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Adapted Aquatics for Children with Severe Motor Impairments

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Abstract

Available research clearly shows that more children who have disabilities, including those with severe disabilities, are participating in swimming programs as well as wanting to be taught in a regular aquatic class without being segregated. Aquatic instructors need to prepare lessons that include children both with and without disabilities. This means that aquatics instructors need to understand and be willing to implement unique teaching and managerial techniques that foster the safe and successful learning environment for all children. While the task of teaching children who have severe disabilities may seem difficult at first, with a little knowledge and experience, instructors can become better teachers to all children, gain confidence in their instructional skills, and see more positive and successful performances in their aquatic programs.

Keywords: adapted aquatics, severe disabilities, inclusion, instruction

Aquatic programs over the years have experienced a steady increase in the number of children with disabilities, including those with severe disabilities (Conatser, 2007a; Karklina, Declerck, & Daly, 2013; Marinho-Buzelli, Alison, Bonnyman, & Verrier, 2015). According to the Centers for Disease Control and Prevention (CDCP) (2016), swimming is the most popular recreational activity for children and teens including those with disabilities. Children who have disabilities clearly enjoy all the inherent benefits offered from aquatic programs (Dimitrijevic, Aleksandrovic, Dejan, Okicic, Radovanovic. & Daly, 2012; Langendorfer & Bruya, 1995; Lepore, Gayle, & Stevens, 2007; Summers, & Wallace, 2013). Instructors, however, are faced with the challenge of learning how to adapt their teaching styles to provide meaningful and safe instruction to diverse populations (Conatser & Block, 2001; Grosse, 2014; Koury, 1996; Pearn & Franklin, 2013).

Instructors appear to adapt their teaching relatively easily for children who have mild disabilities through minimal modifications to equipment, class size, building accessibility, and staff support (Conatser & Block, 2001; Conatser, Block, & Lepore, 2000; Sherrill, 2003). Modifications for those with more severe disabilities are not as simple (Aidar, Silva, Reis, Carneiro, Vianna, & Novaes, 2007; Conatser, 2008; Conatser, Block, & Gansneder, 2002; Patterson & Grosse, 2013). For example, a child with a mild intellectual disability who can talk, control his or her arm movements, and follow simple instructions could easily learn aquatic skills with few to no instructional modifications. On the other hand, for a child with Spastic Cerebral Palsy (quadriplegic), who is mostly non-verbal and perhaps visually impaired, more significant changes to the environment, equipment, and curriculum would be necessary to provide an appropriate learning environment. The fact remains that, if the environment, instruction, and meaningful inclusion all

are allowing the child with severe disabilities to successfully participate, then other normally-abled children should be experiencing similar success. This article presents some ideas and strategies to help instructors provide more appropriate instruction , especially inclusion for persons with severe disabilities into regular aquatic programs.

Benefits of Inclusive Instruction

Available research clearly has indicated that appropriate inclusive instruction can help provide a more stimulating environment for children with disabilities while they are learning aquatic skills (Conatser, 2007b; Lepore, Gayle, & Stevens, 2007; Rich & Giles, 2015; Stan, 2012b). This is primarily because inclusive instruction creates opportunities for meaningful participation which could lead to children with disabilities being viewed as members of the regular aquatic class (Conatser, 2007a). Further, inclusive aquatic classes offer more normal role models which could help instructors be better at age-appropriate interactions (Block, 2008). As a result, children with disabilities will often exhibit improvements in behavior, communication, and socialization when instruction is inclusive (Lepore, Gayle, & Stevens, 2007; Conatser, Block, & Lepore, 2000).

Table 1 Contrasting regular aquatics vs. adapted aquatics practices

Themes	Regular Aquatic Practices	Adapted Aquatic Practices
Assessment and performance standards	One standard for all (e.g., everyone swims using the same stroke; there is only one correct way to do that stroke)	Multiple individualized standards (e.g., children are allowed to choose strokes that match their preferences or goals; strokes are modified and encouraged as necessary and desired)
Game choice	Single activity/game for all (e.g.. everyone plays water polo and must tread in the deep end)	Choices provided in activities/ games (e.g., shallow and deep water polo is offered allowing walking or treading in the same game; use of flotation devices permitted)
Equipment	Same equipment for all (e.g., everyone must use the same type of kickboard)	Choices provided in equipment (e.g., children encouraged to choose from kickboards as well as other flotation devices that suit their skills and needs)
Games design	Games use regulation rules (e.g., everyone must start a relay race from the starting blocks; everyone required to dive from blocks)	Games are modified (e.g., allow starting a race from pool side or even in the water; non-competitive games encouraged)

Note: The philosophy behind the adapted modifications is the basis for developmentally appropriate and inclusive practices such that rules should be created that allow full, safe, and successful participation by all children, even if that means uneven team sizes, changing boundaries and distances, changing movement requirements, and allowing different pieces of equipment and flotation.

Instruction that promotes an adapted style of teaching not only improves the performance of students with disabilities but also normally-abled students (Conatser & Karabulut 2014; Verderber, Rizzo, & Sherrill 2003). By being part of inclusive aquatic classes, normally-abled children may change their attitudes toward children with disabilities, gain a better understanding about disabilities, and learn appreciation for individual differences (Sherrill, 2003).

Instructional Considerations

Aquatic instructors should always conduct pre-, as well as post-instruction assessments (Langendorfer & Bruya, 1995). Pre-instruction assessments help determine the child's strengths and weaknesses that provides information on "what to teach," how much support personnel are needed, the best modes of communication, and specialized equipment needs. The post-instruction assessment can be used to determine if goals where achieved as well possible future modifications to increase the effectiveness of instruction. In that sense, pre- and post-instruction assessments complement each other and lead to more successful inclusive instruction. Also, these assessments help aquatic instructors document and, most importantly, celebrate all performance improvements, whether large or small.

Aquatic instructors also should consider the time factor: how much time it takes for individual children both with and without disabilities to acquire a given skill, how long each swim class period lasts, what activities are included in a regular aquatic program, and what the interests of each child are. On average, children with disabilities can take 3 – 4 times longer to learn a skill compared to their normally-abled counterparts (Steenbergen, van der Kamp, Verneau, Jongbloed-Pereboom, & Masters, 2010; Sherrill, 2003). For example, a normally-abled 10-year-old child may acquire five to seven new swimming skills with medium competence over a typical session of 10, one-hour lessons. By contrast a child with a more severe disability may only improve one skill with minimal competence or success.

Prior to instruction, aquatic instructors should identify and prepare support staff such as volunteers from the community, teacher aids, paraprofessionals, and peer tutors. All support personnel used should be provided information about: (a) their responsibilities (based upon their teaching competence, experiences, and age);

(b) appropriate use of aquatic equipment; (c) safety procedures (e.g., supervision, transfers, locker-room use, emergency action plans); (d) brief backgrounds of each child with and without disabilities; (e) suggestions (written or pictures) for creating modifications; and (f) sample ideas and techniques to facilitate communication.

Additionally, higher functioning individuals with disabilities who demonstrate more proficient swimming skills (e.g., Special Olympic Athletes) and peer tutor "buddies" can make excellent helpers. They can come from a variety of ages and skill levels. Peers can be paired with a child who has a disability and provided with instructional pictures that provide "cues" to facilitate a given swimming skill. Importantly, peer tutors should be instructed how to provide feedback about the aquatic performance in a non-threatening, positive, and constructive way. This suggests that instead of identifying what a person may have done "wrong," feedback should describe the positive accomplishments and achievements the person has made.

Aquatic instructors should prepare all swimmers with and without disabilities for an inclusive aquatics class. Some suggestions for preparing peers without disabilities could include (a) discussing that all people have different skill levels (e.g., some children might be better at floating or holding their breath; others at swimming backstroke or crawl stroke); (b) explaining that people like to do different things and to value each person's unique contribution to the class; (c) identifying the child's disability in general terms; (d) discussing how children should support each other and the importance of friendship skills; (e) inviting a guest speaker with a disability who is a swimmer; (f) showing a videotape of Paralympic or Special Olympic Games; (g) conducting a reverse role play simulation (e.g., swim blindfolded or only using one arm/leg); and (h) having children suggest their own modifications and adaptations to the activities (Block, 2008).

Some children with disabilities may experience extreme fears associated with learning swimming skills. For example, they may fear submerging their face, floating on their back, feeling safe while having difficulty holding a floatation device, staying balanced, and/or feeling scared around children they don't know. Aquatic instructors should introduce and implement skills at a pace that is slow enough not to frighten the child. Recall from earlier that children with disabilities may take four to fives times longer to learn new skills and adjust to the water. Although progress may be slower than expected of normally-abled children, requiring longer time and many more practice trials, gradual improvements in appropriate and modified aquatic skills still can be achieved.

Modifying Curriculum

When instructors examine a standard aquatic curriculum, they can observe how well the children with disabilities are learning skills compared to more normally-abled children. Depending on how well the skills match-up, the instructor can modify or present alternative skills for the student with a disability. Curricular adaptations with multiple options will help all children have a greater chance for success (Obrusnikova, Block, & Dillon, 2010). Modifications should be designed to prevent mismatches between students' capability levels and lesson content while promoting a safe, meaningful, and appropriate aquatics program. Factors to consider in determining the appropriateness of modifications include (a) whether the change allows the student with a disability to participate successfully in an activity while still being challenged; (b) if the activity is safe and fun for all students; and (c) whether any change makes the activity inappropriate for students without disabilities.

Several types of curricular modifications could help aquatic instructors accommodate for varying levels of motor capabilities (Block, 2008). "Multilevel curricular selection" refers to different objectives within the same curricular domain. For example, students with and without disabilities can participate in an aquatic (curricular domain) class with the broad objective to tread water. A child with symptoms along the autism spectrum can attempt to tread water, but a modified objective for him or her may be simply to stay in the water without climbing out.

Extended Skill Stations. An excellent method for allowing all skill levels to participate and practice together at their appropriate level involves extended skill stations. Every station focuses on a specific skill to be practiced and acquired before moving to a more complex or harder skill level or different skill at the next station. For example, children can be instructed to flutter kick in a seated position at the first station; a second station could feature flutter kicking in a prone position while holding the side of the pool; a third station might feature kicking while holding onto a kickboard; and a fourth station could include floating on the back with support and flutter kicking.

Providing Options and Alternatives. When an instructor provides viable alternatives and allows all members of a class to choose options, it reduces the need to single out children with disabilities. For example, if students are given a choice of equipment (e.g., kickboard, personal flotation device, noodle) when attempting to move across the pool, some students may choose a kickboard or noodle while others may choose not to use any assistive devices. Choices also allow each student the opportunity to challenge themselves at their unique level while simultaneously

eliminating the need to highlight children's disabilities or individual shortcomings (Conatser, 2014). This strategy also helps individualize the activity so more children simultaneously can successfully participate at their own skill level.

Curricular Overlapping. When an instructor presents multiple goals from different curricular areas within the same activity it is called curricular overlapping which is an efficient and effective means to promote broader learning. For instance, if the class is working on jumping into the pool, coming up, and floating, and Jo, who is a paraplegic, is unable to engage safely in jumping, Jo may still participate in the activity by wearing a flotation device and holding onto the pool edge with one hand while tossing balls with the other hand to peers as they jump in. Jo's objectives (grasping the edge and throwing) are embedded in the regular activity. This activity also represents a cooperative activity which research has demonstrated helps build group membership and cohesiveness (Obrusnikova, Block, & Dillon, 2010).

Alternative Activities. When the regular aquatic activities are simply inappropriate for a particular child, alternative activities may be good choices to promote success. In this situation, the aquatic instructor could present multiple activities in which two or more activities are introduced instead of one. One form of the activity is designed primarily for normally-abled children while the other form is primarily oriented toward children with disabilities. Normally-abled children who might be waiting their turn or taking a rest break could participate in the other activity that is designed for children with disabilities. For example, some children could be playing a freeze tag game. The child who gets "frozen" and wants to become "unfrozen" and return to the game must hit a balloon volleyball several times or a defined number of passes in an adjacent area of the pool. The balloon volleyball game provides instructors the opportunity to assist a child with a more severe disability to practice alternative activities such as standing, walking, and striking while supported by the water.

Environmental and Equipment Adaptation

Aquatic instructors need to adapt both equipment and the environment based on each child's overall body size, composition, strength, speed, endurance, balance, and/or coordination (Jackson & Bowerman, 2009). For example, a child with cerebral palsy who can barely move his arms/legs which limits her speed of movement in the water might still be able to participate with the class playing a water tag game if the instructor reduces the size of the playing area, create zones of movement or safe areas, or allows the child to be the official "un-freezer" whereby she would have to touch classmates before they returned to play. Further, varying class format (small vs. larger group), duration of participation, and the instructional

settings (deep vs. shallow water; with or without flotation devices) may promote a more successful and inclusive learning environment.

Working with children who have severe disabilities often is very equipment-intensive (Lee & Porretta, 2013). Equipment can be used for many reasons such as maintaining safety, assisting mobility, increasing time-on-task, reinforcing practice, and making learning new skills motivating and enjoyable (Stan, 2012a). Equipment may be used in atypical ways such as using multiple flotation devices (e.g., PFDs and noodles) to maintain a desired body position or to keep the head from submerging, modifying a fin for use on the hand, using velcro gloves to grip a flotation bar-bell, or employing therapy/gymnastic mats to support balance or range of motion exercises. Children with disabilities often benefit from extra motivation to practice and perform some aquatic skills. For example, plastic boats and noise balls may help motivate reaching/grasping or retrieving objects while practicing swim strokes. Equipment that is brightly colored (e.g., reds, yellows) or tactile (e.g., rough, uneven surface) also may increase motivation. Often children with certain disabilities may become fixated on one piece of equipment; therefore, at the beginning of a class period instructors are encouraged to have a wide variety of equipment available for children to choose from to increase motivation. One caveat is that multiple pieces of each equipment are important to avoid limiting students' choices. Instructors should not hesitate to change equipment shape, size, weight, texture, and color if needed to facilitate movement of different individuals. Being creative, adaptable, and allowing multiple choices in how movement can be performed will enhance appropriate instruction for children with and without disabilities in inclusive environments.

Managing Student Information

Each child with a disability will need his or her own individual aquatic plan similar to an IEP, but adapted for the aquatic environment (Langendorfer & Bruya, 1995). As with IEPs, each individual aquatic plan should identify the short term and long term goals, the specific skills that will be taught to achieve those goals, modifications needed, support staff, and the best mode of communication (Lepore, Gayle, & Stevens, 2007). Because every child should have a unique plan, instructors may want to create a working diagram with pictures and an easy-to-read summary of strategies. Instructors also should include activities/skills the regular aquatic class is learning and match or adapt what will be taught for the child with a disability. If adaptation is needed, lists of those modifications to these regular activities should be included so the child with a disability can be successful. Some regular activities may require little modification while other activities may require skills that are more dramatically altered. For example, if normally-abled members of the class are asked to swim the length of the pool using breast stroke, a student

who has had a traumatic brain injury may be allowed to walk in the shallow end of the pool holding the edge or used a modified stroke while wearing a PFD or noodle. More examples are included in Table 2.

Table 2 Reference guide with suggested modification examples for different aquatic domains.

"Normally-abled" Domains (plus specific skills)	Modifications	"Jo" with CP
Water Entry (Dive into deep water)	(parcel/ match)	Sit and roll into water with assist
Water Adjustment (Rotary breathing with front crawl)	(match)	Rhythmic breathing while walking
Buoyancy and Breath Control (Supine float 10 min.)	(parcel/match)	Supine float 1 min. while assisted
Locomotion (Front crawl for 25 yards) (Other formal strokes for 25 yards)	(no match)	Move through water using modified strokes wearing PFD
Personal Safety (Tread water for 10 min.)	(no match)	Walk in shoulder deep water for 10 min.
Game/Learning Activity (Water freeze tag)	(parcel/match)	Uses PFD (designated "unfreezer")

Summary

The available adapted aquatic research clearly shows that more children who have disabilities, including those with more severe disabilities, are participating in swimming programs as well as wanting to enroll in regular aquatic classes without being segregated. Aquatic instructors need to prepare lessons that include children both with and without disabilities. This means that aquatics instructors need to understand how to implement unique teaching and managerial techniques that foster safe, successful, inclusive aquatic learning environments for all children. While the task of teaching children who have severe disabilities is challenging at first, with a little knowledge, experience, and creativity, instructors can become more skillful and effective teachers for all children as they gain confidence in their adapted aquatic instructional skills and see a more positive, successful inclusive aquatic program.

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