

Home-Based Exercise Recommendations

Why is exercise important?

Exercise is an approach to help control overall health. It is considered an important part of care for individuals with pulmonary fibrosis (1,2). Pulmonary rehabilitation involves endurance, strength, and flexibility training, as well as, education on tools to better manage your lung condition. Research on exercise has shown improvements in walk distance, symptoms and quality of life for individuals with pulmonary fibrosis.

During pulmonary rehabilitation, you will establish a home exercise program. Continuing this exercise program will be key to maintaining your fitness and improving your ability to be physically active. If you have stopped exercising and want to start back you may find this exercise guide helpful. The resources below should only be used with the involvement and agreement of your health care provider who knows you best.

Benefits of exercise

- Improved endurance, strength, mood, independence, self-confidence, and well-being
- Reduced breathlessness, fatigue, depression and anxiety
- Overall increased health-related quality of life.

Set SMART goals for yourself. Follow these guidelines and you will be surprised at what you can do.

1. **Specific:** Your goal should be clear and easy to understand. *"I will start exercising."*
2. **Measurable:** How will you track your progress and how you will know when you have reached

your goal? Making your goal measurable means adding a number.

3. **Attainable:** Prior to adding a number, you have to set a range of days you can exercise per week. It's good to 'shoot for the stars', but you don't want to overdo it. Research suggests exercising a minimum of 3 days a week per American College of Sports Medicine (ACSM) (2). Only you and your physician know your limits. A measurable, attainable goal would be, *"I will exercise 2-4 days per week."*
4. **Realistic:** Set goals that fit where you are in your life right now. Don't set a goal that someone else wants you to do or doesn't fit your schedule. It's not motivating, and this may set you up for failure. Examine your goal so far. Does it seem realistic to you? If so, let's continue. If this isn't the right time in your life to focus on this goal, then choose something that is motivating to you.
5. **Time Oriented:** Include an end point. Knowing that you have a deadline motivates you to get started. For our example we can use 8 weeks. *"I will exercise 2-3 days per week for 8 weeks."*

Congratulations! You now have a SMART goal! To have a good game plan, set a few additional action-oriented SMART goals. For example:

- I will set up a designated area in my home to exercise safely.
- I will plan my work out for the time of day I normally have the most energy.
- I will track my exercise sessions on an exercise log. This will show my progress.

Re-evaluate your goals every 30 days, adjust as needed.

Checklist before you exercise

Check with your physician. Before starting any exercise program, make sure the planned exercise routine is safe for you. If you use supplemental oxygen, ask for instructions on settings for exercise and rest. Supplemental oxygen will significantly improve exercise performance, reduce the sensation of breathlessness and prevent exercise-induced hypoxemia (4).

Check your vital signs. Routine monitoring of vital signs is important to evaluate if safe to exercise and track improvements. Check with your healthcare team to know what you need to look for with each of these vital signs:

- Heart rate range
- Blood pressure range
- Oxygen saturation range (SpO₂)
- Rating of perceived shortness of breath using the 0-10 modified Borg CR scale
- Rating of exertion on 0-10 scale
- If you're diabetic, ask about blood glucose (BG) range. Be sure to check your BG before and after exercise. Have appropriate nutrition nearby, if needed.
- If you have chronic pain, you may want to ask about treatment before exercise. Pain management is an important part of exercise tolerance.

Regular monitoring may identify changes in disease course and help initiate timely, appropriate interventions. It is imperative to have monitoring equipment for vital sign assessment before, during and after your workout.

Monitoring equipment

- Pulse oximeter — to assess oxygen saturation (SpO₂) and heart rate (HR)
- Blood pressure monitor — to assess blood pressure (BP) while at rest
- Glucometer (as needed) — to assess blood glucose levels if you have type 1 or 2 diabetes
- Scale (as needed) — to assess weight if you have fluid retention issues and/or you are monitoring weight loss or gain
- Step counter — optional. Some smart phones have fitness apps that will count your steps each day
- Chart with shortness of breath and fatigue and/or exertion rating scale

Staying safe during exercise

- Adequate space for movement with good lighting, non-slip floor and no tripping hazards
- Dress for comfort, wear shoes that fit well and support your feet
- Best to have a family or friend home when you're exercising
- Sturdy chair with or without arms. Make sure the chair is stable enough to support you when seated or when holding on during the exercise
- Monitoring equipment to assess vital signs (see section above)
- Oxygen, if needed
- Water bottle
- Towel

Do NOT exercise if you're experiencing any of the following:

- Worsening of shortness of breath or cough
- Worsening oxygen levels on your usual oxygen prescription
- Treatment complications
- Complications from any of your other medical problems

Call your physician to report those symptoms promptly.

Exercise equipment

Specialized equipment is not necessary for home-based exercise but may add to the workout.

Cardio/Endurance training

Walking indoors or outdoors or marching in place can take the place of walking on a treadmill.

- Treadmill, recumbent stepper or bike
- Floor peddler

Resistance/Strength training

- Resistance bands/tubes
- Light (1 to 8 pound) weights
- Easy to grip 8-16 oz. filled water bottles or soup cans to use as weights
- Shopping bags with full cans
- Tennis ball for hand strength

Flexibility training

- Sturdy chair for seated or standing stretching

Balance training

- Sturdy chair for support

Selecting an exercise program that's right for you

People living with pulmonary fibrosis can do a variety of different exercises based on their physical capabilities and needs. Below is a list of exercises and schedules to provide a well-rounded work out.

Things to consider and discuss with your doctor before choosing a program

- Your current activity level — no/very little activity, some physical activity, or regular exerciser
- Oxygen requirement — low flow (1-6 lpm), high flow (6-10 lpm) or oxygen conserving device (oxymizer). If your current oxygen concentrator only goes to 6 lpm and you're noticing your SpO2 drop to less than 90% please notify your physician

Many patients with pulmonary fibrosis experience significant drops in oxygen saturations with activity. This should be accounted for before starting an exercise program. Have your physician give you guidelines on increasing oxygen flow rate to saturate order. During exercise, oxygen improves exercise tolerance, alleviates exercise-induced hypoxemia and reduces breathlessness .

- Other health issues — diabetes, high blood pressure, congestive heart failure, musculoskeletal problems or pain

Three examples of an 8-week comprehensive fitness program

- **Beginner 2-4 days/week.** Follow this program if you do very little or no activity or have more advanced lung condition
- **Intermediate 4-6 days/week.** May follow this program if you're doing some physical activity

Activity	Frequency	Intensity	Time	Type	Progression
Cardio (endurance)	3-5 d/week (5-7 d/week)	Shortness of breath: 3-6/10 Exertion rating: 3-6/10	20-60 min Continuous or Intervals	Walking, biking, swimming, rowing, marching in place	1-5 min/week
Resistance (strength)	2-3 d/week	Shortness of breath: 3-6/10 Exertion rating : 3-6/10	15-20 min	Upper body weight/band exercises, sit to stand, chair sit ups	1-3 sets of 8-15 reps
Flexibility (stretching)	2-3 d/week	Level of comfort	Hold stretch 10-30 sec	Trunk, chest, shoulder, legs	2-4x/stretch
Balance	2-3 d/week	Level of comfort	20-30 min	Standing balance exercises, Tai Chi, Yoga	

- **Advanced 5-7 days/week.** May follow this program if you're a regular exerciser and in the early stage of pulmonary fibrosis

The ideal exercise prescription for people with pulmonary fibrosis is not yet known (1). ACSM recommends that moderate intensity aerobic exercise should be the core of an exercise program for people with pulmonary fibrosis (2).

General guidelines with any exercise program:

- Start with a warm up
 - » Simple, gentle movement to get your muscles, joints and heart 'ready' for activity
 - » Allows your body to gradually adjust to doing more work and prevents straining muscles
 - » Can be done standing or sitting — depending on how you are feeling that day
 - » Warm up should be 3-5 minutes or longer if needed
- After your warm up
 - » Maintain good body posture and position whether you're seated or standing
 - » Pace yourself. Find the right speed and rhythm that works for you
 - » Breathe regularly during strength exercises. Exhale as you lift the weight and inhale as you lower it. If you're doing leg lifts, exhale as you lift your leg and inhale as you lower it.
 - » Avoid straight arms and gripping tightly — keep arms slightly bent and comfortable grip
 - » Use smooth, controlled movements with lifting
 - » To prevent injury, avoid jerking or thrusting
 - » Stop the exercise if you're experiencing any joint pain during the movement
 - » Avoid holding your breath and straining
- End with a cool down
 - » Just like the warm up, the cool down should be slower and gentler
 - » Slow down the speed and/or reduce the workload
 - » Allows your heart rate, breathing rates and blood pressure to return to your baseline normal gradually

BEGINNERS 8-week Schedule for a Comprehensive Fitness Program (2 – 4 days/week)

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Resistance Training		Work out		Work out			
Endurance Training			Work out		Work out		
Resistance Training on non-consecutive days	<ul style="list-style-type: none"> • Week 1-2: 1 set of 10 repetitions/exercise • Week 3-4: 2 sets of 10 repetitions/exercise • Week 5-6: 2 sets of 12 repetitions/exercise • Week 7-8: 2 sets of 15 repetitions/exercise 						
Endurance Training on non-consecutive days	<ul style="list-style-type: none"> • Week 1-2: for 10-15 minutes • Week 3-4: for 15-20 minutes • Week 5-6: for 20-25 minutes • Week 7-8: for 25-30 minutes 						
Stretch & Balance Training	can be done daily for 5-15 minutes either separately or part of your cool down						

*This eight-week training program is designed for beginners to get you started or for those with more advanced lung condition. It consists of two strength and two workouts to be completed each week. The key to the program is consistency. **For the next eight weeks, if you can commit to 15-30 minutes a day, two to four days a week, you will feel a difference in your health and fitness.***



INTERMEDIATE 8-week Schedule for a Comprehensive Fitness Program (4 – 6 days/week)							
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Resistance Training		Work out		Work out		Work out	
Endurance Training			Work out		Work out		Work out
Resistance Training on non-consecutive days	<ul style="list-style-type: none"> • Week 1-2: 1 set of 10 repetitions/exercise • Week 3-4: 2 sets of 10 repetitions/exercise • Week 5-6: 2 sets of 12 repetitions/exercise • Week 7-8: 2 sets of 15 repetitions/exercise 						
Endurance Training on non-consecutive days	<ul style="list-style-type: none"> • Week 1-2: for 10-15 minutes • Week 3-4: for 15-20 minutes • Week 5-6: for 20-25 minutes • Week 7-8: for 25-30 minutes 						
Stretch & Balance Training	can be done daily for 5-15 minutes either separately or part of your cool down						

*This eight-week training program is designed for those who are regular exercisers. It consists of three strength and four workouts to be completed each week. The key to the program is consistency. **For the next eight weeks, if you can commit to 15-30 minutes a day, five to seven days a week, you will feel a difference in your health and fitness.***

ADVANCED 8-week Schedule for a Comprehensive Fitness Program (5 – 7 days/week)

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Resistance Training		Work out		Work out		Work out	
Endurance Training	Work out		Work out		Work out		Work out
Resistance Training on non-consecutive days	<ul style="list-style-type: none"> • Week 1-2: 1 set of 10 repetitions/exercise • Week 3-4: 2 sets of 10 repetitions/exercise • Week 5-6: 2 sets of 12 repetitions/exercise • Week 7-8: 2 sets of 15 repetitions/exercise 						
Endurance Training on non-consecutive days	<ul style="list-style-type: none"> • Week 1-2: for 10-15 minutes • Week 3-4: for 15-20 minutes • Week 5-6: for 20-25 minutes • Week 7-8: for 25-30 minutes 						
Stretch & Balance Training	can be done daily for 5-15 minutes either separately or part of your cool down						

*This eight-week training program is designed for beginners to get you started or for those with more advanced lung condition. It consists of two strength and two workouts to be completed each week. The key to the program is consistency. **For the next eight weeks, if you can commit to 15-30 minutes a day, two – four days a week, you will feel a difference in your health and fitness.***

Cardio/Endurance exercises	Target body parts and muscles	Functional benefits
Walking (use assistive devices, if needed. Such as cane, walker, rollator, walking poles)	<ul style="list-style-type: none"> • Upper and lower leg muscles (gluteus maximus, quadriceps, hamstrings, tibialis anterior, gastrocnemius and soleus) 	<ul style="list-style-type: none"> • Weight bearing • Build endurance with less shortness of breath with walking
Marching in place (seated or standing)	<ul style="list-style-type: none"> • Upper and lower leg muscles (gluteus maximus, quadriceps, hamstrings, tibialis anterior, gastrocnemius and soleus) 	<ul style="list-style-type: none"> • Weight bearing • Build endurance with less shortness of breath with walking
Treadmill	<ul style="list-style-type: none"> • Upper and lower leg muscles (gluteus maximus, quadriceps, hamstrings, tibialis anterior, gastrocnemius and soleus) 	<ul style="list-style-type: none"> • Weight bearing • Build endurance with less shortness of breath with walking
Recumbent bike	<ul style="list-style-type: none"> • Hip and leg muscles • Ankle muscles 	<ul style="list-style-type: none"> • Non-weight bearing, low impact • Build endurance and strength with less shortness of breath with walking
Recumbent stepper	<ul style="list-style-type: none"> • Hip and leg muscles • Ankle muscles 	<ul style="list-style-type: none"> • Non-weight bearing, low impact • Build endurance and strength with less shortness of breath with walking
Sit to stands	<ul style="list-style-type: none"> • Thighs (quadriceps, hamstrings) • Buttocks (gluteus maximus) 	<ul style="list-style-type: none"> • Transitional weight bearing so you don't plop into your chair • Improve balance when standing
Foot cycle ergometer (peddler)	<ul style="list-style-type: none"> • Hip and leg muscles • Ankle muscles 	<ul style="list-style-type: none"> • Non-weight bearing, low impact • Build endurance and strength with less shortness of breath with walking

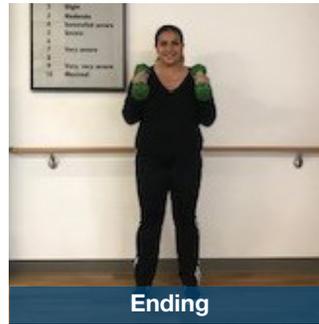
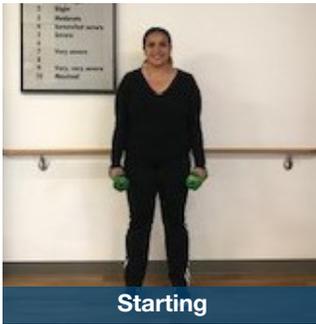
Resistance/ Strength exercises	Target body parts and muscles	Functional benefits
Bicep curls	<ul style="list-style-type: none"> • Front of upper arm (biceps) 	<ul style="list-style-type: none"> • Lifting pots/pans, groceries, laundry, or a grandchild
Upright rows	<ul style="list-style-type: none"> • Shoulders (deltoids) • Back (latissimus dorsi, trapezius) • Front of upper arms (biceps) 	<ul style="list-style-type: none"> • Lifting groceries, laundry, or a grandchild • Lifting something overhead, washing your hair
Chest pec deck	<ul style="list-style-type: none"> • Chest (pectoralis major) • Back of upper arms (triceps) • Shoulders (deltoids) 	<ul style="list-style-type: none"> • Pushing up from lying down/bed • Pushing a door open • Pushing a cart
Back rows	<ul style="list-style-type: none"> • Back (latissimus dorsi, trapezius) • Front of upper arms (biceps) • Shoulders (deltoids) 	<ul style="list-style-type: none"> • Improve posture • Improve thoracic cage capacity • Pulling a door open • Pulling a cart
Triceps extensions	<ul style="list-style-type: none"> • Back of upper arm (triceps) 	<ul style="list-style-type: none"> • Pushing up from a chair, car, toilet seat or from floor
Seated sit ups	<ul style="list-style-type: none"> • Core/abdominal muscles (rectus abdominus, obliques, transverse) • Erector spinae 	<ul style="list-style-type: none"> • Improve posture • More effective cough strength
Sit to stands	<ul style="list-style-type: none"> • Thighs (quadriceps, hamstrings) • Buttocks (gluteus maximus) 	<ul style="list-style-type: none"> • Stand to sitting, stair climbing, walking

Resource: E. Best-Martini and K.A. Jones-DiGenova, 2014, *Exercise for frail elders, 2nd ed (Champaign, IL: Human Kinetics)*

Reference: (3) Pictures to follow

Strength Exercises

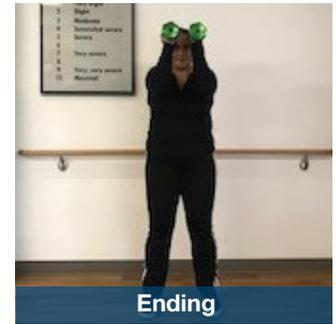
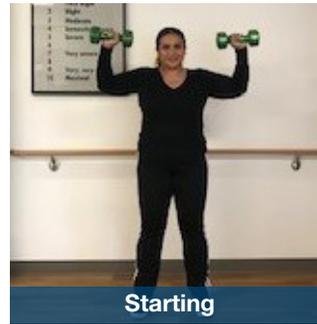
Bicep Curl



Preparation: Position two dumbbells to sides, palms facing in, arms straight. This exercise can be performed alternating or simultaneously (as shown in picture).

Action: With elbows to sides, raise dumbbells to shoulders. You may rotate forearm until forearm is vertical and palm faces shoulder. Lower to original position and repeat.

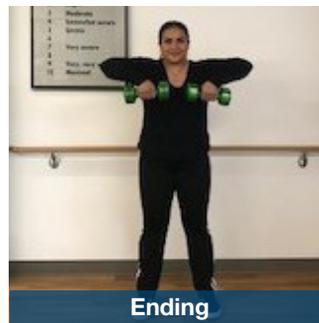
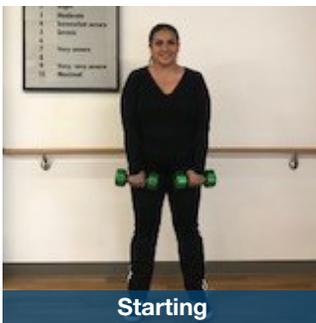
Pec Deck with Dumbbells



Preparation: Grasp dumbbells with palms facing forward, forearms vertical to the floor. Keep weight on the lighter side.

Action: Begin exercise by squeezing your chest and bring arms together so they meet together in front of your chest. Open to starting position and repeat.

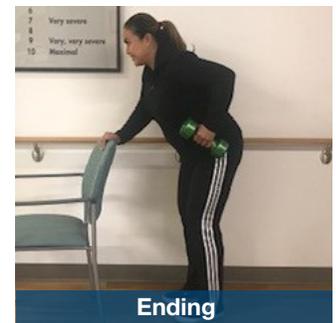
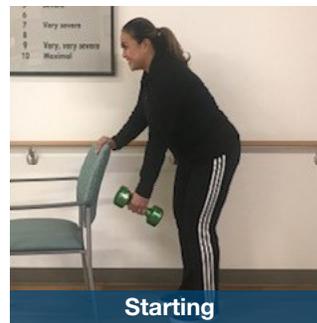
Upright Row



Preparation: Grasp dumbbells with palms facing front of thighs.

Action: Pull dumbbells to front of shoulder with elbow leading. Keep knuckles in line with wrist. May allow wrist to flex slightly as dumbbell rises upward. Lower and repeat.

Supported Back Row

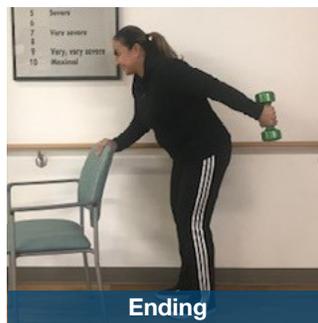
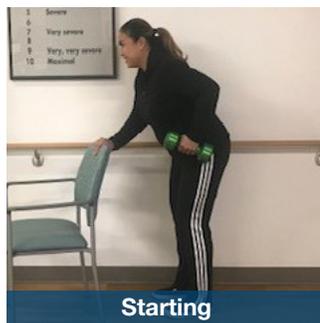


Preparation: Position with slight hinge forward from the hips, one arm supporting body with back of chair. Position foot of opposite leg slightly back to side. Grasp dumbbell from floor.

Action: Pull dumbbell up to side until it makes contact with ribs or until upper arm is just beyond horizontal. Return until arm is extended and shoulder is stretched downward. Repeat and continue with opposite arm.

Strength Exercises

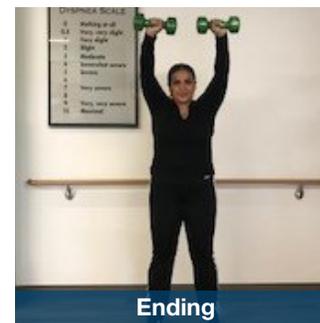
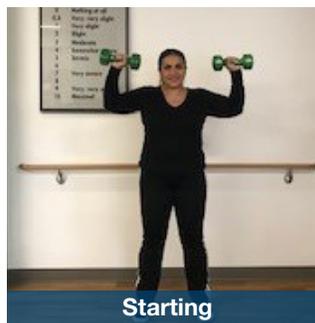
Supported Triceps Extension



Preparation: Hinge slightly forward from the hips, one arm supporting body with back of chair. Grasp dumbbell. Position upper arm parallel to floor.

Action: Extend arm until it is straight. Return and repeat. Continue with opposite arm.

Shoulder Press



Preparation: Position dumbbells to each side of shoulders with elbows below wrists.

Action: Press dumbbells upward until arms are extended overhead. Lower to sides of shoulder and repeat.



Balance exercises 5 static and 3 dynamic	Functional benefits
Hip flexion	<ul style="list-style-type: none">• Stair climbing, posture• Improved balance
Flamingo	<ul style="list-style-type: none">• Stair climbing, posture• Improved balance
Front leg lift	<ul style="list-style-type: none">• Stair climbing, posture• Improved balance
Side leg lift	<ul style="list-style-type: none">• Hip rotation, pelvic stabilization, posture, walking, improved balance
Tandem stance	<ul style="list-style-type: none">• Posture• Improved balance
Toe heel rock	<ul style="list-style-type: none">• Walking (push off phase)• Improved balance (static & dynamic)
Side toe tap	<ul style="list-style-type: none">• Improve balance moving side to side
Reverse toe tap	<ul style="list-style-type: none">• Walking (push off phase)• Improved balance (static & dynamic)
<i>Pictures to follow</i>	

Static and Dynamic Balance Exercises

Static balance. Always hold onto a sturdy chair or counter until your balance improves, you may progress to three fingers on back of chair, to two fingers, to one then none, only if safe to do so.

Hip Flexion



Preparation: Stand behind chair. Place the both hands on back of chair to begin.

Action: Lift one leg to 90-degree bent position. Keep your focus eye level. Hold for 20-30 seconds. Change legs and repeat.

Flamingo



Preparation: Stand behind chair. Place the both hands on back of chair to begin.

Action: Place either ankle/foot behind opposite calf muscle. Keep your focus eye level. Hold for 20-30 seconds. Change legs and repeat.

Side leg lift



Preparation: Stand behind chair. Place the both hands on back of chair to begin.

Action: Lift one leg to the side so it is slightly hovering off the ground. Keep your focus eye level. Hold for 20-30 seconds. Change legs and repeat.

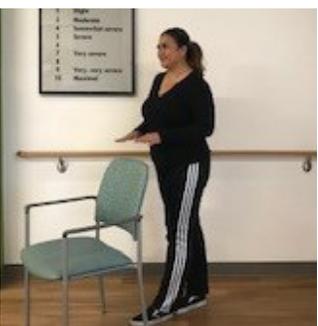
Front leg lift



Preparation: Stand behind chair. Place the both hands on back of chair to begin.

Action: Lift one leg in front of you so it is slightly hovering off the ground. Keep your focus eye level. Hold for 20-30 seconds. Change legs and repeat.

Tandem stance



Preparation: Stand behind chair. Place the both hands on back of chair to begin.

Action: Position the heel of one foot in front of the toes on the other foot. They can touch or almost touch. Keep your focus eye level. Hold for 20-30 seconds. Change legs and repeat.

Static and Dynamic Balance Exercises

Dynamic balance. Always hold onto a sturdy chair or counter until your balance improves, you may progress to three fingers on back of chair, to two fingers, to one then none, only if safe to do so.

Side Toe Tap



Preparation: Stand behind chair. Position your feet hip/shoulder width apart. Place the both hands on back of chair to begin.

Action: Keeping your focus eye level. Extend one leg out to the side, tap toe on the ground and return to starting position. Repeat this movement 10-15 times and switch to other leg. Keep your focus eye level.

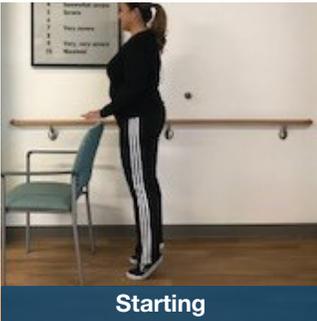
Reverse Toe Tap



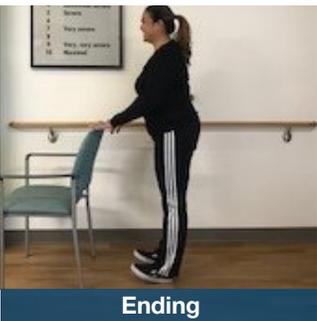
Preparation: Stand behind chair. Position your feet hip/shoulder width apart. Place the both hands on back of chair to begin.

Action: Keeping your focus eye level. Reach back with one leg and tap toe on the ground. Return to starting position. Repeat this movement 10-15 times and switch to other leg. Keep your focus eye level.

Toe Heel Rock



Starting



Ending

Preparation: Stand behind chair. Position your feet hip/shoulder width apart. Place the both hands on back of chair to begin.

Action: Keeping your focus eye level, rise up on the toes. Lower back down to neutral position. Slowly rock back shifting your weight to the heels. Repeat this movement 10-15 times. Keep your focus eye level.

Hip Adduction



Preparation: Stand behind chair. Place both hands on back of chair to begin. Extend one leg out to the side.

Action: Move the outside leg to cross in front of stance leg. Return to start position and repeat this movement 10-15 times. Keeping your focus eye level.

Rating your Shortness of Breath and Exertion

When exercising you will want to assess and rate your shortness of breath and exertion using one of several sliding scales. There are several standardized scales available to use for both ratings. A common scale used is the Borg Scale. The “Borg CR-scales®” with instructions and a short folder can be obtained from: Borg Perception, Dr. Gunnar Borg, Radisvagen 124; 165 73 Hasselby, Sweden, E-mail: borgperception@telia.com. See the home page: www.borgperception.se. Tel: +46(0)8 271426.

Rating your Shortness of Breath (Dyspnea)

Shortness of breath, also called dyspnea, is a way to describe shortness of breath you feel during exercise. You may have been taught or read about how to use a rating of perceived dyspnea (RPD) scale during exercise or tasks. These scales allow you to rate the amount of shortness of breath you feel. The most user-friendly scale will be one that goes from 0 to 10 or 0 to 4. A score of 0 means you have no shortness of breath at all. At 10 (or 4), you are so short of breath that you need to stop the exercise or activity. The scale can help you realize how short of breath you are with specific activities. Your ratings on the scale can help you pace your activity. At first, your shortness of breath may be severe.

As you continue your exercise plan, you should notice improvement.

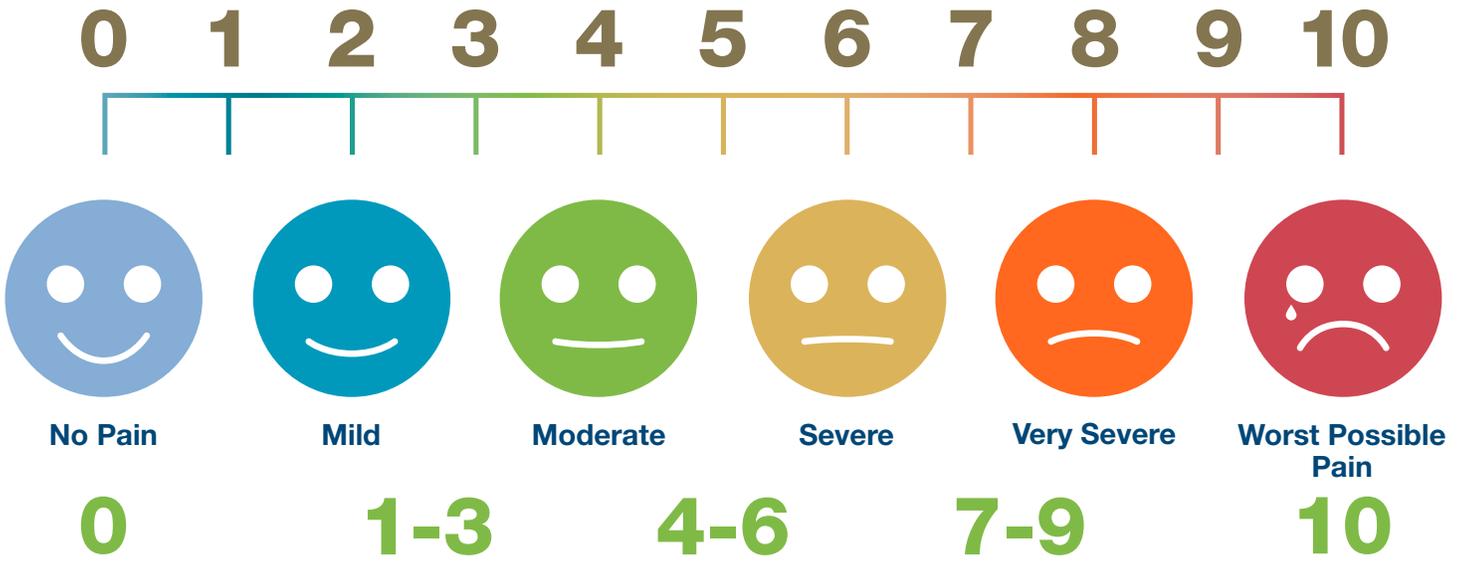
Report to your doctor when you experience any abnormal shortness of breath.

Rating your perceived exertion

Rating of perceived exertion (RPE) is endorsed by ACSM as a valuable and reliable indicator in monitoring your exercise tolerance. Rating your perceived exertion helps in determining how hard you are exerting yourself, including physiological (how hard you are breathing, how fast your heart is beating) and muscular strain (how much you feel the exertion in your muscles). These scales are similar to the shortness of breath scales. Use the same number scale for each parameter.

Recording your measurements in an exercise diary is an excellent way to keep track of your current exercise level as well as identify improvement.

Pain Assessment Tool



References

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