

dive fitness

ED.— ALWAYS CONSULT A PHYSICIAN FIRST BEFORE BEGINNING ANY EXERCISE OR FITNESS PROGRAM.



Are You Scuba Fit?

Text and photos by Gretchen M. Ashton, CFT, SFT, SFN, NBFE Founder of ScubaFit®

Long after the jet lag and the first day back to work, you slip into your favorite dive T-shirt eager to keep the essence of your most recent underwater experience pulsing through your mind and body. Proudly wearing large print logos across your chest is a way of celebrating your passion for diving and sharing it with the rest of the world. And why not? Beyond the obvious comfort of a cotton dive T, diving is a recreational activity that quickly becomes a way of life. Now imagine if you pulled on your favorite dive T-shirt and someone had changed the slogan to express other aspects of your lifestyle. Would you be as enthusiastic about your cholesterol or body weight in large print for the rest of the world to see?

While scuba diving is a recreational activity almost anyone can enjoy, many participate with disregard for any number of unhealthy conditions. Exercising to enhance recreational activ-

ity is a positive way to take responsibility for your health, bring focus and motivation to a fitness routine and improve your overall diving performance. Be concerned more with what's under your T-shirt than what is on it.

It was five years ago that I began to research diving and discovered it primarily described the medical condition of divers. To create a distinction in early discussions, it was necessary to specify physical fitness for diving.

Fortunately, because of opportunities such as this, fitness for diving is being redefined to include a greater awareness and more detailed discussion of the importance of physical fitness in the health and safety of divers.

What does it mean to be physically

fit for diving? Is there a 'best' workout? Where do divers begin a fitness lifestyle? Who do divers trust for advice?

Health profile of the diving community

My research began with a review of 18 years of Divers Alert Network (DAN) annual reports where I found *Reported Medical Conditions by Divers*. In order of prevalence, heart disease/cardiovascular illness, high blood pressure, obesity, diabetes, smoking, asthma and allergy are all consistently present in the diving community. First and foremost, exercise programming for divers helps prevent, reverse and manage these conditions greatly reducing health-related risks when diving.

Training for diving performance and safety

It was significant to discover and incorporate Dr Glen Egstrom's work at the University of California in Los Angeles,

USA. His practical research included studies

a healthy body composition, determine current fitness level, evaluate diving activity, and identify and accomplish specific goals.

What follows is an overview of

such as measuring a diver's heart rate while putting on a wet-hot summer sun.

suit in the His kinesiology discussions are helpful in understanding and emphasizing the importance of training to improve diving performance and safety.

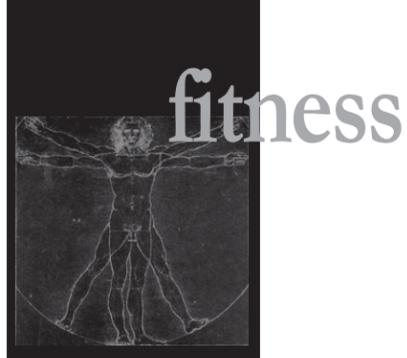
Scuba diving itself should not feel like a workout. Developing a healthy heart and lungs, muscle strength and flexibility, overall endurance, and eating well for diving are, for very important reasons, accomplished on and above the surface.

Getting started

My surveys reveal that less than 30 percent of all divers exercise. For divers who are new to exercise, it is important to as much as possible be in good health, consider orthopedic conditions, maintain

a workout specially designed for divers. It is performed in a fitness center, but may be transferred to a home gym or outdoors by using a few exercise bands and free weights. This is an intermediate workout and a good goal for healthy, injury free divers that have been exercising consistently at least two times per week for three months to a year, or at least three times per week for six months. **It is important to remember not to exercise 24 hours before or after diving.**

To begin, it is recommended to read through the entire program for an introduction to interval training, review the exercises to determine which ones are best for you, and use the formula pro-



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vided to determine your training heart rate or aerobic training zones.

The custom program simulates the physiology and biomechanics of diving in an exercise program. This synergistic workout stimulates your mind and body with timed intervals of functional body weight and resistance exercises alternated with timed intervals of aerobic heart rate training. Therapeutic considerations for the knee, shoulder and low back are built into the program.

Consistent participation in exercise promotes weight loss, supplements lean muscle mass, helps prevent osteoporosis, may reverse clinical conditions such as hypertension and high cholesterol and can be an excellent pain management tool for all forms of arthritis. As a diver, you may

Ball Reach on Feet starting position



Ball Reach on Feet extended position



directly benefit with improved endurance on land and in the water, more stability on the boat and for shore entry, reduced risk of injury and illness, more efficient use of air, and ease of handling gear and tanks.

Aerobic training zones

To maximize the benefits of training, it is necessary to establish your heart rate training zones. These training zones are based on your maximum heart rate, which is the highest number of times your heart can contract in one minute. Working within 60-80 percent of your maximum heart rate is most beneficial for overall health. The 70-80 percent heart rate training zones improve the ability of the body to take in and distribute adequate amounts of oxygen to working muscles during physical activity.

If you have heart conditions, it is recommended that you measure your maximum heart rate by taking a max stress test administered by a physician. Otherwise,

the most respected fitness standard for calculating your training heart rate zones is the Karvonen Formula developed by internationally renowned physician and exercise physiologist, Martti Karvonen.

As soon as you wake up in the morning, before you get out of bed, take your resting pulse by placing two fingers under the back corner of your jaw or on your wrist and count your heart beat for one minute. This number is your Resting Heart Rate.

Use this number to perform the following Karvonen calculation. Subtract your age from 220. From this result subtract your Resting Heart Rate (RHR). Then multiply this number by your training intensity of 70 percent (repeat the formula for 80 percent).

Lastly, add your Resting Heart Rate back in to get your Training Heart Rate (THR). An example looks like this: $220 - (\text{AGE}) 45 = 175$; $175 - (\text{RHR}) 68 = 107$; $107 \times 70\% = 75$; $75 + (\text{RHR}) 68 = 143$ (THR).

Using this example, while training in your 70 percent heart rate training zone, you will attempt to maintain a minimum pulse of 143 beats per minute. Your 80 percent heart rate training zone provides a maximum

pulse of 154 beats per minute. However, if you are a beginner, work at 60 percent intensity until these higher percentages can be performed while still able to carry on a conversation.

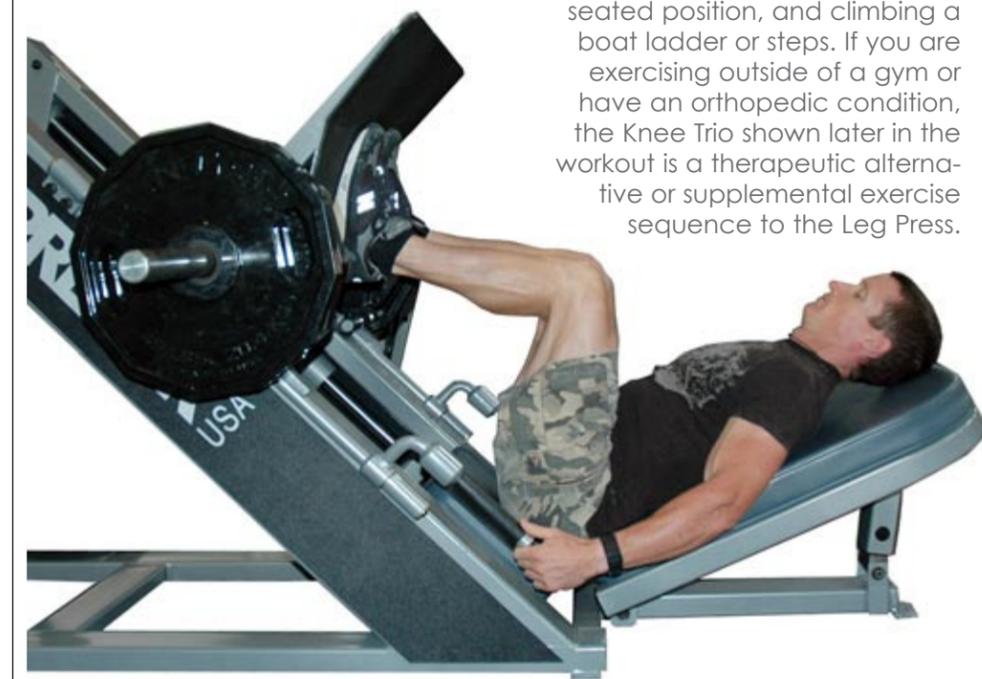
The custom program I describe here applies the 70 percent heart rate training zone primarily to improve the muscle cells ability to utilize oxygen. This zone trains the heart to pump more blood, metabolizes stored body fat as the primary source of energy, is preferred for weight management, and is a healthful intensity in preparation for moderate scuba diving conditions.

Training in the 80 percent zone is most effective for overall cardiovascular fitness. The following custom program uses this heart rate training zone to improve the body's ability to transport oxygenated blood to the muscle cells and carbon dioxide away from the cells. This zone is also effective for increasing overall muscle strength. A training zone of 80 percent of your maximum heart rate is similar to the work of swimming against a moderate current.

Notably, the 90 percent zone, while sometimes used for short periods to train for high levels of athletic performance, is not considered a healthful zone for recreational activity. However, of considerable importance is that exercising with consistency in the heart rate training zones of 70-80



The Leg Press combines all major muscles of the legs and buttocks along with the abdomen and low back. It is foundational in nature and recommended as an alternate to the squat to reduce risk and accommodate certain knee and back conditions.



Direct advantages include all movements under the load of gear, especially standing from a seated position, and climbing a boat ladder or steps. If you are exercising outside of a gym or have an orthopedic condition, the Knee Trio shown later in the workout is a therapeutic alternative or supplemental exercise sequence to the Leg Press.

percent may prepare you for a time when you may need to exert beyond usual conditions.

Training with a heart rate monitor is a great way to easily know if you are working in your training zone and is recommended for individuals with heart disease or

pulmonary conditions. It is recommended to rely on heart rate monitors primarily during aerobic intervals. During resistance training intervals your heart rate will naturally fall slightly below your target training zones.



The “Basic Six” Exercises

The program designed for divers employs functional exercises, which systematically involve muscle combinations and sensory adaptations associated with body position and movement during scuba diving. Utilizing both dynamic and static positions, this workout is designed around six basic exercises. Alternate exercises are provided for the most common conditions of the shoulder and knee. Substitute alternate exercises for Basic Six exercises as indicated.

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Ball Reach on Knees starting position

Ball Reach on Knees extended position



Push Press start position



Push Press and Straight Arm Plank

peutic alternative or supplemental exercise sequence to the Leg Press.

The Push Press and Plank incorporates muscles of the chest, shoulder and triceps along with the abdomen and low back. A combination of static and dynamic exercise, this movement provides a foundation of upper body strength, especially for women. Divers benefit with arm strength for lifting and holding on firmly, and enhanced ability to change direction while the body is in motion. The Shoulder Combo is a therapeutic alternative or supplemental exercise sequence for the Push Up portion of this exercise. You may still be able to perform the Plank position to work the chest without involving the shoulder.

The Ball Reach provides a unique combination of abdominal, low back, hamstring and gluteus (buttocks) strength. This exercise also includes some integration of static chest and shoulder. Swimming, staying in one place during strong currents, putting on fins in the water, and

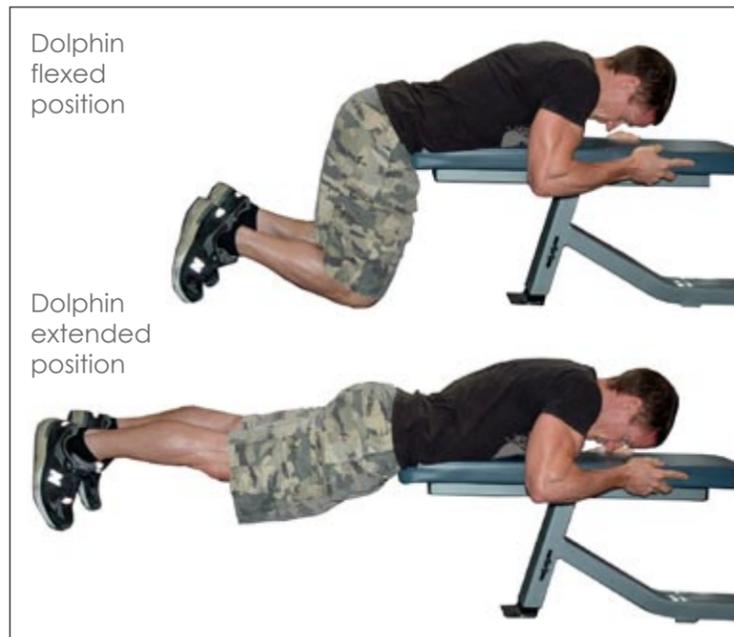
back-roll entry are just a few examples that contribute to diving.

Dolphins integrate low back, hamstrings, gluteus and abdominal muscles in a prone position using the lower body as resistance instead of the upper body. Walking backwards, kicking through strong currents, turtle swimming, wave action, surf and sand are all conditions where this exercise will enhance performance and prevent injury.

The Pullover combines the chest, shoulders, triceps, and abdominal muscles and expands the chest improving breathing capacity. The ability to safely reach over and behind your head and back is the greatest benefit of this exercise. The Shoulder Combo is a therapeutic alternative or supplemental exercise sequence for the Pullover.

A Row of any fashion incorporates five muscles in the back and shoulder and is assisted by the biceps to perform pulling activities. Large back muscles as a group, are second only in size to those of the legs and likewise apply to foundational strength. The row requires a greater demand for oxygen than other upper body exercises and you will notice a slightly higher heart rate during this resistance training interval.

Knee Trio: Bun Wrapper, Wall Sit with Ball Squeeze. The Bun Wrapper is a combination of leg raises throughout the full complement of hip rotation, which targets the medial muscles of the gluteus and provides weight bearing



Dolphin flexed position

Dolphin extended position



Pullover extended position

Pullover start position

your resistance training in this workout. Instead of counting repetitions, you will perform timed sets of each exercise.

To prevent injury, begin your workout with a six-minute warm-up of aerobic exercise (i.e. walking outdoors, treadmill, elliptical, bicycle). When performing resistance training exercises remember to breathe properly. Inhale through the nose and exhale through the mouth. Do not hold your breath at any time under resistance and exhale on the exertion. Do not rest between exercises unless absolutely necessary. Remember to check your heart rate about half-way through each Resistance Training Interval.

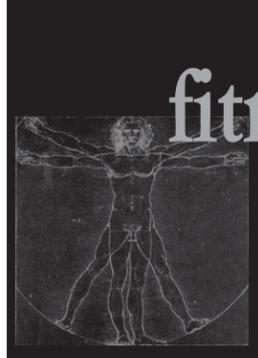
Each Basic Six Exercise Sequence will take six minutes to complete. If you are performing an exercise requiring a single leg or single arm movement, per-

work to improve bone density in the hip and low back. The Wall Sit with the Ball Squeeze between the knees is a static variation to the Leg Press.

Shoulder Combo: Internal / External Rotation for the Rotator Cuff. These exercises are provided to both rehabilitate and prevent injury of the shoulder.

Interval Training

The program comes to life with the unique application of “interval training”. Typically used to enhance running performance, interval training is applied to



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Bun Wrapper start position



Bun Wrapper extended back position



Bun Wrapper side position



Wall Sit side view



Wall Sit front view

form each side for one full minute. Replacing pullovers or push-ups with the Shoulder Combo or replacing Leg Press with the therapeutic Knee Trio will require from six to 12 minutes to complete.

After your warm-up, perform your first resistance training sequence consisting of one-minute intervals for each exercise. Then return to aerobic training for six minutes in your 70 percent training heart rate.

Perform a second full sequence of resistance training intervals followed by a second session of aerobic training. Continue to train in your 70 percent training heart rate for this aerobic interval.

Repeat two more resistance training intervals alternating with two more six-minute aerobic training sessions in your 80 percent heart rate training zone.

Your goal is to complete four full intervals of both resistance

training and aerobic training in less than 90-minutes. If all your intervals are in the six-minute range, you will finish within an hour. Alternate exercises require about an hour and 15-minutes.

The program is designed to strengthen and condition the body in a safe manner. Consistency is important with this workout. Establish a good foundation by training all year to support diving activities. Now, pack a gear bag with a stopwatch or timer, hydrating drink, and a towel.

Put on your favorite dive t-shirt and take your enthusiasm for scuba diving to the gym. It's time to get scuba fit!

In the next issue, we will discuss training for the arms in the fitness column, *Neptune's Triceps*. ■

Gretchen M. Ashton is registered with the National Board of Fitness Examiners. An advanced diver, International Sports Sciences Association Elite Trainer, and world champion athlete, Ashton developed the ScubaFit® program and the comprehensive FitDiver® program, which includes the first mobile app for scuba diver fitness. Ashton is the co-author of the PADI ScubaFit Diver Distinctive Specialty course and is an Expert Speaker for Los Angeles County's Advanced Diver and Underwater Instructor Certifications in California, USA. She is the Health and Fitness Editor of California Diver Magazine, has been published in Divers Alert Network, Alert Diver - United States and Asia-

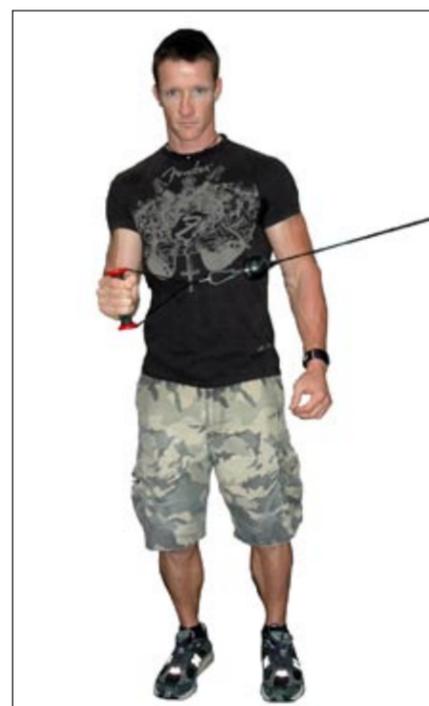
Pacific, on Divetime.com, and is a Scuba Fitness Examiner at Examiner.com. Ashton has appeared on Scuba Radio, presented at the Scuba Show, has been featured in the President's Council of Physical Fitness and Sports newsletter for inspiring and innovative accomplishments in fitness, and in the Margaritaville Key West website culinary column. As an athlete, she set 21 World and American records and was the second women inducted into the Amateur Athletic Union (AAU) Power Lifting Hall of Fame: See: **Scubafit.com**



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Shoulder Combo: External Rotation starting position; External Rotation ending position;



Shoulder Combo: Internal Rotation starting position; Internal Rotation ending position

