SWIMMING

Swimming is a sport that uses the majority of the muscles in the body and has different styles: these are the butterfly, the breaststroke, the backstroke and the freestyle (front stroke). In general, the physiological training demands of any type of competitive swimming style are high, with competitive swimmers training for long periods of time (2 to 3 hours) for 5-6 days a week. However, the aim of introducing and promoting competitive swimming to patients with chronic diseases is not advisable in the first instance. The aim of swimming training for patients is to increase exercise participation and thus, the training should be modified accordingly. Research shows, that due to buoyancy, exercising in the water is considered to be easier for patients and more enjoyable compared to exercising outside the water. There are studies in the literature that have utilised water-based exercises for improving the functional ability of patients with different types of chronic diseases, so we know that this type of training may be beneficial. However, this manual does not focus on water-based simple exercises but the sport of swimming which involves different training. Nevertheless, this manual offers suggestion on how swimming-based exercises can be used for strength training. It is important to note, that the following training suggestions have not been tested in the literature. Therefore, it is advisable to start at low intensity exercises focusing on technique, before progressing to a full swimming training session.

Warm up (10minutes)

At low intensities, the warm up can include:

a) Walking in shallow water 2-3 minutes x 4, with a one minute break

b) Arm cycles forward and backward

c) Extended arm small circles at the shoulder level

d) Trunk rotations with hands on the waist

e) Neck Rotations

Main Session (45minutes)

Flexibility

Stretching is a very important part of swimming training and should be utilised in every swimming training session at the start or at the end or both. It has to be slow, avoiding overstretching and causing pain. The following exercises are used in swimming training and are relevant mainly to the muscles used in the different styles of swimming. However, this type of training may have beneficial results in many other different aspects and will aid in the overall improvement of range of motion of a patient with significant benefits in the functional ability.

Table 25 illustrates exercises that can be performed all or in part, from every patient having any chronic disease prior to entering the water or inside the water:

Table 25: Flexibility Exercises based on a Swimming Training Session for Patients with Chronic Diseases

Exercise	Time/Reps	Frequency	Break	Comments
Neck Tilt	10 reps	2 times	30 sec	Slow avoiding overextension and movements that may cause pain
Neck Turn	10 reps	2 times	30 sec	
Shoulder Stretch	30 secs	2 times	30 sec	
Triceps Stretch	30 secs	2 times	30 sec	
Quadriceps Stretch	30 secs	2 times	30 sec	
Hamstring Stretch	30 secs	2 times	30 sec	
Chest Stretch	30 secs	2 times	30 sec	
Back Stretch	30 secs	2 times	30 sec	
Calf Stretch	30 secs	2 times	30 sec	
Groin Stretch	30 secs	2 times	30 sec	

Cardiorespiratory Fitness

Swimming is an excellent exercise for improving cardiorespiratory fitness. Research has shown that even simple water exercises can help improve fitness with relevant beneficial improvements in other health parameters. Swimming training should not focus on a specific swimming style but instead, different styles can be utilised in training depending on the patients' functional ability. For example, in patients with inflammation and/or pain in the knees, breaststroke (involving significant lower limb power and movements) could be avoided until the treatment of the patient results in painless joint (knee) movements. The intention of the exercise training is to progressively bring the patients up to participating 2-3 times per week followed by training that achieves the recommended guidelines for physical activity participation (150 minutes per week).

Table 26 illustrates exercises that can be used in a sequence or in part, for improving the cardiorespiratory fitness of any patient with any chronic disease:

Table 26: Aerobic Exercises based on a Swimming Training Session for Patients with Chronic Diseases

Exercise	Time/Reps	Progression	Frequency	Break
Forward Movement with Pool Noodle	4 x 20-25m length	10x 20-25m lenth	1time	30 sec
Front Stroke	4 x 20-25m length	10x 20-25m lenth	1time	30 sec
Breaststroke	4 x 20-25m length	10x 20-25m lenth	1time	30 sec
Backstroke	4 x 20-25m length	10x 20-25m lenth	1time	30 sec
Front Stroke with Pull Buoy	4 x 20-25m length	10x 20-25m lenth	1time	30 sec
Leg kicks with the Use of a Kickboard	4 x 20-25m length	10x 20-25m lenth	1time	30 sec

Comments

Forward Movement with Pool Noodle
Use of hands and/or feet and/or both to complete length at patients own pace

Front Stroke
Easy low intensity swimming at the patient's own pace. Use stopwatch to provide feedback. Use aids (such as pool noodle, hand paddles or fins) if necessary to eliminate pain in any movement

Breaststroke
Easy low intensity swimming at the patient's own pace. Use stopwatch to provide feedback. Use aids (such as pool noodle, hand paddles or fins) if necessary to eliminate pain in any movement

Backstroke
Easy low intensity swimming at the patient's own pace. Use stopwatch to provide feedback. Use aids (such as pool noodle, hand paddles or fins) if necessary to eliminate pain in any movement

Front Stroke with Pull Buoy
Easy low intensity swimming at the patient's own pace. Use stopwatch to provide feedback. Use aids (such as pool noodle, hand paddles or fins) if necessary to eliminate pain in any movement

Leg kicks with the Use of a Kickboard
Easy low intensity swimming at the patient's own pace. Use stopwatch to provide feedback.

SWIMMING

Strength

Strength training is essential for swimming training and should be performed at least once a week when starting swimming, progressing to two times per week. The strength training session can be performed on the same day or even on a different day from the aerobic fitness training sessions, which is something that can be discussed and agreed with the patient (according to his/her preferences). Swimming-specific strength training will not only improve the patients' strength in swimming but can also improve functional ability significantly and thus quality of life. This can then have a beneficial impact on performing daily activities which are not swimming specific.

Table 27 highlights exercises that can be performed all or in part, for all participants suffering from chronic conditions, as part of a swimming training session. The coach/volunteer can use any of these exercises at low intensities at the start of the training, increasing the intensity based on how the patient progresses and feels.

Table 27: Strength Exercises based on a Swimming Training Session for Patients with Chronic Diseases

Exercise	Time/Reps	Progression	Frequency	Break
OUTSIDE THE POOL				
Squats	8-10	15-20	3 times	30 sec
Static lunges	8-10	15-20	3 times	30 sec
Knee Push-ups	8-10	15-20	3 times	30 sec
Shoulder Press with Elastic Band	8-10	15-20	3 times	30 sec
Standing Press-ups with Elastic Band	8-10	15-20	3 times	30 sec
INSIDE THE POOL				
Lifts holding the Edge of The Pool	8-10	15-20	3 times	30 sec
Press-Ups in the Edge of the Pool	8-10	15-20	3 times	30 sec
Front Stroke tied to an Elastic Band	30 sec	1 min	3 times	30 sec

Comments

Squats
In patients with lower functional disabilities do not bend much and focus on technique*

Knee Push-ups
In patients with upper functional disabilities do not bend much and focus on technique*

Shoulder Press with Elastic Band
In patients with upper functional disabilities do not bend much and focus on technique*

Standing Press-ups with Elastic Band
In patients with upper functional disabilities do not bend much and focus on technique*

Lifts holding the Edge of the Pool
In patients with upper functional disabilities do not bend much and focus on technique*

Press-Ups in the Edge of the Pool
In patients with upper functional disabilities do not bend much and focus on technique*

lower functional disabilities: inflammation/osteoarthritis of the knee, hip, recent lower body surgery that causes pain and prevents appropriate range of motion
* upper functional disabilities: inflammation/osteoarthritis of the shoulders, elbow, trunk, recent upper body surgery that causes pain and prevents appropriate range of motion

Cool Down (10 minutes)

Very slow swimming at the patient's preferred pace and style.

General Comments

Swimming training and water based exercises have been utilised by research studies to improve the functional ability, strength and fitness of patients with chronic diseases as well as older adults. The coach/volunteer can start first focusing on lower intensity stretching, strength and fitness, progressing (after 3 months) at more complicated training regimes and incorporating more swimming styles. The functional ability as well as the preferences of the patient should be taken into account throughout the training programme. Due to buoyancy, swimming can be enjoyed better from patients, compared to other sports, particularly if the swimming training starts at intensities that can be tolerated by patients with chronic diseases. However, range of motion limitations due to certain conditions such as lymphedema, other post-surgery complications and/or pain/inflammation should be acknowledged and the training regime should be developed avoiding movements that cause discomfort.