APPENDIX - B

HAND BOOK ON PULMONARY REHABILITATION

READ ME

R – Relaxation
E – Exercise
A – Avoidance
D – Drug & Diet
M – Motivation
E – Enduring

Improving Health related quality of life of patients with COPD
KNOW ABOUT LUNGS AND COPD

LUNGS OF A HEALTHY PERSON

Normal lungs of a person allow the entry of atmospheric air for the supply of oxygen to the cells in the body and to blow off the waste product carbon dioxide.

PARTS AND FUNCTIONS OF RESPIRATORY SYSTEM

- The upper respiratory tract consists of nose, pharynx, larynx and trachea and the lower respiratory tract includes the bronchi, bronchioles, alveolar ducts and alveoli.
- The structure of the chest wall, ribs, pleura, internal and external intercostals muscles and diaphragm are also plays the essential parts in respiration.
- The warm, humidify and filter inspired air to the lungs through the upper and lower airway for the removal of CO₂ and absorption of O₂.

LUNGS OF PATIENTS WITH COPD

But in chronic obstructive pulmonary disease the movement of air in and out of the lungs is affected because of an abnormal inflammatory response of the bronchial tree, increase mucous production and destruction of lung tissue due to smoke or any irritant that leads to inefficient functions of lungs cause breathing difficulty and disability of the person. Comparison of normal airway and abnormal airway of the lungs in COPD is given below.
**Risk factors of COPD:**
The major risk factors of COPD are
1. Exposure to tobacco smoke
2. Passive smoking
3. Occupational exposure
4. Air pollution

**Signs and Symptoms of COPD:**
The main signs and symptoms of COPD are as follows

- Cough and excess sputum production
- Dyspnea on exertion
- Weight loss
- Barrel chest
- Retraction of Supra–clavicular fossae on inspiration causing shoulder to heave upward
- Contraction of abdominal muscles on inspiration.
Pulmonary Rehabilitation

The main aim of pulmonary rehabilitation in chronic obstructive pulmonary disease is to minimize the disability and to maximize the Health Related Quality Of Life (HRQOL) by practicing the various aspects of management plan includes the following

- Relaxation
- Exercise
- Avoidance
- Drug & Diet
- Motivation
- Enduring

RELAXATION TECHNIQUES

Relaxation is the best way to keep away from all worries and tension. Involve yourself to perform some easily practicable relaxation techniques in day-to-day life in order to reduce anxiety or any stressful event.

1. Clearing the Mind:

   Sit comfortably in a calm place with loosen your tight clothing, close your eyes and mentally recite on one peaceful word (Ohm, Jesus or any word as you like) along with slow and deep breathing for about five minutes.

2. Visualization or Imagination:

   Imagine that you are lying on a warm sand bed in a beach, hear the sound of the waves lashing on the sand, feel the coolness of the breeze from the air and see the sail boats on the water. Enjoy this imaginary situation for a period of about five minutes.

3. Meditation

   Sit comfortably with back straight, haze at an imaginary spot on the wall in front of you and concentrate all your attention for five to ten minutes. After this you will feel much better and relax.
REST, ACTIVITY AND SLEEP

Balanced rest, activity and sleep are essential for any individual in daily life. The following are few tips to achieve proper rest, activity and sleep

1. Plan adequate period of rest between activities to conserve energy.
2. Perform physical activities during the day and passive non-stimulating activities in the evening.
3. Avoid stimulants such as caffeine, cola, tea, alcohol etc.
4. Recliner chair or backrest to provide comfort, and to prevent dyspnea (if present).
5. Maintain a consistent and regular bedtime routine.

EXERCISES

What is exercise?
Any physical activity can be a form of an exercise. This includes on-structured exercises like cycling, gardening or walking and the structured exercises like timed walking (or) progressive walking, jogging, weight lifting etc.

The pursed lip and diaphragmatic breathing exercises are much helpful in controlling the respiratory rate, pattern and functions of the respiratory muscles.

Walking is helpful because many of the muscles in your body will be exercised, improve the daily activities and to promote breathing.

AVOIDANCE OF RISK FACTORS

Avoidance of risk factors like exposure to smoke, tobacco, air pollution and occupational pollutants such as cotton, leather and chemical fumes are essential to minimize the occurrence of breathing difficulties.
Avoidance of risk factors

- Plan your sexual activity during the part of the day when you can breathe easily.
- Have your inhaled bronco-dilator and oxygen administration if necessary before 10 minutes of sexual activity.
- Select comfortable sexual positioning such as side lying, recline, sitting rather than the dominant position.
- Avoid sexual activity immediately after meal or any strenuous activity.

DRUGS MANAGEMENT

Acceptance of modified Sexual Pattern.
The tips to overcome the breathing difficulty during sexual activity are

- Plan your sexual activity during the part of the day when you can breathe easily.

Use inhaler and the medicine as per the physician’s prescription only.
**DIETARY MANAGEMENT:**

The well balanced diet with high protein, low carbohydrate and low fat diet is essential for you to maintain the body weight, to conserve energy, to prevent dyspnea and for improving the activities of daily living and quality of life.

**DIET**

Dietary guideline (or) tips to be followed are

1. Rest for 30 minutes before each meal in order to minimize dyspnea and to conserve energy.
2. Plan small, frequent meals (3 meals and 3 snacks)
3. Eat soft and easily chewable food to avoid bloating and early satiety in order to relieve pressure and discomfort on diaphragm.
4. Drink at least 8 cups (3 liters/day) of caffeine free fluid unless your doctor contradicts or any restriction.
5. Avoid gas forming vegetables and limit-carbonated beverages if prone to gas.
6. Eat a variety of foods to ensure that you are getting adequate vitamins and minerals.
7. Avoid lying down immediately after a meal (if necessary to have a nap – only after an hour of a meal).
8. Perform exercises (breathing and / or physical) one-hour prior or at least two hours after meal.

**MAINTENANCE OF DESIRABLE BODY WEIGHT**

Maintenance of desirable body weight is much more essential to minimize the breathing difficulty and to maximize the activities of daily living.

**Being over weight** is an associated problem with chronic bronchitis and increases the workload on your heart and lungs to supply adequate oxygen to all cells of the body.

**Being under weight** is an associated problem with emphysema. Weight loss is because of the increased work and cost of breathing, intestinal mal absorption, inability to utilize nutrients and the inadequate dietary intake.

**SPECIFIC NUTRITIONAL NEEDS OF PERSON WITH COPD**

Well balanced and a variety of foods are needed to ensure you to acquire an adequate calories, protein, fat, vitamins and minerals. The specific nutrition like protein, calcium & potassium and its importance are given as below

* **Protein:**
  - Adequate protein is required for repairing and building tissues.
  - Building new immune factors to fight against respiratory infection.
  - Generally, six ounces of protein per day and 250 ml of milk provide an adequate amount of high biological value protein.
* Calcium:
  - Especially important for women and for individual who are on steroid medication.
  - Build bones and helps to regulate blood pressure.
  - Can be obtained from diary products supplements.

* Potassium:
  - Important for controlling blood pressure, muscle contraction and nerve impulse transmission.
  - Found in fruits particularly citrus fruits (orange, guava) and banana vegetables, diary products and meat.
  - Susceptible to depletion as a result of certain diuretic medications.

**IMPACT OF NUTRITION ON IMMUNIZATION IN COPD**

You are more prone for often developing respiratory infection. The body’s cells that fight infection are made up of protein. So you have to acquire your daily calorie need from the following categories of food source to maximize your activities and improve the immunity.

<table>
<thead>
<tr>
<th>Protein</th>
<th>Fat</th>
<th>Carbohydrate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maintenance therapy</strong>&lt;br&gt;1.2 to 1.5gm/ kg / day</td>
<td>20 to 30% of total calories from fat is required both for Maintenance and Repletion therapy.</td>
<td>35 to 50% of total calories from Carbohydrate is required both for Maintenance and Repletion therapy.</td>
</tr>
<tr>
<td><strong>Repletional therapy</strong>&lt;br&gt;2 gm / kg /day</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Liberally allowed - Foods
- High protein like Milk, egg & cereals.
- Salt restricted diet
- Fish –with sauce
- Lean meat
- Consume lots of vegetables (boiled) and fresh fruits to avoid constipation

Minimally allowed - Foods
- Fat and cholesterol rich foods like- Organ meats, Kidney, brain & liver Beef, pork & Chicken skin.
- Whole milk, condensed milk
- Egg yolk
- Cream, butter, cheese
- Coconut oil, palm oil, ghee
- Coconut and other nuts
- Chocolates, toffees
- Ice creams
- Salt rich food – pickle, pappadam, tinned foods.
- Very spicy ,greasy and hot foods.
- Iced drinks & frozen foods.
MOTIVATION
Self-motivation is essential for the maintenance of healthy behavior like quite smoking and positive thinking to live a peaceful and happy life.

a) Quit smoking:
Tobacco smoke contains over 4000 poisons and chemical including nicotine, carbon monoxide and tar. The direct effects of cigarette smoking on the respiratory tract are
- Increases the production of mucus
- Reduces the ciliary’s activity
- Produces abnormal dilatation of the airway and the destruction of alveolar walls.

How to quit smoking?
The tips to quit smoking are

- First decide positively that you want to quit.
- Be confident about your ability to stop.
- Fix a time frame to quit smoking.
- Limit places and circumstances where you smoke.
- Keep smoke diary. Write down the occasion of every cigarette you smoke. Review the information daily, reduce the number of cigarettes daily and gradually quit smoking

b) Positive thinking:
There is no substitute for positive thinking. When you develop the habit of positive thinking you will gain confidence to face many challenges of the world and thereby you are able to cope with stress as a positive challenge. Besides a positive frame of mind start living healthy and peaceful life.

ENDURING
Enduring is an execution (or) implementation of the above learned activities (relaxation, exercises, adaptation, drug and diet management, maintenance of healthy behavior and motivation) as a regular habit in day-to-day practice will be helpful to improve the health related Quality Of Life (QOL), to reduce disability and also to promote life expectancy.
APPENDIX - C

Instructional Manual on
Breathing and Physical Exercises

Improving Health related quality of life of patients with COPD
EXERCISE PROGRAM

Exercise training is the foundation of pulmonary rehabilitation and it is widely recognized as a potential means of improving physical endurance. Whatever exercise you start practicing, try to keep as a regular habit to gain several benefits.

What is an exercise?

Any physical activity is a form of an exercise. This includes non-structured exercise like cycling, working in the garden or walking. The structured exercises include jogging, aerobic exercises etc.

What are the benefits of exercises?

The benefits of regular exercises are

➢ Many muscles in your body have been exercised (especially the respiratory muscles and the heart).
➢ Muscle fibers grow shorter and needs less oxygen.
➢ Walking helps in stimulating deep breathing.
➢ Improve the circulation and also helps blood return to the heart.
➢ Promote relaxation, digestion and sleep.
➢ Maintenance of ideal body weight
➢ Keep blood pressure and cholesterol under control to minimize the risk of heart attack.

EXERCISE PROGRAM

An exercise program consists of breathing exercises for at least 15 minutes a day, physical exercises (upper or lower extremities) 15 to 30 minutes a day for a period of eight weeks will provide a long-term benefits of improving your lung function and quality of life.

What sorts of exercises are good for you?

The beneficial breathing exercises for you are Diaphragmatic with Pursed lip, Blowing Out Bubbles through water using straw and Blowing a Balloon. The Physical exercises that include the Upper and Lower extremities exercises.
GENERAL INSTRUCTIONS:

The general instructions to be followed for during breathing exercises are

1. Breathing exercises reduce dyspnea and increase the respiratory muscles strength.

2. Diaphragmatic with pursed lip breathing, Blowing out Bubbles through water and Blowing a Balloon exercises are the important breathing exercises for patients with chronic obstructive pulmonary diseases.

3. Breathing exercises are to be practiced at least 15 minutes a day.

4. Appropriate timings for breathing exercises is 60 minutes before meal or 2 hours after meal.

5. During breathing exercises a loose fit cotton dress should be worn

6. Diaphragmatic breathing Pursed lip breathing exercises may be performed in sitting or lying positions.

7. Open space or well- ventilated and calm place is essential for practicing breathing exercises.

8. The nasal secretion should be removed before and after breathing exercises.

9. Breaths slowly and rhythmically to exhale slowly by prolonging exhalation time and empty the lungs completely.

10. Inhale only through the nose to filter, humidify and warm the air before it enters the lungs.

BREATHING EXERCISES

Breathing exercises are helpful in controlling the respiratory rate and pattern. It also attempts to decrease the work of breathing and promote the function of the respiratory muscles. The breathing exercises are

a. Diaphragmatic with Pursed lip

b. Blowing Out Bubbles through water using straw and

c. Blowing a Balloon
a. Diaphragmatic with pursed lip breathing

Diaphragmatic breathing (DB) with Pursed lip breathing are designed to increase the use of the diaphragm during inspiration and prolonging the exhalation time. The diaphragm is the major muscle of respiration. Diaphragmatic (abdominal) breathing helps to achieve maximum inhalation, reducing the respiratory rate, controlling and lessening the discomfort associated with breathlessness.

Procedure

Place one hand on the abdomen (just below the ribs) and other hand on the middle of the chest to increase the awareness of the diaphragm and its function in breathing. Diaphragmatic breathing exercise can be performed in sitting, lying position, or waking.

Breaths in slowly and deeply through the nose, letting the abdomen protrude as far as possible. This can also be practiced while walking. Inhale while walking two steps and exhale through pursed lips while walking next four or five steps.
b. Blowing Out Bubbles through water

c. Blowing a Balloon

Blowing Out Bubbles through water and Blowing a Balloon is helpful to improve the strength of the respiratory muscles and also offer tolerable resistance.

PHYSICAL EXERCISES

The physical exercises includes

- Upper extremity exercises
- Lower extremity exercises

UPPER EXTREMITY EXERCISES

The upper extremity exercise trainings are much more important to improve arms function since many activities of daily living involve the use of the arms. The easily practicable upper extremity exercises are

A. Wall hand climbing
B. Rope turning
C. Rod lifting
D. Pulley tugging.
A. Wall hand climbing

Stand facing the wall, with the toes as close as to the wall and as much as possible feet apart. With elbows somewhat bent, place the palms on the wall at shoulder level. By flexing the fingers, work hands up the wall until arms are fully extended. Work hands down to starting point.

B. Rope turning

Stand facing the door. Take free end of light rope in the right hand and place left hand on hip. With arm extended and held away from the body nearly parallel with the floor turn rope as wide swings as possible. Do it slow at first then speed up later. Then place right arm at the hip and turn the rope in the opposite direction, do it slow at first then speed up later.
C. Rod-Raising

Grasp rod with both hands, held about 2 feet apart. With arms straight, raise rod over the head. Bend elbows lowering rod behind head. Reverse maneuver, raising rod above the head, then to starting position.

D. Pulley tugging

Toss rope over shower curtain rod or doorway curtain rod. Stand as nearly under rope as possible. Grasp an end in each hand. Extend arms straight and away from body. Pull left arm up by tugging down with right arm, then right arm up and left down like a seesaw.
LOWER EXTREMITY EXERCISE:

The lower extremity exercise program can be an easily practicable ground based walking.

Ideal environment and walking guidelines:

- Do not exercise in hot/humid/cold weather.
- Avoid exercise soon after meals. Wait for at least two hours after a meal. Do not eat at least 20 minutes following an exercise session.
- Start with your warm up session like stretching or slow walking for 3-5 minutes, followed by brisk walking for at least 15-30 minutes then cool down gradually by walking slowly at end of 3-5 minutes.
- Use proper posture while walking.
- Swing your arms rhythmically and loosely like pendulums.
- Start walking on the level and as you become conditioned, walk upgrades.
- Walking should be regular (at least 3 days per week)

Rating of Perceived Exertion (RPE)

The RPE is a self-assessment scale used by you to determine how hard you are exercising. This scale rates symptoms of breathlessness and fatigue during any exercise program. A rating of 6 would be comparable to getting up in the morning. A rating 20 would be comparable to performing exercises that cause complete fatigue or point at which you physically collapse. Your goal will be to exercise in the range of
While doing exercise, ask yourself: how hard am I working, we wouldn’t want you working too hard or too easy.

**RPE - self-assessment scale**

- 6 very, very light
- 7
- 8
- 9
- 10
- 11 fairly light
- 12 somewhat hard
- 13
- 14
- 15
- 16
- 17 very hard
- 18
- 19 very, very hard
- 20

**How to determine the maximum heart rate?**

- Maximum heart rate = 220 - Age in years
- 60-70% range of maximum heart rate is your target zone and practice exercises in this range only.

**How to count the pulse / heart rate?**

Checking your own pulse is very important part of the exercise program. To check your pulse, place your three fingers just below the thumb over the wrist. Once you could feel the pulse start counting the number of pulsation you feel during a 6 second period. Add a 0 to that number and you know your heart rate for 1 minute. The heart rate slows quickly after you stop exercising that is why you should count for 6 seconds only.

**Determination of the heart rate for 1 minute**

If your pulse is regular

1. Count your pulse for 6 seconds.
2. Multiply by 10 to get your pulse for 1 minute
**Determination of the heart rate for 1 minute**

<table>
<thead>
<tr>
<th>Pulse (6-seconds)</th>
<th>Multiply</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>*10</td>
<td>60</td>
</tr>
<tr>
<td>8</td>
<td>*10</td>
<td>80</td>
</tr>
<tr>
<td>10</td>
<td>*10</td>
<td>100</td>
</tr>
<tr>
<td>12</td>
<td>*10</td>
<td>120</td>
</tr>
</tbody>
</table>

If your pulse is not regular,

Count pulse for **15 seconds** and multiply by 4 to get your pulse for 1 minute.

**HOME EXERCISE PROGRAM**

The **Home Exercise Log - on Breathing & Physical exercise (upper & lower extremity)** is given below

- Keep a record of your rating of perceived exertion (RPE) at rest and after exercise.

- Stop exercise if you experience any untoward symptoms. (e.g.) undue shortness of breath, chest pain, weakness or any irregular heart beat (increased or decreased).

- You have to aim for the following duration and frequency of Breathing and Physical exercises (Both Upper and Lower extremities exercises) for the better benefits.

- Try to perform all the 3 - types of breathing exercises (Diaphragmatic with Pursed lip, Blowing Out Bubbles through water using straw and Blowing a Balloon) everyday for a period of 5 minutes for each type and take 2 minutes rest if necessary prior to the next type of breathing exercise. (Preferably all the 3 – types of breathing exercises if not at least minimum 2 –types should be practiced everyday).

- Try to perform all the four types of Upper extremities exercises (Wall hand climbing, Rope turning, Rod lifting and Pulley- tugging) everyday either in the morning or in the evening each type for about 5 minutes.
/ day, altogether for 20 minutes. (Practice all the four type if not at least minimum 3 – types / day)

➢ Begin the Lower extremities exercise (Walking) with 2min. warm up, brisk walking and ends with cool down exercises. The minimum of 15minutes brisk walking for the first 2weeks, 20 minutes for the third and fourth weeks, 25 minutes for fifth and sixth weeks and to aim for the maximum duration of 30 minutes at the beginning of seventh week to till the end of eighth week.

➢ Perform the Upper and Lower extremities exercises at least in an alternative basis (3-days UEE & 3- days LEE ) can be performed as per your ability and preference either in the morning or in the evening.

NOTE: Sunday or any one day in a week can be a holiday (without exercise) if you feel or require.
APPENDIX – D

DEMOGRAPHIC PROFILE

1. NAME OF THE PATIENT :

2. ADDRESS :

3. PHONE NUMBER :

4. AGE :

5. SEX : Male Female

6. MARITAL STATUS : Married Unmarried Widow / widower/divorced

7. EDUCATION :
   a. Non literate
   b. Primary School education (I to V std)
   c. Secondary School education (VI to X std)
   d. Higher secondary
   e. Graduate and above

8. OCCUPATION :
   a. Agriculture
   b. Factory worker
   c. Office worker
   d. Casual Labour
   e. House Wife
   f. Others (Specify)
7. INCOME (Rs. Per Month):

8. DOMICILE:  

<table>
<thead>
<tr>
<th>City</th>
<th>Town</th>
<th>Village</th>
</tr>
</thead>
</table>

9. EXPOSURE TO POLLUTANTS:

<table>
<thead>
<tr>
<th>EXPOSURE TO POLLUTANT</th>
<th>&lt; 2 years</th>
<th>2 – 4 years</th>
<th>&gt; 4 – 6 years</th>
<th>&gt; 6 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoke</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemicals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. DURATION OF RESPIRATORY ILLNESS:

a. Less than 6 months
b. > 6 months – 1- year
c. >1 year -- 2- years
d. >2 years -- 5- years

12. NUMBER OF HOSPITALISATION OR PHYSICIAN VISIT IN LAST 6 MONTHS:

a. < 2 times
b. 3 – 4 times
c. >4 - times

13. FOOD HABITS:

<table>
<thead>
<tr>
<th>Vegetarian</th>
<th>Non - Vegetarian</th>
</tr>
</thead>
</table>

14. FOOD PREFERENCE:

a. Carbohydrate(More / Average / Less)
b. Protein (More / Average/ Less)c. Fat (More / Average/ Less)

Date:  
Signature
APPENDIX - E

CLINICAL MEASUREMENTS

NAME OF THE PATIENT :                ID No. :

1. AGE    :   Years

2. SEX     :   M / F

3. HEIGHT     :   Cm

4. WEIGHT                     :      Kg

VITAL SIGNS

5. Pulse rate   :   / min

6. Respiratory rate   :   / min

7. Chest measurement

   Inspiration :   cm
   Expiration :   cm
   Difference :   cm

Date:                                               Signature
# PULMONARY FUNCTIONAL MEASUREMENTS

Name of the Patient : 

Age : Years ID No. : 

Sex : M / F 

Height : cm 

<table>
<thead>
<tr>
<th>S. No</th>
<th>Measures</th>
<th>Predicted Normal Value</th>
<th>Pre Test</th>
<th>Post Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Absolute</td>
<td>%Predicted</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Absolute</td>
</tr>
</tbody>
</table>

1. FVC (L) 
2. FEV₁ (L) 
3. FEV₁ / FVC (%) 
4. PEFR (L/S) 
5. MVV (L/min) 

Date of Measurement : Pre : post :

Remarks :

Signature
SIX MINUTES WALKING DISTANCE MEASUREMENTS

1. NAME OF THE PATIENT : ID No. :

2. AGE : Years

3. SEX : M / F

4. SIX MINUTES WALKING DISTANCE:

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Test</th>
<th>Date of Measurement</th>
<th>6MWD (Meters)</th>
<th>Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remarks:
APPENDIX – F

HEALTH RELATED QUALITY OF LIFE
QUESTIONNAIRE FOR PATIENTS WITH COPD

Please describe how often your lung/respiratory problems have affected you over the last one month.

I. BREATHING STATUS

<table>
<thead>
<tr>
<th>S.No</th>
<th>PARTICULARS</th>
<th>22 – 30 days</th>
<th>15 -21 days</th>
<th>8 –14 days</th>
<th>1 –7 days</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(score) 0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Cough</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Sputum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Difficulty in breathing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Wheezing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>During the last one month how many episodes of severe shortness of breath have you had ?</td>
<td>More than 3 episodes</td>
<td>0</td>
<td>3 episodes</td>
<td>1</td>
<td>2 episodes</td>
</tr>
<tr>
<td>6.</td>
<td>Over the last one month how many good days (with few respiratory problems) have you had ?</td>
<td>0 days</td>
<td>0</td>
<td>1 – 7 days/month</td>
<td>1</td>
<td>8 – 14 days/month</td>
</tr>
<tr>
<td>7.</td>
<td>When will you have the feeling of shortness of breath (SOB) in comparison with the person of your same age, height and sex ?</td>
<td>Dyspnea at rest</td>
<td>0</td>
<td>Personal activities (dressing, bathing etc )</td>
<td>1</td>
<td>Ground level walking</td>
</tr>
</tbody>
</table>
## II. PHYSICAL ACTIVITIES

<table>
<thead>
<tr>
<th>S.NO</th>
<th>PARTICULARS</th>
<th>22 – 30 days (score) 0</th>
<th>15 -21 days</th>
<th>8 –14 days</th>
<th>1 –7 days</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Sitting or lying still</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Bathing yourself (or) dressing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Walking in the house/level ground</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Walking up a flight of stairs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Bending</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Exercise</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>7.</td>
<td>Eating</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>8.</td>
<td>Sleeping</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>9.</td>
<td>Communication</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>10.</td>
<td>Sexual activity</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Please describe how often your lung/respiratory problems have affected you over the last one month.
### III. SOCIAL AND OTHER ACTIVITIES

<table>
<thead>
<tr>
<th>S.No.</th>
<th>PARTICULARS</th>
<th>22 – 30 days</th>
<th>15-21 days</th>
<th>8–14 days</th>
<th>1–7 days</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Score)0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Visiting friends or relatives</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Going to worship or religious place</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Shopping</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4.</td>
<td>Entertainment or Recreation</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5.</td>
<td>Difficulty to go for job</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### IV. EMOTIONAL STATUS

<table>
<thead>
<tr>
<th>S.No.</th>
<th>PARTICULARS</th>
<th>22 – 30 days</th>
<th>15-21 days</th>
<th>8–14 days</th>
<th>1–7 days</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Score)0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Feeling of dependency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Nuisance to family members, friends or neighbour</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Worried</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Fear</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Embarrassed due to breathing difficulty and coughing in public place</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Embarrassed to use respiratory medication in public place</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Feeling of invalid</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Loss of self confidence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
HEALTH RELATED QUALITY OF LIFE QUESTIONNAIRE FOR PATIENTS WITH COPD

SCORING

Patient ID No:

Patient Name:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Component</th>
<th>Max. Score</th>
<th>Score</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Breathing Status Score</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Activity Score</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Social Status Score</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Emotion Status Score</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Total HRQOL Score</td>
<td>120</td>
<td></td>
</tr>
</tbody>
</table>

HRQOL Score:

Grade :

Signature :

GRADING

Minimum score = 0
Maximum score = 120

0 – 30 = Very Poor
31 – 45 = Poor
46 – 60 = Fair
61 – 75 = Good
76 – 90 = Very Good
91 – 120 = Excellent.
APPENDIX – G

VALIDATION OF HEALTH RELATED QUALITY OF LIFE QUESTIONNAIRE

LIST OF EXPERTS

1. Prof. Dr. S. Rajasekaran, M.D., DTCD.  
The superintendent, Government Hospital of Thoracic Medicine  
Tambaram, Chennai-600047.

2. Dr. A. Mahilmaran, M.D.  
Assistant Professor, Govt. Hospital of Thoracic Medicine  
Tambaram, Chennai-600047.

3. Dr. O.R. Krishna Rajasekar, M.D  
Assistant Professor, Govt. Hospital of Thoracic Medicine  
Tambaram, Chennai-600047.

4. Dr. B. Hariprasad, M.B.B.S., DNB, DTRD.  
Associate Prof., Department of Pulmonology  
Sri Ramachandra University, Porur, Chennai-600116.

5. Prof. P.V. Ramachandran, M.Sc.(Nursing)  
Chairman, Nursing Education, Sri Ramachandra College of Nursing  
Sri Ramachandra University, Porur, Chennai-600116.

6. Prof. Dr. Rajeswari Vaidyanathan, M.Sc.(Nursing), Ph.D.  
Principal, Sri Ramachandra College of Nursing  
Sri Ramachandra University, Porur, Chennai-600116.

7. Prof. Dr. K. Rajalakshmi, M.Sc.(Nursing), Ph.D. (Research Co-Supervisor)  
Principal, MIOT College of Nursing  
Manapakkam, Chennai – 600089

8. Prof. Dr. B.W.C. Sathiyasekaran. MD., MS. (Advisory Committee Member)  
Head, Dept. of Community Medicine  
Sri Ramachandra University, Porur, Chennai-600116.

9. Prof. Dr. Georgi Abraham M.D., FRCP(London), FRCP(Glasgow)  
(Research Supervisor)  
Department of Medicine  
Sri Ramachandra University, Porur, Chennai-600116.
To
Mrs. Kanniammal
Assistant Professor
College of Nursing
SRMC & RI (DU)

Sub: “Effect of Multi Dimensional Pulmonary Rehabilitation on Patients with Chronic Obstructive Pulmonary Diseases”.

The Medical ethics committee has No Objection for the study being carried out at SRMC & RI (DU). You are advised to be familiar with ICMR guidelines on Biomedical Research in human beings and also to adhere to the Principles of good clinical practice. You are required to submit the final report on the completion of study and any case of adverse reaction should be informed to the Medical Ethics Committee and action taken thereafter.

Wish you all the best.

Yours Sincerely,

(PROF. M.B. RAGHU)
Kilpauk, Chennai-600 010.


Sub:- Research - Tmt. C. Kanniammal, Reader in Nursing, Sri Ramachandra Medical College and Research Institute, Chennai-116 - Request for permission to avail the Research facility at Government Hospital of Thoracic Medicine, Chennai-47 - Permission issued.


2. The Superintendent, Govt. Hospital of Thoracic Medicine, Tambaram, Chennai-47 - Ref. RC 8325/G/05, dt. 17-10-0

---

Necessary permission is hereby accorded to Tmt. C. Kanniammal, Reader in Nursing, Sri Ramachandra Medical College and Research Institute, Chennai to avail Research facility to Government Hospital of Thoracic Medicine, Tambaram, Chennai-47 for her Research Study (Ph.D.) on "Effectiveness of Multi Dimensional Pulmonary Rehabilitation of patients with COPD".

In this connection, the Superintendent is requested to collect a sum of Rs. 5,000/- for every 6 months from the above candidate.

\[Signature\]

for Director of Medical Educat:

To

The Superintendent,
Govt. Hospital of Thoracic Medicine,
Chennai-47.

Copy to Tmt. C. Kanniammal,
Reader in Nursing,
Sri Ramachandra Medical College and Research Institute,
Chennai-116.
Ref.No.8325/G1/05
Office of the Superintendent,
Govt. Hospital of Thoracic Medicine,
Tambaram Sanatorium, Chennai 600 047.
Dt. 5th July 07.2006.

CERTIFICATE

This is to certify that Tmt. C. Kanniammal, Reader in College of Nursing,
Sri Ramachandra Medical College and Research Institute, (DU) Porur, Chennai – 116 has
Conducted Research study (Ph.D) on ‘Pulmonary rehabilitations of patients with COPD’ by
availing the facilities available in this hospital during the period from 15.12.2005 to
15.06.2006 successfully.

To
Tmt. C. Kanniammal, M.Sc. (Nursing),
Reader in College of Nursing,
Sri Ramachandra Medical College and
Research Institute (DU),
APPENDIX - B

HAND BOOK ON PULMONARY REHABILITATION

READ ME

R – Relaxation
E – Exercise
A – Avoidance
D – Drug & Diet
M – Motivation
E – Enduring

Improving Health related quality of life of patients with COPD
KNOW ABOUT LUNGS AND COPD

LUNGS OF A HEALTHY PERSON

Normal lungs of a person allow the entry of atmospheric air for the supply of oxygen to the cells in the body and to blow off the waste product carbon dioxide.

PARTS AND FUNCTIONS OF RESPIRATORY SYSTEM

- The upper respiratory tract consists of nose, pharynx, larynx and trachea and the lower respiratory tract includes the bronchi, bronchioles, alveolar ducts and alveoli.
- The structure of the chest wall, ribs, pleura, internal and external intercostals muscles and diaphragm are also plays the essential parts in respiration.
- The warm, humidify and filter inspired air to the lungs through the upper and lower airway for the removal of CO$_2$ and absorption of O$_2$.

LUNGS OF PATIENTS WITH COPD

But in chronic obstructive pulmonary disease the movement of air in and out of the lungs is affected because of an abnormal inflammatory response of the bronchial tree, increase mucous production and destruction of lung tissue due to smoke or any irritant that leads to inefficient functions of lungs cause breathing difficulty and disability of the person. Comparison of normal airway and abnormal airway of the lungs in COPD is given below
Risk factors of COPD:
The major risk factors of COPD are
1. Exposure to tobacco smoke
2. Passive smoking
3. Occupational exposure
4. Air pollution

Signs and Symptoms of COPD:
The main signs and symptoms of COPD are as follows

- Cough and excess sputum production
- Dyspnea on exertion
- Weight loss
- Barrel chest
- Retraction of Supra-clavicular fossae on inspiration causing shoulder to heave upward
- Contraction of abdominal muscles on inspiration.
Pulmonary Rehabilitation

The main aim of pulmonary rehabilitation in chronic obstructive pulmonary disease is to minimize the disability and to maximize the Health Related Quality Of Life (HRQOL) by practicing the various aspects of management plan includes the following:

- Relaxation
- Exercise
- Avoidance
- Drug & Diet
- Motivation
- Enduring

RELAXATION TECHNIQUES

Relaxation is the best way to keep away from all worries and tension. Involve yourself to perform some easily practicable relaxation techniques in day-to-day life in order to reduce anxiety or any stressful event.

1. Clearing the Mind:
   - Sit comfortably in a calm place with loosen your tight clothing, close your eyes and mentally recite on one peaceful word (Ohm, Jesus or any word as you like) along with slow and deep breathing for about five minutes.

2. Visualization or Imagination:
   - Imagine that you are lying on a warm sand bed in a beach, hear the sound of the waves lashing on the sand, feel the coolness of the breeze from the air and see the sail boats on the water. Enjoy this imaginary situation for a period of about five minutes.

3. Meditation
   - Sit comfortably with back straight, haze at an imaginary spot on the wall in front of you and concentrate all your attention for five to ten minutes. After this you will feel much better and relax.
REST, ACTIVITY AND SLEEP

Balanced rest, activity and sleep are essential for any individual in daily life. The following are few tips to achieve proper rest, activity and sleep.

1. Plan adequate period of rest between activities to conserve energy.
2. Perform physical activities during the day and passive non-stimulating activities in the evening.
3. Avoid stimulants such as caffeine, cola, tea, alcohol etc.
4. Recliner chair or backrest to provide comfort, and to prevent dyspnea (if present).
5. Maintain a consistent and regular bedtime routine.

EXERCISES

What is exercise?

Any physical activity can be a form of an exercise. This includes on-structured exercises like cycling, gardening or walking and the structured exercises like timed walking (or) progressive walking, jogging, weight lifting etc.

The pursed lip and diaphragmatic breathing exercises are much helpful in controlling the respiratory rate, pattern and functions of the respiratory muscles.

Walking is helpful because many of the muscles in your body will be exercised, improve the daily activities and to promote breathing.

AVOIDANCE OF RISK FACTORS

Avoidance of risk factors like exposure to smoke, tobacco, air pollution and occupational pollutants such as cotton, leather and chemical fumes are essential to minimize the occurrence of breathing difficulties.
Avoidance of risk factors

- Plan your sexual activity during the part of the day when you can breathe easily.
- Have your inhaled bronco-dilator and oxygen administration if necessary before 10 minutes of sexual activity.
- Select comfortable sexual positioning such as side lying, recline, sitting rather than the dominant position.
- Avoid sexual activity immediately after meal or any strenuous activity.

DRUGS MANAGEMENT

Acceptance of modified Sexual Pattern.
The tips to overcome the breathing difficulty during sexual activity are
- Plan your sexual activity during the part of the day when you can breath easily.

Use inhaler and the medicine as per the physician’s prescription only.
DIETARY MANAGEMENT:

The well balanced diet with high protein, low carbohydrate and low fat diet is essential for you to maintain the body weight, to conserve energy, to prevent dyspnea and for improving the activities of daily living and quality of life.

Dietary guideline (or) tips to be followed are

1. Rest for 30 minutes before each meal in order to minimize dyspnea and to conserve energy.
2. Plan small, frequent meals (3 meals and 3 snacks)
3. Eat soft and easily chewable food to avoid bloating and early satiety in order to relieve pressure and discomfort on diaphragm.
4. Drink at least 8 cups (3 liters/day) of caffeine free fluid unless your doctor contradicts or any restriction.
5. Avoid gas forming vegetables and limit-carbonated beverages if prone to gas.
6. Eat a variety of foods to ensure that you are getting adequate vitamins and minerals.
7. Avoid lying down immediately after a meal (if necessary to have a nap – only after an hour of a meal).
8. Perform exercises (breathing and / or physical) one-hour prior or at least two hours after meal.

MAINTENANCE OF DESIRABLE BODY WEIGHT

Maintenance of desirable body weight is much more essential to minimize the breathing difficulty and to maximize the activities of daily living.

Being over weight is an associated problem with chronic bronchitis and increases the workload on your heart and lungs to supply adequate oxygen to all cells of the body.

Being under weight is an associated problem with emphysema. Weight loss is because of the increased work and cost of breathing, intestinal mal absorption, inability to utilize nutrients and the inadequate dietary intake.

SPECIFIC NUTRITIONAL NEEDS OF PERSON WITH COPD

Well balanced and a variety of foods are needed to ensure you to acquire an adequate calories, protein, fat, vitamins and minerals. The specific nutrition like protein, calcium & potassium and its importance are given as below

* Protein:
  - Adequate protein is required for repairing and building tissues.
  - Building new immune factors to fight against respiratory infection.
  - Generally, six ounces of protein per day and 250 ml of milk provide an adequate amount of high biological value protein.
**Calcium:**
- Especially important for women and for individual who are on steroid medication.
- Build bones and helps to regulate blood pressure.
- Can be obtained from dairy products supplements.

**Potassium:**
- Important for controlling blood pressure, muscle contraction and nerve impulse transmission.
- Found in fruits particularly citrus fruits (orange, guava) and banana vegetables, diary products and meat.
- Susceptible to depletion as a result of certain diuretic medications.

**IMPACT OF NUTRITION ON IMMUNIZATION IN COPD**

You are more prone for often developing respiratory infection. The body’s cells that fight infection are made up of protein. So you have to acquire your daily calorie need from the following categories of food source to maximize your activities and improve the immunity.

<table>
<thead>
<tr>
<th>Protein</th>
<th>Fat</th>
<th>Carbohydrate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maintenance therapy</strong> 1.2 to 1.5gm/ kg / day</td>
<td><strong>20 to 30% of total calories from fat is required both for Maintenance and Repletion therapy.</strong></td>
<td><strong>35 to 50% of total calories from Carbohydrate is required both for Maintenance and Repletion therapy.</strong></td>
</tr>
<tr>
<td><strong>Repletional therapy</strong> 2 gm / kg /day</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Liberally allowed - Foods</th>
<th>Minimally allowed - Foods</th>
</tr>
</thead>
<tbody>
<tr>
<td>- High protein like Milk, egg &amp; cereals.</td>
<td>- Fat and cholesterol rich foods like- Organ meats, Kidney, brain &amp; liver Beef, pork &amp; Chicken skin.</td>
</tr>
<tr>
<td>- Salt restricted diet</td>
<td>- Whole milk, condensed milk</td>
</tr>
<tr>
<td>- Fish –with sauce</td>
<td>- Egg yolk</td>
</tr>
<tr>
<td>- Lean meat</td>
<td>- Cream, butter, cheese</td>
</tr>
<tr>
<td>- Consume lots of vegetables (boiled) and fresh fruits to avoid constipation</td>
<td>- Coconut oil, palm oil, ghee</td>
</tr>
<tr>
<td></td>
<td>- Coconut and other nuts</td>
</tr>
<tr>
<td></td>
<td>- Chocolates, toffees</td>
</tr>
<tr>
<td></td>
<td>- Ice creams</td>
</tr>
<tr>
<td></td>
<td>- Salt rich food – pickle, pappadam, tinned foods.</td>
</tr>
<tr>
<td></td>
<td>- Very spicy ,greasy and hot foods.</td>
</tr>
<tr>
<td></td>
<td>- Iced drinks &amp; frozen foods.</td>
</tr>
</tbody>
</table>
MOTIVATION

Self-motivation is essential for the maintenance of healthy behavior like quite smoking and positive thinking to live a peaceful and happy life.

a) Quit smoking:
Tobacco smoke contains over 4000 poisons and chemical including nicotine, carbon monoxide and tar. The direct effects of cigarette smoking on the respiratory tract are
- Increases the production of mucus
- Reduces the ciliary’s activity
- Produces abnormal dilatation of the airway and the destruction of alveolar walls.

How to quit smoking?
The tips to quit smoking are

- First decide positively that you want to quit.
- Be confident about your ability to stop.
- Fix a time frame to quit smoking.
- Limit places and circumstances where you smoke.
- Keep smoke diary. Write down the occasion of every cigarette you smoke. Review the information daily, reduce the number of cigarettes daily and gradually quit smoking.

b) Positive thinking:
There is no substitute for positive thinking. When you develop the habit of positive thinking you will gain confidence to face many challenges of the world and thereby you are able to cope with stress as a positive challenge. Besides a positive frame of mind start living healthy and peaceful life.

ENDURING

Enduring is an execution (or) implementation of the above learned activities (relaxation, exercises, adaptation, drug and diet management, maintenance of healthy behavior and motivation) as a regular habit in day-to-day practice will be helpful to improve the health related Quality Of Life (QOL), to reduce disability and also to promote life expectancy.
APPENDIX - C

Instructional Manual on
Breathing and Physical Exercises

Improving Health related quality of life of patients with COPD
**EXERCISE PROGRAM**

Exercise training is the foundation of pulmonary rehabilitation and it is widely recognized as a potential means of improving physical endurance. Whatever exercise you start practicing, try to keep as a regular habit to gain several benefits.

**What is an exercise?**

Any physical activity is a form of an exercise. This includes non-structured exercise like cycling, working in the garden or walking. The structured exercises include jogging, aerobic exercises etc.

**What are the benefits of exercises?**

The benefits of regular exercises are

- Many muscles in your body have been exercised (especially the respiratory muscles and the heart).
- Muscle fibers grow shorter and needs less oxygen.
- Walking helps in stimulating deep breathing.
- Improve the circulation and also helps blood return to the heart.
- Promote relaxation, digestion and sleep.
- Maintenance of ideal body weight
- Keep blood pressure and cholesterol under control to minimize the risk of heart attack.

**EXERCISE PROGRAM**

An exercise program consists of breathing exercises for at least 15 minutes a day, physical exercises (upper or lower extremities) 15 to 30 minutes a day for a period of eight weeks will provide a long-term benefits of improving your lung function and quality of life.

**What sorts of exercises are good for you?**

The beneficial breathing exercises for you are Diaphragmatic with Pursed lip, Blowing Out Bubbles through water using straw and Blowing a Balloon. The Physical exercises that include the Upper and Lower extremities exercises.
GENERAL INSTRUCTIONS:

The general instructions to be followed for during breathing exercises are

1. Breathing exercises reduce dyspnea and increase the respiratory muscles strength.

2. Diaphragmatic with pursed lip breathing, Blowing out Bubbles through water and Blowing a Balloon exercises are the important breathing exercises for patients with chronic obstructive pulmonary diseases.

3. Breathing exercises are to be practiced at least 15 minutes a day.

4. Appropriate timings for breathing exercises is 60 minutes before meal or 2 hours after meal.

5. During breathing exercises a loose fit cotton dress should be worn

6. Diaphragmatic breathing Pursed lip breathing exercises may be performed in sitting or lying positions.

7. Open space or well- ventilated and calm place is essential for practicing breathing exercises.

8. The nasal secretion should be removed before and after breathing exercises.

9. Breaths slowly and rhythmically to exhale slowly by prolonging exhalation time and empty the lungs completely.

10. Inhale only through the nose to filter, humidify and warm the air before it enters the lungs.

BREATHING EXERCISES

Breathing exercises are helpful in controlling the respiratory rate and pattern. It also attempts to decrease the work of breathing and promote the function of the respiratory muscles. The breathing exercises are

a. Diaphragmatic with Pursed lip

b. Blowing Out Bubbles through water using straw and

c. Blowing a Balloon
a. Diaphragmatic with pursed lip breathing

Diaphragmatic breathing (DB) with Pursed lip breathing are designed to increase the use of the diaphragm during inspiration and prolonging the exhalation time. The diaphragm is the major muscle of respiration. Diaphragmatic (abdominal) breathing helps to achieve maximum inhalation, reducing the respiratory rate, controlling and lessening the discomfort associated with breathlessness.

Procedure

Place one hand on the abdomen (just below the ribs) and other hand on the middle of the chest to increase the awareness of the diaphragm and its function in breathing. Diaphragmatic breathing exercise can be performed in sitting, lying position, or waking.

Breaths in slowly and deeply through the nose, letting the abdomen protrude as far as possible. This can also be practiced while walking. Inhale while walking two steps and exhale through pursed lips while walking next four or five steps.
b. Blowing Out Bubbles through water

c. Blowing a Balloon

Blowing Out Bubbles through water and Blowing a Balloon is helpful to improve the strength of the respiratory muscles and also offer tolerable resistance.

PHYSICAL EXERCISES

The physical exercises includes
- Upper extremity exercises
- Lower extremity exercises

UPPER EXTREMITIE EXERCISES

The upper extremity exercise trainings are much more important to improve arms function since many activities of daily living involve the use of the arms. The easily practicable upper extremity exercises are

A. Wall hand climbing
B. Rope turning
C. Rod lifting
D. Pulley tugging.
A. Wall hand climbing

Stand facing the wall, with the toes as close as to the wall and as much as possible feet apart. With elbows somewhat bent, place the palms on the wall at shoulder level. By flexing the fingers, work hands up the wall until arms are fully extended. Work hands down to starting point.

B. Rope turning

Stand facing the door. Take free end of light rope in the right hand and place left hand on hip. With arm extended and held away from the body nearly parallel with the floor turn rope as wide swings as possible. Do it slow at first then speed up later. Then place right arm at the hip and turn the rope in the opposite direction, do it slow at first then speed up later.
C. Rod- Raising

Grasp rod with both hands, held about 2 feet apart. With arms straight, raise rod over the head. Bend elbows lowering rod behind head. Reverse maneuver, raising rod above the head, then to starting position.

D. Pulley tugging

Toss rope over shower curtain rod or doorway curtain rod. Stand as nearly under rope as possible. Grasp an end in each hand. Extend arms straight and away from body. Pull left arm up by tugging down with right arm, then right arm up and left down like a seesaw.
LOWER EXTREMITY EXERCISE:

The lower extremity exercise program can be an easily practicable ground based walking.

Ideal environment and walking guidelines:

- Do not exercise in hot/humid/cold weather.
- Avoid exercise soon after meals. Wait for at least two hours after a meal. Do not eat at least 20 minutes following an exercise session.
- Start with your warm up session like stretching or slow walking for 3-5 minutes, followed by brisk walking for at least 15-30 minutes then cool down gradually by walking slowly at end of 3-5 minutes.
- Use proper posture while walking.
- Swing your arms rhythmically and loosely like pendulums.
- Start walking on the level and as you become conditioned, walk upgrades.
- Walking should be regular (at least 3 days per week)

Rating of Perceived Exertion (RPE)

The RPE is a self-assessment scale used by you to determine how hard you are exercising. This scale rates symptoms of breathlessness and fatigue during any exercise program. A rating of 6 would be comparable to getting up in the morning. A rating 20 would be comparable to performing exercises that cause complete fatigue or point at which you physically collapse. Your goal will be to exercise in the range of
While doing exercise, ask yourself: how hard am I working, we wouldn’t want you working too hard or too easy.

**RPE -self-assessment scale**

- 6
- 7 very, very light
- 8
- 9
- 10
- 11 fairly light
- 12
- 13 somewhat hard
- 14
- 15
- 16
- 17 very hard
- 18
- 19 very, very hard
- 20

**How to determine the maximum heart rate?**

- Maximum heart rate = 220 - Age in years
- 60-70% of maximum heart rate is your target zone and practice exercises in this range only.

**How to count the pulse / heart rate?**

Checking your own pulse is very important part of the exercise program. To check your pulse, place your three fingers just below the thumb over the wrist. Once you could feel the pulse start counting the number of pulsation you feel during a 6 second period. Add a 0 to that number and you know your heart rate for 1 minute. The heart rate slows quickly after you stop exercising that is why you should count for 6 seconds only.

**Determination of the heart rate for 1 minute**

If your pulse is regular

1. Count your pulse for **6 seconds**.
2. **Multiply by 10** to get your pulse for 1 minute
Determination of the heart rate for 1 minute

<table>
<thead>
<tr>
<th>Pulse (6-seconds)</th>
<th>Multiply</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>*10</td>
<td>60</td>
</tr>
<tr>
<td>8</td>
<td>*10</td>
<td>80</td>
</tr>
<tr>
<td>10</td>
<td>*10</td>
<td>100</td>
</tr>
<tr>
<td>12</td>
<td>*10</td>
<td>120</td>
</tr>
</tbody>
</table>

If your pulse is not regular,

Count pulse for **15 seconds** and multiply by 4 to get your pulse for 1 minute.

**HOME EXERCISE PROGRAM**

The Home Exercise Log - on Breathing & Physical exercise (upper & lower extremity) is given below

- Keep a record of your rating of perceived exertion (RPE) at rest and after exercise.
- Stop exercise if you experience any untoward symptoms. (e.g.) undue shortness of breath, chest pain, weakness or any irregular heart beat (increased or decreased).
- You have to aim for the following duration and frequency of Breathing and Physical exercises (Both Upper and Lower extremities exercises) for the better benefits.
- Try to perform all the 3 - types of breathing exercises (Diaphragmatic with Pursed lip, Blowing Out Bubbles through water using straw and Blowing a Balloon) everyday for a period of 5 minutes for each type and take 2 minutes rest if necessary prior to the next type of breathing exercise. (Preferably all the 3 – types of breathing exercises if not at least minimum 2 – types should be practiced everyday).
- Try to perform all the four types of Upper extremities exercises (Wall hand climbing, Rope turning, Rod lifting and Pulley - tugging) everyday either in the morning or in the evening each type for about 5 minutes.
/ day, altogether for 20 minutes. (Practice all the four type if not at least minimum 3 – types / day)

➢ Begin the Lower extremities exercise (Walking) with 2min. warm up, brisk walking and ends with cool down exercises. The minimum of 15minutes brisk walking for the first 2weeks, 20 minutes for the third and fourth weeks, 25 minutes for fifth and sixth weeks and to aim for the maximum duration of 30 minutes at the beginning of seventh week to till the end of eighth week.

➢ Perform the Upper and Lower extremities exercises at least in an alternative basis (3-days UEE & 3- days LEE ) can be performed as per your ability and preference either in the morning or in the evening.

**NOTE:** Sunday or any one day in a week can be a holiday (without exercise) if you feel or require.
APPENDIX - E

CLINICAL MEASUREMENTS

NAME OF THE PATIENT :                ID No. :

1. AGE    : Years
2. SEX     :   M / F
3. HEIGHT     :   Cm
4. WEIGHT                     :      Kg

VITAL SIGNS

5. Pulse rate   :  / min
6. Respiratory rate   : / min

7. Chest measurement
   Inspiration : cm
   Expiration : cm
   Difference : cm

Date:                                Signature
# PULMONARY FUNCTIONAL MEASUREMENTS

Name of the Patient : 

Age : Years ID No. :

Sex : M / F

Height : cm

<table>
<thead>
<tr>
<th>S. No</th>
<th>Measures</th>
<th>Predicted Normal Value</th>
<th>Pre Test</th>
<th>Post Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Absolute</td>
<td>% Predicted</td>
</tr>
<tr>
<td>1.</td>
<td>FVC (L)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>FEV₁ (L)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>FEV₁ / FVC (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>PEFR (L/S)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>MVV (L/min)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Date of Measurement : Pre : post :

Remarks :

Signature
SIX MINUTES WALKING DISTANCE MEASUREMENTS

1. NAME OF THE PATIENT:  
   ID No.: 

2. AGE: Years  

3. SEX: M / F  

4. SIX MINUTES WALKING DISTANCE:

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Test</th>
<th>Date of Measurement</th>
<th>6MWD (Meters)</th>
<th>Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remarks:
APPENDIX – F

HEALTH RELATED QUALITY OF LIFE
QUESTIONNAIRE FOR PATIENTS WITH COPD

Please describe how often your lung/respiratory problems have affected you over the last one month.

I. BREATHING STATUS

<table>
<thead>
<tr>
<th>S.No</th>
<th>PARTICULARS</th>
<th>22 – 30 days</th>
<th>15 -21 days</th>
<th>8 – 14 days</th>
<th>1 –7 days</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(score) 0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Cough</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Sputum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Difficulty in breathing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Wheezing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>During the last one month how many episodes of severe shortness of breath have you had ?</td>
<td>More than 3 episodes</td>
<td>0</td>
<td>3 episodes</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 episodes</td>
<td>3</td>
<td>1 episodes</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 episodes</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No episodes</td>
<td>0</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Over the last one month how many good days (with few respiratory problems) have you had ?</td>
<td>0 days</td>
<td>0</td>
<td>1 – 7 days/month</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8 – 14 days/month</td>
<td>2</td>
<td>15 – 21 days/month</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>22 – 30 days/month</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>When will you have the feeling of shortness of breath (SOB) in comparison with the person of your same age, height and sex ?</td>
<td>Dyspnea at rest</td>
<td>0</td>
<td>Personal activities (dressing, bathing etc )</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ground level walking</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Stair climbing</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Continuous physical work</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Please describe how often your lung/respiratory problems have affected you over the last one month. (Activities that usually make you feel short of breath.)
## II. PHYSICAL ACTIVITIES

<table>
<thead>
<tr>
<th>S.NO</th>
<th>PARTICULARS</th>
<th>22 – 30 days (score) 0</th>
<th>15 -21 days</th>
<th>8 –14 days</th>
<th>1 –7 days</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Sitting or lying still</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>Bathing yourself (or) dressing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Walking in the house/ level ground</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Walking up a flight of stairs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Bending</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Exercise</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Eating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Sleeping</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Communication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Sexual activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please describe how often your lung/respiratory problems have affected you over the last one month.
## III. SOCIAL AND OTHER ACTIVITIES

<table>
<thead>
<tr>
<th>S.No.</th>
<th>PARTICULARS</th>
<th>22 – 30 days</th>
<th>15 -21 days</th>
<th>8 –14 days</th>
<th>1 –7 days</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Score)0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Visiting friends or relatives</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Going to worship or religious place</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Shopping</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Entertainment or Recreation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Difficulty to go for job</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## IV. EMOTIONAL STATUS

<table>
<thead>
<tr>
<th>S.No.</th>
<th>PARTICULARS</th>
<th>22 – 30 days</th>
<th>15 -21 days</th>
<th>8 –14 days</th>
<th>1 –7 days</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Score)0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Feeling of dependency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Nuisance to family members, friends or neighbour</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Worried</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Fear</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Embarrassed due to breathing difficulty and coughing in public place</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Embarrassed to use respiratory medication in public place</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Feeling of invalid</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Loss of self confidence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
HEALTH RELATED QUALITY OF LIFE QUESTIONNAIRE FOR PATIENTS WITH COPD

**SCORING**

**Patient ID No:**

**Patient Name:**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Component</th>
<th>Max. Score</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Breathing Status Score</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Activity Score</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Social Status Score</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Emotion Status Score</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Total HRQOL Score</td>
<td>120</td>
<td></td>
</tr>
</tbody>
</table>

**HRQOL Score:**

**Grade** :

**Signature** :

**GRADING**

<table>
<thead>
<tr>
<th>Minimum score</th>
<th>Maximum score</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>120</td>
<td></td>
</tr>
</tbody>
</table>

0 – 30 = Very Poor
31 – 45 = Poor
46 – 60 = Fair
61 – 75 = Good
76 – 90 = Very Good
91 – 120 = Excellent.
APPENDIX - E

CLINICAL MEASUREMENTS

NAME OF THE PATIENT :                ID No. :

1. AGE    :    Years

2. SEX     :   M / F

3. HEIGHT     :   Cm

4. WEIGHT                     :      Kg

VITAL SIGNS

5.  Pulse rate   :  / min

6.  Respiratory rate   : / min

7.  Chest measurement

   Inspiration       : cm
   Expiration        : cm
   Difference       : cm

Date:                                Signature
# PULMONARY FUNCTIONAL MEASUREMENTS

Name of the Patient:  
Age: Years  
Sex: M / F  
Height: cm

<table>
<thead>
<tr>
<th>S. No</th>
<th>Measures</th>
<th>Predicted Normal Value</th>
<th>Pre Test</th>
<th>Post Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Absolute</td>
<td>% Predicted</td>
</tr>
<tr>
<td>1.</td>
<td>FVC (L)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>FEV1 (L)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>FEV1 / FVC (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>PEFR (L/S)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>MVV (L/min)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Date of Measurement:  
Pre:  
post:  
Remarks:  

Signature
SIX MINUTES WALKING DISTANCE MEASUREMENTS

1. NAME OF THE PATIENT: 
   ID No.: 

2. AGE: Years

3. SEX: M / F

4. SIX MINUTES WALKING DISTANCE:

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Test</th>
<th>Date of Measurement</th>
<th>6MWD (Meters)</th>
<th>Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remarks:
APPENDIX - B

HAND BOOK ON PULMONARY REHABILITATION

READ ME

R – Relaxation
E – Exercise
A – Avoidance
D – Drug & Diet
M – Motivation
E – Enduring

Improving Health related quality of life of patients with COPD
KNOW ABOUT LUNGS AND COPD

LUNGS OF A HEALTHY PERSON

Normal lungs of a person allow the entry of atmospheric air for the supply of oxygen to the cells in the body and to blow off the waste product carbon dioxide.

PARTS AND FUNCTIONS OF RESPIRATORY SYSTEM

- The upper respiratory tract consists of nose, pharynx, larynx and trachea and the lower respiratory tract includes the bronchi, bronchioles, alveolar ducts and alveoli.
- The structure of the chest wall, ribs, pleura, internal and external intercostals muscles and diaphragm are also plays the essential parts in respiration.
- The warm, humidify and filter inspired air to the lungs through the upper and lower airway for the removal of CO₂ and absorption of O₂.

LUNGS OF PATIENTS WITH COPD

But in chronic obstructive pulmonary disease the movement of air in and out of the lungs is affected because of an abnormal inflammatory response of the bronchial tree, increase mucous production and destruction of lung tissue due to smoke or any irritant that leads to inefficient functions of lungs cause breathing difficulty and disability of the person. Comparison of normal airway and abnormal airway of the lungs in COPD is given below.
Risk factors of COPD:
The major risk factors of COPD are
1. Exposure to tobacco smoke
2. Passive smoking
3. Occupational exposure
4. Air pollution

Signs and Symptoms of COPD:
The main signs and symptoms of COPD are as follows

- Cough and excess sputum production
- Dyspnea on exertion
- Weight loss
- Barrel chest
- Retraction of Supra–clavicular fossae on inspiration causing shoulder to heave upward
- Contraction of abdominal muscles on inspiration.
Pulmonary Rehabilitation

The main aim of pulmonary rehabilitation in chronic obstructive pulmonary disease is to minimize the disability and to maximize the Health Related Quality Of Life (HRQOL) by practicing the various aspects of management plan includes the following
- Relaxation
- Exercise
- Avoidance
- Drug & Diet
- Motivation
- Enduring

RELAXATION TECHNIQUES
Relaxation is the best way to keep away from all worries and tension. Involve yourself to perform some easily practicable relaxation techniques in day-to-day life in order to reduce anxiety or any stressful event.

1. Clearing the Mind:
   Sit comfortably in a calm place with loosen your tight clothing, close your eyes and mentally recite on one peaceful word (Ohm, Jesus or any word as you like) along with slow and deep breathing for about five minutes.

2. Visualization or Imagination:
   Imagine that you are lying on a warm sand bed in a beach, hear the sound of the waves lashing on the sand, feel the coolness of the breeze from the air and see the sail boats on the water. Enjoy this imaginary situation for a period of about five minutes.

3. Meditation
   Sit comfortably with back straight, haze at an imaginary spot on the wall in front of you and concentrate all your attention for five to ten minutes. After this you will feel much better and relax.
REST, ACTIVITY AND SLEEP

Balanced rest, activity and sleep are essential for any individual in daily life. The following are few tips to achieve proper rest, activity and sleep.

1. Plan adequate period of rest between activities to conserve energy.
2. Perform physical activities during the day and passive non-stimulating activities in the evening.
3. Avoid stimulants such as caffeine, cola, tea, alcohol etc.
4. Recliner chair or backrest to provide comfort, and to prevent dyspnea (if present).
5. Maintain a consistent and regular bedtime routine.

EXERCISES

What is exercise?
Any physical activity can be a form of an exercise. This includes unstructured exercises like cycling, gardening or walking and the structured exercises like timed walking (or) progressive walking, jogging, weight lifting etc.

The pursed lip and diaphragmatic breathing exercises are much helpful in controlling the respiratory rate, pattern and functions of the respiratory muscles.

Walking is helpful because many of the muscles in your body will be exercised, improve the daily activities and to promote breathing.

AVOIDANCE OF RISK FACTORS

Avoidance of risk factors like exposure to smoke, tobacco, air pollution and occupational pollutants such as cotton, leather and chemical fumes are essential to minimize the occurrence of breathing difficulties.
Avoidance of risk factors

- Have your inhaled bronco-dilator and oxygen administration if necessary before 10 minutes of sexual activity.
- Select comfortable sexual positioning such as side lying, recline, sitting rather than the dominant position.
- Avoid sexual activity immediately after meal or any strenuous activity.

DRUGS MANAGEMENT

Acceptance of modified Sexual Pattern.
The tips to overcome the breathing difficulty during sexual activity are
- Plan your sexual activity during the part of the day when you can breath easily.

Use inhaler and the medicine as per the physician’s prescription only.
DIETARY MANAGEMENT:
The well balanced diet with high protein, low carbohydrate and low fat diet is essential for you to maintain the body weight, to conserve energy, to prevent dyspnea and for improving the activities of daily living and quality of life.

Dietary guideline (or) tips to be followed are
1. Rest for 30 minutes before each meal in order to minimize dyspnea and to conserve energy.
2. Plan small, frequent meals (3 meals and 3 snacks)
3. Eat soft and easily chewable food to avoid bloating and early satiety in order to relieve pressure and discomfort on diaphragm.
4. Drink at least 8 cups (3 liters/day) of caffeine free fluid unless your doctor contradicts or any restriction.
5. Avoid gas forming vegetables and limit-carbonated beverages if prone to gas.
6. Eat a variety of foods to ensure that you are getting adequate vitamins and minerals.
7. Avoid lying down immediately after a meal (if necessary to have a nap – only after an hour of a meal).

8. Perform exercises (breathing and / or physical) one-hour prior or at least two hours after meal.

MAINTENANCE OF DESIRABLE BODY WEIGHT

Maintenance of desirable body weight is much more essential to minimize the breathing difficulty and to maximize the activities of daily living.

Being over weight is an associated problem with chronic bronchitis and increases the workload on your heart and lungs to supply adequate oxygen to all cells of the body.

Being under weight is an associated problem with emphysema. Weight loss is because of the increased work and cost of breathing, intestinal mal absorption, inability to utilize nutrients and the inadequate dietary intake.

SPECIFIC NUTRITIONAL NEEDS OF PERSON WITH COPD

Well balanced and a variety of foods are needed to ensure you to acquire an adequate calories, protein, fat, vitamins and minerals. The specific nutrition like protein, calcium & potassium and its importance are given as below

* Protein:
  - Adequate protein is required for repairing and building tissues.
  - Building new immune factors to fight against respiratory infection.
  - Generally, six ounces of protein per day and 250 ml of milk provide an adequate amount of high biological value protein.
**Calcium:**
- Especially important for women and for individual who are on steroid medication.
- Build bones and helps to regulate blood pressure.
- Can be obtained from dairy products supplements.

**Potassium:**
- Important for controlling blood pressure, muscle contraction and nerve impulse transmission.
- Found in fruits particularly citrus fruits (orange, guava) and banana vegetables, diary products and meat.
- Susceptible to depletion as a result of certain diuretic medications.

### IMPACT OF NUTRITION ON IMMUNIZATION IN COPD

You are more prone for often developing respiratory infection. The body’s cells that fight infection are made up of protein. So you have to acquire your daily calorie need from the following categories of food source to maximize your activities and improve the immunity.

<table>
<thead>
<tr>
<th><strong>Protein</strong></th>
<th><strong>Fat</strong></th>
<th><strong>Carbohydrate</strong></th>
</tr>
</thead>
</table>
| **Maintenance therapy**
  1.2 to 1.5gm/ kg / day | 20 to 30% of total calories from fat is required both for **Maintenance** and **Repletion therapy.** | 35 to 50% of total calories from Carbohydrate is required both for **Maintenance** and **Repletion therapy.** |
| **Repletion therapy**
  2 gm / kg /day | **Fat** | **Carbohydrate** |

**Liberally allowed - Foods**
- High protein like Milk, egg & cereals.
- Salt restricted diet
- Fish –with sauce
- Lean meat
- Consume lots of vegetables (boiled) and fresh fruits to avoid constipation

**Minimally allowed - Foods**
- Fat and cholesterol rich foods like- Organ meats, Kidney, brain & liver, Beef, pork & Chicken skin.
- Whole milk, condensed milk
- Egg yolk
- Cream, butter, cheese
- Coconut oil, palm oil, ghee
- Coconut and other nuts
- Chocolates, toffees
- Ice creams
- Salt rich food – pickle, pappadam, tinned foods.
- Very spicy, greasy and hot foods.
- Iced drinks & frozen foods.
MOTIVATION
Self-motivation is essential for the maintenance of healthy behavior like quite smoking and positive thinking to live a peaceful and happy life.

a) Quit smoking:
Tobacco smoke contains over 4000 poisons and chemical including nicotine, carbon monoxide and tar. The direct effects of cigarette smoking on the respiratory tract are
- Increases the production of mucus
- Reduces the ciliary’s activity
- Produces abnormal dilatation of the airway and the destruction of alveolar walls.

How to quit smoking?
The tips to quit smoking are

- First decide positively that you want to quit.
- Be confident about your ability to stop.
- Fix a time frame to quit smoking.
- Limit places and circumstances where you smoke.
- Keep smoke diary. Write down the occasion of every cigarette you smoke. Review the information daily, reduce the number of cigarettes daily and gradually quit smoking

b) Positive thinking:
There is no substitute for positive thinking. When you develop the habit of positive thinking you will gain confidence to face many challenges of the world and thereby your are able to cope with stress as a positive challenge. Besides a positive frame of mind start living healthy and peaceful life.

ENDURING
Enduring is an execution (or) implementation of the above learned activities (relaxation, exercises, adaptation, drug and diet management, maintenance of healthy behavior and motivation) as a regular habit in day-to-day practice will be helpful to improve the health related Quality Of Life (QOL), to reduce disability and also to promote life expectancy.
APPENDIX – D

DEMOGRAPHIC PROFILE

1. NAME OF THE PATIENT :

2. ADDRESS :

3. PHONE NUMBER :

4. AGE :

5. SEX :

   Male    Female

6. MARITAL STATUS :

   Married  Unmarried  Widow / widower/divorced

7. EDUCATION :
   a. Non literate
   b. Primary School education (I to V std)
   c. Secondary School education (VI to X std)
   d. Higher secondary
   e. Graduate and above

8. OCCUPATION :
   a. Agriculture
   b. Factory worker
   c. Office worker
   d. Casual Labour
   e. House Wife
   f. Others (Specify)

7. INCOME ( Rs. Per Month) :

8. DOMICILE :  

<table>
<thead>
<tr>
<th>City</th>
<th>Town</th>
<th>Village</th>
</tr>
</thead>
</table>

9. EXPOSURE TO POLLUTANTS :

<table>
<thead>
<tr>
<th>EXPOSURE TO POLLUTANT</th>
<th>&lt; 2years</th>
<th>2 – 4 years</th>
<th>&gt; 4 – 6 years</th>
<th>&gt; 6 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoke</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemicals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. DURATION OF RESPIRATORY ILLNESS :

- a. Less than 6 months
- b. > 6 months – 1- year
- c. >1year -- 2- years
- d. >2years -- 5- years

12. NUMBER OF HOSPITALISATION OR PHYSICIAN VISIT IN LAST 6 MONTHS :

- a. < 2 times
- b. 3 – 4 times
- c. >4 - times

13. FOOD HABITS :

<table>
<thead>
<tr>
<th>Vegetarian</th>
<th>Non - Vegetarian</th>
</tr>
</thead>
</table>

14. FOOD PREFERENCE :

- a. Carbohydrate(More / Average / Less)
- b. Protein (More / Average/ Less)
- c. Fat (More / Average/ Less)

Date:  
Signature
APPENDIX – G

VALIDATION OF HEALTH RELATED QUALITY OF LIFE QUESTIONNAIRE

LIST OF EXPERTS

1. Prof. Dr. S. Rajasekaran, M.D., DTCD.
The superintendent, Government Hospital of Thoracic Medicine Tambaram, Chennai-600047.

2. Dr. A. Mahilmaran, M.D.
Assistant Professor, Govt. Hospital of Thoracic Medicine Tambaram, Chennai-600047.

3. Dr. O.R. Krishna Rajasekar, M.D
Assistant Professor, Govt. Hospital of Thoracic Medicine Tambaram, Chennai-600047.

4. Dr. B. Hariprasad, M.B.B.S., DNB, DTRD.
Associate Prof., Department of Pulmonology Sri Ramachandra University, Porur, Chennai-600116.

5. Prof. P.V. Ramachandran, M.Sc.(Nursing)
Chairman, Nursing Education, Sri Ramachandra College of Nursing Sri Ramachandra University, Porur, Chennai-600116.

6. Prof. Dr. Rajeswari Vaidyanathan, M.Sc.(Nursing), Ph.D.
Principal, Sri Ramachandra College of Nursing Sri Ramachandra University, Porur, Chennai-600116.

7. Prof. Dr. K. Rajalakshmi, M.Sc.(Nursing), Ph.D. (Research Co-Supervisor)
Principal, MIOT College of Nursing Manapakkam, Chennai – 600089

8. Prof. Dr. B.W.C. Sathiyasekaran, MD., MS. (Advisory Committee Member)
Head, Dept. of Community Medicine Sri Ramachandra University, Porur, Chennai-600116.

9. Prof. Dr. Georgi Abraham M.D., FRCP(London), FRCP(Glasgow)
(Research Supervisor)
Department of Medicine Sri Ramachandra University, Porur, Chennai-600116.
APPENDIX - A

PATIENT CONSENT FORM

I, Mr./Ms.________________________________________, exercising my free power of choice give my consent to be included as a subject in the Pulmonary Rehabilitation. I have been informed by the Researcher about the purpose of the study, objective and subjective outcome measures, what I will be expected to do during the study period and the nature of the intervention to the level of my understanding.

I have been given the opportunity to question on all aspects of the study. I agree to fully co–operate with the Researcher and to inform him/her immediately in case I suffer any unusual manifestation during the study.

I understand that the information related to my participation in the study would remain confidential except when they will be required to be provided by the law. I hereby give permission for the Researcher of this study to release the information obtained as a result of my participation in the study to national and international regulatory body, Governmental agencies and as research reports or research paper.

I am also aware of my right to opt out of the study at any time during the course of the study without the need to give any reason.

Signature/Thumb impression of the patient                      Date:

Signature of the Independent Witness                              Date:

Signature of the Researcher                                               Date:
APPENDIX - F
HEALTH RELATED QUALITY OF LIFE QUESTIONNAIRE FOR
PATIENTS WITH COPD

Please describe how often your lung/respiratory problems have affected you over
the last one month.

I. BREATHING STATUS

<table>
<thead>
<tr>
<th>S.No</th>
<th>PARTICULARS</th>
<th>22 – 30 days</th>
<th>15 -21 days</th>
<th>8 –14 days</th>
<th>1 –7 days</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(score) 0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>1.</td>
<td>Cough</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Sputum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Difficulty in breathing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Wheezing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. During the last one month how many episodes of severe shortness of breath have you had ?

<table>
<thead>
<tr>
<th></th>
<th>More than 3 episodes</th>
<th>3 episodes</th>
<th>2 episodes</th>
<th>1 episodes</th>
<th>No episodes</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Over the last one month how many good days (with few respiratory problems) have you had ?

<table>
<thead>
<tr>
<th></th>
<th>0 days</th>
<th>1 – 7 days/month</th>
<th>8 – 14 days/month</th>
<th>15 – 21 days/month</th>
<th>22 – 30 days/month</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. When will you have the feeling of shortness of breath (SOB) in comparison with the person of your same age, height and sex ?

<table>
<thead>
<tr>
<th></th>
<th>Dyspnea at rest</th>
<th>Personal activities (dressing, bathing etc)</th>
<th>Ground level walking</th>
<th>Stair climbing</th>
<th>Continuous physical work</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Please describe how often your lung/respiratory problems have affected you over the last one month. (Activities that usually make you feel short of breath.)

II. PHYSICAL ACTIVITIES

<table>
<thead>
<tr>
<th>S.NO</th>
<th>PARTICULARS</th>
<th>22 – 30 days (score)</th>
<th>15 –21 days</th>
<th>8 –14 days</th>
<th>1 –7 days</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Sitting or lying still</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>Bathing yourself (or) dressing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Walking in the house/level ground</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Walking up a flight of stairs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Bending</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Exercise</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Eating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Sleeping</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Communication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Sexual activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Please describe how often your lung/respiratory problems have affected you over the last one month.

### III. SOCIAL AND OTHER ACTIVITIES

<table>
<thead>
<tr>
<th>S.No.</th>
<th>PARTICULARS</th>
<th>22 – 30 days</th>
<th>15-21 days</th>
<th>8 –14 days</th>
<th>1 –7 days</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Visiting friends or relatives</td>
<td>(Score)0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>Going to worship or religious place</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Shopping</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Entertainment or Recreation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Difficulty to go for job</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### IV. EMOTIONAL STATUS

<table>
<thead>
<tr>
<th>S.No.</th>
<th>PARTICULARS</th>
<th>22 – 30 days</th>
<th>15-21 days</th>
<th>8 –14 days</th>
<th>1 –7 days</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Feeling of dependency</td>
<td>(Score)0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>Nuisance to family members, friends or neighbour</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Worried</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Fear</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Embarrassed due to breathing difficulty and coughing in public place</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Embarrassed to use respiratory medication in public place</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Feeling of invalid</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Loss of self confidence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
HEALTH RELATED QUALITY OF LIFE QUESTIONNAIRE FOR PATIENTS WITH COPD

SCORING

Patient ID No:

Patient Name:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Component</th>
<th>Max. Score</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Breathing Status Score</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Activity Score</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Social Status Score</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Emotion Status Score</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Total HRQOL Score</td>
<td>120</td>
<td></td>
</tr>
</tbody>
</table>

HRQOL Score:
Grade :

Signature :

GRADING
Minimum score = 0
Maximum score = 120

0 – 30   = Very Poor
31 – 45  = Poor
46 – 60  = Fair
61 – 75  = Good
76 – 90  = Very Good
91 – 120 = Excellent.
APPENDIX - C

Instructional Manual on Breathing and Physical Exercises

Improving Health related quality of life of patients with COPD
**EXERCISE PROGRAM**

Exercise training is the foundation of pulmonary rehabilitation and it is widely recognized as a potential means of improving physical endurance. Whatever exercise you start practicing, try to keep as a regular habit to gain several benefits.

**What is an exercise?**

Any physical activity is a form of an exercise. This includes non-structured exercise like cycling, working in the garden or walking. The structured exercises include jogging, aerobic exercises etc.

**What are the benefits of exercises?**

The benefits of regular exercises are

- Many muscles in your body have been exercised (especially the respiratory muscles and the heart).
- Muscle fibers grow shorter and needs less oxygen.
- Walking helps in stimulating deep breathing.
- Improve the circulation and also helps blood return to the heart.
- Promote relaxation, digestion and sleep.
- Maintenance of ideal body weight
- Keep blood pressure and cholesterol under control to minimize the risk of heart attack.

**EXERCISE PROGRAM**

An exercise program consists of breathing exercises for at least 15 minutes a day, physical exercises (upper or lower extremities) 15 to 30 minutes a day for a period of eight weeks will provide a long-term benefits of improving your lung function and quality of life.

**What sorts of exercises are good for you?**

The beneficial breathing exercises for you are Diaphragmatic with Pursed lip, Blowing Out Bubbles through water using straw and Blowing a Balloon. The Physical exercises that include the Upper and Lower extremities exercises.
GENERAL INSTRUCTIONS:

The general instructions to be followed for during breathing exercises are

1. Breathing exercises reduce dyspnea and increase the respiratory muscles strength.

2. Diaphragmatic with pursed lip breathing, Blowing out Bubbles through water and Blowing a Balloon exercises are the important breathing exercises for patients with chronic obstructive pulmonary diseases.

3. Breathing exercises are to be practiced at least 15 minutes a day.

4. Appropriate timings for breathing exercises is 60 minutes before meal or 2 hours after meal.

5. During breathing exercises a loose fit cotton dress should be worn

6. Diaphragmatic breathing Pursed lip breathing exercises may be performed in sitting or lying positions.

7. Open space or well-ventilated and calm place is essential for practicing breathing exercises.

8. The nasal secretion should be removed before and after breathing exercises.

9. Breaths slowly and rhythmically to exhale slowly by prolonging exhalation time and empty the lungs completely.

10. Inhale only through the nose to filter, humidify and warm the air before it enters the lungs.

BREATHING EXERCISES

Breathing exercises are helpful in controlling the respiratory rate and pattern. It also attempts to decrease the work of breathing and promote the function of the respiratory muscles. The breathing exercises are

a. Diaphragmatic with Pursed lip
b. Blowing Out Bubbles through water using straw and
c. Blowing a Balloon
a. Diaphragmatic with pursed lip breathing

Diaphragmatic breathing (DB) with Pursed lip breathing are designed to increase the use of the diaphragm during inspiration and prolonging the exhalation time. The diaphragm is the major muscle of respiration. Diaphragmatic (abdominal) breathing helps to achieve maximum inhalation, reducing the respiratory rate, controlling and lessening the discomfort associated with breathlessness.

Procedure

Place one hand on the abdomen (just below the ribs) and other hand on the middle of the chest to increase the awareness of the diaphragm and its function in breathing. Diaphragmatic breathing exercise can be performed in sitting, lying position, or waking.

Breaths in slowly and deeply through the nose, letting the abdomen protrude as far as possible. This can also be practiced while walking. Inhale while walking two steps and exhale through pursed lips while walking next four or five steps.
b. Blowing Out Bubbles through water

c. Blowing a Balloon

Blowing Out Bubbles through water and Blowing a Balloon is helpful to improve the strength of the respiratory muscles and also offer tolerable resistance.

PHYSICAL EXERCISES

The physical exercises includes
  ➢ Upper extremity exercises
  ➢ Lower extremity exercises

UPPER EXTREMITIE EXERCISES

The upper extremity exercise trainings are much more important to improve arms function since many activities of daily living involve the use of the arms. The easily practicable upper extremity exercises are

A. Wall hand climbing
B. Rope turning
C. Rod lifting
D. Pulley tugging.
A. Wall hand climbing

Stand facing the wall, with the toes as close as to the wall and as much as possible feet apart. With elbows somewhat bent, place the palms on the wall at shoulder level. By flexing the fingers, work hands up the wall until arms are fully extended. Work hands down to starting point.

B. Rope turning

Stand facing the door. Take free end of light rope in the right hand and place left hand on hip. With arm extended and held away from the body nearly parallel with the floor turn rope as wide swings as possible. Do it slow at first then speed up later. Then place right arm at the hip and turn the rope in the opposite direction, do it slow at first then speed up later.
C. Rod- Raising

Grasp rod with both hands, held about 2 feet apart. With arms straight, raise rod over the head. Bend elbows lowering rod behind head. Reverse maneuver, raising rod above the head, then to starting position.

D. Pulley tugging

Toss rope over shower curtain rod or doorway curtain rod. Stand as nearly under rope as possible. Grasp an end in each hand. Extend arms straight and away from body. Pull left arm up by tugging down with right arm, then right arm up and left down like a seesaw.
LOWER EXTREMITY EXERCISE:

The lower extremity exercise program can be an easily practicable ground based walking.

Ideal environment and walking guidelines:

- Do not exercise in hot/humid/cold weather.
- Avoid exercise soon after meals. Wait for at least two hours after a meal. Do not eat at least 20 minutes following an exercise session.
- Start with your warm up session like stretching or slow walking for 3-5 minutes, followed by brisk walking for at least 15-30 minutes then cool down gradually by walking slowly at end of 3-5 minutes.
- Use proper posture while walking.
- Swing your arms rhythmically and loosely like pendulums.
- Start walking on the level and as you become conditioned, walk upgrades.
- Walking should be regular (at least 3 days per week)

Rating of Perceived Exertion (RPE)

The RPE is a self-assessment scale used by you to determine how hard you are exercising. This scale rates symptoms of breathlessness and fatigue during any exercise program. A rating of 6 would be comparable to getting up in the morning. A rating 20 would be comparable to performing exercises that cause complete fatigue or point at which you physically collapse. Your goal will be to exercise in the range
of {11-13}. While doing, exercise, ask yourself: how hard am I working, we wouldn’t want you working too hard or too easy.

RPE -self-assessment scale

6 7 very, very light
8 9 10 fairly light
11 somewhat hard
12 13 very hard
14 15 16
17 very hard
18 19 very, very hard
20

How to determine the maximum heart rate?

- Maximum heart rate = 220 - Age in years
- 60-70%range of maximum heart rate is your target zone and practice exercises in this range only.

To use radial Pulse

1. Place palm up.
2. Use index and middle fingers.
3. Follow thumb down to base and 1”past wrist.
4. Locate the long bone on the thumb side (radial bone).
5. Slide index and middle finger into groove pressing lightly.
6. Count the number of throbs. The correspond exactly to the beats of the heart.

How to count the pulse / heart rate?

Checking your own pulse is very important part of the exercise program. To check your pulse, place your three fingers just below the thumb over the wrist. Once you could feel the pulse start counting the number of pulsation you feel during a 6 second period. Add a 0 to that number and you know your heart rate for 1 minute. The heart rate slows quickly after you stop exercising that is why you should count for 6seconds only.

Determination of the heart rate for 1 minute

If your pulse is regular

1. Count your pulse for 6seconds.
2. Multiply by 10 to get your pulse for 1minute.
Determination of the heart rate for 1 minute

<table>
<thead>
<tr>
<th>Pulse (6-seconds)</th>
<th>Multiply</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>*10</td>
<td>60</td>
</tr>
<tr>
<td>8</td>
<td>*10</td>
<td>80</td>
</tr>
<tr>
<td>10</td>
<td>*10</td>
<td>100</td>
</tr>
<tr>
<td>12</td>
<td>*10</td>
<td>120</td>
</tr>
</tbody>
</table>

If your pulse is not regular, count pulse for 15 seconds and multiply by 4 to get your pulse for 1 minute.

HOME EXERCISE PROGRAM

The Home Exercise Log - on Breathing & Physical exercise (upper& lower extremity) is given below

- Keep a record of your rating of perceived exertion (RPE) at rest and after exercise.
- Stop exercise if you experience any untoward symptoms. (e.g.) undue shortness of breath, chest pain, weakness or any irregular heart beat (increased or decreased).
- You have to aim for the following duration and frequency of Breathing and Physical exercises (Both Upper and Lower extremities exercises) for the better benefits.
- Try to perform all the 3- types of breathing exercises (Diaphragmatic with Pursed lip, Blowing Out Bubbles through water using straw and Blowing a Balloon) everyday for a period of 5 minutes for each type and take 2 minutes rest if necessary prior to the next type of breathing exercise. (Preferably all the 3 – types of breathing exercises if not at least minimum 2 –types should be practiced everyday).
- Try to perform all the four types of Upper extremities exercises (Wall hand climbing, Rope turning, Rod lifting and Pulley- tugging) everyday either in the morning or in the evening each type for about 5 minutes / day, altogether for 20 minutes. (Practice all the four type if not at least minimum 3 – types / day)
Begin the Lower extremities exercise (Walking) with 2min. warm up, brisk walking and ends with cool down exercises. The minimum of 15minutes brisk walking for the first 2weeks, 20 minutes for the third and fourth weeks, 25 minutes for fifth and sixth weeks and to aim for the maximum duration of 30 minutes at the beginning of seventh week to till the end of eighth week.

Perform the Upper and Lower extremities exercises at least in an alternative basis (3-days UEE & 3- days LEE ) can be performed as per your ability and preference either in the morning or in the evening.

**NOTE:** Sunday or any one day in a week can be a holiday (without exercise) if you feel or require.
APPENDIX - E

CLINICAL MEASUREMENTS

NAME OF THE PATIENT :                ID No. :

1. AGE    :   Years

2. SEX     :   M / F

3. HEIGHT     :   Cm

4. WEIGHT                     :      Kg

VITAL SIGNS

5. Pulse rate   :  / min

6. Respiratory rate   : / min

7. Chest measurement
     Inspiration :  cm
    Expiration :   cm
     Difference :  cm

Date:                                             Signature
# PULMONARY FUNCTIONAL MEASUREMENTS

## Name of the Patient:

### Age:

#### Years

#### ID No.:

### Sex:

#### M / F

### Height:

#### cm

## Measures

<table>
<thead>
<tr>
<th>S. No</th>
<th>Measures</th>
<th>Predicted Normal Value</th>
<th>Pre Test</th>
<th>Post Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Absolute</td>
<td>% Predicted</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Absolute</td>
<td>% Predicted</td>
</tr>
</tbody>
</table>

1. FVC (L)
2. FEV₁ (L)
3. FEV₁ / FVC (%)
4. PEFR (L / S)
5. MVV (L / min)

## Date of Measurement:

### Pre:

### Post:

## Remarks:

Signature
SIX MINUTES WALKING DISTANCE MEASUREMENTS

1. NAME OF THE PATIENT :                ID No. :

2. AGE :   Years

3. SEX :   M / F

4. SIX MINUTES WALKING DISTANCE:

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Test</th>
<th>Date of Measurement</th>
<th>6MWD (Meteres)</th>
<th>Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remarks:
APPENDIX - B

HAND BOOK ON PULMONARY REHABILITATION

READ ME

R – Relaxation
E – Exercise
A – Avoidance
D – Drug & Diet
M – Motivation
E – Enduring

Improving Health related quality of life of patients with COPD
KNOW ABOUT LUNGS AND COPD

LUNGS OF A HEALTHY PERSON

Normal lungs of a person allow the entry of atmospheric air for the supply of oxygen to the cells in the body and to blow off the waste product carbon dioxide.

PARTS AND FUNCTIONS OF RESPIRATORY SYSTEM

- The upper respiratory tract consists of nose, pharynx, larynx and trachea and the lower respiratory tract includes the bronchi, bronchioles, alveolar ducts and alveoli.
- The structure of the chest wall, ribs, pleura, internal and external intercostals muscles and diaphragm are also plays the essential parts in respiration.
- The warm, humidify and filter inspired air to the lungs through the upper and lower airway for the removal of CO$_2$ and absorption of O$_2$.

LUNGS OF PATIENTS WITH COPD

But in chronic obstructive pulmonary disease the movement of air in and out of the lungs is affected because of an abnormal inflammatory response of the bronchial tree, increase mucous production and destruction of lung tissue due to smoke or any irritant that leads to inefficient functions of lungs cause breathing difficulty and disability of the person. Comparison of normal airway and abnormal airway of the lungs in COPD is given below.
Risk factors of COPD:
The major risk factors of COPD are
1. Exposure to tobacco smoke
2. Passive smoking
3. Occupational exposure
4. Air pollution

Signs and Symptoms of COPD:
The main signs and symptoms of COPD are as follows

- Cough and excess sputum production
- Dyspnea on exertion
- Weight loss
- Barrel chest
- Retraction of Supra–clavicular fossae on inspiration causing shoulder to heave upward
- Contraction of abdominal muscles on inspiration.
Pulmonary Rehabilitation

The main aim of pulmonary rehabilitation in chronic obstructive pulmonary disease is to minimize the disability and to maximize the Health Related Quality Of Life (HRQOL) by practicing the various aspects of management plan includes the following

- Relaxation
- Exercise
- Avoidance
- Drug & Diet
- Motivation
- Enduring

RELAXATION TECHNIQUES

Relaxation is the best way to keep away from all worries and tension. Involve yourself to perform some easily practicable relaxation techniques in day-to-day life in order to reduce anxiety or any stressful event.

1. Clearing the mind
   Sit comfortably in a calm place with loosen your tight clothing, close your eyes and mentally recite on one peaceful word (Ohm, Jesus or any word as you like) along with slow and deep breathing for about five minutes.

2. Visualization or Imagination:
   Imagine that you are lying on a warm sand bed in a beach, hear the sound of the waves lashing on the sand, feel the coolness of the breeze from the air and see the sail boats on the water. Enjoy this imaginary situation for a period of about five minutes.

3. Meditation
   Sit comfortably with back straight, haze at an imaginary spot on the wall in front of you and concentrate all your attention for five to ten minutes. After this you will feel much better and relax.
REST, ACTIVITY AND SLEEP

Balanced rest, activity and sleep are essential for any individual in daily life. The following are few tips to achieve proper rest, activity and sleep:

1. Plan adequate period of rest between activities to conserve energy.
2. Perform physical activities during the day and passive non-stimulating activities in the evening.
3. Avoid stimulants such as caffeine, cola, tea, alcohol etc.
4. Recliner chair or backrest to provide comfort, and to prevent dyspnea (if present).
5. Maintain a consistent and regular bedtime routine.

EXERCISES

What is exercise?

Any physical activity can be a form of an exercise. This includes unstructured exercises like cycling, gardening or walking and the structured exercises like timed walking (or) progressive walking, jogging, weight lifting etc.

The pursed lip and diaphragmatic breathing exercises are much helpful in controlling the respiratory rate, pattern and functions of the respiratory muscles.

Walking is helpful because many of the muscles in your body will be exercised, improve the daily activities and to promote breathing.

AVOIDANCE OF RISK FACTORS

Avoidance of risk factors like exposure to smoke, tobacco, air pollution and occupational pollutants such as cotton, leather and chemical fumes are essential to minimize the occurrence of breathing difficulties.
Avoidance of risk factors

- Plan your sexual activity during the part of the day when you can breathe easily.
- Have your inhaled bronco-dilator and oxygen administration if necessary before 10 minutes of sexual activity.
- Select comfortable sexual positioning such as side lying, recline, sitting rather than the dominant position.
- Avoid sexual activity immediately after meal or any strenuous activity.

Acceptance of modified Sexual Pattern.
The tips to overcome the breathing difficulty during sexual activity are
- Plan your sexual activity during the part of the day when you can breath easily.

DRUGS MANAGEMENT

Use inhaler and the medicine as per the physician’s prescription only.
DIETARY MANAGEMENT:
The well balanced diet with high protein, low carbohydrate and low fat diet is essential for you to maintain the body weight, to conserve energy, to prevent dyspnea and for improving the activities of daily living and quality of life.

Dietary guideline (or) tips to be followed are

1. Rest for 30 minutes before each meal in order to minimize dyspnea and to conserve energy.
2. Plan small, frequent meals (3 meals and 3 snacks)
3. Eat soft and easily chewable food to avoid bloating and early satiety in order to relieve pressure and discomfort on diaphragm.
4. Drink at least 8 cups (3 liters/day) of caffeine free fluid unless your doctor contradicts or any restriction.
5. Avoid gas forming vegetables and limit-carbonated beverages if prone to gas.
6. Eat a variety of foods to ensure that you are getting adequate vitamins and minerals.
7. Avoid lying down immediately after a meal (if necessary to have a nap – only after an hour of a meal).
8. Perform exercises (breathing and / or physical) one-hour prior or at least two hours after meal.

MAINTENANCE OF DESIRABLE BODY WEIGHT

Maintenance of desirable body weight is much more essential to minimize the breathing difficulty and to maximize the activities of daily living.

Being over weight is an associated problem with chronic bronchitis and increases the workload on your heart and lungs to supply adequate oxygen to all cells of the body.

Being under weight is an associated problem with emphysema. Weight loss is because of the increased work and cost of breathing, intestinal mal absorption, inability to utilize nutrients and the inadequate dietary intake.

SPECIFIC NUTRITIONAL NEEDS OF PERSON WITH COPD

Well balanced and a variety of foods are needed to ensure you to acquire an adequate calories, protein, fat, vitamins and minerals. The specific nutrition like protein, calcium & potassium and its importance are given as below

* Protein:
  - Adequate protein is required for repairing and building tissues.
  - Building new immune factors to fight against respiratory infection.
  - Generally, six ounces of protein per day and 250 ml of milk provide an adequate amount of high biological value protein.
**Calcium:**
- Especially important for women and for individual who are on steroid medication.
- Build bones and helps to regulate blood pressure.
- Can be obtained from diary products supplements.

**Potassium:**
- Important for controlling blood pressure, muscle contraction and nerve impulse transmission.
- Found in fruits particularly citrus fruits (orange, guava) and banana vegetables, diary products and meat.
- Susceptible to depletion as a result of certain diuretic medications.

**IMPACT OF NUTRITION ON IMMUNIZATION IN COPD**
You are more prone for often developing respiratory infection. The body’s cells that fight infection are made up of protein. So you have to acquire your daily calorie need from the following categories of food source to maximize your activities and improve the immunity.

<table>
<thead>
<tr>
<th>Protein</th>
<th>Fat</th>
<th>Carbohydrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance</td>
<td>20 to 30% of total calories from fat is required both for Maintenance and Repletion therapy.</td>
<td>35 to 50% of total calories from Carbohydrate is required both for Maintenance and Repletion therapy.</td>
</tr>
<tr>
<td>Repletional</td>
<td>therapy</td>
<td></td>
</tr>
<tr>
<td>1.2 to 1.5gm/ kg / day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 gm / kg /day</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Liberally allowed - Foods</th>
<th>Minimally allowed - Foods</th>
</tr>
</thead>
<tbody>
<tr>
<td>High protein like Milk, egg &amp; cereals.</td>
<td>Fat and cholesterol rich foods like-</td>
</tr>
<tr>
<td>Salt restricted diet</td>
<td>Organ meats, Kidney, brain &amp; liver</td>
</tr>
<tr>
<td>Fish –with sauce</td>
<td>Beef, pork &amp; Chicken skin.</td>
</tr>
<tr>
<td>Lean meat</td>
<td></td>
</tr>
<tr>
<td>Consume lots of vegetables (boiled) and fresh fruits to avoid constipation</td>
<td></td>
</tr>
</tbody>
</table>

- Whole milk, condensed milk
- Egg yolk
- Cream, butter, cheese
- Coconut oil, palm oil, ghee
- Coconut and other nuts
- Chocolates, toffees
- Ice creams
- Salt rich food – pickle, pappadam, tinned foods.
- Very spicy ,greasy and hot foods.
- Iced drinks & frozen foods.
MOTIVATION
Self-motivation is essential for the maintenance of healthy behavior like quite smoking and positive thinking to live a peaceful and happy life.

a) Quit smoking:
Tobacco smoke contains over 4000 poisons and chemical including nicotine, carbon monoxide and tar. The direct effects of cigarette smoking on the respiratory tract are
- Increases the production of mucus
- Reduces the ciliary’s activity
- Produces abnormal dilatation of the airway and the destruction of alveolar walls.

How to quit smoking?
The tips to quit smoking are
- First decide positively that you want to quit.
- Be confident about your ability to stop.
- Fix a time frame to quit smoking.
- Limit places and circumstances where you smoke.
- Keep smoke diary. Write down the occasion of every cigarette you smoke. Review the information daily, reduce the number of cigarettes daily and gradually quit smoking.

b) Positive thinking:
There is no substitute for positive thinking. When you develop the habit of positive thinking you will gain confidence to face many challenges of the world and thereby your are able to cope with stress as a positive challenge. Besides a positive frame of mind start living healthy and peaceful life.

ENDURING
Enduring is an execution (or) implementation of the above learned activities (relaxation, exercises, adaptation, drug and diet management, maintenance of healthy behavior and motivation) as a regular habit in day-to-day practice will be helpful to improve the health related Quality Of Life (QOL), to reduce disability and also to promote life expectancy.
APPENDIX – D

DEMOGRAPHIC PROFILE

1. NAME OF THE PATIENT :

2. ADDRESS :

3. PHONE NUMBER :

4. AGE : 

5. SEX :

6. MARITAL STATUS : Married Unmarried Widow / widower/divorced

7. EDUCATION :
   a. Non literate
   b. Primary School education (I to V std)
   c. Secondary School education (VI to X std)
   d. Higher secondary
   e. Graduate and above

8. OCCUPATION :
   a. Agriculture
   b. Factory worker
   c. Office worker
   d. Casual Labour
   e. House Wife
   f. Others (Specify)
7. INCOME (Rs. Per Month):

8. DOMICILE:

<table>
<thead>
<tr>
<th>City</th>
<th>Town</th>
<th>Village</th>
</tr>
</thead>
</table>

9. EXPOSURE TO POLLUTANTS:

<table>
<thead>
<tr>
<th>EXPOSURE TO POLLUTANT</th>
<th>&lt;2 years</th>
<th>2 – 4 years</th>
<th>&gt;4 – 6 years</th>
<th>&gt;6 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoke</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemicals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. DURATION OF RESPIRATORY ILLNESS:

a. Less than 6 months
b. > 6 months – 1- year
c. >1 year -- 2- years
d. >2 years -- 5- years

12. NUMBER OF HOSPITALISATION OR PHYSICIAN VISIT IN LAST 6 MONTHS:

a. < 2 times
b. 3 – 4 times
c. >4 - times

13. FOOD HABITS:

<table>
<thead>
<tr>
<th>Vegetarian</th>
<th>Non - Vegetarian</th>
</tr>
</thead>
</table>

14. FOOD PREFERENCE:

a. Carbohydrate(More / Average / Less)
b. Protein (More / Average / Less)
c. Fat (More / Average / Less)

Date: Signature
LIST OF APPENDIXES

APPENDIX – A  Patient consent form
APPENDIX – B  Hand book on Pulmonary Rehabilitation
APPENDIX – C  Instructional Manual on Breathing and Physical Exercises
APPENDIX – D  Demographic form
APPENDIX – E  Clinical measurement, Pulmonary functional measures and Six minutes walking distance measures form
APPENDIX – F  Health related quality of life questionnaire
APPENDIX – G  List of experts – validation of HRQOL questionnaire
APPENDIX – G

VALIDATION OF HEALTH RELATED QUALITY OF LIFE QUESTIONNAIRE

LIST OF EXPERTS

1. Prof. Dr. S. Rajasekaran, M.D., DTCD.
The superintendent, Government Hospital of Thoracic Medicine
Tambaram, Chennai-600047.

2. Dr. A. Mahilmaran, M.D.
Assistant Professor, Govt. Hospital of Thoracic Medicine
Tambaram, Chennai-600047.

3. Dr. O.R. Krishna Rajasekar, M.D
Assistant Professor, Govt. Hospital of Thoracic Medicine
Tambaram, Chennai-600047.

4. Dr. B. Hariprasad, M.B.B.S., DNB, DTRD.
Associate Prof., Department of Pulmonology
Sri Ramachandra University, Porur, Chennai-600116.

5. Prof. P.V. Ramachandran, M.Sc.(Nursing)
Chairman, Nursing Education, Sri Ramachandra College of Nursing
Sri Ramachandra University, Porur, Chennai-600116.

6. Prof. Dr. Rajeswari Vaidyanathan, M.Sc.(Nursing), Ph.D.
Principal, Sri Ramachandra College of Nursing
Sri Ramachandra University, Porur, Chennai-600116.

7. Prof. Dr. K. Rajalakshmi, M.Sc.(Nursing), Ph.D. (Research Co-
Supervisor)
Principal, MIOT College of Nursing
Manapakkam, Chennai – 600089

8. Prof. Dr. B.W.C. Sathiyasekaran. MD., MS. (Advisory Committee
Member)
Head, Dept. of Community Medicine
Sri Ramachandra University, Porur, Chennai-600116.

9. Prof. Dr. Georgi Abraham M.D., FRCP(London), FRCP(Glasgow)
(Research Supervisor)
Department of Medicine
Sri Ramachandra University, Porur, Chennai-600116.
APPENDIX - A

PATIENT CONSENT FORM

I, Mr./Ms.______________________________________, exercising my free power of choice give my consent to be included as a subject in the Pulmonary Rehabilitation. I have been informed by the Researcher about the purpose of the study, objective and subjective outcome measures, what I will be expected to do during the study period and the nature of the intervention to the level of my understanding.

I have been given the opportunity to question on all aspects of the study. I agree to fully co-operate with the Researcher and to inform him/her immediately in case I suffer any unusual manifestation during the study.

I understand that the information related to my participation in the study would remain confidential except when they will be required to be provided by the law. I hereby give permission for the Researcher of this study to release the information obtained as a result of my participation in the study to national and international regulatory body, Governmental agencies and as research reports or research paper.

I am also aware of my right to opt out of the study at any time during the course of the study without the need to give any reason.

Signature/Thumb impression of the patient                      Date:

Signature of the Independent Witness                              Date:

Signature of the Researcher                                               Date:
Please describe how often your lung/respiratory problems have affected you over the last one month.

### I. BREATHING STATUS

<table>
<thead>
<tr>
<th>S.No</th>
<th>PARTICULARS</th>
<th>22 – 30 days</th>
<th>15 -21 days</th>
<th>8 –14 days</th>
<th>1 –7 days</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(score) 0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>1.</td>
<td>Cough</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Sputum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Difficulty in breathing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Wheezing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>During the last one month how many episodes of severe shortness of breath have you had?</td>
<td>More than 3 episodes</td>
<td>0</td>
<td>3 episodes</td>
<td>1</td>
<td>2 episodes</td>
</tr>
<tr>
<td>6.</td>
<td>Over the last one month how many good days (with few respiratory problems) have you had?</td>
<td>0 days</td>
<td>0</td>
<td>1 – 7 days/month</td>
<td>1</td>
<td>8 – 14 days/month</td>
</tr>
<tr>
<td>7.</td>
<td>When will you have the feeling of shortness of breath (SOB) in comparison with the person of your same age, height and sex?</td>
<td>Dyspnea at rest</td>
<td>0</td>
<td>Personal activities (dressing, bathing etc)</td>
<td>1</td>
<td>Ground level walking</td>
</tr>
</tbody>
</table>
## II. PHYSICAL ACTIVITIES

<table>
<thead>
<tr>
<th>S.NO</th>
<th>PARTICULARS</th>
<th>22 – 30 days (score) 0</th>
<th>15 -21 days</th>
<th>8 –14 days</th>
<th>1 –7 days</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Sitting or lying still</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Bathing yourself (or) dressing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Walking in the house/ level ground</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Walking up a flight of stairs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Bending</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Exercise</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Eating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Sleeping</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Communication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Sexual activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please describe how often your lung/respiratory problems have affected you over the last one month.
### III. SOCIAL AND OTHER ACTIVITIES

<table>
<thead>
<tr>
<th>S.No.</th>
<th>PARTICULARS</th>
<th>22 – 30 days</th>
<th>15 -21 days</th>
<th>8 –14 days</th>
<th>1 –7 days</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Score)0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Visiting friends or relatives</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Going to worship or religious place</td>
<td></td>
<td></td>
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<td>3.</td>
<td>Shopping</td>
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<td>4.</td>
<td>Entertainment or Recreation</td>
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<td>5.</td>
<td>Difficulty to go for job</td>
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### IV. EMOTIONAL STATUS

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<th>S.No.</th>
<th>PARTICULARS</th>
<th>22 – 30 days</th>
<th>15 -21 days</th>
<th>8 –14 days</th>
<th>1 –7 days</th>
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<td>2</td>
<td>3</td>
<td>4</td>
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</tr>
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<td>1.</td>
<td>Feeling of dependency</td>
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<td>2.</td>
<td>Nuisance to family members, friends or neighbour</td>
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<td>3.</td>
<td>Worried</td>
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<td>4.</td>
<td>Fear</td>
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<td>5.</td>
<td>Embarrassed due to breathing difficulty and coughing in public place</td>
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<td>6.</td>
<td>Embarrassed to use respiratory medication in public place</td>
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<td>7.</td>
<td>Feeling of invalid</td>
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<td>8.</td>
<td>Loss of self confidence</td>
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HEALTH RELATED QUALITY OF LIFE QUESTIONNAIRE FOR
PATIENTS WITH COPD

SCORING

Patient ID No:

Patient Name:

<table>
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<tr>
<th>Sl. No.</th>
<th>Component</th>
<th>Max. Score</th>
<th>Score</th>
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<tr>
<td>1</td>
<td>Breathing Status Score</td>
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<td>2</td>
<td>Activity Score</td>
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<td>3</td>
<td>Social Status Score</td>
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<td>4</td>
<td>Emotion Status Score</td>
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<td>5</td>
<td>Total HRQOL Score</td>
<td>120</td>
<td></td>
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</table>

HRQOL Score:
Grade : 

Signature :

**GRADING**

Minimum score $= 0$
Maximum score $= 120$

$0 – 30 = $ Very Poor
$31 – 45 = $ Poor
$46 – 60 = $ Fair
$61 – 75 = $ Good
$76 – 90 = $ Very Good
$91 – 120 = $ Excellent.
APPENDIX - C

Instructional Manual on
Breathing and Physical Exercises

Improving Health related quality of life of patients with COPD
EXERCISE PROGRAM

Exercise training is the foundation of pulmonary rehabilitation and it is widely recognized as a potential means of improving physical endurance. Whatever exercise you start practicing, try to keep as a regular habit to gain several benefits.

What is an exercise?

Any physical activity is a form of an exercise. This includes non-structured exercise like cycling, working in the garden or walking. The structured exercises include jogging, aerobic exercises etc.

What are the benefits of exercises?

The benefits of regular exercises are
- Many muscles in your body have been exercised (especially the respiratory muscles and the heart).
- Muscle fibers grow shorter and needs less oxygen.
- Walking helps in stimulating deep breathing.
- Improve the circulation and also helps blood return to the heart.
- Promote relaxation, digestion and sleep.
- Maintenance of ideal body weight
- Keep blood pressure and cholesterol under control to minimize the risk of heart attack.

EXERCISE PROGRAM

An exercise program consists of breathing exercises for at least 15 minutes a day, physical exercises (upper or lower extremities) 15 to 30 minutes a day for a period of eight weeks will provide a long-term benefits of improving your lung function and quality of life.

What sorts of exercises are good for you?

The beneficial breathing exercises for you are Diaphragmatic with Pursed lip, Blowing Out Bubbles through water using straw and Blowing a Balloon. The Physical exercises that include the Upper and Lower extremities exercises.
GENERAL INSTRUCTIONS:

The general instructions to be followed for during breathing exercises are

1. Breathing exercises reduce dyspnea and increase the respiratory muscles strength.

2. Diaphragmatic with pursed lip breathing, Blowing out Bubbles through water and Blowing a Balloon exercises are the important breathing exercises for patients with chronic obstructive pulmonary diseases.

3. Breathing exercises are to be practiced at least 15 minutes a day.

4. Appropriate timings for breathing exercises is 60 minutes before meal or 2 hours after meal.

5. During breathing exercises a loose fit cotton dress should be worn

6. Diaphragmatic breathing Pursed lip breathing exercises may be performed in sitting or lying positions.

7. Open space or well- ventilated and calm place is essential for practicing breathing exercises.

8. The nasal secretion should be removed before and after breathing exercises.

9. Breaths slowly and rhythmically to exhale slowly by prolonging exhalation time and empty the lungs completely.

10. Inhale only through the nose to filter, humidify and warm the air before it enters the lungs.

BREATHING EXERCISES

Breathing exercises are helpful in controlling the respiratory rate and pattern. It also attempts to decrease the work of breathing and promote the function of the respiratory muscles. The breathing exercises are

a. Diaphragmatic with Pursed lip

b. Blowing Out Bubbles through water using straw and

c. Blowing a Balloon
### a. Diaphragmatic with pursed lip breathing

Diaphragmatic breathing (DB) with Pursed lip breathing are designed to increase the use of the diaphragm during inspiration and prolonging the exhalation time. The diaphragm is the major muscle of respiration. Diaphragmatic (abdominal) breathing helps to achieve maximum inhalation, reducing the respiratory rate, controlling and lessening the discomfort associated with breathlessness.

**Procedure**

Place one hand on the abdomen (just below the ribs) and other hand on the middle of the chest to increase the awareness of the diaphragm and its function in breathing. Diaphragmatic breathing exercise can be performed in sitting, lying position, or waking.

Breaths in slowly and deeply through the nose, letting the abdomen protrude as far as possible. This can also be practiced while walking. Inhale while walking two steps and exhale through pursed lips while walking next four or five steps.
b. Blowing Out Bubbles through water

c. Blowing a Balloon

Blowing Out Bubbles through water and Blowing a Balloon is helpful to improve the strength of the respiratory muscles and also offer tolerable resistance.

PHYSICAL EXERCISES

The physical exercises includes
- Upper extremity exercises
- Lower extremity exercises

UPPER EXTREMITIE EXERCISES

The upper extremity exercise trainings are much more important to improve arms function since many activities of daily living involve the use of the arms. The easily practicable upper extremity exercises are

A. Wall hand climbing
B. Rope turning
C. Rod lifting
D. Pulley tugging.
A. Wall hand climbing

Stand facing the wall, with the toes as close as to the wall and as much as possible feet apart. With elbows somewhat bent, place the palms on the wall at shoulder level. By flexing the fingers, work hands up the wall until arms are fully extended. Work hands down to starting point.

B. Rope turning

Stand facing the door. Take free end of light rope in the right hand and place left hand on hip. With arm extended and held away from the body nearly parallel with the floor turn rope as wide swings as possible. Do it slow at first then speed up later. Then place right arm at the hip and turn the rope in the opposite direction, do it slow at first then speed up later.
C. Rod- Raising

Grasp rod with both hands, held about 2 feet apart. With arms straight, raise rod over the head. Bend elbows lowering rod behind head. Reverse maneuver, raising rod above the head, then to starting position.

D. Pulley tugging

Toss rope over shower curtain rod or doorway curtain rod. Stand as nearly under rope as possible. Grasp an end in each hand. Extend arms straight and away from body. Pull left arm up by tugging down with right arm, then right arm up and left down like a seesaw.
LOWER EXTREMITY EXERCISE:

The lower extremity exercise program can be an easily practicable ground based walking.

Ideal environment and walking guidelines:
- Do not exercise in hot/humid/cold weather.
- Avoid exercise soon after meals. Wait for at least two hours after a meal. Do not eat at least 20 minutes following an exercise session.
- Start with your warm up session like stretching or slow walking for 3-5 minutes, followed by brisk walking for at least 15-30 minutes then cool down gradually by walking slowly at end of 3-5 minutes.
- Use proper posture while walking.
- Swing your arms rhythmically and loosely like pendulums.
- Start walking on the level and as you become conditioned, walk upgrades.
- Walking should be regular (at least 3 days per week)

Rating of Perceived Exertion (RPE)

The RPE is a self-assessment scale used by you to determine how hard you are exercising. This scale rates symptoms of breathlessness and fatigue during any exercise program. A rating of 6 would be comparable to getting up in the morning. A rating 20 would be comparable to performing exercises that cause complete fatigue or point at which you physically collapse. Your goal will be to exercise in the range of
While doing exercise, ask yourself: how hard am I working, we wouldn’t want you working too hard or too easy.

**RPE -self-assessment scale**

6  
7 very, very light  
8  
9  
10  
11 fairly light  
12  
13 somewhat hard  
14  
15  
16  
17 very hard  
18  
19 very, very hard  
20

**How to determine the maximum heart rate?**

- Maximum heart rate = 220 - Age in years
- 60-70%range of maximum heart rate is your target zone and practice exercises in this range only.

To use radital Pulse

1. Place palm up.
2. Use index and middle fingers.
3. Follow thumb down to base and 1”past wrist.
4. Locate the long bone on the thumb side (radial bone).
5. Slide index and middle finger into groove pressing lightly.
6. Count the number of throbs. The correspond exactly to the beats of the heart.

**How to count the pulse / heart rate?**

Checking your own pulse is very important part of the exercise program. To check your pulse, place your three fingers just below the thumb over the wrist. Once you could feel the pulse start counting the number of pulsation you feel during a 6 second period. Add a 0 to that number and you know your heart rate for 1 minute. The heart rate slows quickly after you stop exercising that is why you should count for 6 seconds only.

**Determination of the heart rate for 1 minute**

If your pulse is regular

1. Count your pulse for 6 seconds.
2. Multiply by 10 to get your pulse for 1 minute
Determination of the heart rate for 1 minute

<table>
<thead>
<tr>
<th></th>
<th>Multiply</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse</td>
<td>(6-seconds)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>*10</td>
<td>60</td>
</tr>
<tr>
<td>8</td>
<td>*10</td>
<td>80</td>
</tr>
<tr>
<td>10</td>
<td>*10</td>
<td>100</td>
</tr>
<tr>
<td>12</td>
<td>*10</td>
<td>120</td>
</tr>
</tbody>
</table>

If your pulse is not regular,
Count pulse for **15 seconds** and **multiply by 4** to get your pulse for 1 minute.

HOME EXERCISE PROGRAM

The Home Exercise Log - on Breathing & Physical exercise (upper & lower extremity) is given below

- Keep a record of your rating of perceived exertion (RPE) at rest and after exercise.
- Stop exercise if you experience any untoward symptoms. (e.g.) undue shortness of breath, chest pain, weakness or any irregular heart beat (increased or decreased).
- You have to aim for the following duration and frequency of Breathing and Physical exercises (Both Upper and Lower extremities exercises) for the better benefits.
- Try to perform all the 3- types of breathing exercises (Diaphragmatic with Pursed lip, Blowing Out Bubbles through water using straw and Blowing a Balloon) everyday for a period of 5 minutes for each type and take 2 minutes rest if necessary prior to the next type of breathing exercise. (Preferably all the 3 – types of breathing exercises if not at least minimum 2 – types should be practiced everyday).
- Try to perform all the four types of Upper extremities exercises (Wall hand climbing, Rope turning, Rod lifting and Pulley - tugging) everyday either in the morning or in the evening each type for about 5 minutes.
SELF CARE REQUISITES OF PATIENTS WITH COPD

Seeking & securing assistance for
- Dyspnoea management
- Breathing and physical exercise training
- Improvement of HRQOL

For continuous improvement

ASSESSMENT OF CHANGES IN
- Pulmonary functional measures (FVC, FEV₁, FEV₁/FVC, PEFR)
- HRQOL
- 6 Minutes walking distance

OUTCOME

EDUCATIVE ROLE
- Disease Condition
- Risk Factors
- Drugs & Diet
- Coping Techniques

SUPPORTIVE ROLE
- Demonstration of Exercises
- Guidance and supervision
- Periodic follow up

NURSING SYSTEM

SELF CARE DEFICITS

UNABLE TO
- Acquire instruction on exercise training
- Practice and regulate breathing and physical exercise
- Cope with impairment
- Modify the life style and self concept

IDENTIFICATION OF SUITABLE
- Breathing exercises and
- Physical exercises

DEVELOPMENT OF
- Manual on education & exercises
- Tool for assessment of HRQOL

THERAPEUTIC PLAN

Fig. 2.1 Conceptual Frame Work Based on Dorothea Orem’s Self Care Nursing Model for The Study on Effect of Multi Dimensional Pulmonary Rehabilitation of Patients with COPD
/ day, altogether for 20 minutes. (Practice all the four
type if not at least minimum 3 – types / day)

➤ Begin the Lower extremities exercise (Walking) with
2min. warm up, brisk walking and ends with cool down
exercises. The minimum of 15minutes brisk walking for
the first 2weeks, 20 minutes for the third and fourth
weeks, 25 minutes for fifth and sixth weeks and to aim
for the maximum duration of 30 minutes at the
beginning of seventh week to till the end of eighth
week.

➤ Perform the Upper and Lower extremities exercises at
least in an alternative basis (3-days UEE & 3- days LEE
) can be performed as per your ability and preference
either in the morning or in the evening.

**NOTE:** Sunday or any one day in a week can be a
holiday (without exercise) if you feel or require.