



MOVE to LIVE and LIVE to MOVE

POST STROKE

Move to Live and Live to move

- Introduction
- Why and how to exercise?
- Brain changes
- The exercise prescription
- Exercise Demonstration and Group Participation
- References
- Questions

Physical
Therapy
Rewiring
the Brain
After a
Stroke



Who am I



- Megan Cliff, registered Physiotherapist specializing in the neurological population
- Graduated from University of Manitoba in 2011
- Several years of acute care then moved in to private practise at a Neuro clinic in Vancouver
- Post-graduate education: Basic and several advanced courses in the Bobath Concept, Exercise for Parkinson's Disease, Level 1 Male/Female Urinary Incontinence, Basic Vestibular Therapy, and Basic Concussion workshop
- Currently work at In Balance Rehab and Physiotherapy in Abbotsford

- Heart and Stroke recommends adults should accumulate at least 150 minutes of moderate-to vigorous-intensity aerobic physical activity per week, in bouts of 10 minutes or more. The activity doesn't have to be non-stop, such as an aerobics class. You can do 10 minutes or more at a time throughout the day to reach your daily total
- Walking, interval training, biking, boxing, swimming
- To improve balance and prevent falls older adults should add muscle and bone-strengthening activities using major muscle groups at least two days per week
- Seated resistance exercises, balance exercises, Tai Chi, cycling, Functional Exercises

How Much
and How to?

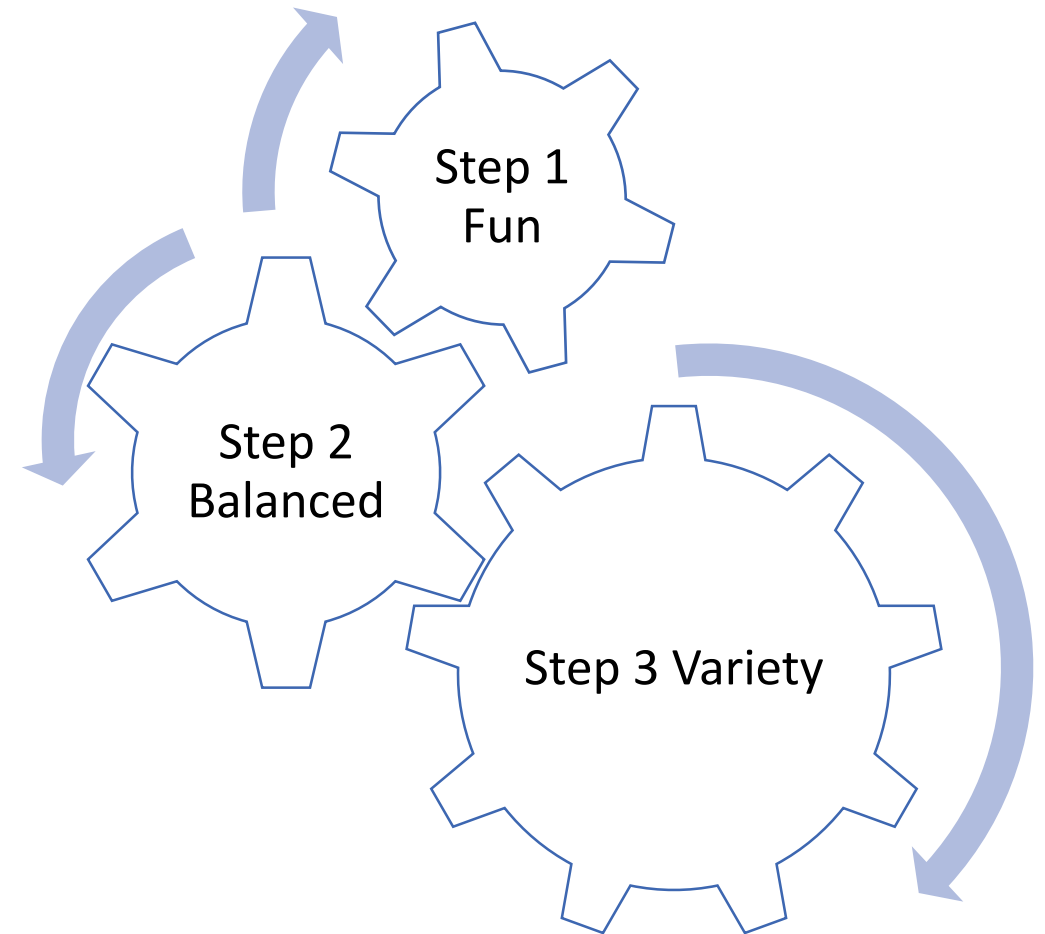
What should my exercise program look like?

- **FUN**

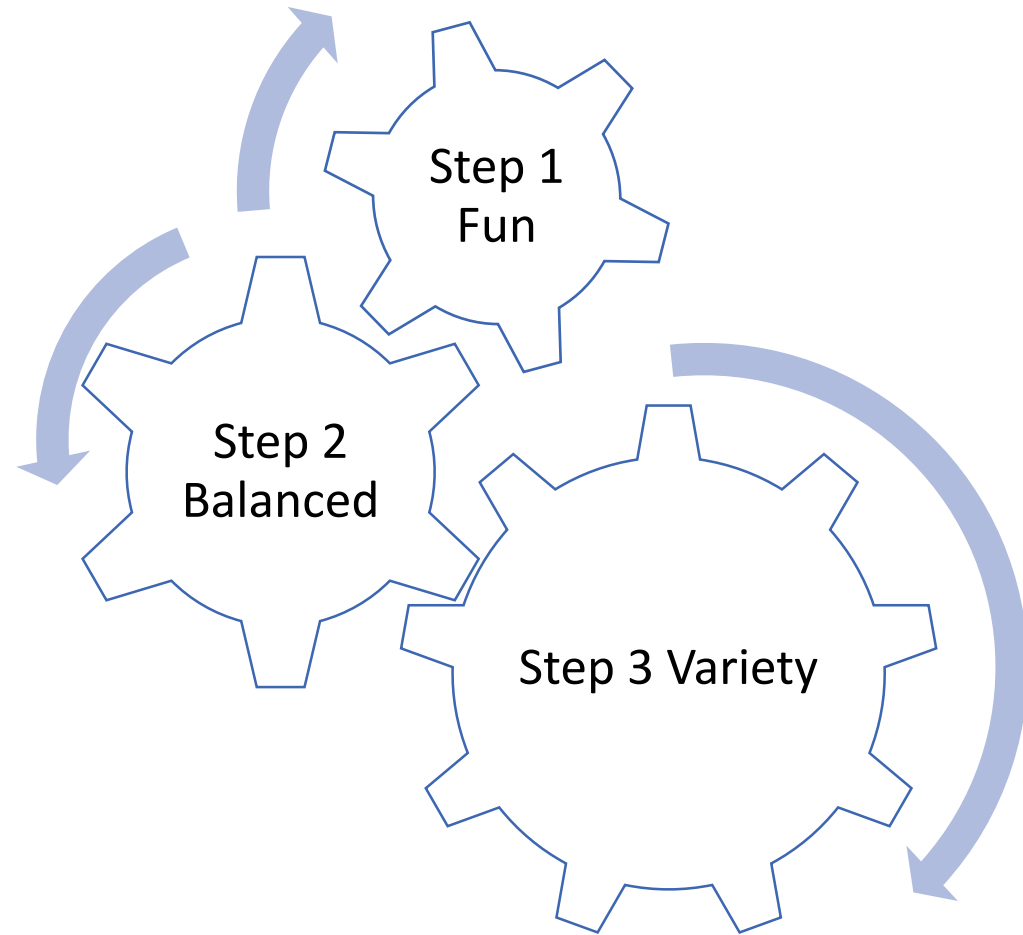
- If you don't enjoy doing it you won't be motivated
- Having a partner or a group increases your chance of being consistent

- **BALANCED**

- Cardio, strengthening, flexibility and balance exercises



Exercise Program Con't



VARIETY

- Our body is very good at adapting so we must always be changing our exercise routine to see the physical change
- We know our brain needs novelty and challenge for motor learning to occur



Did you say Motor Learning?!

- Motor control- "The process of initiating, directing, and grading purposeful voluntary movement". ⁽¹⁾

Repetition of the same
thought or physical action
develops into a habit
which, repeated frequently
enough, becomes an
automatic reflex.

Motor Learning- " The
process of acquiring a skill by
which the learner, through
practice and assimilation,
refines and makes automatic
the desired movement"⁽²⁾



Norman Vincent Peale
American Author
1898-1993

QuoteHD.com

Neuroplasticity

- “capacity of neurons and neural networks in the brain to change their connections and behaviour in response to new information, sensory stimulation, development, damage, or dysfunction” ⁽³⁾



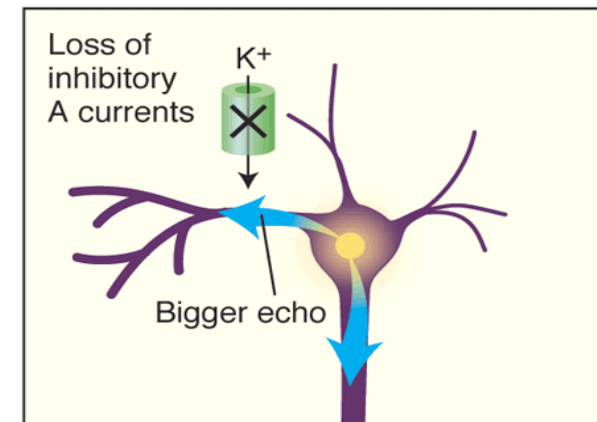
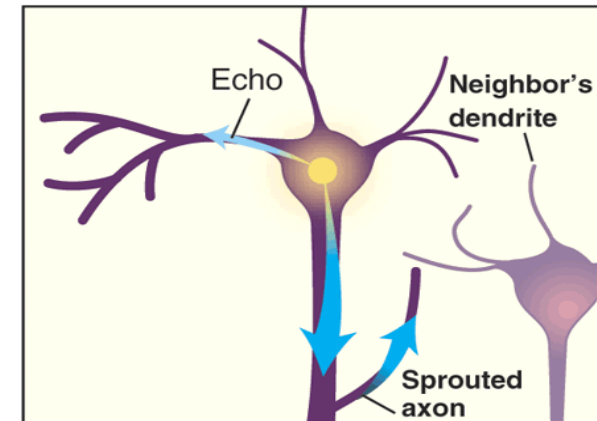
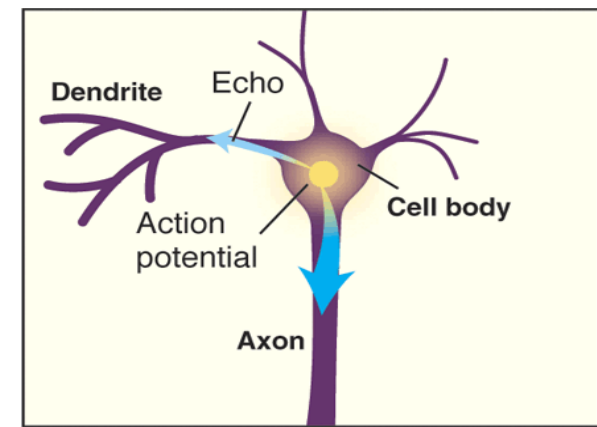
Neuroplasticity

- To gain a new skill, a whole bunch of neurons need to activate together
- The more neurons that are activated, the deeper the learning and more engrained those pathways become.



Neuroplasticity

- Every signal sent also re-enforces it's connection to the neighbouring neurons.
- “Neurons that fire together, wire together” through a ‘neuronal echo’



Neuroplasticity and Novelty

- New experiences or novel tasks improves the structure of the existing neuronal connects which increases the efficiency
- Creates brand new connections and/or pathways between the neurons ⁽⁴⁾



Neuroplasticity

- Bottom line= you can create a new pathway or you can shape an existing one
- Repetition is key to neuroplasticity
- “Perfect Practise make Perfect”

Summary Thus Far

What do I need to know?

Change your brain to see the change in your body

PERFECT practice makes perfect

Repetition, Repetition, Repetition with NOVELTY

Using the skill in a functional way or to be task specific

Creating an exercise that is attainable but challenging and continues to progress its challenge to the learner

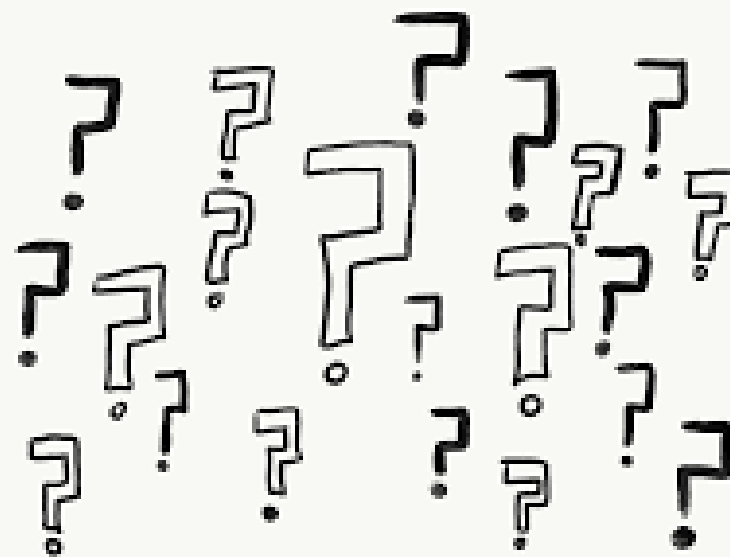


Physiotherapy Post Stroke

(briefly)

I had a stroke 10 years ago, can I still improve?

- YES.....



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However

There are factors that contribute to recovery and potential

- Gains made since the stroke
- Cognition
- Environment and support
- Finances
- **MOTIVATION**

So what muscles should we be focusing on?



- All of Them
- However.....

This is what typically occurs post stroke

Inability to come forwards



Side flexion

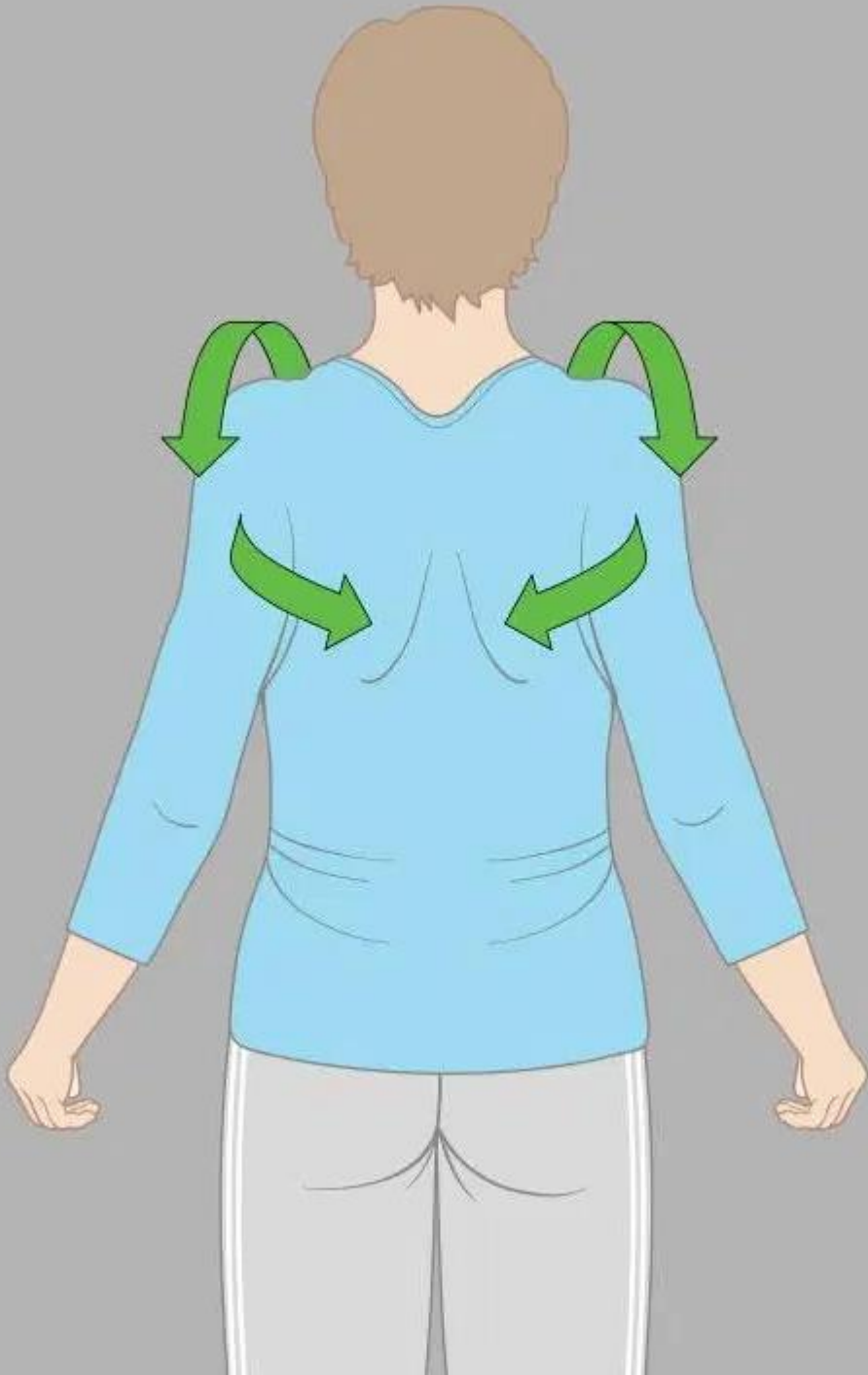




THE STORK
OR
KICKSTAND

Muscles groups to focus on

- **Extensors**- shoulder blade and back muscles, gluts, calf, triceps
- **Abdominals** – where did those go?
- Trunk and head rotators



Postural Control

This helps to sit you up tall and light

Time to move!!!!



FLEXIBILITY
EXERCISE



CARDIO



RESISTANCE
TRAINING



BALANCE
WORK

Take Home

- Use it or lose applies to everyone
- If you want to gain a new skill you must challenge your body and brain and practise it many ways many times and ideally practise using functional tasks
- It is possible to make gains post stroke but it takes work and determination
- There are some consistent patterns post stroke and to see improvement you must change your existing movement pattern

Take Home Continued



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- Your exercise program must be fun and make sense for YOU
- Your exercise program should consist of cardio, strengthening, flexibility and balance exercises
- If you seek out a physiotherapist make sure your goals are SMART and you have a treatment plan that works for you

References

1. Physiopedia [https://physio-pedia.com/Motor Control and Learning#cite note-Med Dictionary Health Professionals .26 nurses-2](https://physio-pedia.com/Motor%20Control%20and%20Learning#cite_note-Med_Dictionary_Health_Professionals_.26_nurses-2)
2. Medical Dictionary for the Health Professions and Nursing. (2012). Retrieved March 11 2016 from <http://medical-dictionary.thefreedictionary.com/motor+learning>
3. Physiopedia <https://physio-pedia.com/Neuroplasticity>
4. [https://www.physio-pedia.com/images/d/d4/Neuro Principles of Neurorecovery.pdf](https://www.physio-pedia.com/images/d/d4/Neuro_Principles_of_Neurorecovery.pdf)

Resources

- Website for neuroplasticity education and various exercises

<https://www.stroke-rehab.com/stroke-rehab-exercises.html>

- Sitting PWR moves

<https://www.youtube.com/watch?v=z7zTWzOMJc8>

- Free moderate intensity exercise videos (aimed at PD but can be adapted)

<https://www.youtube.com/channel/UC5kLaXx3PMslzSfxVcieM2>

- Tai chi

<https://www.youtube.com/watch?v=21-HARM-E4g>

- Seated tai chi

https://www.youtube.com/watch?v=IKO03x_5OU

Resources

- SRABC online exercise classes

<https://strokerecoverybc.ca/virtual-programs/>

- Chair exercises, twice a week
- Exercise program on demand (lower and upper body)

<https://youtu.be/NyVD-St1S8E> and https://youtu.be/9Ap7_wG38dM

- Online stroke recovery exercises

- <https://www.strokeclass.com/>

Resources

- Yoga channel (not adapted though)--but many nice easy flows.

<https://www.youtube.com/user/yogawithadriene>

- Mindfulness group (insight LA)

https://soundcloud.com/insightla_meditation/sets

- Mindfulness teacher and her podcast Tara Brach

<https://www.tarabrach.com/talks-audio-video/>

- The Brain's Way of Healing- Norman Doidge



Goals for Physiotherapy

- Goals must be created between the client, clinician and family whenever possible
- Goals need to be SMART- specific, measurable, attainable, realistic and timely
- **THEY NEED TO HAVE PURPOSE INTO YOUR DAILY LIFE**

Goal examples



Walk with no cane 6 steps to take my coffee cup from the island to my arm chair



Be able to readjust myself in the wheelchair to prevent sliding or make foot propelling easier



Be able to take 50% of my body weight on to my affected leg so I can use a transfer pole to get on/off the toilet



Have less tone in my arm to improve my balance while walking or decrease my pain

treatment

- Needs to be driven by realistic goals as it is a financial and time commitment
- Can look many different ways
 - Environment- At home in a clinic
 - Frequency- 2-3x/week for change, 1-4x/month for maintenance, intense week then time off, every 3 months for a progression of ex's....
- Should include a home exercise program and if the client is willing, integration in to community programs whether it be exercise or for leisure