



Introduction to Strength Training

A PHA Classroom Video Resource Guide

Objectives: The goal of the PHA Classroom Exercise Series is to provide people with pulmonary hypertension (PH) information on improving endurance, muscle strength and quality of life through three broad fitness categories: flexibility, strength and cardio. This video series by the Pulmonary Hypertension Association is designed to give you information you need to work with your doctor and pulmonary rehabilitation program to tailor an exercise routine that is right for you.

Regular exercise can improve exercise capacity, muscle function and quality of life for patients with various types of PH. Strength training targets major muscle groups through resistance or weight training. It can improve the function of large muscles, overall stability and confidence, and cardiovascular health when part of a full exercise regimen.

The Introduction to Strength Training video provides examples of exercises that target major muscle groups: legs, core, arms and back. You

can complete them at home, in a gym or as part of a rehabilitation program. These exercises are designed for you to complete without weights or with light hand weights, resistance bands or commonly found household items such as soup cans.

Always ask your PH doctor before attempting any of these exercises. Ask your doctor whether these exercises would be safe and helpful for you.

Safe Exercise Tips

- Plan to exercise when you have the most energy.
- Always exercise with a partner and never alone.
- If there is furniture around, ensure it's out of the way in case you lose your balance.
- Don't hold your breath during exercise.
- Do not strain when lifting weights or doing strength exercises.
- You shouldn't feel exhausted, light-headed or dizzy during exercise. You might feel some shortness of breath, but you should always be able to talk and feel in control. If you don't, slow down and regain control of your breathing. Contact your doctor or call 911 if your shortness of breath doesn't ease after five minutes of rest.
- Include a warmup and cool-down into your exercise routine. It might take you more time to warm up than people who don't have PH. Don't feel discouraged if you need a longer warmup.
- Start small and work up. If you feel tired, you have found the limit of what you can do today. You're stronger than you were yesterday.

	Video Time Stamp	Intermediate	Chair/Modified	Doctor's Recommendation
Warmup Five minutes	3:30	Deep Breathing		
	4:10	Shoulder Rolls: three times		
	4:45	Knee Lifts: 10 times		
	5:20	Mini Squats: 10 times		
Leg Strength	6:08	Chair Squats: two sets of 10 Standing with your arms extended, start to sit down and lightly tap the chair, then stand back up.	Chair Squats: two sets of 10 Arms extended, start to stand up (putting weight on the leg) and then sit down.	
	9:42	Calf Raises: one set of 10 on the right and one set of 10 on the left or two sets of 10. Standing on one leg, rise onto the ball of your foot. Tap your heel on the ground and rise onto the ball of your foot again.	Calf Raises: one set of 10 on the right and one set of 10 on the left or two sets of 10. Standing with your feet shoulder-width apart, rise onto the ball of your feet. Tap your heels on the ground and rise onto the balls of your feet again.	
	12:14	Hip Exercise: one set of 10 on the right and one set of 10 on the left. Place a light resistance band between your ankles. Standing feet shoulder-width apart, place your right hand on your right hip. Move your right leg out, and then back in. Switch sides after one set.	Hip Exercise: one set of 10 on the right and one set of 10 on the left. Standing feet shoulder-width apart, place your right hand on your right hip. Move your right leg out, and then back in. Switch sides after one set.	
	14:52	Hamstring Curls: one set of 10 on the right and one set of 10 on the left. "Crisscross" a light resistance band and place between your ankles. With the leg being lifted, stand on the resistance band. Slowly bend your knee, bringing your heel toward your bottom. Keep your thighs together. Lower your foot.	Hamstring Curls: one set of 10 on the right and one set of 10 on the left. Slowly bend your knee, bringing your heel toward your bottom. Keep your thighs together. Lower your foot.	

Upper Body Strength

Video Time Stamp	Soup Cans/Hand Weights	Resistance Bands	Doctor's Recommendation
17:17	<p>Bicep Curl: two sets of 10.</p> <p>Holding a hand weight or a soup can palm up, bend the elbow to bring the weight to your shoulder.</p>	<p>Bicep Curl: two sets of 10.</p> <p>Step on a sport cord or resistance band and grip with both hands. Bend your elbow to bring the band up to your shoulder.</p>	
19:25	<p>Shoulder Abduction: two sets of 10.</p> <p>Hold a weight or soup can in your hand with your palm facing your body. Slowly raise your arm to the side with your thumb facing up.</p>	<p>Shoulder Abduction: two sets of 10.</p> <p>Step on a sport cord or resistance band and grip with both hands. Slowly raise your arm to the side with your thumb facing up.</p>	
20:30	<p>Shoulder Flexion: two sets of 10.</p> <p>Hold a weight or soup can in your hand with your palms facing back. Raise your arms forward until your hands are just below your shoulder.</p>	<p>Shoulder Flexion: two sets of 10.</p> <p>Step on a sport cord or resistance band and grip with both hands. Raise your arms forward until your hands are just below your shoulder.</p>	
21:34	<p>Tricep Extension: one set of 10 on the right and one set of 10 on the left.</p> <p>Hold a weight or a soup can in one hand. Lean slightly forward, with the arm slightly behind you. Straighten this arm backward, and then bend it back to your body.</p>	<p>Tricep Extension: one set of 10 on the right and one set of 10 on the left.</p> <p>Hold a sport band in your right hand, and loop it around the same hand. Place your left hand about 10 inches away on the band and secure against your right shoulder. Slowly extend your right elbow to straighten the right arm from the elbow downward. Slowly bend and straighten 10 times, then repeat on the other side.</p>	
24:02	<p>Postural Muscles: two sets of 10.</p> <p>Grip a resistance band.</p> <p>Relax your shoulders. Squeeze your shoulder blades back (together), stretching the resistance band.</p>	<p>Postural Muscles: two sets of 10.</p> <p>Relax your shoulders. Squeeze your shoulder blades back (together).</p>	

Core Strength	Video Time Stamp	Intermediate	Modified/Chair	Doctor's Recommendation
	27:22	<p>Upright Plank/Wall Pushups: two sets of 10.</p> <p>Stand near a sturdy table on a non-slick surface.</p> <p>Place your palms on the table and form the position of a plank. Lower the plank slightly toward the table, and then push it away.</p>	<p>Upright Plank/Wall Pushups: two sets of 10.</p> <p>Stand so your palms just touch the wall. Make your legs and back like it is a board (but do not lock your knees). Lower your body toward the wall.</p>	
31:40	<p>Dead Bug: two sets of 10.</p> <p>Lie on the floor. Try to touch your lower back flat against the floor. Place your hands lightly on your hips. Raise your legs slightly and slowly "march."</p>	<p>Dead Bug: two sets of 10.</p> <p>Sit toward the front of the chair. Keep your back straight, but lean slightly back. Place your hands lightly on your hips. Raise your legs slightly and slowly "march."</p>		

Questions to Ask Your PH Doctor

- Is it safe for me to exercise? If not, why?
- Is building strength through exercise right for me?
 - If strength building exercises aren't right for me, could you tell me why?
 - Is there anything I should avoid?
- Is there a pulmonary or cardiac rehabilitation program where I could safely learn about and try new strength-building exercises?
- What equipment do you recommend I use or avoid?
- How many times a week should I exercise to build strength? How long during each session? Can you describe how I will feel and if I will be sore after exercising?
- Should I plan to exercise around the time I take my PH meds? The video suggests that some people exercise an hour after taking their PH meds. Is this right for me? What about my diuretics?
- Is it safe for me to drink 8-12 ounces of water when I exercise? If not, what is appropriate for me?
- Should I monitor my heart rate when I exercise? What should be my maximum heart rate? The video says some people use 70% of their age-adjusted max. Is this appropriate for me?

$$(220 - \text{Age}) \times 70\% = \text{___ max BPM}$$
- How should I check my heart rate? Do I need a heart rate monitor? How do I check my pulse? Is it safe to check my pulse on my neck? Should I monitor my blood pressure?
- Should I monitor my oxygen levels when I exercise? Continuously, or just every once in a while? Is there an oxygen saturation level I should always be above? The video said many people use 88%. Is that right for me? What do I do if my oxygen saturation goes below that level?
- Should I change anything about my supplemental oxygen when I exercise?



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Disclaimer: This video and worksheet series has been created for people living with PH interested in learning more about exercise. Included in this series are the opinions of individual PH-treating healthcare professionals and not necessarily those of the Pulmonary Hypertension Association (PHA).

The PHA Classroom Exercise Series does not replace conversations between a patient and his or her PH care team, nor the recommendations that follow these conversations. It is imperative that you have a conversation with your PH team about whether or not exercise is safe and appropriate for you prior to engaging in any exercise activity, including those presented as examples in this series. Your PH team may have recommendations about exercise modifications, exercises to avoid, and any monitoring that would keep you safe. Every person is different, and that is especially true when it comes to people living with PH.

These resources are not designed to be a substitute for medical advice. As with any physical activity, you should talk to

your doctor about whether you are healthy enough to exercise or engage in any activities described in this educational series and the risks of engaging in such activities. PHA makes no warranty or guarantee as to the effectiveness of the methods described within these resources or that the activities are safe for all individuals.

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