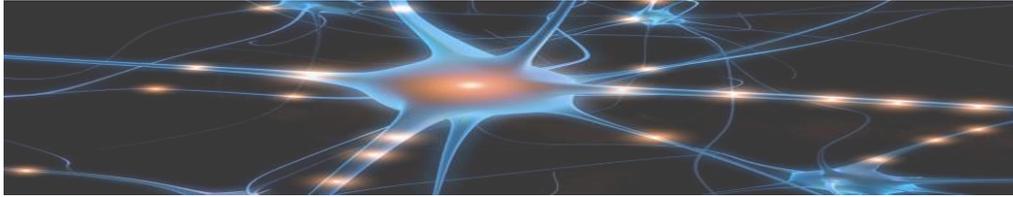


Getting Better After a Stroke

Exercise, Movement & the Brain



Effects of Exercise on Memory, Thinking, Attention and Physical Function: Does time from stroke make a difference?

Exercise training can improve memory, attention, and thinking (this is known as cognition) in people who had stroke*

- Aerobic exercise such as walking or cycling as well as resistance training (strength training) may improve cognition
- Improvements in cognition can occur any time after a stroke

Exercise also improves:

- How long you can walk
- How fast you can walk
- How far you travel with each step and how fast you move your legs when walking
- Balance
- Muscle strength
- How far you can move your joints in different directions (range of motion)*

You will get more improvement in how far you can walk, the earlier that you start exercising after a stroke.

*Marzolini et al., 2012 and 2013

How does Exercise Improve Function? Changes in Brain Activation, Structure and Blood Flow

Exercise increases brain activity

- One study** showed that for people who did aerobic exercises for 6 months after having a stroke, brain activity increased by up to 72% when they moved their stroke affected leg. No change was seen for the group that did not exercise
- People who walked faster during the training period also had more brain activity

**Luft et al., 2008



Constraint Induced Movement Therapy (CIMT)

Less impaired arm / hand restrained

Encourages use of affected arm in everyday tasks

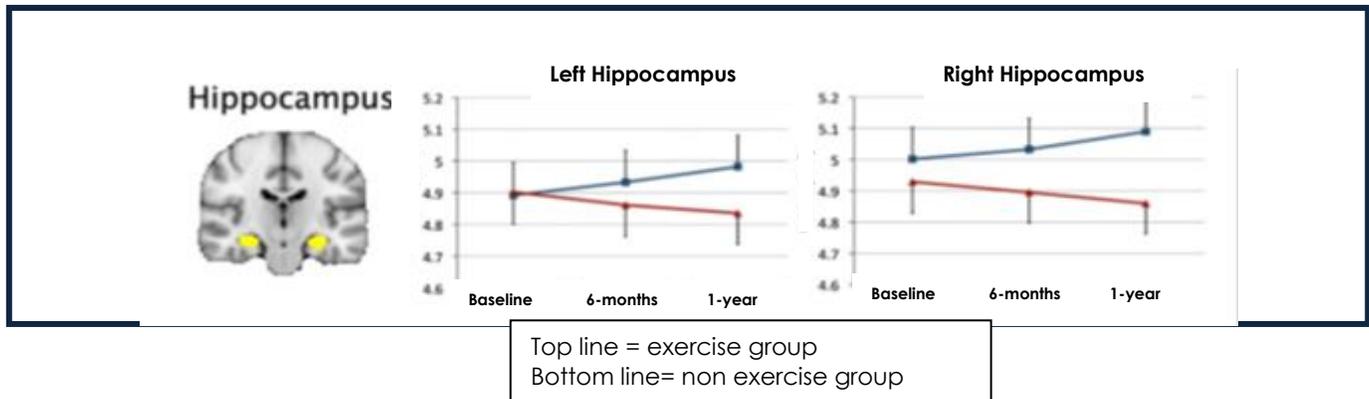
Improves movement of the affected arm no matter how long post-stroke



Using a mitt to constrain the non-affected arm, forcing the affected arm to perform everyday tasks

Exercise improves the brain's structure

- People who never had a stroke and did aerobic exercise 3 days a week saw changes to the part of the brain that controls memory (hippocampus). The hippocampus grew. Those who didn't exercise had a decrease in brain size.***
***Erikson et al., 2011



Exercise increases blood flow to the brain

A group of people who had a stroke more than 6 months earlier were divided randomly into 2 groups: an exercise or non-exercise group.

- The exercise group improved blood flow to their brains, the non-exercise group did not.
- People who had the greatest change in fitness also had the greatest increase in blood flow and walking speed.****

What will happen if I don't use my stroke affected arm or hand?

Using the stroke affected arm, hand, and leg less and less leads to what is called 'learned non-use'. The less you use it, the weaker and the more non-functional it becomes. Studies show that other areas of the brain can take over from the damaged part of the brain when the affected arm or leg gets more activity.

What can I do to make sure I see improvements?

Use the stroke affected arm, hand, and leg as much as possible

- Practice using the proper movement patterns when you are walking, and moving your limbs. The more you practice, the more you will benefit.

Exercise regularly to:

- Increase blood flow to the brain
- Increase brain activity
- Exercise will help to lower the damage to cells in the blood vessels
- Increase the substances in the blood that help the brain cells to grow

Once you are comfortable, make the exercise harder

- Increase how far and how hard that you are exercising
- Lift a heavier weight or add more resistance