

Pflex[®] (my new friend) and More ...

Carol Wallace, MEd, Certified Rehabilitation Counselor, Austin, Texas, contact at info@ventusers.org

I contracted polio in 1951 at age 5. Acute and rehabilitation hospitalization totaled two-and-a-half years with six months of iron lung treatment. Both of my upper extremities were and are paralyzed with only partial and weak right-hand motor function. As an adult, my forced vital capacity averages 48 percent. I require noninvasive mechanical ventilation whenever supine.

The Philips Respironics Pflex Inspiratory Muscle Trainer is an exercise device that my pulmonologist, who conducts a neuromuscular clinic once a month, prescribed for respiratory muscle strengthening. Pflex has six levels of inhalation resistance with setting 1 giving the least resistance and setting 6 giving the greatest resistance. Breathing only through the mouth, training starts at the setting that requires the patient “to work hard but not to the point where it is exhausting.”



Carol Wallace is shown using the Philips Respironics Pflex Inspiratory Muscle Trainer as part of her respiratory exercise program.

The instructions also say to inhale as deeply and forcefully as possible for approximately two seconds and exhale normally. During the first week, limit training to 10-15 minutes per day gradually increasing to 20-30 minutes per session or two 15-minute sessions per day. When your training gets easy, begin the process again for whatever length of time is tolerated at the greater resistance setting and gradually increase the duration of exercise as before.

I began using Pflex in mid-November 2012. I began at setting 1 and in a few days progressed to setting 2. I do two 15-minute Pflex sessions separated by about a 10-minute break every evening while watching TV news. When I tried setting 3 for only a few seconds, it felt so extraordinarily difficult that I questioned whether I would ever achieve it.

In the meantime I had noticed that, for me, the hardest part of the training was the first few minutes and the easiest was the last 15 minutes of 30. Because of this, when I began setting 3, I started by substituting setting 3 for setting 2 at the end of that session and gradually increased the minutes of setting 3 while decreasing the equivalent number of minutes of setting 2. This process continued until I reached two 15-minute sessions of setting 3.

Similarly, when I tried setting 4 for a few seconds, I felt I would never be able to do it. However, following the same above procedure of starting with the last few minutes of the second 15-minute setting 3 session and gradually increasing,

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within a week I was able to complete two 15-minute sessions at setting 4.

The benefits of Pflex for me include a noticeable decrease in shortness of breath during certain activities, most notably during aquatic exercise. For 22 years, three times per week, I've been walking in a rehab pool of 92-degree water for general health and to maintain balance and lower extremity and respiratory muscle strength. Included in my aquatic exercises are 20 minutes walking against water just above breast level and 20 minutes just below breast level. I exercise in the deeper level to achieve the greater water resistance against my respiratory muscles for strength maintenance.

***Ventilator-Assisted Living* asked Norma M.T. Braun, MD, FACP, FCCP, to review and comment on Carol Wallace's use of the Pflex® Inspiratory Muscle Trainer. Here is her response:**

I read with interest Carol Wallace's experience with learning to use a Pflex device for respiratory muscle training and it is accurate for her. In polio survivors there is wide variability in what muscles were affected and how severely as well as compensations/losses over time. She had growth on her side. The fact that she needed an iron lung so early guaranteed her need for ventilation at some time in the future. There are no good data, especially longer term, to describe the potential benefits of respiratory muscle training for patients with neuromuscular disorders and some in patients with post-polio syndrome: it is very much individuated.

Her approach is "scientific" as she edged into the task, assessing herself and her reactions to each incremental step. She back tracked or altered the pattern when fatigued or when perception of the task was too great, learned her pattern of responses and limitations and then "tested" herself in the pool, a translated real-life task. It would be useful to have parallel pulmonary and respiratory muscles function testing before, early and later to use as a measure that might reflect the extent of her improvement and what was of benefit and how long it may last. Kudos to her. Finding that fine line between enough and too much in respiratory or other muscle training is as pertinent in non-polio subjects as in polio survivors. It is just that the margin is so much smaller for polio survivors.

Dr. Braun is Ombudsman, Clinical Professor of Medicine, Columbia University College of Physicians & Surgeons, Department of Medicine, Pulmonary/Critical Care/Sleep Division, St. Luke's-Roosevelt Hospital, New York, New York.

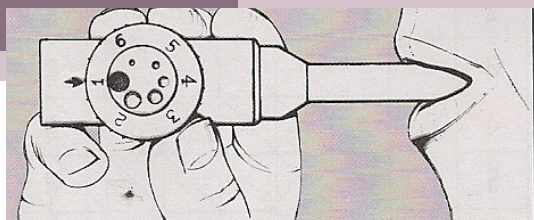
When I return after missing a few sessions in the pool, the difficulty is even greater for the first few minutes. In the last two to three years, breathing while walking through that deeper level has become more difficult and I've wondered if in a year or so whether I'd be able to continue. Immediately after starting setting 4, I had to miss a few weeks at the pool. As soon as I returned and entered the deeper level, I was immediately shocked at how much easier it was to breathe. This was my first deep water walk since beginning Pflex setting 4. My guess is that my breathing exertion at this deep level has improved to about the same as it was two to three years ago!

I will most certainly continue to use the Pflex trainer and intend to try setting 5 soon. Although I haven't had pulmonary testing since beginning Pflex, my clinical experience is encouraging enough for me.

"As soon as I returned and entered the deeper level [of the pool], I was immediately shocked at how much easier it was to breathe."

Note: I altered my Pflex training a bit from the instructions. Using the recommended nose clip caused me some panic, so I don't use it. I am disciplined to breathe only through my mouth without a nose clip because I've done so for years with my ambu bag exercise. I also stray from the instructions which say to "try to train at least 3-5 times per week." I found that when I skip a day the next day's sessions are noticeably harder. To avoid a more difficult session, I train every day but only for one 15-minute session once or twice a week.

The other piece of my respiratory exercise program is that every evening for a number of years, I stack breaths with an ambu bag to maintain chest wall flexibility as recommended by my pulmonologist. As I understand it, anatomical changes of normal aging result in a stiffening, and a decrease in size, of the thoracic cage. Since I cannot



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squeeze the ambu bag with my hand, I use a slightly longer hose and squeeze the bag between my knees. I stack breaths for maximum – but safe – chest wall expansion and hold it for about 50 to 55 seconds. One time I felt some pain in a rib at expansion, so that became a guideline for what to avoid. I do this stretching of my chest wall five times once a day, although ideally I should do it at least twice a day.

This is my management/exercise program for maintaining and improving my chest wall flexibility and respiratory muscle strength. ■

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Airway Clearance and Lung Volume Recruitment
Ventilator-Assisted Living, Vol. 25, No. 4
www.ventusers.org/edu/valnews/val_25-4aug11p1etc.pdf

MARCH 19-21. Medtrade Spring.

Mandalay Bay Convention Center, Las Vegas, Nevada.
www.medtrade.com/medtrade-spring

MARCH 23-29. Ventilator-Assisted Children's Center (VACC) Camp.

Miami, Florida. Contact Bela Florentin, VACC, Miami Children's Hospital, 305-662-8222, bela.florentin@mch.com, www.vaccamp.com.

APRIL 11-13. "A Breath of Fresh Air," Canadian Respiratory Conference.

Québec City Convention Centre, Québec City, Québec, Canada.
www.lung.ca/crc/home-accueil_e.php

APRIL 11-13. Sleep and Breathing.

European Respiratory Society and European Sleep Research Society. Berlin, Germany. www.sleepandbreathing.org

APRIL 26-28. Parent Project Muscular Dystrophy West Coast Connect Meeting.

San Diego Marriott Mission Valley, San Diego, California.
www.parentprojectmd.org

MAY 9-11. Spring FOCUS on Respiratory Care, Sleep Medicine, and Critical Care Nursing Conference.

Gaylord Opryland Hotel, Nashville, Tennessee. www.foocus.com

MAY 17-22. American Thoracic Society Annual International Conference.

Philadelphia, Pennsylvania. www.thoracic.org

JUNE 12. "Interdisciplinary Perspectives on Spinal Muscular Atrophy: Defining Your Role," SMA Research Group.

Disneyland Hotel, Anaheim, California. www.fsma.org

JUNE 13-16. FSMA Annual Conference.

Disneyland Hotel, Anaheim, California. www.fsma.org

JUNE 27-30. Parent Project Muscular Dystrophy Annual Connect Conference.

Baltimore, Maryland. www.parentprojectmd.org

SEPTEMBER 7-11. European Respiratory Society Annual Congress.

Barcelona, Spain. www.ersnet.org

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