

Myositis Presentation: Aquatic Therapy September 15th 2011

WHY WATER? SPECIFIC BENEFITS

This brief summary illustrates why water exercise is used for the specific benefit for individuals with arthritis, chronic pain, chronic disease and inflammation disorders.

The combined influences of turbulence, resistance, hydrostatic pressure, buoyancy, thermal conductivity and exercise can restore flexibility and range of motion much faster, more safely and with less stress on the body than a typical land exercise program. Water creates opportunities for early rehab, cross training, and a precursor program that progresses to land exercise.

Resistance

Water provides modifiable resistance to movement in all directions. This effect encourages the balanced use and strengthening of all muscles, promotes trunk stability and postural alignment. The participant controls the intensity of the workout: the harder one pushes against the water the harder it pushes back. Water exercise provides excellent training opportunities for muscle balance and strengthening without putting undue stress on the joints. Water offers support or resistance, making it a flexible and progressive program

Buoyancy

The body is almost weightless in chest or shoulder depth water. The weakness in the legs from myositis is not a problem in the water. Water will support you when your limbs can't, but when you are ready buoyancy will challenge you.

Exercise and movement forces have less impact in the absence of load-bearing compression on ankles, knees, hips, and spine. Without this compression, pressure, and impact to the joints, pain subsides. Buoyancy allows an improved blood supply into joint spaces and surrounding muscles which helps to support progress toward a fuller range of motion, increased strength, fitness, and function. Buoyancy assists any movement upward, it assists with upright posture, it assists flexion of the ankle hip and knee, conditions of myositis are nicely supported in the aquatic environment.

Hydrostatic Pressure

The squeezing effect of water supports every movement and has a positive effect on the cardiovascular system. While standing upright in shoulder depth water, hydrostatic pressure causes a 60% increase in blood volume (700 ml) to the chest cavity. Prior to entering the pool this blood volume due to gravity is located in the hip area. Hydrostatic pressure causes the heart to take in a greater blood volume, and the heart stroke volume or output increases by 32% (Starling's Law). The greater blood volume at the heart causes an increased filling time of the right atrium and causes the

heartbeat to slow down by 10 to 17 bpm. The resulting effect provides safety against high heart rates, a well-conditioned heart muscle from pumping larger volumes of blood, superior circulation deep into extremities and muscle tissues, and increased cleansing of toxins. Hydrostatic pressure also helps to reduce edema or swelling of the working joints and associated muscle groups especially the ankles and knees.

Turbulence

Movement through water creates turbulence. Turbulence has a massage like effect on the body and causes increased blood flow to the surface of the skin. Turbulence contributes to feeling invigorated and energized after a water exercise session. Working against turbulence demands increased muscle activity, and provides additional opportunities for stabilizing and strengthening against the turbulence. Turbulence increases sensory input and continues to slow down movement, allowing the mind the time to grasp and sense the activity in the body, hence contributing to greater body awareness.

Thermal Conductivity

Pool temperature has a significant effect on the results and outcome of Aquatic rehabilitation, and rheumatology programs. Therapeutic water temperature, usually 88°F - 92°F (29°C - 31°C) or more helps to warm the muscles so they stretch more easily. This effect is particularly good for people with myocitis, fibromyalgia, arthritis, scleroderma, and other flexibility deficits. Pools that are 84 to 88° F. are also helpful for clients of moderate fitness.

Safety, non-impact or modified impact

Water slows movement, allowing clients time to react. Falls happen slowly in the water allowing the client time to right themselves, or the myocitis patient can wear a safety floatation ring which can be worn to prevent falls. Multi-directional resistance prevents ballistic movement and promotes muscle balance. Buoyancy reduces the risk and fear of falling, making injuries in the water environment less likely to occur. Water exercise seldom contributes to muscle soreness or fatigue, and is safe enough to start 7-10 days after surgery (doctor's recommendation required). Water exercise can give a head start to recovery and reduce over-all therapy needs.

Pre- and Post-Surgery Applications

Therapeutic aquatic exercise helps to strengthen the muscles without impact on load-bearing joints. Pre-strengthening before surgery aids a speedy recovery. Once the incision has healed, and the physician has approved, the client may attend the pool for a safe, gentle, pain-free and expedient recovery from surgery.

Water Exercise is recommended when there is:

- Pain with land exercise
- Load-bearing injury
- Inadequate trunk stability
- Inefficient circulation
- Fear of falling
- Poor postural alignment
- Muscle weakness and fragile bones
- Limited range of motion/inflexibility

- Inadequate balance
- Obesity
- Back surgery
- Mastectomy - recovery
- Respiratory disorder
- Developmental delay
- Need for muscle conditioning
- Need for cardio-respiratory endurance training
- Chronic pain
- Hip or knee replacement
- Diabetes
- Arthritis, inflammatory and autoimmune disorders
- Sports and orthopedic injury
- Need for general fitness conditioning
- Requirement for flexibility training, or

THE PHYSIOLOGICAL EFFECTS OF IMMERSION & HYDRODYNAMICS

- Therapeutic exercise in water is vastly different from therapeutic exercise on land.
- Qualities of the aquatic environment provide a superior therapeutic training modality.
- Knowledge of fundamental principles of hydrodynamics is essential for the effective design and modification of therapeutic aquatic training programs, and ultimately the improved wellness of clients.

Shape, Velocity, Resistance and Drag:

- When clients move through water, they experience a pressure drag effect. An increase in speed increases the drag effect.
- Frontal-plane resistance is the resistance experienced by the anterior surface of the body intercepting the water as it moves through it. The frontal surface of a body can vary in size and shape, depending on the trunk or limb position, i.e. turning the body sideways and presenting a smaller frontal surface to the water. Vertical posture increases frontal plain resistance; poor posture reduces frontal plain resistance.
- The density of water is 1000 times greater than the density of air, which accounts for the difference in resistance or pressure drag between the water and air.

Shapes, and Their Effects on Resistance

Shape	Difficulty
<ul style="list-style-type: none"> • Arm shorted by flexing the elbow and the wrist, and the limb is close to the body • A long arm with slicing hand. • Slender person moving sideways. • An obese client walking forward • A movement reaching far away from the body's center. • A hand cupped in the direction of movement. • A long leg with plantar flexed foot. • A long lever, hand or foot held far from center with resistive equipment on the hand or foot. 	<p style="text-align: center;">Easiest</p> <p style="text-align: center;">Easy</p> <p style="text-align: center;">Harder</p> <p style="text-align: center;">More Difficult</p> <p style="text-align: center;">Most difficult</p>

Implications for Aquatic Therapy & Training:

The shape of hands, feet and limbs create opportunities for resistance modification that can greatly affect aquatic exercise intensity and design. As seen above, resistance or drag effect increases with a longer lever and a larger surface area. The greater the distance away from the body core and the intentional shape of the hand, such as a cup, can also be applied to increase resistance. It is recommended that practitioners encourage the use of various lever lengths and hand positions to meet the requirements of each client.

To lighten the resistance for new participants a slicing hand or a soft held fist will protect sensitive joints, a paddle hand will add resistive forces. While warming up, we encourage clients to use slicing motions and shorter levers to facilitate a gradual increase in intensity. In an arthritis class, a slice can be used throughout the class to avoid overloading a weakened joint or muscle group with too much resistance. On the other hand leaders can encourage clients to use a soft held fist or a paddle hand to enhance the strength training opportunities. Arthritic hands may not tolerate the fist or flat hand positions. A comfortable or gently folded position or holding a soft sponge may work more effectively.

Altering the position of the torso, limbs, hands and feet while moving through the water, can dramatically alter resistance without the use of equipment. The water is the equipment. Some joint disorders will not tolerate the use of equipment, resistance or long levers. Small progressions toward increasing the lever length on good days are advisable. We need to educate our clients how to use the water. In some cases, the use of equipment will enhance the effectiveness of strength changes in clients.

Educating clients about body awareness and posture will be important factors in the maintenance of

appropriate resistance. To maximize resistance the larger surfaces of the body must be presented perpendicular to the water in the direction of movement. Poor posture can eliminate most of the resistance, as it presents a diagonal shape that cuts into the water eliminating resistance as well as cause a misalignment of the spine and jeopardize safety. A smaller surface feels less resistance than a larger surface. Expect a large bodied participant to exert more effort to travel a set distance than one with a very small body. Obese individuals need more time to complete a movement, keep this in mind when encouraging progress. The bigger the body and body surface the more difficult the forward progress.

The addition of equipment is a modification that can be applied to assist, resist, or support a movement. For example, the weak quadriceps muscles of myocytis can be supported in upward motion with a buoyant weight.

Equipment is designed with a variety of shapes and sizes to vary the amount of resistance or support. A few examples follow. A round surface such as a barbell allows the water to roll around it. A flat surface causes the water to bounce off or come back, as in the flat side of a bar bell or bells constructed with flat surfaces, which is more difficult. A cupped or a well-shaped apparatus (hydro tone bells) will capture the water; the water will become turbulent when it escapes the well and mixes with more incoming water, this creates intense resistance, and is not equipment you would use for support.

PRECAUTIONS AND CONTRAINDICATIONS FOR WATER EXERCISE

MEDICAL RISK FACTOR	PRECAUTIONS AND ACTION
Cardiac conditions High or low blood pressure Diabetes symptoms cause risk of heart problems, hypertension.	Safety procedures are required, with a medical practitioner and oxygen therapy on site, in some cases. The risk of overexertion or over-heating may compromise client safety. Monitor heart rate and exertion levels. Avoid cardio respiratory exercise in a warm pool for longer then 2 minutes.
Urinary tract infection, bladder incontinence, colostomy	Consider the risk to pool sanitation, risk of disease transmission, and client infection. The colostomy bag can be worn in the pool; it will float in the water. Wearing a T-shirt or elastic belt over it will prevent turbulence from tugging at it.
Hydrophobia: fear of water	Client fear will cause rigidity, small ROM, increased stress. Client may be unstable in water. A caring orientation to water, and safety skills may prevent fear, or, client may be unsuitable for the water.
Menstruation (in some cases)	Internal protection needs to be worn.
Intravenous lines	Turbulence will pull on the line. Wall exercises with intravenous hand on the wall may help.
Multiple Sclerosis	Client generally needs cool water therapy. Avoid over exertion.
Excessive skin sensitivity or chlorine sensitivity	Barrier cream applied before pool exercises, or wear long tights and moisturize afterwards.
Vital capacity less than 1500cm	Hydrostatic pressure reduces respiratory reserve. Risk of respiratory anxiety. Perform breathing exercises in shallow water, then move deeper cautiously.

Behavior problems	Can be dangerous or disruptive for practitioner and other clients. A volunteer assistant may help monitor the client.
Alcohol or pain killer abuse	Client safety is at risk. Do not allow the client to participate under the influence.
Unstable cervical vertebrae	Use movement precautions or a soft neck collar. Neck hyperextension, impact, uncontrolled twisting, and unstabilized movements should be avoided. Carelessness could result in permanent, or life-threatening damage.

ABSOLUTE CONTRAINDICATIONS	RISK INVOLVED
Open wounds, skin infections, immediately post surgery	Risk of infection of the open wound, and risk of spreading infection to other clients.
Acute symptomatic venous thrombosis, or presence of a blood clot	Increased circulation of water exercise from hydrostatic pressure can cause movement of a clot. Or cause a rupture.
Bowel incontinence	Risk of spreading infection and compromising pool sanitation.
Unstable blood pressure	Risk of heart failure.
Tracheotomies	Risk of drowning. Some physiotherapists use a trachea cap, or a custom designed trachea snorkel.
Transmittable disease in water Hepatitis A or B	Disease transmission risk to other clients and practitioner.
Fever over 100 degrees	Client is very ill and requires bed rest. Warm water will aggravate the fever.
Myocardiopathy: heart muscle does not expand efficiently, or severe or unstable heart conditions Highly unstable arrhythmia	Risk of pressure building in the heart, causing heart failure. Medical professionals should monitor exercise.
Vomiting, diarrhea	Risk of infection spreading to other clients, and compromised pool sanitation.
Advanced renal failure	Increased circulation causes increased blood filtration, and increased urine. In an extenuating circumstance, a client can stand in shoulder-depth water using the skin and the water as a filtering system.
Cerebral hemorrhage	Increased circulation will increase hemorrhaging.
Perforated ear drum	Water seepage into the eardrum may cause inner ear infection. Use earplugs and a bathing cap.

Aquatic Rheumatology Client Orientation Sheet

Before your first pool visit:

If your doctor has not referred you, let him/her know what you are planning. If you are taking prescription drugs, ask your doctor what effect they may have on your exercise program, especially if you are taking muscle relaxants, pain medication or beta-blockers. Ask your doctor if the use of your pain medication should change to accommodate exercise, i.e. should the medication be taken before or after exercise. Have your physician fill out the consent form, if the therapy pool requires it.

What to Bring:

Yourself, arrive a little early on the first day.

Bring the completed health history form and the physician's consent form.

Towel, swimsuit. a big t-shirt and leggings can be worn if you prefer more coverage or get cold easily. Long leggings can cover skin conditions like eczema, sparing other swimmers the worry of it being contagious.

You need toiletries, and deck shoes if you have them.

Aqua shoes are highly recommended, for diabetes, for arthritic feet with bone remodelling close to the surface, thinning delicate senior skin and especially for feet not used to load being.

What to expect:

Swim skills are not required for aquatic therapy. For the most part your feet will be on the floor of the pool for upright exercise, strengthening, stretching, and relaxation exercises.

We will teach you the skills for deep-water exercise after a proper orientation. Do not worry if you are not comfortable in deep water; exercises can be performed in shallow water if you prefer.

If Possible choose a pool with warm water 86-90 degrees, with stairs entry or a ramp and/or a hydraulic lift for entering and exiting the pool.

Drink water:

Drink water before, during and after your class. Muscles work much better with proper hydration. Please do not consume ALCOHOLIC BEVERAGES before your class. We cannot ensure your safety or health and fitness improvement when under the influence. Do know however that water exercise causes "profound dyarehhesus

Ask questions of your practitioner.

Do not continue any movement that causes an increase in pain. Do let the practitioner know if you feel dizzy or unwell, or if a movement causes an increase in pain. Do come to class even if you feel fatigued. You will feel better for making the effort.

Modifications can be made to the exercise to accommodate your energy and pain and ability levels.

Sample Exercises and Progression for a Low level to Moderate Arthritis Class

Warm Up: 5 to 8

Healthier populations can warm up in 5 minutes or 8-10 for more complex health conditions i.e. hypertension, asthma, obesity, arthritis, neurological conditions etc. Many degenerative diseases respond better to dynamic stretching over static stretching. The reason is the joint is not forced into compression with the dynamic stretches. Use the static and dynamic stretches adapted as needed for individual client/pathology needs. Overly dynamic stretching can cause micro tearing.

Clients with chronic pain and generalized tenderness may need to stretch in a variety of positions to integrate stretching of deeper muscle fibers and fascia, to incorporate different lines of pull.

Many stretches can be integrated into warm up walking patterns

If you are being seen one on one by a therapist, if possible, do your own warm-up before being treated. It will save time and you will get more out of your session.

Warm up exercise can vary greatly but should address the whole body generally, and focus on the hips shoulders and spine, then moving outward to all the joints of the extremities. For some a long warm-up will be the program until there is progress.

Walking exercises and the purpose for each

Gentle forward walk, you may need floatation support for safety or may need to use the wall to hold on to, or hold the therapists/helpers hands. When walking in water progress to swinging the arms through the water as if walking on land. If this is the only move you do, it's a good move. Focus on body awareness, feeling your position, posture, the muscles working, the temperature and resistance of the water, be deliberate and conscious of each step and your breath. Breath in for one or two steps and breath out for one or two steps.. Match your pace with your breath. Being able to take 3 or 4 walking steps for an IN breath and 3-4 steps for an Out breath demonstrates a progress of the depth and volume of your breath, which is a demonstrator of improved physical health. Deeper longer breaths cultivate calmness, muscle relaxation (so they work better), inhibits hypoxia (poor oxygen level in the blood and muscles), activates the parasympathetic nervous system, which better activates the restorative functions of the body, such as the immune system.

Backwards walks with arm variations: allows the muscles that usually support movement, instead, lead the movement, Very Important for reversing muscle imbalance and postural irregularities.

Corkscrew walk: A walk with a wide outward leg swing then a controlled step in-front of the other foot, focus on solid posture, do not let the body twist around. Benefit strength, Hip stabilization balance and co-ordination.

Grape vine walk: step side walking placing the step alternately in front of or behind the other foot. Purpose: hip rotation, add and abduction of the hip, coordination, fun, can be done slow and big or faster with small twisting type steps

Tin soldier walk: a straight leg march, purpose: active hamstring stretches, soft heel placement (timing), and balance

Knee Dip walk: large step forward, then bend forward knee to dip, Purpose: Knee strength, balance, control

Power walk, Tall posture, strong stride with resistive arm action Purpose: Is difficult, trains whole body for strength, Trunk stabilization, the can be a good cardio & strength combined work out move

Diagonal walk: step forward at an angle away from the body, Purpose: body awareness, stabilization, mixing of side and front muscle activation which is more complex for the body's muscle groups

Keep on Truckin walk: large leg swing forward into a giant step, a slow move with soft heel placement and long forward reach Purpose: stability, timing and control of the heel strike through the hamstrings, stable trunk and balance challenge

Exaggerated push off walk: exaggerate the toe push off when walking Purpose: works on calf strength and plantar flexion of the foot, and trains strong core muscles

Walk the lines or narrow base of support walk: Purpose: Trains a narrower base of support, and challenges/improves balance

Walk stop stabilize...walk...stop...walk...etc: Purpose: It is harder to walk and stop then it is to keep walking. Used to train, strength and co-ordination, Also improves body awareness, control and balance ,

Cha Cha: on the spot step and step, then step forward for three fast little steps cha cha cha...Fun, nostalgia, timing coordination, and cadence

Box step: Step in a box pattern, Fun Nostalgia awakes the spirit, timing, coordination, and cadence

Walk pivot turn Walk: Upper and lower body integrated movement, complex co-ordination

Walk and elevate up onto toes: Calf strength Balance

Walk with tightened abdominal muscles try 20-40-60-% effort: Gentle abdominal strengthening to train better posture and support when walking on land.

Walk stop... rock from heel to toes.... walk: Weight Shift and balance, foot flexibility

Walk on heels, walk on toes, walk on outside edges of the feet, and walk on inside edges of the feet

Walking with Big wide closing and opening arms: adds resistance if closing the arms in front and walking forward, if walking backwards the arms assist.

Hip hike walk: Hike upward one hip and step forward, repeat on the other side continue to walk this hiking hips Purpose: for hip control, improved ROM, stabilization and balance

High knee march with toe up hold and balance: Balance in single leg stance, calf strength,

Skate walk: weight shift hip extension posterior strengthening

Skate Walk Hold the weight shift: explore and hold the weight shift, balance

Squat Lateral Walk, with assistive and resistive arms: knee flexion leg strength

Jogs or rebound moves: Sartarius jog, hamstring curls, rocking horse, ballet (stag leaps), ski, jacks,

Anchored Marches: As if feet were glues and difficult to remove from the floor, narrow to wide march, large to small and quick

Shoulder Exercises:

Shoulder protraction, retraction, elevation, depression,

Alternate circles while moving arms front then to the side

Lateral pull down,

cross arms in front then behind the body

Give your self a hug,

Internal external shoulder rotation

Elbow Flex/tensions, Stabilized (Cube position) Single arm pulls, elbow circles, try to touch elbows in front, start the lawn mower, ladder climb with elbows

Lower Extremity:

Hamstring curls, Purpose: to strengthen hamstrings, variation: curls with externally rotated hips/knees kicking to the opposite bum cheek

Rocking horse,

Lateral pendulum,

Reverse or Mule kicks

Seated Exercises Options:

Bum Walk or Hip hike: walk to edge of seat and to the back of the seat, elevated trunk and seat

Cross elbow or hand toward lifting knee: hip and knee flexion elbow adducts toward midline and the opposite knee, provides a nice strong abdominal contraction

Sitting knee flexion and extension

Foot exercises, plantar flexion and dorsal flexion, circumduct ankle, figure 8's

Seated trunk rotations, forward fold, side bends, reaches up,

Seated shoulder rolls, scapula retraction, protraction, elevation depression

Postural Alignment Exercises

Reverse walk with arms slightly open to the sides with paddle hands to create resistance causes the spine to take on a more neutral posture

The Body Wave, Chin Tuck, Neutral pelvis,

Cues: Tall posture, transverse abdominal contraction 20%, scapula retracted, cervical spine in neutral chin is pulled back into alignment,

Chin tucks are a nice exercise to do while waiting for red lights to turn green driving a car, Keeping the head level press the occipital bone into the seat rest do 10 reps several times Dailey.

Gait Rail Exercises:

Sit in Cube position, while holding the gait rail allow the body to swing or glide toward and away from the rail. Purpose: involves relaxation, breathing when the chest open exhaling when the chest closes, worked to lubricate all the joints

Feet stay stationary shoulder width apart; hands hold the gait rail and stay stationary

Arms stay long and relaxed

Body is in a cube squat

With as little effort as possible move hips forward over knees and over toes, include a deep breath in, move hips forward to an almost back bride position, glide hips back until knees full extent stretch the low back all while exhaling slowing

Stationary Exercises:

Foot Proprioception: Place Disc under foot flex ankle moving the forefoot through figure 8 patters, flex/extension, inversion eversion

Standing heel slides

Squat Variations: forward lung squat, one leg squat

One-leg stance exercises: hip add and abd, hip flex/ext, circumduction, diagonals, 8's reverse directions

Weight shift exercises: Step side recover, step forward recover, back and diagonals

Heel pumps to move edema, and stimulate vascular flow

Squat and squeeze

Pelvic Clocks: at the wall

Trunk Rotation (slow and controlled), Trunk side beds, press the hip out

Hip circumduction with soft knees

Trunk stabilization exercises:

European series of cube exercise series with arm variations

Body holds a stable cube, chin in the water, and choose appropriate depth for client's

ability to flex their load bearing joints. Perform single leg and arm movements while body remains stable

Flutter board paddling series:

Sink buoyant stabilization equipment with long levers and stabilized body, back at pool wall

Shallow Suspended Noodle Series of Exercises: Sitting on the noodle, kneeling on the noodle, balanced over the noodle with handhold.

Use of Equipment and their application:

Ankle weights: assist flaccid or overly buoyant limbs to the floor also increases joint proprioceptive and kinesthetic receptor feedback

Rubber tubing: A tool for education on resistance and effort

Buoyant ankle cuffs: assist knee flexion or extension depending on body positioning, also facilitate firing of core stabilizers to maintain erect posture and challenge balance.

Some arthritic hands do not hold equipment well; sponges or short pieces of noodles work well.

Wands: Assist bi-lateral arm movements

Exaggerated gait arms

Tarzan arms

Chest press downward, front,

Big circles like rowing, sideways circles

Kayak paddling

Gluteal massage

Posterior push, Posterior side sweeps

Partner Wand Exercises: CC Ski

Other patterns as beneficial to the needs of the client

Finger walks up the wand and down

Wand supported anterior reach

Hand Wrist Exercises:

Pray to Fan hands, Finger push-ups, Thumb circles, Fist and fan, Play piano, Touch each finger to the thumb, Princess Di wave, wringing out the noodle,

Foot Exercises

Butt out the cig, Ankle circumduction, toe raises, heels raise, double calf stretch, and ankle 8s, pick up a ring or toy from the bottom of the pool

Deep Water: jogging, cycle, skiing, hamstring curls, backwards sideways and forward, wide and narrow

Stabilized heel slides

Side lying bicycle

Seated packman, vertical pogo or frog legs, narrow and wide tucks, tall swivel, kneeling swivel, Jumping Jacks, inward and outward jacks, seated knee extension alternate or together, leg raises singles and doubles, seated double leg circles and 8's,

Full body swings front to back and side to side with noodle under arms

Use of Equipment and their application:

Ankle weights: assist flaccid or overly buoyant limbs to the floor also increases joint proprioceptive and kinesthetic receptor feedback

Buoyant ankle cuffs: assists the foot with upward motions, or assists knee flexion or extension depending on body positioning, also facilitate firing of core stabilizers to maintain erect posture and challenge balance.

Rubber tubing: An elastic tool for increasing resistance and effort

Some arthritic hands do not hold equipment well; sponges or short pieces of noodles work well. One will be more likely to push harder on an object then with without one.

Cool Down

Glut stretch, hamstring stretch, double calf stretch, shin stretch, lunge inner thigh stretch, side stretch, deltoid stretch, triceps stretch, upper back stretch, lower back stretch, chest stretch,

Thank You for coming to this Workshop, do contact me if you have any questions, I am happy to help..

Sheralee Beebe
575 Canyon Road
Redwood City Ca 94062

Phone: 650 260 2593 Email: Sheraleebeebe@comcast.net