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## Priming the Brain to Recover from Stroke

For the 300,000 Canadians living with the aftermath of a stroke, partial paralysis and loss of independence is a daily reality.

Now a UBC brain stimulation technique that primes the brain to relearn and retain old movements is showing encouraging results for faster and more effective recovery. A wand, connected to a computer, is placed adjacent to persons head and a stimulus is applied.



Dr. Lara Boyd  
Department of Physical Therapy,  
University of British Columbia

“Currently, there are no drugs to help stroke patients regain mobility,” says Lara Boyd, UBC assistant professor of Physical Therapy in UBC’s Faculty of Medicine. “Physical therapy has proven to be an effective treatment for stroke patients to regain mobility. However, one of the biggest challenges is the time and amount of practice it takes for the brain to relearn an old movement.”

The two-part study tests a healthy brain first to ensure the technique is safe and that there are no adverse effects and then applies the same technique to a stroke-affected brain. The study is currently in the second phase.

Following a stroke, the affected part of the brain is no longer active because of the loss of blood flow, which causes brain cell death. The area of the brain affected by the injury determines the patient’s inability to move, see, remember, speak, reason and read and/or write.

“One of the reasons that it is so difficult for the brain to recover from a stroke and reorganize itself is that the side of the brain that is damaged becomes suppressed while the undamaged side becomes hyperactive,” says Boyd, who is a Canada Research Chair in Neurobiology of Motor Learning. “The left and right side of the brain become unbalanced. It becomes more difficult for the

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## Priming the Brain to Recover from Stroke – cont'd

affected side of the body to move because the damaged side of the brain is suppressed. Conversely, the unaffected side of the body moves much easier because the undamaged side of the brain becomes hyperactive.”

This negative feedback loop helps explain why it becomes increasingly difficult for stroke patients to regain mobility.

“Fortunately, the brain is an amazingly dynamic organ that can reorganize itself,” says Boyd, whose current study looks at the benefits of applying an electromagnetic stimulus to the stroke affected section of the brain. “What we want to do is to stimulate and enhance brain cell reorganization around the damaged part of the brain.”

In doing so, Boyd believes that the brain can reorganize itself and find an alternate pathway to performing a previous movement.

The first part of the study tested individuals who had never suffered a stroke. The participants received an electromagnetic stimulus and were then asked to practice a specific movement. Participants who received the stimulus demonstrated increased and improved learning for 15 – 20 minutes following the stimulus.

“Preliminary results of our research on non-stroke patients show that if you pre-excite the brain by applying an electromagnetic stimulus, motor learning and retention of skill is improved and retained,” says Boyd. “We are currently applying this technique to the stroke affected brain and the available data is positive. We are quite optimistic that this approach will work and we expect results in the coming months.”

Each year, there are between 40,000 to 50,000 strokes in Canada and close to 16,000 Canadians die.

– UBC Reports | Vol. 55 | No. 2, By Catherine Loiacono

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## BC Stroke Strategy Update

After three years of planning and preparation, stroke patients in British Columbia are seeing on-the-ground benefits from the BC Stroke Strategy. Now, we have TIA Rapid Assessment Clinics spreading across the province. Telestroke is operating in one Health Authority, and being introduced in two more. We've launched a TeleLearning series, and our expanded our website.

A new web-based format of the BC Stroke Strategy Newsletter makes it easier to keep in touch with developments and achievements. To receive updates, please join the mailing list at [www.bcstrokestrategy.ca](http://www.bcstrokestrategy.ca), click on **News** then **Join Our Newsletter**. The newsletters will keep you informed in the Stroke Strategy projects and initiatives.



In 2005, the Heart and Stroke Foundation of BC & Yukon developed the BC Stroke Strategy to improve the recognition of, treatment for and rehabilitation from stroke. The strategy identifies gaps in the care and the standards of practice for stroke in BC, and makes recommendations to close them.

# Tea to Protect Against Stroke?

There's been talk in the past few years about the healthful effects of drinking green tea. Apparently, it's more than just talk. A recent meta-analysis by a group of UCLA researchers found a clear association between tea consumption reduced risk of stroke. The researchers looked at 10 studies from six different countries – Japan, Finland, the Netherlands, the US, Australia, and China – all of which have different tea-drinking habits, not to mention different ranges of lifestyles and socio-cultural conditions. Despite these differences, drinking 3 or more cups of tea per day was linked in all the studies to a lower risk of stroke. This reduced risk applied regardless of the kind of tea consumed. Black tea was just as effective as green tea. The link held across the different countries, as well, so it's not an effect of society or culture, diet or level of physical activity, in any particular country.

At this point, we don't know the mechanisms by which tea affects stroke risk. The authors cite three possibilities. Animal studies have shown an inverse relationship between blood pressure and tea-drinking. However, clinical studies in humans have not supported this conclusion.

A second possible link is through the active ingredient in tea, molecules known as catechins. Animal models have shown that catechins block increases in nitrous oxide in the blood. Too much nitrous oxide damages the arteries.

Yet another possibility is the presence of an amino acid, theanine, in tea. Theanine is able to cross the blood-brain barrier and contains glutamate, a key neuro-transmitter. During stroke, the over-production of glutamate is a key factor in the cascade that leads to brain damage. However, evidence points to theanine having a protective effect during stroke, limiting the extent of damage caused by an arterial blockage.



A meta-analysis is a study of studies in which the researchers reassess the data gathered for the other studies and then compares the differences and similarities. In this case, they used rigorous statistical methods to identify the variation between the different studies.

However, a key shortcoming of the research they examined is that none of the studies involved a randomized controlled trial (RCT), comparing a randomly selected group of people who drank tea with another, similar group of people who drank no tea. Instead, most of the studies involved comparisons of tea-drinkers with the general population. RCTs provide the best evidence of causal relationship, rather than simply an association between two things, like tea-drinking and level of stroke risk.

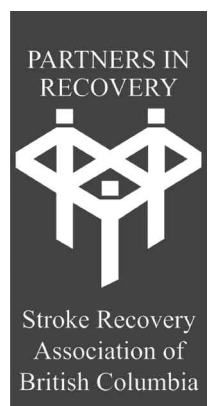
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## Stroke Recovery Association of BC Announces Two Appointments to their Management Team

The Stroke Recovery Association of BC is pleased to announce two appointments to their management team. Doug Querns, CGA, MBA has accepted the position of Executive Director and Tim Readman has accepted the new position of Program Director.

The SRA-BC has a strong management team to provide leadership in developing rehabilitation and community re-integration resources in the province. The SRA-BC is committed to empowering stroke survivors and their caregivers, throughout British Columbia, to enable independence and improve overall quality of life.

For more information contact The Stroke Recovery Association of BC at 604-688-3603 or toll-free: 1-888-313-3377 or visit their website at [www.strokerecoverybc.ca](http://www.strokerecoverybc.ca).



## RECIPE

# Spinach Salad with Blueberries and Feta Cheese

Makes 4 servings

Spinach is a dark green leafy vegetable that is a good source of beta-carotene. To remove some of the salt from the feta cheese, drain water from the feta container, rinse the feta under running water then place in cold water.



### Ingredients

- 8 cups (2 L) baby spinach, washed
- 1 cup (250 mL) fresh blueberries
- ¼ cup (50 mL) feta cheese, rinsed and crumbled

### Dressing

- 1 tsp (5 mL) olive oil
- 2 tbsp (25 mL) balsamic vinegar
- 1 tbsp (15 mL) maple syrup
- ½ tsp (2 mL) black pepper
- 2 tbsp (25 mL) finely chopped dried apricots (about 3 apricots)

### Directions

1. Place spinach, blueberries and feta cheese in a large bowl.
2. In a small bowl combine dressing ingredients. Toss with the salad and serve.

### Nutritional information per serving

(2 cups /500 mL)

- |                             |                       |
|-----------------------------|-----------------------|
| • Calories: 113             | • Carbohydrates: 18 g |
| • Protein: 5 g              | • Dietary Fibre: 4 g  |
| • Total Fat: 4 g            | • Sodium: 202 mg      |
| • Saturated fat: 1 g        | • Potassium: 764 mg   |
| • Dietary Cholesterol: 9 mg |                       |

Recipe developed by Nadine Day, RD.  
©The Heart and Stroke Foundation 2008. Posted April 2008

## contact

If you have had a stroke, or know someone who has, we'd like to hear from you.

If you'd like to share your story or ask a question, please contact us at:

### Heart and Stroke Foundation of BC & Yukon

200-1212 West Broadway,  
Vancouver, BC V6H 3V2

Tel: 604.736.4404

Fax: 604.736.8732

Toll-Free: 1.888.HSF.INFO

(1.888.473.4636)

[www.heartandstroke.bc.ca](http://www.heartandstroke.bc.ca)

Register to receive StrokeLine newsletters free through our website or toll-free number.



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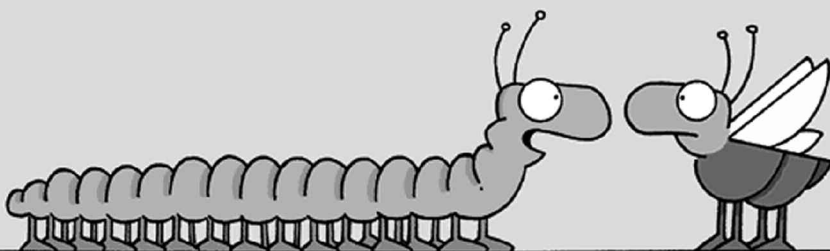


The Heart and Stroke Foundation of BC & Yukon provides a valuable resource for Patient Programs: a Patient/Caregiver Message Board.

This online tool is accessible from the Foundation's website:  
[www.heartandstroke.bc.ca/patientprograms](http://www.heartandstroke.bc.ca/patientprograms)

The message board is intended to unite patients, survivors and caregivers throughout British Columbia, providing them with a means of exchanging tips as well as stories and personal patient or caregiver experiences. People are encouraged to sign up, free of charge, and share their experiences while learning valuable heart healthy advice.

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*"I tried all the fitness fads, but my doctor was right all along – walking is still the best exercise."*