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Brochure Inside

**From wellness to
transformation**

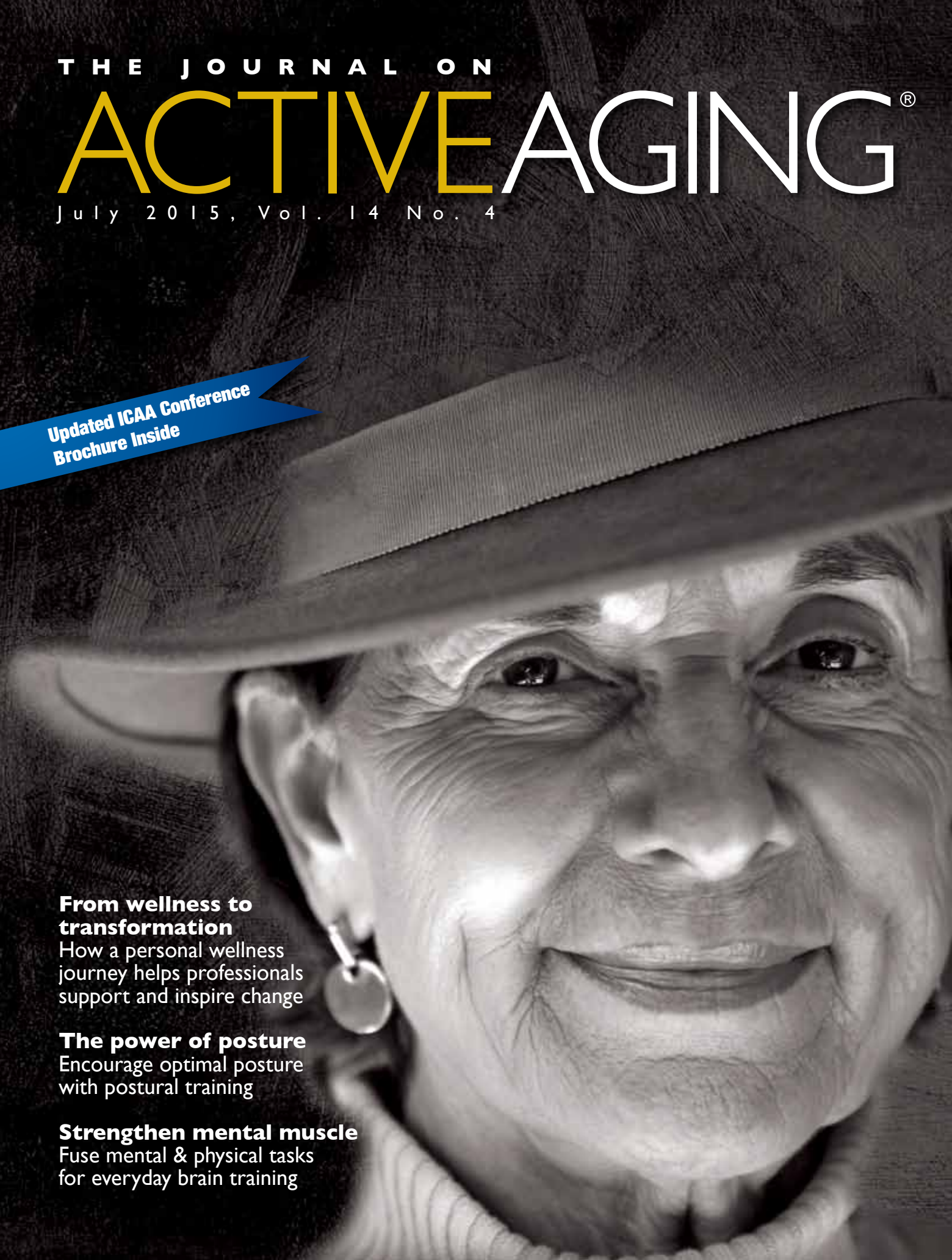
How a personal wellness
journey helps professionals
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Strengthen mental muscle

Fuse mental & physical tasks
for everyday brain training



Training the brain

to change the way we
age, part 2: building
mental muscle



Fitness and wellness professionals can help clients—and themselves—build mental muscle for healthier aging by adding neuroplasticity training to daily life

by Lawrence Biscontini, MA

This two-part article explores the brain and its functions and skills, factors that affect brain function, and practical ways to apply research on brain training. In the March/April 2015 issue of the Journal on Active Aging®, the first installment looked at brain functions and skills, as well as brain-training research. It also discussed some implications for translating research into practice. This second installment focuses on factors that have a negative impact on brain function, general guidelines for neuroplasticity training, and different brain games.

A basic understanding of new research-based findings can help fitness and wellness professionals understand what contributes to, or detracts from, optimal activities of daily-life brain function. In part one of this article, we explored the concept of *neuroplasticity*, or the brain's ability to reorganize and rewire itself in response to experiences and stimuli.^{1,2} Neuroplasticity training, also called brain training, sets out to provoke this response. For the purposes of this article, neuroplasticity training refers to mental tasks combined with physical movement of any intensity.³ Research supports the importance of this combined approach to strengthen and improve some regions of the brain.^{4,5}

In addition, neuroplasticity training must target both brain hemispheres with

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Adding a conversation game to physical activity trains both brain and body



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tasks that cause brain waves to fluctuate between the left and right sides; plus draw individual and collective responses from areas of the brain. (See part one⁶ in the March/April 2015 *Journal on Active Aging* for more.)

Before undertaking any suggested starting points for neuroplasticity training, however, everyone should understand that we can approach training the brain as if it were a muscle.^{7,8}

Research reveals that when individuals undertake any brain skill, the same concepts apply—overload, specificity, fatigue and rest—as they do to traditional physical training.⁸ Furthermore, brain-training programs may consider the traditional approach of 3 sets of 8–15 repetitions where possible, based within the framework of following practical suggestions as appropriate for each client. Simply engaging in a skill or 2 per day does little to improve the brain's function over time. As with muscles, sets and repetitions of brain games work best.⁹

This article installment provides brain games and tips on how to add neuroplasticity training into daily life to change the way we age. Let's start with a look at factors that affect both brain function and brain training.

Factors affecting brain function

Several inverse relationships exist when it comes to brain training, and we can control many of these factors with lifestyle, nutritional approaches and sleep patterns. When the following factors *increase*, our brain function tends to *decrease*:

- **Cortisol**—The more stressful our lives become, the more cortisol accumulates in the blood, slowing the brain's ability to process crucial functions.¹⁰ This stress-producing hormone can harm or kill brain cells.

- **Sleep**—The more sleep deprived the brain becomes, the less quickly it processes right- and left-hemisphere functions. Most of the research agrees that the optimal sleep amount averages 8 hours per 24 hours, and these hours do not have to be accumulative (e.g., power naps or afternoon “siestas” can total the overall sleep amount).¹¹
- **Dehydration**—Research shows that the less water the brain has to conduct neural impulses from cell to cell, the slower the brain functions. Judgment can also suffer.^{12,13}
- **Hypoglycemia**—Glucose fuels the brain, so hypoglycemia—a lack of glucose (low blood sugar)—can impair the brain's ability to function. A low caloric intake or a severely low-carbohydrate meal plan may result in low blood sugar.¹⁴
- **Disruptive, loud music**—Disruptive, loud background music over 95 decibels subconsciously distracts the brain.¹⁵ However, soft, instrumental classical music under 50 decibels may stimulate brain function in individuals with brain issues.
- **Depression**—The brain of a depressed individual processes data much slower than that of an individual with enough serotonin, a euphoria-causing natural brain chemical.¹⁶
- **Sedentary lifestyle**—Even mild activity boosts peripheral calcium to the brain, which assists with the brain's overall functions. The brain requires a delicate balance between the amount of calcium outside and inside its cells, and when this balance is disrupted, all brain functions can suffer.¹⁷

Engaging in neuroplasticity training—simple brain games with movement—supports overall health and well-being, plus strengthens “mental muscle.”

Neuroplasticity training: general guidelines

Neuroplasticity occurs with movement, but that movement can range from sim-

ply sitting and raising alternating fingers (think: frail individuals) to plyometric burpees (think: elite athletic training). In addition, select the most appropriate mental tasks that ideally undulate (fluctuate) between right- and left-brain skills. As a caveat, drills work best when done in one's strongest language, so those who speak several languages should choose the one in which they dream.

All people can have certain brain functions that they favor. As a result, clients will prefer some brain games to others—for example, left-brain mathematical puzzles such as Sudoku or right-brain crossword puzzles. To ensure well-rounded neuroplasticity training, be sure to include brain games that use the different areas of the brain.

Here are some more general guidelines for brain games:

- Most games come with timed suggestions; try to follow these closely. As an example, it may prove easy for a client to count from 1 to 50 in increments of 7, but the difficulty increases when the person has to reach the number 50 in 20 seconds or less.
- Use 7 items when working with amounts, as the research agrees that this is the most desirable number.¹⁸ As there are 7 days in a week, 7 colors of the rainbow, 7 major notes on the musical scale, and 7 digits in telephone numbers in most countries, this number of items taxes the brain in the most appropriate manner. Compensate with more or less items, as appropriate, for each individual or group.
- For visual drills, utilize color reproductions where appropriate, such as with Table 1 (see page 32).
- Consider introducing brain games to familiar activities such as walking the dog (try the Name Games that follow,

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or the Phone Number Games in part one⁶). Performing mental tasks while moving simply adds a layer to these activities.

For the purposes of this article, we'll consider any item a client can recall successfully after 29 minutes as a "memory bridge" between short- and long-term memory, often referred to in the research as "working memory."¹⁹ We use this left-brain skill when we learn the last 4 digits of a new phone number and recall them periodically during a day. When the information is repeated successfully at the end of an hour, two hours and so on, the bridge exists towards a potential long-term memory.⁸

Finally, to appeal to clients, it's best to refer to neuroplasticity training as "brain games" instead of "brain exercises." No games can include all the brain skills possible, but those provided in the first article installment⁶ and in the sections below will tax most of the brain's faculties.

Conversation games

Engaging others in casual conversation can become neuroplasticity training when participants follow a protocol of involving both hemispheres of the brain to process information in an undulating format. As a starting point, the following conversation serves as brain training as long as at least one part of the body engages in movement.

The Name Game with a friend

Two participants pair up. One person is Friend A; the other is Friend 1. This unexpected way of dividing and labeling "friends" unites left- and right-brain skills from the start. Besides participants having to stay alert to remember partner names, these labels also ensure every game is positive: Each partner is first in the alphabet or number system.

Script for part 1: What did you eat?

Friend A: "Hi, [name]. Let's play some

brain games. Can you try to tell me what you had for dinner last night in order? I promise not to judge what you tell me, but just to use the words you tell me."

[Friend 1 answers.]

Friend A: "Great. Can you now list those same items in reverse order?"

[Friend 1 answers.]

Friend A: "Terrific. Can you now list those items in a forwards order again, but spell each of the items?"

[Friend 1 answers.]

Friend A: "Good. Take the last item you mentioned and spell it backwards."

[Friend 1 answers.]

Friend A: "Fantastic. Now take one other food item you mentioned and spell it backwards."

Be sure to change roles while continuing movement.

Script for part 2: Groceries

Friend A: "Now for something different, let's talk about what we have to buy at the grocery store the next time we go. Can you name one item?"

[Friend 1 says "Bread."]

Friend A: "Good. 'Bread.' And I'll add 'strawberries.'"

[Friend 1 repeats "'Bread and strawberries.' And I'll add 'sweet potatoes.'"]

Continue in this way until you have a list of 7 food or grocery items. Before finishing the game, see how well you each can name the items in forward and reverse order.

Encourage each other as you play these games. If you find any section too dif-

ficult, ask for assistance or skip that section.

Using visual aids and equipment

Visual aids (printed papers and actual objects) can serve as games to train both sides of the brain. One caveat: Participants must ensure they have at least one hand free to hold the visual aid, while engaging the body in some form of movement.

Example of a visual game using printed lamination

Right-Left Hemisphere Integration

Start marching or squatting in place. While performing this movement, read aloud the colors—not the words—in Table 1 in order from left to right (see page 32). Perform 3 complete sets, with a 10-second rest between sets. Reading the entire table counts as 1 set. Try to accomplish each set in under 30 seconds. (Note: If you say "red" to the first word, you are starting correctly.)

Example of a visual game using objects

Object Recall Game 1

Hide 7 easily identifiable objects and then slowly reveal them, one by one, forming a line across the floor or table. Leave the objects undisturbed for 30–60 seconds, then return the objects to their concealed area in the same order in which you revealed them.

Guidelines: While marching or moving in place, notice 7 objects in visual proximity, such as a clock. Name one of the observed objects and then add an additional object; repeat the object list from the start. Continue in this format until you have recited up to 7 objects, recalling the list in a forward order and then in reverse. Close your eyes and repeat the objects' names. If you play this game at home, here are 7 easily identifiable objects that would work well: clock,

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Right-Left Hemisphere Integration

blue	red	orange	green	black
green	green	purple	red	red
green	white	red	orange	red
blue	purple	orange	purple	blue
purple	blue	yellow	white	red

Table 1. Right-Left Hemisphere Integration brain game. State the colors of the words you read and not the words themselves as quickly and accurately as possible.

television, remote control, window, rug, coffee mug and telephone.

Brain games, including those using visual aids and equipment, are affordable and easily become part of the daily routine. By adding mental tasks to physical movement—remember, movement does not need to be intense—we can build mental muscle for healthier aging. (For more brain games, consult the websites listed in “Resources” on page 33.)

Wave of the future

Neuroplasticity training involves an approach that fuses mental and physical simultaneous components. While many approaches exist, the starting point involves merely understanding the different types of tasks that the brain can do while engaged in movement. Finding and coupling appropriate types of brain games with appropriate movements continues to be one of the waves of the future for helping to change the way we age. ☺

Lawrence Biscontini, MA, has been involved in brain training since an eye operation in 1972 left him without sight for several months in recovery. As an Advisory Board Member for the International Council on Active Aging®, and as an “active ager” himself, Biscontini dedicates a great deal of time to making practical the most recent research on keeping our brains as young and sharp as possible. He copresented the workshop “Training neuroplasticity: current research for training the

active older adult” at the ICAA Conference 2014, in Orlando, Florida. Biscontini neither supports nor endorses any sources of brain games. He can be reached at www.findlawrence.com.

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Resources

Internet

Brain Awareness Week (The Dana Alliance): Tips and Resources

Downloadable materials include “Staying Sharp” and “BAW Favorites” puzzle series

www.dana.org/BAW/content.aspx?id=44679

The Brainwaves Center: Puzzles and Self-Tests

www.brainwaves.com/puzzles_selfTests.html

FunEducation: Fun Tests and Quizzes

www.funeducation.com/tests

Mensa International: Mensa Workout

www.mensa.org/workout.php

SharpBrains: Brain Teasers

<http://sharpbrains.com/brainteasers/brain-games-and-teasers-top-50>

Print

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