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AUTHOR Schilling, Mary Lou  
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ABSTRACT

This bulletin shares information regarding adaptive equipment, recommended interventions, precautions, and fun activities related to aquatic activities and exercise for persons with handicapping conditions. The bulletin begins with a list of 13 safety precautions and then describes instructional aids, adaptive aids, fitness-oriented devices, and easy on/off swim suits and names their vendors. Swimming recommendations are offered for individuals with cerebral palsy, spinal cord injuries, muscular dystrophy, amputations, spinal curvatures, visual impairments, seizure disorders, and arthritis. Nine aquatic games are described. (Contains 16 references and a list of 7 catalogs.) (JDD)

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# PAM REPEATER NO. 80

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## Aquatics and Persons With Disabilities

Arselia Ensign, Editor

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### GUEST EDITOR RETURNS

TO THE EDUCATIONAL RESOURCES  
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Welcome back, **Mary Lou Schilling!** We are proud to present to our readers "Aquatics and Persons with Disabilities," a timely and unique publication authored by a fine professional and longtime friend of our organization. Mary Lou Schilling, MA,CTRS, is President of Central Rehabilitation Services, Inc. of Mount Pleasant. She is also an instructor at Central Michigan University. Mary Lou is a valued member of the Board of Directors of P.I.A. M.

Mary Lou was originally a Guest Editor for the PAM REPEATER in 1982 (#8, Winter Fun-Indoors and Out) in which she described some homemade alternatives to adaptive recreational equipment. In 1983 she provided us with REPEATER #15 which identified and illustrated commercial adaptive recreational equipment. In 1984 we published REPEATER #22, entitled "Familiar Sports and Activities Adapted for Multiply Impaired Persons."

Each of these REPEATERS met an obvious need felt by parents, school personnel and park and recreation directors. The publications have literally enjoyed worldwide circulation throughout the years. We are confident that the topic of Aquatics will be equally well received. We also wish to acknowledge Mary Lou's husband, Alan J. Schilling, who has been kind enough to provide us with illustrations.

We are indebted also to our friends from the Rotary Club of Lansing for providing the PAM Assistance Centre with monies to publish and mail this publication to our current membership. As is our custom, we publish additional copies which we make available to callers at the Centre, and to other persons whom we may contact through our programs and exhibits.

The Rotary Club of Lansing Foundation has provided modest grant monies to many worthy organizations through the years. The timely support of local foundations such as Rotary has been a great boon to our PAM Assistance Centre since we began in 1979. Our heartfelt thanks!

The Rotary Club  
of Lansing Foundation



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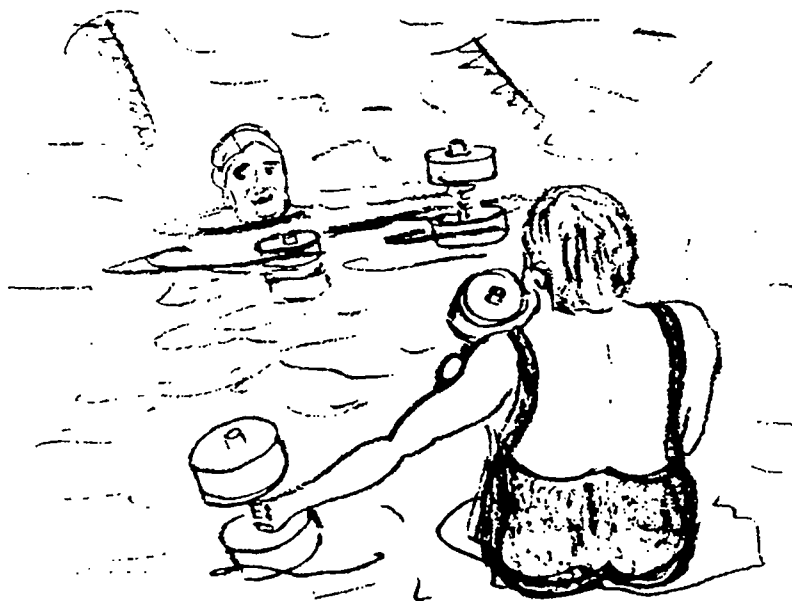


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## Value/Purpose of Aquatic Activity/Exercise

The benefits of aquatic exercise and/or activity are multiple and range from physical to psychological in nature. Aquatic activity has been successful in treating orthopedic problems, arthritis, multiple sclerosis, impaired circulation and obesity to name a few. The primary advantage of aquatic exercise is that of water buoyancy. Since water buoyancy decreases the negative effects of gravity, joints are supported and allow for increased freedom of movement and flexibility with reduced pain. Due to increased mobility, aquatic activity promotes improved circulation and improved/deeper respiratory functioning, while helping to maintain (versus increase) heart rate. Additionally, water resistance prevents rapid movement while promoting muscle strengthening. Fun, relaxation and increased freedom of movement (without crutches, wheelchairs or other mobility devices) are a few of the psychological benefits of aquatic activity.

The intent of this REPEATER is to share with the reader baseline information regarding adaptive equipment, recommended interventions, precautions and generally fun activities that you can perform in the water. Further information can be obtained by contacting your local Red Cross office and requesting names of water safety instructors who have experience in working with persons with handicapping conditions. Additionally interested parties may contact the author directly for further information.



## **Safety Issues/Precautions**

The following are general safety rules that we should all follow in an aquatic environment:

1. Never swim in an unguarded area.
2. Never swim alone.
3. Beginners should always remain in shallow water.
4. Never swim with artificial aids in deep water if you must depend on them to support you.
5. Never dive into unknown waters.
6. Never dive in water depth of less than 9 feet.
7. When boating/canoeing/etc. always wear approved life jackets.
8. Don't "rough house" in the water.
9. Know your limits, never exceed them.
10. Try not to over fatigue or chill yourself.
11. Remember, pool rules are designed for the safety of the consumer. Always follow the safety rules posted at your public pool or beach front.
12. Do not swim in dark, unlighted pools or when it's storming, raining or lightning out.
13. Avoid swimming when you have any of the following conditions:
  - infections diseases in the active stage
  - chronic ear infections
  - eczema or other skin conditions
  - chronic sinusitis
  - open wounds
  - severe cardiac conditions
  - acute episode of rheumatoid arthritis
  - osteomyetitis in its active stage or
  - allergies to chlorine.

## **Adaptive and/or Instructional Equipment**

The following is a listing of aids and appliances that will assist persons with disabilities in the aquatic environment. These devices vary from instructional aids, adaptive aids, fitness oriented devices as well as easy on/off swim suits. A brief description is provided of each device as well as a listing of vendors or suppliers of said device. It should be noted that the listing of vendors is not necessarily complete and it demonstrates no partiality on the part of this writer towards named vendors.

Water Walker/Waist Floats/Instructional Swim Belts: support participant at the waist for buoyancy support while learning new swim strokes, ambulating in shallow water, etc.

Available through: J & B Foam Fabricators Inc., P. O. Box 144, Ludington, MI 49431; Flaghouse Inc. 150 N. MacQuesten Pkwy, Mt. Vernon, N.Y., 10550.

Swim/Stabilizer/Therapy Bars: provided upper extremity support while participant works on kicking or lower extremity stroke pattern. Ideal for instruction in front crawl.

Available through: Hydro Fit Inc., 440 Charnelton St., Eugene, Oregon 97401-2626; Danmar Products Inc., 221 Jackson Industrial Dr., Ann Arbor, MI 48103; Flaghouse Inc., 150 N. MacQuesten Pkwy, Mt. Vernon, N.Y. 10550; J & B Foam Fabricators, Inc. P. O. Box 144, Ludington, MI 49431; Access to Recreation, 2509 E. Thousand Oaks Blvd., Suite 430, Thousand Oaks, CA 91362.

Kick Boards/Flutter Boards: rigid light weight boards used to stabilize upper extremities while propelling self in prone with lower extremities.

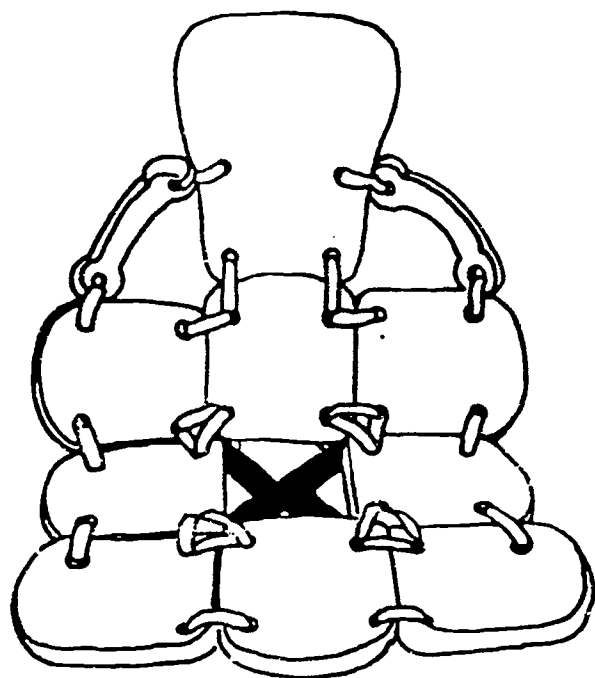
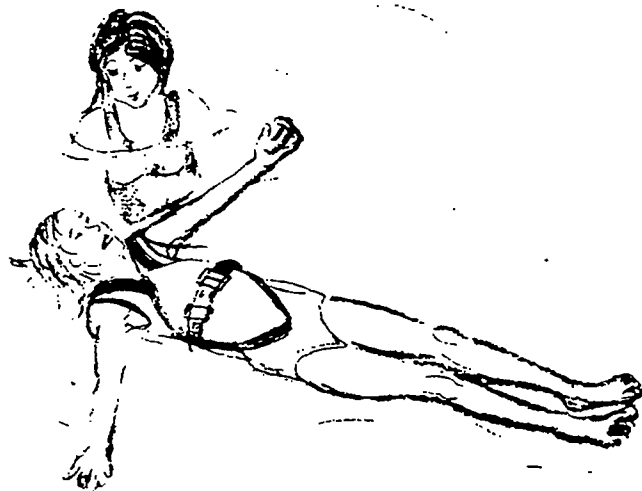
Available through: J & B Foam Fabricators, Inc., P. O. Box 144, Ludington, MI 49431; Flaghouse Inc., 150 N. MacQuesten Pkwy., Mt. Vernon, N.Y. 10550; Sportime, One Sportime Way, Atlanta, Georgia 30340.

Multi Purpose Swim Rings: a set of vinyl coated foam rings attached to one belt; designed for versatile use to support lower extremity, upper extremity or 2 belts snapped together maybe used for waist support. Vinyl coated rings may be easily decreased or increased based on participants skill and need for buoyancy.

Available through: Danmar Products Inc., 221 Jackson Industrial Dr., Ann Arbor, MI 48103; Flaghouse Inc., 150 N. MacQuesten Pkwy., Mt. Vernon, N.Y. 10550; Access to Recreation, 2509 E. Thousand Oaks Blvd., Suite 430, Thousand Oaks, CA 91362.

Delta Float System: vinyl coated triangular shaped swim support system. Front and rear support of torso provided.

Available through Danmar Products Inc., 221 Jackson Industrial Dr., Ann Arbor, MI 48103; Flaghouse Inc., 150 N. MacQuesten Pkwy., Mt. Vernon, N.Y. 10550; Access to Recreation, 2509 E. Thousand Oaks Blvd., Suite 430, Thousand Oaks, CA 91362.



Sectional and/or Modular Rafts: for persons with severe disabilities. Allows for total body support in either supine or prone positioning yet frees participant to move rest of upper and lower extremities.

Available through: Danmar Product Inc., 221 Jackson Industrial Dr. Ann Arbor, MI 48103; Flaghouse Inc., 150 MacQuesten Pkwy., Mt. Vernon, N.Y. 10550.

Head Float: float that secures around neck of participant for buoyancy or support.

Available through: Danmar Products Inc., 221 Jackson Industrial Dr. Ann Arbor, MI 48103; Flaghouse Inc., 150 N. MacQuesten Pkwy, Mt. Vernon, N.Y. 10550; Assess to Recreation, 2509 E. Thousand Oaks Blvd., Suite 430, Thousand Oaks, CA 91362.

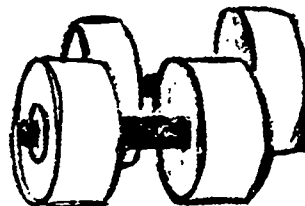
Mobile Pool Pal: pool side lounge for persons with severe disability. Stainless steel frame and quick dry polyester mesh cover. Mobile on 4 non-marring rubber wheels.

Aids for Fitness/Exercise:

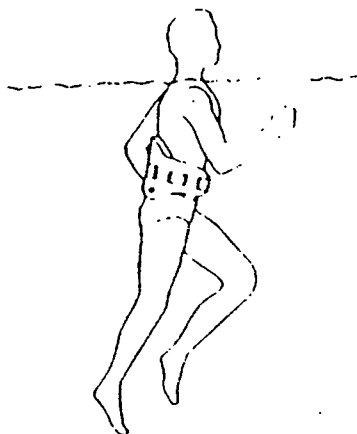
Water Wafers: 12 inch diameter, circular foam discs used for development and strengthening of upper extremities.

Available through: J & B Foam Fabricators Inc., P. O. Box 144, Ludington, MI 49431.

Hand Bars/Hand Buoys/Delta Bells: similar to the swim bar but smaller. Holding one in each hand they provide resistance while performing upper extremity exercises.



Available through: Solutions, P. O. Box 6878, Portland, OR 97228; J & B Foam Fabrications Inc., P. O. Box 144, Ludington, MI 49431; Hydro Fit Inc., 440 Charnelton St., Eugene, Oregon 97401-2626; Sportime, One Sportime Way, Atlanta, Georgia 30340.



Aqua Jogger/Wet Belt: ideal waist support to allow for deep water aquatic exercises in vertical positions. Allows participant the freedom to work/exercise both upper and lower extremities simultaneously.

Available through: Hydro Fit, Inc., 440 Charnelton St., Eugene, Oregon 97401-2626; Solutions, P. O. Box 6878, Portland, Oregon, 97228; Sportime, One Sportime Way, Atlanta, Georgia, 30340.

Swim Mitts/Wave Webs: hand worn mitts with webbing between fingers; allows for increased water resistance for effective upper body conditioning. May be used with both aquatic exercise as well as during swim strokes.



Available through: Hydro Fit, Inc., 440 Charnelton St., Eugene, Oregon 19740; Solutions, P. O. Box 6878, Portland, OR 97228; Sportime, One Sportime Way, Atlanta, Georgia 30340.

Water Wheel: a 20" disk designed for upper extremity strengthening. This disc has "windows" that adjust for increasing or decreasing resistance. Designed to be used in shallow water, for the non swimmer.

Available through: Danmar Products, Inc., 221 Jackson Industrial Drive, Ann Arbor, MI 48103.



Floatation/Buoyancy and Resistance Cuffs: resistance cuffs designed to be worn in a variety of ways (ie. around ankles for lower extremity workouts, around arms for upper extremity workouts and, secured together, around waist for buoyancy belt). Buoyancy cuffs provide natural resistance to increase physical workout.

Available through: Hydro Fit, Inc., 440 Charnelton St., Eugene, Oregon 97401-2626; Flaghouse Inc., 150 N. MacQuisten Pkwy., Mt. Vernon, NY10550; Solutions, P. O. Box 6878, Portland, OR 97228; Sportime, One Sportime Way, Atlanta, Georgia 30340.

Swim Fins: wear to increase resistance to lower extremities and improve kick pattern.

Available through: Local vendors, large department stores, sporting good stores.

Others:

Aqua Socks: shoes to be worn in and around the aquatic environment. Bottom traction provide increased safety on the deck, in the locker room and may additionally be appropriate while ambulating in shallow water.

Available through: Check local businesses and/or shops (sporting good stores or larger department stores).

Lap Counter: battery operated, electronic unit that adheres to the side of the pool; touch pad used to cue completed lap on digital display screen. Accurately count your laps and pace with this unit. Ring sized lap counter are also available. This "ring" is worn on your index finger, as you finish a lap touch a button with your thumb to record your lap.

Available through: Solutions, P. O. Box 6878, Portland, OR 97228.

Life Jackets: number of types that provide maximum to moderate levels of buoyancy. Watch that they are coast guard approved. Mae West and Horseshoe shaped types will support the head and will keep head out of water in aquatic safety situation. Vest and other types will support body but will not keep head out of water in safety situations. Investigate various options prior to purchase. Make sure size and weight is appropriate for participant.

Available through: Local vendors (ie larger department stores or sporting good stores). Also available through: Access Recreation, 2509 E. Thousand Oaks Blvd., Suite 430, Thousand Oaks, CA 91362; Sportime, One Sportime Way, Atlanta, Georgia 30340; Flaghouse Inc., 15 N. MacQuesten Pkwy., Mt. Vernon, NY 10550.

Swim Goggles/Masks: to be used for comfort with under water swim or prone swim strokes.

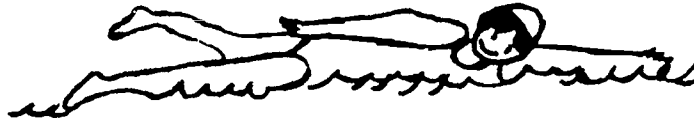
Available through: Local vendors.



### Easy Access Swim Suits:

Men's Swim Trunks and Women's Swim Suits: side zippers, velcro closures and snaps makes removing that wet suit a much easier task.

Available through: Danmar Products Inc., 221 Jackson Industrial Dr., Ann Arbor, MI 48103.



## **SWIMMING RECOMMENDATIONS FOR PERSONS WITH DISABILITIES**

The following are recommended interventions, swim strokes and/or precautions for persons having various disabilities. Further information can be obtained by contacting a recreational therapist or a water safety instructor that has experience in programming with persons with disabilities.

### **Cerebral Palsy:**

1. Water temperature of 85-95 degrees is recommended for those with contractures. Remember, air temperature should generally be 10 degrees higher than pool temperature.
2. Provide "calm"/relaxing aquatic environment.
3. Encourage normal postural.
4. Preferred strokes are generally those in supine ie. elementary back stroke or basic elementary back stroke. Also, stroke patterns that are the same bilaterally are easily to perform.
5. Avoid extension of the head with back stroke as it will increase extensor tone and eliminate possibility of relaxation. Maintain head in neutral position.
6. Swim in prone should be avoided until participant can submerge the head to avoid increased extensor tones throughout the back.
7. The 'frog kick' or elementary back stroke kick is recommended. The flutter kick is contraindicated as it increases muscle tonus.

## **Spinal Cord Injuries:**

### **- Paraplegia:**

1. Any stroke can be successfully learned including breast stroke, side stroke, butterfly, etc.
2. The "drag" effect caused from nonfunctional lower extremities can be reduced through the use of slightly inflated arm floats (or similar device) worn around the knees.
3. Socks or "Aqua socks" maybe worn to prevent possible scrapes/scratches to feet due to abrasive floor/step surfaces.

### **Quadriplegia:**

1. Accommodate/encourage as much movement as functionally possible.
2. Utilize floatation device that supports yet allows maximum levels of extremity movement.
3. Bilateral strokes (ie. breast strokes, elementary back stroke) provide the best method of movement.
4. Breathing patterns may be problematic and therefore supine swim strokes are most recommended.
5. Provide short periods of intense work with longer periods of rest.

### **Muscular Dystrophy:**

1. Moderate levels of activity.
2. **DO NOT** over fatigue.
3. Build in frequent rest periods.
4. Water temperature of 85 degrees to 95 degrees.
5. Do not "chill" the person as they are susceptible to pulmonary infections. Warm water and air is required as well as drying the participant off quickly and putting on warm clothing.
6. Elementary back stroke most preferred. A flutter kick may be utilized with this stroke with flexion at the knee for ease in propulsion.
7. Remember, the intent of swimming is to assist in maintaining strength in unaffected muscle groups so as to prolong the persons ability to be independent and maintain ALD skills.

### Kyphosis:

1. Back crawl, elementary back stroke and breast stroke are most recommended as the goal is to stretch and strengthen upper back/shoulder area.

### Lordosis:

1. Scissor kick on both sides is recommended in an attempt to stretch the hips flexors and lumbar extensors.

NOTE: Diving is not recommended for persons with spinal curvatures due to the high impact it has on the spine

### **Amputee:**

#### Upper Extremity Complete Bilateral:

1. Focus on kick for propulsion. Scissor kick or whip kick preferred.

#### Upper Extremity Complete Unilateral:

1. Side stroke recommended with the non-functional arm down.

#### Lower Extremity Complete Bilateral:

1. Focus on arm action and glide portions of strokes.

#### Lower Extremity Complete Unilateral:

1. Requires stronger pull with opposite arm.
2. Flutter kick will assist with directional control.

#### **Additional tips:**

1. Partial amputees should utilize effected limbs as much as possible.
2. Watch for initial balance problems due to the effects of water buoyancy.

### **Spinal Curvatures:**

#### Scoliosis:

1. The side stroke is considered the best stroke to aid in correcting spinal deformity. The concave portion of his/her primary curve should be down in the water to maximize the stretching effect during the glide and propulsive phase of this stroke.
2. The back crawl is also recommended for persons with scoliosis

### **Visual Impairments:**

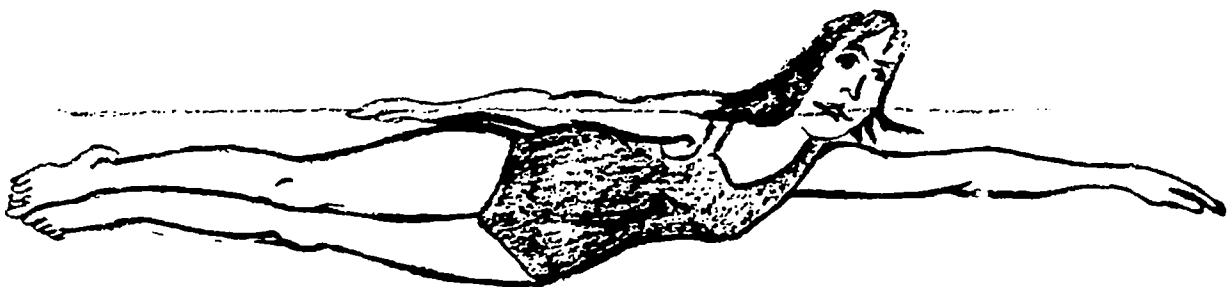
1. Utilize sighted guides or electronic auditory cueing aids.
2. Allow to "survey" the entire aquatic environment including locker room, deck, pool, etc. to assure familiarity with environment

### **Seizure Disorders:**

1. Lifeguard should be notified prior to participant entering the pool.
2. Do not over fatigue or over work.
3. Diving is contraindicated.
4. Avoid deep water swim.
5. Supervision in locker room important as seizure activity is likely to occur following activity or during activity cool down.
6. If seizure occurs while in the water someone should maintain the persons head above water and allow seizure to continue. It may also be necessary for 2 people to support the persons body under water. Following seizure the participant should be allowed to rest in warm, dry area and proper emergency procedures should be followed.

### **Arthritis:**

1. Work within limitations of range of motion.
2. Avoid exercising to point of fatigue.
3. Provide frequent rest periods.
4. Water temperature of 85 degrees to 95 degrees.



## AQUATIC GAMES TO BE ENJOYED BY FAMILY AND FRIENDS

Aquatic Baseball: Played the same as regular-baseball but in shallow water. Designate 4 corners of the pool as "bases" and/or home plate. Divide group into 2 teams. Position defensive players similar to regular baseball (baseman, outfielders, short stop, and someone positioned at "pitchers mound"). Offensive players establish a batting line up. There is no pitcher per se. Using a red playground ball, beach ball, etc. batters strike ball with their hand similar to volleyball serve. Points are scored for every run/swim in to home plate. Outs are scored by tagging the swimmer of base plate, catching a fly ball or when the batter hits the ball out of the pool area.

Keep It Up: All participants stand in a circle, shoulder to shoulder. A beach ball is thrown into the center of the circle. The ball is passed from participant to participant (in no order/sequence). The object is to keep the ball in the air as long as possible. My groups have a record all time high of `40' can your group beat that?

Shark and Fish: One person in the group of `fish' be selected to be the shark. The `shark' is "it" and positions him/her self in the center of the pool. The fish lineup against one side of the pool. When the shark calls "SHARK" to all the fish; the fish must swim/walk/run/etc. to the other side of the pool without getting tagged by the shark. Those participants who are tagged turn into sharks and may "tag" the other fish on the next play. Play continues until all "fish" are turned into sharks. (Also known as Pullaway, Neptune's Call, and Duck in the Pool).

Marco Polo: One person is designated as "it" and positions him/herself in the center of the pool. All other people are scatter themselves around the pool; boundaries may be designated prior to game play. The person that's `it' is blindfolded his/her job is to tag one of the other participants. To assist the person who's `it' in locating the other participants he/she calls out "Marco", other participants must immediately reply "Polo". Play continues until a person is tagged. The new person tagged becomes the new `it'.

Water Volleyball: Players divided into 2 equal groups. A net is hung between each group approximately 2 feet above the water surface. A beach ball may be used. Regular volleyball rules are used.

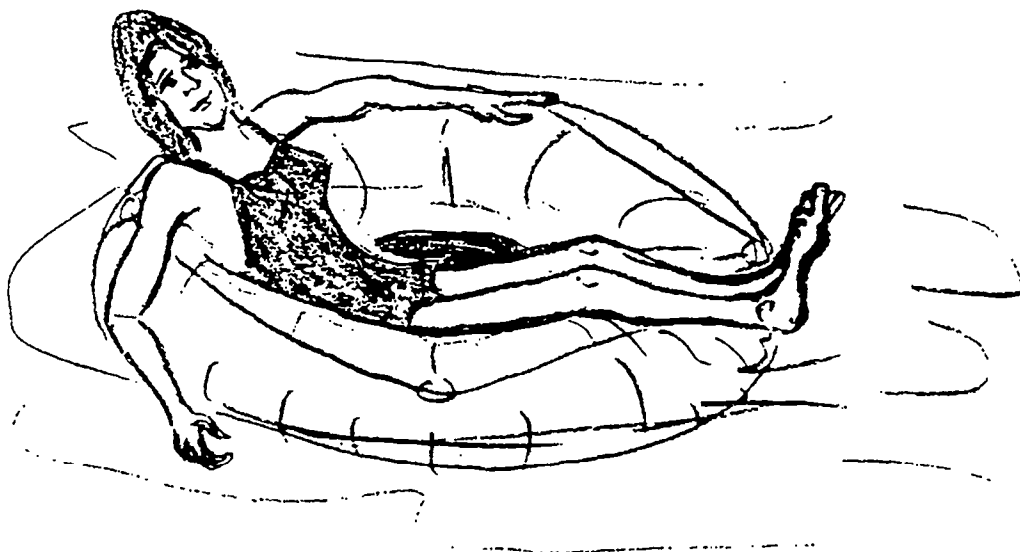
Under Cover: This is a modification of a tag game that's played in a restricted area. One person is `it' and tries to tag a second person who would be the new "it". To be safe from being tagged, the participants must be completely submerged.

Water Football: Participants divide into 2 equal teams. One team has the ball for 4 plays. They try to swim across/over the line of the other team making yardage. If one player can swim around and get into position for a pass, he does so and goes to the end of the pool for touchdown (TD). If a TD is made the game goes back to

the middle and the other team gets the ball. If a TD is not made, the play begins wherever they last ended. Each TD scored counts as 6 points.

Charlie Over The Water: Everyone has a colored pebble or small sinkable object. One person is chosen to be "Charlie" or "it" and he/she stands in the middle of the circle and says "Charlie over the water, Charlie over the sea, Charlie caught a black bird, but he can't catch me". On the first Charlie line ("Charlie over the water") everyone drops their pebble into the water, on the last Charlie line everyone goes under water opens their eyes, and picks up their pebble. Charlie attempts to tag a participant before he/she picks up his/her pebbles. The person tagged will be the next person "it".

Water Polo (modified): All participants must play in inner tubes or on some type of float. Participants divide into 2 teams. Goal lines/areas are designated (approximately 6'-8' long, centered at each end of the pool). Each team has one goal keeper, forward and guard. Game is played as the 'referee' throws the ball into the center of the pool and blows a whistle or says "play ball" each team swims for the ball (exception of the goalie). The team member that retrieves the ball carries or passes the ball to other team members. The object is to advance the ball towards the opponents goal and pass his goal line. Each goal scored is valued at 1 point, after each point the ball is put into play as in the beginning of the game. You can play in 4 quarters of 5 minutes each or until a designated number of points are scored.



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Catalog Resources:

Access to Recreation, 2509 E. Thousand Oaks Blvd., Suite 430, Thousand Oaks, CA 91362

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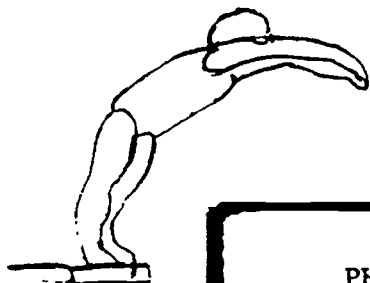
Flaghouse Inc., (Special Populations Catalog), 150 N. MacQuesten Pkwy., Mt. Vernon, NY 10550

Hydro-fit Incorporated, 440 Charnetion St., Eugene, Oregon 97401-2626

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APPLICATION FOR MEMBERSHIP  
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ORGANIZATION (if any) \_\_\_\_\_

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MY INTEREST IS :  PERSONAL  FAMILY MEMBER  PROFESSIONAL  
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Enclosed is my check made out to P.I.A.M.

Individual - \$10  Organization - \$25  Out of country (personal) - \$15  
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 Corporate donation \$ \_\_\_\_\_ (\$50 minimum donation)

**PLEASE RETURN THIS CARD WITH YOUR PAYMENT.** Send to:  
P.I.A.M., 601 W. Maple St., Lansing, MI 48906

**The Chair**  
--Steven Cole, Age 22.

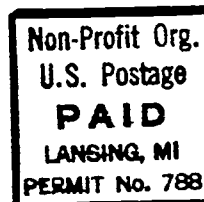
It stands like a sentinel always on standby  
Waiting endlessly to serve.  
The new light of day reveals its shining presence.  
Somehow it says that it will work continuously.  
It gives independence and freedom to its master.  
Like a butterfly when it emerges from a cocoon  
An extension of oneself  
That magnifies the senses.  
Certain feelings you get  
Like when you're rolling with nominal speed.  
Feel of the bearings in the pit of your stomach.  
Going round a corner without breaking stride.  
Even though inanimate, you sense a spirit.  
It's honored and proud to be there always.  
It sits silent but powerful  
Waiting to be called upon to perform.  
And yet when it sees it's been replaced  
Somehow it seems willing to let go.  
Without it there'd be nothing,  
But with it, it's almost normal.  
The speed, independence and comfort it gives!  
That special warmth of the wheelchair.



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