Pool Safety and the TBI Patient

The chronic effects of Traumatic Brain Injury are getting the attention and research to better identify, prevent, and rehabilitate these injuries. Brain injuries include both traumatic and non-traumatic. The Centers for Disease Control and Prevention (CDC) estimates 1.6 to 3.8 million sports-and recreation- related concussions each year in the United States. The Traumatic Brain Injuries (TBI) result from a blow or jolt to the head (closed-head) or from a penetrating head injury (open-head) where the skull is crushed, fractured or penetrated and normal function of the brain is disrupted. Non-traumatic injuries can result from stroke, lack of oxygen, infection, brain tumors, shaken baby syndrome, and some types of whiplash. All brain injuries can lead to physical, cognitive and psychosocial/behavioral impairments including balance and coordination deficits, hearing, vision and speech problems, fatigue, memory loss, difficulty concentrating, anxiety, depression, impulsivity, and impaired judgment.

Closed-head injuries are more common and are usually the result of falls, motor vehicle crashes, assaults, and sports/recreation accidents in which the skull remains intact. The National Football League is spearheading research into these injuries and the impact on football players. Downhill skiers are now being encouraged to wear ski helmets – partly because of deaths from prominent people while skiing. Most states have helmet laws for motorcycle riders and all are encouraged to wear helmets when biking or skateboarding. Helmets and helmet laws are under review. A motorcycle accident where the helmet has a severe impact must be replaced. Football and recreational helmets are worn after repeated impacts. The Army is researching the impact of TBIs from IED explosions and accidents in Iraq and Afghanistan.

A person with a brain injury may present for aquatic rehabilitation or aquatic exercise because of other limiting physical injuries. The mTBI or TBI may not be apparent to others upon meeting, but the person's personality may have completely changed. Suspecting or recognizing that the patient/client has suffered a brain injury requires specialized protocol and appropriate safety measures.

Rehabilitation includes balance activities, gait training, core strength exercises, and stretching/Range or Motion. Selection of exercises is complicated by the possibility that the patient/client may have neurological involvement, balance/coordination deficits, dizziness, and cognitive issues. The first safety issue is to assess if they have a fear of the water. A fear of the water may present too complex of a situation for aquatic activity to be acceptable.

Additional safety concerns start from the time they enter the dressing room. Upon exiting the dressing/locker room, are entries and exits clearly and simply marked? It is very easy in many locker rooms to forget where the entrance to the pool area is

accessed. Does the entry to the pool area open to the deep water or the shallow and is it clearly marked and proper barriers in place? Are rules in place on when/where to enter the pool and are they understood? Do they need guidance after the session to return to the locker room?

Successful aquatic activities require simple instructions and a check with them for understanding. One simple direction is what many can follow. Giving a list of movements will confuse, irritate, and result in anxiety or impulsivity. Be prepared for the impulsivity response. The buoyancy of the water assists with balance and reduces their fear of falling. Many yoga positions are performed with simple instructions and can be held or supported if necessary. Another concern with supporting in a position or assisting into a position requires identifying if they have negative reactions to touch. Always cue what you will be doing. Ai Chi is another option for developing balance, core strength, and beginning to combine movements. For some, introducing each Ai Chi movement separately is a proper beginning. Once familiar with several movements, begin to string together – omitting some of the more coordinated complex moves until they are ready.

Being in the water allows the provider to communicate directly with the patient or client – eye to eye, hearing, assisting – a feeling of supportive environment. It also lets the provider quickly identify any changes in the patient. Balance and coordination deficits, reduced fitness, anxiety require the provider ready to give support, such as the walking assist taught in risk awareness and safety training courses. Some TBI are susceptible to seizures. This takes immediate response and knowledge of how to support in the pool until the seizure subsides.

Traumatic Brain Injuries and the need for research – prevention, identification, and rehabilitation – are receiving national attention. The aquatic arena has much to offer. Research for aquatic rehabilitation of TBIs is needed including effect of water temperature and appropriate protocol to address the many deficits presented.