

# **CEC ARTICLE1, 2008: Adaptive Aquatic Arthritis Exercise**

## **By C. Holcomb**

Derived from two Greek words.

arthron - means joint

itis - means inflammation

There are 127 different kinds of arthritis. (Arthritis, Your Complete Exercise Guide; Neil F. Gordon). One in every seven Americans is afflicted with arthritis, and is not limited to the elderly. It can strike any age. There are mechanical forms and rheumatic forms:

Mechanical forms: include direct injury to cartilage and bones through accident or cumulative joint damage.

Rheumatic forms: are chronic (i.e. incurable, with recurrent symptoms) and can affect bones, muscles and connective tissue.

Two most common forms of arthritis:

1. Osteoarthritis: loss of joint cartilage.

This mechanical damage usually occurs in the weight-bearing joints (spine, hips and knees). Cartilage is gradually lost until there is bone-on-bone inflammation and bone loss. It usually strikes after the age of 40, and progresses slowly.

2. Rheumatoid: painful, swollen and often disfigured joints

This arthritis can appear in any joint in the body, can strike at any age and affects more women than men. Rheumatoid arthritis involves an autoimmune response in the body. The immune system mistakenly attacks and destroys healthy tissue. This causes tissue breakdown, leading to painful, swollen and often-disfigured joints.

The following principles should be followed:

- Water and air temperature should be at least 84 F.
- Arms can be raised overhead, but only with the shoulder joints submerged, and only within a comfortable range of motion.
- Muscles should fully relax between contractions.
- Pain or fatigue are the body's signals to stop.
- People with fibromyalgia should exercise for only 20 min. at a time, at first, to avoid overexertion.
- Breathing should be deep and rhythmic at all times.
- Additional resistance equipment (buoys, bells, gloves, etc.) should only be used under the direct supervision of a qualified physical therapist.

Part of any good arthritis program is the socialization of the participants. Arthritis starts the pain cycle that causes sufferers to withdraw from social activities. Encourage interaction between participants, and encourage family involvement. Information for this class was extracted, in part, from the Arthritis Foundation YMCA Aquatic Program (AFYAP) and AFYAP PLUS Instructor's Manual.

## What role does exercise play in arthritis care?

Exercise is very important in managing arthritis. People with arthritis should exercise daily by practicing slow, controlled movements through each joint's full range of motion. The sequence of an arthritis workout is very important.

Slow warm-up of walking variations, emphasizing proper postural alignment and full ROM in feet and ankles-heels to toe, and toe to heel.

Static stretches of trunk, legs, shoulders, and neck.

Low intensity endurance segment, using slow, rhythmic movements, and going only 50-75% of maximal heart rate

Joint isolation exercise employing strengthening and flexibility components, keeping all moving joints submerged.

For people with bursitis of the shoulder actions like unzipping a dress and reaching overhead can be difficult so joint range of motion exercises for the shoulders is important.

For people with arthritis of the knees, strengthening the quads, hamstrings, gastrocnemius, soleus and tibialis anterior (muscles of the knee) is important.

For people with arthritis or bursitis of the hips, strengthening the hip extensors, hip flexors, abductors and adductors is important.

Alternate periods of work and rest,

-Circuit training: endurance, strength, balance

-Water properties: levers, form drag, speed

-Working levels: buoyancy+other properties

-“Brain” Work- one hand does one joint motion and the other does a different one then switch and bodywork

-Patterns: Add-on, link, pyramid, layer, etc.

-Partner Noodles

-Line Dancing

-Races and Pair competitions

Final Static stretch

## Formats for Arthritis

Arthritis Considerations

### 1. Limitations

Range of motions

Move through the water

Arms in the water

Exercise adherence

### 2. Program Design – 1

10 min warm-up

5 min static stretches

10 min water walking

### 2. Program Design – 2 for those with mild arthritis

10 min warm-up

5 min static stretches

35 min combined water

5 min upper body conditions  
 10 min low level aerobics  
 15 min noodles  
 15 min stationery ROM  
 5 min stationery stretches  
 Pool temperature (83-86)

walking ROM with upper  
 body ROM  
 8 min balance  
 12 min stationery lower  
 body ROM  
 5 min stationery stretches

### 3. Balance/Stabilization

Balance on one foot  
 Travel backward, laterally, and diagonal  
 Freezes  
 Currents  
 Change ROM  
 TaiChi  
 Slow-Motion Moves  
 Find a Spot, 1 Leg at a time-side of pool and middle of pool  
 Noodles/Buoyancy devices  
 Direction Changes

### 4. Flexibility

Static Stretches, Soleus, Achilles, Quadriceps, Gluteus, Hamstrings, Deep 6 Rotators

### 5. Kinds of Arthritis

### 6. Music

## Arthritis Moves

Stationary (at the wall)	Perform while doing water-walking moves.	On a noodle
<p>Stand sideways at the wall; hold the edge of the pool for balance.  <b>Hip flexion/extension:</b> lift the leg slowly to the front. Keep the back erect; do not slump. Lower the leg to starting position.</p> <p><b>Gluteal strengthening:</b> squeeze buttocks tightly together. Hold for 5 seconds. Relax, repeat.</p> <p>Stand with back to the pool wall, knees relaxed.  <b>Hip internal/external rotation:</b> Tap the toe out and in, pivoting on the heel. Motions should take place in the hip.</p>	<p><b>Arm abduction/adduction</b> (jumping jack arms)</p> <p><b>Arm abduction/adduction and internal rotation:</b> cross arms in front of the body, and in back of the body.</p> <p><b>Pinch shoulder blades together,</b> then round the back by rolling the shoulders forward.</p> <p><b>Shoulder shrug.</b> Shrug both shoulders; shrug one at a time.</p> <p><b>Elbow flexion/extension</b> (bend the elbow, try to touch the thumbs to the shoulders. Keep elbows close to the side of the body)</p>	<p><b>Hip abduction/adduction</b> (jumping jack legs)</p> <p><b>Hip and knee flexion/extension:</b> "bicycle"; pedal the legs.</p> <p><b>Hip flexion/extension:</b> Front leg lifts, and cross country ski.</p> <p><b>Hip and knee flexion/extension:</b> March, lifting one knee up then the other.</p>

<p>Stand sideways. <b>Internal/external rotation:</b> (fishtail) Lift one knee up; rotate the knee out the side, then return to midline.</p> <p>Stand sideways. <b>Hip abduction/adduction:</b> Abduct the right leg to the side, and then pull it in toward the wall, crossing the midline. CAUTION: if a participant has had a hip replacement, they should not cross the midline.</p> <p><b>Hip rotation:</b> Leg circles. abduct one leg to the side, then make inward circles with the leg; reverse and make outward circles with the leg.</p> <p>Stand with back to the pool wall. <b>Ankle dorsiflexion/plantar flexion, ankle inversion/eversion:</b> point and flex the foot; circle the ankle; turn sole of the foot inward then outward.</p> <p><b>Ankle dorsiflexion/plantar flexion:</b> Calf raises. Rise up on balls of feet, lower then roll back onto the heels while lifting up the toes.</p>	<p>REPEAT this exercise touching the fingertips to the shoulders. Palms face down when lowering the hands. Advanced variation - touch the fingertips to the shoulders and lift the elbows up higher.</p> <p><b>Elbow flexion/extension:</b> place the hands together, bending both elbows until the hands touch the right shoulder. Slice the hands down to touch the outside of the left thigh. Reverse; repeat.</p> <p><b>Scapular retraction:</b> raise both arms in front of the body. Bend the elbows sliding them back and behind the body, pinching the shoulder blades together. Keep the bent arm parallel.</p> <p><b>Shoulder circumduction (rotation:)</b> raise both arms in front of the body - palms up. Push the arms out to the side, palms back and thumbs down. Lower the arms. Repeat.</p> <p><b>Shoulder circumduction:</b> make circles with the shoulders, forward and backward. Arms are at the sides.</p> <p><b>Supination/pronation:</b> Turn the palm toward the ceiling; then turn them down to face the bottom of the pool. Keep elbows near waist.</p> <p><b>Finger flexion/extension:</b> Curl the fingers in to make a loose fist, then straighten them out.</p>	
<p>Stationary - continued</p>	<p>With water walking moves - continued</p>	
<p><b>Combined arm movements - stationary.</b></p> <ol style="list-style-type: none"> <li>1. With straight arms, clap the hands together in front, then in back.</li> <li>2. Clap the hands together in front, then raise them straight up, Then lower the arms slowly, and clap them behind the back.</li> <li>3. Raise the arms to the side, then up overhead, touching the palms together. Lower the arms.</li> <li>4. Clap the hands together, low in front, fingertips towards the pool floor. Keep the palms together, and raise the arms overhead;</li> </ol>	<p><b>Finger flexion/extension:</b> Bend and straighten the fingers in both hands to imitate a cat's clawing motion.</p> <p><b>Finger flexion/extension:</b> Bend each finger as though playing a piano.</p> <p><b>Thumb opposition:</b> Touch the tip of the left thumb to the tips of the other fingers, one at a time, to form a round letter O.</p> <p><b>Thumb flexion/adduction:</b> Touch the left thumb to the base of each finger in the left hand. Repeat with the right hand. Perform both at the same time.</p>	

<p>keep the palms together as you lower the arms to starting position.</p> <p>5. Raise both arms overhead. Slowly move both arms side to side while they are overhead. Trunk does not move.</p> <p>6. Clasp the hands together in front of the body. Slowly turn the trunk to the right using the hands to direct the turning motion. Moving upper body only, do not move the hips, pelvis or feet.</p> <p><b><u>Pull your dress zipper.</u></b></p> <p>Reach one hand up and over to the "top of the dress zipper".</p> <p>Reach one hand at the base of the spine to the "bottom of the dress zipper".</p>	<p><b><u>Thumb circumduction:</u></b> Move the thumb in a large circle, in each direction.</p> <p><b><u>Wrist flexion/extension:</u></b> bend both wrists backward and forwards.</p> <p><b><u>Wrist extension:</u></b> Praying hands palms together. Lift the elbows up, and rotate the heel of the hands toward chest. Keep heels of hands together.</p> <p><b><u>Wrist extension/flexion:</u></b> Praying hands, lace the fingers. Press the left hand gently forward with the right hand. Reverse.</p> <p><b><u>Combined arm motions:</u></b></p> <p>Breast stroke Crawl stroke</p>	
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## Anchored Aquatix Walking ROM

Circles in the Sand – Moving Backward, Step back on the right leg, circle the left leg from the front to the back, step on the left leg, and circle the right leg from the front to the back

Charleston – Step right, kick the left leg front, step left, touch the right toe in back, repeat on other side.

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Crab Walk – Feet opened wide, squat down with shoulders under the water, then scuttle.

Cross Country – Anchored on the left leg, move the right leg forward and back, repeat on other side.

Fish Tail Walk – Step on the right leg, left foot on the right knee, open the left knee to the side, and to the front, then step forward, repeat on other side.

Grapevine – Step side cross back, step side cross front

Hamstring Curls – Travel backwards, step on the right, and curl the left leg behind. repeat on other side.

Heel Walk – Walk on your heels

Hopscotch – Start with legs apart, reach the left hand to the right ankle, step; repeat on other side.

Jacks – Anchored on the left leg, move the right leg out and in. repeat on other side.

Knee Extension – Bend the knee; straighten it as you step forward (do not lunge)

Lunge Walks – Forward and Backward. Shoulders drop under the surface on the lunge, and then stand up tall.

Mule Kick – Balance on the left leg, swing the right knee up, then extend it to the back near the floor. repeat on other side.

Punch Kick – Balance on the left leg, bend the right knee, punch the leg to the floor in front, bend the right knee, and punch the leg to the floor in back. repeat on other side.

Rocking Horse – Step lift the right knee to the front, step curl the left leg behind

Side Together – Step to the side with stiff, straight legs then step together

Skateboard – Anchored on the right leg, sweep the floor with the left foot a number of times as if riding a skateboard. repeat on other side.

Soldiers March – (Goose Step\_ Lift the leg straight up and down as you travel

Step Kick - Step then do a flit kick, kicking out from the knee

Step Touch – Step right leg front, touch the left toe to the side. repeat on other side.

Square Dance – Hand over hand, Do-Se-Do

Squats – Sideways. Shoulders drop under the surface, and then stand up tall

Toe Walk – Walk on your toes

Triplet – Two steps up on your toes, one lunge. Repeat.

Walk Backward – Arms do a crawl stroke forward or a breast stroke/pull

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1. What air and water temperature is recommended for arthritis workouts?
  
2. When should resistance equipment be used with arthritis classes?
  
3. The term arthritis refers to any \_\_\_\_\_, and applies to over 100 different diseases.
  
4. \_\_\_ Mechanical forms of arthritis are chronic, and can affect bones, muscles and connective tissue.  
(True/False)
  
5. The two most common types of arthritis are \_\_\_\_\_ and \_\_\_\_\_.
  
6. Exercise programs for arthritis should include:
  - a) slow warm-up
  - b) static stretches in warm up
  - c) low intensity aerobics/endurance
  - d) moderate intensity aerobics/endurance
  - e) joint isolation exercises
  - f) warm down
  - g) static stretches in warm down
  - h) all but b
  - i) all but d
  - j) all but c
  - k) all but b and d
  - l) all but b and c
  
7. \_\_\_ Recommended air and water temperature is at least \_\_\_ degrees
  - a) 92
  - b) 86
  - c) 84
  - d) 82

8. \_\_\_ One of the most important aspects of an arthritis program is \_\_\_, because it can break the pain cycle, which causes sufferers to withdraw.

- a) range of motion
- b) endurance
- c) socialization
- d) stretching

9. \_\_\_ Case studies done at the Cooper Institute show that regular exercise is the most important aspect of an effective treatment plan. In addition, exercise helps combat depression. (True/False)

10. \_\_\_ The bursa sacs, ligaments and tendons in these joints may become inflamed, making us unable to perform tasks such as zipping back zippers, reaching overhead, and scratching our backs.

- a) elbows
- b) shoulders
- c) wrists
- d) spine

11. \_\_\_ and \_\_\_. It is important for individuals with osteo-arthritis of the HIPS to strengthen these muscles.

- a) hip flexor and extensor
- b) iliotibial band and sortorius
- c) adductors and abductors
- d) anterior tibialis and gastrocnemious
- e) adductors and iliotibial band
- f) quadriceps and hamstrings

12. \_\_\_ and \_\_\_. It is important for individuals with osteo-arthritis of the KNEES to strengthen these muscles.

- a) hip flexor and extensor
- b) iliotibial band and sortorius
- c) adductors and abductors
- d) anterior tibialis and gastrocnemious
- e) adductors and iliotibial band
- f) quadriceps and hamstrings

13. List 5 joint isolation exercises for the upper body (fingers, hands, wrists, shoulders)

- 1) \_\_\_\_\_
- 2) \_\_\_\_\_
- 3) \_\_\_\_\_
- 4) \_\_\_\_\_
- 5) \_\_\_\_\_

14. List 5 joint isolation exercises for the lower body (hips, knees, and feet)

- 1) \_\_\_\_\_
- 2) \_\_\_\_\_
- 3) \_\_\_\_\_

- 4) \_\_\_\_\_
- 5) \_\_\_\_\_

15. List 5 anchored aquatic moves.

- 1) \_\_\_\_\_
- 2) \_\_\_\_\_
- 3) \_\_\_\_\_
- 4) \_\_\_\_\_
- 5) \_\_\_\_\_

16. List 3 balance training exercises.

- 1) \_\_\_\_\_
- 2) \_\_\_\_\_
- 3) \_\_\_\_\_

17. \_\_\_\_ It is okay for the arms to be out of the water with arthritis participants when performing joint isolation movements for the shoulders as long as the shoulders are out of the water as well. (True/False)