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## FROG BREATHING: STILL USEFUL, STILL LIFESAVING

by Judith R. Fischer

**F**rog breathing, the common term for glossopharyngeal breathing (GPB) because of the frog-like gulping technique, has been used for centuries by deep sea divers in order to fill their lungs with reserve air just before diving. During the polio epidemics of the 1950s, respiratory polio survivors accidentally taught themselves to use GPB, and Rancho Los Amigos Hospital under Clarence W. Dail, MD, in Downey, California, became the leading respiratory center for GPB use. GPB enabled a person to produce adequate ventilation without the use of equipment. Many polio survivors still use it during equipment emergencies, and as a way to stretch the chest and aid coughing. GPB can also be taught to individuals with spinal cord injury.

Basically, the mechanism of GPB is the same as that of a pump: the tongue and the throat act as a piston, and the mouth, soft palate, and larynx act as valves, resulting in an expansion of the lungs as air is pumped into them. Canadian polio survivor Gary McPherson describes the technique thus: "Frog breathing involves the use of the throat and posterior tongue muscles to hold the breath once you have taken it. A vital capacity three to four times the tidal volume can be achieved with frog breathing.

"You take a breath through your nose or your mouth, then hold your breath and add to it with gulps of air. I start by taking a neck breath with my accessory muscles. I get about 150 cc of air in my lungs and then I hold it. Next I open my mouth and draw my tongue and throat muscles down to allow air to enter my throat. Then I close my mouth and force the air down my throat with my tongue and throat muscles while I hold my breath. I call this inspiration of air a stroke, and I get about 50-75 cc of air into my lungs with each stroke. Since my average breath is about 800 cc and I started with 150 cc from the neck breath, I need about ten strokes per breath. Sitting and talking I need about eighty breaths per minute. . . . Only when I have taken several strokes do I release my breath. It takes a lot of practice, and your throat and tongue muscles need to be active. . . .

"Frog breathing through the nasopharyngeal airway is very similar except you draw air in

through your nose instead of your mouth. However, the stroke volume is somewhat reduced. The advantages of frog breathing through the nose are that it provides natural humidification, it eliminates the dryness of the mouth, and aesthetically it is less obvious to the people around you. The muscles used in frog breathing need to be exercised regularly to gain strength and efficiency."

Augusta Alba, MD, who has helped many people learn frog breathing at Goldwater Memorial Hospital in New York, suggests one start by saying, "gup." The "g" puts the ball of the tongue in the proper position to push a bolus of air into the pharynx. Then the "p" closes the lips while the tongue relaxes in the floor of the mouth. "gup" should be said repeatedly about 100 times per minute with a pause every 15 seconds to exhale. If there is enough air in the lungs, the air expired at the end of a series should last 15 seconds. Dr. Alba's frog breathing studies show that effective use of the technique permits a more effective cough, improves lung compliance, allows more normal speech, decreases lung infections, and, of course, reduces dependence on mechanical assistance.

Audrey King, polio survivor and frog breather, says, "Those who have reduced capacities may find it a little harder to learn glossopharyngeal breathing because they guard the air they have and don't relax their chests to allow air in. Also, if you say "gup" you need air coming out of the lungs to voice the word, and that's the opposite of what you're trying to do, so it gets a little confusing. . . . It takes about eight or so successful "gups" before you can feel your chest expanding and know that you're doing the right thing, but once you get this feedback, you really are on to it.

"I think the best way to teach somebody is by having that person imitate the cluck sound that you make in the back of your throat. Then once you're copying the cluck sound, if you form the word "gup," but don't actually voice it so that you have the lip and mouth movement, you can feel the air going in fairly quickly. Frog breathing can be done anywhere, anytime. It is great for fatigue, for coughing, and for getting a deep breath."

Randy Haims, C-2 quad, learned frog breathing from a polio survivor while he was in a rehabilitation hospital following his accident. He did not use it consciously until about eight months later when he suddenly found himself doing it automatically. Haims asked his attendant to plug his trach, and frog breathed for about 25 minutes. He

"Frog Breathing with Gary McPherson," a 12-minute video, is still available from University of Alberta, Health Science Media Service, OJ1 Mackenzie Health Science Center, Edmonton Alberta T6G 2R7 Canada. 403/492-6560 or FAX 402/492-7303. Cost is \$50 Canadian.

eventually worked his way up to almost two hours of frog breathing time. For Haims, the disadvantages are dry mouth and fatigue; he prefers to neck breathe.

Frog breathing is not easy to learn for some people; perhaps the best way is to watch another person "frogging." John R. Bach, MD, of the University of Medicine and Dentistry of New Jersey, who also helps people learn to frog breathe, advises, "Frog breathing should be monitored by regular measuring of the volume of air per gulp and the number of gulps per breath. Many people are successful at it, but do not realize it."

Once learned, frog breathing can provide valuable minutes of air during ventilator breakdowns or other emergencies. Gary McPherson states, "a person can rest comfortably knowing that he is ultimately dependent on himself, not on a machine."

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### **PULMONARY REHABILITATION: THE OBSTRUCTIVE AND PARALYTIC CONDITIONS**

*Edited by John R. Bach, MD*

Of primary interest to *I.V.U.N. News* readers is the second half of *Pulmonary Rehabilitation: The Obstructive and Paralytic Conditions* (Hanley & Belfus, Inc., 1996, \$69.95). "The Paralytic/Restrictive Conditions" by John R. Bach, MD, Vice Chairman of the Department of Physical Medicine and Rehabilitation, the University of Medicine and Dentistry of New Jersey, covers conditions seldom discussed in other medical texts. Dr. Bach is to be commended for his thorough and comprehensive treatment of neuromuscular ventilatory failure and its medical management. A compelling feature of the book is the numerous photographs of ventilator users and their panoply of masks, mouthpieces, and adaptations. Dr. Bach concludes appropriately with a discussion of quality of life and ethical issues. An excellent resource for pulmonary rehabilitation health professionals and anyone else interested in longterm mechanical ventilation.

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