway, Breathing , Circulation.

Resp rate >30,
Pulse >120,
Confusion.

Systolic Blood pressure< 90mmHg,
Cyanosis,
Fever >39C

Consider:
Massive pulmonary embolism
cardiogenic shock
Severe sepsis
Tension pneumothorax

Imminant collapse patient

Assess and Correct ABC
A - Airway - remove dentures etc.
B - Breathing - Respiratory rate, pattern
C - Circulation - Blood pressure, pulse

Put an airway if unconscious.- consider intubation
- O_2 by mask support with ambu bag if necessary.
- IV cannula- normal saline drip

→ Transfer to a suitable institute as soon as possible after stabilization

Take a short history.

Was there a preexisting lung disease???
Is this an exacerbation of the same illness ??

→ bronchial asthma, COPD → follow protocol.

↓ Not sure/ not the same illness

Chest tightness ,Breathlessness / Wheeze
go to page 02

Fever, Pleuritic chest pain, Cough +/- sputum
go to page 03

Silent chest- indicate severe bronchospasms

Tracheal shift } to the oppsite side
Shifted apex beat }
↓ Chest movements on opposite side
Stoney dull percussin note
Absent breath sounds

Indicate Massive pleural Effusion

Tracheal shift } to the same side
Shifted apex beat }
↓ Chest movements on same side
Stoney dull percussin note
Absent breath sounds

Indicate Massive collapse

Acutely Wheezing Patient

Assement

- Acutely distressed
- Unable to speak in sentences
- Clammy extreamities.
- Altered sensorium
- Unable to lie flat.

Targeted history

- Known COPD
- Known bronchial asthma
- Known Left ventricular failure (LVF)
- Past or current smoking history
- Current medication if known

- Symptoms episodic, normal periods of breathing in between
- Symptoms worst at night and early morning
- Known triggers of symptoms
- Associated allergic rhinitis, eczema
- Family history and / or childhood history of asthma or allergies.
- Previous symptom control with inhaled steroids

Asthma likely - Follow protocol

Refer page 25

- Symptoms onset after age 35
- Slowly worsening symptoms
- Long history of almost daily cough and sputum production
- Prominant exertional shortness of breath
- Short of breath all day long - No diurnal variation
- History of heavy smoking

COPD likely - Follow protocol

Refer page 30

- History of hypertension, Ischemic Heart disease, Diabetes
- Difficulty in lying flat in bed
- Nocturnal cough when lying flat in bed

LVF patients may also present with wheezing.

Mitral stenosis can present with acute pulmonary oedema

Examination

- Ankle swelling
- Raised JVP
- Shifted apex beat
- Gallop rhythm/ third heart sound
- Bibasal crepitations

LVF likely - Manage as follows

Management

- Pulse Oxymetry if possible.
- Document RR, pulse, SpO2, BP .
- Nebulize salbulamol every 20 min (Practical points -refer page 43)
- O2 by face mask / venti mask (max 28% if COPD is likely)
- IV cannula.
- Oral prednisolone 1mg / kg OR IV hydrocortisone 100-200mg stat.

-IV furosemide 20-40 mg stat. if SBP is >120mmHg.
- If BP> 180/100mmHg, consider IV GTN infusion
- Consider CPAP if available

Assessment is a continuous process — Review the patient in 30 minutes

If fully recovered - Likely asthma

If recovory is unstisfactory

- Continue nebulizations; add ipratropium
- Consider CPAP if available especially if COPD, LVF likely

If still not improved

If worse than the baseline

Transfer to a suitable centre

Assessment of patient with Cough, fever, pleuritic chest pain

Are there upper respiratory features? YES → Follw protocol page 7

Are there any lower respiratory features?

Cough
Breathlessness
Haemoptysis
Pleuratic chest pain

→ YES

? TB Suspect - follow protocol

refer page 51

A Assess for severety of illness

A. Confusion - recent onset
B. Repiratory rate >30 per minute
C. Systolic blood pressure <90mmHg
D. Age >65

B Assess for comobiditities

- Heart failure
- Uncontrolled diabetes
- Uncontrolled Asthma/COPD
- Chronic renal failure
- Known underlying structural lung disease (i.e. - lung fibrosis, bronchiectesis)
- Underlying Malignansis
- Immunosuppressed patients / HIV

C Also look for

- Acute dehydration
- Vomiting/unable to take orally
- Poor support at home
- Debility

Of above

0 or 1	any 2	3 or 4
GROUP 1 Low risk	GROUP 2 Intermediate risk	GROUP 3 High risk
Likely to be suitable for home treatment	Consider hospital admission	Manage in hospital/ICU severe pneumonia

- Also consider factors in boxes B and C when deciding admission to hospital
- If in group 3 of risk assessment, transfer to a centre with ICU facility

Pulse Oximatry < 92%, consider as group 3

An initial IV bolus of an appropriate antibiotic within the first 6 hours of presentation has been shown to reduce mortality in patients with severe pneumonia

Community Acquired Lower Respiratory Tract Infections

? TB Suspect - follow protocol

refer page 51

GROUP 1
Low risk
Likely to be suitable for home treatment

- Diagnosis is clinical
- CXR, Hb FBC, ESR, CRP not always needed but may be useful in diagnosis and followup
- Antibiotic treatment is emperical.

HEM - 44A, 45A

Common bacterial pathogens

Streptococcus pneumonia
Chlamydia pneumoniae
Mycoplasma pneumoniae
Haemophilus influenzae
Moraxella catarrhalis
Legionella pneumophila

In 40-60% of cases in adults the cause is unknown

Antibiotic Choices

1. Amoxycillin 500mg tds for 5-7 days
2. If penicillin allergy - Erythromycin 500mg 6 hourly for 5-7 days
   OR
3. Azithromycin 500mg daily for 3 days
   OR
4. Oral second or third generation cephalosporins
   OR
5. Doxycycline 100mg bd 5-7 days (avoid in - pregnant mothers and children)

Other antibiotics

1. First generation cephalosporins have poor penetrance into repiratory tract and are less suitable alternatives
2. Ciprofloxacin is not effective against pneumococcai and should not be used to treat community acquired lower respiratory tract infections. It is a drug used to treat drug resistant TB and may mask underlying tuberculosis.
3. Newer Quinalones i.e. Levofloxacin, Moxifloxacin are effective , but should be used with caution in high TB prevelance settings.

Factors to consider when choosing antibiotics

- Antibiotics used in the past 3 months- cosider a differant group to minimize resistance
- Hospitalizations in the past three months- possibilty of hospital acquired pathogens
- Institutional care - i.e. Nursing homes, refugee camps- possibility of resistant pathogens
- Alcoholism - cosider Gram negative bacilli
- Smoking -*H. influenzae, M. catarrhalis*
- Underlying structural lung disease i.e. Bronchiectasis, fibrotic lung- consider *pseudomonas aeruginosa*

In risk groups consider Co-amoxiclav preparation

- Advice on fluid intake, diet, anti-pyretics

- If smoker- Initiate smoking cesasion refer page 45

- Control of underlying conditions i.e. Asthma, COPD and Diabetes
- If No clinical improvement within 48-72 hours, worsening fever, difficulty in breathing, urgent review or hospital transfer
- Look for clinical evidence of pleural effusions, sepsis - if evident give a bolus IV injection of a broad-spectrum antibiotic and arrange early hospital transfer

For management of hospitalized patient, refer national guideline

Patient Presenting with Haemoptysis

Assess

Respiratory rate
Blood pressure
O_2 saturations/ cyanosis
Massive active bleeding
Altered sensorium

Try to determine the site of bleeding- Lungs, mouth, GI tract, Upper airways.

? TB Suspect - follow protocol
refer page 51

STABLE

- Blood streaking with mucopurulant sputum	→	Bronchitis
- Chronic sputum with recent change	→	AECB*
- History of fever and chills	→	Pneumonia
- Putrid smell	→	Absess
- Chronic copious sputum	→	Bronchiactasis
- Acute onset chest pain + dyspnea	→	Pulmonary Embolism

Also consider

Mitral stenosis
Renal disease - Goodpastures
Systemic Lupus Erythematosis
HIV - Kaposi sarcoma
Past malignancies
Smoking
Asbestos exposure
Bleeding disorders - anticoagulants

Stable patient - History suggestive of aetiology - Follow protocol

Treatment

Tranexemic acid 500mg tds for 5 days
Amoxycillin/Erythromycin or
Co-amoxiclav - for patients with chronic lung disease
O_2 if dyspnoeic or having low O_2 Saturations
Rest
Cough suppressants

UNSTABLE

Stabilize the patient.
IV line
O_2
Place the abnormal side in a dependent position
Contact anaesthetist/ ICU- arrange transfer

? Amount >600ml/24 hours - Massive haemoptysis

Refer for early assesment even if currantly stable

All non diagnosed patients need CXR and may also need bronchoscopy

Refer for further assessment

* - Acute Exacerbation of Chronic Bronchitis

Epistaxis

Asses haemodynamic stability.
- Pulse
- Blood Pressure

Stable

Pinch the nose
keep the patient in a seated up position
apply an ice pack on the nose
If no contraindications nasal decongestent drops
(ephadrine, Oxymethazolin,)
1:1000 adrenaline nose pack

History
Bleeding disorders
Anti coagulant use
Hypertension
Alcohol abuse

Bleeding arrested

Refer to ENT unit

Bleeding not settled

Unstable

IV Cannula
IV Normal Saline
Blood Grouping and DT

Stabilized

Not stabilized

Arrange transfer to an ENT/medical casualty

All patients should be refered for assesment by an ENT unit

Runny Nose (Clear waterly discharge)

Short duration of symptoms < 3-5 days

- Mild sore throat
- Fever
- Headache
- Malaise

Commonly viral
Rhinovirus, Corona virus, Parainfluenza
Respiratory syncytial virus, Influenza,

No antibiotics required

- Paracetamol
- Anti-histamines

If persistant

Re-evaluate

Protective measures from influenza

- Frequent hand washing with soap and water
- Avoid rubbing eyes, mouth and nose (this is how viruses gain entry from contaminated hands)
- Door handles, holding bars on buses are sources of contamination.

- Cough etiquette

1. Cover mouth and nose with a tissue when coughing or sneezeing
2. Dispose the tissue in a waste bin
3. Wash hands frequently

- Have seasonal flu vaccine
- During outbreaks of influenza - Advise patient to refrain from public places/work/school
- Stay in good health by paying attention to nutrition, fluid intake, rest

Influenza outbreak

- Specimen collection and transport - Refer annexure page 50

REFER TO SMOKING CESSATION PROGRAM (refer page 45)

Symptoms for more than 3 weeks

- Runny nose
- Sneezing
- Nasal itching
- Itchy eyes

Refer to Allergic Rhinitis algorithm (page 8)

Allergic Rhinitis (Hay Fever) — ICD - J30.1

Intermittent symptoms
1. <4 days/week
2. or <4 weeks

1. Is it intermittant or persistant?
2. Is it Mild or Moderate-Severe?

Persistant symptoms
1. >4 days/ week
2. and >4 weeks

Symptoms	Mild	Moderate - Severe
1. Impairment of sleep	No	If 'YES' to any
2. Impairment of daily activities, sport, leisure	No	
3. Impairment of work and school	No	
4. Troublesome symptoms	Nil	

Intermittent symptoms

Mild
- Oral antihistamines (H_1)
- Intra nasal anti histamine
  and / or
- Decongestant
  or LTRA

Moderate to Severe
Oral / intranasal antihistamine (H1)
and / or
Decongestant
or
Intranasal CS
or
LTRA
↓
If persistant rhinitis review the patient after 2-4 weeks
↓
No improvement → Step up
Improved → Continue for 1/12

Persistant symptoms

Mild
- Intranasal CS
-oral anti histamines (H_1) or LTRA
↓
Review 2-4 weeks

Improved → Step down & continue treatment for 1 month

No improvement
- Review for compliance
- Look for infection
↓
None
↓
Refer to Physician/ENT surgeon/ Chest Physician

Moderate to Severe
- Intranasal CS
-oral anti histamines (H_1) or LTRA
↓
Review 2-4 weeks

Improved → Step down & continue treatment for 1 month

No improvement
- Review for compliance
- Look for infection
↓
None
↓
Refer to Physician/ENT surgeon/ Chest Physician

Allergen and irritant avoidance

-Clear discharge from one nostril
? CSF Rhinorrhea/ base of skull fracture
-prolonged use (> 7days) of decongestants lead to rebound symptoms

Refer annexture for medication - Page 35

LTRA - Leucotriene Antagonists
CS - Corticosteroids

Mildly ill patient
headache and / or sinus tenderness

- Symptoms <1/52
- Clear nasal discharge
- Mild pain over sinuses
- Post nasal drip

Viral sinusitis ICD - J 01

- Reassure
- No antibiotics

- Saline nasal drops every 4-6 hourly
- Steroids (Betamethasone + Neomycin)
- PCM 1g - 6 hourly
- Intranasal oxymetazoline 6-8 hourly <5 days

(Nasal decongestions if used for more than 7 days can cause rebound symptoms)

Examination of throat and sinuses

- Open the mouth widely and ask the patient to put the toungue out
- Inspect the oral cavity
- Use a tongue depressor to depress the tongue while inside the mouth
- Inspect the tonsils and the posterier pharyngial wall
- Using the tongue depressor to move the tongue to either side to inspect the gums and the retromolar space.

- Symptoms <1/52 or severe symptoms
- Purulent nasal discharge
- Facial pain/ tooth pain / tenderness

Bacterial sinusitis ICD - J 01

- Oral amoxycillin 500mg tds - 10 days **OR**
- Amoxycillin + Clavulanate 375-625 tds for ten days **OR**
- Macrolides-clarithromycin 250-500mg bd for 7-10 days **OR**
- Doxycycline 100mg bd for ten days **OR**
- Cefuroxime axetil 250-500 bd for7-10 days

(In case of penicillin allergy co-trimazole)

- intra nasal steroids

- Suspected tooth abscess.
- Swelling around the eye or face.
- Failure to respond to medication after 10 days.
- Rapid progression of symptoms
- Immunocompromised patient

- Refer to the ENT unit

Sore throat
Mildly ill

- Red throat
- No pus/associated features
- Cough
- Low grade fever
- Sneezing
- Nasal congestion

ICD - J 02 — Viral pharyngitis

- Reassure
- No antibiotics required
- Salt water gargling – BD
- Paracetamol 1g 6 hourly

If no response,
Refer to ENT Surgeon

Common pathogens
Group A: ß-hemolytic, streptococcus, Rhinovirus, RSV, Parainfluenza, epstein barr virus, Influenza, HIV, Herpes simplex virus, N.gonorrhoeae

Examination of throat and sinuses
- Open the mouth widely and ask the patient to put the tongue out
- Inspect the oral cavity
- Use a tongue depressor to depress the tongue while inside the mouth
- Inspect the tonsills and posterior pharyngeal wall
- Using the tongue depressor move the tongue to either side to inspect the gums and retromolar space.

- Red throat
- Pus with white patches
- +/-Tender cervical lymphadenopathy

Bacterial tonsillitis — ICD - J 03

- Oral penicillin 500mg 6 hourly for 10 days **OR**
- Oral amoxycillin 500mg tds - 10 days **OR**
- Amoxcillin/Clavulanate 375-625 tds for ten days **OR**
- Macrolides clarithromycin 250-500mg bd for 7-10 days **OR**
- Doxycycline 100mg bd for ten days **OR**
- Cefuroxime axetil 250-500 bd for7-10 days

1. Severe swallowing problems
2. Inability to open mouth (Retropharyngeal abscess, Ludwig's angina)
3. >4 episodes per year
4. Peritonsillar abcess
5. Acutely ill patient

- Salt water gargling
- Paracetamol 1g 6 hourly
(In case of penicillin allergy erythromycin 250mg 6 hourly for 10 days)

Mildly ill patient
'Ear problems'

Examine outer ear and ear canal

- Pain
- Pustule (Furuncle)

Oral cloxacillin

Discharge +

ICD - H60 Otitis externa

Otitis Externa

Common Pathogens
Pseudomonas aeruginosa, *Staphylococcus aureus*, Aspergillus sp, Candida sp

White / Black ear canal

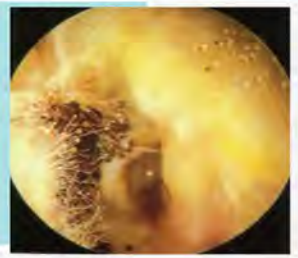
Fungal otitis externa

Refer to ENT Surgeon

Ear Anti- infectives

Neomycin/Hydrocortisone	-	4-6 drops tid-qid x 5-10 days
1-12 yr	-	5 drops bid x 10 days
>12 yr	-	10 drop bid x 10 days

Other antibiotic/corticosteroid combination are available



If no response, refer to ENT Surgeon

Otitis media — ICD - H66

Ear ache +/- Discharge

- Inflammed or bulging ear drum
- +/-Pus from ear for <2/52

→ Acute Otitis Media

→ Oral amoxicillin for 7-10 days

→ No response in 48 hours

→ Refer to ENT Surgeon

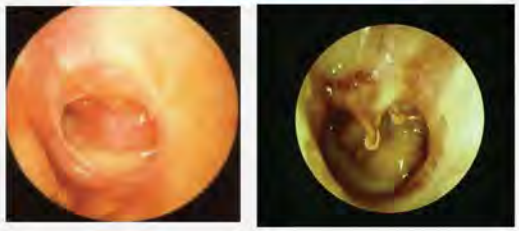
Common Pathogens
Streptococcus pneumonia, Haemophillus influenzae, Moraxella catarrhalis, Klebsiella sp.,Enterobacter sp., *Staphylococcus aureus, Pseudomonas aeruginosa*, Bacteroides, Fusobacterium, Prevotella, Porphyromonas, *Staphylococcus epidermidis*

- Oral amoxycillin 500mg tds - 10 days
- Amoxcillin/Clavulanate 375-625 tds for ten days
- Macrolides clarithromycin 250-500mg bd for 7-10 days
- Doxycycline 100mg bd for ten days
- Cefuroxime axetil 250-500 bd for7-10 days
  (Adjust dosage according to age)

Using an Otoscope
- Pull the pinna postero superiorly
- Hold the otoscope with the left hand when examining the left ear and right hand when examining the right ear
- Light should reflect antero inferiorly on tympanic membrane.
- Inspect the
  - External auditory canal
  - Tympanic membrane for
    1. Integrity
    2. Position
    3. Colour
  - Middle ear cavity

- Perforation
- Pus from ear for >2/52

→ Chronic Otitis Media



→ Refer to ENT Surgeon

Mastoid pain
Refer to ENT Surgeon

COUGH >2/52
- In the absence of shortness of breath & pleuritic chest pain
- Normal chest examination
- Normal chest X-ray (If available)

LOOK FOR
- Productive cough
- Loss of weight
- Loss of appetite
- Heamoptysis
- Lethargy
- Night Sweats

? **TB Suspect - follow protocol**
refer page 51

History of smoking → REFER TO SMOKING CESSATION PROGRAM refer page 45

- Phlegm in throat
- Trickling sensation along the throat
- Need to clear the throat frequently

Post nasal drip syndrome

- Runny nose
- Sneezing
- Nasal itching

Allergic Rhinitis

Refer AR management algorithm **page 08**

- Blocked nose
- Loss of taste & smell
- Headache

Sinusitis

Refer Sinusitis management algorithm **page 09**

- Episodic cough
- Known triggers
- Diurnal variation of symptoms
- Associated atopy

Eosinophillic cough syndromes

Cough variant asthma
Eosinophilic bronchitis
Tropical pulmonary eosinophilia
Refer page 15

Preceded by a Respiratory tract infection

Post infectious cough

Reassure
- high dose inhaled steroids
- Cough suppressant

Abdominal fullness/ Dyspepsia / cough related to meals

GORD (Gastro oesophageal reflux disease)
(Refer GORD algorithm)
(Page 14)

Drug history (ACEI* /β blockers)

Drug induced cough

- Consider an alternative drug
- Liaise with the treating physician

- Cough with stridor / choking - adult onset pertussis
- Cough with suspected foreign body inhalation

Refer for specialist's care

* ACEI - Angiotensin Converting Enzyme Inhibitor

GORD
(Gastro oesophagel reflux disease)

ICD - K 21

-Cough 1 hour after meals
- Heart burn / chest pain
- Acid reflux/ bitter taste in mouth
- Belching/ retching abdominal puffiness/ fullness

Acid reflux disease

- Dietary modification
- Avoid alcohol and smoking
- Weight reduction
- Omeprazole 20mg bd (1/2 hour before meals)
- Domperidone or Mosepride

Treat for 4 - 6 weeks, if no response

Refer to physician/ Gastroenterologist

- Cough within 10 minutes of eating or while eating certain foods. i.e. breads, spicy, oily food
- Cough when talking for a long time
- Cough brought on by singing or speaking
- Cough when getting out of bed in the morning
- Hoarseness of voice

Non acid reflux disease

can occur in the absence of dyspepsia

REFER TO SMOKING CESSATION PROGRAM refer page 45

- Dysphagia
- Loss of weight
- Loss of apetite

Refer to Physician/ Gastroenterologist

Eosinophillic Cough Syndrome

ICD - J 82

Do WBC/DC - absolute eosinaphil count (E)

(E) > 3000mm³

Tropical pulmonary eosinophilia

Constitutional symptoms

DEC 6 mg/kg body weight for 21 days

Review - If persistant symptoms

Refer to Physician / Chest Physician

(E) < 3000

- Cough variant asthma

- Eosinophilic bronchitis

Refer Asthma algorithm
Page 20

DEC - Diethyl carbamazine

Cough with sputum

Cough for >2 weeks
Difficulty in breathing with sputum production

- **Haemoptysis**
- **Loss of weight**
- **Loss of appetite**
- **Lethargy**
- **Evening fever**
- **Contact history**
- **Night sweats**

- Fever
- Weight loss
- Loss of appetite
- Foul smelling sputum

- Sputum production
- +/- haemoptysis
- Postural cough
- Past history of TB/Pneumonia
- Clubbing
- Lungs coarse crepts + wheeze

- Cough for >3 times a year >3 consecutive years
- Purulent sputum
- Weight loss
- Infective exacerbation

Will need a chest X-ray to confirm diagnosis

? TB Suspect - follow protocol

refer page 51

Haemoptysis, Clubbing -think Malignancy

Lung abscess — ICD - J85

Refer to physician or chest physician

Bronchiectasis — ICD - J47

(exclude TB reactivation)

Refer Bronchiectasis algorithm Page 18

Chronic Bronchitis — ICD - J41

Refer Bronchitis algorithm Page 17

Ref page - 13A

Bronchitis

Acute bronchitis

ICD - J 20

- Bronchodilators
- Anti pyretics
- Avoidence of toxic exposure and smoking cessatinon when relavant
- Mostly with viruses (influenza, adeno, rhino, corona)- antibiotics not indicated, reassure
- Less commonly Bacterial-*Mycoplasma pneumoniae* and *Chlamydia pneumoniae*, *Bordetella pertusis*

oral macrolides for 7-10 days.

Acute Exacerbation of Chronic Bronchitis

ICD - J 44.0

Symptoms of an excacerbation

1. Increasing breathlessness
2. Increasing sputum volume
3. Increasing sputum purulence

antibiotics are of greatest value in patients with all 3 features.
May be appropriate with 2 features

Influenza viruses

H influenzae
Moraxella catarrhalis } beta-lactamase producing strains

S. pneumoniae
Chlamydia pneumoniae

Differential diagnosis

Pulmonary Embolism, Pnemothorax, Pneumonia, Cor-pulmonale
Consider bronchial carcinoma

Indications for hospital referral

- Severe breathlessness
- Poor physical function
- Cyanosis
- Altered level of consciousness
- Severe right heart failure
- 03 Exacerbations/year

Antibiotic choices

- Co-amoxyclav preparation 500mg tds 7d
- Macroloids clarithromycin 500mg bd
- Roxithromycine 150mg bd 7d
- Doxycycline 100mg bd 7d
- Newer qunialones levofloxacin 500mg daily 7d

Bronchodilators

- SABA / anti-cholinergic bronchodilators
- LABA
- Sustained release Theopyllines
- Oral steroid
- Prednisolone 30-40 mg/day for 7 d.
- Smoking cessation - Refer Page 45
- Pulmonary rehabilitation - Refer Page 47

Bronchiectasis

ICD - J 47

- Cough productive of sputum, postural increase in volume of sputum +/- haemoptysis, weight loss, breathlessness/Wheeze
- Clubbing
- localized or diffuse coarse crepts on auscultation
- Look for indications for hospital referral

Indications for hospital referral

- Severe breathlessness
- Poor physical function
- Cyanosis
- Altered level of consciousness
- Severe right heart failure
- 03 Exacerbations/year

- Increasing breathlessness
- Increasing sputum volume
- Increasing sputum purulance
- +/- Haemoptysis

Antibiotics

Co-amoxyclav preparation 625 mg tds 7d
Amoxycillin 500mg-1g tds for 7-10 days
Macroloids clarithromycin 500mg bd OR
Roxithromycine 150 mg bd for 7d OR
Doxycycline 100 mg bd for 7d OR
Newer qunialones levofloxacin 500mg daily for 7d

Bronchodilators
SABA
Theophyllines

Oral steroid (if wheeze /bronchospasms prominant)
Prednisolone 30-40 mg / day for 7 d.

Haemoptysis
Tranexemic acid 500mg tds for 5days

? TB Suspect - follow algorithm

refer page 51

Clinically stable patient

Asses the current episode

? **Infective exacerbation.**

Copious foul smelling sputum
poor oral hygine, uncontrolled diabetic, alcohol abuse.

ICD - J 85

CONSIDER LUNG ABSCESS

Common organisms
anaerobes-fusobacterium, bacteriods, *clostridium perferingens*, klebsella , Staphyllococci , and Group A streptococci

Amoxycillin 1g tds AND
Metranidazole 400mg tds
OR
Co-Amoxyclav
OR
Clindamycin

Total duration for 4- 6weeks

All patients will need CXR +/- HRCT to confirm the diagnosis.
Should be referred to district chest clinic / physician run clinic for sputum AFB culture, fungal studies, Gram stain and culture and spirometry

will need to be enrolled in a programme of chest physiotherapy for secretion clearance techniques

HEM - 14A - 19A, 42A - 46A

Cough >2 weeks
with difficulty in breathing with/without sputum

- Previous diagnosis of asthma
- Episodic symptoms
- Symptoms worse at night or early hours of morning
- Triggers
- Relievers - Bronchodialaters or nebulization
- Associated allergic rhinitis, rhinitis, eczema, urticaria
- Family history of asthma

→ Bronchial Asthma — ICD - J 45

- Onset Later in life >4th decade
- Progressive symptoms
- Limitation of physical activity
- History of smoking
- Occupational exposure to fumes / irritants
- Domestic - fire wood
- Past history of pulmonarary TB

→ Chronic Obstructive airway disease — ICD - J 44

- Chest pain
- Past history of ischelmic heart disease
- Orthopnoea
- Paroxysmal nocturnal dyspnoea

→ Heart Failure — ICD - I 50.1

Exclude anaemia

- Haemoptysis
- Loss of weight
- Loss of apetite
- Lethargy
- Low grade fever
- Contact history

→ Tuberculosis suspect

→ Refer algorithm Page 51

Haemoptysis - Malignancy

Bronchial Asthma — ICD - J45

Asthma is a chronic inflammatory disease characterized by variable and reversible airflow obstruction

In the majority, the diagnosis can be made on clinical grounds

Symptoms of athma are
- Cough
- Wheeze
- Breathlessness
- Limitation of activity
- Chest tightness

These Symptoms are
- Episodic
- Variable
- Triggered by certain factors
- At times occupation related
- Relieved by bronchodilators/steroids

associated with allergic rhinitis
family history of atopy/asthma

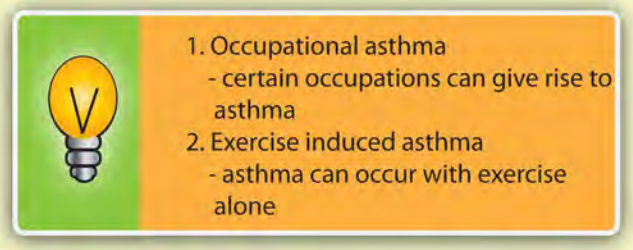
Asthma most likely

Confirmatory investigations usually not required

→ Follow protocol

Asthma probable

→ 1. Refer for reversibility test ⟶ Page 33
AND / OR
2. Initiate ICS and assess response in 4-6 weeks



1. Is your patient already on...

Inhaled Corticosteroid (ICS)	⟶ Assess control (Refer page 23)	⟶ Follow Protocol (Refer page 23)	
Bronchodilaters - Oral/Inhaled	⟶ Assess severity (Refer page 21)	⟶ ICS initiation Protocol (Refer page 22)	
Oral steroids	⟶ Start ICS as moderate persistant asthma & tail off oral steroids	⟶ Assess in two weeks	⟶ Follow Protocol (Refer page 23)

Assessing Asthma

2. Determine frequency

Ask your patient

1. Day time symptoms are < 2 times per week
2. Night time symptoms are < 2 times per month
3. No limitation of daily activities
4. No severe attacks needing hospitalization
5. Rescue medication (oral or inhaled bronchodilators) use < 2 times / week

If 'YES' to all ⟶ Manage as intermittant asthma ⟶

- As required oral or inhaled broncho-dialators
- If allergic rhinitis present, follow guideline on page 8
- Health Education about asthma, avoidance of triggers and recognition of poor control
- Avoid active/passive smoking exposure

If 'NO' to one or more ⟶ PERSISTENT ASTHMA

REGISTER PATIENT IN REGISTER OF PERSISTENT ASTHMA

3. Severity assessment

Severity	Day time symptoms	Night time symptoms	Rescue medications (SABA) use	PEFR variability. *
Mild Persistent	>2 times per week . May affect daily activity	>2 times per month	>2 times per week but not daily	> 80 % . Variability 20 -30%.
Moderate Persistent	Daily symptoms Activity affected	>1 per week	Daily use of SABA	> 60- 80% Variability >30 %
Severe Persistent	Continuous symptoms Limited activity	Frequent	Frequent	< 60% Variability >30 %

CHOOSE THE WORST CATEGORY

SABA = short-acting-beta-agonists , PEFR= Peak Expiratory Flow Rate. FEV1= Forced Expiratory Volume in one second.
*Calculating Variability page 31

Management of persistant asthma

1. Choose the drug

Drug	Mild	Moderate	Severe
Beclamethasone dipropionate(BDP) Budasanoide (BUD)	200-400 µg/day in two divided doses	400-800 µg/ day in two divided doses	800-1600 µg/day in two or three divided doses
†SABA	for symptom relief if required.		
Long acting theophylline	- long acting theophyllines at night will releive nocturnal/ early morning symptoms - In the absense of ICS, these can be used in bd dosage for symptom control ***(theophyllines are not an alternative to ICS)***		
Oral steroids	ICS may take 2-4 weeks to achieve optimal asthma control. Till such time a short course of oral steroids (30-40mg of prednisilone) will be of benefit		
Combination Inhalers *(ICS+LABA)			Are preferred if available or if patient could afford *(refer guideline for prescribing combination inhalers - page 40)*

* = *Inhaled corticosteroid + Long acting β agonists* † = *short acting β agonists* ◉ = *Long acting β agonists*

Principles of prescribing combination inhalers - Refer page 40

2. Selecting inhaler device/principles of use - Refer page 41 & 42

3. If associated allergic rhinitis (runny nose) - Refer page 08

◉LABA should always be prescribed along with ICS in asthmatics

Principles of prescribing combination inhalers - Refer page 40

Asthma follow up protocol

ICD - J45

Aims of control

Minimum or no day-time or night time symptoms
Minimum or no excacerbations
Minimum need for SABA
No limitation of daily activity

Assessing level of control during the last 4 weeks

Level Of Control	Well Controled	Partially Controlled	Uncontrolled
Day time symptoms	< 2 times per week	2-4 times per week	Continuous
Night time symptoms	< 2 times per month	2-4 times per month	Frequent
Daily activity	No limitation	Activity affected	Activity limited
SABA use	<2 times per week	>2 times per week	Daily

If well controlled

Preventer	= ICS
Controller	= LABA
Preventer +Controller	= ICS+LABA
Reliever	= SABA

- Continue current Preventer / Preventer+Controller combination for 3 months
- Check / reinforce correct inhaler technique
- Document PEFR in notes
- The patients best PEFR when well controlled should be documented . This can be used as a guide in self-management plan
- Give a self management plan
- Organize a follow up visit in 1-3 months
- If well controlled at 3 months consider stepping down as indicated on Page 40

Asthma Management

If partially controlled or uncontrolled – use check list

- ☐ - Check compliance
- ☐ - Is patient taking Preventer/ Preventer + Controller combination in prescribed dose in prescribed frequency
- ☐ - Is patient taking SABA alone as he/she feels that this gives better symptom relief than Preventer/Preventer+Controller combination
- ☐ - Check technique DPI, MDI, MDI + Spacer, see Page 41 & 42
- ☐ - Ask about smoking active, passive exposure
- ☐ - Treat allergic rhinitis
- ☐ - Check medication patient may be on (i.e. : beta-blockers, ACEI, NSAIDS (Non-steroidal anti-inflammatory drugs))
- ☐ - Triggers at work place/home.

☑ Attend to correctable factors

If the patient is NOT under control with 2000µg of BDP/BUD, refer for specialists' assessment

Difficult to control Asthma
>2000µg of BDP/BUD required
- ABPA - Allegic Broncho Pulmonary Aspergillosis
- Churg - Strauss syndrome
- Vocal Cord Disfunction

If sub-optimal control

Partially Controlled	Uncontrolled
Increase ICS dose upto 800-1600µg / day of beclamethasone / budasonide. or Add LABA or start on a combination inhaler .* or Add long acting theophyillin	Increase ICS dose to 800-1600µg / day of beclamethasone / budasonide. and Add LABA or start on a combination inhaler and Add long acting theophyillin and Low dose oral steroids. **(Under Supervision of a chest physician)**

* = *current evidence favours starting on a combination inhaler to options of increasing ICS dose or adding long acting theophiline*

Acute Exacerbations of Asthma

A - Assessment of severity

Symptoms	Mild	Moderate	Severe and life threatening *
Physical exhaustion	No	No	Yes , May have paradoxical chest wall movements
Talks in	Sentences	Phrases	Words
Pulse rate**	<100/min	100-120/min	>120/min
Central cyanosis	Absent	May be present	likely to be present
Peak expiratory flow (% predicted)	>75%	50-75%	<50%
Oximetry on presentation	>95%	92-95%	<92%

* any of these features indicated that the episode is severe
** bradycardia may be seen in imminant respiratory arrest

Take a short history

- Cause for the present exacerbation (URTI, Allergen exposure, defaulting drugs)
- Duration of symptoms - longer duration before presentation may indicate a higher risk of muscle fatigue and respiratory failure
- Severity of symptoms - sleep distrubances, limitation of activities
- Details of the current asthma medications, time of the last dose, compliance.
- Details of other medications - can they exacerbate asthma - i.e. β blockers, NSAIDS
- Details of past exacerbations - ICU admissions, brittle asthma
- Co-existing cardiopulmonary diseases
- Smoking

Acute Asthma cont.

- Nebulize with salbutamol 2.5-5mg every 20min upto 1hour
- Nebulization useing a Jet Nebulizer using O_2 as the driving gas at 6-8 liters/min
- Alternatively, Salbutamol MDI 4 puffs via a large volume spacer can be used
- In a patient who is distressed nebulizer is the prefered option (Refer page 43 for tips on nebulization)
- Oral prednisolone 30-40 mg or IV hydrocortisone 100-200mg 6 hourly
- Reassess using the table at **1hour**

Improving

- Nebulize hourly upto 4 hours
- Assess PEFR at 1 hour and 4 hours
- At 4 hours if PEFR >80% of predicted or of the patients personal best - safe to discharge

Unchanged (Not improving nor worsening)

- Add 0.5mg of ipratropium to salbutamol solution and nebulize 2 hourly
- If improving, continue nebulization with ipratropium and salbutamol 4 hourly
- If the patient is improving, needs to be under observation for 24 - 48 hours prior to discharge
- If PEFR >80% of predicted or of the patients personal best - safe to discharge.
- If patient not improving after 4 hours, consider IV $MgSO_4$ 1.2 - 2g in 100ml normal saline over 30 mins

Worsening in spite of initial management

- Consider IV salbutamol
- IV Aminophylline infusion
- Inform ICU. Patient may need ventilatory support

Discharge Plan

- Discharge on
  - Oral prednisolone 5-7 days.
  - Bronchodilators
  - If infections present - prescribe antibiotics (Refer Page 04)
- Review currant asthma medications, compliance, technique.
- Advice on smoking cessation - Refer Page 45
- Organize follow up visit in 2 weeks

Initiate inhalers before discharge

Probable Chronic Obstructive Pulmonary Disease (COPD)

ICD - J 44

COPD is characterized by airflow obstruction that is not fully reversible.
Airflow obstruction is progressive and is associated with an abnormal inflammatory response of lungs to noxious particles or gases.

Symptoms of COPD are
- Cough
- Wheeze
- Breathlessness
- Limitation of activity
- Chest tightness

May present with
- Cough preceeding breathlessness.
- Breathlessness and cough during an exacerbation.
- Persistant and prograssive breathlessness.
- More breathlessness during day and physical activities, than at night
- Right heart failure - In advanced stage
- Sytemic manifestations, such as reduction in muscle mass and wasting.

On examinations
- Plethora
- Prominant accessory muscles of neck.
- Barrel shaped chest
- Auscultation, wheeze/soft breath sounds
- Signs of right heart failure

Finger clubbing - possible bronchial carcinoma

Risk Factors

- Smoking
Packs per day = cigarettes per day / 20 per pack.
Pack year = packs per day x years smoked.

- Environmental exposure to dust
- Fumes
- Smoke, Gas, Paints, Sprays
- Domestic cooking / wood fires
- Repeated airway infections
- Past history of Tuberculosis

Spirometry is the 'Gold Standard' in diagnosing COPD .
A Post Bronchodilator FEV_1/ FVC ratio of less than 0.7 (70%) with absence of reversibility confirms the diagnosis of COPD.

All patients suspected of COPD should have spirometry done as this is essential in the diagnosis and assessment of the degree of severity of COPD.

PEFR measurements and reversibility testing is NOT an alternative to spirometry in COPD patients but may be used to identify asthma and identify patients with airflow obstruction with a reversible component who will benefit from inhaled corticosteroids.

How to do a reversibility test ⟶ Refer page 33

COPD Management

HEM - 32A - 35A, 41A

TB Suspect - follow protocol

Refer Page 51

A - Assess your patient

MRC dyspnoea scale

Grade	Degree of breathlessness
0	Breathless only on strenuous activity
1	Short of breath when hurrying or walking up a slight hill/a flight of stairs
2	Walk slower than others of same age on the level ground because of breathlessness or has to stop for breath when walking at own pace
3	Stops for breath after walking about 100 meters or after a few minutes on the level
4	Too breathless to leave the house, or breathless when dressing or undressing

B - Has the patient had more than three exacerbation during the past year

Exacerbation
A sustained worsening of symptoms of acute onset beyond normal daily variations

C - Look for features of cor-pulmonale

↑ JVP, ankle oedema, loud P_2, Pulsatile hepatomegaly, right ventricular heave (tall peak P waves in ECG)

If MRC 'Grade 3' or 'Grade 4' or if YES to 'B' or 'C' → Initiate treatment as below and arrange EARLY referral

COPD ICD - J 44

HEM - 20A - 27A, 36A - 38A

FEV1/ FVC ratio of less than 0.7 (70%)

	Mild	Moderate	Severe	Very Severe
Post-bronchodilator FEV1 (% predicted)	>80%	80-50%	50-30%	<30% or < 50% predicted **PLUS** chronic respiratory failure
MRC grade	0	1	2	3 4

- Avoidance of risk factors
- Oral or inhaled bronchodialators when needed
- Influenza vaccination

- Add regular treatment with one or more long-acting bronchodilators
- Pulmonary rehabilitation

Add regular treatment with inhaled corticosteroids if repeated exacerbations

- Long-term oxygen therapy (LTOT) if respiratory failure
- Consider surgical options


SABA


Short Acting Anticholinergic


Long Acting Anticholinergic


ICS + LABA


LABA


Theophyllin


Oral LABA

All MRC Grades -
REFER TO SMOKING CESSATION PROGRAM refer page 45

COPD Exacerbations

ICD - J 44.0

HEM - 30A, 35A, 36A, 50A

SYMPTOMS

- Increased breathlessness
- Increased sputum volume
- Wheeze
- Ankle swelling
- Symptoms of URTI
- Fever or Rigors

FACTORS FAVOURING HOSPITAL ADMISSION

- Impaired consciousness
- Rapid rate of progression
- Severe breathlessness
- Poor physical function
- Cyanosis
- Severe peripheral oedema
- Patient on long term home Oxygen
- Unable to cope at home

DIFFERENTIAL DIAGNOSIS

- Pulmonary embolism
- Pneumothorax
- Myocardial infarction
- Left ventricular failiure
- Pneumonia
- Bronchial carcinoma.

OXYGEN

2-4 liters with face mask or 24-28% through venturi device. Uncontrolled O2 may lead to abolision of the hypoxic repiratory drive.

DRUG MANAGEMENT OF EXACERBATIONS

- Bronchodilators
- Controlled Oxygen therapy
- Oral steroids
- Antibiotics
- Diruetics- if cor-pulmonale is suspected
- Thromboembolism prophylaxis

ANTIBIOTIC CHOICES

- Co-amoxyclav preparation 625 mg tds 7d
- Amoxycillin 500mg-1g tds for 7-10 days
- Macrolides clarithromycin 500mg bd , roxithromycine 150 mg bd 7d
- Doxycycline 100 mg bd 7d
- Newer quinolones eg. levofloxacin 500mg daily 7d
  caution- exclude Tuberculosis.

Non-invasive ventilation (NIV) is now considerd the treatment of choice in COPD patienet in hypercapnoic respiratory failure.

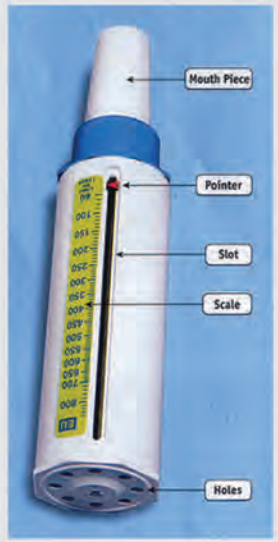
Annexure I - Peak Expiratory Flow (PEF) measurement

A PEF meter is used to detect and measure an individuals

a) Limitation of airflow from predicted normal.
b) Variation of airflow over a period of time.

PEF is useful when,

a) Monitoring response to treatment.
b) Monitoring airflow limitation in response to an occupational trigger.



The test is effort dependent and is not a substitute for Spirometry

How to use

1) Fix a disposable mouth piece to the end of the meter and set the marker at zero.
2) The patient should be standing and the meter should be held from the bottom without obstructing the marker or the holes at the opposite end of the meter.
3) Patient should take a deep breath to fill his/ her lungs , seal lips tightly around mouth piece and blow as hard and as fast as possible.
4) The marker will move and the result is expressed in L/min.
5) Return marker to zero and repeat two more times.
6) Document the highest of the three readings.

How to select PEF meter – This should comply with European Respiratory Society recommendations

$$\text{Variability of PEF} = \frac{\text{Highest PEF in L/min} - \text{Lowest PEF in L/min}}{\text{Highest PEF in L/min}} \times 100$$

A variability of >20% (or 60 l/min) for 3 days in a week over a period of two weeks is supportive of a diagnosis of asthma.

Variability may not be present in patients already on inhaled or oral steroids and patients with severe air flow obstruction.

Annexure I - Spirometry

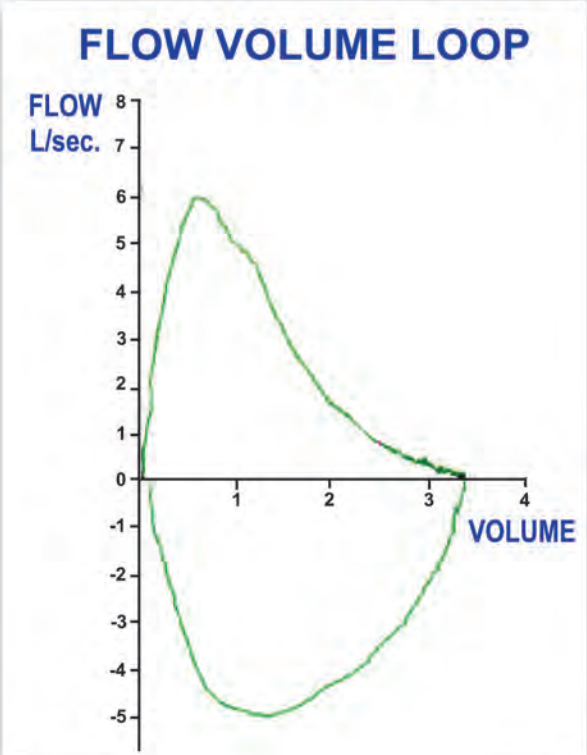
Presence of air flow obstruction is best assessed using spirometry .

Important Spirometric measures

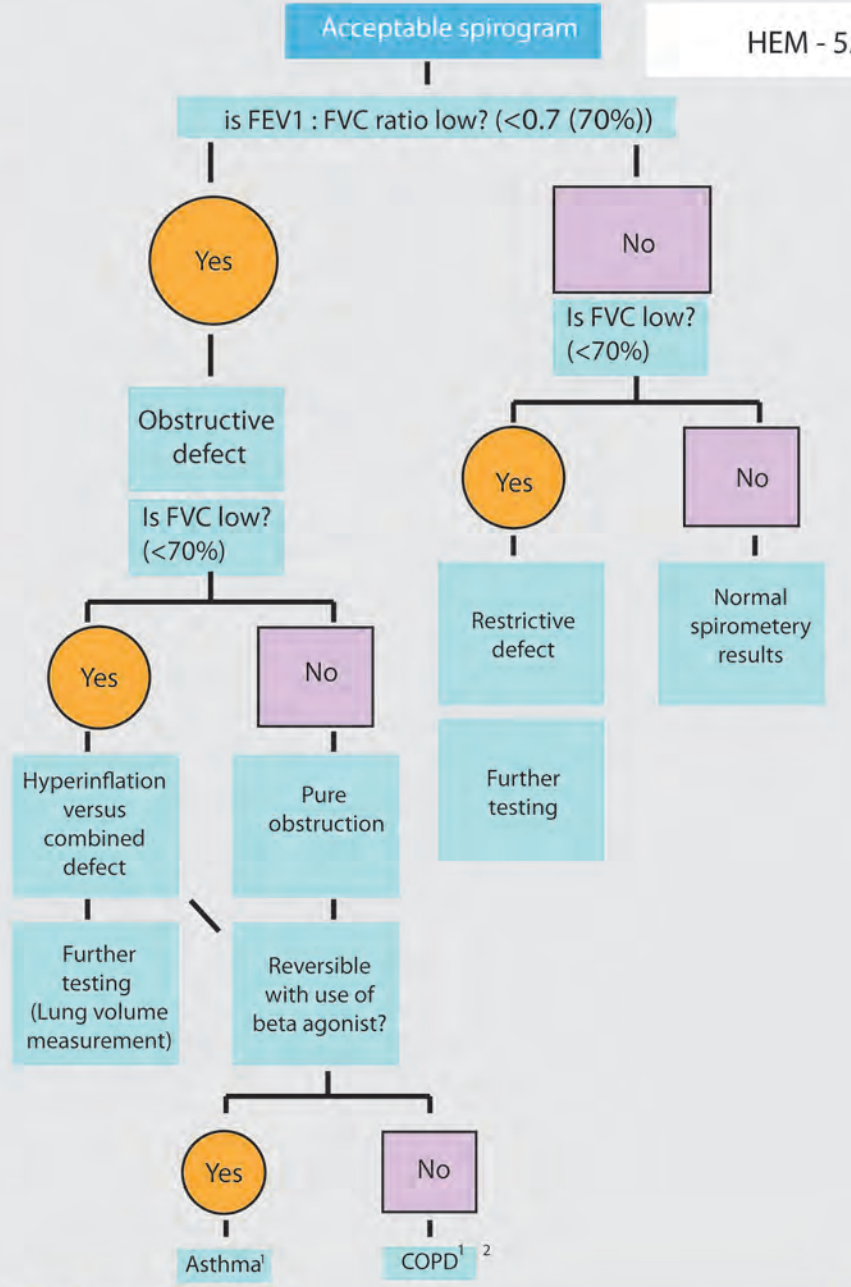
FVC - Is the total amount of air exhaled , when the patient inhales maximally and exhales as forcefully and as deeply as possible .

FEV_1 - Measures the volume of air forcefully exhaled in the first second

VC - Is the total amount of air exhaled after a maximum inspiratory effort



HEM - 5A, 33A



1. If clinical correlation is present.
2. Some COPD may have a reversible component.

COPD: chronic obstructive pulmonary disease; FEV1:Forced expiratory volume in one second; FVC: forced vital capacity.

Annexure I - Reversibility Testing

Test Protocol

Baseline Spiromety (FEV1) or PEFR .

Nebulized salbutamol (2.5mg) or 4 puff via MDI and spacer.

Repeat Spirometry (FEV 1) or PEFR in 20 min

Patient:

must be clinically stable

Not having an excacerbation of the disease.

Should avoid

- Short-acting-beta-agonists (SABA) for 6 hrs prior to test
- Long- acting-beta-agonists (LABA) for 12 hrs prior to test
- Sustained release theophyillines for 24 hrs.

$$\text{Reversibility} = \frac{\text{Post-bronchodialator FEV 1 OR PEF in L/min} - \text{Pre-bronchodialator FEV 1 OR PEF in L/min} \times 100}{\text{Pre-bronchodialator FEV1 or PEF in L/min}}$$

Interpretation of reversibility test results.

A Post-bronchodialator FEV1 > 200 ml and a 15 % increase over the Pre-bronchodialator value suggests reversibility.

A PEF 15 % increase (> 60 l) suggests reversibility.

Same test can be performed before and after a 8 day course of oral prednisolone at a dose of 0.5 mg/Kg body weight / day.

Annexure II - Allergic rhinitis Medication

HEM - 10A

Name	Usual Doses	Side effects	Comments
Oral H_1 antagonists – 2 nd generation Cetivizine Desloratadine Fexofenadine Levocetirizine **1 st generation** Chlorpheniramine Ketotifen **Others** Astemizole Terfenadine	*Cetirizine* – adult and child over 6 years. 10mg once daily or 5 mg twice daily Desloratadine- 5mg once daily, child 1-6 years 1.25 mg once daily, 6 -12 years 2.5 mg once daily *Loratadine* – Adult and child over 6 years 10 mg once daily, 2-6 years 5 mg once daily *Fexofenadine* – 120 mg once daily, child 6 -12 years 30 mg twice daily *Levocetirizine* – Adult and child over 6 years 5 mg once daily.	No cardiotoxicity 1st generation Sedation is common and/ or anti cholinergic effect Cardiotoxic	Rapidly effective (less than 1 hour) on nasal and ocular symptoms Moderately effective on nasal congestion
Local H_1 antihistamine (intranasal, intraocular) Azelastine Levocabastine Olopatidine		Minor local side effects Azelastine: bitter taste	Rapidly effective (less than 30 mins) on nasal or ocular symptoms

Annexure II- Allergic Rhinitis Medication

Name	Usual Doses	Side effects	Comments
Oral decongestants Ephedrine Phenylephrine Phenyl propanolamine Pseudoephedrine		Hypertension, palpitations, restlessness, agitation, tremor, insomnia, headache, dry mucous membranes, urinary retention, exacerbation of glaucoma or thyrotoxicosis Use oral decongestions with caution in patients with heart disease	sympathomimetic drugs, relieve symptoms of nasal congestion. Oral H_1 antihistamine decongestant combination products may be more effective than either product alone but side effects are combined
Intranasal decongestants Oxymethazoline		Same S/E as oral decongestants, but less intense rhinitis medicamentosa is a rebound phenomenon occurring with prolonged use (over 10 days)	Sympathomimetic drugs, Relieve symptoms of nasal congestion
Intranasal anti cholinergics Ipratropium		minor local side effects. Almost no systemic anti cholinergic activity	Effective on allergic and non allergic patients with rhinorrhea

Annexure III- Asthma Medication

Name	Usual Doses	Side effects	Comments
Glucocorticosteroids Adrenocorticoids Corticosteroids Glucocorticoids **Inhaled** Beclomethasone (BDP) Budesonide (BUD) Fluticasone (FP) Ciclesonide **Oral:** Hydrocortisone Methylprednisolone Prednisolone Prednisone Betamethasone Dexamethasone	**Inhaled:** Starting dose depends on asthma severity. Different preparations of inhaled steroids are not eqivalent on per puff or mcg basis Titrate down over 2-3 months to lowest effective dose once control is achieved. **Oral:** For acute attacks 30-60mg daily in 1 or 2 divided doses for adults or 1-2 mg/kg/day in children	**Inhaled:** Hoarseness and oropharyngeal candidisis. Attainment of predicted adult height does not appear to be affected. Long term treatment has not been associated with any increase in osteoporosis or bone fractures **Oral:** long term effects - Osteoporosis, hypertension, diabetes, cataracts, adrenal suppression, growth suppression, obesity.	**Inhaled:** Use of spacer devices with MDI and mouth washing with DPIs after inhalation decreases oral candidisis. CFC propellents in MDI are being replaced by HFA propellents. Lung deposition is better with HFA propellant. **Oral:** For acute attacks 30-60mg daily in 1 or 2 divided doses for adults or 1-2mg/kg/day in children

Annexure III-Asthma Medications

Name	Usual Doses	Side effects	Comments
Short acting Beta agonists ß2 stimulants Salbutamol, Terbutaline	Differences in potency exist but all products are comparable on per puff basis. For symptomatic relief or prior to exercise 2 puffs of MDI or 1 inhalation of DPI can be used. In asthma exacerbations 4-8 puffs of MDI administered via a spacer given under medical supervision can be used instead of nebulizer treatment. (equivalent to 5 mg of salbutamol nebulizer treatment)	Tachycardia, tremor, headache. At very high doses hyperglycemia, hypokalemia	If ß2 agonist inhalation is needed more often than once daily, prophylactic treatment should be considered. At recommended dose the duration of action is about 3 – 5 hours.
Long acting beta 2 agonists (LABA) Inhaled Salmeterol/Formoterol	Salmeterol – 50 µg (2 puffs or one blister) twice daily. Formoterol – 12 µg twice daily,	Common to all ß2 agonists	Salmeterol should not be used for the relief of an asthma attack. Formoterol is licensed for short symptomatic relief and for the prevention of exercise induced asthma. When added to regular ICS they have a role in long term management of asthma. Useful in nocturnal asthma.
Anti cholinergics Ipratropium bromide Tiotropium	Ipratropium – aerosol inhalation 20 – 40 µg 3-4 times daily, dry powder inhalation 40 µg 3-4 times daily Tiotropium – aerosol 9 µg twice daily / 18 µg OD	Dry mouth. Less commonly nausea, headache	The aerosol inhalations of ipratropium can be used for short term relief in mild COPD. The maximal effect occurs 30 -60 minutes after use and the duration of action is 3 to 6 hours.

Annexure III - Asthma Medication

Name	Usual Doses	Side effects	Comments
Theophyllines	Starting dose 10mg/kg/day with 400mg maximum in 1-2 divided doses.	Nausea, vomiting . With higher doses seizures, tachycardia and arrhythmias.	Theophylline level monitoring is ideally required. Absorption and metabolism may be affected by many factors, including febrile illness.
Leukotriene Receptor antagonists (LTRA) Montelukast Zafirlukast	- Prophylaxis of asthma – adult and child over 15 years 10 mg once daily in the evening. Child 6 months – 6 years 4 mg once daily, 6- 15 years 5 mg once daily Seasonal allergic rhinitis – 10 mg once daily in the evening	Abdominal pain, thirst, hyperkinesias (young children)	LTRA are effective in asthma and rhinitis. Effective on all symptoms of rhinitis and on ocular symptoms
Cromoglycate and related therapy Sodium cromoglycate Nedocromil sodium	– Adult and child. Dry powder inhalation -20 mg 4 times daily increased in severe cases to 8 times daily. Additional doses may also be taken before exercise Nedocromil – Adult and child over 6 years, 4 mg 4 times daily, when control achieved may be possible to reduce to twice daily	Cough, transient bronchospasm and throat irritation	These drugs may be of value in asthma with an allergic basis, but difficult to predict who will benefit. ICS is superior and should be the first line of treatment in persistent asthma
Local cromones (intra nasal, intraocular) Cromoglycate, nedocromil		Minor local side effects	Intraocular cromones are very effective, intra nasal cromones are less effective and their effect is short lasting. Overall excellent safety

Annexure III - Comparative Daily Dosage of ICS

Drug	Low Daily Dose		Medium Daily Dose		High Daily Dose	
	Adult	Child	Adult	Child	Adult	Child
Beclomethasone (CFC)	200-500	100-250	500-1000	250-500	>1000	>500
Beclomethasone (HFA)	100-250	50-200	250-500	200-400	>500	>400
Budesonide (DPI)	200-600	100-200	600-1000	200-600	>1000	>600
Budesonide (Neb inhalation suspension)		500-750		500-1000		>1000
Fluticasone	100-250	100-200	250-500	200-400	>500	>400

Annexure III - Relative potency of oral corticosteroids

Corticotropin	Relative potency		
	Glucocorticoid Dose (mg)	Glucocorticoid activity	MIneralocorticoid activity
Short acting			
Cortisone	25	0.8	2+
Hydrocortisone	20	1	2+
Intermediate acting			
Methylprednisolone	4	5	0
Prednisolone	5	4	1+
Prednisone	5	4	1+
Triamcinolone	4	5	0
Long acting			
Betamethasone	0.6	20-30	0
Dexamethasone	0.5-0.75	20-30	0
Paramethasone	2	10	0

Annexure III - Combination Inhalers

Prescribing combination medication.

- Combination medications contain Inhaled glucocorticosteroid (ICS) + a Long Acting Beta-Agonist (LABA).
- ICS is budasonide or fluticasone.
- LABA is salmeterol or formoterol.
- Fluticasone is in combination with salmeterol and budasonide is in combination with fomoterol.
- For optimal effects daily dose of salmeterol should be 100µg while fomotrol dose should be 18 micrograms .
- Fluticasone is twice as potent as beclomethasone or budesanoide, therefore the equivalent dose is half that of beclomethasone or budesanoide

LABA should always be prescribe in combination or along with ICS in an asthmatic patient.
Use of LABA medication alone in asthmatics can lead to severe excacerbations and deaths.

SABA medication should be used only as rescue medication and not on a regular basis .

The LABA fomoterol has fast acting reliever effects too therefore this can be used for symptom relief in addition to regular use.

Annexure III - Step down

Maintain the ICS dose for at least 3-4 months after achieving the control
if control remains satisfactory, gradually reduce ICS dose by 25-50%

If the patient is on combination medications-
- Start reducing from the ICS dose.
- Once the ICS dose is 500µg of BDP/BUD (250µg of FP) per day, LABA can be withdrawn.

Duration of the maintenace therapy is not known- yet it is possible to stop ICS altogether in some patients.
patients must be educated about recurrences and the need to restart ICS

Annexure III - Devices

How to choose a device

If adequate inspiration or hand-lung coordination is not possible MDI should always be prescribed with a spacer.

Older patients and children under 5 years should always be prescribed a MDI along with a spacer.

Very young children or children who find it difficult to hold spacer in mouth should be provided with a mask.

Other patients may be started on dry powder capsules.

Dry Powder Inhalers

Deposition in the lung depends primarily on inspiratory force. Devices include rota-halers, dry powder halers, cyclohalers to which a powder containing capsule or blister has to be loaded

Pre-loaded devices such as Accuhalers (Diskhalers), Turbohalers delivers drugs at low inspiratory flow rate of around 30 - 60 l/min

Steps in use

1) The capsule and device should be compatible and manufacturers instructions must be carefully followed.
2) When loading a DP haler coloured side should be facing up and the transparent side downwards.
3) In a cyclohaler patients should not hold on to side pins while inhaling.
4) Breathe out to the end of a normal breath.
5) Take the mouth piece into the mouth and close lips tightly around it.
6) Tilt head back slightly.
7) Breathe in as fast and deep as possible.
8) Hold the breath for 10 seconds or as long as comfortable
9) Steps 4-8 are repeated until all powder is inhaled.
10) Mouth should be rinsed and water thrown out.

Annexure III - Devices

MDI

Delivers medication in the form of an aerosol on actuation of the device.
Lung deposition depends on hand lung coordination.

How to use a Metered Dose Inhaler (MDI)

1. Remove the protective cap.
2. Shake the inhaler well.
3. Breathe out deeply to empty the lungs.
4. Insert the mouthpiece in the mouth, sealing the lips around the. mouthpiece.
5. Breathe in deeply while pressing on the base of the inhaler to help the aerosol penetrate deeply into the airways.
6. Remove the inhaler and hold the breath for 10 seconds, without breathing out.
7. Breathe out, then breathe normally.

How to make and use a spacer

1. Remove the cap of the inhaler and fit the mouthpiece of the inhaler at the bottom of a clean, empty plastic bottle at least 1 liter in size
   (the mouthpiece of the inhaler should be directly opposite the mouth of the bottle)
2. Trace the shape of the mouthpiece of the inhaler on the base of the bottle.
3. Cut an opening in the base of the bottle exactly the size of the line traced
   (Do NOT allow any leaks)

. If the bottom of the bottle is too hard it can be pierced using a utensil that has been heated red hot: the mouthpiece can then be inserted into the softened plastic

Using the bottle spacer

1. Shake the inhaler and insert the mouthpiece into the opening made in the base of the bottle.
2. Breathe out deeply to empty the lungs.
3. Hold the opening of the bottle in the mouth
4. Press the bottom of the aerosol cannister to release a dose into the bottle
5. Inhale the air and the product in the bottle: breathe through the mouth normally but as deeply as possible for around 10 seconds.
6. Remove the bottle from the mouth, breathe out deeply, then breathe normally
7. Repeat step 1-5 depending on the number of puffs prescribed

Annexure IV - Nebulization

A nebulizer turns an aqueous solution of a drug to a mist of fine particles for inhalation.
For efficient drug delivery to the bronchial tree , the aerosol should have a particle size of 1-5 µm.
The manufacturers will specify aerosol droplet size using terms such as Mass Median Aerodynamic Size (MMAD or MMD)
If this is specified as 5 µm , it means > 50% of particles are above this respirable range.

Two main types

1) Jet Neulisers-commomly used in the treatment of asthma and COPD .
2) Ultrasonic nebulizers

Factors affecting drug output

- Driving gas flow.
- Volume fill.
- Residual drug volume.
- Concentration of the solution.
- Viscosity and surface tension.
- Nebulization time.
- Variation and nebulizer ageing.
- Breathing pattern of the patient.

Jet Nebulizers

- A compressor blasts a stream of air through a narrow nozzle (Venturi).

- The process creates a negative pressure around the air stream which in turn results in the nebulizer solution being sucked in.

- This "primary generated" aerosol of varying particle size is modified by specially constructed and positioned "baffles" to a uniform respirable particle size.

- The larger particles are returned back to the nebulizer solution

- Manufactures will specify the flow rate in user manual , familiarize yourself with these. In conventional small volume Jet Nebulizers a minimum flow rate of 8L /minute is required.

-The driving gas should be oxygen in acute severe asthma . In COPD the driving gas should be air. Uncontrolled oxygen in COPD patients can result in abolition of the hypoxic drive.

-All nebulizer chambers have a small volume of solution remaining in the chamber after nebulization. This amount cannot be nebulized and is termed residual volume . This is usually 0.5- 1ml.

Nebulizer chambers are designed to hold a specific volume of solution at the beginnig of nebulization.This is called the volume fill and is around 4-5 ml in a conventional small volume jet nebulizer .
Larger chambers used for continuous nebulisation have volume fills of 10-15 ml .

Bronchodilators , steroid solutions should be diluted in 0.9% normal saline . Distilled water is irritant to the airways.

Nebulised medications such as beta-agonists and anticholinergics can be combined. the volume of the drug solutions and the diluant should reach the volume fill.

Annexure IV - Nebulisation

Steps in nebulization

- Wash hands
- Fix the compressor/ gas source to the tubing and the chamber
- Run the nebulizer without the drug to dry the components (tubes ect)
- Open the chamber and fill the drug ; dilute appropriately
- Close the chamber.
- Choose a clean face mask or preferably a mouth piece.
- look for uniform misting without "spluttering."

If not functioning properly, check troubleshooting guide.

- Position the patient upright. Make sure the nebulizer chamber is not tilted.
- Encourage the patients to take tidal breaths, pause for 10 seconds and exhale slowly over 6 second ,too rapid exhalation will lead to wastage of drug during expiration.
- Towards the end of nebulization, if spluttering occurs tap the sides of the chamber to make sure maximum amount of drug is nebulized.

When no more misting is occurring certain amount of drug will remain in the nebuliser. this amount cannot be nebulized . This is the residual volume specified by the manufacturer.

Cleaning Nebulizer

Wash with soapy water or detergents and air dry after each use.
30 min soak in 2.5% acetic acid./ 30 % hyperchlorate solutions each day .

Connectors should be stored in sealable plastic bag .
(refer BTS or Sri Lankan guidelines for details)

- The patient must be instructed to breath through the mouth.
- Use of mouth piece encourages oral breathing.
- Nasal passages may filter upto 50% of the aerosol produced .
- Face mask should be well fitting or could significantly reduced aerosol output available for inhalation.
- With face mask nebulized anti-cholinergics can get into the eyes and worsen glaucoma.
- Nebulized steroids can also get onto the face

Trouble Shooting Guide

If something out of the normal happens during operation, please check and correct the following points:

Symptom	Possible cause	Suggested solutions
Although the device is on, it does not work	1. Incorrectly connected to power source 2. No power 3. The AC Adapter is not connected	1. Check the plug is properly connected 2. Check that power is on 3. Check the AC Adapter is properly connected
The mist does not come out	1. Not enough medication in jet nebulizer 2. Too much medication 3. PVC tubing disconnected	1. Add medication, maximum 10 ml 2. Remove excess medication from cup 3. Connect the PVC tubing
Aerosol output reduced (low)	1. Air filter is clogged 2. The jet nebulize is dirty	1. Replace with a clean air filter 2. Replace with a new one

Nebulizer ageing

- With use "Venturi" can get narrowed by dirt, solutes and drug crystals.
- Repeated high flow of air through the " Venturi" and excessive cleaning can lead to wear and tear and make the "Venturi" large affecting droplet out put from the chamber.
- Even "Reusable" chambers should be replaced after around 60 neulizations.

Annexure V - Smoking Cessation

The Fagerstrom Test for Nicotine Dependence (FIND) has been widely used in evaluating tobacco dependence; its main value is in determining dosage for nicotine replacement medications,

Fagerstrom Test for Nicotine Dependence

How soon after your wake up to you some your first cigarette ?

< 5min	3
6-30 min	2
31-60 min	1
> 61 min	0

Do you find it difficult to refrain from smoking in places where it is forbidden,
Eg : in church, at the llibrary, in a cinema?

Yes	1
No	0

Which cigarette would you most hate to give up ?

The first in the morning	1
Any other	0

How many cigarettes per day do you smoke ?

<10	0
11-20	1
21-30	2
> 31	3

Do you smoke more frequently during the first hours after waking than during the rest of the day ?

Yes	1
No	0

Do you smoke if you are so ill that you are in bed most of the day ?

Yes	1
No	0

Total scores of 7 or more indicate high dependence, more severe withdrawal and difficult stopping.
Patients with high nicotine dependence may benefit from maximum dosages of nicotine replacement therapy

Hooked on Nicotine Checklist

When you tried to stop smoking... (or when you haven't used tobacco for a while)

1. Have you ever tried to quit but couldn't ?	Yes	No
2. Do you smoke now because it is really hard to quit ?	Yes	No
3. Have you ever felt like you were addicted to tobacco ?	Yes	No
4. Do you ever have strong cravings to smoke ?	Yes	No
5. Have you ever felt like you really needed a cigarette ?	Yes	No
6. Is it hard to keep from smoking in places where you are not supposed to ?	Yes	No
7. Did you find it hard to concentrate because you couldn't smoke ?	Yes	No
8. Did you feel more irritable because you couldn't smoke ?	Yes	No
9. Did you feel a strong need or urge to smoke ?	Yes	No
10. Did you feel nervous, restless or anxious because you couldn't smoke?	Yes	No

Any "yes" answer is considered a sign of perceived loss of autonomy concerning tobacco

Source: Wellman et al. 2006

Annexure V- Smoking Cessation

The 5As approach

Ask : Ask if he or she uses tobacco. Sometimes people stop temporarily when they have chest symptoms. These people should also be identified for reinforcement and encouragement to maintain cessation.

Advise : Counsel about the immediate and future gains in abandoning tobacco use. tobacco use may not be considered very harmful, so the intervention may be the only source of information concerning health risks of tobacco use.

Assess. : Determine the readiness of the patient to continue using tobacco (or continue abstaining). If the patient is not yet willing to stop, **go to the 5Rs** (see below)

Assist. : If the patient is willing to try to stop, the health professional can provide assistance in the form of working with the patient to find methods to avoid difficult situations and to cope with craving. If cessation medication is available and desired by the patient, indicate the correct use and dosage.

Arrange: Follow-up should therapy is needed, help the patient to find the most appropriate cessation programme available

If the patient is unwilling to quit, apply the 5Rs to enhance the patient's motivation to quit:

Relevance : Encourage the patient to indicate why quitting is relevant to his or her disease

Risks : Ask the patient to identify potential negative consequences of tobacco use and emphasise that smoking other forms of tobacco will not eliminate these risks.

Rewards : Ask the patient to identify potential benefits of stopping tobacco use

Roadblocks : Ask the patient to identify barriers or impediments to quitting and note elements that could address barriers (withdrawal symptoms, fear of failure, weight gain, lack of support, depression, enjoyment of tobacco)

Repetition : The motivational intervention should be repeated every time an unmotivated patient visits the clinic setting. Inform tobacco users who failed in previous quit attempts that most people make repeated quit attempts before they are successful

Nicotine replacement therapies work by reducing the severity of the physical symptoms of withdrawal so that all energies can be focused on breaking environmental, emotional and contextual ties with tobacco. However, success rates continue to be low because breaking those ties is difficult

Annexure VI -Pulmonary Rehabilitation

Components

- Education about disease .
- Smoking cessation .
- Symptom management
  - Diaphragmatic breathing >>>
  - Pursed lip breathing >>>
- Exercise training.
- Nutrition
- Psychological support.
- Social / family support
- Coping with severe disease.

A common diaphragmatic breathing exercise:

1. Sit or lie comfortably, with loose garments.
2. Put one hand on your chest and one on your stomach.
3. Slowly inhale through your nose to a count of three .
4. As you inhale, feel your stomach expand with your hand.
5. Slowly exhale through pursed lips to a count of six
6. Rest and repeat.

Pursed Lip Breathing Technique

1. Relax neck and shoulder muscles.
2. Breathe in slowly through the nose counting up to two, keeping mouth closed.
   (Don't take a deep breath; a normal breath will do)
3. Purse the lips as if going to whistle .
4. Breathe out slowly and gently through the pursed lips while counting to four.

Benifits of Pursed lip breathing:

- Improves ventilation
- Releases trapped air in the lungs
- Keeps the airways open longer and decreases the work of breathing
- Prolongs exhalation to slow the breathing rate
- Improves breathing patterns by moving old air out of the lungs and allowing new air to enter the lungs
- Relieves shortness of breath
- Causes general relaxation

Practice this technique 4-5 times a day at first so you can get the correct breathing pattern.

Annexure VI - Pulmonary Rehabilitation

BODE Index for COPD Survival Prediction

Body mass index, airflow **O**bstruction, **D**yspnea and **E**xercise capacity

FEV1 % Predicted After Bronchodialator

>= 65%	(0 points)
50-64%	(1 point)
36-49%	(2 points)
<= 35%	(3 points)

6 Minute Walk Distance

>= 350 Meters	(0 points)
250-349 Meters	(1 point)
150-249 Meters	(2 points)
<= 149 Meters	(3 points)

MMRC Dyspnea Scale (4 is worst)

MMRC 0: Dyspneic on strenuous excercise	(0 points)
MMRC 1: Dyspneic on walking a slight hill	(0 points)
MMRC 2: Dyspneic on walking level ground; must stop occasionally due to breathlessness	(1 point)
MMRC 3: Must stop for breathlessness after walking 100 yards or after a few minutes	(2 points)
MMRC 4: Cannot leave house; breathless on dressing/undressing	(3 points)

Body Mass Index

> 21	(0 points)
≤21	(1 point)

Approximate 4 Year Survival	**Interpretation**
0-2 points	**80%**
3-4 points	**67%**
5-6 points	**57%**
7-10 points	**18%**

Exercises for COPD Can Help by

- Improving how well the body uses oxygen.
- Decreasing symptoms and improving breathing.
- Strengthening the heart and lowering the blood pressure.
- Improveing energy, enabling to stay more active.
- Improveing sleep and makeing the patient feel more relaxed.
- Helping to maintain a healthy weight.
- Enhanceing mental and emotional outlook.
- Strengthening bones.

Types of Exercises for COPD

Four types of exercises can help COPD patients

1. Stretching exercises lengthen muscles, increasing flexibility. Stretching can also help prepare muscles for other types of exercise,

2. Aerobic exercises use large muscle groups to move at a steady, rhythmic pace. improves endurance by working respiratory muscles and the heart.
This helps the body use oxygen more efficiently and, with time, can improve breathing.

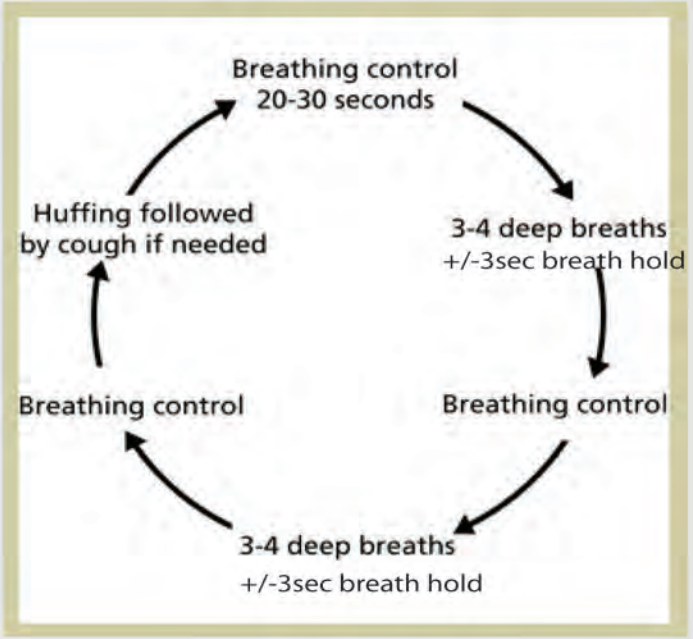
3. Walking and using a stationary bike are two good choices of aerobic exercise

4. Strengthening exercises involve tightening muscles repeatedly to the point of fatigue. When you do this for the upper body, it can help increase the strength of breathing muscles.

Is an important part in the management of patients with COPD , Bronchiectasis, and Chronic Bronchitis. accumilation of secretions can lead to clogged airways, atelectasis , impaired ventilation and infective exacerbations. Different techniques are used for secretion clearance. Active Cycle Breathing is one such technique that can be practiced at home.

ACBT

- Uses breathing exercises to remove secretions from lungs. It can be used alongside other clearence techniques .
- Can be performed in any position but initially should be started in sitting position.
- Uses alternating deep breathing to move secretions from small airways of the lungs to larger airways where they can be cleared more easily with huffing or coughing.



The parts of the ACBT are :

Breathing control

This is normal gentle breathing using the lower chest (diaphrgmatic breathing) with relaxation of the upper chest and shoulders. It helps the patient to relax between the deep breathing and huffing.

Deep breathing

These are slow deep breaths in followed by a three second hold with gentle exhalation. 3 – 4 deep breaths are enough.

Huffing

This is a medium sized breath in, followed by a fast breath out through an open mouth, using the muscles of the chest and stomach to force the breath out. This will move secretions along the airways to a point where the patient can cough them up.
Huffing is a less tiring way of clearing secretions than coughing.

Coughing

This should follow 2 – 3 huffs OR a deep breathe in.
Don't cough unless secretions are ready to be cleared.

Other useful tips

- The patient can practice ACBT in a position that seems to clear most secretion; eg. sitting on a chair, lying on his side, or 'tipped'.
- The patient or a helper can 'clap' his chest while he breathe out.
- The duration and the frequency is as follows;
  - If the patient is very well, 10 minutes.
  - If secretions persists at 10 min, continue up to 20 mins.
  - When there is an infection and the cough is more productive than usual, advice to practice multiple cycles.

Annexure VII- Specimen collection in influenza like illness

Criteria for patient selection

1. Fever of >38 C
2. Cough.
3. Rhinorrhea or nasal congestion.
4. Sore throat.
5. Contact history with another patient with ILI
6. Recent travel abroad.

Types of specimens

1. Nasopharyngeal aspirate (NPA).
2. Two nasal & 1 throat swab.
3. Tracheal aspirate.
4. Broncho-alveolar Larvage (BAL).
5. Postmortum biopsy of lung.

Technique

Nasal swabs

Insert the flexible fine-shafted swab into the nostril and rotate the swab
Let the swab rest in place for several seconds to absorb secretions
Use a sepatrate swab for each nostril. Place into Virus Transport Medium (VTM)
Place both swabs in the same VTM bottle

Throat swabs

Vigorously swab both tonsil areas and place in VTM. Use tongue depressor to depress the tongue so that contamination of the swab with saliva is prevented.

All 3 swabs should be trasported in a single bottle of viral trasport medium packed in ice.

Viral Transport Medium should be obtained from
The Department of Virology,
Room No.437 or Specimens Counter,
No 811, Medical Research Institute,
Colombo 08.

Annexure VIII - TB Suspect

HEM - 42A - 46A

- Cough > 2 weeks
- Haemoptysis
- Loss of weight
- Loss of apetite
- Lethargy
- Evening fever
- Contact history

Risk groups

low BMI
Malnutrition
chronic illnesses
DM , CRF, COPD
immunosppressed
HIV, underlying malignancy, immunomodulatory drugs.
institutionalized individuals
prisnors, mentally ill,
dislplaced people
smokeing alcohol and substance abuse.

- Register in TB suspects register.
- Fill TB 5 / sputum smear request form.
- Ensure that patients residential address is correctly and completely filled (incomplete information will make it difficult to trace patients if they become sputum positive).
- Refer to microscopy center / district chest clinic for sputum examination.
- At least 3 samples should be examined on consecutive days, one of these should be an early morning sample.
- If patient is not acutely ill antibiotics are not required until sputum results become available.
(for antibiotic prescription follow LRTI guideline.)

- Ask for history of smoking , initiate smoking cessation. (refer page 45)
- Obtain smear results from microscopy center / district chest clinic.
- Document these in TB suspects register.
- TB Suspects Register should be available for review on supervisory visits from District Chest Clinic.
- Those who have one or more sputums positive should be referred to District Chest Clinic for further evaluation/registration and initiation of treatment.
- Those who are sputum negative and not improving should be referred to chest clinic/ physician run clinic for further investigations.

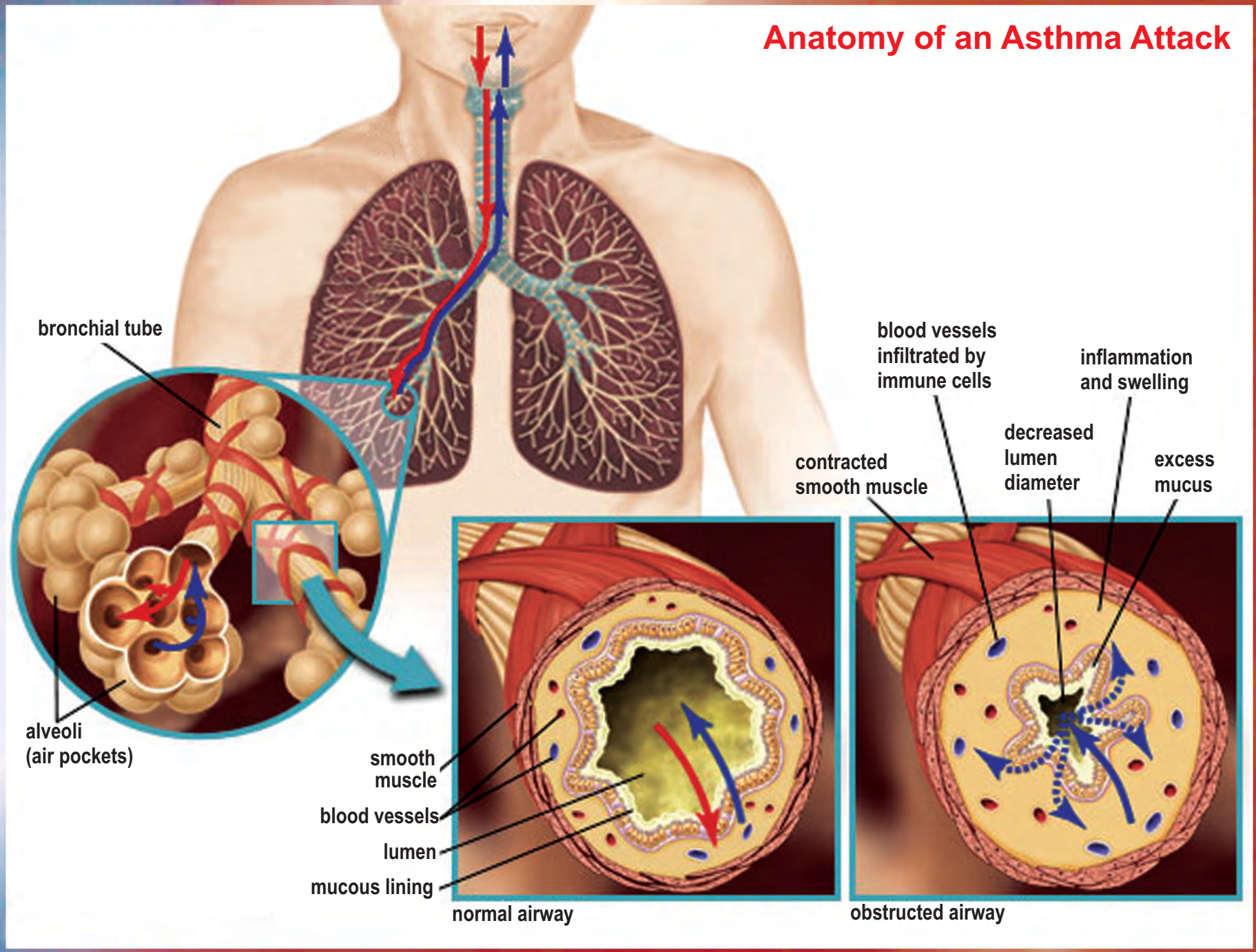
Remember FBS

If TUBERCULOSIS is diagnosed

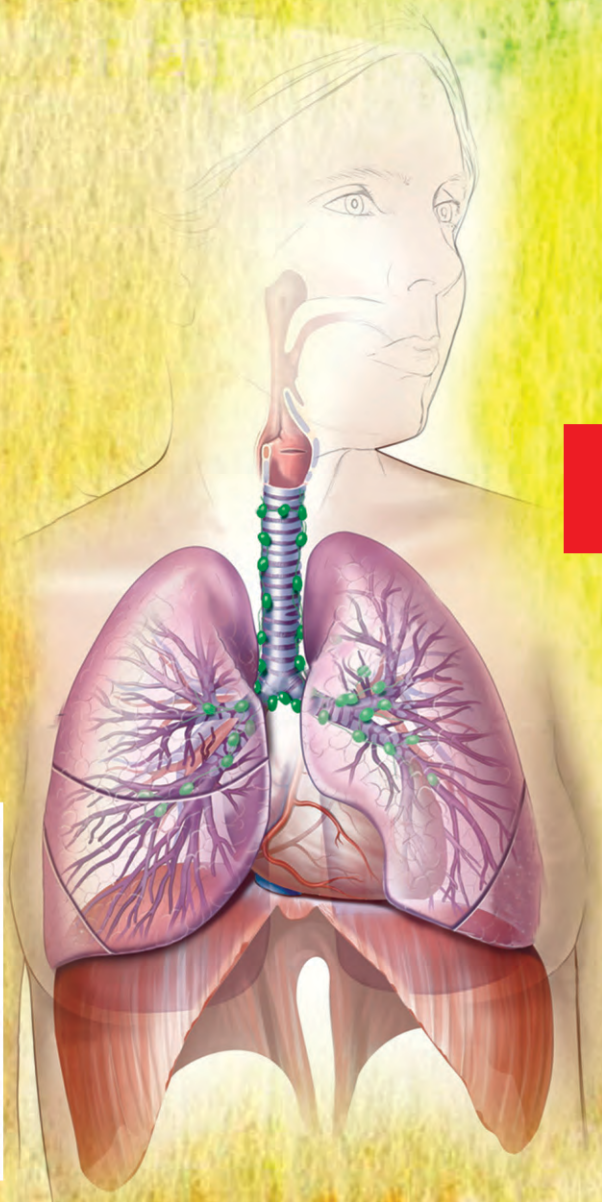
TB Suspect

Avoid quinalone antibiotics
untill TB is excluded

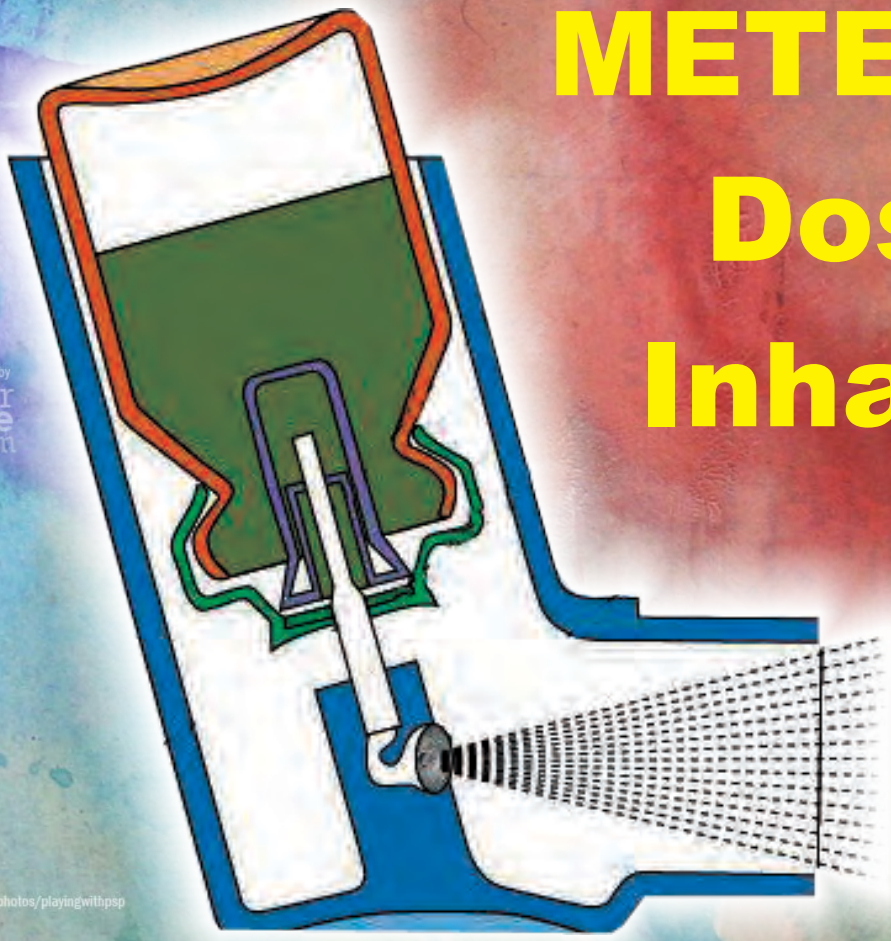
Anatomy of an Asthma Attack

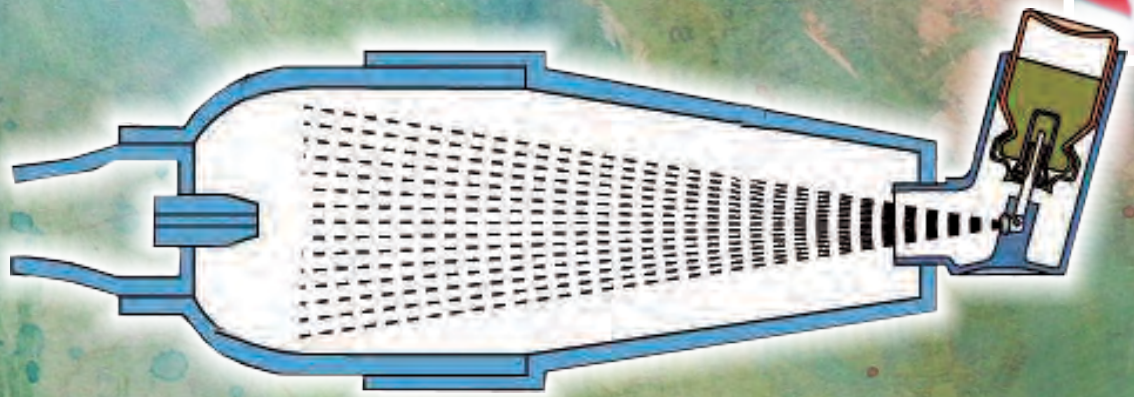


Inhaler Devices

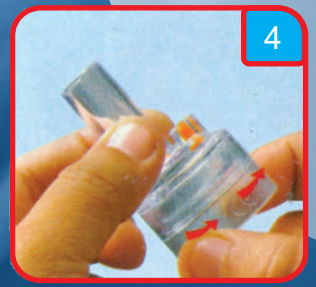


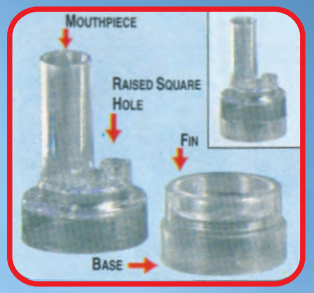
METERED Dose Inhaler





Using your dry power Inhaler (DPI)





The ACT TEST

Score: 25 - Congratulations!

You have **TOTAL CONTROL** of your asthma. you have no symptoms and no asthma-related limitations. See your doctor if this changes.

Score: 20 to 24 - On Target

Your asthma may be **WELL CONTROLLED** but not **TOTALLY CONTROLLED.** Your doctor may be able to help you aim for **TOTAL CONTROL.**

Score: less than 20 - Off Target

Your asthma may **NOT BE CONTROLLED.** Your doctor can recommend an asthma action plan to help improve your asthma control.

The following test can help people with asthma (12 years or older) assess their asthma control.

There are FIVE questions in total.

Step 1 : Circle your score for each question and write the number in the box.
Please answer as honestly as possible. This will help you and your doctor discuss what your asthma is really like.

						SCORE
1	During the past 4 weeks, how often did your asthma prevent you from getting as much done at work, school or home?	All of the time 1	Most of the time 2	Some of the time 3	A little of the time 4	None of the time 5	5
2	During the past 4 weeks, how often have you had shortness of breath?	More than once a day 1	Once a day 2	3 to 6 times a week 3	Once or twice a week 4	Not at all 5	5
3	During the past 4 weeks, how often did your asthma symptoms (wheezing coughing, shortness of breath, chest tightness or pain) wake you up at night or earlier than usual in the morning?	4 or more times a week 1	2 to 3 nights a week 2	Once a week 3	Once or twice 4	Not at all 5	5
4	During the past 4 weeks, how often have you used your rescue inhaler or nebulizer medication (such as salbutamol)?	3 or more times a day 1	1 or 3 times a day 2	2 or 3 times a week 3	Once a week or less 4	Not at all 5	5
5	How would you rate your asthma control during the past 4 weeks?	Not controlled 1	Poorly controlled 2	Somewhat controlled 3	Well controlled 4	Completely controlled 5	5

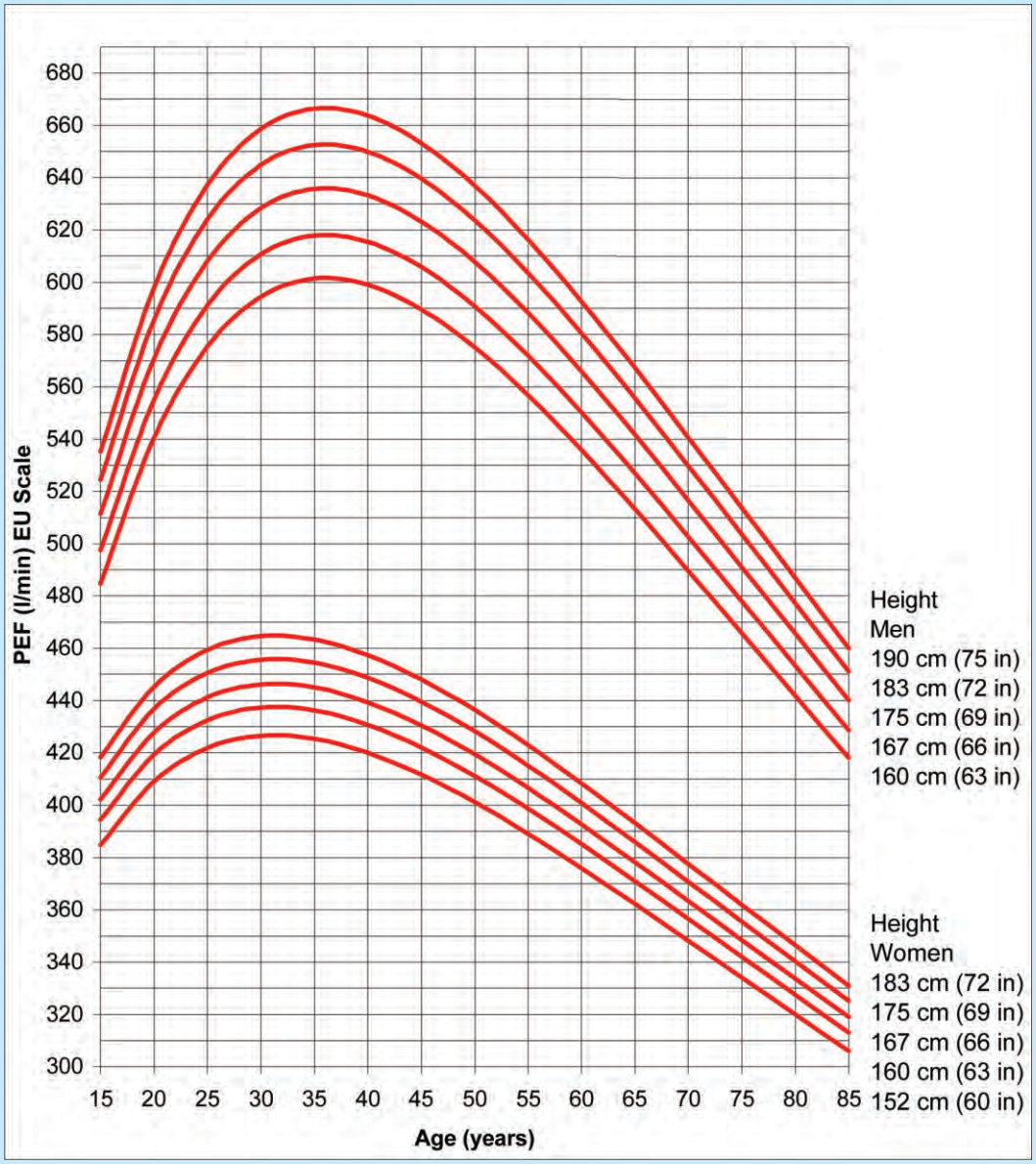
Step 2 : Add up your score to get your total.
Step 3 : Find out what your score means.
Be sure to review your results with your doctor or nurse.

TOTAL 25

Curtsey of ***GSK***

PEAK EXPIRATORY FLOW RATE - NORMAL VALUES

For use with EU/EN13826 scale PEF meters only



Adapted from Nunn AJ Gregg I, Br Med J 1989:298;1068-70
for use with EN13826 / EU scale peak flow meters

In men, readings up to 100 L/min lower than predicted are within normal limits.
For women, the equivalent figure is 85 L/min.
Values are derived from Caucasian populations.

Mini-Wright EU scale (EN 13826)

Blue text on a yellow background

(Standard Range)

(Low Range)

www.peakflow.com

Household Asthma triggers

The way you work can affect your air ways

If

- you have adult onset asthma
- you are more sick when at work
- you work in a dusty environment
- others in your work place have got adult onset asthma

May be you have

Occupational Asthma

Use protective gear

Speak to the labour officer about industrial health
May be you should change the job.

Get your Nose Fixed.

- your asthma is not yet controlled
- Waterily nasal discharge
- Sneezing
- Scratchy eyes, ears and face
- Heavy head

Allergic rhinitis can be treated

It only make life better

(For you and for others)

How to use the nasal spray

Different types of nasal sprays in market

Your nasal spray may contain

- Topical steroids
- Decongestants.
- Topical anti-cholinergics
- Saline

- Shake the container for 10 seconds.
- Remove the protective cap.
- Close one nostril with a finger as indicated.
- Insert the spray into the other nostril gently.
- point the spray towards the lateral wall of the nose.
- Inhale while activating the spray.
- Repeat the same with the other nostril.
- Clean the nose piece with a tissue, replace the cap.

Read the instructions sheet provided with the spray

Heartburn Can Inflame Your Lungs

If you have

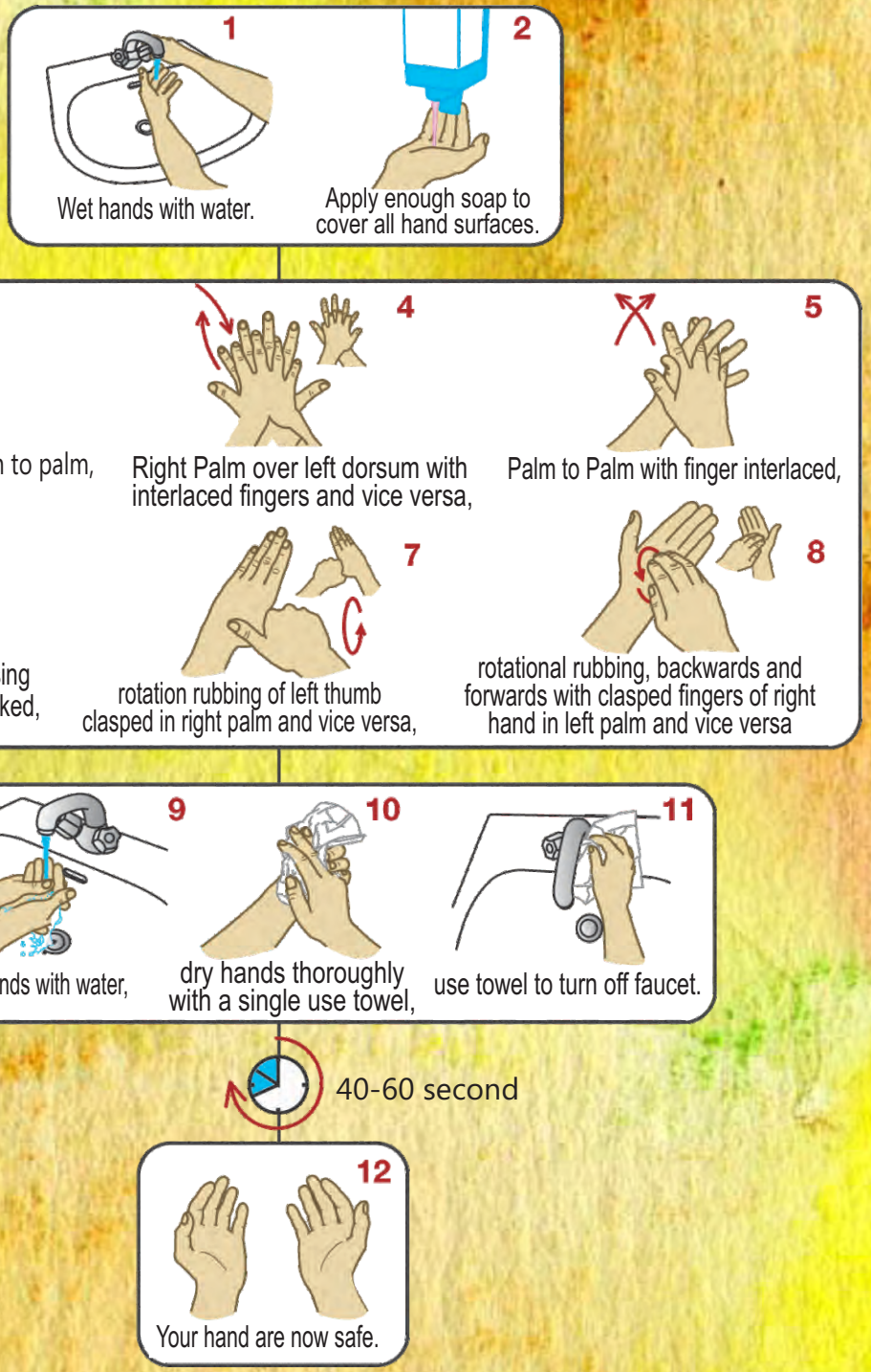
- Gastritis
- Heart Burn
- Reflux/Regurgitation of food

and your chest is still bad

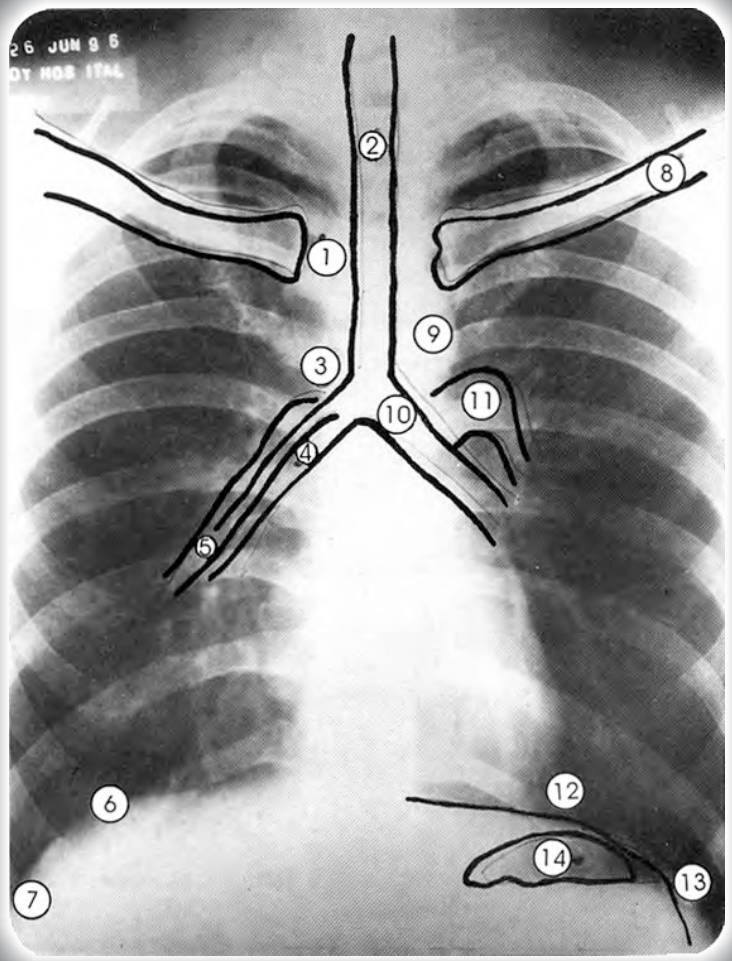
Your doctor can help you

Treating Gastritis can help asthma

Handwash with Soap and Water

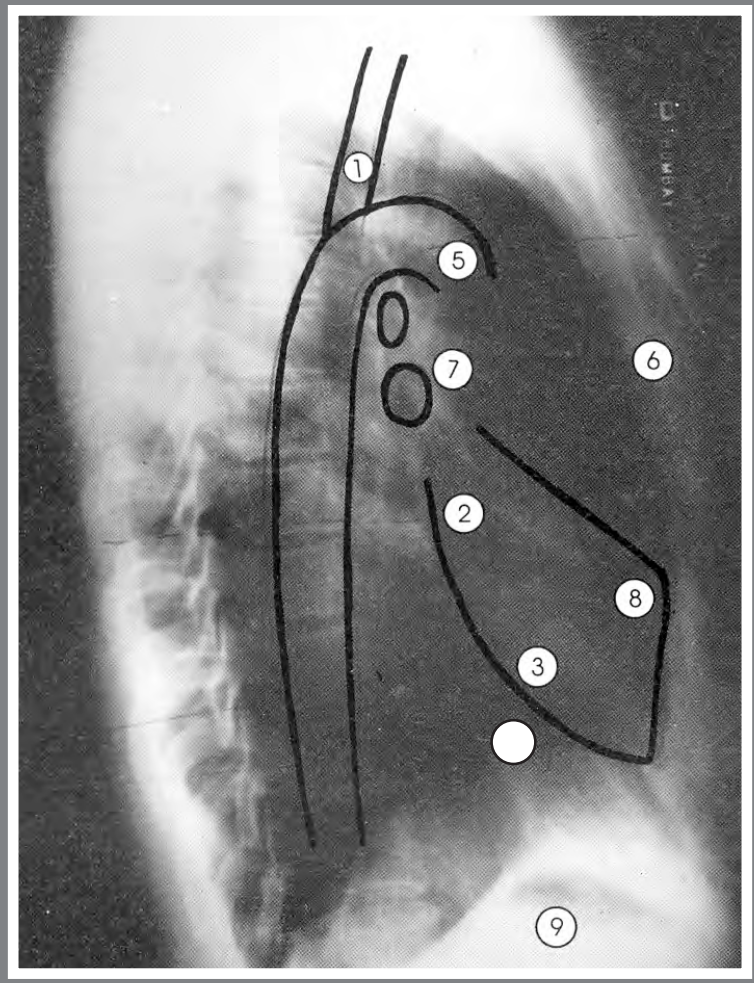


Interpreting the Chest X ray



Normal PA view

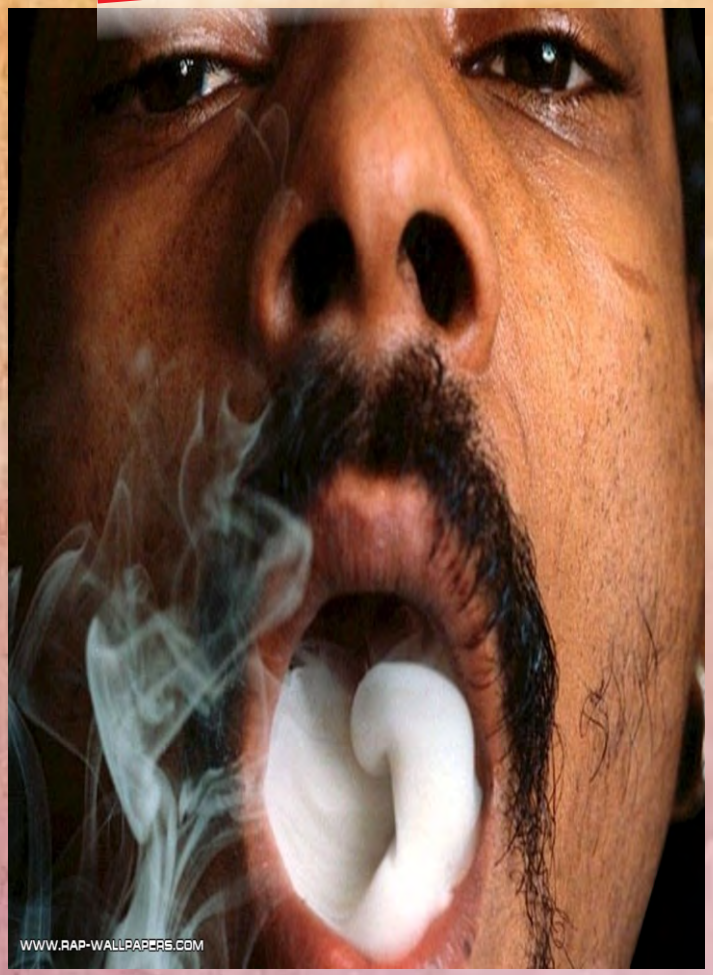
1. Sterno-clavicular joints
2. Trachea
3. Azygos vein
4. Right main bronchus
5. Right pulmonary artery
6. Right diaphragm
7. Right costophrenic angle
8. Clavicle
9. Aorta
10. Left main bronchus
11. Left pulmonary artery
12. Left diaphragm
13. Left costophrenic angle
14. Gas in stomach

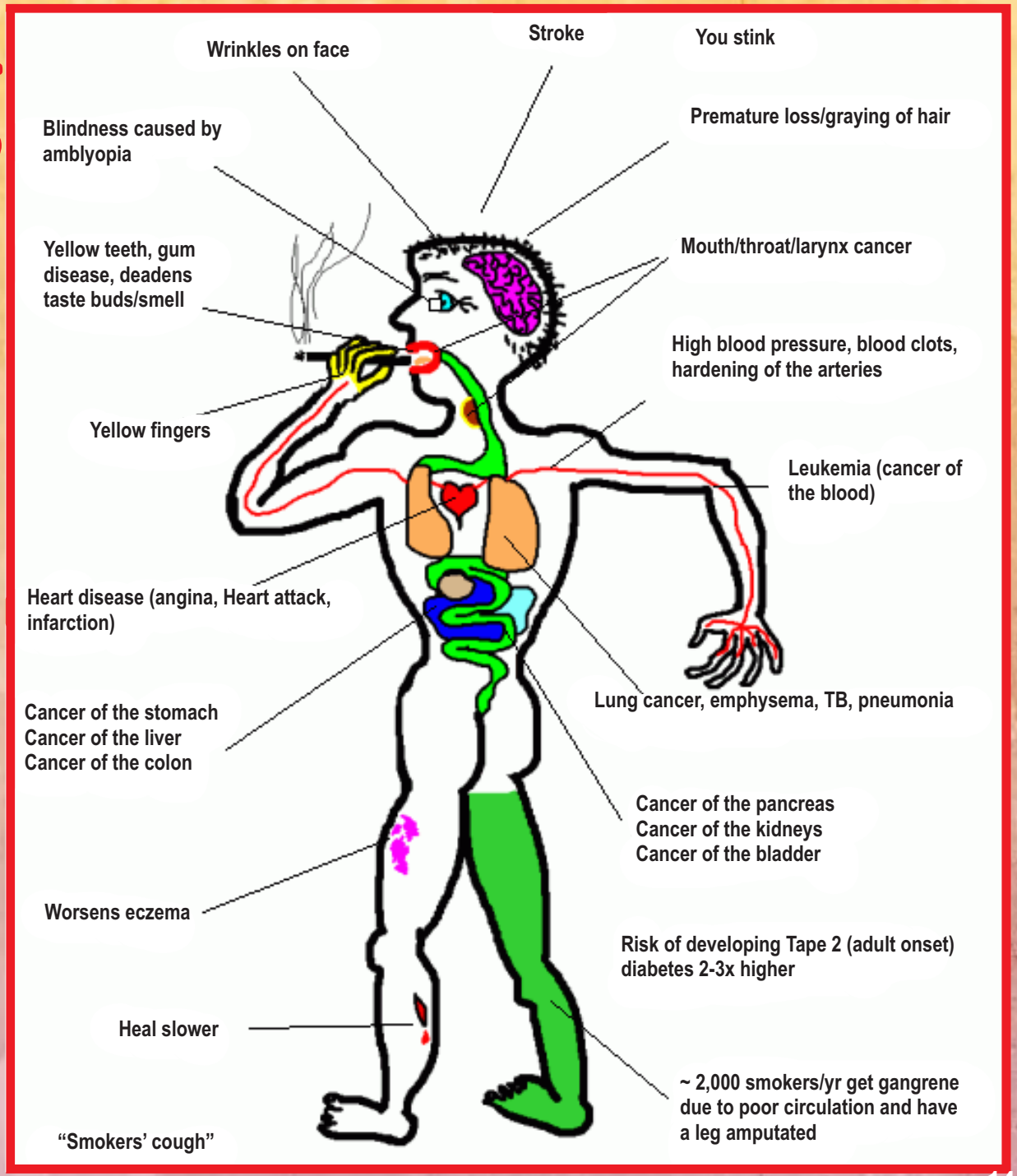


Normal Lateral view

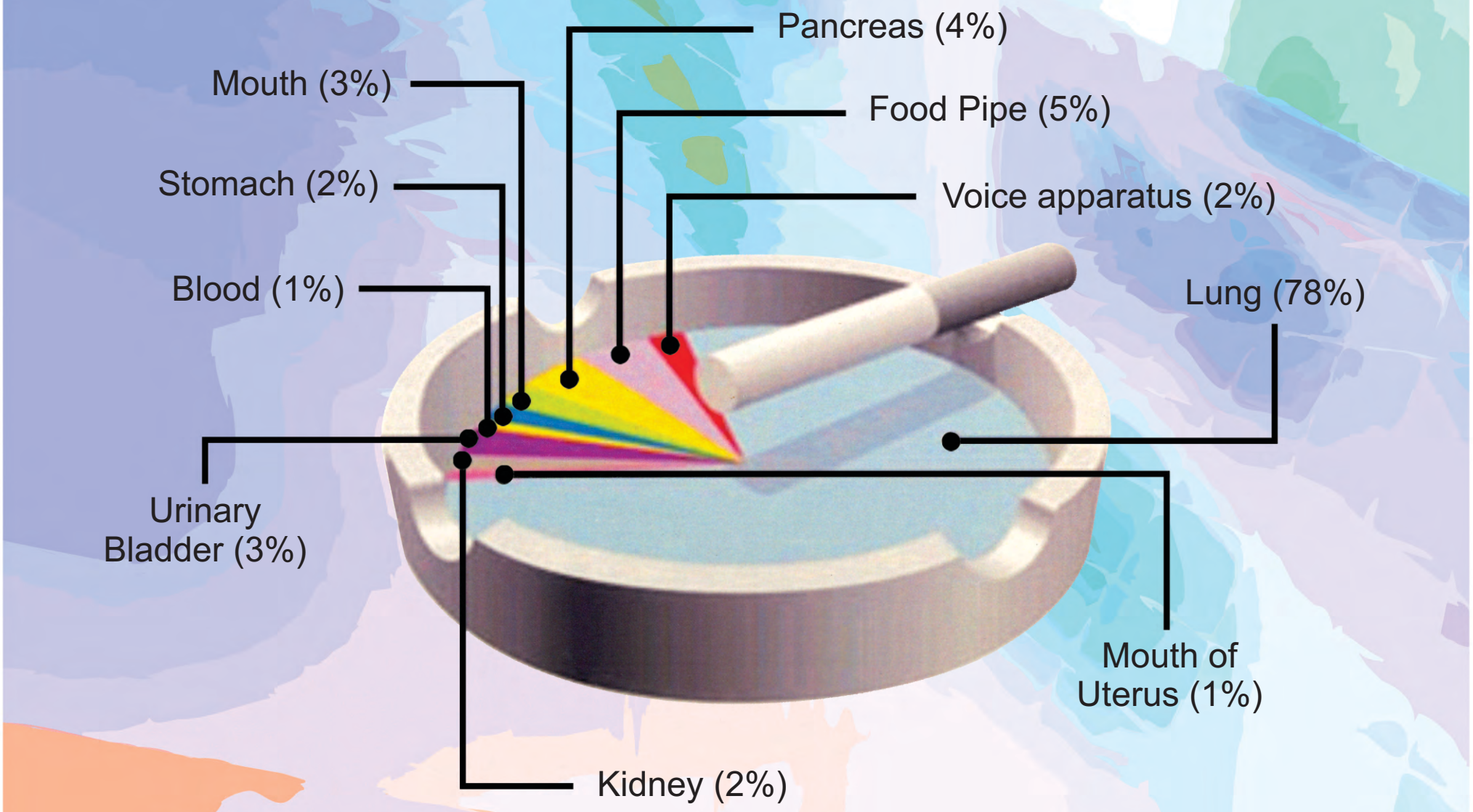
1. Trachea
2. Left artrium
3. Left Ventricle
4. Inferior vena cava
5. Aorta
6. Sternum
7. Pulmonary conus
8. Right ventricle
9. Diaphragm

Smoking Man


WWW.RAP-WALLPAPERS.COM


Wrinkles on face
Stroke
You stink
Blindness caused by amblyopia
Premature loss/graying of hair
Yellow teeth, gum disease, deadens taste buds/smell
Mouth/throat/larynx cancer
High blood pressure, blood clots, hardening of the arteries
Yellow fingers
Leukemia (cancer of the blood)
Heart disease (angina, Heart attack, infarction)
Lung cancer, emphysema, TB, pneumonia
Cancer of the stomach
Cancer of the liver
Cancer of the colon
Cancer of the pancreas
Cancer of the kidneys
Cancer of the bladder
Worsens eczema
Risk of developing Tape 2 (adult onset) diabetes 2-3x higher
Heal slower
~ 2,000 smokers/yr get gangrene due to poor circulation and have a leg amputated
"Smokers' cough"

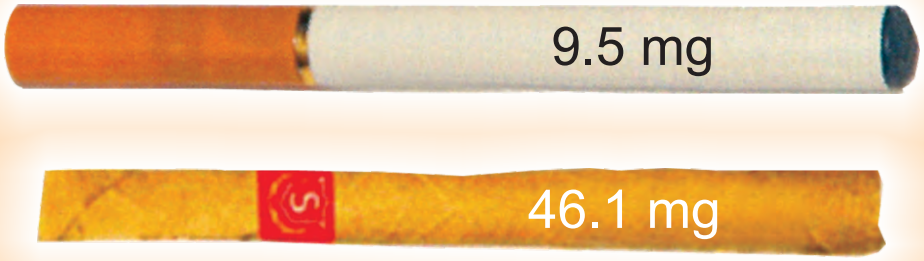
CANCERS YOU GET FROM SMOKING



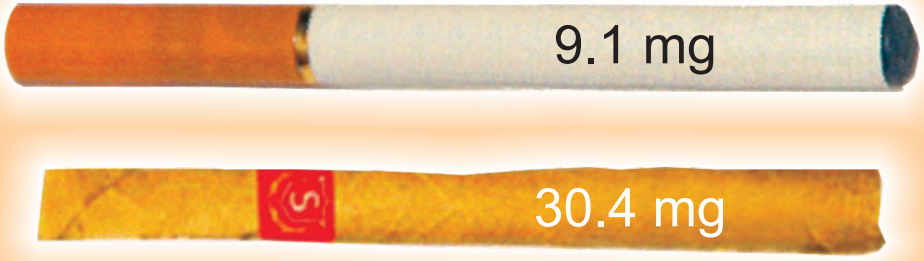

Cadmium
Batteries
Butane
Lighter
Fluid
Stearic Acid
Candle Wax
Hexamine
Barbecue
Lighter
Toluene
Industrial
Solvent
Nicotine
Insecticide
BUG SPRAY
Ammonia
Toilet Cleaner
Acetic Acid
Vinegar
Methane
Sewer Gas
Arsenic
Poison
Carbon
Monoxide
Methanol
Rocket Fuel
FUEL
PAINT
Cigarette
-The Killer!

Bidi smoking is more harmful

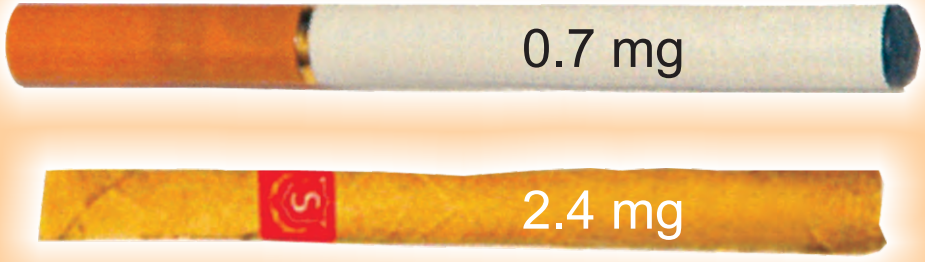
Tar

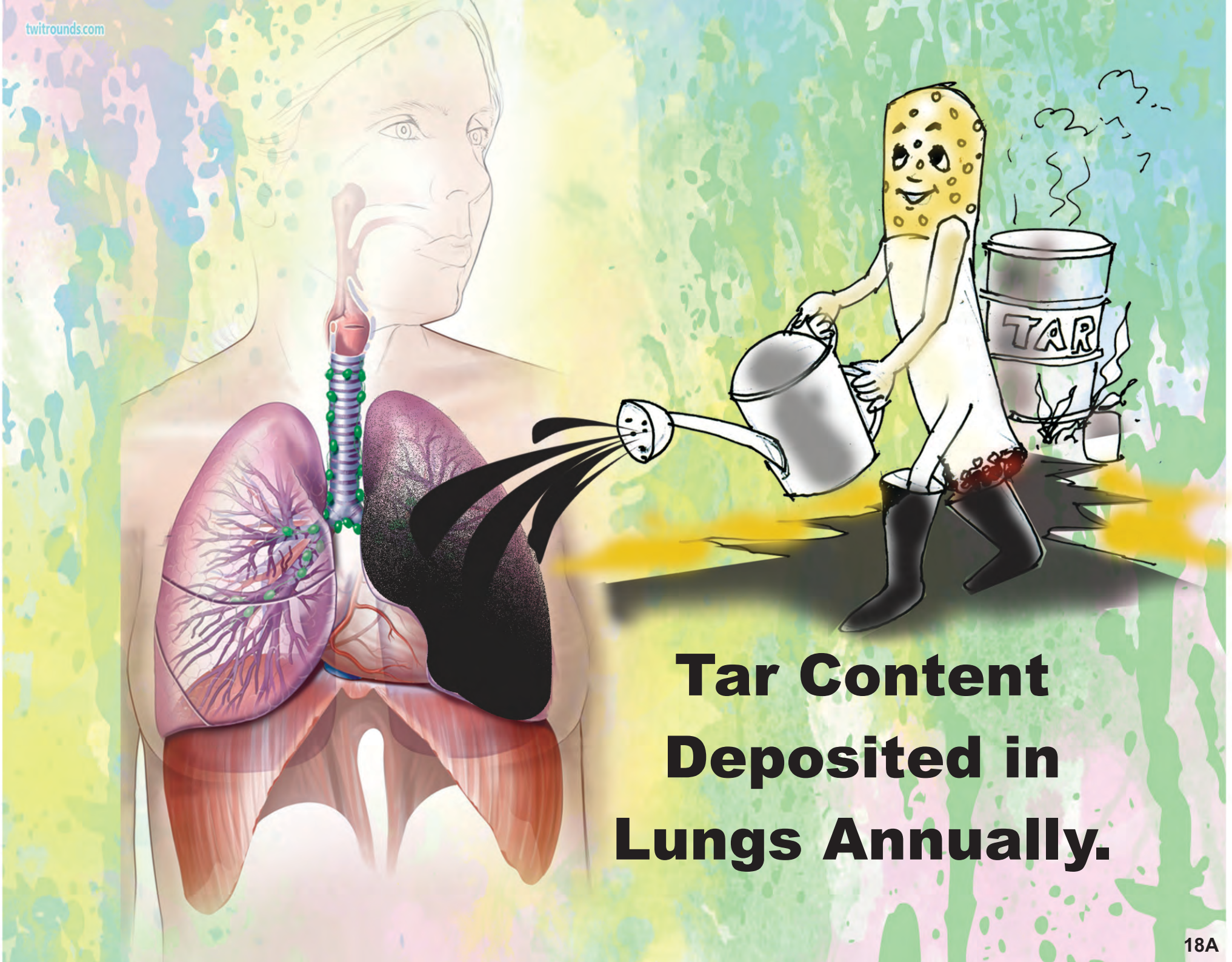


Carbon Monoxide



Nicotine





Tar Content Deposited in Lungs Annually.

Smokeless Tobacco Outcomes

HAZARDS

- Contains at least 25 carcinogens
- 90% oral cancers due to its use
- ½ hour of chewing releases nicotine equivalent to 4 cigarettes

වියදම සහ ඉතිරිය

දවසකට
සිගරට් 10ක්
බිව්වොත්
රු 200/-

=

මාස 6කට
සිගරට්
බිව්වොත්
රු 36000/-

=

දවස් 10ක්
සිගරට්
බිව්වොත්
රු 2000/-

=

අවුරුද්දක්
සිගරට්
බිව්වොත්
රු 72000/

=

මාසයක්
සිගරට්
බිව්වොත්
රු 6000/-

=

අවුරුදු 5ක්
සිගරට්
බිව්වොත්
රු 360000/--

=

Benefits of Stopping Smoking

Stopping smoking is the single best thing you can do to improve your health and quality of life.

Within 8 hours

Carbon monoxide level drops in your body and oxygen level in your blood increases to normal

Within 48 hours

Your chances of having a heart attack starts to go down your sense of smell and taste begin to improve

Within 72 hours

Your breathing tubes relax making breathing easier and your lung capacity increases

Within 2 weeks to 3 months

Your blood circulation improves your lung function increases by 30 percent

Within 6 months

Your coughing, stuffy nose, tiredness and shortness of breath improve

Within 1 year

Your risk of a smoking-related heart attack is reduced by half

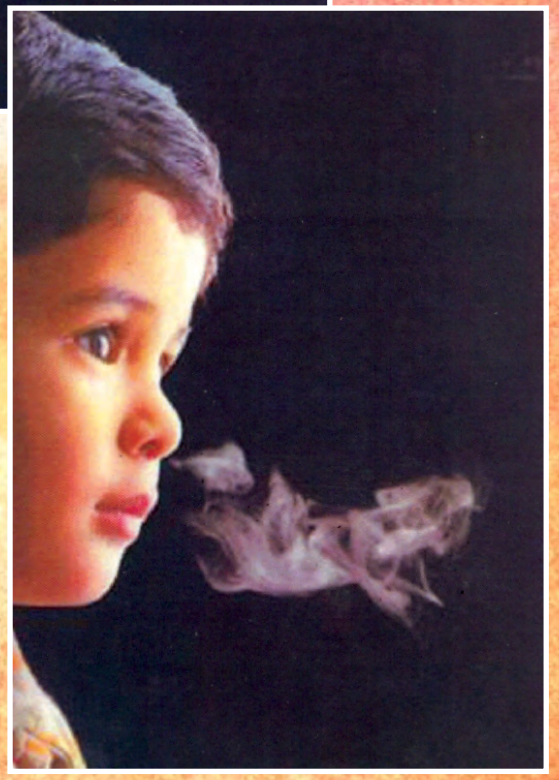
Within 10 years

Your risk of dying from lung cancer is reduced by half

Within 15 years

Your risk of dying from a heart attack is the same as a person who never smoked

They have a right



For Clean Air

When you have the urge to smoke try the 4-D Solution :

1. Drink water

Drink lots of water. This flushes the nicotine and other chemicals out of your system faster. It can help to keep your mouth busy.

2. Deep breaths

Take a deep breath break instead of a smoke break.Take a few deep breaths. Hold the last one. Breathe out slowly.

3. Delay

As a smoker you were not always in control. You smoked when your body wanted nicotine. By delaying or holding off, you are gaining control. Your craving for a cigarette will probably pass in a few minutes. Just wait and you can get through this.

4. Do something different

When a craving hits, it helps to change what you're doing. Step outside. Read a book. Do something different. Get involved with a hobby like gardening start an exercises routine. Spend time with your family.

Withdrawal symptoms and how to cope

Withdrawal is your body's response to being without the **addictive drug nicotine**. Everyone who quits smoking experience some withdrawal symptoms as stop smoking.
Some people believe quitting begins by reducing the number of cigarettes they smoke gradually . This they feel helps overcome withdrawal symptoms. Research has shown this to be incorrect as when number of cigarettes are limited for the day smokers tend to ”enjoy” the cigarette smoked by inhaling more deeply and holding breath for longer. This in fact leads to more addiction and harmful health effects. Each person will have their own set of withdrawal symptoms. For some people, withdrawal won't feel so bad. For others, it will feel horrible. It's different for each person. It depends on many things, including how much you smoke. In general, people notice symptoms within a few hours of quitting. Their symptoms may be worse in the evening.
Withdrawals symptoms don't last forever. They usually become less noticeable after the first 4-5 days.

Withdrawal symptoms and how to cope

Withdrawal sign or symptom	Why you're feeling it	How long it lasts	What you can do
You're irritable (in a bad mood)	Your body craves nicotine	2- 4 weeks	Take a walk or do some other kind of exercise. Try to relax: read a book/paper listen to music, get involved with family / children
You feel tired and you have low energy	Nicotine is a stimulant - it keeps your body and brain alert. Your body is now learning how to stay alert without nicotine.	2 - 4 weeks	Take a nap if you're tired. Don't push yourself, and don't take on any extra work.
You have trouble sleeping	Nicotine has affected your sleep patterns. Your brain is adjusting to new sleep patterns.	1 week	Avoid caffeine (coffee, cola).

Withdrawal sign or symptom	Why you're feeling it	How long it lasts	What you can do
You've got a dry throat, **cough**, and/or **you're coughing up phlegm. You have post-nasal drip** - mucus that drips from the back of your nose into your throat.	When you first quit, you might notice a lot of coughing and phlegm. This is a good sign. Your lungs are trying to clear out the tar and other dirt trapped inside your airways. Help your lungs by allowing yourself to cough and spit this stuff out.	A few days	Drink lots of water to thin out the phlegm and make it easier to bring up. Cough it up.
You feel dizzy	Your body is getting more oxygen now that you've quit smoking. This is a good thing! But your body needs a little time to adjust	1 or 2 days	When you get up from sitting or lying down, get up slowly.
You have trouble concentrating	Your brain is used to getting a stimulation from nicotine. Now it's learning to stay alert without nicotine.	A few weeks	Try something relaxing. Get involved with religious activities, family activities.
Your chest is tight	You may have sore muscles from coughing, or tense muscles from nicotine cravings.	A few weeks	Take some deep, slow breaths

Withdrawal sign or symptom	Why you're feeling it	How long it lasts	What you can do
You have gasseous stomach pains constipation	While you're in withdrawal, your bowels may move less often than before. This constipation won't last forever it's just a part of withdrawal. Give your body a chance to adjust, and your bowel movements will be regular again.		Drink lots of water and eat high-fibre foods like fruits and vegetables
You feel hungry	Your brain is confusing a nicotine craving with a craving for food (hunger). Your mouth isn't busy smoking, so you have the urge to eat to keep it busy.	2-4 weeks	Eat healthy, balanced meals, and fruit. Drink lots of water.
You crave another cigarette	Your brain is begging for another hit of nicotine, a highly addictive drug.	For most people, cravings are strongest in the first few days after quitting. Some people have cravings occasionally for months or years.	Wait it out. Your strong craving will probably last just a few minutes. Try another activity - have a drink of water, take a walk, or use a nicotine replacement product (for example, NRT gum).

There are many other good reasons to quit smoking:

You'll set a good example for your children.

Children whose parents smoke are more likely to be smokers themselves as they grow up.

Your will have more energy to do the things you love.

You'll have more money to save or to spend on other things - a pack of cigarettes a day adds up to more than Rs. 1,45, 000 per year (20 x20 x 365)

You will save money on medical care as you no longer need them.

Cigarettes will no longer control your life

We all have a Darker Side

- Smoke
- Alcohol
- Addiction
- Bad Habits
- Promiscuity

Don't hide it from the doctor

Most illnesses have their roots in that dark side

Start a new life today

come out of Heroine and other drugs

you have to live for them.

Your doctor understands

don't hide your addiction

When the inhaler is not enough

Your doctor may recommend some of these

home nebulizer

When you need long term Oxygen

oxygen cylinders

oxygen concentrator

regulator for
oxygen cylinder

pulse oxymeter

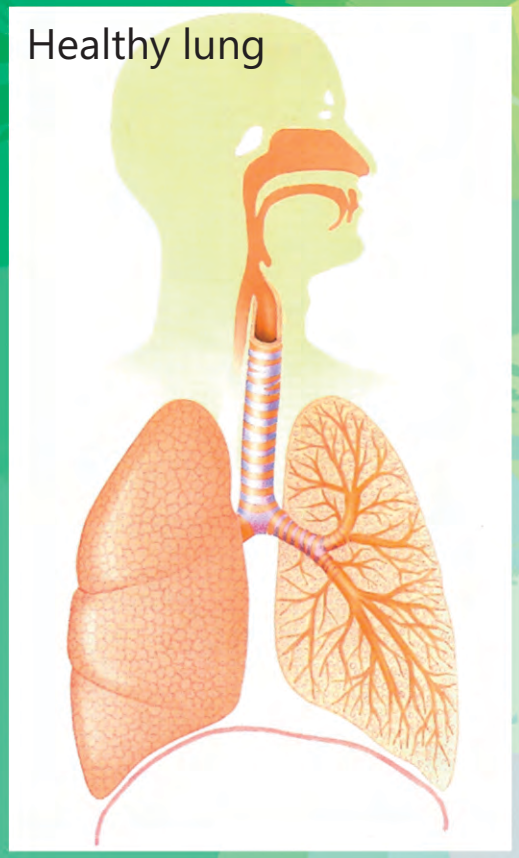
nebulizer mask

nebulizer chamber
with mouthpiece

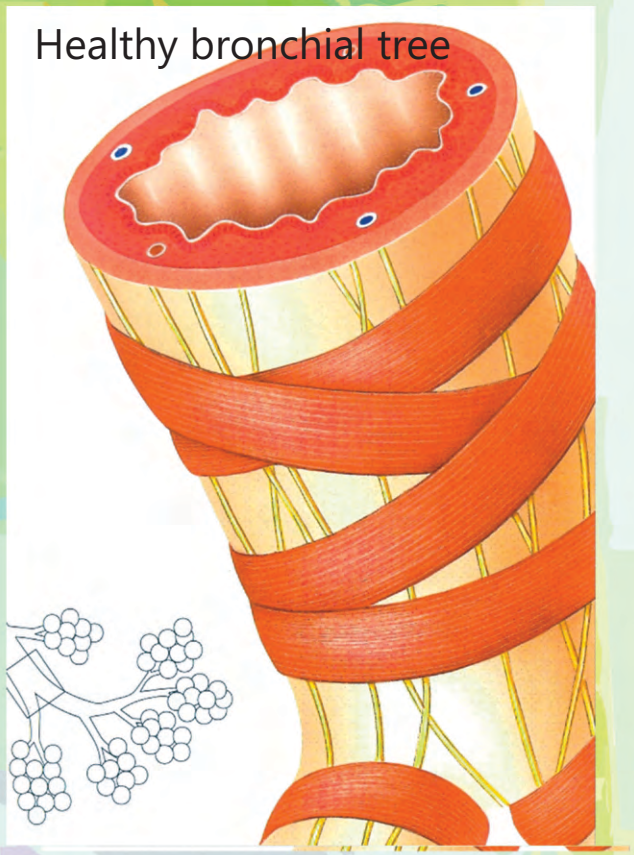
BECAUSE LIFE IS PRICELESS

COPD 1 - Anatomy, Diagnosis

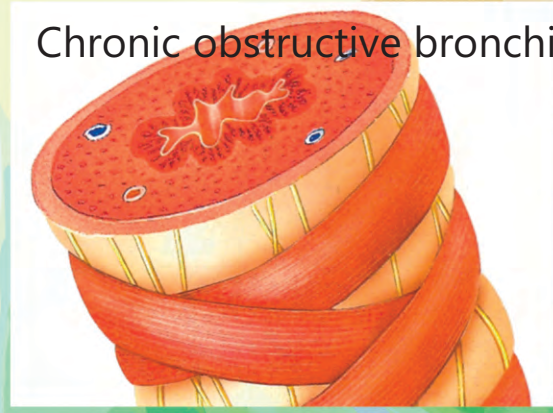
Healthy lung



Healthy bronchial tree



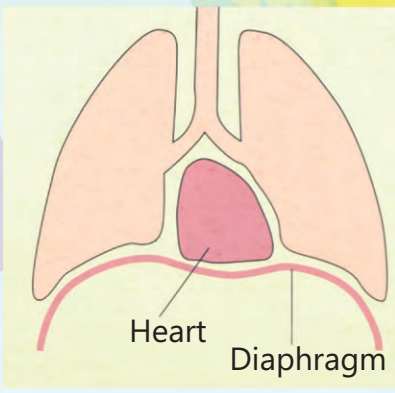
Chronic obstructive bronchitis



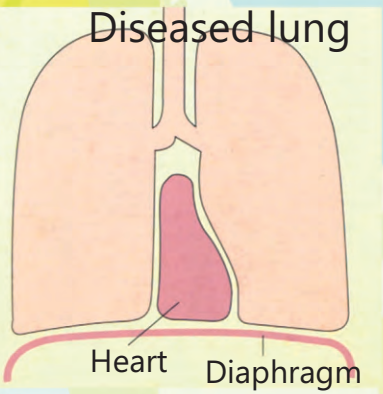
Pulmonary emphysema

Diseased alveoli

Healthy lung



Diseased lung



COPD ACTION PLAN

Actions for you to take when your symptoms increase

SYMPTOMS

- Not breathless doing usual activities
- Mucus is clear/white, easy to cough up, small in amount
- Mentally alert.
- Can do usual activities without tiring

ACTION TO CONTINUE

1. Continue with you usual activities including exercise
2. Take medicines as ordered by your doctor

WORSENING SYMPTOMS

- More shortness of breath, wheezing or coughing than usual

ACTION TO TAKE

1. Take Reliever inhaler or tablets.
2. Use pursed lip breathing and relaxation exercises.
3. Pace yourself and limit activities.
4. You may need nebulizer treatment - consult your doctor.

- Mucus is thicker or stickier than usual
- Mucus is green, yellow or brown for more than 12 hours
- Blood in mucus
- Fever develops and is above 100,4

1. Increase fluids if no fluid restrictions.
2. Consider medicine to thin mucus
3. Start antibiotics if ordered by your doctor
4. Consult your doctor

- More forgetful, restless, less able to concentrate
- Gained or lost weight for no reason; swelling in feet or ankles
- Tired and not able to finish usual activities without resting
- Feel that, in general, health has worsened
- Difficultly in sleeping
- Morning headaches, dizzy spells or restlessness

1. Contact your doctor

SEVER SYMPTOMS

- Breathing does not improve with treatment
- Chest pain
- Feel like you are going to faint
- Frightened by not being able to breathe
- Frightened by how tired or drowsy you feel
- Confusion

- Seek medical treatment urgently

Adapted from Canadian Lung Foundation

How is your COPD? Take the COPD Assessment Test (CAT)

This questionnaire will help you and your healthcare professional measure theimpact COPD (Chronic Obstructive Pulmonary Disease) is having on you well being and daily life. Your answers, and tests core, can be used by your and your healthcare professional to help improve the management of your COPD and get the greatest benefits from treatment.

For each item below, place a mark (X) in the box that best describes you currently. Be sure to only select one responseh question.

I never cough	1	2	3	4	5	I cough all the time	
I have no phlegm (mucus) in my chest at all	1	2	3	4	5	My chest is completely full of phlegm (mucus)	
My chest does not feel tight at all	1	2	3	4	5	My chest feels very tight	
When I walk up a hill or one flight of stairs I am not breathless	1	2	3	4	5	When I walk up a hill or one flight of stairs I am very breathless	
I am not limited doing any activities at home	1	2	3	4	5	I am very limited doing activities at home	
I am confident leaving my home despite my lung condition	1	2	3	4	5	I am not at all confident leaving my home because of my lung condition	
I sleep soundly	1	2	3	4	5	I don't sleep soundly because of my lung condition	
I have lots of energy	1	2	3	4	5	I have no energy at all	

<10	low	Most days are good, but COPD causes a few problems and stops people doing one or two things that they would like to do. they get exhausted easily.	• Somking cessation • Annual influenza vaccination • Reduce exposure to exacerbation risk factors • Therapy as warranted by further clinical assessment
10-20	Medium	COPD is one of the most important problems that they have. they either do their housework slowly or have to stop for rests.	In addition to above, consider: • Reviewing maintenance therapy • Referral for pulmonary rehabilitation • Ensuring best approaches to minimizing and managing exacerbations • Reviewing aggravating factors
>20	High	COPD stops them doing most things that they want ot do. they are afraid and panic and do not feel in control of their chest problem	In addition to above, consider: • Additional pharmacological treatments • Referral to specialist care
>30	Very high	Their condition stops them doing everything they want to do. they feel as if they have become an invalid.	

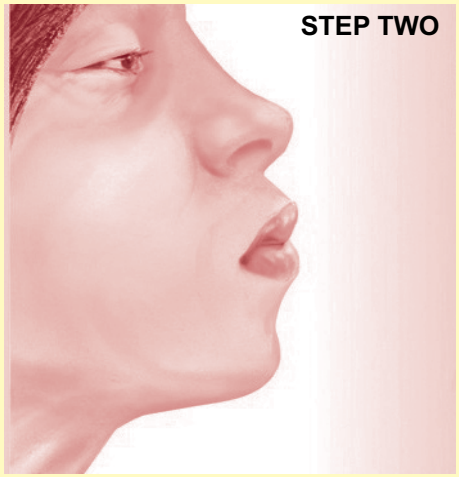
HOW TO COPE WITH BREATHLESSNESS

Patients with moderate to severe COPD feel breathless most of the time. This leads to limited physical activity, increase in symptoms, inefficient use of energy leading to anxiety.

Learning techniques of breathing helps lungs and breathing muscles work more efficiently.

Pursed Lip Breathing.

With your mouth closed, breathe in a normal amount of air through your nose.



Purse your mouth as if you're whistling or making a candle flame flicker gently.

Keeping your lips pursed, slowly blow the air out through your mouth. Do not strain yourself to force the air out.

Try to breathe out (exhale) twice as long as you breathe in (inhale). Hint: It can be helpful to count to two as you inhale and to four as you exhale.

In COPD, the airways tend to close before you have finished breathing out (exhaling). When you can't push the 'used' air out of your lungs it is hard to take in a deep breath of fresh, oxygen-rich air. This makes you feel breathless.

Pursed-lip breathing helps keep the airways open so that air trapped in the lung can escape. It also helps slow down your breathing, especially when you're doing something that takes effort and uses extra oxygen, like lifting, bending or walking. You can practice this by blowing bubbles through a straw.

Diaphragmatic Breathing

Learning to use this muscle more effectively may allow you to control your breathlessness.

You could learn this by sitting or lying down.

Sitting position

STEP TWO

Sit in a comfortable chair with your back against the chair, lean slightly forward with shoulders relaxed and bent slightly forwards.

STEP TWO

Place your hands lightly on your abdomen.

STEP THREE

Breathe in slowly through your nose. You should feel your abdomen rise out under your hands.

STEP FOUR

Breathe out slowly through pursed lips. Your abdomen should fall inward.

Lying down position

Step one

Put one hand on upper chest and other on your belly just above the waist

Step two

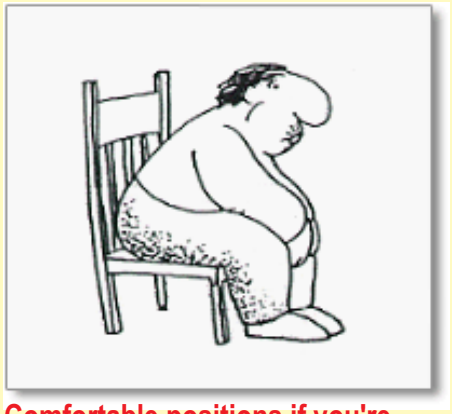
Breathe slowly through your nose. You should feel the hand on the belly move out. The hand on the chest shouldn't move.

Step three

Breath slowly out through your pursed lips. You should feel the hand on the belly move in as you breathe out.

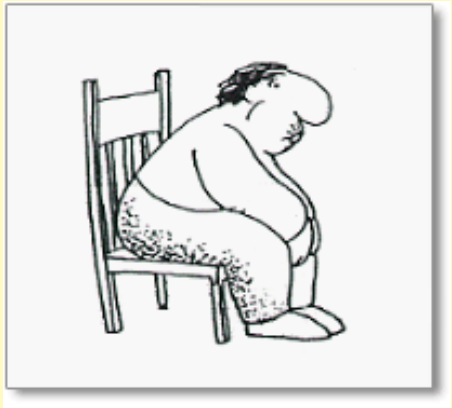
What to do if you're short of breath

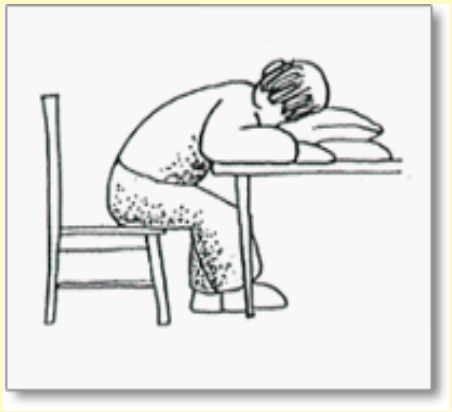
Stop and rest in a **comfortable position** Lower your head and shoulders Breathe in through your nose, and blow out through your mouth Begin to blow out more slowly and for a longer time. Use **pursed lip breathing** to slow your breathing down Begin breathing through your nose. Begin doing **diaphragmatic breathing** Stay in this position for 5 minutes longer



Comfortable positions if you're short of breath

01. Sitting: Sit with your back against the back of the chair. Your head and shoulders should be rolled forward and relaxed downwards. Rest your hands and forearms on your thighs, palms turned upwards. Do not lean on your hands. **Follow the steps above** until your breathing is normal.





02. Sitting: Place a pillow on a table and sit down, arms folded and resting on the pillow. Keep your feet on the floor or a stool, and rest your head on your arms. Follow steps above until your breathing is normal.

This position may also be used standing, arms resting on a table or back of chair, not leaning, knees bent slightly, one foot in front of the other.

03 Standing: Lean with your back to the wall, a pole, etc. Place your feet slightly apart and at a comfortable distance from the wall, head and shoulders relaxed. **Follow the steps above** until your breathing is normal.

04. How to cough up phlegm: controlled coughing

People with COPD usually have extra phlegm in their lungs. If you have phlegm, cough it up.

If the phlegm stays in your lungs, it can block your smaller airways, making it hard to breathe. The phlegm could also become infected. It's important to get the phlegm out. Controlled coughing helps you clear the phlegm from your lungs.

Here's how to do it ;

Sit down and make yourself comfortable. Lean your head forward slightly. Place both feet firmly on the ground. Breathe in deeply using diaphragmatic breathing (push your belly out while you breathe in).Try to hold your breath for three seconds. While keeping your mouth slightly open, cough out twice. " HUFF" , "HUFF"(Make the sound "HA-HA") and cough. The first cough should bring up the phlegm, and the second cough should move it towards the throat. Spit the phlegm out into a disposable container (Yoghurt cup) or tissue Take a break and repeat these steps once or twice if necessary. Make note of the colour of phlegm ,see if any blood. Dispose phlegm containers hygienically.

Tips for home based Pulmonary Rehabilitation Programme.

This should include three types of exercises

1. Flexibility
2. Aerobic
3. Strengthening

Your COPD should be fully assessed and you should get your doctors approval before starting any execises routine.

1. **Flexibility training ;**

This helps your muscles and joints to be flexible and relaxed. It also prevents tension and straining of your muscles. Start by walking slowly for a few minutes, use breathing techniques described above if you feel breathless. Warm up routine should take up about ten to fifteen minutes.

Stretching techniques:

1. Back thigh stretch

Sit with you back straight, one foot flat on the floor, and he other foot extended in front of you with the heel on the floor and the toes pointing upwards. Try not to bend the knee of the extended foot. Bend down to touch your calf, knee and foot. Gradually increase your range of movement as far as you are able to without pain. Bend from the hip not the back. You should feel a stretch on the back of the thigh. Hold this position for 30 seconds. Do the same with other leg. Repeat three times with each leg.

2. Buttock stretch

Sit with back strait and one ankle placed on the knee of the opposite leg. Then forward at the waist. You should feel a stretch in the buttock. Hold this position for 30 seconds and repeat same with other leg. . Repeat three times with each leg.

3. Front thigh stretch

Stand resting one hand on a wall or back of chair. Hold your ankle and bend your leg towards your buttock. Keep your leg straight at the hip. Hold this position for 30 seconds and repeat same with other leg. Repeat three times with each leg.

4. Shoulder stretch.

Sit or stand with your back straight and one hand placed on the out side of the elbow of the opposite arm.Pull the elbow gently across the chest. Hold the stretch for 30 seconds. Repeat same with other arm Repeat three times with each arm.

5. Shoulder and chest stretch.

Stand with one hand and fore arm placed against the wall. The fore arm should be at the same level with the shoulder. The elbow should be slightly behind the shoulder. Slowly turn your head away from the wall. You should feel a sketch in your arm ad chest. Hold the stretch for 30 seconds. Repeat three times with other shoulder.

6. Palm down forearm stretch.

Sit or stand with back straight and one arm extended in front of you with palm facing down. With your other hand gently pull down the hand towards you. You should feel a stretch in the forearm. . Hold the stretch for 30 seconds. Repeat three times with other hand.

Adopted by Canadian Lung Foundation

1. Heel Lift

Sit with your back straight and hands resting on knees and feet flat on the floor. Raise your heels. Return to original position. Repeat 5 to 15 times.

1. Front Arm lift.

Lift your arms in front of you so that your shoulders are parallel to the floor. Return arm to original position. Repeat 5 to 15 times. You can also do these using weights.

1. Side Arm Lift.

Sit with your feet flat on the floor with arms by your side. Lift arm parallel to the floor up to shoulder level. Repeat 5 to 15 times. You can also do these using weights.

Toe lift

Sit with back straight, hands on thighs and feel flat on the floor .Lift your feet with toes pointing upwards and pressing heels towards the floor. Repeat 5 to 15 times.

1. Front Elbow bend

Sit with your back well supported and arms hanging straight down by your side. Bend your elbow lifting hand and forearm upwards. Repeat 5 to 15 times. You can also do these using weights.

1.Back Elbow Bend

1. Sit with feet flat on the floor, back well supported and the arm held out behind you. Bend your elbow with palm facing back. Extend the lower arm straight back. Return arm to the original position. Repeat 5 to 15 times. You can also do these using weights.

1. Arm Extension

Stand with back straight and arms held straight in front of you. Pull arms back to form 90 degree angle. Return to original position. Repeat 5 to 15 times.

Standing pushups.

Stand facing wall with feet flat on the floor and press on the wall with your palms. Your hand should be at shoulder height and a shoulder width part. Repeat 5 to 15 times.

2. Abdominal contractions

Sit with your back straight feet flat on the floor, hands placed on the abdomen with fingers pointing inwards. Contract your abdominal muscles, pulling your naval inwards and breathing out at the same time. Release your abdomen to its original position and breathe in slowly. Repeat 5 to 15 times Do the same exercise standing.

1. COOLING DOWN.

Do not forget to stretch after completing your aerobic and strength training exercises.

Adopted by Canadian Lung Foundation

1. Palm up forearm stretch.

Sit or stand with back straight and one arm extended in front of you with palm facing up. With your other hand gently pull down the hand towards you. You should feel a stretch in the forearm. Hold the stretch for 30 seconds. Repeat three times with other hand.

8. Neck Stretch

Sit or stand with your back straight and feet flat on the floor. Tilt your head to one side and push down on the opposite hand. You should feel a stretch on the side of the neck opposite the tilt. Hold this for 30 seconds and repeat on opposite side in same manner.

2. AEROBIC EXERISES

Walking, climbing stairs, cycling, and swimming is all good aerobic exercises. Start slowly. Go only as far as you can without becoming uncomfortably short of breath. Use breathing techniques taught about gradually increase distance. By working longer each time you will slowly be able to increase your level o fitness.

3. STRENGHNING EXERCISES.

Resistance training strengthens and conditions your muscles. Your muscle will use oxygen more efficiently and ease the workload of your lung. For patients with COPD exercise that works the upper body is especially helpful as they strengthen breathing muscles too. Use dumbbells or make your own weights using bags or rubber tubing filled with sand.

1. Leg extension.

Sit with you back straight, one foot flat on the floor, and the other foot extended in front of you with the heel on the floor and the toes pointing upwards. Try not to bend the knee of the extended foot. Return leg to original position. Repeat 5 to 15 times for each leg. Now perform same routine holding weights in your hand.

1. Leg extension.

Sit with your back straight and legs forming a 90 degree angle to the floor. Lean forward and stand up from the chair to a straight position with hand by your side. Repeat 5 to 15 times. Perform same routine with weights in your ankle.

Knee Lift.

Stand with back straight and hand by your side. You may hold on to a wall or chair or balance. Lift one leg up from hip to form a 90 degree angle. Return leg to original position. Repeat 5 to 15 times. Perform same routine with weights in your ankle.

1. Leg lift

Stand with your back straight, resting your hands on a wall or on the back of a chair for balance. Give one leg a small slow kick backwards. Return leg to original position. Repeat 5 to 15 times. Perform same routine with weights on your ankle.

1. Knee bend

Stand with your back straight, resting your hands on a wall or on the back of a chair for balance. Lift your foot out behind, so that your lower leg is parallel with to floor. Return leg to original position. Repeat 5 to 15 times. Perform same routine with weights on your ankle.

Adopted by Canadian Lung Foundation

Obstructive Sleep Apnoea

Don't risk your life, and of others

Talk to your doctor
OSA can be treated.

How you eat could make a difference

- High proteins- to maintain muscle mass
- Adequate carbohydrates- just enough to get energy
- High fiber- to prevent constipation
- Low Salt- to prevent oedema and high blood pressure
- High in vitamins and minerals- to boost the immunity
- Low refined sugars- to keep obesity at bay.

and lots of fluids.

ENJOY your Life
your Food

YOUR DOCTOR WILL REFER YOU TO A DIETICIAN

Body Mass Index (BMI) Chart for Adults

Obese (>30) | Overweight (25-30) | Normal (18.5-25) | Underweight (<18.5)

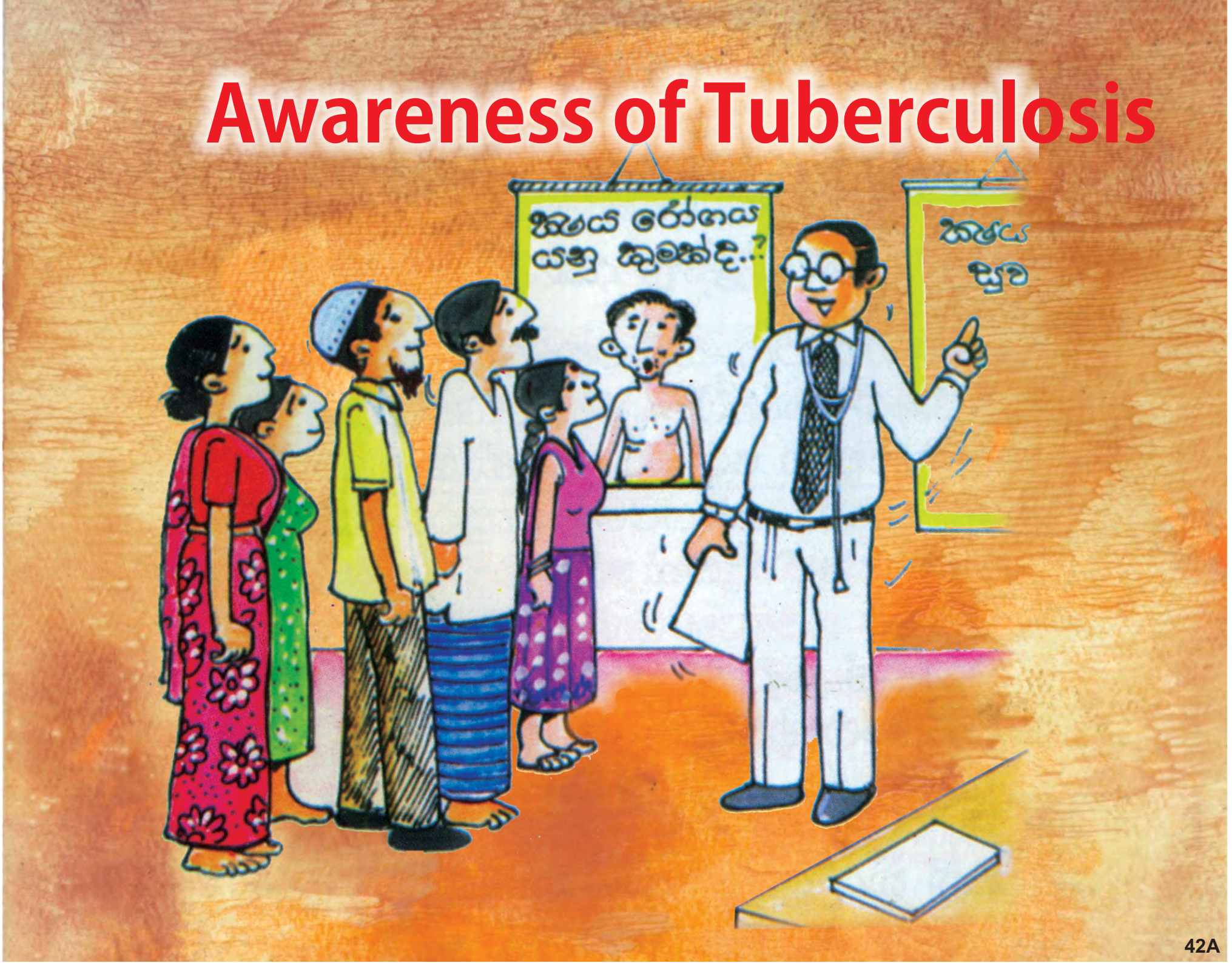
HEIGHT in feet/inches and centimeters

WEIGHT Lbs	(Kg)	4'8"	4'9"	4'10" 147	4'11" 150	5'0" 152	5'1" 155	5'2" 157	5'3" 160	5'4" 163	5'5" 165	5'6" 168	5'7" 170	5'8" 173	5'9" 175	5'10" 178	5'11" 180	6'0" 183	6'1" 185	6'2" 188	6'3" 191	6'4" 193	6'5" 196
260	(117.9)	58	56	54	53	51	49	48	46	45	43	42	41	40	38	37	36	35	34	33	32	32	31
255	115.7	57	55	53	51	50	48	47	45	44	42	41	40	39	38	37	36	35	34	33	32	31	30
250	113.4	56	54	52	50	49	47	46	44	43	42	40	39	38	37	36	35	34	33	32	31	30	30
245	111.1	55	53	51	49	48	46	45	43	42	41	40	38	37	36	35	34	33	32	31	31	30	29
240	108.9	54	52	50	48	47	45	44	43	41	40	39	38	36	35	34	33	33	32	31	30	29	28
235	106.6	53	51	49	47	46	44	43	42	40	39	38	37	36	35	34	33	32	31	30	29	29	28
230	104.3	52	50	48	46	45	43	42	41	39	38	37	36	35	34	33	32	31	30	30	29	28	27
225	102.1	50	49	47	45	44	43	41	40	39	37	36	35	34	33	32	31	31	30	29	28	27	27
220	99.8	49	48	46	44	43	42	40	39	38	37	36	34	33	32	32	31	30	29	28	27	27	26
215	97.5	48	47	45	43	42	41	39	38	37	36	35	34	33	32	31	30	29	28	28	27	26	25
210	95.3	47	45	44	42	41	40	38	37	36	35	34	33	32	31	30	29	28	28	27	26	26	25
205	93.0	46	44	43	41	40	39	37	36	35	34	33	32	31	30	29	29	28	27	26	26	25	24
200	90.7	45	43	42	40	39	38	37	35	34	33	32	31	30	30	29	28	27	26	26	25	24	24
195	88.5	44	42	41	39	38	37	36	35	33	32	31	31	30	29	28	27	26	26	25	24	24	23
190	86.2	43	41	40	38	37	36	35	34	33	32	31	30	29	28	27	26	26	25	24	24	23	23
185	83.9	41	40	39	37	36	35	34	33	32	31	30	29	28	27	27	26	25	24	24	23	23	22
180	81.6	40	39	38	36	35	34	33	32	31	30	29	28	27	27	26	25	24	24	23	22	22	21
175	79.4	39	38	37	35	34	33	32	31	30	29	28	27	27	26	25	24	24	23	22	22	21	21
170	77.1	38	37	36	34	33	32	31	30	29	28	27	27	26	25	24	24	23	22	22	21	21	20
165	74.8	37	36	34	33	32	31	30	29	28	27	27	26	25	24	24	23	22	22	21	21	20	20
160	72.6	36	35	33	32	31	30	29	28	27	27	26	25	24	24	23	22	22	21	21	20	19	19
155	70.3	35	34	32	31	30	29	28	27	27	26	25	24	24	23	22	22	21	20	20	19	19	18
150	68.0	34	32	31	30	29	28	27	27	26	25	24	23	23	22	22	21	20	20	19	19	18	18
145	65.8	33	31	30	29	28	27	27	26	25	24	23	23	22	21	21	20	20	19	19	18	18	17
140	63.5	31	30	29	28	27	26	26	25	24	23	23	22	21	21	20	20	19	18	18	17	17	17
135	61.2	30	29	28	27	26	26	25	24	23	22	22	21	21	20	19	19	18	18	17	17	16	16
130	59.0	29	28	27	26	25	25	24	23	22	22	21	20	20	19	19	18	18	17	17	16	16	15
125	56.7	28	27	26	25	24	24	23	22	21	21	20	20	19	18	18	17	17	16	16	16	15	15
120	54.4	27	26	25	24	23	23	22	21	21	20	19	19	18	18	17	17	16	16	15	15	15	14
115	52.2	26	25	24	23	22	22	21	20	20	19	19	18	17	17	16	16	16	15	15	14	14	14
110	49.9	25	24	23	22	21	21	20	19	19	18	18	17	17	16	16	15	15	15	14	14	13	13
105	47.6	24	23	22	21	21	20	19	19	18	17	17	16	16	16	15	15	14	14	13	13	13	12
100	45.4	22	22	21	20	20	19	18	18	17	17	16	16	15	15	14	14	14	13	13	12	12	12
95	43.1	21	21	20	19	19	18	17	17	16	16	15	15	14	14	14	13	13	13	12	12	12	11
90	40.8	20	19	19	18	18	17	16	16	15	15	15	14	14	13	13	13	12	12	12	11	11	11
85	38.6	19	18	18	17	17	16	16	15	15	14	14	13	13	13	12	12	12	11	11	11	10	10
80	36.3	18	17	17	16	16	15	15	14	14	13	13	13	12	12	11	11	11	11	10	10	10	09

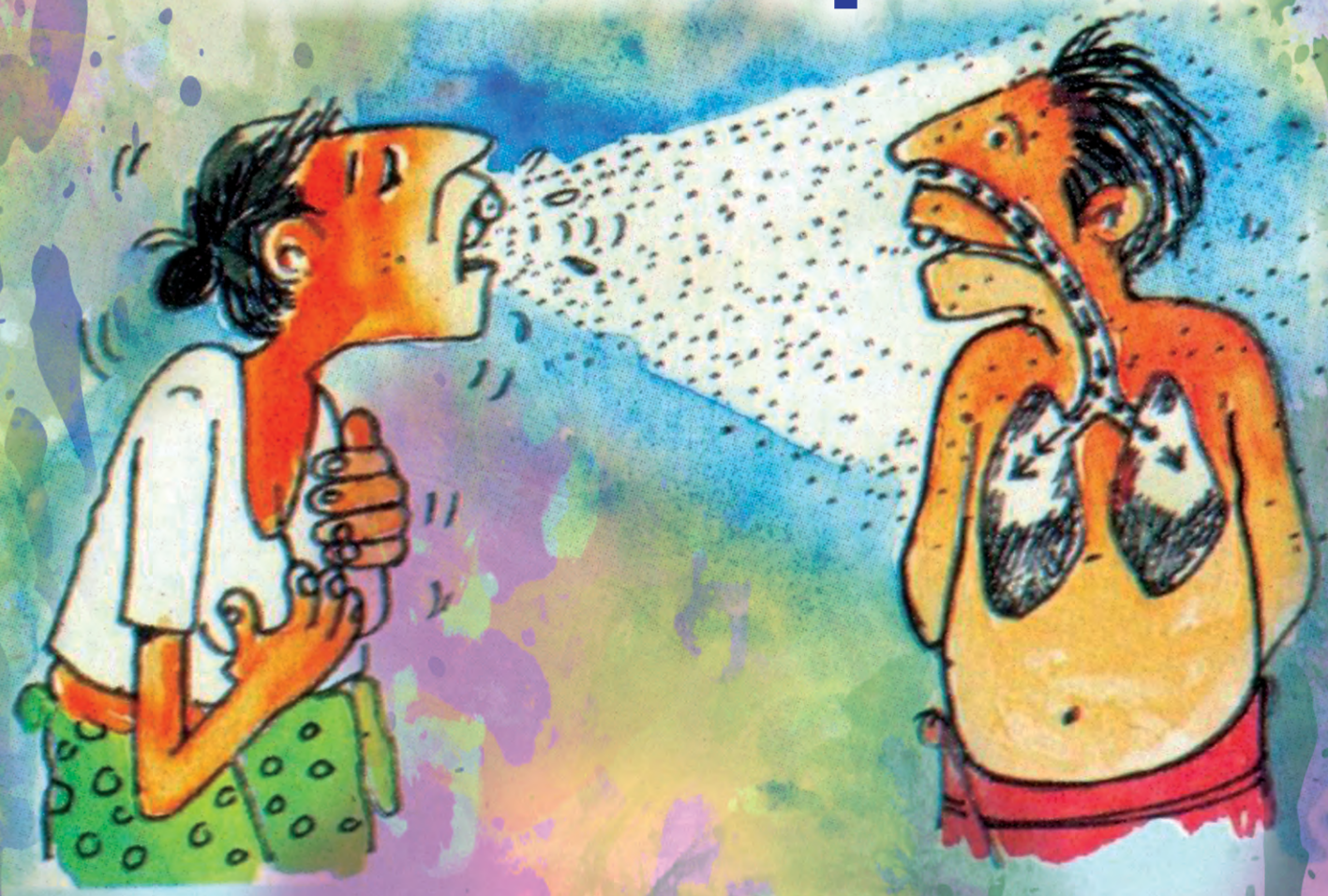
Note : BMI values rounded to the nearest whole number. BMI categories based on CDC crieria.

BMI = Weight[kg] / (Height[m] x Height[m]) = 703 x Weight[lb] / (Height[in] x Height[in])

Awareness of Tuberculosis



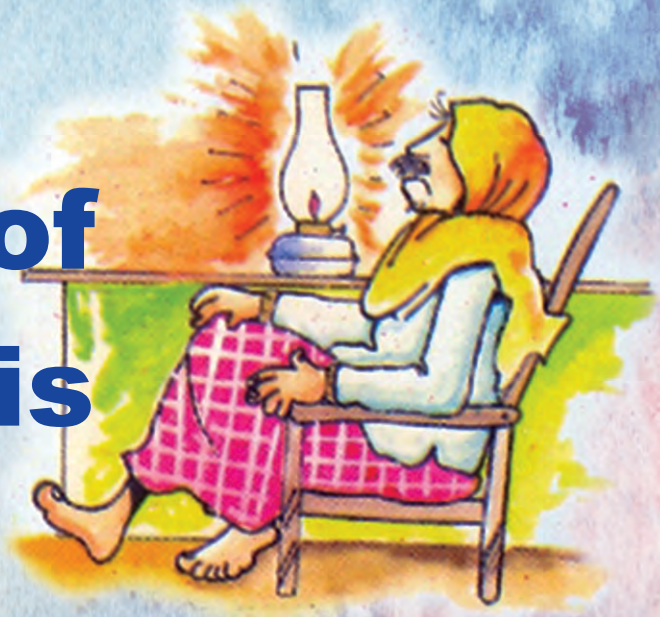
How the disease spreads

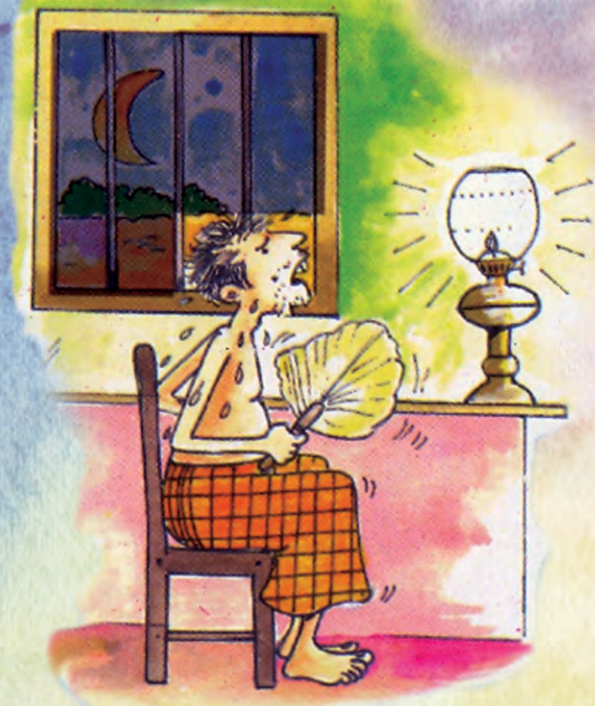


Cough etiquette

infections
are costly-
lets minimize
them

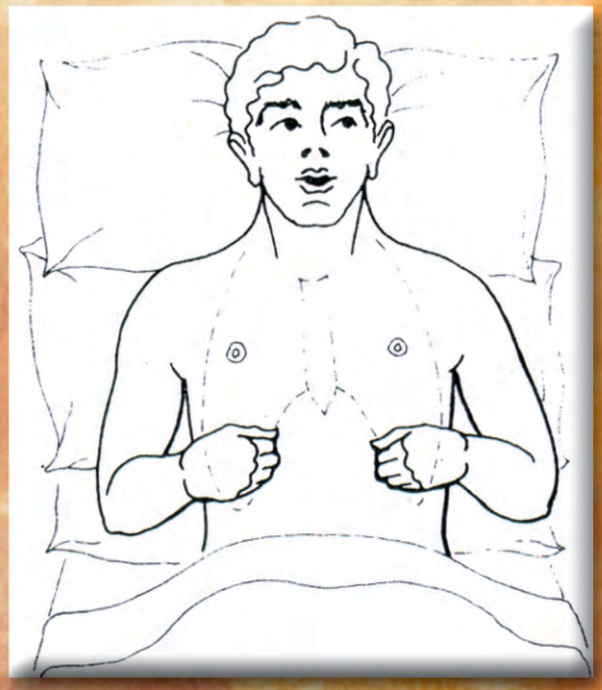
Signs & Symptoms of Tuberculosis

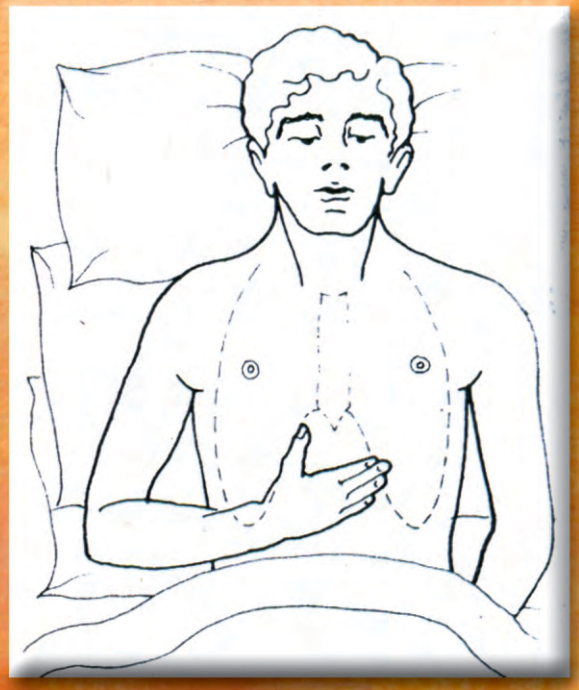


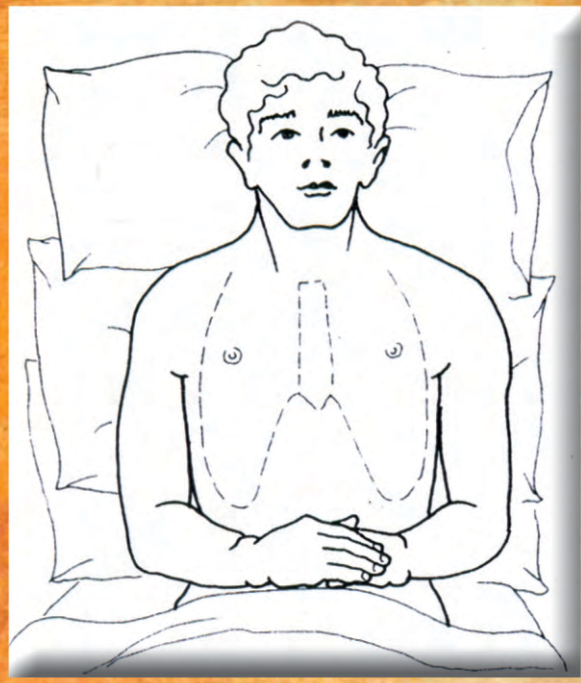


Risk Factors of TB

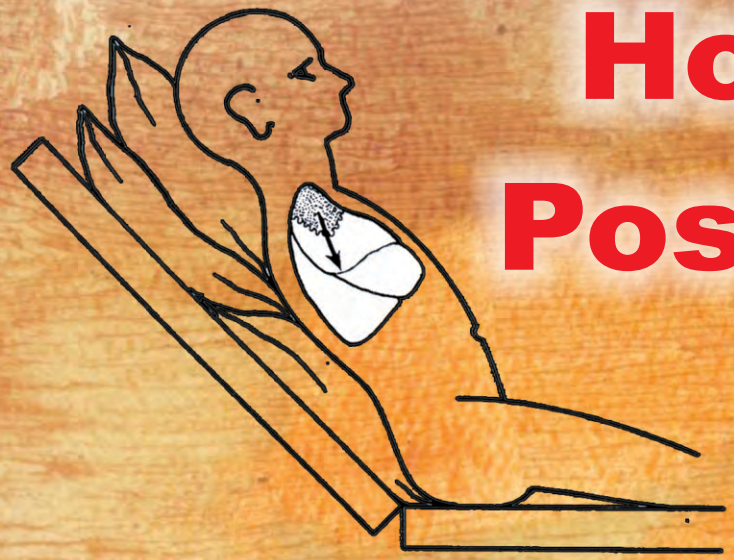
How to Perform Postural Drainage

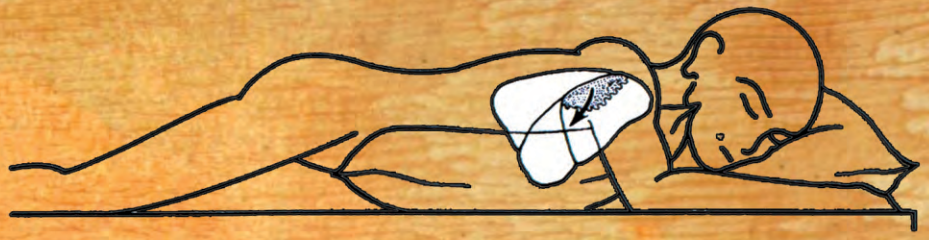




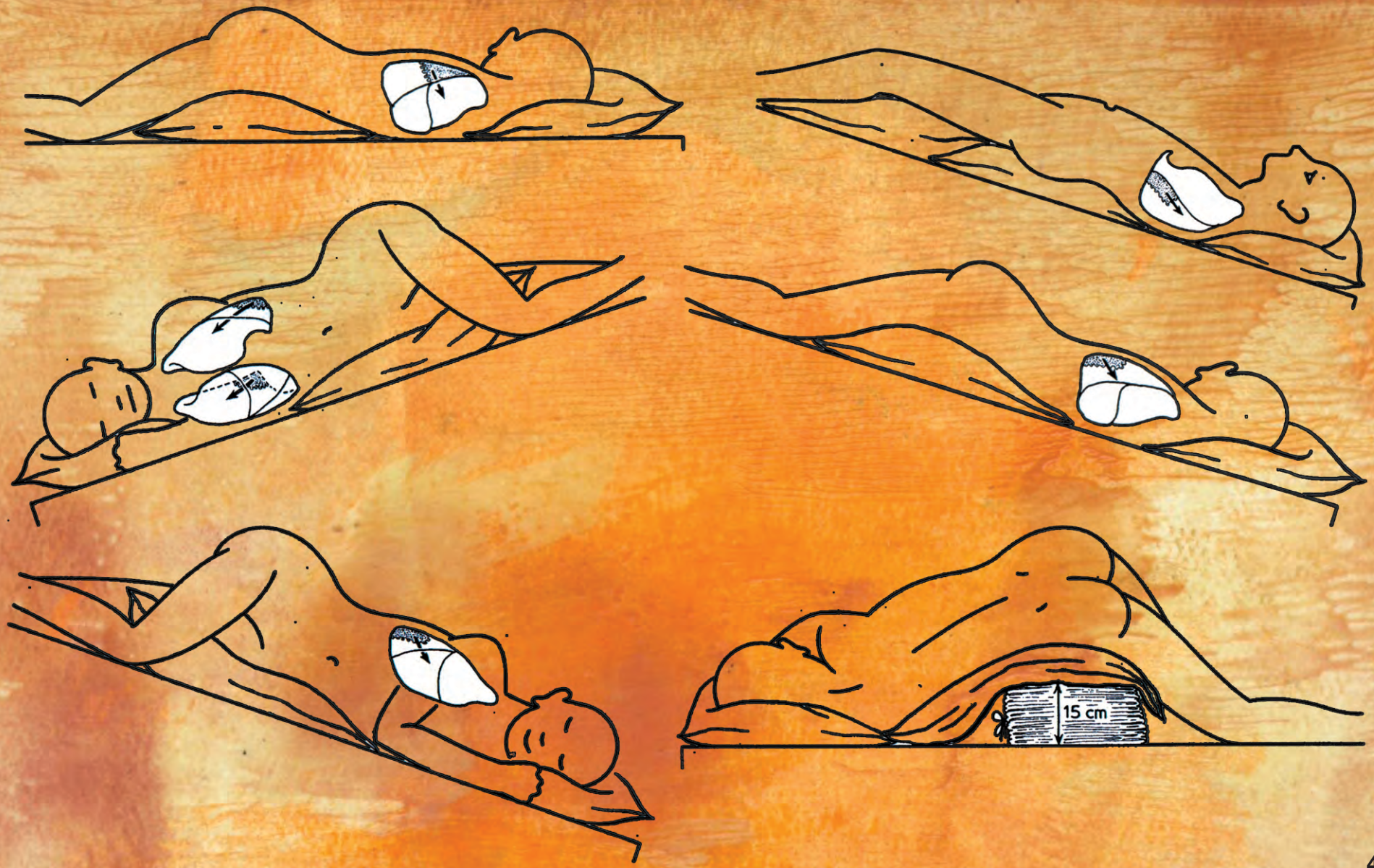


How to Perform Postural Drainage





How to Perform Postural Drainage



Vaccines for Adults

If you have

- COPD
- Bronchiectasis
- Difficult Asthma

or

Chronic Illnesses like

- Diabetis
- Kidney/Liver Disease

Immunization can help you stay healthy

- Pneumoccocal 23 valant
  (single dose; revaccinate in 5 years)
- Seasonal Influenza vaccine*
  (every year)

ASK YOUR DOCTOR FOR DETAILS

*subject to registration & availability.

PAL Initiative Team

- **DR. Palitha Maheepala**
  Additional Secretary of Health (Former DDG-PHS)
- **DR. Ajith Mendis**
  DGHS
- **DR. Sunil De Alwis**
  Director - NPTCCD
- **DR. Amal Harsha De Silva**
  PDHS, Western Province
- **DR. V. T. S. F. Siriwardana**
  RDHS, Colombo
- **DR. Amitha Fernando**
  Consultant Chest Physician, Chest Clinic, Borella.
- **DR. Sudath Samaraweera**
  Consultant Community Physician /NPTCCD
- **DR. Rohitha Dharmasiri**
  DTCO, Chest Clinic, Borella.
- **DR. Ruwani Perera**
  Medical Officer, Chest Clinic, Borella.
- **DR. Thushara Ambagahage**
  Medical Officer/ NPTCCD

Guideline Development Board.

- **DR. Amitha Fernando**
  MBBS (NCMC), MD, FRCP (London)
- **DR. Geethal Perera**
  MBBS, MD; (Colombo)
- **DR. Sudath Samaraweera**
  MBBS (Colombo), MSc, MD (Com.Med); PhD
- **DR. Chandimani Undugodage**
  MBBS, MD; Senior Registrar (Respiratory Medicine)
- **DR. Suntharalingam Rishikesaan**
  MBBS, MD(Colombo)
- **DR. Daminda Domingoarachchi**
  MBBS, MS (Otorhinolaryngology)
- **DR. Sunil De Alwis**
  MD (USSR), Msc. (Com.Med.), PGDEnM (SL), MBA (SL), MD (Med.Ad.,SL)

AND

Numerous doctors and patients
who directly and indirectly helped this concept to bloom