

# Aquatic Consulting & Education Resource Services



Susan J. Grosse  
7252 W. Wabash Avenue  
Milwaukee, WI 53223  
Phone/fax 414-354-8717  
sjgrosse@execpc.com  
<http://my.execpc.com/~sjgrosse>

## Research in Therapeutic Aquatics: Characteristics, Barriers, and the *AIM*

Research justified practice is a relative norm in the medical profession. Before a medical procedure or drug becomes common practice, it undergoes much study and validation, so that when it becomes available to the entire population, those who are the receivers can be confident they are getting a proven product. Striving for research-justified practice is not limited to land practice. Professionals in therapeutic aquatics also seek to implement aquatic activities that have been proven to be successful. However, their search for research validated protocols is often less successful than in other rehabilitation fields. What validates information in the field of therapeutic aquatics and why is obtaining research validated treatment protocols more difficult for professionals in therapeutic aquatics than for individuals in other professional fields?

### Characteristics of Sound Research

Not all research is scientifically sound. Just because an article or presentation includes the term *research* in its title or claims to be the result of actual research, doesn't mean that research is scientifically sound. Almost anyone can claim anything and label it the result of research. How can an individual seeking research justification tell scientifically sound research from everything else? Here are characteristics of sound research. While in all probability no sound research has all of these characteristics, scientifically valid research should contain most.

- Researchers should have credentials validating their educational background and/or training in conducting research. In most (but not all) cases, this means master's degree level education.
- The research design contains both an experimental and a control group. One group should receive the treatment protocol and the other group should not.
- Experimental and control groups should be as accurately matched as possible. Groups should be made up of individuals having the same condition or disability, be the same age, gender, and have very similar functional abilities.
- The larger the population sampled in the research the better. Comparing groups of 4 or 5 people is much less sound than comparing groups of 50 or 100 or 1000.
- If norms are developed from the research, the larger the population group, the more valid the norms.
- Assessment protocol research should compare the new assessment process with an existing, scientifically valid and reliable, comparable assessment protocol.
- Results should undergo statistical analysis for validity and reliability. Within this validation, the higher the statistical result, the better the score.

### Barriers to Research

Meeting the criterion for sound research is a difficult task. While there are many therapeutic aquatic programs and protocols that achieve excellent results, research documentation is scanty at best (Grosse, 2009). A multitude of barriers exist to achieving a body of scientifically sound research.

- Implementing the concept of withholding treatment. In order to have an experimental and a control group, therapeutic aquatics would have to be withheld from half of the target population. Because treatment in

the aquatic medium is unique in nature, asking a control group to not participate is very often found inappropriate.

- Due to the wide variance in impairments, disease manifestations, and disabilities, it is extremely difficult to obtain matching groups.
- Obtaining participation from a large group of individuals in therapeutic aquatic programs is also very difficult. Therapeutic treatment may have a limitation in time, and individuals may move from therapeutic treatment into community programming. Keeping a large group in the same program long enough for research to take place is very difficult.
- Norms require either a large population sample, or a small sample participating over a multi-year time span (longitudinal research). This type of population is difficult to obtain in aquatics.
- There are very few existing, scientifically validated, norms for aquatic activities. Therefore, finding an existing aquatic assessment tool against which to validate a new protocol is almost impossible. Comparisons between a new aquatic protocol and an existing land-based protocol are possible, but all of the other barriers still will exist. In addition, experimental and control groups will need to participate in both aquatic and land-based programs.
- Statistical analysis is extremely difficult to perform outside of a college or university setting. Research institutions have the human and technological resources to handle the statistical side of any investigation. The professional in therapeutic aquatics rarely has the time, nor the expertise to handle on-going aquatic programming, the research design and implementation, and the statistical analysis
- Without all of the above, true, valid, scientifically sound research cannot get published in reputable aquatic publications. There may be sound research taking place, but results remain unknown without dissemination by publication.
- Very few individuals who claim to be seeking evidenced-based aquatic practice actually subscribe to national and/or international level journals where aquatic research is the focus of the publication. The research that does exist, then, is not being recognized.

## A Sound Research Example

For the past several years a group of aquatic professionals from Israel and The Netherlands has been doing research, sound research, into implications of aquatic intervention for children with disabilities. Their research has resulted in validation of the *Aquatic Independence Measure* (AIM) (Getz, 2006b).

The AIM originated in Israel with Chacham and Hutzler, as published in 2002. The assessment tasks on the AIM are taken from the aquatic motor tasks of the Halliwick method. The original reliability and validity of the AIM was determined by Chacham and Hutzler. Publication of their results was in Hebrew.

In further, more definitive development and validation of the AIM, Getz, Hutzler, and Vermeer (2006b) compared the AIM with several land-based assessments of motor function. Forty-nine children with neuro-motor impairments, ages 3 to 7 participated in their study. The results of implementation of the AIM were compared with results of the Gross Motor Function Measure (GMFM), and the Pediatric Evaluation of Disability Inventory (PEDI). Pearson correlations were applied to determine the relationships between the AIM and the GMFM, PEDI, and Gross Motor Function Classification System (GMFCS). To be more specific –

“Significant correlations were found between the total AIM and GMFM scores ( $r = .69, p < .01$ ) and PEDI self-care sub-scale ( $r = .79, p < .01$ ) as well as the PEDI mobility sub-scale scores ( $r = .35, p < .05$ ).” (Getz, 2006b, 339).

This was a very good result and the AIM was found to be favorable in comparison to land-based assessments, particularly so for the water adjustment subscale of the AIM.

This research meets criterion for sound scientific research. Population size is appropriate. Groups have been matched, statistical analysis has been applied and assessment instruments have been validated against existing assessments. Results have been reviewed by publications of research stature. This is quality research in therapeutic aquatics.

## Meeting the Need

Professionals in therapeutic aquatics need scientifically validated treatment modalities. This is the basis of acceptability within the medical profession. While not all therapeutic aquatics exists within the medical framework, quite a bit does. To be recognized and recommended, the scientific validation must be present. Where substantial subject populations exist and research institutions are near by, full-scale research projects can be undertaken. If impetus does not come from the research institution, initiation must be undertaken by professionals practicing in therapeutic aquatics. Seeking out and making contact with individuals within the research institution environs can open the door for improving the research focus on therapeutic aquatics.

Where populations are small and/or a research institution is not available, a professional in therapeutic aquatics can undertake anecdotal research. While this might seem tedious, gathering and documenting treatment protocols of individuals, compiled over a significant number of years, can also generate a research base. During the first year or two, all that will result will be pages of documentation. But, at year 5, year 10, and year 15 it will be possible to sort the documentation into population groups based on commonalities. From these groups, it will be possible to make generalizations appropriate to validation of treatment protocols.

How is an anecdotal record generated? Create a form with the following fill-in categories:

- Label of individual – not the name, as a name is confidential. Give each individual a letter or number.
- Demographics of the individual – age, gender, and any other measurement appropriate to the study.
- Diagnosis of individual – specifically as related to why the individual is being seen in the aquatic medium.
- Treatment protocol – what activities, for how long each session, for how many sessions at what frequency.
- Benefits of treatment – what has resulted from treatment? What can you prove, based on assessments, has taken place following treatment?
- Assessments used – making sure each assessment is performed in the same way each time it is given.
- Assessment scores – noting improvements, as well as lack of same.
- Contributing factors – anything else known about the individual that might affect the results of assessments.

Gather enough documentation and eventually a research population will result. Professionals in therapeutic aquatics have an obligation to contribute to the research base they seek. Research does not just materialize out of thin air. Developing research requires commitment to learning something new about a specific population of individuals. Part of being a professional in therapeutic aquatics means making a commitment to that learning and providing research, at whatever level, to enhance the growth of the field.

## Resources

- Chacham, A., & Hutzler, Y. (2002). Reliability and validity of the aquatic adjustment test for children with disabilities. *Movement*. 6,160-189. (In Hebrew – abstract available in English from Movement Editorial Board at Zinman College for Physical Education and sport Sciences, Wingate Institute, 42902, Israel.)
- Getz, M., Hutzler, Y., & Vermeer, A. (2006a). Effects of aquatic interventions in children with neuromotor impairments: a systematic review of the literature. *Clinical Rehabilitation*. 20(11), 927-36. November.
- Getz, M., Hutzler, Y., & Vermeer, A. (2007). Effects of aquatic intervention on perceived physical competence and social acceptance in children with cerebral palsy. *European Journal of Special Needs Education*. 22(2), 2178-226. May.
- Getz, M., Hutzler, Y., & Vermeer, A.. (2006b). Relationship between aquatic independence and gross motor function in children with neuro-motor impairments. *Adapted Physical Activity Quarterly (APAQ)* 23(4). 339-355. October.
- Grosse, S. (2009). Aquatics for individuals with disabilities: research implications. *International Journal of Aquatic Research and Education (IJARE)*. 3(4), November. 356-367.

- Grosse, S.J. (2001). *The Halliwick Method: Water Freedom for Individuals with Disabilities*. Milwaukee, WI: Aquatic Consulting and Education Resource Services (7252 W. Wabash Avenue, Milwaukee, WI 53223).
- Grosse, S. & Lambeck, J. (2004). The Halliwick method: a comparison of applications to swim instruction and aquatic therapy. *ICHPER-SD Journal*. 40(4), 31-36.
- Tirosh, R., Katz-Leurer, M, and Getz, M. (2008). Halliwick-based aquatic assessments: reliability and validity. *International Journal of Aquatic Research and Education (IJARE)*. 2(3). August.