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ABSTRACT

This manual provides guidelines for aquatic teachers of people with disabilities. It is based on experience in teaching American Red Cross Adapted Aquatics and is to be used to complement and accompany the Red Cross Adapted Aquatics materials. Emphasis is placed on successful experiences in a positive, safe, reinforcing environment stressing individualized programs. Contents should be especially helpful to physical educators, special educators, recreation leaders, physical and occupational therapists, nurses, and aquatic professionals. An extensive bibliography of films, books, journal articles, curriculum guides, and programs in adapted aquatics is appended. (JD)

UNIVERSITY OF RHODE ISLAND

ADAPTED AQUATICS PROGRAM MANUAL

SECOND EDITION

COLLEGE OF HUMAN SCIENCE AND SERVICES

DEPARTMENT OF PHYSICAL EDUCATION, HEALTH AND RECREATION

UNIVERSITY OF RHODE ISLAND

ADAPTED AQUATICS PROGRAM MANUAL

SECOND EDITION

By

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Project Director: Lorraine E. Bloomquist, Ed.D.

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INTRODUCTION

This Aquatics Manual provides guidelines for aquatic teachers of people with disabilities. It is based on fifteen years experience of teaching American Red Cross Adapted Aquatics and conducting a class for children with disabilities for the last nine years. Basically, it is to be used to complement and accompany the American Red Cross Adapted Aquatics materials which has been taught at the University level.

Used with professional knowledge and personal judgement it is designed to provide additional specific information such as biomechanics of swimming as well as teaching hints for people with cerebral palsy, paraplegics and senior citizens.

PHILOSOPHY

Objectives of the Aquatic Manual are basically the same as any swimming course. We want to teach people with disabilities to swim, to be comfortable, safe and independent in the water and have an enjoyable experience.

Emphasis is placed on successful experiences in a positive, safe, reinforcing environment stressing individualized programs.

Positive values of swimming for all learners include physiological, sociological and psychological. However, the buoyancy of the water gives positive support which is especially advantageous for those physically disabled. Basically, the only difference is the approach and specific adaptations for the swimmer with a disability.

PREREQUISITES AND SCOPE OF THE MANUAL

The manual is written for individuals who are interested in planning and implementing a swim program for people with disabilities. Before such a program can be conducted it is important that the reader should have:

1. experience in teaching swimming.
2. certification in American Red Cross as a Water Safety Instructor.

Contents should be especially helpful to the following people: physical educators, special educators, recreation leaders, recreation therapists, physical therapists, occupational therapists, nurses and aquatic professionals.

Information presented does not replace the American Red Cross material but is to be used with it. Ultimately, the goal is for the learner to be certified in Adapted Aquatics when all requisites are met. Contact your local Red Cross for enrollment in the program. Materials are listed in the Bibliography and Course Syllabus.

ADAPTED AQUATICS COURSE

University of Rhode Island
Department of Physical Education, Health and Recreation
Professor Lorraine E. Bloomquist, Ed.D.

Title of Course: Adapted Aquatics
PED 430
3 Credits

I. Course Description:

Planning, administering, teaching adapted aquatics. Students learn and apply specific theory and methods of teaching swimming to the handicapped. American Red Cross certificate in Adapted Aquatics possible. (Pre: Water Safety Instruction certificate or comparable skill as determined by the instructor.) Lec. 2, Lab 2.

II. Course Requirements:

A. Texts:

American National Red Cross (1985). Instructor Candidate's Manual for the Introduction to Health Services Education (IHSE) American National Red Cross, 17th and D Streets, NW, Washington, D.C.

American National Red Cross (1977). Adapted Aquatics. Swimming for Persons with Physical or Mental Impairments. American National Red Cross, 17th and D Streets, NW, Washington, D.C.

Methods in Adapted Aquatics: A Manual for the Instructor (1977). American National Red Cross, 17th and D Streets, NW, Washington, D.C.

Swimming for the Handicapped. A Manual for the Aide (1977). American National Red Cross, 17th and D Streets, NW, Washington, D.C.

American National Red Cross (1981). Swimming and Aquatics Safety. American National Red Cross, 17th and D Street, NW, Washington, D.C.

B. Closed Reserve Texts:

Lawrence, C. and Hackett, L. Water Learning, A New Adventure (1975). Peek Publications, Palo Alto, C.A.

Campion, M.R. Hydrotherapy in Pediatrics (1986). An Aspen Publication, Rockville, M.D.

C. Class meetings: Lecture: 2 hours each week
Laboratory: 2 hours each week
Total hours: 60 hours

D. Facilities: Classroom, swimming pools.

E. Maximum enrollment: 20 students

III. COURSE OBJECTIVES:

At the conclusion of the course, the student will:

A. Demonstrate knowledge of the physical and psychological advantages of swimming programs for the handicapped.

B. Demonstrate knowledge of the need for adapted programs for special populations.

C. Demonstrate knowledge of the specific methods of teaching aquatics to the following populations: mentally retarded, behavioral disordered, learning disabled, orthopedic, neurological, sensory and multiply handicapped. Adapting to the aged person will also be considered.

D. Demonstrate knowledge of planning, conducting, teaching and evaluating adapted aquatic programs.

E. Demonstrate knowledge of the methods and techniques of mainstreaming in adapted aquatics, including making facilities available to all people.

F. Demonstrate knowledge of behavior modification techniques in adapted aquatics.

G. Demonstrate knowledge of movement exploration and perceptual motor techniques in adapted aquatics.

H. Demonstrate knowledge of proper use of adapted aquatics in equipment, boating and artificial respiration techniques.

I. Demonstrate knowledge of various methods of planning and conducting an aquatic Individual Educational Plan (IEP) according to the type of handicap involved.

J. Demonstrate ability to work effectively with handicapped people.

IV. COURSE CONTENT AND LEARNING ACTIVITIES

A. Introduction to course. Discussion and determination of course objectives.

B. Historical overview of current status of aquatic programs for the handicapped.

C. Introduction to the physical and psychological needs of the various types of handicapped people.

D. Review of physics relating to aquatic exercise and swimming.

E. Methods of planning, conducting, teaching and evaluating an adapted aquatic program.

F. Laboratory experiences with simulated handicaps of orthopedic, sensory and multi-handicapped people.

G. Laboratory experiences with visiting special guests.

H. A program will be planned and conducted with a handicapped population.

I. Individual write-up of an Individual Educational Program on a selected person.

J. Lectures from visiting specialists in the adapted aquatic field.

K. Films appropriate to the adapted program and special populations.

L. Class discussions of current readings in the literature in adapted aquatics.

V. COURSE PROJECTS

Student responsibility will be:

A. to choose one type of special needs population and present a class experience including the following: mimeographed handout for the class which includes etiology, brief references, incidence, special psychological or physical problems, teaching techniques in adapted aquatics.

B. to review and critique for class discussion, four adapted aquatic articles.

C. to prepare a typed summary of one field experience with one handicapped person.

D. to develop one individual educational plan (IEP) for a chosen person in the area of adapted aquatics.

VI. EVALUATION

Upon course completion, students will demonstrate knowledge of planning, conducting, teaching and evaluating adapted aquatic programs for a diverse group of special needs populations.

Evaluation Criteria:	Units
Class presentation, theory and practical laboratory experience	1.0
Individual education program write-up	0.5
Review and critique of four periodical articles	0.5
Written term paper of selected special person	1.0
Final written examination	1.0
Total Units:	4.0

VII. RESOURCES

Films and Slides:
Introduction to Health Services Education. (Stock No. 321829) American National Red Cross, 17th and D Streets, N.W. Washington, DC, 20006.

Focus on Ability. American National Red Cross General Supply Office, 17th and D Streets, N.W. Washington, DC, 20006, 1977.

Break The Barrier. American National Red Cross General Supply Office, 17th and D Streets, N.W. Washington, DC, 20006, 1980.

Lifts and Transfers. American National Red Cross General Supply Office, 17th and D Streets, N.W. Washington, DC, 20006, 1977.

The Hidden Handicap. Mc-Graw Hill publishers.

Videotapes:
Adapted Aquatics I. L.E. Bloomquist, Department of Physical Education, Health and Recreation, U.R.I.

Adapted Aquatics II. Use of Equipment. L.E. Bloomquist, Department of Physical Education, Health and Recreation, U.R.I.

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Blackman, G. J. and Silverman, A. (1971). Modification of child behavior, Belmont, CA, Wadsworth Publications.

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Canadian Association for Retarded Children (1969). Swimming programm for the trainable retarded, Toronto, Canada: 186 Beverly.

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University of Rhode Island
PED 430 Adapted Aquatics
Department of Physical Education, Health and Recreation
Professor Lorraine E. Bloomquist, Ed.D.
Course Syllabus

Text: Adapted Aquatics
Manual: Methods In Adapted Aquatics: A Manual for the Instructor
IHSE: Introduction to Health Services Education

Class	Topic	Assignment
1	Introduction, orientation, course objectives and requirement. Slide presentation and lecture. Introduction to IHSE, ARC.	Chapters 1,2,text; Make a PFD IHSE Section I-IV
2	Lecture: History of water for therapy, physics of floating and swimming; Film: Focus on Ability, pool activity: use of PFD's, positioning in water, review pre-beginner skills, manual (p. 43), review tests for classification, assign projects for presentation.	Chapters 3-7,text; Section I,II, Manual Plan 2 games with pre-beginner skill
3	Video tapes URI program, Adapted Aquatics I, II, update on teaching aquatic skills, pool activity: assess games for pre-beginners, water preparation techniques, plan class presentations, IHSE, teaching methods, aids and evaluations.	Chapters 8,9,11, text, p. 39 manual, "Lifts and transfers", plan 2 games of academic reinforcement; IHSE V-VIII
4	Preparation of Individual Education Program (IEP), two typed, critiques of articles due in class for presentation and discussion, Film: Lifts and Transfers, handicapped children are assigned to teachers, pool activity: practice lifts, present games of academic reinforcement.	Section III, IV Manual 2 articles and critiques due

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Class	Topic		Assignment
5	3:30	Review of games, planning of IEP	Section V Manual, Plan IEP's, 2, Students plan games
	4:00	Pool activity: Children are oriented and tested for classification; games at beginning and end of session.	
	5:00	Class reviews tests results and determine individual goals for each child. Assess games. Games for next class assignment by assistant. Plan class presentations.	
6	3:30	Review games and skill to be taught. Submit IEP on assigned child to Dr. Bloomquist.	Review Chapter 8 Write brief summary on experience with children
	4:00	Swim Class	
	5:00	Assess games and class. Plan class presentations.	
7	3:30	Review games and skills, submit summary of previous class to assistant.	Chapter 10,12 text, Write summary of experience
	4:00	Swim Class	
	5:00	Assess games and critique class, class presentations, Movement exploration.	
8	3:30	Review games and skill, submit summary to assistant.	Chapter 13,14 text, Write summary of experience
	4:00	Swim Class	
	5:00	Assess games and critique class, guest: Dr. Diane Seleen, Aquatics for the Elderly	
9	3:30	Review games and skills, submit summary of previous class.	2 Critiques of articles due
	4:00	Swim Class	
	5:00	Assess games and critique class, class presentation: orthopedic conditions and cerebral palsy.	

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Class	Topic		Assignment
10	3:30	Review games and skills; submit two types, critiques of articles in class	Summary of experiences
	4:00	Swim Class	
	5:00	Assess games and critique class, class presentation: learning disabled, mentally retarded.	
11	3:30	Review games and skills, submit summary of previous class.	Summary of experiences
	4:00	Swim Class	
	5:00	Assess games and critique class, class presentations: visually impaired.	
12	3:30	Review games and tests, submit summary of previous class	A Manual for the Aide, American Red Cross
	4:00	Swim Class, start testing	
	5:00	Assess games and critique tests Discussion: Role of Aide	
13	3:30	Review games and testing; all summaries are returned	Review Chapter 14
	4:00	Swim Class, final testing, canoeing, present cards to children	
	5:00	Class presentation: hearing impaired.	
14	Review artificial respiration, cooperative games in water, typed papers of field experience due, evaluation forms distributed and completed.		
15	Authorization cards completed: Summary and review of course.		
16	Final Exams (2)		

CONTENT OF TEN WEEK ADAPTED SWIM PROGRAM

Before the program begins, swimmers are instructed in the pool safety rules. A copy will be given to the parents. During the first and second class, swimmers will be classified into the appropriate level in order to learn skills which are specified in the course. Tests are included in the Manual for Pre-beginner (American Red Cross), spina bifida and cerebral palsy learners. Skills to be learned and tests for each swimming course in the American Red Cross program are found in the text: Swimming and Aquatic Safety, (American Red Cross, 1981, pp. 133-143).

Each class starts with some warm-ups and concludes with a group game. If the ages are diverse and there are enough swimmers, two games appropriate for the age level may be conducted.

During one class, all learners will have a session in learning basic rescue, personal safety skills and artificial respiration.

Emergency evacuation drills should be held every three or four weeks to prepare learners and teachers alike for such an event.

Teachers should follow a prescribed course and check off on a posted skills chart, the skills which were learned during the session for positive reinforcement. A star may be placed on the chart in order to identify the skill which was completed.

At holiday times, children may want to dress for a parade (Easter, Halloween) and have games appropriate to the specific celebration.

Part of one swimming session may be devoted to canoeing with life jackets on as teachers or learners paddle.

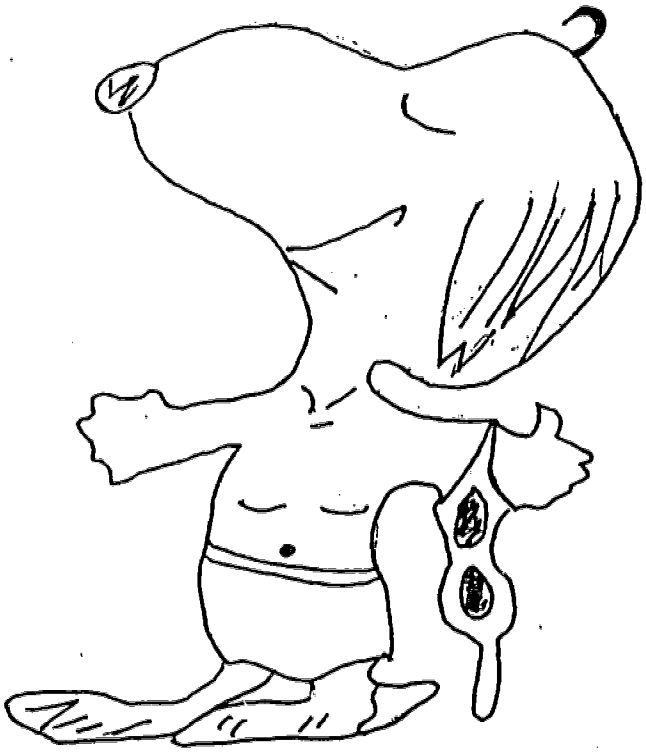
During the last two classes, teachers should conduct the test needed to complete the course. If the swimmer does not complete the skills needed to earn a course card (Beginner - Advanced Swimmer), he/she will be presented with an Adapted Aquatic Card obtained from the American Red Cross on the last day of the program. Where time permits, the last class may have some recreation, games, pictures or slides of the swimmers and presentation of awards with parents present.

Courtesy of the American Red Cross

MODIFIED AMERICAN RED CROSS ADAPTED AQUATICS SUGGESTED SKILL BREAKDOWN BELOW BEGINNER LEVEL

URI Pre-Beginner Program

1. Enter pool with assistance
2. Leave pool with assistance
3. Bob to chin level with assistance
4. Bob to chin level with assistance
5. Blow Bubbles
6. Assume prone position with assistance
7. Back float with assistance
8. Kick legs when towed by instructor
9. Use of innertube or Personal Flotation Device (PFD) w/assistance
10. use of innertube or PFD without assistance.
11. Play catch with instructor



Adapted Beginner Skills

1. Enter pool w/assistance
2. Leave pool w/assistance
3. Put face in water
4. Blow bubbles at chin level
5. Blow bubbles w/face in the water
6. Bob in water to chin level w/assistance
7. Bob in water to nose level w/assistance
8. Bob in water to top of head w/assistance
9. Walk length of table w/assistance
10. Walk length of table unassisted
11. Pick up ring on bottom with feet
12. Move arms using humar. stroke w/assistance
13. Kick legs while instructor tows
14. prone float assisted
15. back float assisted
16. prone float unassisted
17. back float unassisted
18. kick w/board
19. Use of PFD
20. Human stroke w/assistance
21. Sculling on back with assistance
22. kicking on back with assistance
23. combined stroke on back with assistance

Courtesy of the American Red Cross

URI ADAPTED AQUATICS PROGRAMS

AMERICAN RED CROSS SWIMMING PROGRESSIONS

Recommended Skill Progression

Beginner Skills

1. Breath-holding, 10 sec.
2. Rhythmic breathing, 10 times
3. Prone float
4. Prone glide, 10 ft.
5. Back float
6. Back glide, 6 ft.
7. Prone glide w/kick, 20 ft.
8. Back glide w/kick, 20 ft.
9. Arm stroke, 20 ft.
10. Finning or sculling, 20 ft.
11. Crawl stroke, 20 yd.
12. Combined stroke (back), 10 yd.
13. Changing direction
14. Turning over
15. Leveling off
16. Jump (chest-deep water)
17. Jump (deep water)
18. Front dive
19. Safety skills
20. Combined skills

dvanced Beginner Skills

- Rhythmic breathing
- Survival floating, 2 min.
- Treading water, 30 sec., changing positions
- Elementary backstroke, 25 yd.
- Crawl stroke, 25 yd.
- Diving and underwater swimming, 15 ft.
- Use of PFD
- Safety and rescue
- First combined skills
-). Second combined skills

Intermediate Skills

1. Scissors kick, 20 yd.
2. Crawl kick, 20 yd.
3. Breaststroke kick, 20 yd.
4. Sidestroke arms, 10 yd.
5. Crawl stroke arms, 10 yd.
6. Breaststroke arms, 10 yd.
7. Elementary backstroke arms, 10 yd.
8. Elementary backstroke, 50 yd.
9. Selected stroke, 100 yd.
10. Turn on front
11. Turn on back
12. Survival floating, 5 min.
13. Sculling, 10 yd.
14. Treading water, 1 min.
15. Floating, 1 min.
16. Underwater swimming, 15 ft.
17. Standing front dive
18. Rescue skills
19. 5-minute swim

Courtesy of the American Red Cross

Swimmer Skills
1. Breaststroke, 100 yd.
2. Sidestroke, 100 yd.
3. Crawl stroke, 100 yd.
4. Back crawl, 50 yd.
5. Swimming on back (legs only), 50 yd.
6. Front turn
7. Back turn
8. Side turn
9. Surface dive, underwater swimming 20 ft.
10. Disrobing, floating with clothes, 5 min.
11. Long shallow dive
12. Running front dive
13. 10-minute swim

Basic Survival Skills
1. Breath control, rhythmic breathing
2. Survival floating, 2 min.
3. Human stroke, 40 yd.
4. Elementary backstroke, 40 yd.
5. Feetfirst surface dive
6. Underwater swimming
7. Jumping and remaining afloat
8. Lifesaving skills
9. Use of improvised flotation devices
10. Artificial respiration
11. First combined test
12. Second combined test

Basic Water Safety
1. Extension assists
2. Throwing assists
3. Wading assists
4. Swimming assists by the novice
5. Ice rescue
6. Personal flotation device
7. Care of victims with neck and back injuries
8. Boat safety: boarding and debarking
9. Boat safety: capsize procedure
10. Artificial respiration
11. Supplementary care
12. ABC's of family water safety

Advanced Swimmer Skills
(Prerequisite: Basic Rescue or Advanced Lifesaving)
1. Elementary backstroke, 100 yd.
2. Breaststroke, 100 yd.
3. Inverted breaststroke, 50 yd.
4. Sidestroke, 100 yd.
5. Overarm sidestroke, 100 yd.
6. Trudgen crawl or Trudgen, 100 yd.
7. Back crawl, 100 yd.
8. Crawl stroke, 100 yd.
9. 5-minute float
10. Survival float clothed, 10 min.
11. Surface dive feet first, underwater swimming, 10 yd.
12. Running front dive
13. 30-minute swim

Advanced Survival Skills
1. Sidestroke, 100 yd.
2. Breaststroke, 100 yd.
3. Crawl stroke, 100 yd.
4. Elementary backstroke, 100 yd.
5. Breaststroke modifications
6. Sidestroke modifications
7. Jumping and remain afloat, 10 min.
8. Use of improvised flotation devices
9. Lifesaving skills
10. Artificial respiration
11. First combined test
12. Second combined test

Basic Rescue
1. Cramp emergencies
2. Current emergencies
3. Undertows, runouts, rip currents emergencies
4. Weed emergencies
5. Disrobing in the water
6. Use of clothing for flotation
7. Survival floating
8. Swimming skills for basic rescue
9. Search and rescue surface dives
10. Search and rescue underwater swimming
11. Search and rescue use of mask, fins and snorkel
12. Search and rescue for skin diving
13. Search procedure for recovery of submerged victims
14. Search patterns for recovery of submerged victims
15. Approach to submerged victim
16. Towing the unconscious victim

University of Rhode Island Adapted Aquatics
Evaluation of Spina Bifida Swimmers

Child: _____

A. Getting into the water:									
1. Sits at edge of pool.									
2. Gets into pool with assistance.									
3. Gets in with verbal encouragement.									
4. Gets in when asked once or twice.									
5. Gets in without hesitation.									
B. Gaining confidence with floaties:									
1. Holds onto bar w/therapist closeby.									
2. Holds onto bar alone.									
3. Walks hands on bar around pool.									
4. Kicks legs (prone), adult holding shoulders.									
5. Lets go of one adult to move to another.									
6. Moves from adult to bar at 3 feet.									
7. Unaided in water for 30 seconds.									
8. Unaided in water for 3 minutes.									
C. Face and head in water:									
1. Splashes own face with water.									
2. Puts chin and mouth in water.									
3. Blows bubbles into water.									
4. Submerges eyes and forehead.									
5. Keeps face in water for entire breath.									
6. Floats prone, face in water.									
7. Puts head under water (without holding nose).									
D. Gaining confidence without floaties:									
1. Floats unaided but for floaties.									
2. Swims with floaties (attempts breathing).									
3. Floats without floaties supported by adult.									
4. Floats holding bar, without other support.									
5. Is drawn through water by adult.									
6. Swims with adult support 6 ft.									
7. Swims without support 6 ft.									
8. Swims width of pool, adult support 25%.									
9. Swims width of pool, no support.									

PROGRESS CHART
UNITED CEREBRAL PALSY
U.C.P. Adapted Aquatics Program

NAME _____ AGE _____

DIAGNOSIS _____ MOVEMENTS DESIRED _____

_____ MOVEMENTS DISCOURAGED _____

INSTRUCTOR _____ DATE _____

****

PROGRESS SCALE: 0 - no performance 1 - performance with instructor
2 - performance with P.F.D. 3 - performance independently

Skill Areas Pre-test

Stimulation					
Sensory stimulation & reaction (accepts H_2O)					
Reacts to Water					
Range of motion (arms, legs, neck, wrist, ankles, toes, fingers)					
Relaxation Exercises (tension reduction) (feels at ease)					
Free Movement Exploration (participates in play, toys, etc.)					

COMMENTS					
Self-Help					
Undresses					
Puts on suit					
Toilets self					
Dries self					
Dresses after swim					
Comments					
Water Adjustment					
Enters Pool Area					
Approaches Pool					
Sits on Edge					
Enters Water					
Holds side of Pool					
Stands in Water					
Walks in Water					
Comments					
Breath Control					
Wets Face					
Wets Head					

Submerges Chin					
Submerges Mouth					
(momentary) Total submerge					
Hold breath and submerge					
Pick up from bottom (shallow)					
Pick up from bottom (deep)					
Bobbing					
Rhythmic breathing					
Comments					
Pre-swim skills					
Prone float (head out)					
Prone float (head in)					
Prone tow					
Supine float					
Supine tow					
Kick in prone (whip, flutter, dolphin, etc.)					
Kick in supine					
Use kickboard					
Armstroke (1 arm)					
Armstroke (both arms)					

Finning					
Prone glide					
Prone glide & recover					
Back glide					
Back glide & recover					
Prone float & recover					
Back float & recover					
Turn Over					
Combined strokes					
Human stroke					
Combined back (finning)					
Crawl					
Breast stroke					
Elementary back stroke					
Back stroke					
Side stroke					
Butterfly					
Comments					
Jumps & Dives					
Jump to shallow					
Jump to deep					
Dive-seated					

RELAXATION

Every swimming session should contain some segment in relaxation techniques. One specific, successful method of relaxation is presented in detail. However, other methods may prove to be more appropriate for the individual depending upon the age and type of disability. The following approaches are offered as alternatives or supplements:

1. Manual massage of muscles. Slow, static, or passive stretch of each body part may be performed.

2. Never tell the swimmer to "relax". An awareness of the tenseness may increase the body rigidity. Trying hard to relax may be counterproductive.

3. Laughter is a good relaxer. Try light, reasonable tickling or humor.

4. Rhythmic, repetitive, pendular movements such as slowly swinging body parts or the whole trunk lowers tension.

5. Yoga exercise and Tai Chi are slow stretching type activities which some may enjoy.

6. Playing blowing games with balloons or table tennis balls across the water. This increases the range of diaphragm activity.

7. Play blowing games with toys starting with easy to use ones. For example, use a large whistle, flute or recorder, party horn, harmonica and party blowers. These can precede breathing exercises. Rhythmic bobbing done slowly can also increase relaxation once the technique is mastered.

8. Slow, controlled breathing exercises or diaphragmatic breathing may help.

9. Some learners are receptive to mental imagery such as picturing melting in the sun, rag dolls, snowflakes, jello, etc.

10. Jacobson's techniques consists of progressive, conscious neuro-muscular relaxation. Specific muscles are contracted deliberately while others are consciously relaxed. The objective is to learn to recognize tension and remove it.

11. Warm water relaxes the body. However, if it is too warm (over 93°F) swimmers become enervated, exhausted and lethargic. Muscles controlling anus and urinary sphincter may be relaxed and accidently release waste into the water.

12. When in the water, slow rhythmic, swinging, swaying, rocking and rolling may decrease tension. One could start rolling from side to side while the learner is lying supine.

13. Soothing music may help perform the movements as well as be used during movement exploration activities designed to slow down and relax the swimmers.

14. Relaxation can only occur when people feel secure and acquire confidence and trust in the instructor. Time for this to be attained will vary.

For a more complete description of these methods, refer to Sherrill (1986 pp. 345-351). Teachers should realize that some swimmers may never completely relax as it is an individual skill. However, we should try to decrease the tension and spasticity to make swimming easier to learn, more efficient and enjoyable.

Reference

1. J.R. Cautela and J. Groden. (1978) Relaxation. A comprehensive manual for adults, children and children with special needs. Champaign, IL, Research Press Company.

RELAXATION TECHNIQUES

by
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EQUIPMENT: Darkened room, rolled towel, rolled carpet square, carpeted floor, gym mat, pillow, bolster, various sizes of foam rubber pads.

DEFINITION:

Hook-lying:	Lying on back with legs flexed at a 45 degree angle.
Prone:	Lying on abdomen.
Rotate:	Move a portion of the body in a circular motion.
Semi-supine:	Lying on back with upper trunk elevated.
Stretch-release:	To extend a body part to induce relaxation with a specific muscle group upon release.
Supine:	Back lying position.
Support:	Use of rolled towel, rolled carpet square, foam pad or pillow to elevate and support a specific body part.
Vibrate:	Gentle shaking of an area or portion of the body.

GUIDELINES:

(1) Proceed in a cephalo-caudal (head to toe) and proximal-distal (midline outward) manner or begin at most obvious center of tension.
(2) Room should be darkened and free from distraction.
(3) Students are passive and facilitative during the actual relaxation.
(4) Understand that not all procedures are appropriate for each individual child. Always check for contraindications and successful past experience to become aware of most appropriate relaxation techniques.

TECHNIQUES

(1) FACIAL RELAXATION

Objective: To relax muscles of the face.

Equipment and position: Student semi-supine, Hook-lying with head on instructor's lap; use carpeted floor or mat.

Method:
(a) Place palm of each hand on cheek and rotate for one minute.
(b) Place thumb at base of nose firmly stroke to corner of mouth three times.
(c) Place fingers on forehead and gently stroke from midline to temple five times.

(2) NECK RELAXATION

OBJECTIVE: To relax muscles of the neck.

Equipment and Position: Student semmi-supine, hook-lying with head on instructor's lap; use carpeted floor or mat.

Method:
(a) Firmly massage muscles of neck using rotation for one minute.
(b) Cradle the child's head by placing your hands at the base of the skull, gently extend the head away from the shoulders and move from side to side in a rotating motion for one minute.
(c) With hands as in position (b), turn head from left to right (Chin to left shoulder - chin chin to right shoulder - chin chest). Repeat two times.
(d) Using above position, vibrate head in various positions for one minute.

(3) SHOULDER RELAXATION

Objective: To relax upper arm and shoulder girdle.

Equipment and Position: Student supine on carpeted floor or mat, support under lower back.

Method:
(a) Place one hand under shoulder and one hand over shoulder, rotate and vibrate for one minute, complete each side left and right.
(b) Place heels of hands on top of shoulders, push toward waistline and return to normal position. Repeat five times.

(4) HEAD AND BACK EXTENSION

Objective: Strengthen upper back.

Equipment and Position: Student prone, chest support with hands under forehead.

Method:
(a) Stroke length of back to have child raise head and support self with arms.
(b) Watch for head drop once it has reached the extended position.
(c) Count to three.
(d) Repeat five times.

(5) ARM CROSSING

Objective: Relaxation of arm muscles and shoulder girdle.

Equipment and Position: Supine with support of lower back and neck.

Method:
(a) Grasp each arm gently at the wrist.
(b) Cross over chest slowly, watch for tension which may dislocate shoulder.
(c) Watch for exhalation, then return arms to full extension at sides.
(d) Repeat five times.

(6) ABDOMINAL RELAXATION

Objective: Relax abdominal musculature.

Equipment and Position: Carpeted floor or mat, student supine, support of lower back and under knees.

Method:
(a) Trace on abdomen a series of straight lines right to left from ont to two inches below navel to rib cage. proceed from low to high.
(b) After each stroke, wait for exhalation or relaxation.
(c) Do complete abdomen three times.

(7) RELAX UPPER THIGH

Objective: Relax upper thigh

Equipment and Position: Child supine with lower back and knees supported on carpeted floor or mat.

Method:
(a) Place one supporting hand under knee.
(b) Grasp over ankle and gently grip achilles tendon.
(c) Draw leg toward head in flexed position with heels no more than three inches off floor or mat until tension exists - count to three - release slowly.
(d) Repeat five times.
(e) Repeat above procedure with opposite leg.

(8) OUTWARD THIGH ROTATION

Objective: Relax hip Region

Equipment and Position: Supine on mat or carpeted floor. Support of lower back with log or rolled towel under knees.

Method:
(a) Gently grasp under knee and over thigh.
(b) Forcibly rotate upper thigh outward until tension exists inside thigh - count to three - release slowly.
(c) Repeat five times.
(d) Repeat above procedure with opposite leg.

(9) INWARD THIGH ROTATION

Objective: Relax deep inner thigh.

Equipment and Position: Carpeted floor or mat, support of lower back with rolled towel or log under knee.

Method:
(a) Grasp over knee and under thigh.
(b) Forcibly rotate upper thigh inward until tension exists - release slowly.
(c) Repeat five times.
(d) Repeat same procedure with opposite leg.

(10) PLANTARFLEXION OF FEET/ANKLE

Objective: To relax muscles of lower shin and ankle.

Equipment and Position: Carpeted floor or mat. Rolled towel or log under knee.

Method:
(a) Place one hand under heel of foot. Place other hand over foot and over toes.
(b) Plantarflex muscle of toes and shin toward the feet to tightness - count to three - relax slowly.
(c) Repeat five times.
(d) Repeat above procedures with opposite foot.

(11) DORSIFLEXION OF FEET/ANKLE

Objective: To relax muscles of lower calf and ankle.

Equipment and Position: Carpeted floor or mat, log or rolled towel under knees.

Method:
(a) Place one hand in ankle-supporting position. Place heel of other hand over balls of feet.
(b) Curl toes and ankle toward the head - stretch calf - count to three - and allow to go limp slowly.
(c) Repeat five times.
(d) Repeat above procedure with opposite foot.

PROGRAM DIRECTOR'S RESPONSIBILITIES

The Program Director is responsible for organizing and directing the Aquatics program. These duties are divided into pre-program, during the program and post-program assignments.

Pre-Program:

1. Contact parents by mail and accept applications, medical and release forms.
2. Assign children to the appropriate instructors after consultation with them.
3. Organize and bring equipment to the swimming area. (See equipment section.)
4. Place table and stairs in water and mats at the edge.
5. Post children's swim charts and safety regulations.
6. Assign one instructor to elevator with keys.
7. Assign lifeguard with a whistle to a station. Tell lifeguard of any special needs such as seizure prone swimmers.
8. Make sure that emergency telephone numbers are available by the telephone.
9. Check on availability of first aid kit.
10. Review game with the teacher who has been assigned and others.

Duties during the program:

1. As children arrive, make sure that all the teachers meet with them immediately.
2. Oversee warmup period.
3. Oversee the lifeguard.
4. Observe the teachers lessons and assist briefly when necessary.
5. Keep track of the time and supervise final game period.
6. Call for emergency evacuation procedures intermittently during the program. (Once every two or three weeks.)
7. Remind teachers to star or check off children's chart at the end of the session.

Post program duties:

1. Make sure the children have assistance to and in the locker room if necessary. (Parent should be with child in the locker room.)
2. Return all equipment, mats, table, stairs, etc. to the storage area.
3. One instructor takes children up the elevator.
4. Assign games' leader for the next swimming session.
5. Meet with teachers to critique their lessons and games.
6. Before locking the pool and returning the keys, scan the bottom of each pool to make sure that it is empty.
7. If an accident has occurred, fill out an accident report, make a copy for yourself and submit it to the program administrator.

TEACHER RESPONSIBILITIES

1. Learn lifting techniques using legs to prevent back injury or dropping swimmer.

2. Review the medical form and learn more of the type of disability of the student to see if special needs are required.

3. If swimmer is seizure prone be prepared and alert for signs of a seizure.

4. Learn relaxation techniques especially effective with the person you teach.

5. Watch swimmer for labored breathing, pale or distressed look in the face, fatigue, eyes not focused, or change in behavior.

6. If there is evidence of breathing difficulty, lift swimmer so chest is out of water making breathing easier.

7. Stay with swimmer at all times. If more equipment is needed, ask for help.

8. Learn reflex action posibilities of your swimmer so you can deal appropriately with it when it occurs. Or, try to prevent it.

9. Learn to adapt the skill to the capabilities of the swimmer.

10. Find out first what the swimmer <u>can</u> do and go from there.

11. When swimming with a seizure person in deep water, use a kickboard for yourself in case it is needed for support.

12. On slippery surfaces, spot or assist any learner who has balance or ambulation problems. Place hand under armpit where there is more control of the trunk.

13. If swimmer is heavy, do not lift across the deck. Use wheelchair to transport to the water.

14. Swimmers without leg control should enter the water head first from side of pool or board.

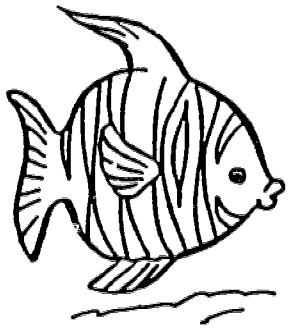
15. Keep visual contact with the learner at all times.

16. Have a towel ready to wrap around the swimmer immediately after swimming to prevent chilling.

17. Be aware that floating devices which are inflatable can also be deflated. Watch air mattresses, arm floats, inner tubes or balls.

LIFEGUARD RESPONSIBILITIES

1. Wear a whistle and swim suit. Be ready to swim.
2. Keep alert and observant.
3. Scan the pool constantly; check under the board, in the corners, under stairs and table.
4. Have a signal system ready and teach it to the instructors and swimmers.
5. Practice emergency water evacuation procedures.
6. Observe which swimmers are identified as seizure prone.
7. Keep conversation with others to a minimum.
8. Listen selectively for sounds of distress or help.
9. Make sure diving area is clear before swimmers dive.
10. Control behavior. Make sure people walk on deck.
11. Before locking pool, scan bottom of water.



UNIVERSITY OF RHODE ISLAND POOL RULES

1. Dive only in the diving or competitive racing pools.
2. Walk around the deck.
3. One person on the diving board at a time.
4. A lifeguard will be on duty at each pool being used.
5. Keep food and drinks outside the pool area.

SWIMMING PROGRAM RULES

1. Every swimmer requires a medical form signed by a physician before entering the pool.
2. Every swimmer requires a release form signed by a parent or guardian before entering the pool.
3. Swimmers with colds, fever, infections, open sores, dizziness or who act listless should not be in the water.
4. Swimmers should use the toilet before entering the pool area.
5. Incontinent swimmers should use the toilet first and wear protective underpants under the swim suit.
6. Enter water only with an instructor.
7. Dangling jewelry should be removed before entering the water.
8. Swimmers who are subject to seizures may be requested to wear identifying wrist bands, tags of colored caps especially during recreation.
9. Unless the swimmer needs help, parents should observe from the upper level stands.

WHISTLE SYSTEM AND EMERGENCY PROCEDURE

1. One whistle blast: stop and listen.
2. One long whistle blast: all out of the water.
3. Three short whistle blasts: emergency evacuation procedure.

   A. All out of the water.
   B. Swimmers stay with instructors.
   C. Lifeguard conducts rescue.
   D. Assigned person gets first aid equipment if needed.
   E. Assigned person telephones for medical assistance if needed.
   F. Telephones must be available with numbers posted.
   G. Family of swimmer should be notified.
   H. Accident report will be made to administrator of program.

SAFETY PRECAUTIONS

1. Keep all glass and metal objects away from the swimming area.

2. Mats, wheelchairs, blankets, towels, rescue equipment, first aid kit and telephone should be kept readily available.

3. Emergency procedure should be posted and taught to all teachers and lifeguards.

4. Swimming area should be accessible by ramps or elevators for wheelchairs.

5. A mat should be placed over the end of the deck where people may enter in order to protect the bodies of the people when entering.

6. A table or chairs should be placed in the water where swimmers can rest when tired rather than lifting them in and out.

7. Water temperature should be 86 - 92 for greatest comfort and relaxation. If it is too warm, it is enervating. If too cold, it prevents relaxation and produces more rigidity.

8. Emergency equipment needed includes: ring buoy, rescue tube, pole and kickboard.

9. Prosthetic devices, braces and crutches should be placed away from the swimming area and kept dry.

10. Wheelchairs should be locked before the person is removed and covered with a towel before the wet person is returned.

11. Portable stairs can be placed in the shallow end for those unable to maneuver down wall stairs.

12. Assign areas or stations for different levels of swimming skill. Swimmers should be taught separately from non-swimmers. Control traffic.

SEIZURES

A seizure is a non-contagious disorder of the nervous system characterized by the tendency to have sudden, uncontrolled episodes of excessive electrical discharges of brain cells. Other terms used are: convulsion, fit or epilepsy. Seizures rarely occur during physical activity classes but do so with greater incidence in the time that follows. Therefore, swimmers who have been identified as being seizure prone should be watched carefully during and after the class is finished. The most common types which must be considered in a swimming program are the following:

A. Tonic-Clonic (previously called grand mal): There is a continuous contraction (tonic) of muscles causing rigidity after which the person loses consciousness. When there is intermittent contraction and relaxation of muscles, it is called clonic. Total time involved for the tonic-clonic seizures may be 2 to 5 minutes.

Safety Precautions:
Identify those swimmers who are seizure prone by colored swim caps or colored wrist bands. Be alert to medication being taken as some may produce sleepiness. Under water swimming and diving should be undertaken with careful supervision. Scuba diving is not recommended.

First Aid:
If a seizure occurs in water, the person should be supported in the water with the head tilted so the face and head stay above the surface until the seizure stops. Keep the head protected and away from the pool side. The person should be removed from the water as quickly as possible. Once on dry land, the person should be examined, and if he or she is not breathing, artificial respiration should be started at once. After being removed from the water following the cessation of the convulsion, the person should be laid on the side, head on the arm and head protected. Dry and keep the person warm. Record the time and length of the seizure. Anyone who has a seizure in water should be taken to an emergency room for a careful medical checkup, even if the person appears to be fully recovered afterward. Delayed shock from ingestion of water is a possible hazard in such cases. (Epilepsy Foundation of America, Jopke, 1986, p. 30)

If seizure lasts more than three minutes, or another seizure follows, emergency procedure to obtain medical help is essential. Notify parents or family. Fill out an accident report.

B. Absence Seizures (formerly called petit mal):
These are characterized by brief loss of consciousness for one to ten seconds, staring, eye blinking, appearing dazed or facial twitching. Such seizures are rarely serious. There are no convulsions.

First Aid:
Wait until the learner is alert with the eyes focused, head kept above water and person remains in the water. Demonstrate confidence and a calm manner to prevent fear of tenseness in the person. Continue the lesson when the person has recovered.

For a more complete description of seizures read:

C. Sherrill, 1986. Adapted Physical Education, 3rd Edition, W.C. Brown Publishers, Dubuque, Iowa, pp. 426-430.

T. Jopke, August, 1986. Working and working out: Fitting activities for people with epilepsy. Fitness in Business, pp. 28-31.

Epilepsy Foundation of America (1983J). Epilepsy: Recognition and first aid. Epilepsy Foundation of America, Landover, Maryland, 20785, p. 3.

INCONTINENCE

A person is incontinent when there is lack of control of the bladder and/or the bowels. The condition is found when there is paralysis of the pelvic region such as seen in spinal cord injuries and spina bifida. During a convulsive, tonic-clonic seizure, the person may be temporarily incontinent.

In the case of lack of bowel control, the bowels should be evacuated before the learner goes swimming. Plastic pants can be worn under the swim suit with careful observance that the leg openings are not too tight causing undue pressure on the skin which cannot be felt by the swimmer. An unusual skin color should be reported and the swimmer kept from swimming until the person returns to the usual color. Some swimmers wear padding, diapers or "Pamper" type pants under the plastic pants for greater protection.

Accidental release of feces demands removal of swimmers from the water. Waste should be removed, water tested for bacteria count and treated. If the department of health standards are not met, no swim classes are held until the water is declared safe.

Bladders should be emptied by manual expression before entering the pool. If a bag is worn, this should be emptied and the closure secured. Because swim classes for the disabled are conducted for not more than one hour each session, this is usually not a problem as PH levels can be controlled by proper chemical balance in the water.

EQUIPMENT

Floatation Devices:

Chlorox and soda bottles, arm floaties (inflatable), plastic solid bubbles, inner tubes (inflatable), all sizes, (tape valve to prevent scratching); ski belts, life jackets and vests, wet suit vests, (Wet Wraps), jackets or pants; plastic doughnut rings, air mattresses, kickboards, rafts and "My Buddy" stretch swim suit with removable plastic floatation pieces (Adolph Klefers).

Safety and Motivational Equipment:

Swim mitts, nose clips, ear plugs, swim paddles, swim fins, goggles, masks, snorkles, sound sources such as a beeper, metronome, radio or cassette tape player for visually impaired people. Also, diving brick, clams, rocks covered with aluminum foil or colored masking tape.

Whiffle balls, golf balls, beach balls, balloons, hula hoops, diving rings, sponges, plastic flowers, table tennis balls (may float down the drain).

Squirt guns, pucks, velcro straps, watering can, plastic sand pail and shovel, elastic leg bands, wash cloth, plastic squeeze bottle, plastic straws, small plastic trash can and old, clean towels.

Plastic box with: tissues, safety pins, elastic hairbands, swim caps (some colored), colored wrist bands.

First aid kit should be available to staff.

BIOMECHANICS OF FLOATING: PUTTING THEORY INTO PRACTICE

Introduction:

There are many ways to position a body in the water in order to float and also maintain a position which will improve the learning in all basic swimming strokes. The objective of this section is to use the biomechanical principles needed in an aquatic environment, apply them to the normal population and specifically to those with a variety of disabilities.

It is interesting that the American Red Cross swimming program lists floating under an intermediate skill, whereas previously it was a beginner skill. Teachers have recognized that floating is not an easy skill, it must be taught. This requires a fine balance, practice and much patience.

DEFINITION OF TERMS:

Archimedes principles of buoyancy: a body immersed in a fluid is buoyed up by force equal to the weight of the displaced fluid. A body wholly or partially immersed in fluid at rest experiences an upward thrust equal to the weight of the fluid displaced.

Center of gravity: an imaginary point about which the weight of an object is equally distributed. In the human body it is normally in the pelvic region near the navel.

Center of buoyancy: the imaginary center of gravity of the displaced water of a floating object. It is where the upward weight force of water is applied on the body, normally near the rib cage which contains air in the lungs.

Static equilibrium: a person floats stationary when the center of gravity and center of buoyancy fall in the same vertical line. It is called co-linear.

True floater (Positive buoyancy) : a person whose average body density is less than water density even with air expelled from the lungs. Specific gravity is less than 1.

Sinker (Negative buoyancy): a person with body density greater than that of water even with air held in the lungs. Specific gravity is greater than 1.

Conditional floater: a person whose average density is less than water density only when inhaled air is kept in the lungs.

Neutral buoyancy: the specific gravity of the body is the same as water (1) and the person remains suspended below the surface of the water.

Monoplegic = paralysis in one body part.

Diplegic: paralysis on both sides, with the same body parts affected.

Paraplegic = paralysis in both legs.

Quadriplegic: paralysis in all four limbs.

Hemiplegic: paralysis on one side of the body.

Scoliosis: a curvature of the spine in "C" or "S" shape as viewed from the back.

Kyphosis: a condition of abnormal convex curve of the thoracic spine. From a side view the back looks "humped".

Cerebral Palsy: a condition caused by brain damage which affects control of the muscles. There are various types.

Spina Bifida: a condition caused by incomplete closing of two vertebrae from which the nerve cord and meninges may protrude. The person is paralyzed below the level of the vertebrae affected.

STNR: Symmetrical Tonic Neck Reflex. A reflex which is affected by head position. When the head is hyperextended, arms go into extension and legs into flexion. When the head is flexed, arms flex and legs extend.

ATNR: Asymmetrical Tonic Neck Reflex, called the fencers position. When the head is turned to the side the arm and leg on the face side extend and opposite arm and leg flex.

Moro Reflex: Fear, moving quickly or a loud noise cause extension of limbs then flexion into the body.

Righting Reflex: From supine position, turn the head and the trunk will reflexly turn in the same direction. From prone lying turn the hips and head will follow.

Labyrinthine Righting Reflex: When body tips sidewards, forward or back from an upright position, the head will attempt to return to the upright position.

AVERAGE DENSITY OR SPECIFIC GRAVITY
OF VARIOUS OBJECTS IN WATER

OBJECT	SPECIFIC GRAVITY
WATER (4°C Fresh)	1.0
SALT WATER	1.15
IRON	7.7
WOOD	0.75
LEAD	11.30
ICE	0.92
CHILDREN	0.86
TEENAGERS	0.97
ADULTS	0.95
ELDERLY	0.86
MUSCLE TISSUE	1.085
ADIPOSE (FAT) TISSUE	.70 - .98

COMPARISON OF VARIOUS TYPES OF SITUATIONS
IN WHICH SOME OBJECTS ARE MORE FLOATABLE THAN OTHERS

MORE FLOATABLE	LESS FLOATABLE
Children	
Elderly	
Women	Teenagers
Non-athletic	Men
Thorax or chest area	Athletic
Wood crutches	Spastic leg muscles
Thin bones	Solid metal crutches
Paralyzed legs	Heavy bones
Ping pong	Normal legs
Salt water	Golf ball
Specific gravity less than 1	Specific gravity greater than 1
White race people	Black race people
Prone, tuck position	Supine, long lying

1. Application of Archimedes Law.

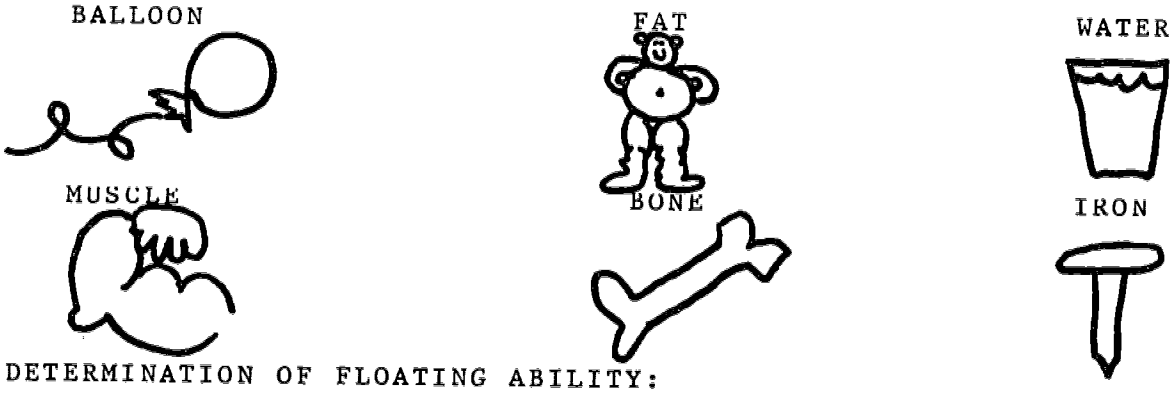
According to Archimedes, 287 BC, an object will float when it weighs less than the weight of the water which it displaces or pushes away. Of what relevance is that to us when we teach floating and swimming? Our first responsibility is to make a general observation of the learner. Referring to the table on floatable and non-floatable objects, we can see that certain age categories such as children and women float more easily than teenagers, for example. Those with fat are also more floatable than people who are thin, muscular or spastic.

In the drawing which shows the relative density of various objects, we notice that a balloon with air has less density than bone. Using that information, we can use the air, either in the lungs or with an inflated object such as arm floaties or an inner tube to help decrease the density of the person and improve the floating ability. Conversely, the person with heavy muscles or heavy bones may not float at all without some floatation device or arm movement to counter the gravital force pushing the learner under the water.

Once that we have decided whether or not the person will tend to float, we next must look at the laws of buoyancy and gravity so they can be applied. As we saw in the definition of terms, static equilibrium can be attained only when the downward force of gravity and the upward force of buoyancy are in alignment. Because the center of gravity tends to be lower, (near the navel) than the center of buoyancy, (near the chest) there is a constant rotary force acting on the supine floating body. Even true floaters and conditional floaters will start to rotate, gain momentum and sink if they are improperly positioned. The floater in figure has adjusted the body position so that he can float without moving because the two forces impinging from above and below, are now in line (co-linear).

What can we do to help the student attain this? First the center of gravity can be raised by raising the arms over head. All movement should be slow as balance is easily lost. Body parts should remain under the water because the buoyancy generated by that part is lost as soon as it is removed. If the knees are bent, that also raises the center of gravity. If air is kept in the lungs for a period of time, released quickly and inhaled again, the buoyant force is greater. Another suggestion is to start the learner in a standing, vertical position then lie back slowly until the body is lifted up into the position of static equilibrium. This eliminates the momentum acquired when feet start near the surface in a horizontal supine position and move downward. Some learners may float with just the face above water and body angled down. When assuming the face down survival float, greater buoyancy is seen when the head is submerged displacing more water. In addition, it is more difficult for water to go up the nose when the face is forward.

RELATIVE DENSITIES OF VARIOUS OBJECTS FROM LOW TO HIGH:



DETERMINATION OF FLOATING ABILITY:

Another logical question the teacher should ask is, "Can the person float at all?" If the specific gravity of the body is greater than 1 after air has been exhaled, then the person will float no matter what we do. This means that when tested for a swimming skill of static floating, the person will fail the test. The biomechanics of the body will prevent it.

So how can we decide whether or not we will have a stationary floater in the class? The easiest test is to have the swimmer attain a tucked, prone, face down position in the water, air in the lungs and arms wrapped around the legs. A conditional floater is seen when the student stays at the top in the tuck position but sinks when the air is expelled from the lungs. Next, the air is released from the lungs and we can watch the position of the body. If it sinks to the bottom we, logically, have a sinker. If it remains below the surface with no body part visible the person has neutral buoyancy and is suspended as though it is a part of the water itself. When we see the back rise to the surface, we have a floater. The next step is to try several suggestions related to face up or supine floating.

POSITIONING:

Once the body is floating in a supine position, it is important to keep the head back in the water at ear level, in line with the body itself. When the chin is dropped, the body response is to drop the feet because of Newton's third law of motion. It is an equal but opposite reaction, and the movement will be difficult to stop. When moving body parts into the proper position, such as extending the arms over the head, it is important to move slowly as balance is more easily lost from the turbulence, eddies or little whirlpools which are formed by fast motion causing negative pressure and into which the body or parts will move.

Another reaction may be that, instead of the feet dropping, the hips will flex causing the swimmer to drop the rear end down and collapse. The goal is to keep the body planed or flat upon the surface of the water. This has great importance when teaching a swimming stroke because of the drag which results from the body being angled as it moves through the water's resistance.

The head is the key factor in maintaining good alignment. If rotated even slightly to either side, the body will tend to roll with it. If we manually roll the trunk to the side, the swimmer can practice righting the body to a flat, supine position by just turning the head.

One suggestion which can be used to help keep the head back is to stand behind the head of the learner and ask him/her to look at your eyes or nose or count the lights in the ceiling. Fear and sense of insecurity are the major reasons for inability to extend the head and lie supine and horizontal. Relaxation must be attained to some degree in order to keep the proper position for floating and swimming.

Environmental factors may also affect the students. Splashing, loud noises such as the diving board banging, starter guns, quick movements or students too close may cause reflex movements which prevent relaxing during floating.

FACTORS TO CONSIDER FOR ALL FLOATERS:

1. When any body part is removed from the water, the buoyancy decreases.

2. When the head is lifted during supine (face up) floating, the feet sink.

3. When balance is lost, the falling is slowed because of the resistance of the water allowing for more recovery time.

4. When the head turns to the side, the body tends to follow causing rotation on the vertical axis.

5. Air held in the lungs increases floating ability.

6. Long, heavy legs lower the center of gravity causing feet to drop.

7. Bending the knees raises the center of gravity thereby increasing floating ability.

8. Raising arms over head slowly and underwater, raises the center of gravity thereby increasing floating.

9. People with more than average amount of fat float more easily.

10. Muscular people and adolescents have more difficulty floating.

11. Children and elderly tend to float more easily.

12. Gripping with hands, holding the breath or shutting the eyes increases tension and decreases floating.

13. Fear and cold decreases floating.

14. Because of the need to rotate from prone to supine and return, all learners should learn to exhale and blow bubbles as soon as the face enters the water.

15. The first skill to be learned is to exhale under water.

FACTORS TO CONSIDER FOR FLOATERS WITH A DISABILITY:

1. Spastic muscles are heavier and tend to decrease floating ability in that area.

2. Paralyzed, flacid muscles are less dense and tend to increase floating ability in that area.

3. Scoliosis (curved spine) tends to cause body rotation.

4. A spastic hemiplegic will:

   A. have decreased respiration and less buoyancy on the affected side thereby decreasing floating ability.

   B. tend to be shorter on the affected side and roll toward that side.

5. Spastic people have extra sensitivity to noise and may become startled causing reflex muscular reaction, decreased floating ability and increased spasticity.

6. Blind or visually impaired people will have more difficulty floating and following instructions when their main mode of communication (hearing) is lost because of ears being below the water line when floating supine.

7. A spastic person with elbows, wrists and knees in flexion may lift body parts out of the water causing buoyancy to decrease.

BODY SHAPES AND THE EFFECTS UPON FLOATING:

All people have some balance problem in the water. No one is perfectly symmetrical in shape. However, we can change our body shapes to make ourselves more or less stable. In learning to float, a simple test for body density is to have the learner take a breath, tuck the head, grasp bent knees and see if the back comes up the surface. A true sinker will, at this point, sink. Tucked into this ball shape, the body is in the most stable position for floating. Some people with disabilities may not be able to roll into a ball but may try this prone position in a slightly bent or piked position. This is a basic test of floating ability.

A symmetrical block of wood floats in balance and flat in the water because the center of gravity force and center of bouyancy force are directly in line. Canoes are almost symmetrical and therefore float balanced. Rarely does the human body float flat on top of the water in horizontal balance because of our different shape. Usually the buoyant force from below acts upon the chest area of least density while the gravital force from above acts upon the hip region having greater mass. Such nonlinear and imbalanced forces cause the feet to drop, the body to rotate and sink. Now add to this common occurrence such

nonsymmetrical shapes as are observed with various types of disabilities. Common alterations in shapes include the following(1):

1. Unequal rectangle: When the hand and leg on the same side are in flexion and abduction as seen in a hemiplegic stroke patient, single amputee or spastic cerebral palsy person, the shorter side will cause the body to roll toward the affected side. Supine position is best for these learners. Rotating the head slightly away from the flexed side may help to balance the body. Practice of rolling in a horizontal position with manual assistance at the waist from the instructor helps teach proper balance. For a complete description of teaching swimming to stroke patients see Heckathorn (1980).

2. Triangle: When there is flexion at the hips and knees with plantar flexion at the ankle, the body looks like a triangle in shape. People with such a position include spastic quadriplegics who half lie on a chair, have insufficient hip flexion, incomplete hip extension and have kyphosis as well as those who are spastic diplegics. Because these learners float with the hips down, it is safer and easier to remain supine. A prone position makes it difficult to lift the face out of the water. When a spastic person is placed supine and fear is evident, the floater instinctively flexes at the hips, raising the head. This action causes the buttocks to drop and the triangle position is seen. No horizontal floating can occur until relaxation is attained.

3. Scissors: When both legs are spastic and adducted the legs cross in a scissors shape causing rotation on a vertical axis when floating horizontal. Floatation devices at the sides may help prevent lateral rolling. Pre-stretching of the legs to the sides helps increase abduction of the legs which is one goal for the people in scissors position.

4. Hyperextended: When lying supine some swimmers arch the back and lay the head back. Caused by a reflex extensor pattern, the body tends to be hyperextended. Floating is more difficult as rotation tends to move the heavier end depending on the muscle mass and bone weight.

(1) Adapted from M.R. Camion: Hydrotherapy in Pediatrics, p.21.

AXES OF ROTATION AFFECTING BALANCE AND SWIMMING SKILLS

In teaching floating and swimming skills, the body rotates on two different axes or directions. Practice moving around these axes helps the learner better control the body and perform skills more efficiently.

1. Vertical axis: If a long pole were placed through the body from head to foot, rotation would be on the vertical (longitudinal) axis as seen when the swimmer rolls from front lying in the front crawl stroke to back lying in the back crawl stroke. Basically, the head controls the rolling as there is much weight in a small area and the body reflexly follows the head (righting reflex).

2. Horizontal (Frontal) axis: If a long pole were placed through the hips at the middle of the body from side to side the body would rotate on the horizontal frontal axis. An example in swimming would be recovering forward to a standing position in the water after floating supine. Much practice is needed moving around this axis as safety and body control are dependent upon this skill.

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SUGGESTIONS FOR TEACHING SWIMMING TO PEOPLE WITH CEREBRAL PALSY

CEREBRAL PALSY:

Cerebral palsy is a condition caused by some trauma or lack of oxygen to the brain which affects the voluntary muscles. It results from damage to that portion of the brain which controls and coordinates muscular action and is manifested by abnormal tone and patterns of movement rather than muscle weakness. Types include:

1. Spastic. Muscles are contracted, rigid and tense with movements irregular, stiff or jerky (approximately 50%).

2. Athetoid. Movements are involuntary and purposeless, uncontrolled, slow and rhythmical or fast and irregular (approximately 30%).

3. Ataxia. Balance is affected. There may be lack of muscle tone and poor spatial relations (approximately 10%).

4. Mixed cerebral palsy. Person has more than one type (approximately 10%).

Speech difficulties may be present and approximately 30-35% may be mentally retarded.

TEACHING HINTS FOR SWIMMERS WITH CEREBRAL PALSY:

1. Whenever speech is affected, teach the swimmer basic hand signals to assist you both. Non-verbal cues should be used. In addition, a symbol board can be used.

2. If speech problems exist, work on blowing bubbles, bobbing and rhythmic breathing.

3. Water temperature should be about 80° - 95° F (35 ° C) to effect relaxation. Cooler water increases spasticity. These swimmers should be watched closely for signs of cold and fatigue.

4. Include slow stretching or yoga in warm-ups to try to increase range of motion. Stretch body parts up to pain level and don't force beyond.

5. Sitting position for warm-ups should be wide stride or Indian style. Do not allow "W" sitting. Thighs and hips should be outwardly rotated.

6. Encourage walking first with and then without assistance in the water. If person walks on tip toes, use exercises to stretch calf (gastrocnemeus) muscle.

7. For balance activities, practice walking early in the lessons starting in neck deep water. Progress to chest, waist, knee deep water. Try one foot balance.

8. Always warm up with relaxation techniques. Stress relaxation in water activity. Do not tell them to "relax". This will increase awareness of tension and may hinder progress.

9. When the learner is supine (face up), the neck should be slightly flexed especially if the back tends to arch reflexly. Head in mid line with the body and chin slightly down will prevent the reflexes of ATNR and STNR. Recovery to the feet is easier to teach from a supine floating position because the knees tend to be drawn up toward the abdomen. Swimming on the back also eliminates breathing problems especially if speech is impaired.

10. Try teaching without a personal floatation device first to see if proper positioning can be attained.

11. Teach strokes with underwater recovery. When an arm is removed from the water and lifted, the buoyancy decreases and the reaction for the body is to go down.

12. Teach symmetrical strokes to the learners. Elementary back, breast stroke, finning, sculling and winging are recommended. Front and back crawl require shoulder circumduction and greater range of motion (ROM) than is normally found in the cerebral palsy person. Where primitive reflexes still exist asymmetrical strokes also may elicit the ATNR. Kicking action should also be symmetrical. Use the whip or frog kick. Asymmetrical kicking promotes extensor hypertonus in the lower extremities and will lead to a scissors gait in the ambulatory child (Harris, 1978, P. 980). Therefore, no flutter kick should be employed. For a detailed description of skill progressions for such swimmers, see Harris (1978).

13. Spastic muscles are more dense and less buoyant so PFD's may be needed early in the learning.

14. When a person has uneven contractures producing hemiplegia, or monoplegia, some adjustments have to be made in positioning and type of swim stroke. For adaptations see page 39 on body shapes which describe methods.

15. Swimmers who have ataxia (lack of balance) and who are very buoyant may be afraid. This elicits the startle reaction when they discover that they have difficulty remaining standing or keeping a stable position in the water. Start ataxic people in a ball position. Practice rotating. Next move to rolling on the long axis, front to back.

16. Hemiplegia affects the muscles of respiration on one side of the body so decreased lung volume decreases buoyancy and tends to cause the swimmer to rotate to the affected side. Floatation devices may be needed to counter the rotation.

17. Be aware that loud noises such as a whistle or diving board pounding may elicit reflex movement such as the startle reflex. Reduce stimuli such as bright lights in the eyes, temperature changes, splashing and loud noises to decrease fear and reduce reflexes.

18. Slow down activities. Speak with control and in a low, well-modulated voice.

19. To straighten the arm during the stretching routine, first lift by rotating it outward at the shoulder and elbow joints. When holding a spastic child while in the water, separate the legs and flex knee and hips to reduce spasticity. For a complete reference of lifting, holding and moving cerebral palsy children, see Finnie (1974).

20. Play games where blowing balloons or ping pong balls are used. This encourages diaphragm activity and precedes breath control skill learning.

21. When arms and legs tend to go into flexion, swimming activities may be more successful in a vertical position as is used for the human stroke or survival skill such as drown-proofing.

22. Rolling, rocking and pendular movements reduce spasticity. Try it to music. If the body hyperextends (arches back) try rolling the person into a ball.

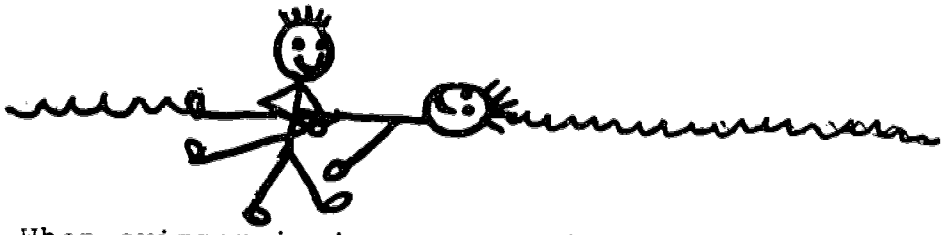
23. Use movement exploration techniques.

24. Practice wide sweeps of arms and legs to feel the water's effect on appendages while under water.

25. For proper head support and jaw control, grasp swimmer by placing index finger horizontally in front of chin, middle finger under chin, with thumb over the temporal-mandibular joint.

26. If floating in a supine position, roll head from side to side to see if the body log rolls in one section. This righting reflex must be inhibited before rotary breathing can be taught.

27. When legs are in tight adduction, try floating swimmer supine. Stand between legs with hands on the swimmers hips to encourage abduction.



28. When swimmer is in prone position, stand in front and support under the ribs. This is a difficult position for such swimmers as they tend to be in flexion and rotate forward.

29. When swimmer is in supine position (1), hold under the armpits or (2) support head and chin as described in #25.

30. If a person has severe athetosis, more success may be obtained by keeping the person vertical with head upright and the line of gravity going down through the vertical axis. This assists in maintaining the head upright in midline in a more balanced position with the rest of the body under water getting the benefit of the water's resistance. Less random movement occurs and the swimmer can do survival floating and swimming when vertical.

Teaching Swimming for Paraplegics

By Mary Cooper
Barrington Public Schools

Paraplegia is paralysis or paresis (partial paralysis) of both legs and the lower part of the trunk. It may be the result of damage to the spinal cord below the first thoracic vertebrae from an accident, disease or condition such as multiple sclerosis, spina bifida, stroke, herniated discs, muscular dystrophy or cerebral palsy.

There are many degrees of neurological impairment among persons with paraplegia caused by a spinal cord injury. The higher the injury to the spinal cord, the more extensive the paralysis and loss of sensation. If the spinal cord is completely damaged at the site of the location, there is complete loss of sensation and voluntary muscle control below the level of the injury. If the spinal cord is incompletely damaged at the site of the lesion, there may be some sensory and motor stimuli passing to and from the brain to the bodily structures below. This may range from a few nerve fibers to complete preservation of the fibers in the injured area. (Young, Burns, Bowen & McCutchen, 1982). Therefore, two people with injuries at the same spinal cord level can have significantly different neurological functioning.

There are several physical impairments and complications of paraplegia in addition to paralysis of motor function and loss of sensation. Poor circulation makes the healing process slower and increases the tendency toward chilling and fatigue. (American National Red Cross, 1977). Another problem is lack of bladder and bowel control because the nerves for these organs are located at the sacral level. If an external catheter is worn, it may be removed for swimming or a catheter and bag may be worn in the pool. Bowel management is usually under control. There is a high incidence of urinary tract infection. Exercise should not be resumed until symptoms including a flushed face and elevated temperature disappear. (Sherrill, 1986).

Immediately after a spinal cord injury, there is a state of shock with absence of all reflexes below the level of injury. After a period of months, reflexes return and may lead to reflexive, non-voluntary muscle spasms. (Young, Burns, Bowen & McCutchen, 1982). Other problems common to people in wheelchairs include muscle contractures if in one position for a long period of time, decubitus ulcers and pressure sores. If not active there may be muscle weakness, lack of endurance and obesity.

The possible benefits that swimming may provide for paraplegics include relief of contractures, increased circulation, improvement of self-esteem, increased strength and endurance of muscles and improved cardio-respiratory system. Swimming provides an enjoyable outlet in which assistive devices and wheelchairs can be left behind. (Adams, Alfred, McCubbin & Rullman, 1982).

The following techniques are recommended for teaching swimming to paraplegics:

1. The American Red Cross regular, progressive swimming program can be used but execution of skills to the best of ability is more important than performing skills exactly by the book.

2. Teach the safest way to enter and leave the pool. They should not enter feet first from a height such as a diving board which may result in twisting and muscle strain. (American National Red Cross, 1977). A suggested entry is for the swimmer to sit on the pool edge with the feet in the water, hold the breath, and lean forward into the water. Assistance may be necessary to roll over but independent entry is the goal. To manually lift the swimmer out of the water, have the person's back to the wall. The instructor in the water grabs the swimmer's hips and lifts while a helper on the deck holds under the armpits and lifts the person to a sitting position. The swimmer may get out of the pool independently by facing the wall and using his arms to lift his upper body onto the deck, rolling over, and sitting up. Until this technique is mastered, it may be necessary to assist in lifting.

3. Water temperature should be a least 80 degrees Fahrenheit for comfort and to promote relaxation and circulation.

4. Movement exploration is recommended to allow the individual to find the most efficient floating and swimming positions.

5. Do not give physical assistance unless necessary or requested. Most paraplegics strive to be as independent as possible.

6. Encourage relaxed breathing and maximum use of functioning muscles.

7. It is important to teach the basic safety skills - rhythmic breathing, prone float and recovery, back float and recovery, turning over and changing direction. (American National Red Cross, 1977).

8. Check to see if any skills have been contraindicated by the physician.

9. Protect against skin abrasions by having the person wear socks in the pool.

10. Keep the activities fun and do not create pressure situations.

11. Paraplegics legs are usually buoyant and provide stability in floating positions but recovery from a prone or supine position is sometimes difficult and should be carefully taught and practiced.

12. Teacher:participant ratio should be 1:1.

13. Poor circulation increases the tendency toward chilling and fatigue which should be avoided.

14. Resting can be done by the instructor standing behind the swimmer and supporting under the armpits or by the swimmer holding onto the pool edge.

15. Generally, provide opportunities for the participant to:
    a. experience success.
    b. increase muscular and cardiovascular strength and endurance through activities such as lap swimming.
    c. increase range of motion.
    d. increase body awareness and movement capabilities through a variety of aquatic skills.

Flotation devices that may be used in the swimming program include inflatable cuffs or a small innertube for the ankles, buoyant water ski belts, vests or large innertubes. Those who have not been swimming since their accident and beginners may want to wear a ski belt until they become accustomed to the water. When ready, they should be encouraged to practice swimming with no floatation devices, which they are generally anxious to do. Flotation devices work best for strokes performed on the back, as they tend to submerge the head if used in the prone position. Also, they cause the swimmer to use shallower strokes than will be necessary without the device. (American National Red Cross, 1977). Large innertubes are fun for games such as water polo, basketball, or volleyball, as well as for relaxation after swimming laps.

Execution of the swimming strokes to the best of ability is more important than performing strokes exactly by the book. Strokes performed on the back using symmetrical arm movements with an underwater recovery are learned more easily because they minimize breathing problems and utilize arms to the advantage. Examples of this are the elementary backstroke and sculling on the back.

The goal for most paraplegics in a swimming program is to be able to swim many laps of various strokes using efficient form. The following is a list of technique suggestions for various strokes:

Sidestroke: The swimmer should find a balanced position through experimentation, which is usually a partially prone position rather than wholly on the side of the body. (Fait & Dunn, 1984).

Breaststroke: Raising the head to breathe lowers the hips and legs in the water. Many paraplegics are able to maintain a constant position of the head in relation to the trunk, raising their mouth out of the water to breathe by drawing the elbows together sharply as the last motion in the propulsive phase of the stroke. (Karman, 1982).

Back crawl stroke: For balance, many disabled swimmers scull next to their hips after completing the propulsive phase of the stroke, prior to beginning the recovery. (Karman, 1982).

Front crawl stroke: The swimmer may need to exaggerate the body rotation for rotary breathing or scull after the propulsive phase for balance.

Butterfly: Swimmers should work on strength and flexibility before attempting this stroke. (Karmen, 1982).

Elementary backstroke: This is a very popular stroke which utilizes the strength of the arms. The arms should always be recovered underwater or a wave will rush over the face.

Underwater swimming: Utilizes arm strength and breath control.

Turns: Rotate body and push off the wall with the hands.

Videotapes of swimmers performing labs of various strokes should be taken regularly for stroke analysis to aid the swimmer in improving the stroke. A chart for keeping track of the number of laps completed can be motivational.

Many of the aforementioned teaching techniques were found to be successful in a swimming program for people with spinal cord injuries at the SHAKE-A-LEG Body Awareness Training Program. SHAKE-A-LEG, Inc. is a non-profit organization based in Newport, Rhode Island which serves victims of physical trauma, with emphasis on spinal cord and related nervous system impairments.

Swimming is a beneficial form of exercise for paraplegics. Swimming exercises the body without putting extreme stress on body parts. Warm pool water can help increase circulation, promote relaxation of muscles, relieve constant pressure on areas susceptible to skin breakdown, relieve contractures of the joints, and encourage more efficient movement and postural tone. The reduction of gravitational pull in the water increases movement potential. By participating in aquatics programs, individuals can become more aware of their movement capabilities. Realizing that swimming is somewhat of a risk sport helps the swimmer to improve self-esteem. (Adams, Daniel, McCubbin & Rullman, 1982).

Daily living skills for paraplegics require strength of the upper extremities, which can be developed by swimming, and is an important tool for independence.

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SENSORY IMPAIRMENTS

Teaching hints for hearing and visually impaired students.

A. Hearing Impaired:
   1. Know and teach child basic signs for stop, go, look, etc.
   2. Use more tactile teaching and much demonstration.
   3. Stand where you can be easily seen.
   4. Use a buddy system.
   5. Be aware of possible balance difficulties.

B. Visually Impaired:
   1. Use tactile demonstrations.
   2. When possible, have ears of swimmers out of water for more security and comprehension.
   3. Use buddy system.
   4. Use circle formations so they can touch more, especially in games situations.
   5. Use more verbal instruction so communication is constant.
   6. Use balls with bells or beepers inside foam.
   7. Use large, soft, safe balls like beach balls.
   8. Use ropes to separate pool into sections or into deep and shallow ends.
   9. Keep a sound source such as a radio or tape deck at the shallow end of the pool for orientation of the swimmer.
   10. Teach pool land marks, steps, ramps, doors, pool edge, lockers, toilet, etc.
   11. Allow swimmer to hold you above the elbow as you lead them.

SLOW LEARNERS

1. Positively reinforce health and safety habits.
2. Teach by demonstration and few, simple repeated, verbal cues.
3. Use tactile method along with demonstration.
4. Identify a reward system early and use it often (stars on chart, praise, pat on back, hug, free play time, etc.).
5. Break skills into simplest component parts (task analyze).
6. Discipline firmly to keep class in control.
7. Keep swimmers facing away from distractions.
8. Plan for successful experiences, especially at the end of class.
9. Use skills in game situations.

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Down Syndrome

Seventeen percent of the people with Down syndrome have atlantoaxial instability. Serious injury may result if the neck is flexed forcibly because the vertebrae may shift and squeeze or sever the spinal cord. Symptoms of this condition are difficulty in walking, neck pain, reduced range of neck motion, changes in bowel or bladder function, and weakness in the extremities.

Fifty percent of moderately and severely mentally retarded people have Down syndrome. Although many compete in the Special Olympics, none has suffered serious injury during training or competition. Nevertheless, in 1983, a group of concerned physicians suggested the following measures to protect athletes with Down syndrome:

1. Prohibit participation in gymnastics, diving, swimming the butterfly stroke, high jump, pentathalon, soccer, and any warm-up placing pressure on head and neck muscles until the athlete has passed a required medical exam by a knowledgeable physician to test for atlantoaxial instability. This exam includes x-ray of head and neck.

2. Permanently prevent participation in the above-stated activities if the condition is present.

3. Allow those who are free from this condition to participate. But because of the potential health risk, it is important that every parent, coach, and trainer require a medical clearance for these athletes to ensure that their sports activity is safe and enjoyable. (See medical form in Appendix for physician's response.)

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AQUATIC EXERCISE FOR SENIOR CITIZENS

INTRODUCTION: This chapter is written for swimming programs for senior citizens who have no debilitating disease or condition and is, therefore, for the general population of healthy older people. Included are physiological advantages, specific modications needed to teach, safety concerns, release forms, and specific, recommended water exercises and activities.

PHYSIOLOGICAL BENEFITS: When dealing with the older citizen approximately 60 years of age or older the usual benefits of exercise such as cardiovascular endurance, strength and flexibility are natural concomitants. However, the older population needs special attention to range of motion and improved balance performed in a gravity-reduced environment which the water affords. Arthritis patients find less stress on the knees and hips when buoyancy assists. This is one of the major reasons why swimming is so valuable to the elderly. Jogging, aerobic dancing and jumping rope are too strenuous for those with joint pain. Deeper breathing is effected, both inspiration and expiration because of the water presure on the thorax region. Less fatigue, improved sleep habits as well as digestion have been reported by older swimmers. It is most important to start slowly, gradually building endurance or the students will become discouraged early and discontinue swimming.

Additionally, because of the greater incidence of osteoporosis (bone thinning) the older person needs to be weight bearing as well as to exercise to decrease mineral loss. Standing in the water while exercising accomplishes both objectives.

Another physical benefit from swimming is relaxation which is needed by all of us. When exercises and swimming are conducted appropriately, relaxation of individual parts as well as the whole body is accomplished.

For some swimmers, it may be the only time that they can walk independently, in balance and unaided. Any difficulty they may have in ambulation is less evident to others when the student is in the water.

PREPARATION FOR PROGRAM IMPLEMENTATION: Organization and administration of a senior swim program can be found in detail in Seleen's article (1981). However, once the students have signed up for class there are several considerations to be made. Included are the release forms which are used at URI and allows the teacher to see any special needs which the participants have. Basically, the responsibility is placed upon the swimmer as in any adult fitness or activity program. At Penn. State University, Iffert and Cinnelli, use a physician's exercise approval

sheet which is helpful for designing an individual program for specific body parts. If you are interested in the swimmers' perceptions of their health, you may administer a Health Perception Questionnaire before and after the program. The form used at URI by Seleen is included for your information.

Other considerations before they arrive are: How far is the distance from the parking lot for them to walk? Are there ramps or elevators? Are the pool deck and ramps covered or protected from slipping? Are there rails on the ramps or stairs and grab bars in the showers? Are the benches wide enough to sit safely? Are there steps going into the pool? Is there enough shallow water for them to rest safely? Can they see the steps as well as the charts you may use for attendance or swimming laps? Can they hear your instructions or whistle? Is the water temperature reasonable (85 degrees to 92 degrees)? Have they been well informed as to safety rules and procedures which you follow at the swimming class?

If music is used during the program and after the initial instruction of each exercise, it is important that the tempo and type be consistent with the type of movement desired. Warm-ups and cool-downs should be slower and more relaxed. If the music is too stimulating during the exercise session, people may be motivated to be too vigorous. The participants should be observed and music tempo should be controlled at all times. Ask your swimmers if they want any music at all!

TARGET HEART RATE: Some students may be interested in monitoring their own heart rate for their own information. This also helps the instructor to better understand the fitness level of the students as well as being a safety factor in assessing the health status during the exercise routine. As people age, optimum endurance benefits are obtained at less strenuous levels of exercise. Exercisers over age 55 can achieve peak conditioning by exercising at only 60 to 75 per cent of maximum heart rate for three times each week. In swimming, it is recommended that seniors do not go above 60 percent of the maximum heart rate. To find the maximum heart rate, subtract the student's age from 220. Then calculate 60 percent of the resulting number. The exercise session should not cause the heart rate to exceed this. For example, if one is 70 years old: 220 less 70 equals 150 beats per minute, the maximum heart rate. Then multiply 150 by .60 (60 percent) which equals 90. The maximum rate for that person is 90 beats per minute. During the swimming exercise session, the students should stop, take a radial pulse for 10 seconds and multiply by 6. The pulse rate should not go above 90 beats per minute for that 70 year old swimmer.

Taking the pulse rate also allows the students to monitor the time it takes to return to resting following the exercise session. The total time for the exercise session will depend on the fitness level of the swimmers. It may range from 15 to 30 minutes. This should be done individually and may be difficult for some.

EXERCISE SESSION

1. Avoid any ballistic bouncing movements. This puts extra stress on the joints aand elicits the stretch reflex which causes the muscle to contract, rather than relax.

2. Encourage regular breathing during the exercises by allowing, talking, singing, etc.

3. All exercises should have movement so the circulation will be enhanced. Stationary or isometrics slow down circulation, raise diastolic blood pressure and encourage breath holding which hinders venous return.

4. Position yourself where all can see you. Without their glasses, many will be visually impaired.

5. If instructions are given, be sure that they can hear you or teach them some basic signs to communicate. Some swimmers will be hearing impaired.

6. Discourage back arching or lifting straight legs to the back. Lumbar pain can be caused by back hyperextension.

7. Encourage students to keep hips tucked under and abdomen flat to help align the body, improve posture and prevent lumbar arching.

8. Avoid double leg lifts because of tendency for lumbar back to arch, especially if the abdominals are weak.

9. Have an emergency procedure plan ready if anyone needs treatment quickly and has to be removed from the pool.

10. Never force extremities to point of pain. Gentle stretching is safer, accomplishes more and prevents tissue tears.

11. Allow the swimmers to set their own limits but be ready to encourage them to rest if it appears needed.

12. To increase the difficulty of the exercise, students press arms or legs down against the water and decrease difficulty by raising these appendages up while in the water. Buoyancy of water assists upward and resists downward movement.

13. Wearing swim goggles will improve their vision under water and decrease the effects of the chemicals in their eyes if swimming in a pool.

14. Use American Red Cross Swim Charts so that students may chart their laps swum. Awards may be given for 10, 20, 30 miles swum, etc.

15. Following exercise, the swimmer should wait five minutes before showering. Warm, not hot water, should be used and a hot sauna is not advised.

SENIOR SWIM

NAME: _____

ADDRESS: _____

TELEPHONE: _____

NAME AND TELEPHONE # OF YOUR DOCTOR: _____

NAME AND TELEPHONE # OF PERSON TO NOTIFY IN CASE OF EMERGENCY:

_____

SWIMMING LEVEL: NON-SWIMMER_____ BEGINNER_____

INTERMEDIATE_____ ADVANCED_____

LIST ALL MEDICATIONS THAT YOU ARE CURRENTLY TAKING:

_____

LIST AND DISCUSS ANY HEALTH CONDITIONS YOU HAVE:

_____

_____

_____

DO YOU CURRENTLY PARTICIPATE IN ANY OTHER PHYSICAL ACTIVITY?_____

ARE THERE ANY RESTRICTIONS TO YOUR PHYSICAL PARTICIPATION?_____

PLEASE READ THE FOLLOWING:

Senior Swim is a physical activity involving water exercises and swimming. We will begin in an easy manner and increase gradually. If at any time you feel uncomfortable, you are encouraged to stop, set your own limitations and inform the instructor. All precautions will be taken by the instructor to insure a safe environment. However, we do not take responsiblity for your own health conditions. If you have not participated in any physical activity lately or if you have any doubts about your physical condition, you should consult with your physician prior to participation. If in the judgement of the instructor certain limiting physical conditions are present, a letter from your physician may be requested.

I have read the above statement and I agree to follow all directions of the instructor and certify that all of the information presented is accurate.

_____ _____

Signature Date

Health Perceptions Questionnaire

How did you hear about this swim program?_____

Please check all that apply: Did you come to the program alone _____, with your spouse _____, with a friend _____, with an organization e.g. Senior Center _____, other (please describe) _____. Are you planning to take this course again? Yes_____ No_____ Depends on cost _____..

If yes, what activity would you prefer after completing the exercises?

Swimming instruction _____ Swimming laps _____

Please rate the following terms by circling the number which best describes your perceptions of yourself before this swimming program.

Poor health	1 2 3 4 5 6 7	Excellent health
Stiffness	1 2 3 4 5 6 7	Flexibility
Painful joints	1 2 3 4 5 6 7	Painless joints
Shortness of breath	1 2 3 4 5 6 7	Ease in breathing
Restricted mobility	1 2 3 4 5 6 7	Mobile
Little endurance	1 2 3 4 5 6 7	Excellent endurance
Depressed	1 2 3 4 5 6 7	Happy
Nervous	1 2 3 4 5 6 7	Calm
Self-conscious	1 2 3 4 5 6 7	Confident
Lonely	1 2 3 4 5 6 7	Not lonely
Low swimming ability	1 2 3 4 5 6 7	High swimming ability
Fear of water	1 2 3 4 5 6 7	No fear of the water
Little swimming endurance	1 2 3 4 5 6 7	Excellent swimming endurance

Please rate the following terms by circling the number which best describes your perceptions of yourself after this swimming program.

Poor health	1 2 3 4 5 6 7	Excellent health
Stiffness	1 2 3 4 5 6 7	Flexibility
Painful joints	1 2 3 4 5 6 7	Painless joints
Shortness of breath	1 2 3 4 5 6 7	Ease in breathing
Restricted mobility	1 2 3 4 5 6 7	Mobile
Little endurance	1 2 3 4 5 6 7	Excellent endurance
Depressed	1 2 3 4 5 6 7	Happy
Nervous	1 2 3 4 5 6 7	Calm
Self-conscious	1 2 3 4 5 6 7	Confident
Lonely	1 2 3 4 5 6 7	Not lonely
Low swimming ability	1 2 3 4 5 6 7	High swimming ability
Fear of water	1 2 3 4 5 6 7	No fear of the water
Little swimming endurance	1 2 3 4 5 6 7	Excellent swimming endurance

In general, how do you feel about the way you spend your time?

Very satisfied_____, satisfied_____, dissatisfied_____, very dissatisfied_____

EXERCISE SEGMENT
AQUATIC EXERCISES FOR SENIOR SWIM PROGRAM
BY: DR. DIANE SELEEN, ASSOCIATE PROFESSOR
UNIVERSITY OF RHODE ISLAND

1. Standing facing wall hang on with both hands
   Jump up and twist right
   Jump up and twist left
   Repeat quickly back and forth jumping and twisting

2. Flutter kick on back or front
   Slow, fast, slow, fast, slow

3. Standing with right side to wall
   Leg raises (left leg) front and side
   Keep leg straight
   Change sides

4. Standing out away from wall
   Arm circles:
   One arm at a time - forward and back
   Both arms alternating (crawl) forward and back
   Both arms together forward then back

5. Bobbing
   Go under water to exhale
   Breathing - 5 small breaths in for one breath then one
   Big exhale

6. Standing facing wall hang on with both hands
   Push ups (need a certain gutter)
   Press up until arms lock then lower self down
   Jump off bottom if necessary until arm strength is
   built up

7. Standing facing the wall hang on with both hands
   Raise right knee in front or to side while going up on
   left toes
   Change legs

8. Arms resistance exercises
   Standing out away from wall
   Arms out to side on top of water
   Pull down to sides, rotate palms up and lift up as much
   water as possible (arms come out of water)
   Turn palms down and press down to side again
   Repeat
   Can also be done front to back - pull back and pull forward

9. Belly Dance
   Standing out away from wall rotating hips right and left
   Hands on head or hips

10. Jogging in place away from wall
    Variations:
    Add arm movements (punching, jumping jacks, clapping
    In front and back)
    Side swings with legs
    Goose step
    Elbows to knees
    Lunging forward or to sides
    Jumping as high as you can

11. Side stretch
    Standing with right side to wall (hanging on), left hand
        on hip. Feet should be roughly two feet from wall.
    Push right hip in towards, then out
    When you push hip out bend left arm over head and slowly
        reach for the wall repeat
    Change sides

12. Leg lifts
    Hold on with back and buttocks flat against the wall
    Raise knees to chest, hold, twist right and left,
        lower feet to bottom, raise knees to chest, extend
        feet out in front at right angle (sitting) then to
        chest and down

13. Bicycle
    Hold on with back to wall
    Ride bicycle straight ahead, right, leg, straight
        ahead and fast

14. Face wall and hang on with both hands
    Walk feet up wall as close to hands as possible
    Pull body in close to wall (tuck in ball)
    Straighten arms and legs out,
        in and out, in and out
    Then with feet together on wall swing hips side to
        side (try to get hips all the way out of the water)
    Lean head to opposite side

15. Facing wall hang on with both hands
    Walk feet up wall - feet should be as far as possible apart
    In this position lean to the right and straighten left leg
    Then lean to the left and straighten right leg

16. Facing wall hang on
    Running slowly in place attempt to kick heel to buttocks
    Can also stand and grab foot behind and pull (with same
        hand or opposite) heel to buttocks

17. Jogging
    Around pool (or shallow end)
    Reverse direction after each minute
    Check heart beat - try to work at target heart rate

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Department of Physical Education, Health & Recreation
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Compiled By: Lorraine E. Bloomquist & Paula J. Scraba

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G. EQUIPMENT:

Aqua Learn, the original children's swimaid, Berkeley, CA, (415) 841-9188, Triad Technology, Inc., 6005 Galster Road, East Syracuse, NY, 13057, (315) 437-4089, Easy Ladder.

Aquanaids Pool Lift, 50 Dynamic Drive, Unit 3, Scarborough, Ontario, Canada, M IV 2W2, (416) 293-8200, Telex 065-25456, Local Representative: Neptune-Benson, Inc., One Bridal Avenue, West Warwick, RI, 02893, (401) 821-2200.

Cosom, Schaper Mfg. Co., 7317 Cahill Road, Minneapolis, MN, 55434.

Danmar Products, Inc., 2390 Winewood Avenue, Ann Arbor, MI, 48103, (313) 761-1990.

Flaghouse, Inc., Special Populations, 18 West 18th Street, New York, NY, 10011, (800) 221-5185.

Floatable Products, Co., 1717 S. Brentwood Boulevard, St. Louis, MO, 63144, floating suits.

Gander Mountain, Inc., P.O. Box 248, Wilmot, WI, 53192, seat and tubing for waterskiing.

Klefers, Adolph. 1750 Harding Road, Northfield, IL, 60093, (800-323-4071).

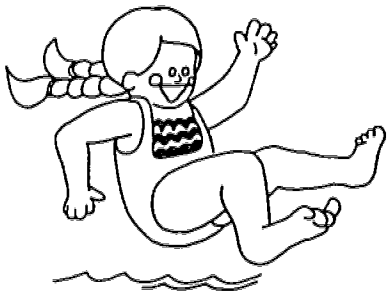
Pull-Buoy, Inc. 2511 Leach Road, Auburn Heights, MI, 48057.

Stadiums, Unltd., Box 374, Grinnell, Iowa, 58112, Tot Dock: Portable aluminum, swim platform in adjustable heights.

Wet Wrap, Equipment Shop, P.O. Box 33, Bedford, MA, 01730, (617) 275-7681.

APPENDIX

The University of Rhode Island, Kingston, RI 02881-0810
Department of Physical Education, Health & Recreation, Tootell Physical Education Center



University of Rhode Island
Department of Physical Education,
Health and Recreation
Adapted Physical Education Program

The Department announces an Adapted Aquatics swim program for children with disabilities. The enclosed parental and medical forms must be completed in order to better serve the individual needs. Parental responsibilities include: care of dressing your child and bringing the child to the pool deck and back to the locker room.

What: 10 week swim program

Who: Children with disabilities ages 4-14

Where: University of Rhode Island, Tootell Pools

When: Mondays, September 28, 1987 through November 30, 1987
Time: 4:00 - 5:00 PM

Why: Teach children to swim; serve community needs, assist in training physical education students in aquatics.

Staff: ARC Certified Instructor Trainer in Adapted Aquatics; Water Safety Instructors; lifeguard; University of Rhode Island physical education students.

Deadline: All forms must be returned by September 24, 1987.

In order to assure the child's progress and success, weekly attendance is an important factor. Please call the Department if enable to be present for a session so that teaching adjustments may be made. Only a limited number of children can be served so participation is important.

Join us for another fun swim program. Except for hurricane, tornado or national disaster, we plan to see you there!

For information please contact: Dr. Lorraine E. Bloomquist
University of Rhode Island
126 Tootell Center
Kingston, RI 02881
(401) 792-7110, (401) 792-2975

ADAPTED PHYSICAL ACTIVITY PROGRAM - MEDICAL INFORMATION

NAME OF STUDENT _____ DATE OF BIRTH _____

HOME ADDRESS _____ HOME TELEPHONE NUMBER _____

NAME OF PARENT OR GUARDIAN _____ WORK TELEPHONE NUMBER _____

SCHOOL CHILD ATTENDS _____ CITY _____

TO THE PHYSICIAN:

The above named person is planning to enroll in a program where the games and skills to be taught will be determined by the condition of the student. In order to plan a program to meet the specific needs of the student, it is necessary that those responsible for the planning have certain facts concerning the student.

PHYSICIAN RESPONSE:

1. Diagnosis: (if advisable)

_____

_____

2. Recommended physical activities:

_____

3. Specific body movements or positions desired (especially in water):

_____

_____

4. Specific precautions that should be taken, or special needs, ear plugs, etc. (especially in water):

_____

_____

5. Is the person subject to seizures? Yes_____ No_____

6. When was the last time a seizure occurred? _____

7. If taking medication, what type/name? _____

8. What are the side effects, if any? _____

Adapted Physical Activity Program - Medical Information
Page Two

9. Does the child use any of the following equipment?

Wheelchair _____ Walker _____ Crutches _____

Artificial Limb _____ Leg Braces _____ Other_____

10. When should equipment be worn? _____

11. If child has Down Syndrome, has he/she been tested for Atlanto-axial instability? Yes _____ No _____

12. If yes, see below.

13. Date of last Tetanus Booster: _____

14. Other Comments:

_____

_____

PHYSICIAN'S NAME:_____

PHYSICIAN'S SIGNATURE:_____

TELEPHONE NUMBER:_____ DATE:_____

DATE: _____ PARENT OR GUARDIAN:_____

PHYSICIAN STATEMENT FOR DOWN SYNDROME PARTICIPANT

1. On roentgenographic examination of the upper cervical spine I find (check one):

A. _____ No evidence of abnormalities of the upper cervical spine during flexion, extension and neutral positions.

B. _____ Evidence of abnormalities in the upper cervical spine as manifest by:

_____ increased atlanto-dens interval (greater than 4.5 mm)

_____ abnormal configuration of the odontoid (dens)

2. The patient has evidence of spinal cord compression by either history or physical (neulogical) examination.

Physician's Signature:_____ Date:_____

PARENT'S CONSENT RECORD
ADAPTED PHYSICAL EDUCATION PROGRAM FOR CHILDREN
UNIVERSITY OF RHODE ISLAND

In case of injury received en route to or during the physical education activity session, the instructor will attempt to furnish temporary first aid only. The sponsoring department can neither be held responsible for administering medical attention which might be required nor can they assume responsibility for loss or damage suffered by reason of injury to the participant(s). If, in case of injury the parent and/or family physician cannot be located, the instructor is authorized to use his best judgement in determining procedure for care of the injured participant(s). Parents are obligated to pay for professional, medical and/or related services, and the University shall not be held responsible for the payment for such services.

Bring suit and towel, and help your child to the pool deck. Assume responsibility after leaving the pool deck. After class, assist your chi' dress if needed.

Plea e retain the top part of this page for information purposes.

Department of Physical Education (Adapted Children's Program)
Dr. Lorraine E. Bloomquist, Tootell Center, Kingston, RI 02881
Telephone: 792-2975, 792-2976

PARENT'S CONSENT RECORD
ADAPTED PHYSICAL EDUCATION PROGRAM FOR CHILDREN
UNIVERSITY OF RHODE ISLAND

In case of injury received en route to or during the physical education activity session, the instructor will attempt to furnish temporary first aid only. The sponsoring department can neither be held responsible for administering medical attention which might be required nor can they assume responsibility for loss or damage suffered by reason of injury to the participant(s). If, in case of injury the parent and/or family physician cannot be located, the instructor is authorized to use his best judgement in determining procedure for care of the injured participant(s). Parents are obligated to pay for professional, medical and/or related services, and the University shall not be held responsible for the payment for such services.

CHILD'S NAME:_____ DATE OF BIRTH:_____
(Or self if over 18 years of age)

PARENT'S SIGNATURE:_____ DATE:_____

Physical Disabilities or Limitations of Activity for child:

_____

Current interest/skill of child in swimming:_____

_____

Additional helpful information, objectives for child, etc.:_____

_____

Does child need help in dressing? Yes_____ No_____
CHECK BOX ONLY IF YOU DO WANT PICTURES OF YOUR CHILD TAKEN FOR PROMOTIONAL OR EDUCATIONAL PURPOSES: YES_____

PLEASE RETURN THIS FORM TO DR. LORRAINE E. BLOOMQUIST, UNIVERSITY OF RHODE ISLAND, DEPARTMENT OF PHYSICAL EDUCATION, HEALTH AND RECREATION, TOOTELL CENTER, KINGSTON, RI, 02881

DATE:_____

TEACHING LESSON PLAN

NAME OF TEACHER:_____

TEACHING SUBJECT:_____ TOTAL CLASS TIME:_____

SIZE OF CLASS:_____ TYPE OF STUDENTS:_____

OBJECTIVES (ONE OR TWO, SPECIFIC TO SUBJECT MATTER):

_____

_____

_____

EQUIPMENT:

_____

PROCEDURE:

1. WARM-UP (FORMATION, TYPE EXPLAINED): TIME:_____

_____

_____

2. PRESENTATION OF SUBJECT (PROGRESSION, FORMATION): TIME:_____

_____

_____

_____

3. TEACHING HINTS OR CUES:

_____

4. COOL DOWN ACTIVITY: TIME:_____

_____

5. EVALUATION:
   A. PERCEPTION OF CLASS RESPONSE:

_____

   B. TEACHER SELF-EVALUATION:

_____

_____

   C. SUPERVISOR'S COMMENTS:

_____

_____

LEB/NMF