

Chapter 8

Aquatic Rehabilitation for the Treatment of Neurological Disorders

David M. Morris, PT, Ph.D.

Readers should be able to describe:

- Functional problems encountered by persons with neurological disorders.
- Neurorehabilitation treatment principles.
- Justifications for using the aquatic environment for neurorehabilitation.
- Selected aquatic approaches as applied to the rehabilitation of persons with neurological disorders.

Injury or disease affecting the central or peripheral nervous system can result in a wide variety of primary movement problems involving motor, sensory, perceptual, cognitive, and behavioral systems. Additionally, primary impairments (e.g., paralysis, spasticity) can lead to secondary movement problems that do not result directly from the nervous system lesion, but rather develop over time. For example, paralysis resulting directly from spinal cord injury can lead to joint tightness and limited range of motion (ROM) over time. Both primary and secondary impairments often significantly contribute to activity limitations including walking, reaching, and general execution of activities of daily living (ADLs). Aquatic rehabilitation offers a unique, versatile approach to the treatment of these impairments and the activity limitations and participation restrictions they create. Such programs are delivered along a continuum of aquatic rehabilitation programs ranging from skilled therapy to wellness services.¹

The need for neurorehabilitation strategies has increased through years. Improved technology and medical management have allowed more individuals to survive head injuries, brain tumors, strokes, birth injuries, and premature birth.²⁻⁵ In addition, longer life expectancies may account for the increased prevalence of neurological disorders. Currently, our health care system requires increased accountability by the rehabilitation professional, especially with regard to reimbursement for services. Therefore, neurorehabilitation professionals must seek ever more effective treatment strategies. Aquatic rehabilitation has been advocated by many as a useful treatment modality for patients with neurological disorders.⁶⁻¹⁴ Mounting evidence supports these views and has demonstrated benefits of aquatic rehabilitation for a wide range of problems resulting from specific neurological disorders like multiple sclerosis,¹⁵⁻²¹ traumatic brain injury,²²⁻²⁴ muscular dystrophy,²⁵⁻²⁷ spinal cord injury,²⁷⁻²⁹ cerebral palsy,³⁰⁻³² poliomyelitis,⁶⁶⁻⁷² and Down syndrome.³⁴ The unique properties of water, particularly buoyancy and turbulence, enable the design of effective and versatile treatment programs.^{5-8,35,36} Specific benefits of the