





The Breathe Better resource has been developed in partnership with Wintec's Centre for Sport Science and Human Performance with funding provided by the Wintec Research Office through a research voucher. Tanya Oberholzer has researched and developed the material for this resource as part of the Post Graduate Diploma in Sport and Exercise Science under the supervision of Stephen Burden, MSc (Medicine) Exercise Science and Principal Academic Staff Member at Wintec. For more information about Wintec's programmes or if you would like Wintec to undertake research for your organisation please visit www.wintec.ac.nz or call 0800 294 6832.

Breathe Better

The following pulmonary rehabilitation guide contains demonstrations and instructions on all exercises contained in your 'Breathe Better' program.

All the exercises, advice and demonstrations have been developed in association with Wintec Centre for Sport Science and Human Performance Asthma Society Waikato.

Your doctor or nurse has given you this program to provide you with a guide to appropriate exercises that can help improve your breathing.

WHAT IS COPD

Chronic Obstructive Pulmonary Disease (COPD) is a progressive disease that makes it hard to breathe. When it's hard to breathe it's normal to get anxious, making you feel even more short of breath and determined to do less. This in the long term can lead to feeling tired, unfit and even more breathless.

WHY YOU SHOULD EXERCISE IF YOU HAVE COPD

Exercise, especially aerobic exercise, can:

- Improve your circulation and help the body better use oxygen.
- Improve your COPD symptoms.
- Build energy levels so you can do more activities without becoming tired or short of breath.
- Strengthen your heart and cardiovascular system.
- Increase endurance.
- Lower blood pressure.
- Improve muscle tone and strength
- Improve balance and joint flexibility.
- Strengthen bones.
- Help reduce body fat and help you reach a healthy weight.

- Help reduce stress, tension, anxiety, and depression.
- Boost self-image and self-esteem.
- Improve sleep and make you feel more relaxed and rested.

Before starting an exercise program it is important to set realistic goals that can provide you with something measurable that you can work towards.

SETTING GOALS

It is important to set realistic goals that relate to your life and needs. If you are unclear about what goals are best for you, speak with your doctor or nurse, or go see a personal trainer.

HOW TO GET STARTED WITH AN EXERCISE PROGRAM

Pulmonary rehabilitation is a program that can help you learn how to breathe more easily and improve your quality of life by incorporating some exercises. It includes breathing re-training and physical exercise.

WHAT SHOULD YOU INCLUDE IN YOUR PROGRAM

Every exercise session should include a warm-up, conditioning phase, and a cool down/stretching phase.

A warm-up reduces the stress on your heart and muscles, slowly increases your breathing, circulation (heart rate), and body temperature. It also helps improve flexibility and reduces muscle soreness.

The best warm-up includes stretching, range of motion activities, and beginning of the activity at a low intensity level.

The conditioning phase follows the warm-up. During this phase the benefits of exercise are gained.

The cool-down phase helps the body recover faster after exercise. It is also a good time to do some proper stretches and increase flexibility.

EXERCISE TO BE INCLUDED IN YOUR TRAINING PROGRAM

Cardiovascular/Aerobic exercise: Running, stair climbing, walking, star jumps,

swimming etc. This involves a steady physical activity using large muscle groups. This type of exercise strengthens the heart and lungs, and improves the body's ability to use oxygen. Over time, aerobic exercise can help decrease your heart rate and blood pressure, and improve your breathing (since your heart won't have to work as hard during exercise).

Resistance/Strength training: This involves repeated muscle contractions (tightening) until the muscle becomes tired. Strengthening exercises for the upper body are especially helpful for people with COPD, as they help increase the strength of your respiratory muscles. This includes body weight exercises and weighted exercises (e.g. squats, push-ups, shoulder press etc.).

Stretching and range of motion (ROM): This is the slow lengthening of the muscles. Stretching the arms and legs before and after exercising helps prepare the muscles for activity and helps prevent injury and muscle strain. Regular stretching also increases your range of motion and flexibility.

BREATHING DURING ACTIVITY

There are two breathing techniques that can help you get the air you need without working so hard to breathe:

Pursed Lips Breathing Technique

- Breathe in through your nose (as if you are smelling something) for about 2 seconds.
- Pucker your lips like you're getting ready to blow out candles on a birthday cake.
- Breathe out very slowly through pursed-lips, two to three times as long as you breathed in.
- Repeat.

Benefits of Pursed Lips Breathing

- Slows your breathing down.
- Keeps airways open longer so your lungs can get rid of more stale, trapped air.
- Reduces the work of breathing.
- Increases the amount of time you can exercise or perform an activity.

• Improves the exchange of oxygen and carbon dioxide.

Diaphragmatic Breathing Technique

This technique is best used when you're feeling rested and relaxed, and while sitting back or lying down.

- Relax your shoulders.
- Place one hand on your chest and the other on your belly.
- Inhale through your nose for about two seconds.
- As you breathe in, your belly should move outward. Your belly should move more than your chest.

Benefits of Diaphragmatic Breathing

The diaphragm is the main muscle of breathing. It's supposed to do most of the work. When you have COPD the diaphragm doesn't work as well so muscles in the neck, shoulders and back are used. These muscles don't do much to move your air. Training your diaphragm to take over more "work of breathing" can help.

RECORDING HOW BREATHLESS YOU FEEL

It is important to record how breathless you feel during and after exercise. One of the best ways to do this is on a scale of 0 to 10; where 0 = no breathlessness at all, and 10 = maximum breathlessness. This is called the modified BORG scale.

By noting how breathless you feel, it will make it easy to see how you are improving as exercise becomes a part of your daily routine. You can share this information with your doctor.

MODIFIED BORG SCALE¹

Scale	Severity of breathlessness			
1	No breathlessness at all			
2	Very, very slight (just noticeable)			
3	Very slight breathlessness			

Borq G. Psychophysical bases of perceived exertion. Med Sci sports Exerc 1982; 14; 377-81

Slight breathlessness
Moderate breathlessness
Somewhat severe breathlessness
Severe breathlessness
Very severe breathlessness
Almost maximum breathlessness
Maximum breathlessness

GENERAL EXERCISE GUIDELINES

- Gradually increase your activity level, especially if you have not been exercising regularly.
- Remember to have fun. Choose an activity you enjoy. Exercising should be fun and not a chore. You'll be more likely to stick with an exercise program if you enjoy the activity.
- Wait at least 1 1/2 hours after eating a meal before exercising.
- When drinking liquids during exercise, remember to follow your fluid restriction guidelines.
- Dress for the weather conditions and wear protective footwear.
- Take time to include a five-minute warm-up, including stretching exercises, before any aerobic activity and include a five- to 10-minute cool down after the activity. Stretching can be done while standing or sitting.
- Schedule exercise into your daily routine. Plan to exercise at the same time every day (such as in the mornings when you have more energy). Add a variety of exercises so you do not get bored.
- Exercise at a steady pace that allows you to still talk during the activity.
- Exercise does not have to put a strain on your wallet. Avoid buying
 expensive equipment or health club memberships unless you are certain
 you will use them regularly.
- Stick with it. If you exercise regularly, it will soon become part of your lifestyle. Make exercise a lifetime commitment. Finding an exercise

"buddy" will also help you stay motivated.

• Keep an exercise record.

STOP EXERCISISING IF:

- You get chest pains or tightness.
- You feel dizzy or nauseous.
- You feel clammy or cold.
- You feel increasingly wheezy.
- · Your joints or muscles hurt.
- You feel very tired.

HOW TO USE YOUR BREATHE BETTER EXERCISE GUIDE

This program is designed to help you get active and at the same time record how much exercise you do and how breathless it makes you feel.

HOW TO READ YOUR EXERCISE PLAN

Exercise = Each individual movement (e.g., a bicep curl, a calf raise etc.) that you perform in your exercise plan.

Set = Group of repetitions (e.g., 2 sets of 10 reps = do 10 repitions of that exercise, have a break, and then do a second set).

Repetition (rep) = The number of times you lift and lower a weight or complete a movement in one set of an exercise. For example, if you lift and lower a weight 10 times before having a break, you have completed 10 "reps" in one set.

Rest Interval = Pause between sets of an exercise, which allows muscles to recover partially before beginning the next set.

DAYS TO EXERCISE AND WHAT SHOULD YOU BE DOING BY WEEK:

Weeks	Workout Plan	When
1-4	Plan A	Day 1
	Plan B	Day 4
	Plan C (Endurance)	Day 6

5 & 7	Plan A	Day 1 & Day 5
	Plan B	Day 3
	Plan C (Endurance)	Day 6 or 7
6 & 8	Plan A	Day 3
	Plan B	Day 1 & Day 5
	Plan C (Endurance)	Day 6 or 7
9 & 11	Plan A	Day 1 & Day 5
	Plan B	Day 3
	Plan C (Endurance & Interval)	Day 2 & Day 6
10 & 12	Plan A	Day 3
	Plan B	Day 1 & Day 5
	Plan C (Endurance & Interval)	Day 2 & Day 6
12 +	Plan A	Day 1 & Day 5
	Plan B	Day 3
	Plan C (Endurance & Interval)	Day 2, Day 4, & Day 6
13 +	Plan A	Day 3
	Plan B	Day 1 & Day 5
	Plan C (Endurance & Interval)	Day 2, Day 4, & Day 6
	*	•

Weeks 1-4: Start by doing x2 resistance training days and x1 cardio (endurance) day.

Weeks 4-8: Start by doing x3 resistance training days and x1 cardio (endurance) day.

Weeks 8-12: Start by doing x3 resistance training days and x2 cardio (endurance & interval training) days.

Weeks 12+: Start by doing x3 resistance training days and x3 cardio (endurance and interval training days.

Plan A

Exercise	Sets	Reps	Rest
Breathing and relaxation techniques		(3-5min)	

WARM-UP: RANGE OF MOTION EXERCISES

Exercise	Sets	Reps	Rest
Arm swings			
Arm crosses			
Arm pull back		4	
Body twist	1	x5-8	
Body dips	<u>'</u>	X 0	
Heel to toe walking		4	
Leg lift (front to side)			
Leg swings			

THE WORKOUT

Exercise	Sets	Reps	Rest
Push-ups	2-3	x8-15	:30-60sec
Sit-stand/squats		x10-20	
Step ups	2-3	x:30sec	:60sec
Tricep dips	2-3	x8-12	:30-60sec
Hip bridging		x10-15	
Star Jumps	2-3	x:30sec	:60sec

Bicep curls	2-3	x8-12	:30-60sec
Lateral leg raises		x:20-30sec (each)	
Prone hold	2-3	x Max	:30-60sec
High knees		x15-30sec	-

COOL DOWN

Exercise	Sets	Reps	Rest
Chest stretch			
Forearm stretch			
Bicep Stretch		•	
Tricep Stretch	1-2	x15-30sec	
Front thigh stretch		Tomas and the second se	
Back thigh stretch		Assessment	**
Buttock stretch		Automatica	A

NOTE: At the end of each section of exercises make a note of how breathless you feel, using the scale mentioned earlier.

Plan B

Exercise	Sets	Reps	Rest
Breathing and relaxation techniques		(3-5min)	

WARM-UP: RANGE OF MOTION EXERCISES

Exercise	Sets	Reps	Rest
Arm swings			
Arm crosses			
Arm pull back		distance	
Body twist	1	x5-8	
Body dips		X 0	
Heel to toe walking		4	
Leg lift (front to side)		. Paramatana	
Leg swings	→	Automatical	

THE WORKOUT

Exercise	Sets	Reps	Rest
Narrow band row	2-3	x8-15	:30-60sec
Rocking calf raises	_	x15-20	
Shoulder press	2-3	x8-12	:30-60sec
Prone hold		x10-15	
Seated leg extension + Flexion		:20-30sec (each)	:30-60sec
Pully exercises – T-band lat pull down		x8-12	:30-60sec
Side hold		:15-30sec (each)	

Supermans		

COOL DOWN

Exercise	Sets	Reps	Rest
Neck stretch			
Forearm stretch		d de la constanta de la consta	
Back stretch	1-2	x15-30sec	
Tricep Stretch			
Front thigh stretch		Annatani	Anna
Calf Stretch			

NOTE: At the end of each section of exercises make a note of how breathless you feel, using the scale mentioned earlier.

Plan C - Cardio

Examples of cardio exercises:

• Running • Star jumps

• Swimming • Boxing

• Cycling • Burpees

• Rowing • High knee sprinting on the spot

EXAMPLES OF CARDIO EXERCISES

Exercise	Sets	Reps
Endurance Cardio	1	5-30min (Start with 5 minutes, then progress from there).
Full body stretching	5minutes	

NOTE: At the end of each section of exercises make a note of how breathless you feel, using the scale mentioned earlier.

INTERVAL TRAINING SESSIONS TO CHOOSE FROM

Exercise	Work	Rest	Sets			
Interval Cardio	:15s	:45s	12			
OR						
Interval Cardio	:20s	:40s	15			
OR						
Interval Cardio	:30s	:60s	10			
OR						
Interval Cardio	:60s	:120s	7			
AND						
Full body stretches	5min					

Range of Motion Exercises





Arm Swings

Loosen up the shoulders by alternating your arms, swinging them up and down.





Arm Crosses

Swing both arms at the same time across the chest on an angle (loosen up shoulders, chest and arms).





Arm Pull Back

Lift arms up at the front to about shoulder height (palms facing down).

Pull arms back and squeeze shoulder blades together for 2 seconds (loosen up shoulders, shoulder blades and upper back).





Body Dips

Stand upright with arms hanging.

Reach as far as possible down the right side of the body with the right hand, nending the body to the side, without bending forward or backwards (loosen up core and lats).





Body Twists

Bring arms up to shoulder height, bent at elbows, lock hips in, and swing body from side to side (loosen up upper back and core).





Heel To Toe Walking

Walk from your heel onto your toes (loosen up feet and ankles).





Leg Lifts

Lift bended leg up at the front as high as possible then out to the side (loosen up legs and hip flexors).





Leg Swings

Hold on to a wall. Standing upright and swinging one leg at a time through full range of motion a few times (loosen up hamstrings).

Upper Body Strengthening Exercises





Wall Push-up

Inhale as you lower yourself (bending arms), and exhale as you push yourself away from the wall.

Raise both arms in front (just outside of shoulder width apart), placing hands on the wall, give a small step away, raise onto toes, keeping a straight line with the body, contracting the core muscles, slowly lower yourself onto the wall and push away.





Progression - Knee Push-ups

Kneel down, placing your hands on the floor just above shoulder height and wider than shoulder width apart.

Keep your body from your knees to your shoulders in line.

Tighten up the core muscles.

Bend the arms to about 90° and make sure that the body stays in a straight line when going down in to the push up position, then push back up.





Progression - Full Push-ups

This is performed the same way as the knee push-ups, however instead of being on the knees you'll be on your feet, forming a straight line from your ankles to your shoulders, keeping your core tight.





Shoulder Press

Exhale as you push arms up, inhale as you bring them back down.

Stand with feet shoulder width apart, and keep your back straight.

Raise arms up to shoulder height – with your palms facing forward, bending the elbows at 90°. Brace the core muscles as you push the arms up.





Progression - Shoulder Press with Weights

Hold a dumbbell in each hand and perform the exercise the same way as before.





Bicep Curls

Exhale as you curl your arms up, inhale as you straighten your arms.

Standing with feet shoulder width apart, with knees and elbows loose. Keep the back straight and core activated.

Keep arms next to your sides, turn the palms up as you curl your forearms up, then bring the arms back down slowly and controlled, keeping the elbows locked in place.





Narrow Band Row

Sit down on the floor with your knees slightly bent and your back upright, pushing out the chest while bracing the core muscles.

Loop a band around your feet, grabbing the ends with both hands.

Tucking the elbows in closely to the body, start pulling the band into your lower abdomen by moving the shoulders back, tensing the shoulder blades together and relaxing the traps.

Pull in fast (exhale), release slowly (inhale).





Wide Band Row

Take the same position as with the narrow band row, but instead of tucking the elbows in grab onto the band wider than shoulder width apart and keep the elbows high when pulling the band in.

Push chest out, palms facing down and pull the band in towards your upper abs.





Tricep Dips

Exhale when pushing yourself up, inhale when lowering yourself.

Put your hands shoulder width apart on a secured bench or stable chair.

Slide your butt off the front of the bench with your legs bent at 90° .

Straighten your arms, keeping a little bend in your elbows to keep tension on your triceps and off your elbow joints. Dip arms to 90°.





Progression - Straight Leg Tricep Dips

Perform the exercise like before, but instead of bent legs, straighten your legs.



Prone Hold

Breath in through your nose and out through your mouth.

Lie face down on your stomach on a mat, with your elbows right underneath your shoulders.

Raise your body up, stay on your knees, rest your body weight on your elbows, keep your back straight and your hips up and pull your belly button in and hold tight. Forming a straight line from knees to shoulders.



Progression - Full Prone Hold

Move up to a full prone hold on to your toes, keeping the body in a straight line.

Brace your core muscles.



Side Hold - On Knees

Lie on your side in a straight line with your legs bend.

Put your elbow under your shoulder and raise your body off the floor.

Keep the body in a straight line, with the knees placed forward slightly, and brace your core.



Progression - Side Hold On Feet

Repeat the above exercise, but instead of going on your knees, form a straight line with your body from your shoulders to your feet.

Keep the core muscles tight.

Lower Body and Back Strengthening Exercises





Seated Leg Raises

Exhale when raising the leg, inhale when lowering.

Sit on a bench/chair with your buttocks half way on the bench/chair, back straight (on a slight angle), and core activated.

Raise one leg straight out to the front between 45° and 60° and lower it to where it nearly touches the floor, then repeat.





Progression – Seated Leg Raise With Weights Around Ankles



Seated Glute Activation

Exhale on tensing the glutes, inhale on releasing the tension.

Sit on a Swiss ball or chair and tense the buttocks muscles for 2-3 seconds at a time.





Hip Bridging

Exhale on raising the hips, inhale on lowering.

Lie on your back and place your arms at your sides, with the palms on the floor next to your hips.

Place your feet flat on the floor directly beneath your knees. Press into the floor with your heels, exhale as you tighten the hamstrings and gluteal muscles and press your pelvis toward the ceiling, extending the hips fully at the top.

Pause briefly, then slowly lower to the floor.





Progression - Ball Squeeze Hip Bridging

Complete the same exercise, but place a ball between your knees and squeeze it at the top of the hip bridge to activate the inner thigh more.





Progression - Single Leg Hip Bridging

Raise one leg of the floor in a straight line with your body.

Press into the floor with the other heel, exhale as you tighten the hamstrings and gluteal muscles and press your pelvis toward the ceiling, extending hips fully at the top.

Pause briefly, then exhale as you slowly lower the hips to the floor.

Complete the exercise a few times on one leg then repeat on the other leg.



Superman - On Stomach

Exhale on raising arms and legs, inhale on lowering them.

Lay flat on your stomach, with your body stretched out (arms out in front, palms facing the floor).

Keeping the body stable, lift up the right leg and left arm at the same time – contracting the lower back and glutes, then alternating.





Progression - Superman On Knees

Stand on all fours with your hands underneath your shoulders. Form a straight line from your shoulders to your feet.

Contract the core muscles and lift up the right leg and left arm at the same time (contracting the lower back and glute muscles). Then alternate.





Progression - Superman On Feet

Stand on all fours with your hands underneath your shoulders. Form a straight line from your shoulders to your feet.

Contract the core muscles and lift up the right leg and left arm at the same time (contracting the lower back and glute muscles).

Then alternate.





Sit to Stand (Assisted Squat)

Exhale when standing, inhale when sitting.

Stand upright in front of a chair, with feet shoulder width apart.

Keep the core tight and sit back in to the chair, contracting the quadriceps muscles and keeping the chest up and the knees behind your toes.

Then stand back up.





Progression - Body Weight Squat

Perform the same movement, but instead of sitting down take the chair away and pause for a second at the 90° bended knee position and come back up.

When bending down keep your chest up, shoulders back, core tight and your knees behind your toes like you are about to sit on a chair.





Progression – Dumbbell Squats

Hold on to some dumbbells or weights in each hand.

Perform the same movement and pause for a second at the 90° bended knee position and come back up.

When bending down keep your chest up, shoulders back, core tight and your knees behind your toes like you are about to sit on a chair.





Calf Raises

Exhale when pushing up onto toes, inhale when dipping down.

Stand on a box with feet half way on. Raise up on to the heels (tensing the calf muscles), then dipping down as far as possible (dropping the heels).





Progression – 1 Leg Up And 2 Legs Down Calf Raises

Stand on a box with feet half way on.

Push up with 1 leg (keeping the other one in the air) and contract the calf at the top of the movement, then lower yourself down with 2 legs.





Lateral Leg Raises

Exhale when raising the leg, and inhale when lowering the leg.

Stand upright, holding on to a wall, with your stabilizing knee slightly bent and your core muscles tight.

Lift one leg out to the side as high as possible (tensing the glute muscles) without moving the rest of the body and bring it down slowly without touching the floor.

Repeat.

Flexibility Exercises

These exercises will allow you to reduce stiffness and increase your range of motion. It is important when doing these exercises to feel a stretching sensation, possibly with slight discomfort, but not pain.





Neck Stretch

Sit or stand with your back straight and your feet flat on the floor.

Tilt your head to one side.

Push down on opposite hand. You should feel a stretch in the side of the neck opposite the tilt.

Hold this position for 15-30 seconds then stretch the other side of the neck in the same manner.



Shoulder Stretch

Sit or stand with your back straight and one hand placed on the outside of the elbow of the opposite arm.

Pull elbow gently across the chest so you feel a stretch in the shoulder of the arm.

Hold this stretch for 15-30 seconds then stretch the other shoulder in the same way.



Back Stretch

Lay on your back keeping your shoulders on the floor

Bent your right leg over your left and twist your body to touch your right knee to the floor, while keeping your shoulders on the floor.

Hold this stretch for 15 - 30 seconds then stretch the other side the same way.



Chest Stretch

Stand with one hand and forearm placed against a wall. The forearm should be level with the shoulder. The elbow should be slightly behind the shoulder.

Turn your head and chest away from the wall.

You should feel a stretch in your arm and chest.

Hold this stretch for 15 - 30 seconds then stretch the other side of the chest in the same way.



Palm Up - Forearm Stretch

Sit or stand with your back straight and one arm extended in front of you with the palm facing up.

With the other hand, gently push down on the fingers of the extended hand.

You should feel a stretch in the forearm. Hold this position for 30 - 60 seconds the stretch the other palm in the same way. Repeat 3 times on each hand.



Bicep Stretch

Clasp your hands behind your back with your palms together, straighten arms and then rotate them so your palms face downward.

Raise your arms up and hold until you feel a stretch in your biceps. Hold this stretch for 15 – 30 seconds.



Tricep Stretch

Reach your left arm over your head, placing your right hand on the front of your left elbow.

Gently push your left arm down until you feel a nice tension. Hold this stretch for 15 – 30 seconds.



Palm Down - Forearm Stretch

Sit or stand with your back straight and one arm extended in front of you with the palm facing down.

With the other hand, gently push down on the fingers of the extended hand.

You should feel a stretch in the forearm. Hold this position for 30 - 60 seconds.

Stretch the other palm in the same way. Repeat 3 times on each hand.



Buttock Stretch

Sit on the floor with both legs stretched out in front of you.

Bend the right leg and place right foot over left leg.

Pull your right knee towards your chest and twist the upper body towards the right side.

Hold this position for 15 - 30 seconds then stretch the other side of the buttock in the same way.



Back Thigh Stretch (Hamstring)

Sit with your back straight, one leg bent with the foot against the straight leg, and the other foot extended in front of you with the heel on the floor and the toes pointing upward.

Reach down to touch your foot, calf or knee (as far as you are able without pain). Remember, bend from the hip, not from the back. You should feel a stretch in the back of the thigh.

Hold this position for 15 - 30 seconds then stretch the back of the other thigh in the same way.



Front Thigh Stretch (Quads)

Stand resting one hand on a wall or on the back of a chair for balance.

Hold your ankle or the hem of your trousers with your hand and pull up gently.

You should feel a stretch in the front of the thigh.

Hold this position for 15 - 30 seconds.

Stretch the other thigh in the same way.



Calf Stretch (Soleus)

Begin this calf stretch with your hands against the wall and your leg to be stretched in front of you.

Keep your heel down. Gently move your knee forward over your toes until you feel a stretch in the back of your calf or Achilles tendon.

Hold for 15 - 30 seconds.



Calf Stretch (Gastrocnemius)

Begin this calf stretch with your hands against the wall and your leg to be stretched behind you.

Keep your heel down, knee straight and feet pointing forwards.

Gently lunge forwards until you feel a stretch in the back of your calf or knee.

Hold for 15 - 30 seconds.

U



Supported by

