

# Integrating Aquatic Therapy Ideas into Medical Fitness Programs



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**Awarded APTA's highest honor** for aquatic PTs  
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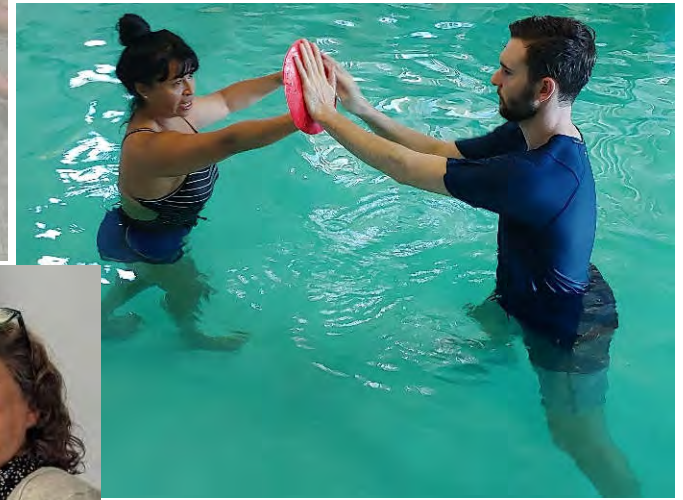
**Has served as:**

- Editor-in-Chief, Journal
- Therapy Pool Manager
- Adjunct Faculty, PT School
- Functional Design Consultant
- **Instructor, over 200 conferences**
- Aquatic Health Research Database (AHRD) Creator
- Author, 5 aquatic therapy-related texts
- Columnist, 6 magazines, over 500 articles
- Author, **Comprehensive Aquatic Therapy** (ed. Becker)

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**AQUATIC THERAPY  
UNIVERSITY**





# Objectives

1. Identify 5 evidence-based aquatic therapy techniques applicable to medical fitness programs by the end of the webinar.
2. Explain 3 benefits of aquatic therapy for specific medical populations.
3. Compare 2 advantages and 2 challenges of aquatic therapy versus land-based therapy, with a focus on resource utilization and accessibility.



**#1.**

**Evidence-based aquatic  
therapy techniques  
applicable for medical  
fitness centers**



# Aquatic High- Intensity Interval Training

**What It Is:** High-intensity interval training (HIIT) in water alternates between bursts of high and low-intensity exercises in one session.

**Why It Works:** Studies show aquatic HIIT provides similar health benefits to traditional continuous exercise but in less time.

**Considerations:** Not ideal for elderly or those with motor limitations on hard surfaces due to intensity demands.

**Aquatic Advantage:** The water reduces impact, making it a safer option for individuals with physical limitations, improving overall health and quality of life.

**Supporting Study: Santos et al. (2020)** demonstrated that aquatic HIIT is as effective as land-based HIIT for improving cardiovascular health, strength, and functional fitness, with the added benefit of being lower-impact and more accessible for diverse populations.

Santos, J. R., et al. (2020). Aquatic high-intensity interval training for improving functional fitness in older adults: A randomized controlled trial. *Journal of Aging and Physical Activity*, 28(2), 207-217.

# HIIT

## Tabata Training



Training Unit Components	Activities	Duration
Warm-up	Prestretch and warmup	2 mins
Aquatic-Based Tabata	<ul style="list-style-type: none"><li>• Squat jump</li><li>• High knee</li><li>• Tuck jump</li><li>• Kick front</li><li>• Jumping jack</li></ul> Single movement was performed with a duration of 20 seconds and 10 seconds rest	4-5 mins
Cool-down	Cardiorespiratory cool down and the post-stretch	2 mins

Gani, R. A., Achmad, I. Z., Julianti, R. R., Setiawan, E., Németh, Z., Muzakki, A., ... & Habibie, H. (2022). Does the Athletes' Leg Muscle Power Increase After the Tabata Aquatic Program?. *Physical Education Theory and Methodology*, 22(1), 56-61.

# Aquatic Plyometrics

**What It Is:** Aquatic plyometrics (APT) use water-based exercises to improve explosive lower-body strength and jump performance.

**Why It Works:** APT has shown similar benefits to land-based plyometrics (LPT) but with reduced impact, making it safer for athletes, especially those with injury concerns.

**Considerations:** APT provides a low-impact alternative for coaches and athletes looking to improve performance without stressing the musculoskeletal system.

**Aquatic Advantage:** Both APT and LPT enhance explosive power and athletic performance, but APT can lead to greater improvements in jump performance compared to LPT in some cases.

## **Supporting Study:**

Mullenax et al. (2021) found APT significantly improves jump performance, with less impact on the body than traditional LPT, making it a viable option for power & strength.

Mullenax, P. M., Johnson, Q. R., Trevino, M. A., Smith, D. B., Jacobson, B. H., & Dawes, J. J. (2021). The impact of aquatic based plyometric training on jump performance: a critical review. *International Journal of Exercise Science*, 14(6), 815.

# Aquatic Plyometrics



# Aquatic Recovery Workouts & Breakfast Club Workouts

**What It Is:** Incorporating water-based recovery techniques to reduce muscle soreness and enhance post-exercise recovery.

**Why It Works:** Hydrostatic pressure and temperature-controlled water boost circulation and reduce inflammation. Active recovery exercises like gentle swimming, floating, and water walking facilitate faster recovery.

**Considerations:** Educate athletes on integrating aquatic recovery into their routine for improved performance and injury prevention.

**Aquatic Advantages:** Reduces muscle soreness and promotes faster recovery.

**Supporting Study:**

Sajadian et al. (2017) found that active recovery and deep water running significantly reduce muscle damage markers in soccer players, supporting the effectiveness of aquatic recovery techniques.

Sajadian, M., Kordi, M., Gaeini, A., & Rahnema, N. (2017). Comparison of effects of active recovery and deep water running on soccer players' indices of muscular damage. *National Journal of Physiology, Pharmacy and Pharmacology*, 7(12), 1417-1421.



# Aquatic Recovery Workouts

# AquaCognition

**What It Is:** AquaCognition integrates aquatic therapy with cognitive-motor training to enhance both physical and mental performance.

**Why It Works:** Chest-level immersion in water provides hydrostatic pressure that exerts compressive forces on the lower body, leading to central translocation of blood and an elevation in cerebral blood flow.

**Aquatic Advantages:** Improves memory, attention, and problem-solving through combined cognitive and motor exercises.

**Considerations:** Implement AquaCognition as part of therapeutic programs for patients requiring both physical and cognitive rehabilitation.

**Supporting Study:** Dunlap (2024) showed that an aquatic cognitive–motor exercise program is feasible and enhanced cognition and functional mobility in older adults.

**Reference:** Dunlap, E., Alhalimi, T., McLaurin, N., Foroughi, F., Hsiao, H. Y., & Tanaka, H. (2024). Aquatic cognitive–motor exercise for cognition, balance, and functional mobility in older adults. *Translational Journal of the American College of Sports Medicine*, 9(3), e000257.

**AquaCognition  
&  
Aquatic  
Cognitive  
Motor Rehab**



# AquaSarong Classes:

## Cognitive Movement Drills

•**What It Is:** AquaSarong classes blend mindful movements with cognitive tasks to improve physical strength and mental sharpness in a supportive aquatic environment.

**Why It Works:** Water resistance enhances strength, flexibility, and stability with minimal joint impact. The cognitive engagement promotes memory, attention, and problem-solving tasks to challenge the brain while moving.

**Aquatic Advantage:** Those seeking a low-impact, dual-task workout that combines mindful movements with cognitive stimulation.

**Considerations:** Boosts core strength, range of motion, and coordination. Improves cognitive function by combining physical exercises with mental challenges. Encourages a holistic mind-body workout ideal for rehabilitation and wellness.

**Reference:** Salzman A. AquaCognition: Water-Based Interventions for Neurological Impairment and Cognitive Enhancement. Aquatic Therapy University seminar; Alcoa, TN; March 2025.



# AquaSarong: Cognitive Movement Drills



# Aquatic PreHab: For Joint replacement

**What It Is:** Aquatic PreHab for joint replacement is a water-based exercise program designed to strengthen muscles, improve flexibility, and increase endurance before surgery, aiding in a smoother and faster recovery.

**Why It Works:** The buoyancy of water reduces joint stress, allowing for safe and effective strengthening of muscles around the joint. Exercises in the pool enhance flexibility and build strength with minimal risk of injury.

**Aquatic Advantage:** Increases muscle strength and joint mobility, improving the body's ability to recover post-surgery. Strengthening muscles before surgery reduces pain, swelling, and the risk of complications during recovery. Helps patients regain mobility quickly and safely after surgery.

**Best Practice:** Integrate Aquatic PreHab into pre-surgery routines to optimize recovery, prevent post-surgical complications, and improve overall outcomes.

**Reference:** Łyp, M., Kaczor, R., Cabak, A., et al. (2016). A water rehabilitation program in patients with hip osteoarthritis before and after total hip replacement. *Medical Science Monitor: International Medical Journal of Experimental and Clinical Research*, 22, 2635-2642.  
<https://doi.org/10.12659/msm.896203>

# Aquatic PreHab Training



# Aquatic Sensory & Motor Integration

**What It Is:** Aquatic sensory and motor integration is a therapeutic approach that combines sensory stimulation with motor exercises in the water to improve physical and neurological function.

**Why It Works:** The water provides a unique environment where sensory inputs and motor movements are enhanced. The aquatic environment stimulates the senses (touch, proprioception, and vestibular system), which helps with sensory processing and motor learning.

**Aquatic Advantages:** Enhances proprioception, body awareness, and stability through water-based sensory activities. Facilitates smoother, more controlled movement patterns, promoting motor skills development.

**Considerations:** Integrate aquatic sensory and motor integration into rehabilitation programs and post-rehab training to support individuals with neurological impairments, developmental delays, motor coordination challenges.

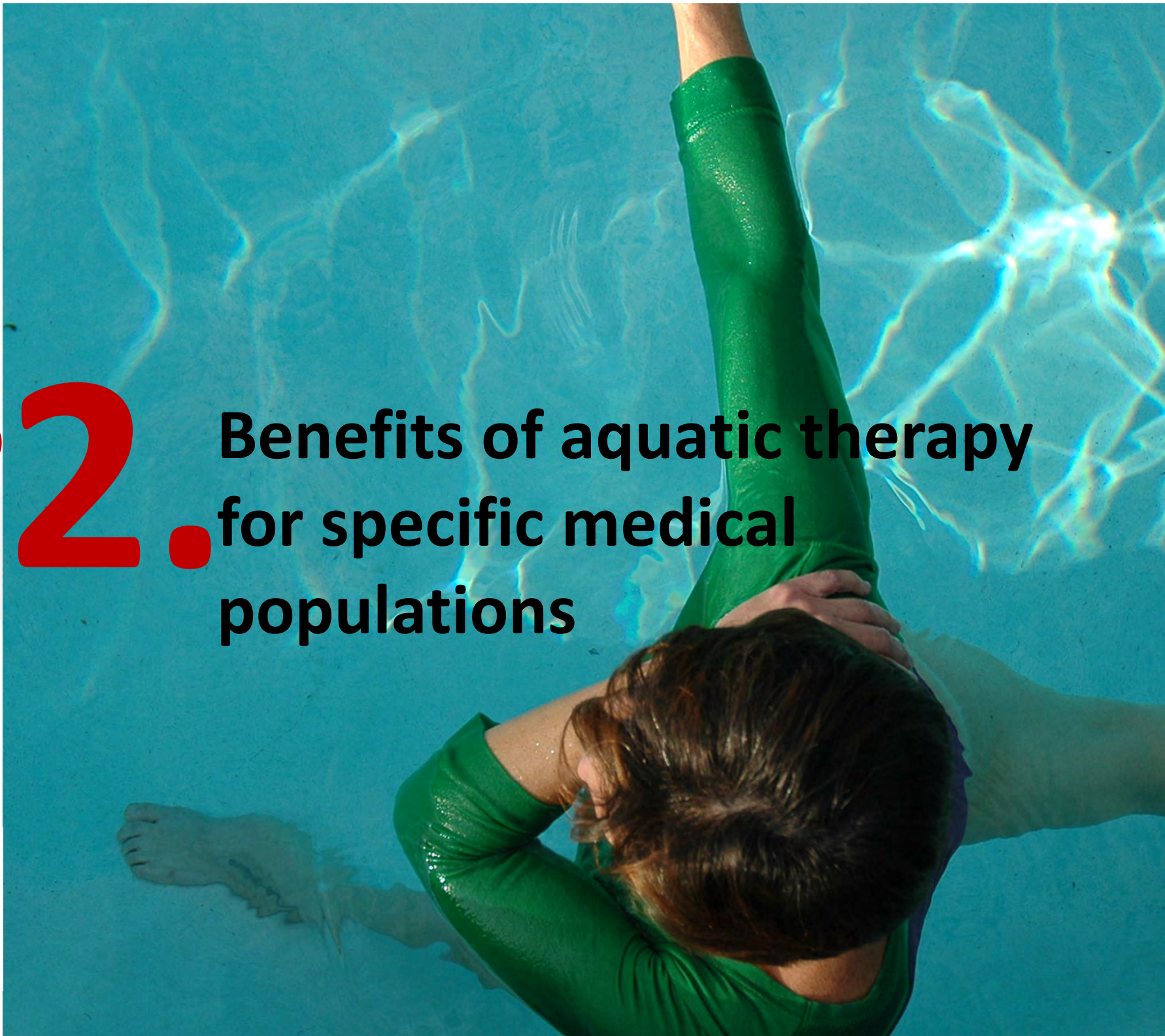
**Reference:** Kemp, E., Nikahd, M., Ackerman, M., Howard, M., Darragh, A., & Crasta, J. (2024). Water competency and sensory processing among children on the autism spectrum. *The American Journal of Occupational Therapy*, 78(6).



## Aquatic Sensory & Motor Integration



# #2. Benefits of aquatic therapy for specific medical populations



# Stroke Rehab & Post-Rehab

**Post-CVA:** Aquatic therapy significantly improves walking, balance, emotional status, and health-related quality of life in stroke patients, showing superior effectiveness compared to land-based interventions.

**"Aquatic therapy rewires the brain and body, unlocking faster recovery, improved mobility, and better quality of life, all with the gentle support of water."**

**Reference:** Veldema, J., & Jansen, P. (2021). Aquatic therapy in stroke rehabilitation: Systematic review and meta-analysis. *Acta Neurologica Scandinavica*, 143(3), 221-241. <https://doi.org/10.1111/ane.13371>

# Multiple Sclerosis

**Multiple Sclerosis:** Aquatic therapy improves balance, quality of life, and reduces fatigue in patients with multiple sclerosis

**"Aquatic therapy empowers those with MS to move freely, reduce spasticity, and regain strength, all while minimizing the impact on their body."**

**Reference:** Corvillo, I., Varela, E., Armijo, F., et al. (2017). Efficacy of aquatic therapy for multiple sclerosis: A systematic review. *European Journal of Physical and Rehabilitation Medicine*, 53(6), 944-952. <https://doi.org/10.23736/S1973-9087.17.04570-1>

# Parkinson's Disease

**Parkinson's:** Aquatic exercise programs improve postural balance, gait, cardiorespiratory fitness, and quality of life in individuals with Parkinson's disease, with greater benefits than land-based exercises

**"Aquatic therapy unlocks movement potential, improving balance, flexibility, and motor control, giving those with Parkinson's the freedom to move with confidence."**

**Reference:** Cugusi, L., Manca, A., Bergamin, M., et al. (2019). Aquatic exercise improves motor impairments in people with Parkinson's disease, with similar or greater benefits than land-based exercise: A systematic review. *Journal of Physiotherapy*, 65(2), 65-74. <https://doi.org/10.1016/j.jphys.2019.02.003>

# Chronic Low Back Pain

**Chronic Low Back Pain:** Aquatic therapy reduces pain, disability, and improves quality of life, body composition, and fitness in sedentary adults with chronic low back pain. [

**"Aquatic therapy takes the strain off the spine, easing pain and improving mobility, helping those with chronic low back pain regain strength and live with fewer limits."**

**Reference:** Baena-Beato, P. Á., Artero, E. G., Arroyo-Morales, M., et al. (2014). Aquatic therapy improves pain, disability, quality of life, body composition and fitness in sedentary adults with chronic low back pain: A controlled clinical trial. *Clinical Rehabilitation*, 28(4), 350-360.  
<https://doi.org/10.1177/0269215513504943>

# Fibromyalgia

**Fibromyalgia:** Aquatic therapy reduces pain, fatigue, and depression, and improves physical function and mental health in patients with fibromyalgia

**"Aquatic therapy not only eases pain but it also promotes restful sleep, giving those with fibromyalgia the restorative rest they need to heal and thrive."**

**Reference:** Calles Plata, I., Ortiz-Rubio, A., Torres Sánchez, I., et al. (2023). Effectiveness of aquatic therapy on sleep in persons with fibromyalgia: A meta-analysis. *Sleep Medicine*, 102, 76-83. <https://doi.org/10.1016/j.sleep.2022.12.016>

# Arthritis

**Osteoarthritis/ RA:** Aquatic exercise provides significant improvements in pain, stiffness, and physical function in patients with knee and hip osteoarthritis

**"Aquatic therapy offers more bang for the buck—reducing joint pain, improving mobility, and building strength, all while giving those with arthritis the freedom to move with less pain and more ease."**

**Reference:** Fail , L. B., Marinho, D. A., Marques, E. A., et al. (2022). Benefits of aquatic exercise in adults with and without chronic disease—a systematic review with meta-analysis. *Scandinavian Journal of Medicine & Science in Sports*, 32(3), 465-486. <https://doi.org/10.1111/sms.14112>

# Osteoporosis

**Osteoporosis:** Aquatic exercise significantly improved bone mineral density at the lumbar spine and femoral neck, highlighting the safety and attractiveness of water-based exercise, particularly for individuals unable or unmotivated to perform intense land-based exercises

**"Aquatic therapy builds bone strength and enhances balance, providing a safe, low-impact way to fight osteoporosis and reduce the risk of fractures with every move."**

**Reference:** Schinzel, E., Kast, S., Kohl, M., et al. (2023). The effect of aquatic exercise on bone mineral density in older adults: A systematic review and meta-analysis. *Frontiers in Physiology*, 14, 1135663.  
<https://doi.org/10.3389/fphys.2023.1135663>

# Breast Cancer Survivors

**Breast Cancer Survivors:** Aquatic therapeutic exercise improves pain, shoulder mobility, cardiorespiratory fitness, muscle strength, and health-related quality of life in breast cancer survivors

**"Aquatic therapy accelerates recovery, reduces pain, and restores strength, empowering survivors to regain control and thrive with every movement."**

**Reference:** Mur-Gimeno, E., Postigo-Martin, P., Cantarero-Villanueva, I., & Sebio-Garcia, R. (2022). Systematic review of the effect of aquatic therapeutic exercise in breast cancer survivors. *European Journal of Cancer Care*, 31(1), e13535. <https://doi.org/10.1111/ecc.13535>

# Children with Neuro Involvement

Neurological disorders: Aquatic therapy enhances motor functions, balance, and muscle strength in children with neurological disorders.

**"Aquatic therapy turns therapy into play, helping kids with neurological challenges build strength, coordination, and confidence—all while splashing through fun, water-filled adventures!"**

**Reference:** Marinho-Buzelli, A. R., Bonnyman, A. M., & Verrier, M. C. (2015). The effects of aquatic therapy on mobility of individuals with neurological diseases: A systematic review. *Clinical Rehabilitation*, 29(8), 741-751.  
<https://doi.org/10.1177/0269215514556297>

## Fall Risk

**Community-Dwelling Older Adults:** Aquatic physical therapy exercises improve balance, gait, quality of life, and reduce the fear of falling in healthy community-dwelling older adults

**"Aquatic therapy helps fall-risk adults move with ease and regain their balance—empowering them to live with less fear, steady on their feet."**

**Reference:** Melo , R. S., Carneira, C. S. F., Rezende, D. S. A., et al. (2023). Effectiveness of the aquatic physical therapy exercises to improve balance, gait, quality of life, and reduce fall-related outcomes in healthy community-dwelling older adults: A systematic review and meta-analysis. PLOS One, 18(9), e0291193. <https://doi.org/10.1371/journal.pone.0291193>



# #3.

**Advantages and challenges  
of aquatic therapy versus  
land-based therapy**



A dynamic splash of clear water against a black background, with a white background at the bottom. The water is captured in mid-air, creating a sense of motion and energy. The splash is centered and spreads outwards, with many small bubbles and droplets visible.

**Advantages:**

**Reduction of edema, effusion,  
or lymphedema**

# Advantages: Reduced **Weight-bearing**



**Advantages:**

**Desensitization to touch**





**Advantages:**  
**Pain reduction**

A woman with blonde hair, wearing a blue tank top, is smiling and stretching her arms overhead. Her hands are clasped together at the top. The background is a bright, blurred indoor space with large windows.

**Advantages:**

**Cognitive Enhancement**



**Advantages:**  
**Strength training**

# Advantages: Sensory stimulation






**Advantages:**

**Balance and proprioception training**

A close-up profile of a woman's face, her eyes are closed, and she is wearing a white towel on her head. The background is a solid blue color. The text "Disadvantages?" is overlaid on the bottom left of the image.

**Disadvantages?**



Andrea Salzman  
Feb 1 • 3 min read

### Ask Andrea: How Can I Justify Aquatic Therapy For Peds? My Hospital Doesn't Believe in the...

★★★★★ (1)

Question: My hospital is asking me to justify the cost of aquatic therapy for pediatrics in the face of rising

25 views 1 comment




Andrea Salzman  
Jan 29 • 3 min read

### Integration of Halliwick Principles into WST: Combining Elements of the Halliwick Ten...

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Byline Johan Lambeck Want to get your Halliwick training? Meet us in Sun City, Arizona from March 10-

93 views 1 comment



Andrea Salzman  
Jan 23 • 5 min read

### Aquatic Therapy for Children with Muscular Dystrophy and Neuromuscular Conditions

★★★★★ (1)

Byline: Ailene Tisser and Cindy Freedman Discover the healing power of water: How Aquatic Therapy can

90 views 1 comment




Andrea Salzman  
Jan 20 • 2 min read

### Why Do We Keep Doing Mediocre Research in Aquatic Therapy (and How Do We Fix It)?

★★★★★ (2)

As a physical therapist with extensive experience assisting numerous PT and OT students with their

36 views 4 comments



Andrea Salzman  
Jan 18 • 2 min read

### Top 8 Reasons the Pool Rules for TKR (Quick: Go Tell their Surgeon the Science is IN!)

★★★★★ (1)

Who says the pool rules? SCIENCE says the pool rules! Science in the house!! Top 8 Reasons Why Water Works

56 views 1 comment



Andrea Salzman



# What next?

- Making your pool a **safe haven** for discharged therapy clients
- **12 methods** to progress any aquatic exercise
- Novel balance, proprioception & **fall prevention**
- Evidence-based **precautions and contraindications** for aquatic exercise & therapy
- **Aquacognition** or Aquasarong certificates...



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Andrea Salzman, Director of Aquatic Therapy University