

# Research Update



Practical, leading edge research results applied to physical activity for older adults, in plain language for health practitioners and leaders.  
Sponsored by the Active Living Coalition for Older Adults (ALCOA).

## Exercise Programming for Alzheimer Disease and Related Dementias

Written by Elizabeth Lusk, M.Sc. Candidate, University of Western Ontario, Canadian Centre for Activity and Aging;  
Stephanie Luxton, M.Ed. Candidate, Education Coordinator, Canadian Centre for Activity and Aging;  
and Denise Connelly, PhD, Associate Professor, Faculty of Health Sciences, University of Western Ontario of Western Ontario

### Active Living Coalition for Older Adults

33 Laird Dr., Toronto  
ON, M4G 3S9  
Toll-free: 800 549-9799  
Tel.: 416-423-2163  
Fax: 416 423-2112  
E-mail: [alcoa3@ca.inter.net](mailto:alcoa3@ca.inter.net)  
[www.alcoa.ca](http://www.alcoa.ca)

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**A**lzheimer disease is a progressive degenerative disease of the brain that affects memory, thinking, behaviour and emotion. Alzheimer disease is not a normal part of aging. It mostly affects people over the age of 65. In Canada, Alzheimer disease and related dementias (ARD) affect 1 in 13 people older than 65, and 1 in 3 of those 85 and older. As the baby boom ages, more than 750,000 Canadians could be affected by 2031. ARD leads to a gradual decline in physical function affecting an individual's ability to independently perform daily tasks such as eating, bathing and getting dressed.

The behavioural changes associated with ARD can be devastating to loved ones. Examples of these behavioural changes are:

- agitation
- anxiety
- depression
- restlessness
- wandering
- physical outbursts
- repetition of words or actions
- anger - often directed at caregivers.

Any or all of these may be experienced as the individual progresses through the stages of the disease (mild, moderate and severe).



### Treatment for Alzheimer Disease

Canadians spend about \$3.9 billion each year to treat people with ARD. Since ARD is progressive and incurable, the goal is to maintain physical functioning and independence for as long as possible. Treatment focuses mainly on improving or preserving the quality of life of patients and their families and on treating associated psychosocial, behavioural and medical issues. Because people with ARD require varying levels of supervision and personal care by caregivers, both the individual and the caregiver are victims of ARD. Case management — relieving symptoms of ARD as well as reducing stress on caregivers — becomes an essential component of treatment.

### Does physical activity play a role?

There is growing evidence that regular physical activity helps to ward off mental decline as people age, and may even protect against ARD. A Canadian study assessed 4,615 older adults and found an association between physical activity and decreased risk of cognitive impairment, Alzheimer disease, and dementia of any type. Data from the Canadian Study of Health and Aging: Risk factors for Alzheimer's Disease in Canada (1994) indicate that regular physical activity was associated with a reduced risk of ARD. The Alzheimer Society of Canada suggests that regular physical activity may reduce the risk of ARD.

## Acknowledgements

### Author:

**Shanthi Johnson, PhD, P.Dt.**  
Acadia University  
Wolfville, NS

### ALCOA Research Committee Chair:

**Michelle Porter, PhD**  
University of Manitoba  
Winnipeg, MB

### Research Committee Members:

**Denis Drouin**  
La Fondation en Adaptation Motrice  
Saint-Augustin-des-Desmaures, PQ

**Gareth R. Jones, PhD**  
University of Western Ontario  
London, ON

**Philippe Markon, PhD**  
University of Quebec  
Chicoutimi, PQ

**Mike Sharratt, PhD**  
University of Waterloo  
Waterloo, ON

**Don Wackley**  
Ontario Coalition of Senior Citizens Organizations  
Toronto, ON

### Reviewed by:

**Robert Petrella MD, PhD**  
University of Western Ontario  
Canadian Centre for Activity and Aging  
London, ON

### ALCOA Staff:

**Pat Israel**  
**Imran Syed**

### Photos:

**Health Canada**

In the early stages of ARD, motor function is usually intact. This means people with ARD can usually derive the same benefits from physical activity as those obtained by healthy older adults.

The benefits of physical activity for people with ARD are:

- retained functional mobility, active lifestyle and health
- improved physical and mental function
- reduced anxiety, agitation and tension
- increased daytime alertness
- improved sleep patterns
- reduced irregular behaviour, such as wandering
- improved continence
- improved diet
- increased self esteem
- decreased burden on caregiver(s).

Several research studies have shown that these desired outcomes result from increased levels of physical activity. One researcher designed a student-supervised exercise program including a combination of aerobic and strength training for people with ARD. A significant increase in duration and distance walked was measured after participation. Many participants were also able to increase the amount of weight pressed in the leg press and the chest press exercises. The program also produced a significant improvement in mood for all exercise participants. Positive results for caregivers were also reported – many felt a reduced burden in one or more areas.

## What current research tells us about physical activity in people with ARD?

Both aerobic and strength training exercise have been used to address declines in function associated with Alzheimer disease and related dementias.

Some important studies are given below:

- A randomized-controlled experiment compared the effects of 30 minutes of walking with 30 minutes of conversation, 3 times per week for 10 weeks. The results indicated that walking resulted in more significant improvement in the communication skills of people with ARD than the conversation did.
- Another study found a 50% reduction in agitation for subjects who took part in low-intensity aerobic exercise 40 minutes daily for 28 days, compared to those who did not. The improvements were reported as a decreased

frequency in "wanting to leave," "complaining," and "verbal aggression." For the group that did not participate in exercise, nine types of agitated behaviour (such as "eating or drinking inappropriately" increased, in some instances by almost 100%).

- One study evaluated the effects of care-giver-assisted, home-based physical activities. The activities, chosen by the participant and the caregiver, could include endurance exercise in the form of walking or stationary bicycle work, resistance exercise, or balance training. After about 7 weeks, participants showed a significant improvement in mental function and nutritional status as well as a significant decrease in risk of falls. It should be noted that most participants and caregivers chose aerobic activity over resistance exercise.
- One study found a 40% decrease in night-time agitation in 22 Alzheimer patients who took part in a 40 minute, 7 day per week, 4 week long aerobic exercise program.
- Still another recent study looked at the effects of exercise on people with ARD when their caregivers participated along with them. The caregivers were taught how to lead the exercises, as well as behaviour management techniques. A control group received routine medical care. When compared to the control group, even 2 years after the study, the intervention group exercised more, had fewer days of restricted activity, had reduced levels of depression, and enjoyed improved physical function.

## Summary of Findings

To date, walking and strength training studies for people with Alzheimer and related dementia have measured improvements in:

- chair rise time
- standing time
- distance walked and walking speed
- night-time sleep
- agitation
- mental function
- capacity to communicate
- continence
- nutritional status.

## Limitations to the Current Research

While most of the studies identified an improvement in some of the outcome measures taken pre- and post-exercise intervention, the duration and format of the exercise program may limit improvement in level of independence. The studies that identified an

improvement had a higher frequency of exercise intervention (3 to 7 times a week) and duration (4 weeks to a year). A learning period may be required before exercise becomes effective. It has been suggested that a seven-week intervention is not long enough to result in a change in independence. It has also been suggested that a lack of support by caregivers decreases the effectiveness of home-based exercise programs.

To date, it is difficult to assess what level of exercise intensity is most beneficial, as many studies do not report the intensity of the exercise program. Interestingly, the effects of exercise were not different for participants with varying levels of dementia. This suggests that exercise may be an effective strategy to promote function in those in the early and middle stages of ARD.

Many of the studies used small samples or lacked a control group. Keeping in mind the difficulties of conducting research with this population, care providers and policy makers may have to accept evidence that is more anecdotal.



## Leading a physical activity program for participants with ARD

As a leader of programs for people with ARD, you must be able to do four things effectively:

- select the appropriate form of physical activity
- communicate
- use strategies for increasing participation and adherence
- create a safe and appropriate environment for exercise.

### Screening

It is important to screen all participants before starting an exercise program. In particular, individuals should be screened for high blood pressure as well as high resting heart rate, and medications that may have an effect on the cardiovascular response to exercise. If individuals are going to participate in high intensity exercise then monitoring of heart rate could also be

done during exercise. Participants should consult a physician or other health professional before making significant changes to their activity level.

### Communication

People with ARD may have difficulty following instructions because they do not understand or they are unable to pay attention to what is being said. They may also respond inappropriately and have difficulty making their needs understood. The Alzheimer Society of Canada recommends the following when communicating with someone who has ARD:

- Limit distractions.
- Get their attention.
- Make eye contact.
- Speak slowly and clearly.
- Give one message at a time.
- Pay attention to their reaction.
- Repeat information using the same words.
- Use actions as well as words.
- Allow them time to respond.

These statements are supported by research. As the number of conversational partners increases, individuals with ARD have greater difficulty following the conversation. This effect also occurs if the speaker moves around while talking. It may be necessary to have one-on-one supervision for even the simplest exercises. Research on communication also supports using closed or "yes-no" questions and suggesting words if the individual becomes "stuck" while searching for the correct word. As well, it is important not to argue with the individual. Speaking in a cheery tone with a calm approach can often help to change their mood, as they may understand the tone of the speech better than the actual words.

### Increasing participation and adherence to physical activity

Due to the memory impairments associated with dementia, the keys to success of an exercise program are structure and repetition. This means using the same:

- training room
- equipment (such as a theraband or weight machines)
- exercise leaders
- exercise routine (such as line dancing or an order of exercise).

The level of supervision needed should be determined for each individual, taking his or her memory impairment into account. Timing of the exercise activity is very important. Morning has been shown to be the best time to maintain adherence to exercise with individuals with ARD since they are more alert and able to concentrate at that time of day.

Recent studies have shown that combining physical activity and cognitive stimulation produces significant gains in people with mild to moderate ARD. It is often

difficult to get them to do aerobic activities long enough to gain any physical benefit. Cognitive activities help them maintain attention while using a treadmill or a stationary bicycle for a longer period of time.

Some examples of the cognition or language activities used are:

- Category fluency: "Name as many fruits as you can."
  - Word association: "Tell me all of the thoughts that the word wedding reminds you of."
  - Similarities: "What do these two words have in common?"
  - Sentence completion: "The dog jumped over the ..."
- In this particular study, students were paired with individuals with ARD; other studies have used caregivers. Another idea for promoting adherence is to create a fitness trail, with stations promoting exercise and sensory stimulation. Stations might include familiar movements such as folding towels, hanging clothes, or putting keys into locks.

The use of music when exercising must be carefully considered. In a case where you need their full attention, for example during a stretching or strength training component, you should avoid using music -- it will distract the participant. When doing aerobic activities such as walking or dancing, using music that was popular when the participant was young may encourage him or her to move. However, this should be evaluated on an individual basis. One exercise intervention program incorporated music with positive verbal reinforcement. Held 3 times a week for 9 weeks, the program reported an increased ability of exercise groups to follow directions, increased interactions among members, and elimination of some inappropriate behaviours, such as swearing.

### ***Creating a safe environment***

It is important to inspect the environment in which the exercise program will take place very carefully. Temperature, lighting and noise can all affect people's ability to maintain attention. Lines on the floor may be perceived as holes or cracks and they may hesitate to cross them for fear of tripping or losing their balance, increasing the risk of falling. People with ARD often will forget where they are and may see unfamiliar surroundings as threatening.

It is important to exercise in a quiet, calm and familiar environment. Circular paths for walking can ensure that the individual does not become lost or confused. Exercising in the same place and using the same equipment will allow the participant to become familiar with the activity.

Remind participants to drink water so that they do not become dehydrated. Carefully monitor them to ensure that they are not overexerting themselves. Use the

"talk test" during endurance training: if they cannot talk, have them slow down. Ensure that they are using equipment properly to prevent injuries.

### **Points to remember when leading exercises:**

- Keep instructions simple.
- Repeat if necessary.
- Build on familiar activities.
- Limit distractions.
- Use demonstrations.
- Be flexible.
- Praise and encourage.
- Make it fun!
- Keep a daily routine.

### **Future directions and recommendations for research**

Apparent benefits in mental and physical function, as well as behavior, have been brought about for individuals with ARD through participation in exercise intervention. Due to a lack of follow-up data and measures, there is no clear evidence of the long-term benefits gained from increased levels of physical activity for people with ARD. More studies using randomized samples need to be done to assess whether exercise intervention can be generalized. Researchers are now looking at what types of activity and intensity levels are best for ARD and what is most feasible and enjoyable for these individuals and their caregivers. What's more, researchers are looking to see whether increased physical activity for caregivers will help to decrease the levels of depression and burden experienced by this population.



The views expressed in this newsletter are those of the authors and do not necessarily reflect those of Health Canada.

# Research Update Reader Survey

Please take a few moments to complete this survey. Your comments and feedback will help ALCOA improve the *Research Update*. Please be assured that your responses will remain confidential.

If you are interested in being entered into a draw for prizes, please submit your details in the space provided at the end of this survey.

## YOUR THOUGHTS ON THE EXERCISE AND ALZHEIMER DISEASE ISSUE

**1. Please circle the response that best describes how much new information you learned about each of the following topics.**

	Learned a great deal	Learned some new things	Did not learn anything new
a. The benefits of physical activity for those with Alzheimer's	1	2	3
b. Communicating more effectively with those who suffer from Alzheimer Disease	1	2	3
c. Creating a safer environment for exercise for those with Alzheimer's	1	2	3

**2. Please rate the issue on the following components (circle your response).**

	Excellent	Good	Fair	Poor	Not Sure
a. Selection of topics	1	2	3	4	NS
b. Quality of information	1	2	3	4	NS
c. Usefulness of information	1	2	3	4	NS
d. Use of visuals (e.g., pictures, layout)	1	2	3	4	NS
e. Overall rating of the Issue	1	2	3	4	NS

**3. Is there anything that you intend to do based on what you have read?** 1  Yes 2  No  
 If Yes, what do you intend to do?

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## YOUR THOUGHTS ON THE ALCOA RESEARCH UPDATE NEWSLETTER

**4. Please rate the EFFECTIVENESS of the *Research Update* in meeting the following objectives.**

	Not at All Effective	Somewhat Effective	Very Effective
a. Keeping you informed on up-to-date information / research on physical activity and older adults	1	2	3
b. Communicating in clear and plain language	1	2	3
c. Providing you with practical tips for using the research	1	2	3

**5. Do you have any suggestions for future newsletter topics?** 1  Yes 2  No  
 If Yes, what topics would you like to see covered?

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**6. Do you have any suggestions to improve the *Research Update*?** 1  Yes 2  No  
 If Yes, how so?

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## DISTRIBUTION OF THE NEWSLETTER

### 7. How do you receive the *Research Update* newsletter? (check all that apply)

- Through the mail  
 At my work or organization  
 Download from ALCOA web site  
 As part of Joe Taylor's Active Living Newsletter  
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### 8a. Do you distribute or share any of the information included in the *Research Update*? Yes No

b. If Yes, with how many others (approx.) do you share the newsletter? \_\_\_\_\_

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- older adults  
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### 9. Do you know of anywhere else that you can get the type of information contained in the *Research Update*?

Yes  No

## DEMOGRAPHIC INFORMATION

10. Age:  54 years of age or less  55 –74 years  75 – 90 years  Over 90 years

11. In which province / territory do you reside? \_\_\_\_\_

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 Other (please specify) \_\_\_\_\_

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