

SIMPLY WATER! WATER REHABILITATION FOR LOWER EXTREMITY OVERUSE RUNNING INJURIES

C. L. **Tant**, PhD, University of West Florida, Pensacola, FL
D. **McGrath**, MS, Iowa State University, Ames, IA

Studies have shown that the physical properties of water coupled with the physiological effects of working in water create **an** unique and ideal treatment medium. Bonnette (1978) found that immersion in water has proven to be beneficial because (a) body bouyancy makes it possible to move the body with less physical effort than is required out of the water, (b) water resistance provides an overload of pressure against movement which is not possible on land, and (c) exercising **motion** creates internal heat and circulation for the injured area, resulting in acclimatization to pain and the development of flexibility. Another attractive aspect of utilizing water as a rehabilitative medium is the conditioning activities which can be added to an exercise program to help eliminate the detraining effects normally associated with an injury. Bridges and **Ferrara** (1984) found that in water, an athlete can develop muscle coordination and expand the cardiovascular system **As** a result, swimming and other water exercises are gaining popularity among runners who do not want to lose their current fitness levels during layoffs because of injury.

It has also been suggested that water training allows better motion and earlier strengthening than on dry land. Koszuta (1986) noted that clinical experts found that the exercises of greatest value to athletes during rehabilitation are sport specific movements that strengthen particular muscles involved in the sport. Bonnette (1978) cited similar clinical **findings** that exercises in the pool should be as specific as possible to the actual movement of a joint, muscle group or skill which individuals are required to perform. Further, both Bonnette and Koszuta insist that skill levels maintained in the water will transfer back to dry land activities. Koszuta however, stated that a crucial factor in the transfer of **skills** is having the correct body alignment. But, not **all** movement patterns in the water can simulate those of *dry* land. For some movements, muscles may contract differently on dry land than they do in the water. It is important to incorporate sport specific movements into the design of water therapy programs.

Watkins, Buhler, and Loverock (1988) found, from clinical applications, that water is virtually a risk-free exercise environment when it comes to joints, muscles and bones. The bouyancy of water allows athletes to exercise much sooner than on land. With the water supporting the muscles, joints and bones around the injury, there is limited impact stress that occurs when the athlete exercises in the water. A water exercise program can be initiated very soon after an injury occurs. Many practitioners feel water is a risk-free weight-training facility. As the body moves through the water, it resists movement, causing the muscles to work harder. The level of resistance is increased the faster the athlete moves the body against the water thereby increasing the level of strength to the injured area. Therefore, the purpose of this project was to develop, in the form of a color video and manual, a water rehabilitation program for some of the more common overuse injuries experienced by high school track athletes. In addition, to incorporate activities into the rehabilitation program that would decrease the detraining effects normally associated with long periods of non-activity. The color video was designed to be used by the coach, athlete, and/or athletic trainer to properly rehabilitate an injured athlete with the use of a swimming pool.

Methodology

Both a video and manual were produced with the assistance of the Iowa State University Media Production Unit. The instructional portion of the video provided a discussion: 1) of the benefits of water therapy as a rehabilitation tool and included the topics of bouyancy, increased range of motion, increased circulation, resistance, maintaining fitness, and indications for use, and 2) reviewed rehabilitation goals such as decreased pain and swelling, increase range of motion and flexibility, and maintain/increase cardiovascular fitness. The demonstration portion of the video provided demonstrations: 1) of therapeutic water exercises with exercise progression, correct form and types of exercises, and 2) water conditioning activities including calculation of target heart rate, perceived exertion scale, land distance to water time correlation scale and conditioning activities.

The main objective of the manual was to provide supplemental information not adequately covered in the video. The manual contains a) benefits of utilizing water, b) who will benefit **from** water, c) proper use of the video, d) injury quick **facts**, e) components of rehabilitation, f) exercise guidelines, g) correct **form**, h) exercises, i) conditioning, and j) sample workouts.

The video program was shot by a crew of two camera personnel. The instructional portion of the tape required one camera operator using 3/4 inch video cassette tape. For on-camera audio taping, the script was transferred to a teleprompter and read by the narrator. The **water** portion of the tape required one camera operator on land, using 3/4 inch video cassette tapes, and an underwater camera operator, using a video camera surrounded by an underwater casing. Fifteen hours of camera shooting time and 45 editing hours were required to complete the 30 minute video program. The cost of the raw materials for taping, editing, and copying the video program was approximately \$200.00. The cost of computer time for design and layout, cut and pasting of pictures and copies of the handbook were approximately \$ 100.00.

The popularity of the video media rests in part on the use of music, movement, and color. Therefore, the editing process was used to manipulate the presentation of the content of the script to **maximize** interest. The producer developed visual **effects** that would keep the viewer interested in the concepts being presented. The use of static, head-and-shoulder shots of the **narrator** were avoided when possible. In order to enhance the flow of the video, music and chart graphics were used where appropriate. Reinforcement of key concepts was made through the **combined** use of narration and printed text on the screen.

Discussion

The program works well as an instructional aid for college personnel teaching athletic training, fitness, and mechanics **because** of its specific rehabilitation exercises and conditioning activities. The video presents why water is such an ideal rehabilitation medium and provides a starting point **for** athletic trainers inexperienced in designing water rehabilitation programs. The program would be valuable to coaches who do not have the

services of an athletic trainer. This video would also be of assistance in the biomechanics classroom to introduce the student to hydrodynamics. The direct use of the video by athletes **may** be limited because of the lack of limited resources available to them in order to obtain the video. However, athletes are the direct beneficiaries of the program.

The videotape has limitations in that the stated benefits **from** use have not been researched. Therefore, this project **will** be continued with the following research recommendations: **1)** to study the effectiveness of the water rehabilitation program vs a traditional program, **2)** to determine fitness levels of water vs traditional land rehabilitation and conditioning programs, and **3)** to investigate the incidence of injury with **all** land workouts vs combined land and water workouts. It is hoped that this combination **video/manual** program **will** increase the utilization of water for rehabilitation and conditioning programs for athletes with lower extremity injuries.

Bibliography

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