

CORE TRAINING + STRETCH TECHNIQUES **AEA Continuing Education Workshop Handout**

Dive into a pool of core training techniques that include standing, traveling and buoyant options to develop dynamic strength for improved function. Learn options with and without equipment to meet a variety of goals and successfully target all skill levels. Flow into a sampler of stretching techniques – static, dynamic and equipment assisted options. From relaxing mind-body options for warm waters to fluid movements for cool pools, learn how remain flexible in all environments!

COURSE OBJECTIVES

Upon completion of this course, participants will:

1. Define “CORE”, musculature involved and how water assists in training.
2. Understand the concept of functional fitness.
3. Define dynamic stability and strength and how this affects activities of daily living as well as sports performance.
4. Review various stretching techniques, focusing on those most applicable to the aquatic environment.
5. Recognize the importance of relaxation in overall health and wellness and understand how to implement relaxation techniques in the pool.
6. Discuss and practice three unique training methods to target the core muscles in the aquatic environment.
7. Discuss and practice four unique stretching techniques suited for the aquatic environment.

INTRODUCTION

The Core Training + Stretch Techniques workshop is a system of progressive exercises in the pool to strengthen and stabilize the core of the body as well as stretch the body from head to toe.

Clinical examples show that weak abdominal muscles can contribute to poor posture, improper body mechanics and low back pain. A strong trunk is important for functional movement on land because that is where we live. On land, there are many ways to do a curl, a crunch or a sit up. While flexing the trunk is how we strengthen the rectus abdominis, most of our daily activities are either in standing or seated positions, with the trunk upright. So, doesn't it make sense to strengthen and stabilize our abdominal muscles in a functional position?

In this workshop you will learn how to strengthen and stabilize the core muscles – rectus abdominis, internal and external obliques, latissimus dorsi, trunk extensors, rhomboids and traps, using the *support* as well as the *resistance* of the water. In the pool, we will demonstrate some progressive exercises using buoyant noodles. You will be able to see the exercises, *hear* the cues, and then practice them in your pool. But first, a quick anatomy review.

WHAT IS THE “CORE”?

DEFINE CONCEPT

The “core” actually consists of many different muscles that run the entire length of the torso. These muscles stabilize the spine, pelvis and shoulder girdle to provide a solid foundation for movement of the arms and legs. The muscles of the core make it possible to stand upright and move on two feet. The muscles help control movement, transfer energy, shift body weight and move in any direction. A strong core distributes the stresses of weight bearing and protects the back. The goal of core stability is to maintain a solid, foundation and transfer energy from the center of the body out to the limbs.

Core strength is the foundation of balance and movement. Training the muscles of the core also corrects postural imbalances that can lead to injury. The biggest benefit of core training is to develop functional fitness – that is, fitness that is essential to daily living and regular activities as well as sport performance.

IDENTIFY MUSCLE GROUPS & ACTIONS

In order to functionally train “the core” you should target more than just the abdominals. Different literature presents slightly different opinions on what muscles constitute the core – some include the quadriceps, hamstrings, abductors and adductors and some may include the scapular region and cervical spine where as others may focus between the scapular region and the pelvis. The pelvic floor and diaphragm may even be discussed because of their role in pressurizing the abdominal cavity. This workshop will focus on primary muscle groups and actions related to the core and discuss why it is important to not to limit training the abdominals in isolation.

Main Muscles and Joint Actions Related to the Core

MUSCLE	JOINT ACTION
RECTUS ABDOMINIS	Flexion of trunk Lateral flexion of trunk (assists)
EXTERNAL OBLIQUES	Rotation of trunk Flexion of trunk (assists rectus ab) Lateral flexion of trunk Assists in moving the pelvis into a posterior tilt (a common position for many of our reclined, stabilization exercises)
INTERNAL OBLIQUES	Rotation of trunk Flexion of trunk (assists rectus ab) Lateral flexion of trunk
TRANSVERSE ABDOMINIS	Abdominal compression (forced expiration)
ERECTOR SPINAE	Extension of trunk
QUADRATUS LUMBORUM	Lateral flexion of trunk
MULTIFIDUS	Trunk extension and rotation

Exercise Etc.'s *Back Stabilization (2000)* correspondence education program provides an analogy of the spine related to a tree sapling to help understand why muscles outside of the abdominals are important in core training.

For more information or to order the correspondence course, please visit the website for Exercise Etc. Inc. <http://www.exerciseetc.com>

Dr. Stuart McGill is known for his research findings regarding back fitness, performance and disorders. His findings are based on an understanding of the anatomical position combined with the origin and insertion points of a muscle. By understanding the way in which the muscle fibers run and where they begin and end we can determine which muscles are the most efficient at particular movements.

All four abdominal muscles work together but are also independent of one another. The primary trunk flexor is the rectus abdominis. The abdominal wall is described as the transverse abdominis and the internal and external obliques, which cause torso twisting, lateral bending, and flexion due to their arrangement. The obliques and the transverse abdominis also work together as a hoop-around the abdomen assisting with spine stability.

Increasing the stiffness of the abdominal hoop will increase the stability and ability to support larger loads. On the contrary, increasing the stiffness of just one of the muscles will break down this stability and decrease the ability to withstand compressive loads. Therefore, a balanced stiffness or the need for the muscles of the abdominal wall to work together is essential.

McGill (2002) describes this harmonious action as abdominal bracing to reflect a simultaneous "super stiffness" of the abdominals, which allows the spine to endure more of a load while reducing the likelihood of injury. His research demonstrates the need to initiate coordination and equal tension to be stable. It is also important to note that you are in fact less stable when you move the muscles close to the spine (i.e. pulling in the transverse abdominis). Focusing solely on the transverse abdominis is misdirected; rather, one should focus on *abdominal bracing or the co-contraction of the entire abdominal wall*, the transverse abdominis, and the obliques for greatest core stability.

For more detailed information on functional anatomy of the spine, refer to *Low Back Disorders: Evidence-Based Prevention & Rehabilitation* by Dr. Stuart McGill.

Resistance training in the aquatic environment provides an ideal environment to focus on increasing endurance of the abdominal and erector spinae groups critical for good posture, back health, and proper movement execution. To help cue for abdominal bracing, have students/clients create a neutral pelvic tilt. A neutral pelvis is midway between full posterior and full anterior tilt. Then, instead of having them pull the belly in, teach clients to create tension in all of the muscles of the abdominal wall with no physical change in position of the spine.

- “Imagine your midsection as a sponge. Now squeeze the water out of the sponge”
- “Allow your muscles to hug your bones”
- “Draw your pelvic floor up toward the top of your head”
- “Imagine you are tightening the lacing on a corset”

HOW THE WATER ASSISTS IN TRAINING

The greatest benefits of the aquatic environment are rooted in the properties of water and maximizing the use of these properties through proper programming. Buoyancy and resistance can provide benefits that might not otherwise be achieved on land. Below are some suggestions on how to maximize the benefits of water for improving core stability and endurance as well as enhancing flexibility and range of motion.

Core Stability & Endurance

- Develop initial strength to maintain correct body alignment during movement.
- Poor posture is often due to weak abdominal and back muscles – work on abdominal bracing through isometric contraction of these muscles.
- Develop kinesthetic and proprioceptive awareness – teach participants to feel body placement and alignment (use lines on the bottom of the pool or the pool wall as tools of reference.) Use props until participants can perform the movements without.
- Use the natural turbulence of the water or create additional turbulence to challenge core-stabilizing muscles.
- Integrate balance exercises that involve maintaining postural stability using various support stances (i.e. center, lunge, tandem or single leg stance).

Flexibility & Range of Motion

- Use buoyancy to assist with static stretching, e.g. stand upright and lift the leg to the front of the body by flexing at the hip; use the hands to scull to balance. Buoyancy assists in stretching the gluteal and hamstring muscles.
- Use the water’s resistance to increase the intensity of a dynamic stretch, e.g. lift one arm out to the side of the body, palm facing forward until the arm is slightly below shoulder height. Look in the opposite direction of the abducted arm and walk in a circle as if you were “following your nose.” The abducted arm trails behind the body using the resistance of the water to stretch the muscles that flex and adduct the shoulder.

FUNCTIONAL FITNESS

DYNAMIC STABILITY / STRENGTH

Dynamic strength and stability go hand in hand. It is hard to think of one without the other. Dynamic strength is the ability to exert muscle force repeatedly or continuous over time. This involves muscular endurance to muscle fatigue. Dynamic stability involves the body’s ability to maintain neutral, or near neutral postural alignment while moving.

The ability to maintain a stable position incorporates core strength, balance, coordination, agility, speed and conditioning. In the majority of activities performed, a structurally safe position for the core of the body should be attempted before overload is added. And remember, neutral postural alignment is a position that places the spine in its strongest, safest alignment.

Core strength has to come before stability. Stability is either static or dynamic; of course, static is never completely without motion. Balance incorporates alignment and strength, as well as visual and auditory input. These four areas are essential for both static and dynamic stability.

Muscular strength is generally defined as one's ability to perform a single repetition with maximum resistance. Muscle endurance is usually understood as one's ability to perform many repetitions with a sub-maximum resistance. Although one may train specifically for muscle strength or muscle endurance, there is an inherent relationship between these abilities. Resistance of some kind is needed to train for muscular strength. Equipment is utilized for strength training in the water to maximize or increase resistance just as on land. In the water, resistance is determined by the amount of resistance, buoyancy, drag, or weight the equipment provides, as well as the velocity or speed at which the movement is performed.

Muscular endurance is assessed by either measuring the length of time the muscle can hold a contraction, or the number of contractions performed in a given length of time. There is no optimal number of sets or reps for building muscular endurance. When focusing on endurance gains, multiple repetitions are usually prescribed in sets of 20 reps or more. By the end of the set, the muscle should feel fatigued, but not necessarily exhausted. Using the resistance of the water is an excellent way to promote and maintain muscular endurance; progressively increase by applying more force against the water's resistance, increasing surface area, and adding equipment.

ACTIVITIES OF DAILY LIVING

Activities of daily living (ADLs) are "the routine things that we normally do including things we might do for self-care (such as feeding ourselves, bathing, dressing, grooming), work, homemaking and leisure. ADLs are a measurement of the functional status of a person.

We all age. And as we age, we tend to see a decline in the musculoskeletal system, which dramatically impacts function. Functional aging is defined as the ability to meet the demands of daily living, or ADL's. Simple activities that we may take for granted from getting in and out of chairs to carrying groceries are examples of functional independence. Helping people attain the adequate fitness level to live in an independent life is the responsibility each aquatic fitness professional should take seriously.

To develop strength, endurance and flexibility needed to meet functional demands, an instructor can incorporate exercises to simulate those motions and thus strengthen the corresponding muscles. Joints should be taken through a full ROM.

Let's look at a simple example of an ADL:

Carrying groceries from the car to the house and putting them away.

Reaching into the trunk of the car requires unsupported forward flexion of the spine, balance, and sometimes loaded rotation. The erector spinae and obliques could be targeted through isolation exercises to encourage postural awareness, strengthen core muscles and increase range of motion. Consider this series of movements and stretches:

- Strengthen the spinal rotator muscles by holding a small ball under the surface of the water and pulling down and across the body toward the outside of the thigh. Keep the knees soft and hips forward, perform the movement to both sides.
- Balance on one leg and have someone create additional turbulence, such as by moving a kickboard nearby under the water, to increase the challenge. Progress to balancing with the eyes closed.
- Stretch the hamstrings, enhance balance AND train for unsupported forward flexion of the spine with a double hamstring stretch in a pike position (hip hinge). Sit back in the water with the legs straight; scull with the hands for balance and lift toes off the pool bottom. Actively engage the core muscles by bracing.

Carrying bags of groceries requires biceps strength, easily simulated in the pool with resistance tubing or drag equipment. Climbing stairs while carrying a load uses the quads and hip extensor strength. This can be accomplished using underwater steps and doing squat exercises. Add a level of balance by performing reverse squats while standing on a noodle.

Putting groceries away might require bending, reaching and twisting. Again, these movements' patterns using corresponding muscles can be replicated in pool activities – be sure to include some arm movements above the water's surface to train the shoulders through full ROM (kitchen cabinets are above shoulder height!)

It is common knowledge that the aquatic environment provides many significant advantages as a modality for creating dynamic strength and stability. The buoyant aspect of the water lessens joint stresses and provides supportive stability to the multi-dimensional resistance, creating a balanced muscle workout. Thus, the pool is clearly a good choice to meet the needs and goals for those seeking to maintain functional capacity.

SPORTS PERFORMANCE

Athletes are always looking for the newest, latest and best way to increase their performance. Whether amateur or professional the foundations of sport performance remain the same. Therefore, no matter what the ability the same questions can be addressed when designing fitness programming. How do I get stronger, quicker, and improve the ability to perform?

Current research suggests the answer is to begin at the core and target improvement of functional strength. The core or power center is the vital link to the functional performance of the complete kinetic chain extending out to the arms and legs.

The following excerpt is from *Effective Strength Training* by Douglas Brooks, MS (2001, p.62-62):

The body is as strong as its weakest link. If an athlete has very strong legs and arms, but a weak midsection (core), force cannot efficiently be transferred if the abdominals lack the strength to stabilize. This instability will ultimately lead to poor performance and possibly even injury.

The CORE needs to be solid to be able to stabilize spinal and pelvic positioning, as well as contract dynamically. Adequately conditioned abdominal and back musculature represents the key "coupling" link of the body that connects movements between the upper and lower body. The strength and importance of the body's core is reflected by modern conditioning programs that emphasize core training as a primary objective, though not exclusive of other important aspects of fitness.

The power center of the body (CORE) is the physical bridge that allows for dynamic, powerful, coordinated, skillful and integrated responses of the whole body. Core training is important for improved fitness, maintaining health or enhanced athletic performance.

STRETCH TECHNIQUES OVERVIEW

Most professionals agree that flexibility is an important component of fitness and a critical factor in achieving peak physical potential. Flexibility is a joint's ability to move freely in every direction, or more specifically, through a full and normal range of motion (ROM).

Using a variety of stretching methods enhances flexibility. It is accomplished by applying a force (stretch or tension) to the involved limb in order to overcome a resistance within a joint, hence increasing the available ROM. Stretch refers to the process of elongation. The basic techniques that will be covered in this workshop to increase flexibility are: static stretching and dynamic stretching.

STATIC STRETCHING

Static stretching involves a slow, gradual and controlled elongation through a full range of motion.

When performing static stretches keep the following in mind:

- Connective tissue elongation is the primary target when stretching.
- Elevated tissue temperature facilitates ROM. Muscles and tendons stretch better when warmed up. Have the participant stretch after 5-10 minutes of light aerobic warm up and / or stretch at the end of the training session.

- Flexibility is specific: therefore stretches must be performed for each joint and /or muscle group.
- Slow, passive static stretching is recommended. This involves slow, gradual, and controlled elongation of the muscle.
- When performing a static stretch, clients should stretch to the point of feeling *tension* in the muscle, *but* not pain.
- Hold each stretch 15-60 seconds when the environmental conditions allow.
- Due to the cooling factor of the water, move other muscle groups to maintain body temperature in the aquatic environment.
- Perform a minimum of 4 reps of each stretch for optimal results (ACSM).

DYNAMIC STRETCHING

Substantial research supports that dynamic stretching is the preferred method to prepare the body for gross movement, increased range of motion, mobility and overall functioning. Dynamic stretching consists of controlled leg and arm movements that gently progress to the limits of one's individual range of motion. It is important to slowly increase range and speed of movement. This method of stretching aims to rehearse similar movements of the sport or activity one is preparing for and is an effective way of warming the body's core temperature, especially important when training in cool water.

Unlike static stretching, dynamic stretching involves movement including more velocity, acceleration and various planes of motion during the stretch. And during the final phase of the stretch the end position is not held, contrary to the static stretch.

The general warm-up should begin with short levers and small range of motion. This facilitates joint motion by lubricating the joint with synovial fluid allowing the joints to function with ease.

Benefits of dynamic stretching include:

- Reduced risk of injury to joints, muscles, and tendons
- Reduced muscular soreness
- Reduced muscular tension
- Enhanced physical fitness
- Enhanced ability to learn and perform skilled movements
- Enhanced kinesthetic awareness
- Increased mental and physical relaxation
- Increased suppleness due to stimulation of the production of chemicals which lubricate connective tissues – synovial fluid

Unfortunately, even those who stretch do not always stretch properly and hence do not reap some or all of these benefits. Some of the most common mistakes made when stretching are improper warm-up, inadequate rest between workouts and over-stretching.

EQUIPMENT ASSISTED STRETCHING

Equipment can enhance range of motion activities, just as equipment can enhance muscular conditioning or cardio training.

Equipment falls into the following categories, each with its own purpose and characteristics:

- Buoyant – specific to the aquatic environment by interacting with the principle of buoyancy; workload increased for movement toward the pool bottom and submerged movements parallel to the pool bottom
- Flotation – specific to the aquatic environment and is utilized to provide neutral buoyancy rather than added resistance
- Weighted – works similar in the water as on land, although total weight is slightly decreased when submerged; workload increased for movement toward the surface of the water or above the surface of the water against gravity
- Drag – increases the surface area and/or turbulence to create additional resistance for all directions of submerged movement; “satisfies the muscle balance equation more simply than if using weighted or buoyant resistance.”
- Rubberized – as with weighted, rubberized equipment works in a similar manner in the water as on land; resistance is created when pulling away from an anchored point (stretching the band or tube)
- Specialty – based upon various principles, examples include the aquatic step (bench), underwater treadmills and bikes, and the Aquatrend™ workout station

Equipment that is buoyant, such as noodles and hand bars, can assist in a variety of stretching techniques. Technically this equipment would fall into the flotation category when being utilized in this manner, as it is not intended to increase intensity but rather maintain a specific position or stretch. Depending upon the stretch and the location of the equipment, it may be necessary for the participant to move to slightly shallower water in order to maintain proper alignment. Working with this buoyant/flotation equipment can be an especially helpful stretching technique for the lower extremities by providing balance and control (e.g. when holding in the hands) and by providing an external source for static-passive stretching.

Specific flotation equipment (belts or vests) will be most useful in maintaining body positioning, either vertical or supine, to more effectively target a specific muscle group for range of motion exercises.

Weighted equipment will probably be most useful in keeping body positioning. For example, certain stretches may be facilitated by using light weights on the lower extremities (one or both legs depending on the targeted muscles). Consider an obese individual who has difficulty with maintaining a vertical and grounded position (i.e. the feet/legs want to float up from the bottom of the pool).

Drag equipment can increase the potential benefits for stretches that incorporate movement (dynamic) or travel (a passive-static stretch facilitated by movement through the water to provide to maintain and enhance the stretch).

Consider this traveling stretch option:

- Pectoralis & Anterior Deltoid Stretch - Walk forward through the water with the arms long, partially abducted in the frontal plane with the palms forward and elbows relaxed. The drag created on the arms while traveling forward will target the pecs and delts.

Rubberized equipment could possibly be used for dynamic stretching or isometric stretching, but in general this type of equipment is not associated with stretching activities as much as it is with muscular conditioning.

Some specialty equipment can provide options for range of motion activities and each piece would need to be considered independently. Later we will discuss how to incorporate a stretch rope for stretching. This piece, designed for land-based training, can work well in the water for some populations.

RELAXATION

Webster's dictionary defines 'relaxation' as refreshment of body or mind through recreation, the lengthening of inactive muscle or muscle fibers and a return or adjustment of a system to equilibrium following a displacement or abrupt change.

Relaxation, based upon these definitions, can easily be accommodated by a well-designed water exercise program. Relaxation exercises can be divided into two categories: those for the body and those for the mind. In a warm water pool, we can explore a variety of relaxation techniques that are body-oriented, yet expand into the mind. The goal is to allow our busy minds and bodies to slow down and feel the water, to inhale and exhale calmness and to release muscular tension. We want to tap into stillness with warm water.

"Having a relaxed body may not prevent a constant flow of anxiety-inducing thoughts, but it's a good basis for getting some control of them."

www.bbc.co.uk/health/conditions

Mary Wykle says, "One of life's lessons is learning to still the mind. This is the opposite of stress."

When you Google "relaxation" you will realize how necessary the art is in our world today. A resource guide produced by a Trauma Center states, "When we are under stress the body goes into survival mode. It produces stress hormones, which gear us up to respond to perceived danger. This has come to be known as the 'fight or flight' response. In that state, the heart rate increases, respiration becomes rapid and shallow, there is a rise in blood pressure and the brain itself moves into a primitive survival mode, suppressing normal thought functions. The result of this is that we react rather than being able to evaluate and plan a response to the stressor. Under certain circumstances the body may be in a constant state of 'fight or flight', which is exhausting and can contribute to the development of physical stress-related disorders, such as cardiac problems, chronic high blood pressure, and the increased risk of stroke

There are many types of exercises and skills we can use to relax. “Research shows that relaxing the body will relax the mind and vice versa. If you struggle with racing, obsessive or intrusive thoughts, it might help to focus on the body. If you have a lot of physical tension or pain, it may be better to work on relaxing the mind. It’s hard to predict which exercise will work for whom; it’s best to try different relaxation exercises until you find the one that feels right. Remember that you are practicing a skill – like playing the piano. The more you practice, the more effective your relaxation work becomes.” NOTE: Access the PDF file on Relaxation Exercises at http://www.traumacenter.org/resources/pdf_files/Relaxation_Exercises.pdf

As you learn to relax, you may have chosen a “mindful” approach. Relaxing exercises can deliver a new focus on what is happening physically, emotionally and mentally. Let your students explore their movements, feel the water and experience visualization. As you get better at mindful observation you will become more in tune with your body and hopefully gain greater self-awareness. Mindfulness may help many students become more aware of their overall health. Teaching our clients how to relax can be a gift they can use at work and home as well as in your class.

A relaxation technique or relaxation training is any method, process, procedure, or activity that helps a person to relax; to attain a state of increased calmness, reduce levels of anxiety, stress or tension. Relaxation techniques are often employed as one element of a wider stress-management program and can decrease muscle tension, lower the blood pressure and slow heart rates, among other health benefits. Relaxation techniques are ways to calm your stress. Relaxation is a process that decreases the wear and tear of life’s challenges on your mind and body. Usually relaxation goes by the wayside or takes the back seat in our programming but we may be missing out on many health benefits. <http://www.mayoclinic.com/health/relaxation-technique/SR00007>

Research shows that stress can elicit physical responses of raising heart rate and blood pressure, increased muscle tension, increased breathing rate and more. All of these responses can be controlled by practicing relaxation techniques. As we review various techniques, remember that relaxation takes practice. Relaxation techniques are skills. You will need to practice the skills to reap its benefits. Your motivation and encouragement for your students to end class with a relaxation technique may deliver the calmness your students crave and want to come back for more!

The Mayo Clinic Website provides a wealth of information on relaxation. The following bullets summarize that information. For more detail, please visit www.mayoclinic.com Practicing relaxation techniques can improve how you physically respond to stress by:

- Slowing your heart rate
- Lowering blood pressure
- Slowing your breathing rate
- Reducing the need for oxygen
- Increasing blood flow to major muscles
- Reducing muscle tension

You may also gain these overall health and lifestyle benefits from relaxation techniques:

- Fewer physical symptoms, such as headaches and back pain
- Fewer emotional responses, such as anger and frustration
- More energy
- Improved concentration
- Greater ability to handle problems
- More efficiency in daily activities

There are several main types of relaxation techniques, including:

- **Autogenic relaxation.** Autogenic means something that comes from within you. In this technique, you use both visual imagery and body awareness to reduce stress. You repeat words or suggestions in your mind to help you relax and reduce muscle tension. You may imagine a peaceful place and then focus on controlled, relaxing breathing, slowing your heart rate, or different physical sensations, such as relaxing each arm or leg one by one.
- **Progressive muscle relaxation.** In this technique, you focus on slowly tensing and then relaxing each muscle group. This helps you focus on the difference between muscle tension and relaxation, and you become more aware of physical sensations. You may choose to start by tensing and relaxing the muscles in your toes and progressively working your way up to your neck and head. Tense your muscles for at least five seconds and then relax for 30 seconds, and repeat.
- **Visualization.** In this technique, you form mental images to take a visual journey to a peaceful, calming place or situation. Try to use as many senses as you can, including smells, sights, sounds and textures. If you imagine relaxing at the ocean, for instance, think about the warmth of the sun, the sound of crashing waves, the feel of the grains of sand and the smell of salt water. You may want to close your eyes, sit in a quiet spot and loosen any tight clothing.

Other relaxation techniques include those you may be more familiar with, such as:

- Yoga
- Tai Chi
- Music
- Exercise
- Meditation
- Hypnosis
- Massage

WARM WATER OPTIONS

If you Google “water relaxation”, you will get over 1.250,000 hits. It’s interesting as many of the hits are linked to promoting water oscillators, fenq shui water fountains and water machines using pulse sequences that offer the ultimate in body relaxation. The warmth of the water, buoyancy and slow movements together create an optimum state of relaxation. Stretching and gentle movements further suppleness and relax tension and can sooth backache, swelling, heaviness and tiredness.

Try these mini relaxation techniques at the end of class. Teach your clients how to do a mini session and hopefully they will practice these relaxation skills at home or at times when needed.

A. First – Breathe

Relax your abs. Breathe in through your nose and out through your mouth. You will feel your abdominal area inflate and chest rise.

B. Second – Count

Count slowly to yourself as you inhale and exhale. With each inhale count down from ten to zero. Inhale “10”, exhale, inhale “9”, exhale etc. OR Inhale “1,2,3,4” and exhale “5,6,7,8”

C. Third - Move

The mind/body approach to class design will include exercises that are “breath centered”. Incorporate “mindful movements” of feeling the water, letting the energy flow, etc. We can move with each inhalation and exhalation as we visualize our stress, anxieties or tension moving from us to the water.

“Have you ever seen a dog when it's resting? Its body is free of tension; its brain has switched off and has gone into peaceful mode. Because of our stressful lives, many human beings have lost the ability to do this, so we have to relearn how.”

www.bbc.co.uk/health/conditions/mental_health/coping_relaxation.shtml

Other great options for enhancing relaxation in warm water include:

Ai Chi

- Practice developed in Japan
- Flowing Aquatic Energy
- Combines fluid yet powerful movements of the arms, legs and torso with focused deep breathing
- Resource: Ruth Sova & Jun Konno www.ruthsova.com

Ai Chi Ni

- Ai Chi techniques working with partners
- Resource: Ruth Sova & Jun Konno www.ruthsova.com

Yoga

- Focus on alignment & lengthening of the spine
- Coordinates movement with breath
- Working the body, mind, and spirit simultaneously to restore balance to each
- Resource: www.yogajournal.com

Tai Chi

- Practice developed in China
- Enhance fitness, reduce stress, reduce tension in muscles and reverse the effects of degenerative & chronic disease
- Gentle rocking and stretch improve circulation & digestion
- Controlled breathing good for asthma
- Resource: www.qi.org

Watsu®

- Gentle form of body therapy performed in warm water
- Combines elements of massage, joint mobilization, shiatsu massage, muscle stretching and dance
- The receiver is continuously supported while being floated, cradled, rocked and stretched
- Resource: www.watsu.org.nz

COOL WATER OPTIONS – FOR RELAXATION

Although warmer water temperatures are more conducive to stretching and relaxation techniques, many group exercise programs do not have access to pools with temperatures above 86 F (30 C). The various techniques can be modified or intermixed with more active techniques to provide a safe and effective alternative.

Consider blending water walking with Yoga poses or adjust Tai Chi postures or movements to a slightly faster tempo to assist with maintaining core temperature. Our pool is something that we typically have little control over, so as aquatic professionals it is imperative that we remain flexible in our thinking and our programming.

INFLUENCE OF MUSIC – ON RELAXATION

The use of music in therapeutic situations includes motor skills, social/interpersonal development, cognitive development, self-awareness and spiritual enhancement. Music as a tool for healing dates back to the beginnings of history with mention in Western history found in the writings of ancient Greek philosophers.

[http://www.articlesalley.com/article.detail.php/45113/193/Alternative Medicine/Health/2/Music For Healing%2C Relaxation%2C and Wellness](http://www.articlesalley.com/article.detail.php/45113/193/Alternative%20Medicine/Health/2/Music%20For%20Healing%20Relaxation%20and%20Wellness)

According to a research study, patients recovering from acute myocardial infarction may benefit from music therapy in a quiet, restful environment. *White, J.M. American Journal of Critical Care. 1999 Jul;8 (4):220-30.* Effects of relaxing music on cardiac autonomic balance and anxiety after acute myocardial infarction.

According to composer, Martin Mayer, relaxing music can be utilized to relieve stress, unwind after a hard day at work, promote better sleep or to focus one's concentration during activities such as yoga or meditation. "To me, music is a powerful tool which can shape emotion and influence moods in ourselves and others around us. It is a powerful positive force that you can harness to aid relaxation and provide a release from stress. Relaxation techniques often rely on music as a spark. Which technique you use depends on your lifestyle and the time you have to yourself."

<http://healing.about.com/od/sound/a/musicrelax.htm>

Experiment with music styles in your class to find the best options for relaxation, considering the acoustics of your particular pool. Having a variety of class participants will likely lead to a variety of music choices, even for a relaxing cool down!

PRACTICAL APPLICATIONS OVERVIEW

Descriptions & Class Notes

Now that you have an understanding of what muscles are involved in core stabilization you can design a variety of core training exercises beyond the typical forward flexion or “abdominal crunch”. For the best results emphasize core stabilization during all phases of the workout.

Core training begins with first teaching participants how to isometrically contract the mid-section. The ability to teach this skill can be challenging. Begin by inhaling and feeling the abdominal muscles and rib cage expand outward; then exhale and notice the abdominal muscles move toward the spine. Continue breathing while actively engaging the abdominal muscles. This might be taught with greater success by starting with the back against the pool wall; then progress to “free-standing” and finally be able to perform throughout exercises.

The ability to isometrically contract the abdominals is a skill that might require some time for students to develop. Be persistent and don't give up; having this mind body awareness is important to perform basic activities of daily living as well as sport performance skills. Provide continuous reminders to actively work the core using the concept of abdominal bracing.

The pool practical will demonstrate standing, traveling and equipment assisted core training exercises that will help to improve core stability and muscular endurance. All exercises will require focus. Consider approaching each exercise three times with your students and clients. Copy it, feel it, own it. The first time, students should learn the exercise, copy the instructor and pay attention. The second time or second set, the student should understand what to do, what the exercise should look like, and hopefully start to “feel” the purpose of the exercise. The third time or set, the student can “own it” and fully feel the purpose and muscular contractions. Keep repetitions to 10-16 so the focus is not lost.

Aquatic Cardio Programs – An AEA Continuing Education Workshop

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PRACTICAL – Core Training, Traveling, No Equipment

Helpful Hints:

1. Traveling can intensify any movement pattern, as it requires more effort to push the body through the resistance of the water, capitalize on this principle.
2. Provide non-travel options if you have a variety of ability levels so participants can self-pace training.
3. Lines traveling in opposite directions that cross paths or concentric circles that move in opposite directions will increase turbulence and challenge stability further.
4. Working against the water's inertia – turning 180 degrees during travel patterns to challenge stability and balance

Impact Level Options:

1. Level I – rebounding, body upright
2. Level II – neutral, body in squat position with shoulders submerged; low impact
3. Level III – suspended; non impact

Core Training Exercise Descriptions

Level I Movements

- Drag Run / Down Run – Run forward with arms dragging behind (as if someone holding onto your fingertips and you are attempting to pull away). Drop low in the water to run backwards, rounding the spine and allowing the arms to relax.
- Ski Forward & Backward – Progress to working with the arms in neutral (hands behind head, hands above the surface of the water, or arms crossed at chest).
- Rocking Horse – Travel intensifies the resistance; add opposing arms to further increase the resistance.
- Tight Rope Walk Forward & Backward – Progress to working with the arms in neutral (hands behind head, hands above the surface of the water, or arms crossed at chest). Do not allow the body to rotate or posture to 'slouch'.

Level II Movements

- Glide – Low in the water with the body, hips externally rotated and on the balls of the feet; take tiny, quick steps to move across the pool. Side-to-side easy, but moving forward & backward not so easy!
- Ski & Tuck – Moving forward & backward initially, then change to lateral travel to increase the challenge.
- Jack – Move forward & backward without the use of the arms to assist.

Level III Movements

- Tuck & Hold – Travel forward, backward, in circles and laterally; keep spine tall
- Side Flutter Kick – Keep spine aligned.
- Jack & Turn – Maintain vertical spinal alignment.
- Cross Country Ski – Visualize a glass of water balanced on your head, maintain elongated spine.

Stance Options

1. Tandem stance (in vertical alignment) with various arm progressions
2. Single leg stance (in vertical alignment) with various arm progressions
3. Single leg stance (in hip hinge position or airplane) with various arm progressions

Core Training Exercise Descriptions

Tandem stance (in vertical alignment) with various arm progressions

Begin by standing in a tandem stance; standing with one foot directly in front of the other. Tandem may begin with 2-3 feet between the heel of the front foot and the toe of the back foot. To increase the difficulty progressively decrease the distance between the feet so that the heel of the front foot and the toe of the back foot are touching. Perform basic movements of the upper body to increase muscular strength/endurance of the arm while simultaneously training the core as the core is used to maintain neutral alignment.

Upper body movements may include some of the following:

- Shoulder flexion/extension
- Shoulder horizontal abduction/adduction
- Shoulder abduction/adduction
- Shoulder internal/external rotation
- Circumduction at the shoulder joint
- Figure 8's at the shoulder joint

Single leg stance (hip hinge position or airplane) w/ various arm progressions

Stand in mid chest depth or perhaps waist deep if the air temperature permits. Take a step forward with your right leg and stabilize in a cross country ski position, staggered stance. Lift your left leg off the bottom of the pool, extend the leg as if someone had your ankle and was pulling it away from the hip joint. Extend the arms out to the side like airplane wings. Hinge at the hip of the standing leg maintaining a slight bend at the knee; align the shoulders with the hip and knee joints of the lifted leg. Brace the abdominals and depress the scapula down toward your hips. Look toward the bottom of the pool to align the cervical vertebrae. If this stance is too challenging, allow participants to return to a single leg stance in vertical alignment.

Upper body movements may include some of the following:

- Superman; Transform the "airplane" position into Superman by extending arms through the water forward and then perhaps lifted out of the water so the arms are extended and by your head. Hold this position.
- Batman; Transform to Batman by moving arms to your sides, extending arms down your legs towards your thighs and knees – batman's cape.
- Shoulder horizontal abduction/adduction
- Circumduction at the shoulder joint
- Figure 8's at the shoulder joint

PRACTICAL – Core Training, Equipment Assisted
Equipment: Noodles

In this core training segment, we will utilize the noodles for both body positioning and added resistance. We will sit on the noodle, recline lengthwise on the noodle, wrap it behind the back for supine training, kneel suspended, hold in the hands for buoyancy and move through the water for added work. Keep in mind that noodles come in a variety of shapes and densities; the noodle you select may influence your exercise choices.

- Pelvic loosening - Sit on the noodle as if on a swing. Keeping knees together and using the obliques, make smiley faces. Cues: Bring the top half of the bikini to the bottom half. Don't move the legs. Make circles with your pelvis; reverse circles. Make figure 8's with your pelvis; reverse 8's. Begin with toes touching pool bottom and progress to being suspended
- Stabilization - Reclined and Suspended with noodle behind shoulders. Heel slides. Keep toes out of water as you bring one knee to chest, keeping the other leg extended. Repeat to fatigue or compensation. Perform with other leg. Bring both knees to chest, keeping toes out of the water as you flex both knees and hips to chest, as well as when you extend knees and hips.
- Reclined and Suspended with noodle behind shoulders. Perform straddles, (hip abduction, adduction), keeping toes up out of the water. Repeat with toes turned in, then turned out. (Hip internal rotation, hip external rotation).
- Reclined and Suspended with noodle behind shoulders. Walk legs down to the bottom of the pool, then up to the surface of the water. Keep head in neutral position, instead of using neck to shift weight and balance body.
- Sit on noodle with upright posture. Flick kick from the knee, with breaststroke arms. Reverse arm movement. Keep pelvis in neutral alignment.
- Kneel on the noodle and stabilize and balance. Alignment from the side should be ears over shoulders, over hips, over knees! Travel forward & backward using arms.
- Long Lever Reverse Curls with noodle behind shoulders – Flex hips, extend knees, pulls abs in tight, toes up out of the water. Use action/reaction to press the noodle down, while using lower abs to lift the heels of the feet up out of the water. Repeat with rhythm.
- Crunches with noodle behind shoulders – Pull in abdominals, keeping toes up out of water. Curl upper body towards knees, touching ends of noodle underneath thighs. This is a combo of heel slides and curl ups.

- Side Lying with noodle behind shoulders. Flutter kicks 8, tuck knees to chest, use obliques to laterally flex to other side, legs following to side lying. Flutter kick 7, tuck knees to chest, legs to other side. Flutter kick, 6, 5, 4,3,2,1, etc until you are tucking side to side.
- Side Lying with noodle behind shoulders: Externally rotate hips (toes turned outward) and abduct and adduct hips. Squeeze quads and gluteals and adductors.
- Trunk Flexion - lie supine on the length of the noodle. (You will get your hair wet.) Cross your ankles and hold the end of the noodle down. Curl up. Breathe! Experiment with various arm placements, i.e. arms reaching towards feet; arms crossed over chest, hands behind head with elbows out to the side.
- Pilates Leg Pull Prone. Hold a noodle down and in front of your chest as you pull your abs in to your spine. Gently fall forward in a diagonal position, feet on the bottom of the pool. Keep your scapula depressed, elbows straight, but not locked. Breathe in, and then out as you extend the hip to raise your left leg, keeping spine in neutral. Breathe in as you lower leg. Breathe out as you lift right leg.
- Pilates Leg Pull Supine. Hold a noodle behind your back and press it down, keeping elbows straight. Lean back and breathe in as you raise your hips up so that the body is diagonal in the water. Keep the scapula depressed, with ears, shoulders and hips aligned, gluteals tightly squeezed. Inhale as you raise your left leg towards the surface of the water, foot plantar flexed, hips fixed. Exhale as you dorsiflex the foot and lower the leg. Repeat with left leg.
- Washing Machine. Feet wide, water mid chest level, semi squat position with feet grounded. Arms extended in front as if you were about to give someone a big hug, hold the ends so the noodle looks like a rainbow coming out of the pool. [To increase difficulty, move your hands toward each other so there is a smaller rainbow coming out of the water and more buoyancy material under the water surface. Remember that you will have buoyancy and drag (from the increased surface area) to overcome.] Push the water to the right and left using surface area of arms and noodle, contracting core to stabilize. Lower body remains stationary and feet grounded.
- World Series. Swinging a baseball bat requires strength as well as good core stabilization. Stand "at the plate" in a semi squat position with feet grounded. Noodle is tied into a knot (pretzel) in front of the body; hold the ends of the noodle in each hand. Lift your right elbow out of the water and pull down with your left hand. Now drag the noodle to the right through the water. Pause, lift left elbow out of water, pull down with right hand, and swing to the left. Intensity changes:
 - Narrow the stance
 - Stand on one foot with the heel of the other leg lifted behind the body
 - Shorten ROM and use acceleration (FORCE)

PRACTICAL – Stretch, Equipment Assisted
Equipment: Noodles

The noodle is an inexpensive piece of equipment that can be found at most pools. They come in a variety of colors, sizes and densities. Here are a variety of ways to use the noodle for assisting with stretches at the end of class. Some of these techniques challenge balance and coordination as well, so cue carefully and provide options as needed.

- **Straddle Stance - Lift, Open Chest and Breathe**
Stand with a wide stance. Hold on the noodle at each end. Take the noodle and *reach for the sky*, keeping the arms outstretched. Lift the noodle high, opening the chest and breathe.
- **Straddle Stance Side Bend (R, L)**
Keeping the wide stance with noodle overhead, SIDE BEND-RIGHT, Return to CENTER, SIDE BEND – LEFT, Return to Center
- **Hamstring Stretch (R, L)**
Standing on the left leg, have the participant place the noodle under the ankle of the right foot. The Right leg is extended and one should feel the stretch in the hamstrings. If the participant's hamstrings are very tight, have the participant have the place the noodle under the R knee. Switch legs. (Stretch the Left leg)
- **Lateral Hip Stretch (R, L)**
Standing on the left leg, place the noodle under the ankle of the R foot. Rotate the R leg (with the noodle under the ankle) laterally to the right. You should a stretch in the R hip and inner thigh. Repeat by switching legs.
- **Quad Stretch (R, L)**
Standing on the left leg, bend the R knee so that the R knee is facing the bottom of the pool. Place the noodle under the R foot feeling the stretch on the upper right quad. Repeat on the opposite leg.
- **Turn & Twist**
Stand with feet shoulder width apart. Hold the noodle toward each end. Keeping your feet planted, twist to the R and L.
- **Forward Bend Noodle Stretch**
Standing with feet shoulder width apart, hold the noodle with hands on each end. Bend forward at the waist, resting the noodle on top of the water, feel the stretch in the shoulders and low back.

PRACTICAL – Stretch, Dynamic with No Equipment

Often we are faced with water and/or air temperatures below the recommended range. Dynamic, rhythmic stretches help to maintain the body's core temperature and provide comfort. Additionally, you could blend these stretches with water walking techniques to prevent chilling.

Dynamic (Rhythmic) Stretch

- Water Pulls – Figure 8's with arms, body rotates
- Fluid Wrist Flexion & Extension – Wrists “wave” up & down
- Modified Ai Chi – Cross Front & Open / Turn Side, Cross Front & Open / Add Leg Lift Back & Front with Cross & Open / Cross Front & Open returning to face front
- Glute / Quad & Hip Flexor – Knee Swing Front & Back with slight pause at each end point; focus on maintaining elongated spine
- “Karate Kid” Low Back / Hamstrings – Lift knee front while rounding spine and reaching both arms around the knee (not touching the leg, more like holding a large beach ball in the hands). Extend the spine and extend the knee into a traditional one leg stance hamstring stretch.
- Exaggerated Leg Pull – Knee Up, Knee Extension, Hip Extension to Hyperextension in slow and fluid movement; incorporate the arms for balance.
- Calf / Quad & Hip Flexor – Begin in lunge position with toes forward and heel down, weight shifted slight back to target the calf. Lift onto the ball of the back foot, contract the glutes and gently press the hip forward to target the quads and hip flexors. Bent arm swings front and back for balance and to maintain warmth.
- Transverse Hip Abduction & Adduction (knee flexed) – Knee Swing Out & In with slight pause at each end point; cross midline only if appropriate for the population.
- External & Internal Hip Rotation – Figure 8's with the knee.
- Hip Abduction & Adduction (knee extended) – Lateral leg swing keeping toes facing forward and upright posture (do not lean laterally to increase ROM); cross midline (front and/or back) only if appropriate for the population.
- Wide Step & Shoulder Roll
- Walking Pec Stretch – Abduct one arm, look away, “follow your nose” walking in circle to allow the water to stretch the chest and front of shoulder

PRACTICAL – Stretch, Static with No Equipment

Static stretching is important to help improve and/or maintain muscle length and range of motion. Static stretching may also help to correct muscle imbalances. The static stretches below should be performed on both sides of the body and ideally should be held for 15-30 seconds. Remember to consider water temperature when performing static stretches; dynamic movement between stretches may be required in cooler water.

Begin static stretches from a stable position; this may require the support of a fixed object like the wall or pool ladder or a moveable support, like a buoyant noodle. Next, decide whether a center stance, lunge, tandem or single leg support is the best way to anchor the body based on the individual and the stretch being performed. The anchor chosen should provide a method to elongate the specific muscle group without placing other joints in an unsafe position (Acton, Denomme & Powers, 2008).

- **Scalene* Stretch**

Place one arm behind the back at 90 degrees; lift the chest; lower the ear to the shoulder opposite of the arm behind the back.

** The scalene muscles are a group of three pairs of muscles in the lateral neck that rotate and tilt the head.*

- **Pectoralis Stretch**

Lift both arms out to the side of the body, palms facing forward, maintaining the arms slightly below shoulder height. Hold arms in this extended position.

- **Posterior Deltoid Stretch**

Lift one arm to the front of the body, thumb facing up, until it is slightly below shoulder height. Place the opposite hand on the forearm and gently move the flexed arm across the body's midline.

- **Upper Back Stretch**

Remaining in an upright position lift the arms in front of the body and hold the arms as if hugging a very wide tree trunk that you can not wrap your arms completely around; next, round the shoulders and upper back.

- **Triceps Stretch**

Lift the arm overhead. Lower the hand of the lifted arm behind the body so that the elbow is pointing upward. To add more intensity to the stretch, gently push the elbow behind the body using the free hand.

- **Bicep & Forearm Supinator Stretch**

Lift both arms out slightly to the side of the body with the palms facing forward. Rotate the forearm so that the palm faces behind the body while extending at the shoulder.

- **Wrist Flexor Stretch**
Extend the arm out in front of the body with the palm down. Using the opposite hand gently apply minimal pressure on the fingers to gently pull the fingers down into a flexed position.
- **Wrist Extensor Stretch**
Extend the arm out in front of the body with the palm up. Using the opposite hand gently apply minimal pressure on the fingers to bend the wrist down into an extended position.
- **Side Stretch**
Start by supporting the body with the opposite arm placed on the hip or wall. Then begin by lifting one arm overhead, so it is positioned slightly in front of the body; palm facing inward. Lean to the side opposite the lifted arm reaching overhead (imagine as though someone is lifting you up by your fingertips).
- **Hip Deep Rotators Stretch**
Begin by crossing one ankle above the opposite knee; flex at the knee and hip of the supporting leg as if sitting in a chair. Flex from the hip forward to deepen the stretch (Figure 4 Stretch).
- **Hip Flexor & Quadriceps Stretch**
Bend one leg at the knee placing the toe of the bent leg against the pool wall. Gently lower the body toward the pool floor by bending at the knee and hip of the supporting leg (be sure the knee of the supporting leg stays behind the toes). Gently push the hips forward.
- **Hamstring Stretch**
Begin by flexing the leg at the hip, allowing buoyancy to assist; dorsiflex at the ankle to increase the intensity of the stretch. Option to place foot on the pool wall (maintain upright posture).
- **Gastrocnemius & Soleus Stretch**
Press the back heel down toward the pool floor (touching if possible). Hold this position by moving the arms in a large sweeping motion in front of the body to assist keeping the back heel down to the pool bottom.
- **Anterior Tibialis Stretch**
Lift one leg slightly behind the body. Point the toe and place the top of the foot on the pool bottom.

PRACTICAL – Stretch, Equipment Assisted

Equipment: Stretch Rope

NOT Covered at the Pool – this is an alternate stretching technique utilizing the Stretch Rope (Promise Enterprises, 800-555-2333)

There are various types of stretching ropes and straps that can assist individuals with achieving flexibility gains that are often utilized in land-based training. For a new format for your classes, consider taking this tool to the pool for a creative stretch alternative.

Below are some ideas to help you get started – the rope allows you to adjust the range of motion at the joints.

Static (Passive) Stretch with the Stretch Rope – Standing Position

- Lumbar Stretch, one foot in loop – lift knee to chest
- Hamstring & Calf Stretch, one foot in loop – extend leg in front of body, dorsiflex ankle
- Figure Four Inner Thigh Stretch, one foot in loop – flex knee and rotate hip outward
- Outer Thigh Stretch, one foot in loop – hip abduction, crossing knee over midline (if allowed by medical conditions/surgeries)
- Standing Iliopsoas & Quad Stretch, one foot in loop with rope over shoulder from back to front, holding in front of body – knee flexion with heel toward glutes
- Hinging Iliopsoas & Quad Stretch, one foot in loop with rope over shoulder from back to front, holding in front of body – repeat stretch above then hinge forward at the hips
- Triceps & Posterior Deltoid Stretch, one hand in loop – pull arm across chest
- Behind-the-Head Triceps Stretch, top hand in loop – hand drops behind head while other arm reaches up behind back to pull down on rope
- Abdominal Stretch, both hands holding rope – both arms overhead, extend spine
- Latissimus Stretch, both hands holding rope – both arms overhead, lateral flexion
- Spinal Rotation, both hands holding rope – both arms overhead, spinal rotation
- Pectoralis Stretch, both hands holding rope – both hands behind lower back, lift away from body without hyperextending lower back

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