Increasing Diver Confidence and Ability with Muscular Fitness

Scuba diving is a great way to enjoy the outdoors. And, it can be a satisfying avenue to increasing your sense of well-being. While diving is typically a relaxing experience, it can require more muscular strength and endurance than everyday activities. Climbing a ladder over the gunwales of a boat, standing up while wearing full gear and walking in the sand wearing 19 to 37 kg or more of dive gear all demand substantial effort. These challenges increase the risk of injury, even more so if the diver's fitness is less than optimal.

Diving is a great example of a lifetime activity, enjoyed by individuals throughout the age spectrum. The seemingly natural strength, agility and resilience of youth, however, can be reduced with age, making tasks more arduous. The good news is that effective exercise programs can slow and, in some cases, even reverse age-related declines (Macaluso and De Vito, 2004). Muscle strength and endurance are two of the five basic elements of fitness. Cardiovascular endurance, body composition and flexibility are the other elements. All five areas should be included in a well-balanced fitness program. The purpose of this article is to directly relate muscular fitness to diving and provide some practical examples of how to retain or improve your diving capabilities.

Strength Training Foundations

Adequate muscular fitness allows you to perform any activity, including diving, with greater ease. A higher level of fitness will prepare you for the often varying demands of dynamic dive conditions. Increased muscular fitness will improve your self-sufficiency and can strengthen or help justify your confidence in your diving ability. When developing a strength-training program, consider three key components: progressive overload, specificity and rest. Attention to each will help to ensure a safe and effective muscular fitness program.

Overload is a condition wherein the muscles are tasked beyond their current normal operating zone. Overload is accomplished by applying a load or resistance during exercise. The body adapts to these changes fairly quickly, so the intensity must be increased as strength increases to maintain the training effect. This process is known as progressive overload. Use progressive overload cautiously. It is common for individuals to push too hard early on in strength programs, often producing excessive muscle soreness or even injury. Such outcomes may encourage dropout. Lifestyle changes should be gradual as well as persistent. Proper exercise progression increases the desired results and reduces the likelihood of injury.

Specificity refers to the effect of the training being greatest on the actual muscle groups and movements involved. While there is some spillover effect, improvements are greatest in what is practiced. For example, a runner's general fitness improves through running, but the performance is best for running. Divers then, should train the muscles they will need to rely on most for the activities of diving.

These include the muscle groups of the back, legs, arms and abdomen. Rest is an important part of a strength-training program. It allows the body time to recover and to optimize the remodeling of muscle. The best strategy is to avoid training the same muscle groups on consecutive days or when sore. Focusing on upper body exercises one day and lower body the next is one option for those who wish to participate in daily workouts. Ignoring the rest component will not allow you to maximize the benefits of your program, and can lead to overtraining injuries and setbacks.

Guidelines

Strength-training guidelines vary depending on the fitness level and experience of the individual.

Individuals should undergo physical exams before beginning any exercise program. The American College of Sports Medicine (ACSM) recommends (for healthy adults with no contraindications to exercise) workouts of eight to 10 exercises for the major muscle groups: arms, shoulders, chest, abdomen, legs, hips and back (ACSM guidelines, 2001). One should perform these exercises two to three times a week.

Resistance (load) includes any type of stimulus that places additional stress on the muscles. A push-up or pull-up would be an example of body weight resistance. Each exercise and the associated resistance will typically be selected to allow a maximum of eight to 12 repetitions ('reps' in gym parlance) prior to fatigue. A focus on increasing muscular strength will employ greater loads and relatively few repetitions (6-8 reps).

Focusing on muscular endurance will employ somewhat lighter loads and more repetitions (12-15 reps). It is advisable to begin with a load that allows 12 or more repetitions to build a foundation. A given training session will often employ three 'sets' of the target number of repetitions; each set is separated by a rest period for that particular muscle group. The number of repetitions and the resistance should be adjusted as the exercises become more familiar and the effort
easier. The initial resistance should be conservative as you learn the proper movements of the exercise. You should be able to complete your target number of repetitions and sets without undue strain or discomfort.

The optimal resistance will vary for each individual and activity. The resistance should allow you to complete each of the desired number of repetitions, but remain challenging. Unexplained decreases in the ability to manage a given resistance could indicate overtraining. Be aware of and accommodate the rhythms of your body in your training effort.

Diving Specific Exercises

Strength training programs can incorporate a wide array of specific exercises. Three examples are provided here with some explanation of how they can influence diving performance. Improving strength can increase your confidence in handling dive gear. Thinking about how specific exercises relate to your diving may provide motivation during your workouts.

Body Squats

Standing up in full dive gear can be challenging, particularly on a rocking boat or during challenging shore accesses. A chair stand or squatting exercise regimen will make such effort easier. Start by sitting in a sturdy chair and stand up with a flat back. Start with 10 repetitions. Do this twice a week or until it is no longer a challenge. Now progress to three times a week or incorporate weights and/or remove the chair. Use hand weights, even dive weights, if most convenient, to add resistance.

Bent-Over Row

The muscles of the back and arms are mostly heavily tasked when climbing a dive ladder or when lifting various pieces of dive gear. The bent-over row targets these muscle groups. Place feet slightly wider apart than shoulder width. There should be a bend at your knees and waist, allowing your upper body to move over your feet. Your back must remain flat throughout the exercise. The weights will be held in your hands directly below your chest. You pull the weight to your chest and then lower it back down to the starting position in a slow and controlled manner.

Upright Row

The shoulders and arms are challenged when lifting dive gear. The shoulder and elbow joints are areas associated with overuse injuries. If you are not accustomed to lifting heavy gear except on dive trips, the soreness may be confused with symptoms of other diving-related problems. Training these areas will

increase the strength of the muscles in your shoulders. Stand with your arms at your side and feet slightly wider than shoulder width. Pull the weight strap up the front of your body to your shoulder, keeping the elbows higher than the hands. Slowly lower the weight to the starting position and repeat for the appropriate number of repetitions.

Conclusion

Diving requires proper planning and maintenance of equipment. Your body is the most important piece of equipment and it requires investment. Ensuring adequate muscular strength is vital in preparing for safe diving. Understanding the process and benefits of strength development can help prepare you for the physical hallenges of diving.

Fitness planning is like dive planning. Establish a program of action and follow it for the best outcome. Begin with easy activities and progress as your capabilities allow. To avoid overtraining or injury, pay attention to your body rhythms. Plan your exercise and exercise your plan. Improve your strength and strengthen your diving ability.

Physiology of Muscle Development

Regular strength training maintains muscle mass, bone mass, connective tissue, and expands the range of activities you can comfortably complete. Increased strength can improve the quality of your dive experience.

More than 600 hundred muscles in the human body make up approximately 40- 50 percent of the total body weight. The primary functions of skeletal muscles are movement, postural support and respiratory function. Muscle contractions involve a complex series of events.

Electrical impulses are generated in the central nervous system, stimulating the onset of voluntary muscle contractions. Proteins within the muscle fiber pull against each other causingthe muscle to shorten. Shortening of the muscle creates the force of contraction. This process continues until the energy supply is diminished or stimulation ceases. Without adequate energy muscle contraction is no longer possible, resulting in muscle fatigue. Strength training increases a person’s capacity for exercise, delaying the onset of fatigue for any given effort.

Terms/Definitions

Overtraining – excessive muscle overload with inadequate rest, resulting in decreased performance and/or injury.

Progressive Overload – progressively increasing the resistance/load to ensure a continued training response as ability and capacity improve.

Specificity – the effect of training being greatest on the actual muscle groups and movements involved.

Resistance Training – performing an activity against a force such as gravity, water, free weight, machines, bands or body weight to increase muscle fitness.

Repetitions (reps) – the number of times an exercise is performed without rest.

Sets – a group of repetitions Muscular Endurance – the ability of muscles to perform contractions (repeatedly or continually) over time.

Muscular Strength – the maximum force that can be generated by a muscle or muscle group.

Muscle Recruitment – muscle fibers are activated to meet/overcome a given resistance/load. Force production is increased with additional recruitment up to the limit of muscular strength.

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