


CALGARY STROKE PROGRAM

Acute Stroke Care

Nancy Newcommon, NP

1



---

---

---

---

---

---

---

---

Acute Stroke Care Overview:

- Stroke Stats
- Calgary Acute Stroke Response Team
- Role of the Acute Stroke NP
- Acute Stroke Unit Care
- Calgary Stroke Unit

2

CALGARY STROKE PROGRAM

---

---

---

---

---

---

---

---

Stroke STATS

Third leading cause of death

- 25% of strokes are fatal

75% who survive live with some form of disability

- #1 cause of acquired long-term disability in adults

3

CALGARY STROKE PROGRAM

---

---

---

---

---

---

---

---

## Stroke STATS

### Incidence:

- 150 cases per 100,000/yr
- Calgary Health Region: 1300 to 1400 per year

### Cost of Stroke in AB:

- \$200-\$300 million annually

4

CALGARY STROKE PROGRAM

---

---

---

---

---

---

---

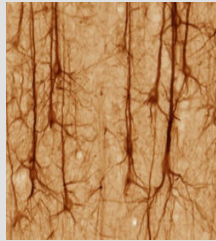
---

## TIME is brain

Early intervention improves patient outcomes:

The following are destroyed each minute in a typical large vessel acute ischemic stroke:

- 1.9 million neurons
- 14 billion synapses
- 12 km of myelinated fibers



(JL Saver, 2006)

5

CALGARY STROKE PROGRAM

---

---

---

---

---

---

---

---

**5 SIGNS OF A STROKE...**



**APSS** **ALBERTA PROTECTS YOUR STROKE**  
Prevention. Awareness. Recovery.

**RECOGNIZE A STROKE & REACT CALL 9-1-1**  
*Someone's life could be in your hands.*

---

---

---

---

---

---

---

---

## Calgary Acute Stroke Response Team

Located at Foothills Medical Centre

### Physicians:

- Stroke Neurologist
- Stroke Fellow
- Neurointerventionalist

### Nursing:

- Acute Stroke NP
- TCD Nurses
- Stroke Research Nurses

### Students:

- Residents
- Nursing



Team Coordinated by Brain Attack Paging System

7

CALGARY STROKE PROGRAM

---

---

---

---

---

---

---

---

## Indications for paging stroke team:

**Disabling stroke** with symptom onset <12 hours

- Pt may be eligible for research study



**TIA** with symptoms lasting >5 minutes within last 48 hours

### Stroke team pager 00379:

- Covered by Acute Stroke NP during the day M-F
- Covered by Stroke Fellow or Stroke Neurologist after hours

8

CALGARY STROKE PROGRAM

---

---

---

---

---

---

---

---

## Role of the Acute Stroke NP

### 1<sup>st</sup> Responder to acute stroke calls

- Investigator:
  - Onset= Last time seen well
  - Presenting stroke signs
  - Pertinent medical history
  - Coordination of transport if necessary

### Initiation of Brain Attack Paging:

- Pager codes to coordinate team

### Coordination of necessary team members

- Crowd control

9

CALGARY STROKE PROGRAM

---

---

---

---

---

---

---

---

### Role of Acute Stroke NP (continued)

- Acute assessment of patient on ED arrival
- Organizes for stat CT head
- Guides ED staff in necessary acute stroke care



---

---

---

---

---

---

---

---

### Role of Acute Stroke NP (continued)

Assists physician team in making treatment decisions:

- **IV tPA:** organizes and initiates tPA protocol
  - Alerts and mobilizes critical care neuro unit
  - Organizes movement of patient to 'blocked bed'



---

---

---

---

---

---

---

---

### Role of Acute Stroke NP (continued)

#### Endovascular Intervention:

- alerts and mobilizes team
  - Assists angiography staff
  - Coordinates transfer of patient to units



#### Supportive Care:

- initiates appropriate consults

---

---

---

---

---

---

---

---

## Role of Acute Stroke NP (continued)

### Patient and family education

### Coordination of care of patient on stroke unit

- Case management
- Care load
- Initiates appropriate rehabilitation team referrals
- Initiates appropriate stroke orders
- Initiates appropriate transfer of patients

### Trouble shooting problems with nursing staff on units

- Multidisciplinary staff education
- Prevention of patient complications



13

CALGARY STROKE PROGRAM

---

---

---

---

---

---

---

---

## Role of Acute Stroke NP (continued)

- Organizes patient discharge and appropriate referrals
- Sees patients in follow up in clinic

14

CALGARY STROKE PROGRAM

---

---

---

---

---

---

---

---

## Goals of care...

- **Onset to (hospital) door time:** < 1 hour
- **Door to CT time:** 10 – 30 minutes
- **Door to needle time:** 30 – 60 minutes
  - tPA should be given <90 min from onset



15

CALGARY STROKE PROGRAM

---

---

---

---

---

---

---

---

## Stroke Unit Care

Follow Best Practice Standards for:

- Hyper-acute stroke treatment
- Acute stroke treatment
- Post acute stroke treatment
- Prevention of complications

16

CALGARY STROKE PROGRAM

---

---

---

---

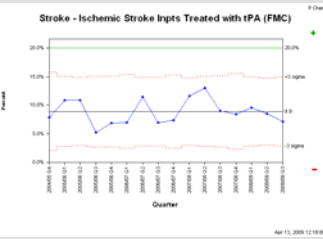
---

---

---

---

## % of Ischemic Stroke Patients treated with tPA



Target is 20%

Current level is 7.1%

17

CALGARY STROKE PROGRAM

---

---

---

---

---

---

---

---

## Ischemic stroke treatment:



tPA: Tissue Plasminogen Activator/Alteplase

- Must be given < 3 hrs from onset of stroke symptoms (Health Canada)
  - Dec 2008 CSS guidelines indicate can be given <4.5 hrs
  - Intervention <90 min improves patient outcomes
  - Pre Tx BP must be <185/110
  - Watch for Angioedema
- Not all patients are candidates:
  - Stroke Neurologist looks at risk vs benefit
- Patients may also benefit from Research trials



18

CALGARY STROKE PROGRAM

---

---

---

---

---

---

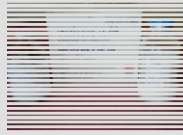
---

---

## Hyper-acute stroke treatment

### APSS Recommended Order Set Acute Stroke t-PA:

- CT scan results: non-hemorrhage
- Notify family physician
- Request previous medical records
- Oxygen sat > 95%, if COPD > 90%
- 2 large bore IVs, one in each limb
  - IV 0.9% NS
- Vital Signs:
  - Notify attending immediately if:
    - Systolic BP > 185 mmHG and or diastolic BP > 110
    - Or if temp > 38.0° C
  - Neurovitals: q 15 min x 2 hrs, then q30 min x 6 hrs, then q1h x 16 h, then q4h x 48 hrs



19

CALGARY STROKE PROGRAM

---

---

---

---

---

---

---

---

---

---

### APSS Recommended Order Set Acute Stroke t-PA (continued):

- Notify physician immediately if:
  - Evidence of bleeding
  - Neurologic deterioration
  - New HA
  - Nausea
  - Worsening of stroke signs
- CBC, Electrolytes, Creatinine, glucose, PTT, INR and lipid profile (troponin)
- ECG
- CT or MRI 18-30 hrs post tPA infusion
- tPA 1 mg/ml concentration (per infusion chart)

20

CALGARY STROKE PROGRAM

---

---

---

---

---

---

---

---

---

---

### APSS Recommended Order Set Acute Stroke t-PA (continued):

- NPO for 6 hrs post tPA, then swallow screen and diet as recommended by dietician SLP/Dysphagia Team
- HOB supine to 30 degrees unless contraindicated
- Assess family coping status
- BR for 12-24 hrs post tPA
- Avoid for 24 hrs:
  - IM injections
  - unnecessary arterial or venous punctures
  - nasogastric tubes

21

CALGARY STROKE PROGRAM

---

---

---

---

---

---

---

---

---

---

APSS Recommended Order Set Acute Stroke t-PA  
(continued):

- Consider therapy for venous thromboembolism prophylaxis :
  - Pneumatic compression stockings
  - Heparin or heparinoid while on BR
- Apply pressure dressings to puncture sites
- Blood glucose q 4h if diabetic, notify physician if >8 mmol/L
- Echocardiogram
- Holter monitor 24 hrs
- Carotid investigations (carotid ultrasound, CT angiogram)
- MRI (MRI brain, MRA circle of willis, MRA neck)
- CXR

---

---

---

---

---

---

---

---

APSS Recommended Order Set Acute Stroke t-PA  
(continued):

- Urinalysis
- Acetaminophen 650 mg rectal supp pr q 4-6h prn if temp>38.0°C
- Dimenhydrinate 25-50 mg IV or PR q 4h prn if nausea
- Standard bowel routine
- Mouth care q2h as required
- Assess skin integrity

---

---

---

---

---

---

---

---

APSS Recommended Order Set Acute Stroke t-PA  
(continued):

- Ensure Stroke Education Binder given to family
- Consultation to:
  - Pharmacist to review current meds
  - Dietician
  - Physiotherapy, Occupational Therapy, Speech Language Pathology, Social Worker, Home Care
  - Physical medicine and Rehabilitation Specialist
  - Cardiology
  - ]Internal Medicine
  - If possible, Foley catheter first 24 hrs initiated prior to tPA bolus
    - Do not delay for catheterization
- Weight on admission

---

---

---

---

---

---

---

---

### APSS Recommended Order Set: Acute Stroke non-tPA

Orders are the same as for tPA Order Set except:

- If patient unable to take PO fluids within 48 hrs insert feeding tube
- Activity as tolerated as soon as possible
- If unable to void, do bladder scan or in and out catheterization q4-6 h, unless contraindicated; foley catheter first 24 hrs if strict bed rest
- Vital Signs: Notify attending if systolic BP > 220 mHg and or diastolic BP > 120 mHg on two consecutive readings 5-10 min apart

---

---

---

---

---

---

---

---

## Hospital worst place to have stroke

SHARON KIRKEY  
CANWEST NEWS SERVICE

One of the worst places to be if you have a stroke is in a hospital, new Canadian research suggests.

A study based on thousands of Ontario residents found patients who have a stroke while they're in hospital wait twice as long for a brain scan and twice as long for a clot-busting drug

as people who come to an emergency room with a stroke. They are also more likely to die.

"You would think, naively, that if someone has a stroke while in hospital — given that we keep emphasizing the concept that 'time is brain' and the sooner you get to treatment, the better — you would anticipate that they would have the best treatment," says Dr. Frank Silver, co-principal investigator of

the Registry of the Canadian Stroke Network and professor of medicine at the University of Toronto.

But instead of doing better than people who have a stroke at home or work, the hospital patients did worse.

Unlike the emergency response when a patient goes into sudden cardiac arrest, most hospital wards have no system of calling for help, Silver says.

Source: Calgary Herald

---

---

---

---

---

---

---

---

### Concept: Stroke Unit Care

Patients cared for on a stroke unit are:

- more likely to return to work and/or home
- less likely to die
- less likely to suffer complications such as pneumonia or pulmonary embolism
- more likely to have a better quality of life at 5 years
- cost the system less by requiring a shorter in-patient stay

---

---

---

---

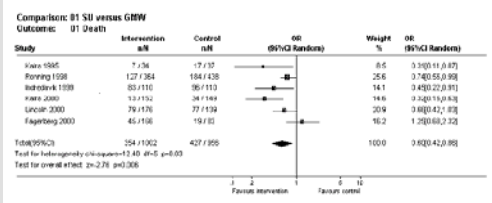
---

---

---

---

## Stroke Units prevent death



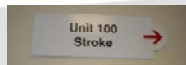
NNT = 11 (95%CI 7-25) to prevent one death

28

CALGARY STROKE PROGRAM

## Calgary Stroke Unit 100 FMC

- 8-bed sub-acute stroke unit opened in November, 2001
- patients with stroke who were rehabilitation candidates eligible for stroke unit care
- staffed with expert nurses, physiotherapist, occupational therapist, social worker and speech pathologist
- Target LOS is 12 days
  - we are averaging 10



29

CALGARY STROKE PROGRAM

## Results

224 patients over 6 months  
Average age = 65.1 years; 46% female  
Average LOS = 6.3 days  
Discharge

Home	65%
Rehabilitation	17%
Deceased	<1%
Long-term care	<1%
Out of region, within hospital	17%

30

CALGARY STROKE PROGRAM

### Goals: Win-Win

Provide the best in stroke care for Calgary patients  
Provide a milieu for clinical and translational research

“While providing better care and achieving better outcomes for patients, we hope to reduce length of stay by 2 days, saving the system \$1 million annually.”

---

---

---

---

---

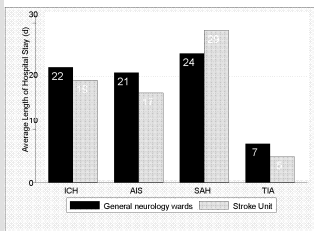
---

---

---

### Calgary Stroke Unit

Figure 2a. Length of Hospital Stay between Two Cohorts by Stroke Type



Note: AIS = acute ischemic stroke; TIA = transient ischemic attack;  
ICH = intracerebral hemorrhage; SAH = subarachnoid hemorrhage

---

---

---

---

---

---

---

---

### Stroke Units – Why?

- Nursing care
- Focused support services
- Prevention of DVT/PE
- Prevention of aspiration pneumonia
- Prevention of recurrent stroke
- Early mobilization and rehabilitation

---

---

---

---

---

---

---

---

## Stroke Unit Care

Follow Best Practice Standards for:

- Hyper-acute stroke treatment
- Acute stroke treatment
- Post acute stroke treatment
- Prevention of complications

34

CALGARY STROKE PROGRAM

---

---

---

---

---

---

---

---

## Avoid Complications:

- Dysphagia:
  - 40% new strokes have
  - High mortality with
  - Aspiration Pneumonia
- DVT Protection
- Depression
- Dehydration
- Urinary Tract Infection

35

CALGARY STROKE PROGRAM

---

---

---

---

---

---

---

---

## Stroke is a Multidisciplinary Approach

Regular team meetings:

- Monday and Tuesday mornings
  - Physio/OT/Social Work/Speech/Nurse Clinician/ Physicians and Acute Stroke NP

Early rehab referrals

- Physio/OT/Social Worker/ Transitional Service/ Speech

Education:

- Families and patient



36

CALGARY STROKE PROGRAM

---

---

---

---

---

---

---

---

