



# Continuing Care & Rehabilitation

Nov./Dec. '01

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FYI...

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American Association  
for Respiratory Care

## Notes from the Chair

by Mary Hart, RRT, RCP

A lot has changed since the last *Bulletin*. My heart is saddened by the events that took place on September 11, 2001. The tragic event touched many lives, but what happened in a matter of minutes also helped reunite our great nation, as witnessed by the outpouring of generous donations and acts of kindness.

I had planned to give you an update in this issue on the "latest and greatest" information I received while attending the annual American Association of Cardiovascular and Pulmonary Rehabilitation meeting in Minneapolis during the week of Sept 10. Unfortunately, that information will have to wait because the meeting was cancelled.

During the 2001 American Thoracic Society meeting, I presented a scientific poster on "Water-Based Pulmonary Rehabilitation" and will be sharing that information in this *Bulletin*. The information gained from this research has

been enough of a "thumbs up" for us to continue with our research in water-based pulmonary rehab. We hope to complete the final phase of our research project this year. I hope that sharing this abstract will encourage each of you to get involved in research. We all have the opportunity to ask a question and then find an answer. You don't have to be a "research scientist." In fact, our Medical Director, Mark Millard, MD, states, "the people taking care of the patients should be the ones asking the questions."

As always, I am still looking for section members who are willing to write articles for this newsletter. Remember, you don't have to be an experienced writer to submit an article. Just send your articles to me and I will send them on to our very helpful and talented staff at the AARC. Please contact me at (214) 820-9774 or email: mc.hart@baylordallas.edu. ■

## Breathin' Easy: Pulmonary Rehab at Saint Agnes Medical Center

by James Fayle, BA, RRT, CPFT, Saint Agnes Medical Center, Fresno, CA

We are proud of the success and benefits of *Breathin' Easy* rehab here at Saint Agnes Medical Center. More than 100 people have graduated from our outpatient program since its inception in August of 1998. Exercise and education sessions are held three times a week for patients in the primary phase of rehab. We are currently adding twice-a-week "maintenance" sessions for graduates who choose to use this format to continue good exercise habits.

Our team consists of a medical advisor physician and health care professionals from respiratory therapy, physical therapy, nursing, occupational therapy, nutrition, pharmacy, and spiritual care who direct participants through the six-week course. The program produces clinically significant improvements in daily function, self-management, and quality of life for most people in this population. (See chart.) Hospital admissions are low for this group. Since its inception, only 17% of our program graduates have been admitted for respiratory-related illnesses within the first year. Half of those readmitted also expired within that first year, which suggests that providing pulmonary rehab as early as possible in the course of a chronic lung disease may reduce the suffering incurred by these individuals and the expense placed upon health care providers.

Since last February, our program has also been participating in the National Emphysema Treatment Trial (NETT), functioning as a satellite rehab center primarily for Cedars-Sinai in Los Angeles. Fifteen other surgical centers across the nation could potentially send a NETT patient to us for the rehab aspect of the study.

Here's a look at our demographic summary from the first three years of operation (8/98 through 7/01):

1. Gender: 62 women, 41 men
2. Age range: 47-86
3. 92% of clients to date have been retirement age.

### Scope of services

The Saint Agnes program is referral-based and designed for *non-smoking* patients who have a chronic pulmonary disease. It has a proven track record for increasing physical and emotional functioning and quality of life, and for reducing admissions to acute care facilities.

The program has three components:

- *Assessment* of the client's severity of disease, exercise tolerance, coping skills, and level of motivation. Assessment is done

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- before and at the end of the program.
- Graded, supervised *exercise* to improve upper and lower extremity conditioning.
- *Education* for improving disease awareness and ongoing self-management skills.

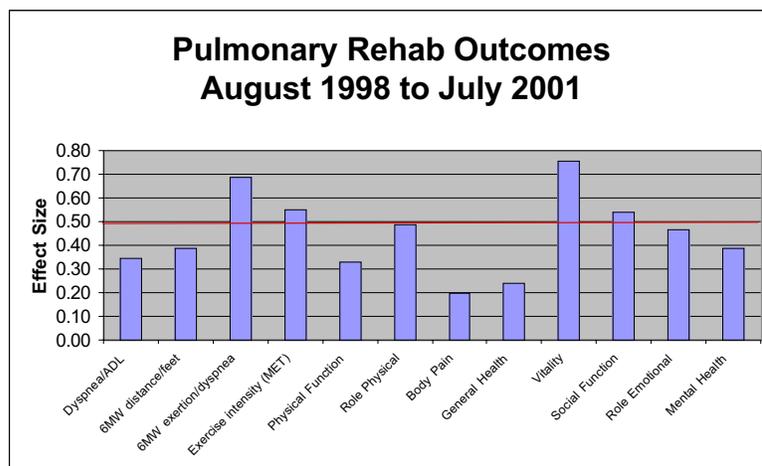
### Program overview

Each rehab class enrolls up to six clients in a format that allows new clients to begin any week there is a vacancy. The main objectives of the program are to increase exercise tolerance and maximize the disease-coping skills of participants. In addition to collecting physical performance data, two health-related survey questionnaires (*SF-36* and *University of California/San Diego Medical Center Shortness of Breath Questionnaire*) are administered before and after the program to assess its impact. Program staff attempt to provide a supportive environment that encourages healthy interpersonal relationships within the group and between participants and their family and physician.

Prompt feedback is given to the referring physician throughout the program. This includes

a written report of the patient's initial presentation and the rehabilitation plan, a follow-up report on program outcomes, and personal contact for incidental outlier events. As a disease

management tool, we track rehab graduates' use of Saint Agnes Medical Center acute care services for three years before and after entering rehab. ■



Number in study: 103 graduates of Pulmonary Rehab at Saint Agnes Medical Center, Fresno, California  
**Effect size** creates a higher threshold for data significance than standard statistical calculations.  
An "effect size" of > 0.5 demonstrates *clinically* significant change after rehab (all categories demonstrated "statistical" significance).

\*Reference: *Journal of Cardiopulmonary Rehabilitation*, Vol 20; No. 4, p. 231-234.

## Water-Based Exercise

by Ana Lotshaw, PT, CCS; Mary Hart, RRT, RCP; Joni Bokovoy, RN, DrPH; Mark Millard, MD; Baylor University Medical Center, Dallas, TX

*Editor's Note: The following article is based on a paper presented at the American Thoracic Society meeting held recently in San Francisco.*

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**American Association  
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11030 Ables Lane  
Dallas, TX 75229-4593  
(972) 243-2272  
FAX (972) 484-2720  
e-mail: info@aacrc.org

**Debbie Bunch**  
Bulletin managing editor

**Edwards Printing**  
Bulletin typesetting

Section Chair and Bulletin Editor

**Mary Hart, RRT, RCP**  
Baylor Asthma and  
Pulmonary Rehab Center  
3504 Swiss Ave., Ste. 303  
Dallas, TX 75204  
(214) 820-3500  
FAX (214) 841-9799  
mc.hart@baylordallas.edu

Traditionally, pulmonary rehabilitation (PR) has included land-based exercise modalities. Previous studies of these traditional programs have shown improvements in strength, endurance, and quality of life (QOL) in subjects with COPD. However, many COPD patients also suffer from other problems, such as arthritis, osteoporosis, and debilitation, that may make land-based exercise difficult. Water-based exercise programs utilize the properties of water; such as buoyancy, hydrostatic pressure, and turbulence, to allow persons with multiple skeletal problems to participate in exercise training at a higher intensity than would be possible on land. COPD patients can also benefit from the hydrostatic pressure to improve diaphragm position and chest wall mechanics. Previous studies have shown that healthy subjects, as well as those with COPD, can obtain endurance training benefits with water exercise. The purpose of this study was to determine if a water training program improves strength, endurance, and QOL in subjects with COPD.

### Methods

Twenty subjects with COPD (13 males, 7 females) participated in a 15-session water-based PR exercise training program. Subjects were, on average, aged 67.7 years (30-82 years) and had an average FEV1 of 1.34 Liters (.47-2.0 L).

Six Minute Walk (6MW), Six Repetition Maximum Strength Test (6RM), and the Medical Outcomes Study 36 Item Short Form Health Survey (SF-36) were obtained before and after the exercise training program. The 90-minute exercise session consisted of upper extremity and lower extremity resistive exercise and guided lane walking. Resistance was provided by the use of various floatation devices, such as kick-

boards, paddles, and foam barbells. Subjects were excluded from this study for unstable cardiovascular status, musculoskeletal limitations



to exercise, pulmonary fibrosis, inability to maintain adequate oxygenation with supplemental oxygen, or fear of water. This study was approved by the Institutional Review Board of Baylor University Medical Center, Dallas, TX.

### Results

Data were analyzed for central tendencies to determine mean values. Significance was determined using paired T-Tests. On an average, the 6MW test improved  $52 \pm 66$  meters ( $333m \pm 120$  to  $385m \pm 150$ ,  $p = .002$ ). Mean 6RM for the quadriceps improved from an average of 8 lbs.  $\pm 3$  to 15 lbs.  $\pm 7$ . ( $p < .0001$ ), and mean 6RM for the upper extremity improved from an average of 8 lbs. ( $\pm 5$  lbs.) to 13 lbs. ( $\pm 4$  lbs.;  $p < .0001$ ). The Mental Health and Physical Health Summary scores of the SF-36 both showed significant improvement, with p values of  $p = .01$  and  $p = .04$ , respectively.

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**Discussion and conclusions**

Based on the results of this study, a water-based PR exercise program is an effective mode of exercise for persons with COPD. The subjects showed improvement in endurance, strength, and QOL outcomes similar to those achieved in land-based PR programs. Limiting factors of this study included patient population and regulation of the intensity of exercise. Future studies would need to examine if patients with restrictive lung disease, who were excluded from this study, could obtain similar training results. Due to the buoyancy properties of water, regulation of intensity becomes an independent factor and definitely subject dependent. Other factors, such as speed of movement, surface area of equipment, and depth of water, all contribute to resistance felt during exercise. Motivation and fatigue become major issues in maintaining and progressing in resistance training in the water.

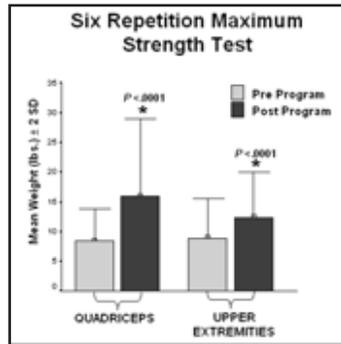
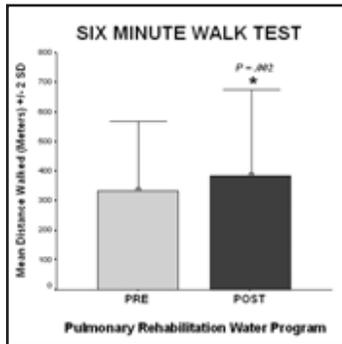
Other environmental factors, such as water temperature, ambient temperature, and pool odors, did not play a role in patient discomfort as previously thought by the investigators.

Anecdotically, patients had fewer complaints of discomfort, muscle soreness, or fatigue than in past PR experiences.

In conclusion, water-based PR exercise training provides an alternative medium for endurance and strength training in patients with COPD. Future studies are needed to compare land- and water-based treatment regimes and determine if water-based treatment programs result in improvements in activities of daily life.

**Acknowledgements**

The authors would like to thank the staff of the Aquatics Center of Baylor Institute of Rehabilitation, Dallas, TX, for their assistance and the use of their facilities. We would also like to thank Ronnie Packer; Rochelle Urquhart; Lazarus Reese; Andrea Beauchamp, SPT; Jeff Jones, SPT; Michelle Livengood, SPT; and Emily Skaarer, SPT for their assistance with the pool training sessions. ■



**FYI . . .**

**Resistance exercise elicits better results for COPDers**

COPD patients are more likely to benefit from a program aimed at strengthening their inspiratory muscles if exercise involves resistance training, say Spanish researchers. The study came after the investigators speculated that previous studies showing little benefit from the use of inspiratory muscle training to improve the lung function of COPD patients may not have adequately controlled the patients' breathing patterns to ensure a beneficial workout.

Their study compared two groups of COPD patients. One trained at home 30 minutes a day, six days a week, for six months using a standard breathing device that was set so that the patient had to exert 60-70% of his or her maximum

inspiratory capacity during the training exercises. Patients in the other group used the device but without any settings requiring a certain level of exertion.

Results showed those in the resistance exercise group had significantly less breathlessness compared to those in the control group. They also performed better on a walking test and had better scores on a test that measured their health related quality of life. (Source: CHEST, 2001;120;748-756)

**Lung damage and air flow obstruction occur independently**

British researchers who used high-resolution CT scans and lung function testing to determine if emphysema is associated with airflow obstruction

in apparently healthy smokers have found that, in their early stages, lung damage and airflow obstruction occur independently of each other. Twenty-five percent of the smokers in the study had evidence of emphysema on the CT scans, and 12.5-25% had signs of airflow obstruction as measured by the lung function tests. However, those with signs of emphysema were not more likely to also have signs of reduced lung function, nor were those with reduced lung function more likely to have signs of emphysema.

A group of nonsmokers who underwent similar tests generally had neither signs of emphysema nor reduced lung function. (Source: CHEST, 2001;120;743-747). ■

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These funds can then be applied to other important programs and projects, such as ensuring effective representation for RTs on Capitol Hill.

To change your option to the electronic section *Bulletin*, send an email to: [mendoza@aarc.org](mailto:mendoza@aarc.org). ■

American Association for Respiratory Care  
11030 Ables Lane  
Dallas, TX 75229-4593

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