

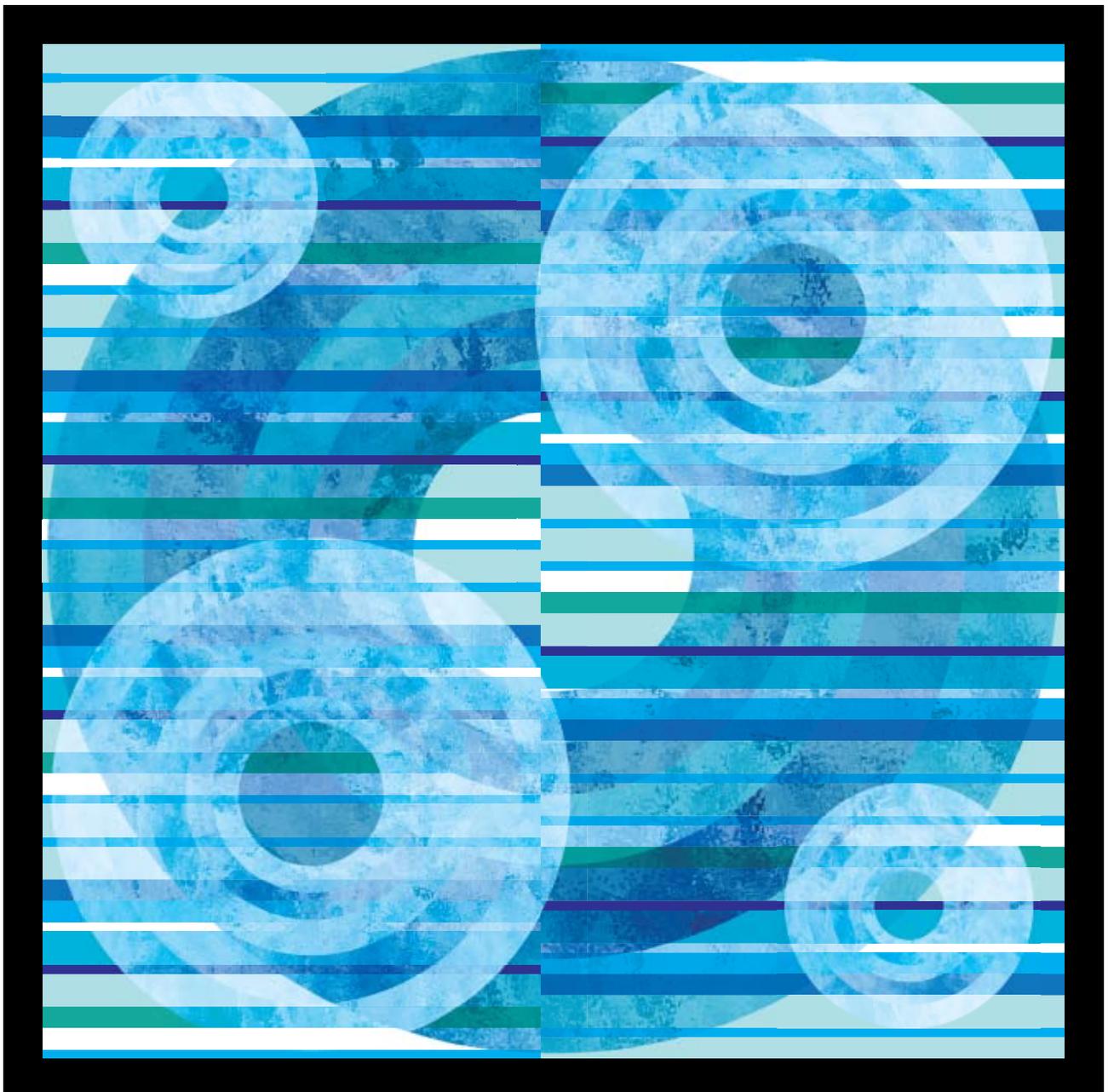
FOR HEALTH PROFESSIONALS

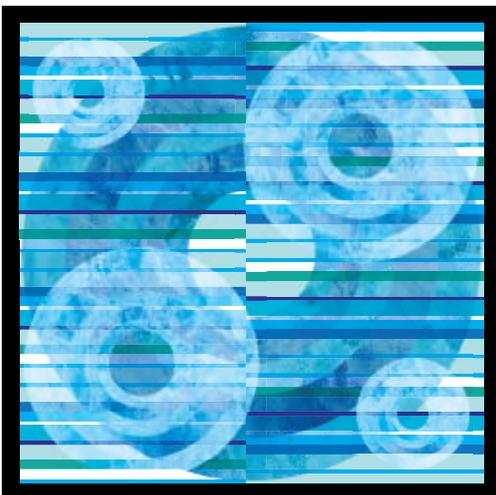


AUSTRALIA

PRACTICE

Aquatic exercise for people
with multiple sclerosis (MS)





Aquatic exercise for people with multiple sclerosis (MS)

Aquatic exercise provides many potential benefits for people with MS. Professionals who have exercise qualifications are suited to prescribe this form of exercise.

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1.0 Beneficial properties of water

The aquatic environment has unique properties that can be used to gain a range of exercise benefits, which are detailed below.

1.1 Buoyancy

Buoyancy is the upward pressure of water on the body, acting in the opposite direction to gravity. Buoyancy reduces body weight, which may assist people to move limbs through the full range of motion and reduce pressure on joints.

1.2 Turbulence

Turbulence is the irregular motion or swirling agitation of water. Turbulent water can provide an environment for static and dynamic balance training with minimal risk of injury. The level of challenge can be raised by increasing the water agitation (perform faster or larger movements of the body within the water).

1.3 Hydrostatic pressure

Hydrostatic pressure is the force exerted by water on an immersed object and is proportional to the depth of water. Hydrostatic pressure on limbs may help reduce swelling.^{1,2}

1.4 Resistance

Water is denser than air and provides greater resistance to movement. The more surface area that you present in the direction of the movement, the more resistance you create, and the more force needed to overcome that resistance. This property is important for strength training in water.

Taking these properties of water into consideration when designing an aquatic exercise program can facilitate movement and vary the intensity of the exercises. In this way, exercise can be tailored to the needs of most people with MS.

2.0 Potential benefits of an aquatic exercise program

Aquatic exercise refers to exercise performed in or upon water. It should not be confused with the term hydrotherapy which refers more specifically to the use of water in the treatment of disease or injury. Hydrotherapy is usually provided by a physiotherapist or other appropriately qualified health professional.

Evidence for the use of aquatic exercise for therapeutic benefit among people with MS is limited, with few studies focusing specifically on this population.

Evidence does exist from studies involving people with spinal cord injuries, traumatic brain injuries and other neurological conditions; however these studies do not provide prescriptive advice. Nonetheless, this growing body of evidence provides useful guidance for the safe application and potential beneficial outcomes of aquatic exercise for people with MS.

Furthermore, research into the areas of hydrotherapy and land-based exercise will be considered since some of the benefits obtained from these types of exercise may also be gained with aquatic exercise.

Research investigating the use of aquatic exercise in people with MS provides varying levels of support for the following benefits:

- Improved muscle strength³
- Improved fitness⁴
- Improved gait and mobility⁵
- Reduced fatigue⁴
- Increased quality of life or sense of wellbeing.⁶

Research investigating the use of other forms of exercise (primarily hydrotherapy or general exercise) in people with MS provides varying levels of support for the following benefits:

- Improved muscle strength⁷
- Improved fitness^{8,9}
- Improved joint range of motion and flexibility⁷
- Reduced fatigue⁸
- Improved balance⁷
- Pain relief⁷
- Increased quality of life or sense of wellbeing.^{7,8,10}



Research investigating the use of aquatic exercise in other populations provides varying levels of support for the following benefits:

- Improved fitness¹¹
- Reduced spasticity¹²
- Reduced swelling in the limbs.^{1,2}

Many of these studies have limited strength of evidence because they are small case studies. However, it is important to note that none of the studies report negative effects of aquatic exercise for people with MS. The strongest evidence in support of potential exercise benefits is found in the following studies which involve non-MS populations or other types of exercise:

- A systematic review by Geytenbeek⁷ looked at the clinical effectiveness of hydrotherapy among a range of populations including people with rheumatoid arthritis, osteoarthritis, lower back pain, and some neurological conditions such as MS. Moderate-to-strong evidence for improvements in pain, strength, flexibility, functional ability, self-efficacy and affect, as well as lower evidence for improved balance and fitness were reported.⁷
- Driver *et al.*¹¹ conducted a small randomised controlled trial with an experimental group of eight brain-injured people. The experimental group completed an aquatic program (aerobic and resistance exercises) and achieved improvements in fitness, range of movement, and muscle endurance.¹¹
- Petajan *et al.*⁸ conducted a randomised controlled trial that assessed the effects of land-based aerobic training (combined arm and leg cycle ergometry) among people with MS. The exercise group demonstrated significant improvements in maximum aerobic capacity and some improvements in strength and function. The exercise group also showed significant reductions in factors related to quality of life, such as depression, anger, and fatigue. From these findings it may be hypothesised that aquatic exercise of similar aerobic intensity (five-minute warm-up, 30 minutes of exercise at 60% VO₂ maximum, followed by a five-minute cool-down) may produce similar effects in people with MS.⁸
- Stuijbergen *et al.*¹⁰ conducted a five-year longitudinal study to identify patterns of change in functional limitations, exercise behaviours, and quality of life in people with MS. A total of

560 participants completed the study. The main findings were that people who reported more frequent exercise behaviours tended to have lower functional limitations and more positive quality of life responses. These results suggest that people with MS who participate in regular and on-going exercise (land-based or aquatic-based) will have a slower accumulation of functional limitation and will maintain a higher quality of life.

To date, no good-quality clinical research has been conducted investigating the effectiveness of aquatic exercise for spasticity management in people with MS. However, a controlled case-matched study by Kesiktas *et al.*¹² compared the effects of aquatic exercise on spasticity severity with the level of oral baclofen intake in people with spinal cord injury. The control group combined oral baclofen with passive range of movement exercises performed twice daily for 10 weeks, while the exercise group did the same with the addition of three aquatic exercise sessions per-week for 10 weeks. The results revealed that the exercise group had significant reductions in oral baclofen intake and improvements in Ashworth, Functional Independence Measure, and spasm severity scales than the matched control group.¹² Similar benefits may be achievable for people with MS who have spasticity.

No studies have investigated the use of aquatic exercise in reducing limb swelling in people with MS. People with MS who are sedentary – especially individuals who use wheelchairs and have minimal or no active movement in the lower limbs – are found, clinically, to develop oedema in the feet and ankles. This is due to inactivity and the maintenance of gravity-dependent positions. Existing evidence for oedema reduction through aquatic exercise has involved non-MS populations, such as pregnant women,² and people with varicose veins.¹ These studies demonstrated that water immersion or aquatic exercise resulted in reductions in foot volume, leg volume or ankle circumference. Aquatic exercise or water immersion may assist people with MS to manage persistent lower limb swelling. It could be used in combination with compression stockings and elevation exercises.



3.0 Assessment prior to commencing aquatic exercise programs

It is recommended that all people with MS obtain a medical clearance certificate from their general practitioner (GP) prior to beginning any aquatic exercise program. It is also important for a physiotherapist or other suitably qualified person to conduct a thorough physical assessment to determine appropriate methods of pool entry and exit, levels of assistance required in and out of the pool, and prescription of exercise.

Important components of an assessment include:

- **Personal care** – Determine the level of independence with showering and dressing.
- **Transfers** – Determine the safest method for transferring into and out of the pool, and for moving between sitting and standing positions.
- **Mobility** – Determine weight-bearing capacity, ability to use aids and ascend and descend stairs, walking endurance and need for support, and/or assistance both on land and in the pool.
- **Pain** – Identify both MS-related and non-MS-related pain. Use this as a benchmark to compare any expression of pain during or after exercise.
- **MS symptoms** – Identify the range of MS symptoms that affect the individual and consider how they will affect the person's ability to engage in aquatic exercise. Of particular note are the following symptoms:
 - **Heat sensitivity and fatigue** – Use this information to identify a suitable pool temperature, estimate appropriate exercise program duration, determine the frequency of rest periods and exercise intensity. Monitor the person's ability to exit the pool and get changed after exercise to determine if exercise induced heat or fatigue is present.
 - **Cognitive impairment** – Many people are able to self-report symptoms related to learning difficulty and memory. Use this information to guide decisions about supervision and choice of training methods (e.g., manual guidance, verbal instruction or visual demonstration). In-depth cognitive assessment may be warranted in certain circumstances. This can be obtained by referral to a neuropsychologist.
 - **Continence** – Identify the presence of issues with bladder or bowel continence and whether the person has appropriate management strategies. This information is important to determine the person's suitability for aquatic exercise. If a person appears to lack appropriate management strategies or skill, they should be referred to a continence nurse or the National Continence Helpline (1800 330 066) to obtain appropriate advice before engaging in aquatic exercise.
 - **Physical assessment** – Take baseline measures of fitness, strength, range of motion, spasticity and any other measure used to monitor exercise outcomes.

4.0 Aquatic exercise prescription

The available evidence shows large variation with regards to the selection of aquatic exercise type, dose, and progression. It is therefore difficult to identify specific guidelines for clinical practice so clinicians must rely on the available evidence for land-based exercise. Please refer to the *Strength and cardiovascular exercise for people with multiple sclerosis* handout for general guidelines about

strength and fitness exercise prescription. Most of the general principles of land-based exercise are also recommended for water-based exercise, such as including a warm-up and cool-down and allowing



adequate rest between sessions (e.g., one day). Most importantly, exercise should be focused towards achieving client-directed goals that are meaningful and relevant to the individual.

The types of exercise commonly used in water include strength, fitness, balance, stretch and relaxation exercises.

4.1 Strength training

Strength training involves working against the resistance of the water, body, or floatation devices.

Exercise examples

- Slow leg kicks or arm movements through the full range in flexion, extension, abduction and adduction, as well as squats, calf raises and jumping.

Exercise progression

- Increase resistance by using aquatic dumbbells, hand paddles, aquatic ankle weights or by moving through the water at a faster rate.
- Decrease resistance by slowing movements, eliminating body weight (by supporting the body with floatation devices such as pool noodles, floatation mats or buoyancy vests, or by exercising in deeper water) or performing movements close to the surface of the water.
- Increase repetitions and amplitude of movements (e.g., jump higher or further).

Exercise modifications

- People who are unable to maintain a standing position independently (e.g., due to weakness or balance impairment) may be able to do so by holding onto a rail at the edge of the pool or with the assistance of a floatation device such as a pool noodle, buoyancy vest or buoyancy ring. Alternatively, many exercises can be performed in supine instead of standing. People can be safely supported in supine by using a combination of floatation devices, such as a neck float to maintain the head above water, a trunk float such as a buoyancy vest or ring, and lower limb floats such as pool noodles or ankle floats. The choice of floatation device is usually guided by the person's size and comfort level in addition to the need to allow movements suitable for the desired exercise.
- Some people may have difficulty maintaining balance during resistance exercises due to the

turbulence created by their movements. They may be able to stabilise the body more effectively by leaning against the pool wall during upper limb exercises, holding a rail during lower limb exercises or by exercising in shallower water.

4.2 Fitness training

Fitness training involves a variety of exercises that increase the work rate of the heart and lungs.

Exercise examples

- Swimming, kicking, running, walking, cycling and jumping.

Exercise progression

- Increase intensity by adding resistance such as hand paddles during swimming or flippers during kicking, increasing speed of movement or increasing duration of activity.
- Decrease intensity by minimising resistance, slowing movements, reducing activity duration or reducing body weight (e.g., exercising in deeper water).

Exercise modifications

- People who have difficulty swimming (e.g., due to impaired coordination or weakness in upper or lower limbs) may be able to participate by focusing on the upper limbs separately to the lower limbs. For example, the legs may be supported with ankle floats, a pool noodle or other buoyancy device when working the arms. Then the arms and trunk may be supported by a pool noodle or buoyancy ring when working the legs. A neck float may also assist people who have difficulty with swimming to feel more water confident.
- People who have difficulty maintaining balance during walking, running or jumping activities may benefit from holding on to a pool edge rail or a floatation device such as a pool noodle or aquatic dumbbells.
- Cycling and kicking exercises can be performed in supine or prone positions (using floatation devices) to maximise comfort and safety.

4.3 Balance training

Balance training involves exercises that reduce the base of support (e.g., standing with one foot directly behind the other or standing on one leg) and/or which perturb the body (e.g., balancing when performing arm or leg movements against the resistance of water).

Exercise examples

- Tandem standing (one foot directly behind the other) standing on one leg, lunging, reaching, walking (forwards, backwards, sideways), running and jumping.

Exercise progression

- Increase difficulty by reducing the base-of-support (e.g., heel-toe walking, reaching or jumping with the feet close together), reducing vision dependence (e.g., walking backwards or balancing with the eyes closed), or increasing water turbulence (e.g., combine balance exercises with arm or leg movements that perturb the water, or perform balance exercises in choppy water).
- Decrease difficulty by increasing buoyancy (e.g., exercise in deeper water), increasing base-of-support (e.g., reaching with feet wide apart), reducing movement complexity (e.g., avoiding combined arm and leg exercises such as star-jumps), minimising water turbulence and providing minor balance assistance (e.g., exercise within reach of a rail or walking with pool noodle in front of the body).

Exercise modifications

- People who are non-ambulant on land may be able to balance and walk in water if they are supported with floatation devices such as a buoyancy vest, buoyancy ring or a pool noodle.
- People who are fearful of being unable to stand up after slipping in the pool may feel more confident if they have a neck float which will keep their head above water at all times.

4.4 Stretching and relaxation

Many people with MS enjoy stretching and relaxation exercises such as passive range of movement exercise or massage. These exercises can be part of anyone's aquatic exercise program but are found to be particularly enjoyable by people who are less mobile because they are able to move the muscles and joints beyond what they can achieve on land.

Exercise examples

- The supine body sway exercise allows the trunk and hips to stretch at the end of each movement. The person floating in the supine position has an assistant behind their head, who gently holds them at the trunk sides, and slowly guides their body through an arcing motion (from side-to-side).
- Supine hip and knee flexion (passive)
- Supine hip abduction (passive)
- Supine shoulder flexion and abduction (passive).

Exercise modifications

- Stretching may be difficult for people who experience strong spasms or spasticity. It is important for the assistant to position the person so that they avoid excessive strain on their own body – for example when passively moving the hips into abduction with the person in the supine position. Rather than having the assistant stand at the feet and separate the legs with one hand on each ankle, it may be better for them to stand between the person's legs at the distal end. The assistant can then rest their own back against one leg to stabilise it, and use both their hands to push and separate the other leg. This is usually more comfortable for both the assistant and the person undertaking the stretching exercise.
- People who have spasticity and some active muscle control may benefit from stretching techniques that alternate resisted contraction of the spastic muscle with stretching of the spastic muscle. For example, for a person with excessive knee extensor tone – alternate isometric resisted active knee extensor contraction, with passive knee extensor stretch. Repeated contraction and stretch may lead to increased relaxation of the knee extensor muscle, which may improve the person's comfort and ability to participate in other exercises during the aquatic exercise session.

5.0 Barriers to participation in aquatic exercise

People with MS can experience a complex range of symptoms that can affect their ability to safely participate in aquatic exercise. The barriers are mentioned briefly below. For further information on strategies for managing these please refer to the *Management of complex symptoms of multiple sclerosis* handout.

5.1 Heat sensitivity

An increase in body temperature can cause the temporary appearance of new signs and symptoms of MS, or temporary worsening of old symptoms. This is related to the slowing of nerve conduction with increased temperature. For some people a temporary increase in symptoms may present as general fatigue and weakness. Others may experience more severe symptoms such as reduced mobility, abnormal sensations and altered vision.⁹ Temporary changes usually resolve within 24 hours.¹³

Studies have shown no adverse effects when people with MS use pools with a temperature range of 25–35 °C.^{3,5,14,15} Note that in these studies, the higher temperatures were used for people with greater physical disability (performing less intense exercise) and the lower temperatures for people with lesser physical disability (performing more intense exercise). Heat sensitivity can also be affected by the temperature outside, so people who experience heat sensitivity should exercise in facilities with good ventilation.

Strategies for managing heat sensitivity include:

- Exercising in a pool that is 25–30 °C for people with minimal-to-mild physical disability, allowing vigorous exercise without excessive increases in body temperature
- Exercising in a pool that is 30–35 °C for people with moderate-to-severe physical disability
- Ensuring good ventilation in the surrounding environment
- Maintaining adequate hydration
- Allowing regular short rests.

Note that these pool temperatures are only general guides. Each individual will have an optimal temperature at which they prefer to exercise. People with MS should be encouraged to try exercising in pools of different temperatures (where possible) so that they can find a pool which suits them best.

5.2 Fatigue

Fatigue has been defined as physical and/or mental weariness resulting from exertion. That is, an inability to continue exercise at the same intensity with a resultant deterioration in performance.¹⁶ Fatigue is also defined as a subjective lack of physical or mental energy that is perceived by the individual or caregiver to interfere with usual and desired activities (MS Clinical practice guidelines).¹⁷

People with MS-related fatigue may tire after short periods of relatively mild activity and may take hours to recover. Their fatigue often peaks in the afternoon and can worsen with heat. The strategies to minimise fatigue for people with MS during aquatic exercise are primarily based on the principles of pacing,^{13,18} and temperature regulation.^{9,19}

Please refer to the *Management of complex symptoms of multiple sclerosis* handout for further information on general strategies for exercise and treatment sessions where fatigue is a factor.

Specific strategies for fatigue management in aquatic exercise sessions include:

- Scheduling aquatic exercise sessions early in the day
- Encouraging the participant to have a cool shower and a rest after exiting the pool
- Encouraging the participant to maintain regular fluid intake to avoid dehydration
- Limiting time in the water to between 30 and 40 minutes.

When a person with MS reports increased fatigue for more than 24 hours after exercise, their program should be adjusted (e.g., reduce repetitions, sets, resistance or total time in the water). It is important to be aware of the person's overall exercise activities so that rest days are scheduled to minimise the cumulative fatigue effect of exercise.

Some people with MS have no symptoms of fatigue and can complete high intensity exercise programs without negative effects. These people should



be progressed at a pace that keeps the program challenging and enables them to gain the maximum benefits of exercise.

5.3 Balance impairment

The buoyancy of water may give people with balance impairments more confidence, encouraging them to walk without aid. However some people will also need additional support in the water to ensure that they are safe. This is particularly true for non-swimmers.

Strategies to assist ambulant people with MS to safely mobilise in the pool include:

- Walking with a pool noodle or kickboard held in front of the body
- Wearing a neck float to prevent submersion of the head in the event of a slip or fall
- Wearing a buoyancy float around the chest
- Wearing aquatic socks to reduce slipping on the pool floor
- Completing walking tasks near a pool edge or rail.

5.4 Communication impairment

People with MS may have difficulties communicating effectively for a number of reasons. Communication difficulties may be due to a motor impairment (e.g., weakness of the orofacial muscles), slowed processing speed (inability to keep up with the speed of conversation), difficulty with word finding, or other impairments. Communication difficulties can make participation in group exercise programs difficult.

Strategies to minimise these difficulties include:

- Using a combination of verbal instruction, demonstration, and physical guidance
- Keeping instructions short and simple
- Repeating instructions as required
- Facing the person when speaking so that they can see your lips
- Keeping music and surrounding sounds low
- Observing the participant's facial expression for signs of fatigue or discomfort.

5.5 Cognitive impairment

Cognitive impairment (i.e., memory and thinking problems) may occur in up to 50% of people with MS.²⁰ Participation in work, social and home environments can be significantly affected by the presence of cognitive impairments. Exercising in an aquatic environment may be challenging for people with MS who have impaired short-term memory, attention,

information processing and executive function (e.g., difficulty with planning, problem-solving, self-monitoring and flexibility of thought).

Strategies that may assist people with MS-related cognitive impairment to participate in aquatic exercises include:

- Minimising background noise and distractions
- Exercising for shorter periods of time to accommodate reduced learning capacity or susceptibility to cognitive fatigue
- Ensuring that sessions are well-structured, engaging, and reinforcing to maintain focus and clarity about the goals of each session
- Giving simple and concise instructions, checking that the person understands each instruction, and allowing adequate time for an appropriate response to the instructions
- Providing feedback and allowing significant repetition when learning new skills
- Providing demonstration (in or out of the water) and/or manual guidance to facilitate understanding about the movements required for the exercises
- Allowing each new skill to be strongly established (using extra rehearsal time if necessary) before introducing new skills. This helps reduce the impacts of rigidity (cognitive inflexibility) or moderate memory impairment
- Encouraging the use of a diary or calendar to improve recollection of appointments
- Ensuring close one-on-one supervision is provided to people who may be at risk of engaging in dangerous behaviours in the water, and to people who need frequent feedback or guidance. This may be achieved by training a friend, relative or carer to support the person in the water.

For more information on assisting people with MS-related cognitive impairment to participate in exercise, refer to the *Management of complex symptoms of multiple sclerosis* handout.

5.6 Exacerbations

People with relapsing-remitting MS are likely to experience exacerbations from time-to-time (the frequency varies with each individual and is often unpredictable). An exacerbation is a sudden worsening



of one or more MS symptoms, or the appearance of new symptoms, which lasts for at least 24 hours. Exacerbations occur at least one month apart and usually take from several days to several weeks to resolve.

Always advise people with a suspected exacerbation to seek medical support and treatment. People having mild exacerbations may continue with low intensity exercise under the advice of their doctor or health professional. They should be encouraged to limit activities that could raise their body temperature or cause fatigue. Exercise intensity should be gradually increased after the exacerbation has resolved.

All people with MS should be reassessed after an exacerbation or period of illness to determine the appropriateness of their program and any changes to their needs. Annual reassessments to review physical status are also recommended.

5.7 Spasticity or hypertonia and pain

Some people with MS experience spasticity or hypertonia in muscles. This can alter their ability to float, especially when only one side of the body is affected. Spastic or hypertonic muscles tend to sink so it can be helpful to provide more support or position floatation devices to counteract this tendency.

People who have persistent pain, muscle spasms or stiffness will have various responses to water. Some will find relief while others may experience symptom aggravation. Experiment with different postures and movements to find exercises that are comfortable and manageable for each person. A warm-up and cool-down with slow and gentle movements may help to minimise discomfort. Where people report new or worsening pain after their program, refer them to their physiotherapist and/or GP.

5.8 Incontinence

People with MS who have urinary or faecal incontinence may be able to participate in aquatic exercise by temporarily using devices such as a spigot to block the catheter or an anal plug. A continence nurse or the National Continence Helpline (1800 330 066) can provide further information.

5.9 Mobility impairment

Always check pool access and the mobility requirements of people with MS. Some pool facilities

will require that a carer is present with any person who has impaired mobility.

Features that make pool facilities more accessible for people with mobility impairment include:

- Ramps (important to access bathroom facilities and also to access the pool)
- Rails at stair and/or ramp entries to the pool
- Pool hoists (chair or bed)
- Disabled parking close to the facility entry
- Short distances to walk between the bathroom and pool
- Disabled bathrooms with rails, seating and shower hoses
- Seats within the pool to enable rests before and after pool entry and exit, respectively.

5.10 Fluctuations in physical ability

People with MS may vary in their physical abilities from week-to-week. Take note of their performance each session and adjust exercises appropriately. Exercise is recognised to slow the physical decline of people with MS;¹⁰ however it is often difficult to gauge such benefits. Some people will have clear improvements in physical function while others will maintain a stable level of function. Some people with MS will show a decline in performance as the disease process continues but the decline may occur at a slower rate than if they were not exercising. When a person appears to have had a significant increase or decrease in physical ability it is important to review their exercise program.

6.0 Summary

- Aquatic exercise is suitable for many people with MS as a method of enhancing or maintaining their physical abilities, and as a leisure activity. The available evidence – although of a relatively low level – indicates a range of positive benefits and no detrimental effects.
- Aquatic exercise should be prescribed according to the individual goals of the participant. There is no available evidence to support certain types of exercise or doses for aquatic exercise prescription. Guidelines provided in this handout are based on the clinical experience of physiotherapists working in aquatic programs with people with MS.
- The key barriers to participation in aquatic exercise programs for people with MS are: heat sensitivity, fatigue, balance impairment, communication impairment, exacerbations, spasticity, hypertonia, pain, incontinence, mobility impairment, and fluctuations in physical ability. A number of strategies have been provided to assist physiotherapists and exercise instructors to overcome these barriers.
- People with MS may have comorbidities that can affect their safety in water. Medical advice should always be obtained prior to starting an aquatic exercise program.
- People with MS should be reassessed after an exacerbation, period of illness, or if they experience physical decline. They may also need their program adjusted slightly from week-to-week if they experience fluctuations in MS symptoms, such as fatigue.

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MS Practice//For Health Professionals

MS Practice is an initiative of MS Australia (MSA). MS Practice is an online resource designed to support allied health professionals in the symptom management of people with multiple sclerosis (MS). The series addresses the various symptoms associated with MS, providing health professionals with evidence-based information and clinical practice recommendations to enhance the quality of care and outcomes for people with MS. The MS Practice topics were identified by the MSA Physiotherapy Network.

Aquatic exercise for people with multiple sclerosis

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Credits

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MS Australia

MS Australia is a not-for-profit organisation that has been supporting people with MS since 1956. Through state-based MS Societies, MS Australia strives for a world without MS through quality research and service excellence for people with multiple sclerosis, their family and friends, and healthcare professionals.

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This handout is intended to provide information to support current best practice for the management and treatment of physical impairments in people with MS. While the information is available to all health professionals, there are details that are most relevant to physiotherapists, exercise physiologists, and people who are qualified to provide exercise opportunities for people with MS. MS Australia has made every effort to ensure that the information in this publication is correct. MSA does not accept legal responsibility or liability for any errors or omissions, or for any physical or financial loss incurred whilst participating in the exercises or activities outlined in the MS Practice handouts. Be sure to seek advice from the sources listed.



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