St. Joseph's Healthcare Hamilton

Respiratory Rehabilitation Program

Ways to control your breathing

St. Joseph's Hospital
50 Charlton Avenue East
Hamilton Ontario L8N 4A6

This book belongs to: _____

Developed by the Occupational and Physiotherapy Department
Respiratory Rehabilitation Program

PD 5817 (Rev 01-2015) File: peyles

Inside this book . . .

Importance of Breathing Exercises

Breathing Training

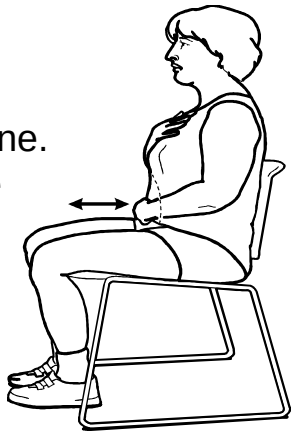
What does breathing training do?

- Moves stale air and carbon dioxide out of the lungs
- Moves fresh air and oxygen into the lungs
- Helps control shortness of breath at rest and with activity
- Helps remove mucous from your lungs

Pursed lip breathing (PLB)

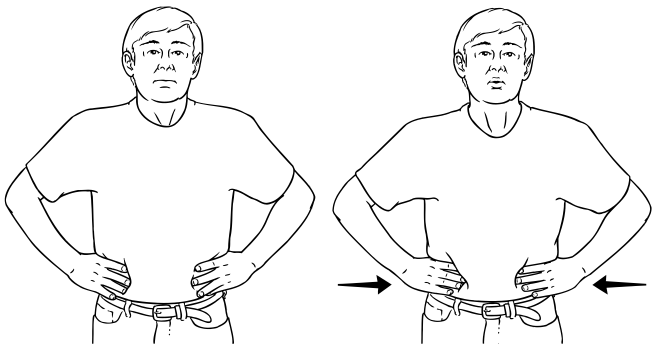
- Breathe in slowly through your nose and count – 1 and 2.
- Purse or pucker your lips as if you were going to whistle.
- Breathe out gently though your pursed lips and count slowly – 1 and 2 and 3 and 4.
- Do not force the air out of your lungs.
- There are a few ways to do this type of breathing. The physiotherapist will help you find the best way for you.

Deep or Diaphragmatic (Belly) Breathing



- Place one hand on your abdomen just under your breastbone.
- Slowly breathe in through your nose and feel your belly rise into your hand.
- Slowly breathe out through pursed lips and feel your belly fall away from your hand.
- Keep your shoulders relaxed - not hunched up.
- Do this sitting or lying in a comfortable position.

Rib Breathing



- Flatten your hands on the lower part of your rib cage.
- Breathe in through your nose and feel your ribs move outward.
- Breathe out and feel your ribs flatte…

Breathing Exercises

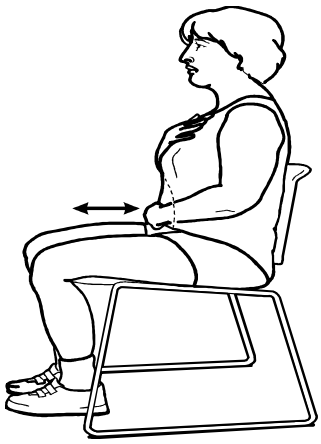
Why do these exercises?

- To promote a proper breathing pattern
- To help you relax
- To improve your flexibility

Remember . . .

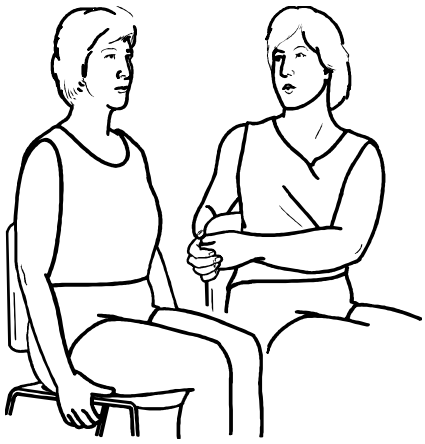
- Do these exercises **EVERY** day. Go at your own pace.
- Breathe out through pursed lips as you move.
- Listen to your body, do what you feel is comfortable; not every exercise is for every body!
- Keep a proper sitting posture:
    - feet flat on the floor
    - back supported (rolled towel if needed)
    - shoulders relaxed

The Exercises



1. Deep or Diaphragmatic Belly Breathing

- Place one hand on your abdomen just under your breastbone.
- Slowly breathe in through your nose and feel your belly rise into your hand.
- Slowly breathe out through pursed lips and feel your belly fall away from your hand.
- Keep your shoulders relaxed - not hunched up.
- Do this sitting or lying in a comfortable position.
- Repeat 5 times.



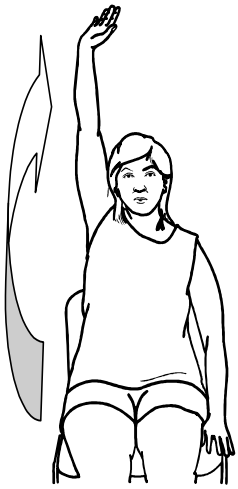
2. Trunk Rotations

- Sit in a relaxed position.
- Cross your arms in front of you, keeping your shoulders relaxed.
- Breathe in through your nose.
- Breathe out through your pursed lips and turn your body to one side.
- Breathe in.
- Breathe out and return to centre.
- Repeat to the other side.
- Repeat 3 to 5 times in each direction.

3. Elbow Touch

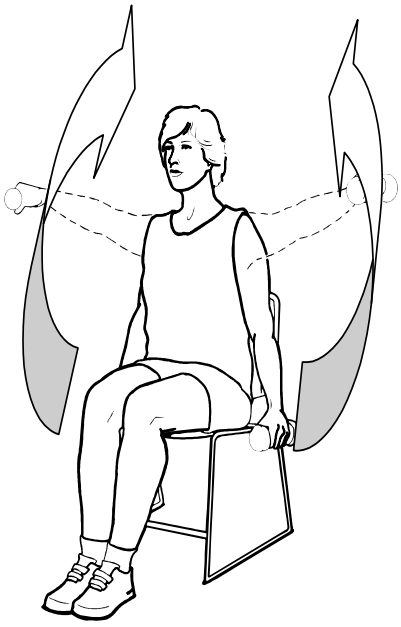
- Sit in a relaxed position with your arms bent at your side.
- Breathe in through your nose.
- Breathe out through your pursed lips and bring your elbows back, as if you were trying to make them touch.
- Breathe in.
- Breathe out and return to start position.
- Repeat 3 to 5 times.

4. Reaching to the sky



- Sit with your arms relaxed by your side.
- Breathe in through your nose.
- Breathe out and lift one arm up, reaching to the sky.
- Breathe in.
- Breathe out and return the arm to the start position.
- Repeat with the other arm.
- Repeat cycle 3 to 5 times.

5. Windmill



- Sit with arms relaxed by your side.
- Breathe in through your nose.
- Breathe out through your pursed lips and bring your arms up over your head and try to touch your palms together.
- Breathe in.
- Breathe out and bring your arms back to the start position.
- Repeat 3 to 5 times.

6. Seated Kicks

- Sit in a relaxed position with both feet flat on the floor.
- Breathe in through your nose.
- Breathe out through your pursed lips and kick your foot up off the floor.
- Breathe in.
- Breathe out and lower it back to the start position.
- Repeat with the other leg.
- Repeat cycle 3 to 5 times.

7. Shoulder Shrugging

- Sit with your shoulder relaxed and your arms by your side.
- Breathe in through your nose.
- Breathe out through your mouth and lift your shoulders up as if trying to touch your ears.
- Breathe in.
- Breathe out through your pursed lips and relax your shoulders to the start position.
- Repeat 3 to 5 times.

Take a break if you need to!

8. Shoulder Rolls

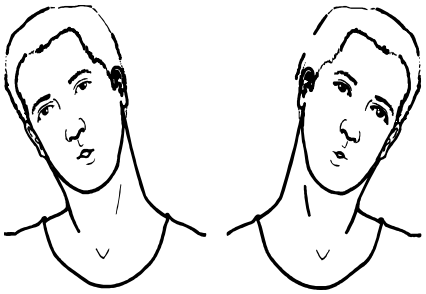
- Sit with your shoulders relaxed and your arms by your side.
- Breathe in through your nose and out through your pursed lips in a slow, controlled manner.
- Roll your shoulders backwards for 3 to 5 breath cycles.
- Repeat rolling your shoulders in a forward direction for 3 to 5 breath cycles.

9. Foot Rocking

- Sit in a relaxed position with both feet flat on the floor.
- Breathe in through your nose and out through your pursed lips in a slow, controlled manner.
- Rock your feet from heel to toes in a smooth pattern.
- Continue for 3 to 5 full breath cycles.

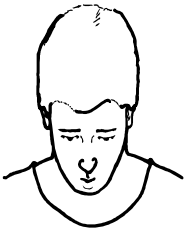
10. Neck Stretches

Sit in a relaxed position with your arms by your side. **Do these slowly and gently.**



Ear to shoulder

- Breathe in through your nose.
- Breathe out and lean your head to one side as if trying to touch your ear to your shoulder. Keep your eyes looking forward.
- Hold the position and breathe in and out 3 times.
- Return to centre on your last breath out.
- Repeat going to the other side.



Chin to chest

- Breathe in through your nose.
- Breathe out and drop your chin down to your chest, keeping your shoulders relaxed.
- Hold the position and breathe in and out 3 times.
- Return to centre on your last breath out.

Turning to one side

- Breathe in through your nose.
- Breathe out and turn your head to one side.
- Hold the position and breathe in and out 5 times.
- Return to centre on your last breath out.
- Repeat going in the other direction.

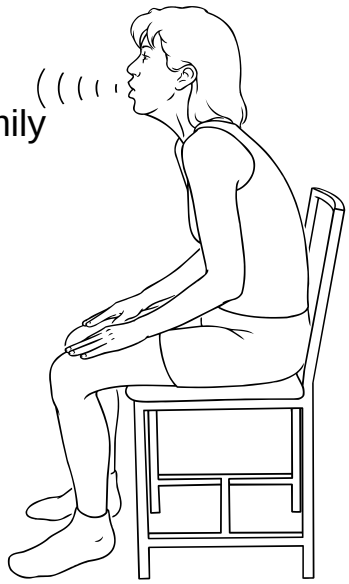
Clearing the Airways

Coughing is the natural way to remove substances from your lungs. Some of you may have more mucous or phlegm that causes you to cough. Also, when you have a chest infection it is important to get the phlegm out. This will keep the breathing tubes open and make breathing easier.

Coughing

Coughing is hard work. It can make you tired. The following steps will help you cough better with the least amount of energy:

1. Sit up.
2. Take a slow deep breath in until your lungs are almost full.
3. Try to hold the deep breath for 2 to 3 seconds.
4. Cough 2 times with your mouth slightly open. The first cough loosens the mucous. The second cough moves it to the back or your throat.
5. Sniff gently to take a breath in. Taking a big breath in right after coughing may send the mucous back into your lungs.
6. Cough the mucous into a tissue. Remember to check the colour.
7. Rest.
8. Wash your hands.
9. Do this with your breathing exercises, at least in the morning, and before you go to bed.



Your Physiotherapist (PT) may also teach you and your family other ways to help clear your airways. There are safety guidelines and instructions for each of them so please consult your Physiotherapist.

This may include:

- postural drainage
- manual techniques or chest physiotherapy
- oral devices

Managing Shortness of Breath

S. O. B.

Help for Shortness of Breath (S.O.B.)
S.O.S. for S.O.B.

When to use S.O.S. for S.O.B?

- To recover after coughing
- To recover after exercise or activity
- To help control panic and anxiety
- To help control sudden onset of shortness of breath
- To aid in relaxing the breathing muscles

S.O.S. for S.O.B.

- Stop and rest in a comfortable position.
- Put your head down.
- Get your shoulders down.
- Breathe in through your mouth.
- Blow out through your mouth.
- Breathe in and blow out as fast as is needed.
- Begin to blow out longer, but not forcibly. Use pursed lips if you find it works.
- Begin to slow your breathing.
- Begin to breathe in through your nose.
- Begin diaphragmatic or deep breathing.
- Stay in position for 5 minutes or longer until your breathing returns to a comfortable level.
- Make reassuring statements like “this will pass” and “I have gone through this before”
- You can use a fan or open a window to help circulate the air.

Adapted from The Lung Association

Positions to Ease S.O.B.

Rate Your Exertion: The Borg Scale
Monitor Your Shortness of Breath

What is the Borg Scale?

The Borg Scale is a way to measure how much work your muscles are doing when you are exerting in activities and exercise. It is a number scale. This scale describes how **you feel**. There is no right or wrong answer.

0	**Nothing at all**
0.5	**Very, very slight**
1	**Very slight**
2	**Slight or light**
3	**Moderate**
4	**Somewhat severe**
5	**Severe or heavy**
6	
7	**Very severe**
8	
9	
10	**Very, very, severe or maximum**

Source: Borg, G. V. (1982) Psychological basis of perceived exertion. Medicine and Science in Sports and Exercise, 14, 377-381.
American College of Sports Medicine.

Activities of Daily Living and Breathing Control

Breathing Control when You Wash and Dress

Many people with lung disease get short of breath when washing and dressing.

This is caused by the movements such as:

- reaching overhead
- rubbing and scrubbing
- twisting
- reaching your feet

Standing – The Problem

Standing to shower, wash at a sink or get dressed, adds extra demands on your body. These movements:

- increase your heart rate
- increase the amount of oxygen your muscles need
- increase the work of breathing

Save your energy

Your Occupational Therapist will help you learn how to wash and dress.
The goal is to control your breathing to lessen:

- fatigue or feeling tired
- shortness of breath
- frustration and
- breathing recovery time

The key to this is to ensure that you are:

- breathing correctly
- breathing with movement
- taking rest breaks

Sit down

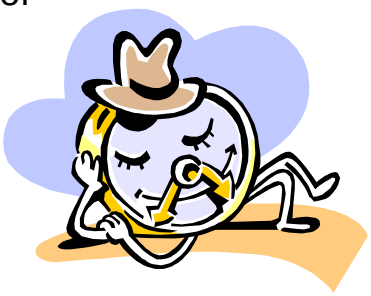
Sitting supports your body so you can focus on your breathing and your activities.

Helpful Hints when Sitting or Standing

- Maintain a regular flow of breathing as you move
- Never hold your breath
- Use pursed lip breathing
- Breath in before starting each movement
- Breathe out when moving out of your resting position or when doing a strenuous movement

  For example:
  - reaching overhead
  - reaching out in front of you
  - reaching below your waist
  - reaching to your feet
  - lifting your legs or feet

- Avoid quick jerky movements. Instead use slow, flowing movements. This uses less energy and causes less shortness of breath.
- Take regular rest breaths and rest breaks throughout the task.
- Avoid rushing. Rushing will cause you to feel more tired and short of breath.



Learning how to wash and dress will take some practice. You need to learn how to change your routines. It may also seem like getting washed and dressed now takes longer. However, by slowing down, breathing with movements, and taking rests, you will be less short of breath and have more energy for other important activities.

Let’s Talk about Exercise

Exercise

Exercise and activity is very important. Strong muscles improve function. Over time, exercise will reduce your level of breathlessness. This means you will be able to do your activities of daily living easier.

Remember . . . if you do not use it, you lose it.
Keep on moving.

Psychological benefits of regular exercise and activity

- Increases your self-confidence and self-image
- Makes you feel good
- Improves concentration and memory
- Helps you relax and sleep better
- Helps control anxiety
- Helps reduce food cravings

Long-term physical benefits of regular exercise and activity

- Helps your respiratory muscles work better
- Helps you control your breathing better
- Improves the function of your heart and lungs
- Improves the flexibility of your muscles and joint range of motion
- Maintains the health of your bones
- Enhances your co-ordination and balance
- Decreases your risk of injury and helps to manage pain
- Boosts your stamina and energy levels
- Optimizes weight control and increases lean muscle mass
- Helps in digestion
- And much more . . .

What to expect from regular exercise and activity

- Our muscles do a lot of work. At times, we may feel aches and pains during activity and exercise. This is normal.
- To help muscles recover, take rest breaks in between exercising.

Parts of an Exercise Program

There are 3 types of Exercise:

1. Stretching:

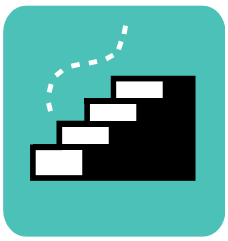
- Improves flexibility
- Lowers the risk of injury
- Keeps muscles and joints loose and agile

When you stretch . . .

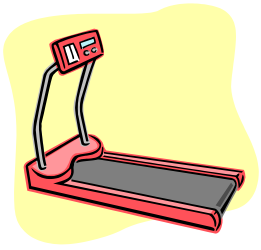
- Stretch slowly until you feel a gentle pull.
- Co-ordinate your breathing with your movements.
- Hold each stretch for 10 to15 seconds or longer if you can.

2. Strength Training:

- Refers to slow repetitive movements with certain muscles. These are often done using weights or resistance.
- Important to help you do tasks of daily living safer and easier.
- Standing up from a chair or climbing stairs also improves leg strength.



3. Cardiorespiratory or Aerobic Training:



- Continuous movement using large muscle groups like walking, cycling or treadmill.
- Increasing your heart and respiratory rate during aerobic activity improves conditioning.
- You need organized aerobic exercise to improve fitness. Walking from your bedroom to the living room **is not enough**.

Warm Up:

It is important to warm up 5 minutes before all exercises to:

- Warm up muscles and body temperature
- Increase heart rate and breathing rate slowly
- Lower the risk of injury
- Slowly increase your speed on the exercise equipment or when you are walking to ease into it

Cool Down:

It is important to cool down for 5 minutes before stopping.

Cooling down:

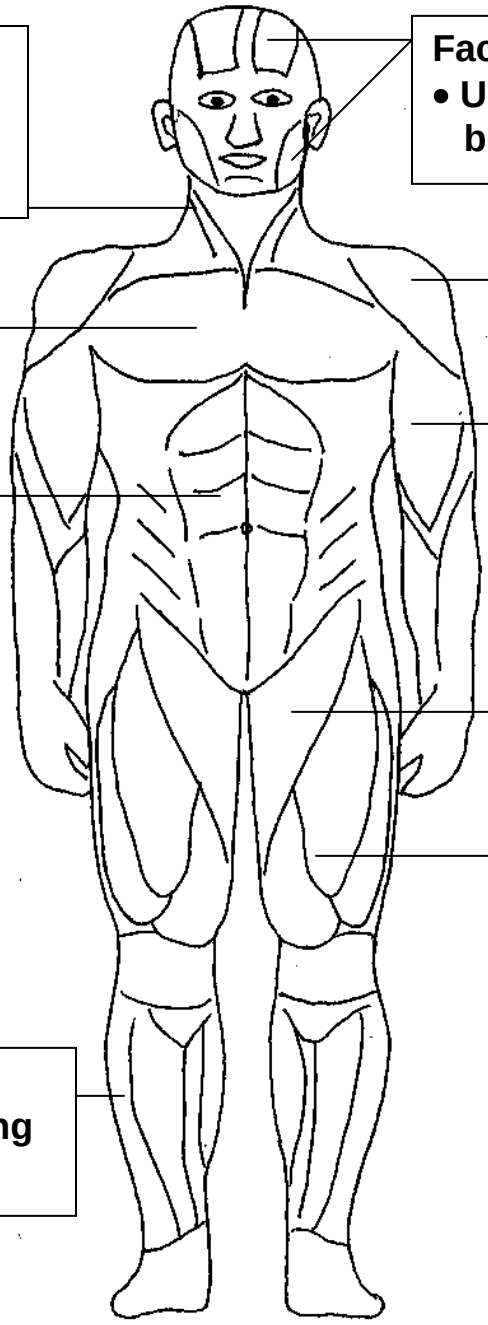
- prevents dizziness, sore muscles and blood pooling
- helps you regain control of your breathing and heart rate
- slowly decrease your intensity on exercise equipment before coming to a complete stop

Warm Up and Cool Down:

Breathing exercises and slow-paced walking are ways to warm-up and cool down.

Muscles to Move By

Muscles in the Front:



Neck Muscles:
- **Help with breathing.**
- **Need to stretch and relax.**

Facial Muscles:
- **Use for pursed lip breathing and smiling.**

Chest Muscles:
- **Help with breathing, moving shoulders.**
- **Need to stretch.**

Shoulder Muscles:
- **Move upper arms.**
- **Need to be strong.**

Abdominal Muscles:
- **Help with breathing, coughing and posture.**

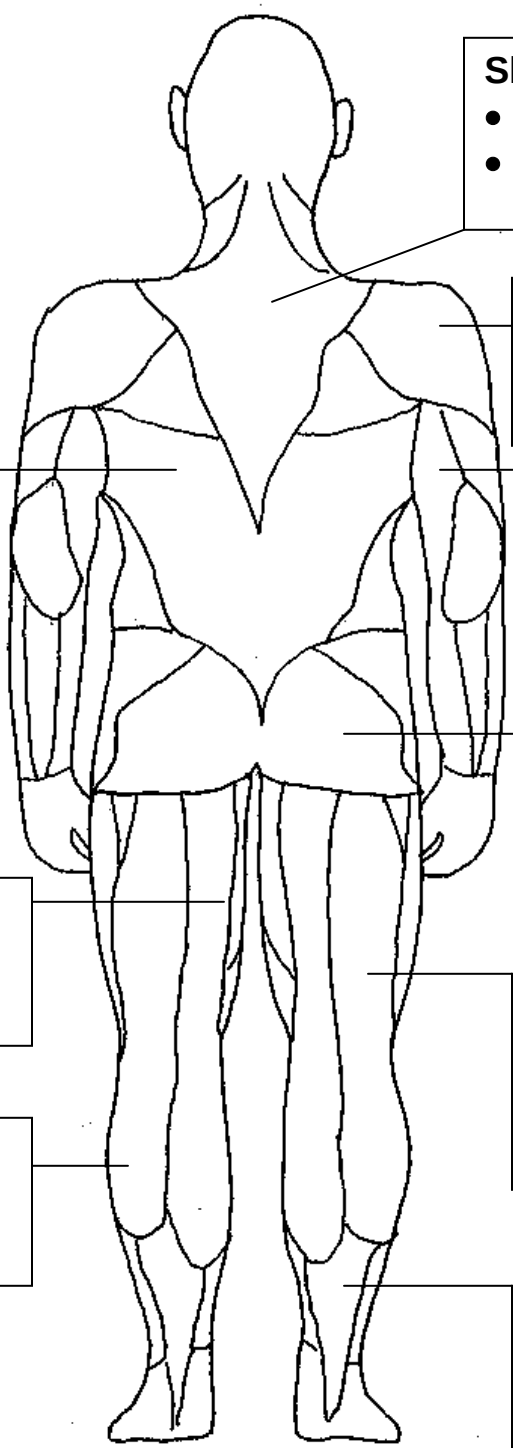
Bicep Muscles:
- **Bend elbows for lifting and overhead tasks.**

Hip Muscles:
- **Need to be strong for walking and moving.**

Thigh Muscles:
- **Need to be strong for walking and stair climbing.**

Shin Muscles:
- **Need to be strong for walking.**

Muscles in the back:



Shoulder and Neck Muscles:
- **Help with breathing.**
- **Need to stretch and relax.**

Shoulder Muscles:
- **Move upper arms.**
- **Need to be strong.**

Back Muscles:
- **Help with posture.**

Tricep Muscles:
- **Straighten elbows.**
- **Used for overhead motions.**
- **Need to be strong.**

Hip Muscles:
- **Help for walking, climbing stairs, and getting up from chair.**

Inner Thigh Muscles:
- **Help with walking.**
- **Need to be strong.**

Back Thigh Muscles:
- **Bend knees.**
- **Help with climbing stairs.**
- **Need to be strong.**

Calf Muscles:
- **Bend the ankles for walking.**

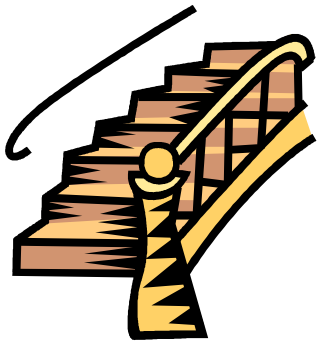
Achilles Tendons:
- **Help with walking and going up on toes.**
- **Need to stretch and strengthen**

Home Exercise Tips

It is important to maintain your exercise and activity levels.
Your Physiotherapist will give you a home exercise program and schedule to follow.

- Make exercise a regular part of your day.
- Set up an exercise space in your home with your equipment.
- Try to follow your schedule to keep on track.
- Give yourself time. It takes a few weeks to get into a routine.
- Avoid feeling discouraged. **Remember, practice makes perfect**.
- **Balance rest with activity.**

Your activity program may include:

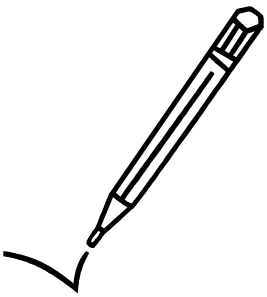


- Daily breathing exercises
- Walking
- Going up and down stairs
- Riding a stationary bicycle
- Using a treadmill
- Doing arm and leg strengthening exercises

Other places to do your exercise routine:

- Community Centre or Senior Centre
- Fitness or Wellness Centre
- YMCA or YWCA
- Shopping Mall walking

Keep an exercise record:



- Use the exercise sheets given to you by your Physiotherapist.
- This record helps you see your progress and keep on track.
- Write your reason for not exercising such as increased shortness of breath, feeling unwell or high humidity.

When you do NOT feel well:

- Do not exercise. You should still do your breathing exercises.

- Contact your doctor as advised on your individual Action Plan.

Introduction to Tai Chi

What is Tai Chi?

- Tai Chi is a form of exercise that combines deep concentration, slow coordinated movements and controlled breathing.
- The slow, circular motions of Tai Chi routines gently stretch muscles, massage internal organs, assist in blood circulation and release tension in your body. It is a full, gentle and relaxing workout with many benefits.

Getting ready . . .

Your physiotherapist will teach you how to do the Tai Chi movements safely. You will learn to do these movements sitting first. When you are ready for a harder workout, you can do Tai Chi standing.

Helpful hints:

- When you are sitting, sit up straight, with your head, neck and spine aligned. This promotes relaxation and helps lessen the stress on your back. Place one foot in front and the other foot slightly behind and angled outward.

- All movements are done slowly. Slow movements help create an awareness of every muscle and joint in your body. This also increases the number of muscles you use. Move at your own comfortable pace.
- Remember, not all movements are good for everybody. Do what feels right. If you have too much discomfort, take a rest break or stop the motion.
- Make sure your elbows are never fully straight. Always keep your joints slightly bent to help the energy flow gently through your body.

Your physiotherapist will teach you how to breathe. Remember to breathe out through pursed lips.

Warm Up

- **Deep breathing:** Internal warm up that relaxes the body and promotes movement of breathing muscles.
- **Ballerina stretch:** Warms up the shoulders and arms.

- **Gentle rotation of body with arms swinging:** Warms up the chest and stretches the breathing muscles.

Tai Chi Routine

Forward Wave

In this exercise, your arms lift smoothly up and down like a wave. "Wave" your arms up to shoulder level.

- Start with your hands on your knees ➔

- As you lift your arms up ➔

- As you lower your arms down ➔

Side-to-Side Wave

- Start with your hands on your knees.
- Lift your arms up gently. Move your arms to one side in a wave-like motion turning your torso at the same time.
- Return your “wave” to the centre and do the same on the other side.



Front-to-Back Wave

- Begin with both hands in the middle with your palms facing each other but not touching as shown in the picture below.
- Swing hands away and push them down and back.
- Return hands to the centre changing positions.
- Repeat 5 to 10 times slowly.



Pushing Hands

- Push your hands to one side as you extend your arms out to one side.
- Bring both hands back to a resting position.
- Then do this on the other side.
- Repeat 5 to 10 times.



Cool Down - Cross Finish Movement

- Raise both hands in front of your palms facing each other.
- Push hands back and down.
- Return to centre with your wrists crossed in front of your body.
- Repeat 5 to 10 times.



Your Heart

Your Heart, Heart Rate and Pulse

Your heart:

Your heart is a muscle. It works like a pump to deliver blood that contains oxygen to all of the parts of your body. As the cells in your body use oxygen they produce carbon dioxide. The blood then brings this back to your lungs to breathe out.

As your heart works it contracts to push the blood around and then relaxes. This is called your heart beat. As your heart contracts and relaxes you can feel your pulse and count the heart beats. This is called your heart rate.

There is a place on your wrist that you can feel your pulse and count your heart beats. This is described on page 27. Your physiotherapist will show you how to take your pulse and count your heart rate.

Why is it is important to check my heart rate when I exercise?

Here are some reasons why:

Safety

- Your heart rate helps you monitor the intensity of your workout to make sure you are not working too hard.
- If your heart rate is above your working heart rate range, you should slow down and use fewer arm movements.

Effectiveness

- If your heart rate shows that you are not working hard enough, you can increase the intensity of your workout.
- To make sure you are doing your aerobic workout hard enough, you need to stay in your working heart rate range for 15 to 30 minutes a day.
- This can be done throughout the day. Here is an example of a 20 minute program: walk 10 minutes in the morning then do 5 minutes of biking and 5 minutes of stairs throughout the rest of the day.

Benefits

- You will find that each week you will be able to exercise at a higher level of intensity and have the same or lower heart rate.
- This is the way your heart tells you it is getting stronger and more efficient. Positive results help you keep exercising.

Monitoring Your Heart Rate

There are 3 heart rates you will monitor:

1. Resting Heart Rate:

This is the rate of your heart after you have been sitting quietly for at least 5 minutes. A lower resting rate can mean that your heart is fit. Some medications can also make your heart rate faster or slower.

Your **Resting Heart Rate** should be between 60 to 100 beats each minute.

Take your **Resting Heart Rate** before starting to exercise.

2. Working Heart Rate:

Your Working Heart Rate is the rate you should try to reach when you exercise. This helps your heart, lungs and body get the most benefit from your workout. The Working Heart Rate may also be called your Target Heart Rate.

- Your Working Heart Rate is a good way to pace yourself when you exercise.
- Adjust your workout to stay in the middle of your working range:
    - ♦ If your heart rate is too high, slow down and do less arm movements.
    - ♦ If your heart rate is too low, go a little faster.
- You can read more about finding your Working Heart Rate range starting on page 40. The physiotherapist or physiotherapist assistant also helps you do this.
- Some people may have heart rates that do not fall within the training ranges due to other health conditions or medications. Your physiotherapist will plan your exercise program with you.

3. Recovery Heart Rate:

This is the heart rate you take as you cool down and 5 minutes after stopping exercise.

- It is important to get back to your resting heart rate.
- As your fitness improves, your heart rate will return to resting levels faster.

Checking Your Heart Rate

Checking your pulse

To check your heart rate you take your pulse. There are 2 places to check your pulse:

- on one side of the neck called the carotid
- on a wrist called the radial

Carotid pulse:

- A carotid artery on each side of the neck supplies blood to the head and neck.
- You can feel the carotid pulse by using your first (index) and second (middle) fingertips.
- **Gently** press these 2 fingers on **one side of the neck** beside your Adam's apple.
- Your physiotherapist will show you where and how to do this safely.

Radial pulse:

The radial pulse is over the radial artery inside the wrist. It is below the base of the thumb when your palm is up.

- Bend your elbow with your arm at your side, the palm of your hand up. Rest your hand on your lap.
- Using your first and second fingertips, **gently** feel for the radial pulse.
- Your physiotherapist will show you where and how to do this safely.

Count your radial pulse for:

- 1 full minute (60 seconds) **or**
- 15 seconds, then multiply this number by 4. Check the chart on the next page.

Remember . . .

- **Never use your thumb to take a pulse. Your thumb has a pulse.**

Heart Rate Table

Number of heart beats in 15 seconds	Number of heart beats in 1 minute
15	60
16	64
17	68
18	72
19	76
20	80
21	84
22	88
23	92
24	96
25	100
26	104
27	108
28	112
29	116
30	120
31	124
32	128
33	132
34	136
35	140

Calculating Your Working Heart Rate Range

For moderate intensity, your Working Heart Rate should be 60% to 80% of your maximum heart rate.

We will use the following short forms to calculate your Working Heart Rate and your Maximum Heart Rate:

- Beats per minute = **bpm**
- Heart Rate = **HR**
- Working Heart Rate = **Working HR**
- Maximum Heart Rate = **Maximum HR**

An estimate of your Working Heart Rate can be calculated by subtracting your age from 220.

For example, if you are 55 years old:

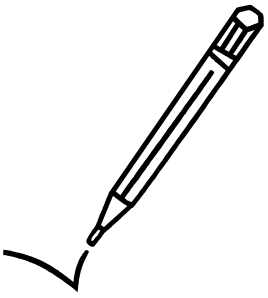
Step 1 220 – 55 = 165 bpm
Your Maximum Heart Rate is 165 bpm

Step 2 60% level: 165 x 0.60 = 99 bpm

Step 3 80% level: 165 x 0.80 = 132 bpm

Therefore your Working Heart Rate range is 99 to 132 bpm.

Calculating your Working Heart Rate Range



- There are working sheets on the next 2 pages to help you calculate your Working Heart Rate if you would like to try it yourself.

Your physiotherapist or physiotherapist assistant can help you do this or check your calculations.

Work Sheet

Step 1

220 - _____ **=** _____
Your age — Maximum Heart Rate

Step 2

60% level = _____ **X 0.60 =** _____
Maximum Heart Rate — Lower Working Heart Rate

Step 3

80% level = _____ **X 0.80 =** _____
Maximum Heart Rate — Higher Working Heart Rate

Your Working Heart Rate range is:

_____ to _____ bpm

or

_____ to _____ 15 seconds

(refer to the Heart Rate table on page 28)

Work Sheet

Step 1

220 - _____ **=** _____
Your age — Maximum Heart Rate

Step 2

60% level = _____ **X 0.60 =** _____
Maximum Heart Rate — Lower Working Heart Rate

Step 3

80% level = _____ **X 0.80 =** _____
Maximum Heart Rate — Higher Working Heart Rate

Your Working Heart Rate range is:

_____ to _____ bpm

or

_____ to _____ 15 seconds

(refer to the Heart Rate table on page 28)

Notes