New Developments in Stroke Care in BC

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Declaration

- No conflicts to declare
- BC Stroke Strategy – Rehabilitation and Reintegration work group, Chair
Objectives

* Overview of the recent developments in stroke care in BC in terms of the stroke journey
* Updates on new clinical interventions for stroke care in BC
The Quality of Stroke Care in Canada

Canadian Stroke Network

2011
The Stroke Journey

- Hyper-Acute/Acute
- Inpatient Rehab
- Community Rehab
- Community Reintegration
Getting to the hospital

Time from symptom onset to arrival at hospital (2008-9)

- Arrives within 3.5 hours: 65%
- Arrives after 3.5 hours: 35%
<table>
<thead>
<tr>
<th>Province</th>
<th>Percent (%)</th>
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<tbody>
<tr>
<td>BC</td>
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<tr>
<td>AB</td>
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### Stroke Patients Admitted to a Stroke Unit (%)

<table>
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<tr>
<th>Province</th>
<th>Percent (%)</th>
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Vancouver General Hospital
  * dedicated stroke unit opened in 2008
  * Recruitment of additional stroke specialists

St. Paul’s Hospital
  * 8 bed stroke unit

Victoria General Hospital
  * Stroke rapid assessment unit – for TIA management
BC Telestroke Program

- Started working on telestroke project in 2008 with Heart and Stroke Foundation of BC / Yukon
- Vancouver Island – started new program July 2009
- Lower mainland – Started telestroke in Feb 2010
- Phase one – completed
  - Expected rates of tPA administration
  - Use of both video and telephone systems
  - Satisfaction from patients and physicians
- Telestroke project is still on going
  - Better site preparations
  - Access and reliability of video equipment / CT Scan images
The Stroke Journey

Hyper-Acute/Acute

Inpatient Rehab

Community Rehab

Community Reintegration
## Discharge destination after stroke (%)

<table>
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<th>Province</th>
<th>Home</th>
<th>Long Term Care</th>
<th>Rehab</th>
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• All acute stroke should be assessed to determine the severity of stroke and early rehabilitation needs by rehabilitation professionals as soon as possible after admission [Evidence Level A], preferably within the first 24 to 48 hours [Evidence Level C].

• Assessment should include assessment of patient function; safety and risk; physical readiness and ability to learn and participate; and transition planning [Evidence Level C].
Are we meeting Best Practice?

- Stroke Rehabilitation and Reintegration Framework
  - High-level framework to help guide implementation of stroke rehab best practices
- BC Stroke Services
  - Stroke Rehab lead in each Health Authority
  - To carry out audit of stroke patients in each Health Authority in terms of whether standards are being met
  - Identifying gaps in service delivery
"Patients, families, and caregivers should be prepared for their transitions between care environments by being provided with information, education, training, emotional support, and community services specific to the transition they are undergoing."

Also need to educate the health care providers!

On going project from GF Strong to implement a province wide educational “Tool Kit” to “Train the Trainers”
The Stroke Journey

- Hyper-Acute/Acute
- Inpatient Rehab
- Community Rehab
- Community Reintegration
Community Reintegration

- On going projects to promote:
  - Early supported discharge – Fraser Health Authority
  - Integrating community care services
  - Promoting the work of the Stroke Recovery Association
- Development of more “day programs”
  - Example: GF Strong
    - 5 “Intensive Rehab Day Program” spaces
    - Lessen need for hospitalization
- Supporting other NGOs
  - Example: www.brainstreams.ca
Constraint induced movement therapy (CIMT)
CIMT

- Introduced by Dr. Edward Taub (U. of Alabama at Birmingham)
- Restraining the unaffected limb and forcing the use of the affected limb in intensive repetitive purposeful activities
- Counters “learned non-use” of the affected arm
- Principle of use-dependent neuroplasticity
- Need some active movement in the wrist and hand to start with
Mean MAL arm use scores from CI therapy (n=21) and placebo control (n=20) participants.

Taub E et al. Stroke 2006;37:1045-1049
A self administered graded repetitive arm supplementary program improves arm function during inpatient stroke rehabilitation: a multi-site randomized controlled trial.

Jocelyn Harris, Janice Eng, William Miller, Andrew Dawson.

Stroke 2009; 40:2123-2128
GRAsp

- Single blind (evaluators blinded), controlled trial involving 4 sites
- Active scapular elevation (shoulder shrug) against gravity and palpable wrist extension on affected side
- Self-administered, homework based exercise program
- 60 min per day, 6 days per week for 4 weeks
- At end of 4 weeks, subjects kept exercise kit and booklet for another 3 months
- 1º Outcome: Chedoke arm and hand activity inventory
## Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Baseline Chedoke score</th>
<th>Posttest score</th>
<th>Change score</th>
<th>ANCOVA</th>
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<tbody>
<tr>
<td>Grasp (n=53)</td>
<td>32.6</td>
<td>46.7</td>
<td>14.1</td>
<td>P&lt;0.001</td>
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<td>Control (n=50)</td>
<td>32.7</td>
<td>40.1</td>
<td>7.9</td>
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Functional Electrical Stimulation
Main areas of application:
- Management of chronic spasticity
- Lower extremity - gait improvements

Accumulating evidence that FES with physiotherapy / exercise program results in better gait outcomes than either one alone
There are multiple makes of FES based dorsiflexion devices:

- Oddstok
- Walk Aid
- Ness L300
- Stimu-step – Implanted electrodes

Shown to increase gait speed in patients with foot drop
16% of stroke patients have atrial fibrillation

- Increases the risk of stroke by 4-6 times
- Risk increases with age
  - In people over 80 years old, AF is a direct cause of stroke in 1 out of 4 cases
- Can significantly reduce stroke risk by “thinning” or anticoagulating the blood to prevent formation of blood clots
Treatments for A. Fib

* Coumadin / Warfarin
  * Well known, familiar drug
  * Requires regular and frequent blood tests to stay within acceptable treatment range
  * Risk of bleeding
  * Interference from other drugs and foods rich in vit. K

* Newer drugs
  * Example: dabigatran / Pradaxa
  * No blood test required
Robotic assisted Rehab
Robotic assisted therapy

- An enhancement to traditional therapy
- Allows specific, semi-autonomous practice of therapeutic tasks
- Offers sensorimotor feedback – auditory, visual, et
- Practice of 2D and 3D tasks
- Strong evidence to support robotic therapy in improving function at the shoulder and elbow, but not at the wrist and hand
- Not enough evidence to support robotic therapies in lower extremity rehab