


**Impact of a Stroke on the Ability to Participate in Community Exercise Programs**

Jacquie Levy PT  
With acknowledgement to Wendy Sarsons PT  
Clinical Specialist Neurosciences



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**Impact of a Stroke**

**Overview:**

- ❖ Risk factors, signs / symptoms of Stroke
- ❖ Definition, description of Stroke
- ❖ Sequela of a Stroke
- ❖ Common clinical presentation of Left vs. Right-sided Stroke



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**Risk Factors for Stroke (fixed)**

- ♥ Age
- ♥ Gender
- ♥ Family History
- ♥ Ethnicity
- ♥ History of Stroke or TIA



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### Risk Factors for Stroke (changeable)

- ♥ High Blood Pressure (Hypertension)
- ♥ High Blood Cholesterol
- ♥ Heart Disease Atrial Fibrillation
- ♥ Diabetes
- ♥ Being Overweight
- ♥ Excessive Alcohol Consumption
- ♥ Physical Inactivity
- ♥ Smoking
- ♥ Stress
- ♥ Women's Unique Risk Factors



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### Stroke Warning Signs

**Weakness** – Sudden loss of strength or sudden numbness in the face, arm or leg, even if temporary

**Trouble Speaking** – Sudden difficulty speaking or understanding or sudden confusion, even if temporary

**Vision Problems** – Sudden trouble with vision, even if temporary

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### Stroke Warning Signs

**Headache** – Sudden, severe and unusual headache

**Dizziness** – Sudden loss of balance, especially with any of the above signs

**FAST: Face Arm Speech Time**

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### Definition of Stroke

- ❖ Damage to brain cells caused by disruption of blood supply
- ❖ 2 main causes: ischaemic (clot), hemorrhagic (bleed)

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### Blood Clot

Area of brain deprived of blood  
Blood clot  
Blood vessel  
Blood unable to pass clot

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### Bleed

Skin  
Skull bone  
Dura mater  
Subarachnoid space  
Pia mater  
Arachnoid  
Subarachnoid haemorrhage - blood escapes and fills subarachnoid space  
Intracerebral haemorrhage - blood collects within the brain

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### Disruption caused by Stroke

Interruption of Brain function:

- ❖ Motor output (movement)
- ❖ Interpretation and organization of incoming information
- ❖ Communication within brain
- ❖ Metabolism, regulation
- ❖ Processing speed



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### Sequela from Stroke

- ❖ Fatigue
- ❖ Movement Impairment
- ❖ Sensory Impairment
- ❖ Visual Impairment
- ❖ Perceptual Impairment
- ❖ Communication Problems
- ❖ Behavioural / Cognitive Changes/memory changes



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### Movement Impairment

- ❖ Impaired Postural Control and Balance
  - Upright against gravity
  - Midline orientation
  - Core Stability

Implications:

- Postural control + core stability impact ability to move limbs (eg. hip flexion)
- Altered starting position (eg. shlder abduction)



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**Movement Impairment (cont'd)**

- ❖ **Altered muscle tone (readiness to move)**
  - High tone (tight)
  - Low tone (floppy)

**Implications:**

- Tone increased by speed, effort, stress, cold
- Can be modulated with movement
- Assistance necessary, esp. with initiation
- Can be tight and still weak
- Safety issues (eg. arm getting caught)



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**Movement Impairment (cont'd)**

- ❖ **Muscle imbalance**
  - Tight, weak, over-active, inactive
  - Imbalance between muscle groups, between sides of body

**Implications:**

- Weakness on one side of body affects movement on other side (eg. abdominals)
- Muscle response time differs
- Strategies to strengthen weaker muscles



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**Movement Impairment (cont'd)**

- ❖ **Alignment issues**
  - alignment critical to efficient movement
  - change align, change muscle recruitment, change action of muscle
  - avoid mal-alignment + compensation
  - can cause damage (impingement)

**Implications:**

- Often better to do less in improved alignment than reinforce pattern they have



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**Movement Impairment (cont'd)**

❖ Pain – *shoulder, hip*

- Unstable joint, weak or tight muscles

**Implications:**

- Avoid pulling on shoulder, arm
- Avoid exercising above shoulder height
- Monitor alignment when exercising
- Do not use pulleys



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**Movement Impairment (cont'd)**

❖ Associated Reactions

- Involuntary
- Often with excitement, yawning, startle or effort

**Implications:**

- Can be useful to monitor effort or indication of progress



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**Common Muscle Problems**

- Tightness in flexors of upper extremity (*pectorals, lat.dorsi, flexors of elbow, wrist and hand, pronators*)
- Tightness in hip flexors, hamstrings, gastrocsoleus
- Weakness in trunk muscles, hip extensors, quadriceps, tibialis anterior



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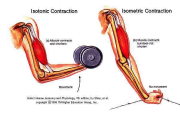

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## Muscle Atrophy

**In affected muscles :**

- Increased inflammatory markers involved in muscle atrophy
- Shift from slow twitch to fast twitch fibre (fatigue)
- Increased intramuscular fat
- Reduction of # capillaries per muscle fibre

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## Sensory Loss

- ❖ Touch
- ❖ Pressure
- ❖ Temperature
- ❖ Proprioception (position sense)
- ❖ Kinesthesia (awareness of movement)



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## Sensory Impairment – Implications:

- ❖ Safety issues with impaired sensation
- ❖ Client may have decreased awareness of how to move or where limbs are
- ❖ May need physical cueing, guiding
- ❖ May be able to continue once assisted to begin



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**Visual Impairment**

- ❖ Visual field problems
- ❖ Double vision
- ❖ Visual Spatial Dysfunction
- ❖ Visual Midline Shift

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**Visual Impairment – Implications:**

- ❖ May not see objects on one side (visual field)
- ❖ May miss part of visual demonstration
- ❖ May misjudge doorways, spaces
- ❖ Double vision may cause dizziness
- ❖ May have difficulty organizing movement or turning to one side



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**Perceptual Impairment**

- ❖ Body and Spatial Awareness
- ❖ Neglect (ignore affected side)
- ❖ Apraxia (difficulty planning movement)



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### Perceptual Impairment – Implications:

- ❖ Safety Risk (spatial, neglect)
- ❖ Physical or verbal cueing to be aware of hemi side
- ❖ Task breakdown, repetition of component parts (apraxia)
- ❖ May do better with more automatic or functional activity
- ❖ May need to change your instructions



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### Communication Problems

- ❖ Receptive aphasia (understanding speech)
- ❖ Expressive aphasia (speaking)
- ❖ Dysarthria (articulation)
- ❖ Damage to language centres
- ❖ Motor problems affecting speech (apraxia, muscle control)



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### Communication Problems – Implications:

- ❖ Simplify instructions into key words
- ❖ Present information by auditory, visual, demonstration, guiding
- ❖ Offer pictures, visual schedule
- ❖ Have pen and paper available
- ❖ Avoid assumptions of understanding
- ❖ Repetition / routine / predictability



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### Behavioural / Cognitive Changes

- ❖ Impulsivity, lack insight, unrealistic
- ❖ Depression
- ❖ Emotional Lability
- ❖ Memory Problems



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### Behavioural / Cognitive Changes - Implications:

- ❖ May need to provide more structure or even impose limits (impulsivity)
- ❖ Reassurance that you know problems are stroke related (lability, depression)
- ❖ Physical, verbal, written cues (memory)
- ❖ Repetition / routine / predictability



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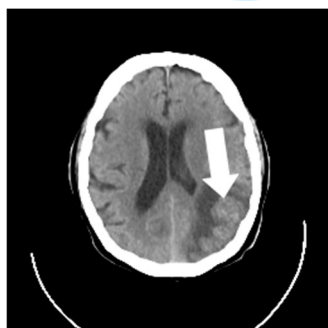
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### Impact of an individual stroke depends on the location and the extent of the damage



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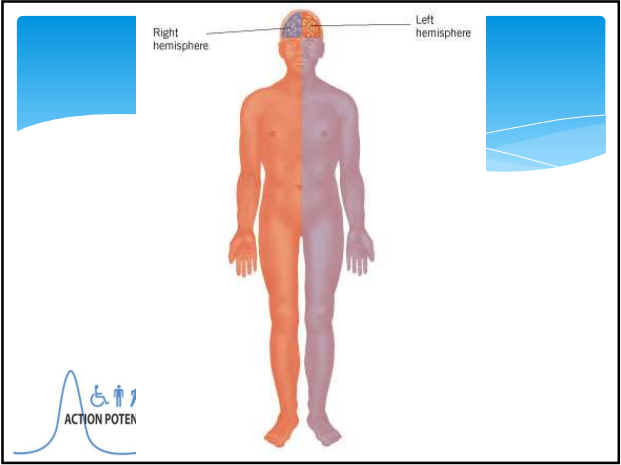
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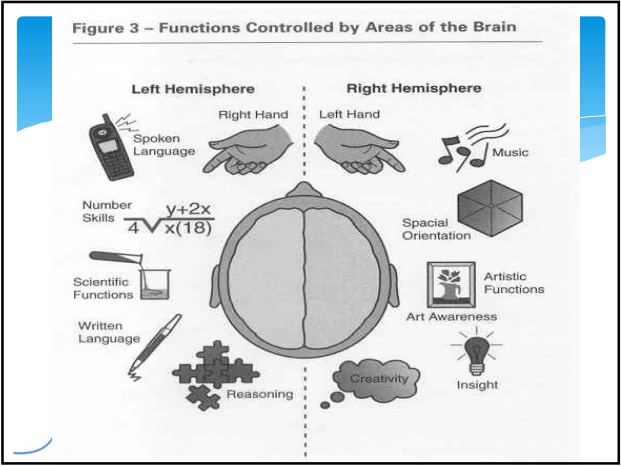
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### Left Hemiplegia

- ❖ (L) movement, visual problems
- ❖ Spatial, perceptual problems
- ❖ Impaired judgement, insight
- ❖ Impulsive, short attention span
- ❖ Can be seen as poorly motivated

Right cerebral hemisphere controls left-side motor coordination

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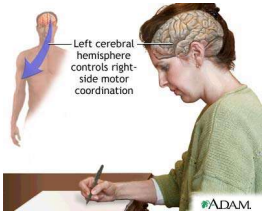
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### Right Hemiplegia

- ❖ (R) movement, visual problems
- ❖ Communication problems
- ❖ Judgement, insight intact
- ❖ Reacts slowly and cautiously
- ❖ Can be seen as overestimating disability



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