Physiotherapy – stroke care and prevention

Presented by Marian Mullaney
MISCP
Definition of Stroke (WHO)

‘A clinical syndrome characterised by rapidly developing symptoms and/or signs of focal and at times global loss of cerebral function, with symptoms lasting more than 24 hours or leading to death, with no apparent cause other than of vascular origin’.
Incidence of stroke

- While stroke may affect anyone at any age, it is more likely to occur in people after age 45.
- The frequency of stroke increases with age.
- Stroke is the most common acquired physical disability in adulthood (30,000 with residual disability from stroke) Irish Heart Foundation (2008)
Incidence of Stroke

- Stroke impairs mobility and disposes survivors to sedentary behaviours (Michael et al 2005)
- Decreased walking speed and endurance
- Cardiovascular deconditioning, loss of muscle bulk, osteoporosis, (Worthens et al 2005), social isolation and depression (Hauber et al 2005)
Secondary prevention is fundamental to preventing stroke recurrence (Duncan et al 2005)

Physical activity, in particular ambulatory activity is a recommended strategy for functional improvement and a reduction of cardiovascular risk factors after stroke (Michael et al 2005)
Characteristics of stroke

- Hemiplegia or loss of voluntary movement, alteration of muscle tone and sensation on one side of the body, the opposite side of the body to side of the clot/bleed.
- Difficulty in speaking and swallowing difficulties (Niamh will talk more on this)
- Loss of memory brief periods of time that cannot be recalled
A physiotherapist should give the patient a ‘memory of what it is like to move….how can he/she remember to move a limb normally when half the body has switched off?’
Every movement has

- A past
- A present
- A future
Past

- The infant builds up its movement repertoire through interaction with his environment and moving within it.

- An individual with an impoverished background and poor movement experiences may be developmentally influenced in a negative way.
Present

- This encompasses your past but reflects the current demands being made on the movement system

- ‘Move it or lose it’
The potential for change in movement efficiency reflects the plasticity of the neuromuscular system.

Change only occurs with changing demand on the system.
‘Neuroplasticity is dynamic and continues throughout life’
‘just a little bit of independence really….to be able to go and undo the back door and get a little bit of fresh air when you want it when nobody’s in, or walk over and put the TV on, just silly things really that you don’t normally give a second thought to’
Recovery post stroke

- Plasticity in damaged brain
- Restoration of function
Brain Plasticity

Damaged brains

- **Early recovery** – resolution of swelling, resolution of ‘brain shock’, absorption of necrotic (dead) tissue, opening of collateral circulatory channels i.e. (new means of blood flow)

- **Later recovery** - plasticity
  i.e. Unmasking of unused pathways
  Sprouting of fibres from surviving nerve cells
  Redundancy – parallel pathways share the same function
FUNCTIONAL TASKS

- Functional tasks using real life objects in an enriched environment provide a multidimensional approach to treatment.

- Functional tasks are beneficial to stroke survivors because they help bridge the gap between movement and function.
Historical Perspective

- Previously patients with neurological disability were afforded nursing care only

**Goal of Treatment (Perry 1969)**

1. The attainment of a safe, not normal mode of travel
2. Tripod to replace leg +/- caliper.
   (Tripods should no longer be used…)


The **Bobath or normal movement concept** is a problem solving approach to the assessment and treatment of individuals with disturbances of tone, movement and function due to a lesion of the nervous system (stroke). The goal of treatment is to optimise function through the facilitation of improved postural control and selective movement.
Pre-Bobath approach:

- Encourage compensation
- Strengthen muscles on the stronger side
- Recovery post lesion impossible
Motor re-learning (neuropsychology)

- Motor relearning with constant and repetitive tasks with appropriate feedback leads to motor recovery and learning.
Constraint induced therapy

- Unaffected arm/hand is kept in a sling or mitten for 90% time patient is awake.
- Treatment is one therapist to one patient.
- The treatment is carried out for two weeks (10 days) 6 hours a day intensive and repetitive practice to overcome learned non-use of stroke arm.
What approach is the best?

- Physiotherapy using a mix of components from different approaches appears the best for promoting functional independence following stroke.
- Research has proven that no one physiotherapy approach is clearly best for promoting recovery after stroke.
Balance is the foundation for sitting, standing and walking. Good balance helps the Central Nervous System to recover. A person needs to be able to balance on their own rather than ‘Slumping to the side’.
What can I do to help recovery of movement?

Good positioning is important.
Painful shoulder

- BAD POSITIONING AND POOR MOVEMENT CAN LEAD TO A PAINFUL INJURY AND PERMANENT DAMAGE
Shoulder cuff
Normal Shoulder  Subluxed
AVOID!
Recovery of the arm – post stroke

- The arm deficits are present in up to 90% of stroke patients initially.
- At 3-6 months 55-75%
- Literature suggests most upper limb recovery occurs early (within the first 2 months) (Feys 2000)
- Best recovery in first 30 days (Nudo 2000)
Recovery of the upper limb - post stroke

- It is important to get balance and postural control for accurate upper limb activity

This frees the arm for selective activity
Can the brain heal after injury?

- Most studies suggest that once brain cells are destroyed or damaged for the most part they do not regenerate. However, recovery after brain injury can take place, as in some cases, other areas of the brain compensate for the injured tissue. The brain can learn to reroute information and function around the damaged areas.

- Each brain injury and rate of recovery is unique and not predictable at time of injury.
Does all recovery of activity or improvements take place within the first 3 – 6 months?

- Improved function happens up to 5 years after stroke. With informed therapy, diligent performance of a home exercise programme and increasing your activity level and fitness the chances of later recovery are far greater.....
Elderly patients with loss of voluntary movement are poor candidates for rehabilitation

- Age is not proven to be a significant factor in determining the success of rehabilitation.
- Older persons may not be given the chance of intensive rehabilitation because of age.
Dedicated stroke unit

- Stroke patients who receive organised inpatient care in a dedicated stroke unit are more likely to survive, be independent and living at home one year after the stroke.

- The evidence in support of this guideline is overwhelming- 1A (Clinical guidelines 2008)
Dedicated stroke unit

- St Camillus and St Josephs
- Benefit
- mortality
- length of hospital stay
- rate of discharge home
- functional outcome at six months post stroke.
Physical fitness

- Physical fitness is important for the performance of everyday activities.
- Physical fitness improves walking ability.
- Positive effect on multiple cardiovascular disease risk factors
- Reduced risk for mortality from stroke and cardiac events.
WALKING:

- Complex..
- We walk because we have intentions and goals to achieve, because we need to maintain balance and move out of the way to avoid other people and objects in our path.
- The therapist helps the patient to regain the components of gait/walking through meaningful activities.
Energy

- Stroke survivor can use up to twice as much energy as an able bodied person.
- Increase your aerobic fitness - enhances glucose regulation, decrease in body weight and fat stores, blood pressure (HTN) and cholesterol.
Getting active

- It is recommended that stroke survivors walk at moderate intensities for 20-60 minutes per day at least 3 days a week. (Gordon et al 2004).
- Moderate = 16-30 steps per minute
Getting active

- Periods of discontinuous walking probably do not have the same effect on physical activity as periods of continuous walking. (Touillet et al)
Getting active

- 30 minutes of moderate intensity physical exercise, most days
- ↓ risk factors for stroke (American Heart Association 2006)
Circuits
Confidence

‘I used to have terrible fears to move forward… it was psychological in that the messages were so tuned if I did it I would fall…I couldn’t bend down, it was like a visual cliff there that I couldn’t go beyond…but there is no cliff of course… I used to think I could not move forward… and now I can go forward quite easily’
Improving after a stroke and getting fitter is 24 hours a day—and must involve educating, training and supporting stroke survivors, relatives and other carers. This encourages a consistency of approach which carries over into the rest of the daily routine.
‘Most of the important things in the world have been accomplished by people who have kept on trying when there seemed to be no hope at all….’

*Dale Carnegie*
Thank you for listening
References:

- Irish Heart Foundation (2008) National Audit on Stroke Care; Irish Heart Foundation
References:

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