KEEPING YOUR PATIENT OUT OF THE HOSPITAL BY PREVENTING A SECOND STROKE

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Relationships with commercial interests:
► Not Applicable

Potential for conflict(s) of interest:
► Not Applicable
Mitigating Potential Bias

► All the recommendations involving clinical medicine are based on evidence that is accepted within the profession.
► All scientific research referred to, reported, or used is in the support or justification of patient care.
► Recommendations conform to the generally accepted standards.
► The presentation will mitigate potential bias by ensuring that data and recommendations are presented in a fair and balanced way.
► Potential bias will be mitigated by presenting a full range of products that can be used in this therapeutic area.
Discuss recognition of stroke and TIA.

Discuss the basic medical management of patients after a stroke.

Review common symptoms in stroke survivors.
INFORMING PATIENTS ABOUT STROKE
First hours from stroke onset through initial management in the emergency department may have a significant impact on patient outcomes.

Recognition of stroke and activating the medical system is a critical first step.
The sooner normal blood flow can be restored, the greater likelihood of a good outcome for the patient.

Most stroke patients are not able to recognize their stroke and call 911 themselves – therefore important for everyone to learn the signs of stroke and know to call 911.
<table>
<thead>
<tr>
<th>Time Interval</th>
<th>Median Range (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median time first 9-1-1 call to paramedic arrival on-scene (patient location)</td>
<td>7 to 10 minutes</td>
</tr>
<tr>
<td>Median paramedic on-scene time</td>
<td>15 to 24 minutes</td>
</tr>
<tr>
<td>Median Transport time from scene to hospital</td>
<td>10 to 29 minutes</td>
</tr>
</tbody>
</table>

2014 Data provided by provincial EMS services across Canada, except Quebec and Newfoundland
Baseline: Stroke Transport to the ED by Ambulance

2006: Update of HSF Signs of Stroke to include ‘Call 911’

Impact of FAST?

WHAT IS A HIGH RISK TIA?
High Risk TIA

Which of the following are higher risk TIA symptoms? (More than 1 correct answer)

A. Speech (aphasia or dysarthria)
B. Sensory Loss
C. Vertigo
D. Motor/weakness
E. Memory loss
Answer

- A and D
- Motor and Speech are high risk TIA symptoms.
A Prospective Cohort Study to Derive the Canadian TIA Score for Identification of Subsequent Stroke Risk within 7 Days
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Funded by Canadian Institutes of Health Research
# Independent Predictors of Subsequent Stroke within 7 Days of Index Diagnosis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds Ratio</th>
<th>95% CI Lower</th>
<th>95% CI Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atrial Fibrillation on ECG</td>
<td>3.0</td>
<td>1.4</td>
<td>6.3</td>
</tr>
<tr>
<td>Already on antiplatelet therapy</td>
<td>3.8</td>
<td>1.4</td>
<td>10.0</td>
</tr>
<tr>
<td>Initial triage DBP $\geq$ 110 mmHg</td>
<td>3.8</td>
<td>1.9</td>
<td>7.9</td>
</tr>
<tr>
<td>Dysarthria or aphasia</td>
<td>1.7</td>
<td>1.1</td>
<td>2.6</td>
</tr>
<tr>
<td>History of gait disturbance</td>
<td>2.0</td>
<td>1.2</td>
<td>3.1</td>
</tr>
<tr>
<td>History of unilateral weakness</td>
<td>1.9</td>
<td>1.2</td>
<td>3.0</td>
</tr>
<tr>
<td>Glucose $\geq$ 15 mmol/L</td>
<td>4.5</td>
<td>2.0</td>
<td>10.0</td>
</tr>
<tr>
<td>First TIA (in lifetime)</td>
<td>2.3</td>
<td>1.3</td>
<td>4.0</td>
</tr>
<tr>
<td>Symptoms $\geq$ 10 min</td>
<td>2.8</td>
<td>1.0</td>
<td>7.8</td>
</tr>
<tr>
<td>Platelet count $\geq$ 400 x $10^9$/L</td>
<td>2.5</td>
<td>1.0</td>
<td>6.0</td>
</tr>
<tr>
<td>Past history of carotid stenosis</td>
<td>2.3</td>
<td>0.9</td>
<td>5.5</td>
</tr>
<tr>
<td>Vertigo</td>
<td>0.3</td>
<td>0.09</td>
<td>0.98</td>
</tr>
<tr>
<td>Infarction (new or old) on CT</td>
<td>1.6</td>
<td>1.0</td>
<td>2.5</td>
</tr>
</tbody>
</table>
## Canadian TIA Risk Scale to Identify Patients with TIA at High Risk of a Subsequent Stroke within 7 Days

### ITEMS

**Clinical Findings:**
1. First TIA (in lifetime)  
2. Symptoms ≥ 10 minutes  
3. Past History of Carotid Stenosis  
4. Already on Antiplatelet Therapy  
5. History of Gait Disturbance  
6. History of Unilateral Weakness  
7. History of Vertigo  
8. Initial Triage Diastolic Blood Pressure ≥ 110 mmHg  
9. Dysarthria or Aphasia (History or Examination)

<table>
<thead>
<tr>
<th>POINTS</th>
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<tbody>
<tr>
<td>2</td>
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<td>2</td>
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<td>3</td>
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<td>1</td>
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<tr>
<td>1</td>
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<tr>
<td>-3</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

### Investigations in Emergency Department:
1. Atrial Fibrillation on Electrocardiogram  
2. Infarction (new or old) on CT  
3. Platelet Count ≥ 400 × 10⁹/L  
4. Glucose ≥ 15 mmol/L

<table>
<thead>
<tr>
<th>POINTS</th>
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<tbody>
<tr>
<td>2</td>
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<tr>
<td>1</td>
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<tr>
<td>2</td>
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<tr>
<td>3</td>
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</tbody>
</table>

**Total Score (-3 to 23):**
Canadian TIA Score

Take Home Clinical Points

- Tool requires validation
- Recognizes need for testing in addition to clinical criteria
- Highlights consistent findings with other studies

<table>
<thead>
<tr>
<th>High Risk</th>
<th>Low Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor</td>
<td>Vertigo</td>
</tr>
<tr>
<td>Speech</td>
<td>Memory/Amnesia</td>
</tr>
<tr>
<td>Gait</td>
<td>Pure sensory (especially if recurrent)</td>
</tr>
</tbody>
</table>

*Stroke.* 2014;45:92-100
MEDICAL THERAPY AFTER A TIA OR STROKE
Standard Medical Therapy After Stroke

- Antithrombotics
- Blood Pressure Control
- Cholesterol Control
- Diabetic Control
Which Antithrombotic is Recommended after TIA or Stroke?

A. ASA 81 mg daily
B. ASA 325 mg daily
C. Plavix 75 mg daily
D. ASA 81 + Plavix 75 daily
E. Aggrenox (ASA 50 mg/dipyridamole) 1 tab BID
Answer

- A, B, C and D are correct
- B is incorrect
Discussion

- ASA 80 – 325 mg is equally effective in stroke prevention
  - Standard to initiate ECASA 81 mg
- Clopidogrel and ASA/Dipyridamole have minimal efficacy differences in comparison to ASA
- Antiplatelet agents are often switched but the most valuable intervention is to reassess for the cause of the event
Dual Antiplatelet Use After Stroke

- May be initiated for several reasons
  - Most commonly for large vessel stenosis intracranially or extracranially
  - Most significant benefit presumed after plaque rupture

Chance Study, NEJM, June, 2013
Dual Antiplatelet Cessation

- Should only be a short term therapy
  - 3 weeks then single antiplatelet therapy
  - Your role is often to assure it is not continued indefinitely
  - Increased bleed risk after 3 months

Chance Study, NEJM, June, 2013
Anticoagulation after Ischemic Stroke

► Only proven role for anticoagulation is with atrial fibrillation/flutter.

► We will assume your patient does not have afib for now. Anticoagulation will be discussed later in this session.
BLOOD PRESSURE CONTROL AFTER A STROKE
Blood Pressure Control

Your patient has a blood pressure in your office of 168/98. HR = 78, reg. You should:

A. Lower the blood pressure within 24-48 hours to 140/90.
B. Titrate down BP over weeks by starting a low dose agent today
C. Raise the BP with salt. The brain loves blood.
D. Leave it alone and recheck in 2 weeks.
Correct answer: B
BP Control

► CHEP Guidelines apply to stroke patients
  ▪ There are no separate stroke targets
  ▪ No indication for specific agents

► Gradually lower BP after ischemic stroke
  ▪ Achieving target over weeks is recommended
  ▪ In certain circumstances (arterial occlusions) higher BPs may be needed while collateral circulation develops. If symptoms worsen, back off BP lowering.
Blood Pressure Agents

Which antihypertensive agents are recommended for stroke patients:

A. ACE Inhibitor
B. Beta blocker
C. BP control is not very important in stroke
D. CHEP Guidelines apply to stroke patients
Correct answer: D
**Blood Pressure**

- CHEP guidelines apply
- No focus on specific agents
- Generally gradual lowering is recommended
- HTN remains the most significant risk factor for stroke
SPRINT

► 9361 patients, primary prevention trial
  ▪ Stroke was an exclusion criteria

► BP < 120 was beneficial for reducing fatal and non-fatal cardiovascular events
  ▪ Stroke subgroup effect was not significant

► Several studies with stroke patients have not demonstrated a benefit with more aggressive BP control in secondary prevention

NEJM Nov 10, 2015
Cholesterol

Stroke/TIA patients should have cholesterol treated by:

A. Lipitor 80 mg for all patients
B. Any statin to target LDL < 2.0
C. Cholesterol is only an MI issue
D. Is more important in hemorrhagic stroke
Answer

Correct: B
Most TIA/ischemic stroke patients should be on a statin agent to target an LDL < 2.0 or 50% reduction in LDL.

Statin therapy is not indicated for prevention of intracerebral hemorrhage.
Recommendations follow Canadian Diabetic Guidelines.

Initiating glucose control therapy immediately after stroke is safe and recommended.
- Both hypo and hyperglycemia have been associated with worse stroke outcomes.
WHAT TESTS SHOULD I ORDER AFTER A TIA OR STROKE?

How about an MRI?
Etiology of Stroke

► Two major sources of emboli
  ▪ Atrial Fibrillation
  ▪ Carotid stenosis

► Small vessel infarcts require reassessment of vascular risk factors
Test For Predominant Embolic Sources
(Which Have Treatments)

Carotid Stenosis
Atrial Fibrillation
Atrial Fibrillation in Patients with Cryptogenic Stroke

Bar chart showing the percentage of patients with atrial fibrillation detected over different durations of ECG monitoring.

- 24 Hr: 2.2%
- 1 Wk: 7.4%
- 2 Wk: 11.6%
- 3 Wk: 12.3%
- 4 Wk: 14.8%

Duration of ECG Monitoring
Testing for a Cardioembolic Source in Hospital

- Transthoracic echocardiogram
- Consider holter monitor
  - Or outpatient holter/loop event monitor
CAROTID STENOSIS
Vascular Imaging

► Carotid imaging is recommended for all stroke patients
► Carotid doppler is sufficient screen
► CT Angiogram
  ▪ More precise
  ▪ Use when doppler not available rapidly or need for second test for verification
► MR Angiogram
  ▪ Generally not as precise as CTA
Timing of Carotid Revascularization

<table>
<thead>
<tr>
<th>Symptomatic Stenosis &gt; 70%</th>
<th>NNT (Prevent 1 stroke in 5 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within 2 weeks</td>
<td>3</td>
</tr>
<tr>
<td>After 2 weeks</td>
<td>6</td>
</tr>
<tr>
<td>&gt; 12 weeks</td>
<td>125</td>
</tr>
</tbody>
</table>

Timing of patients with recent stroke can be complex and should be discussed with a neurologist and/or carotid surgeon.
When Should You Consider an MRI?

► When the stroke is not clearly visualized on CT
LESS OFTEN DISCUSSED STROKE TOPICS
Common Effects of a Stroke You May Not Immediately Notice

► Depression
► Cognitive impairment
► Fatigue
### Table 1B: Overview of Antidepressant Therapy for Post-Stroke Depression

This table provides a summary of the pharmacotherapeutic properties, side effects, drug interactions and other important information on select medications identified through evidence reviews as the most frequently used medications for the management of post-stroke depression. This table should be used as a reference guide by health care professionals when selecting an appropriate agent for individual patients. Patient compliance, side effects, drug interactions and comorbidities should all be taken into consideration during decision-making, in addition to other information provided in this table and available elsewhere regarding these medications.

<table>
<thead>
<tr>
<th>Medication Generic and Trade Names</th>
<th>Selective Serotonin Reuptake Inhibitors (SSRI)</th>
<th>Serotonin–norepinephrine reuptake inhibitors (SNRI)</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>citalopram – Celexa</td>
<td>duloxetine - Cymbalta</td>
<td>methylphenidate – Ritalin (amphetamine)</td>
<td></td>
</tr>
<tr>
<td>escitalopram – Cipralex</td>
<td>milnacipran – not available in Canada</td>
<td>nortriptyline – Aventyl (tricyclic antidepressant)</td>
<td></td>
</tr>
<tr>
<td>fluoxetine – Prozac</td>
<td>reboxetine – special access program only</td>
<td>trazodone – Desyrel, PMS-, Apo-, Dom-, Mylan-, Nu-, Phl-, ratio-, Teva-trazodone (tetracyclic antidepressant)</td>
<td></td>
</tr>
<tr>
<td>fluvoxamine - Luvox</td>
<td>venlafaxine – Effexor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>paroxetine – Paxil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sertraline – Zoloft</td>
<td></td>
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</tbody>
</table>

**Contraindications**

- Fluoxetine – intracranial hemorrhage
- All Hypersensitivity to SSRIs, or taking Monoamine oxidase inhibitors (MAOIs)
- Hypersensitivity, patients with a seizure disorder, or taking MAOIs
- Nortriptyline – cardiac abnormalities
- Hypersensitivity, patients with uncontrolled narrow angle glaucoma, or patients taking MAOIs, certain antibiotics, CYP1A2 inhibitors (e.g. fluvoxamine and quinolones)
Other Common Symptoms You May Not Notice

► Pain
  ▪ Ensure proper ROM
  ▪ Spasticity management
► Social Withdrawl
► Loss of sexuality
Emotional Lability

► The ability to control emotions can be a major problem after a stroke, especially with frontal lobe involvement

- Crying or laughing inappropriately can be part of the stroke
Caregiver Stress

► Stress from new issues
► Concern they will get worse
► Guilt if they are not around to help
Conclusion

► It is important for us to improve public recognition of stroke in order to initiate acute treatments
► High risk TIAs: Motor and speech symptoms
► Control BP – gradually in most cases
► Investigate in most cases for an embolic source:
  ▪ Carotid stenosis
  ▪ Atrial fibrillation
► Stroke survivors can develop less discussed complications