Operation Stroke

How to Reduce the Risk of Stroke Complications

Objectives

- Focus on Acute Stroke as an active disease
- Discuss the most common stroke complications
- Describe how first 72 hours sets the stage for optimal recovery

Proactive Approach

- Stroke is an active disease
- First 72 hours sets the stage
- Dramatic changes can occur within first 72 hours
  - Mild stroke can get worse and severe stroke deficits can improve greatly

Proactive Approach

- Critical ROLE and RESPONSIBILITY of healthcare providers at every stage of the care continuum to enable optimal stroke care and recovery
- Preventing, Recognizing, Monitoring and Managing complications starts early

EMS On-Scene Management

- EMS personnel use a standardized acute stroke diagnostic screening tool as part of on-scene assessment [Evidence Level B].
- Information is obtained about the suspected stroke (presenting symptoms, time of onset, and sequence of events), co-morbid conditions, and any formal or informal advance directives [Evidence Level C].

EMS On-Scene Management

- On-scene time is as short as possible; ideally less than 15 min if presenting within 4.5 h time window [Evidence level C].
- Blood glucose measurement [Evidence Level B].
- Instructions provided to family, include accompany patient or be accessible by phone for decision-making, confirming time last known well and be able to provide info such as health conditions & medications [Evidence Level C].

Transport & Handover

- While en route to receiving hospital, paramedics notify ED early of suspected stroke which initiates activation of acute stroke team and further protocols.
- Paramedics provide following info: stroke onset time, total symptom duration time at anticipated time of arrival in the ED, GCS, CTAS triage score, age and ETA [Evidence Level C]. Glucose level also provided.
  - Paramedics document on EMS record and copy is provided to receiving hospital [Evidence Level B].

Evaluation & Management in ED

GOAL is RAPID ASSESSMENT

- **ABCs**
  - Rapid, initial evaluation of ABCs
- **Time of stroke onset is determined**
- **Neurological assessment**
  - Standardized Stroke Scale (e.g., NIHSS, CNS)
- **Vital Signs including HR, BP, Temperature**
  - Lack of evidence to guide specific treatment of elevated BP
    - Eligible for tPA: Very high BP (>185/110mmHg) should be treated
    - Not eligible for tPA: Extreme BP (>220 systolic or >120 diastolic) may be treated
- **Oxygen Saturation**
  - O2 saturation is monitored with vital sign checks and maintained per protocol.

Evaluation & Management in ED

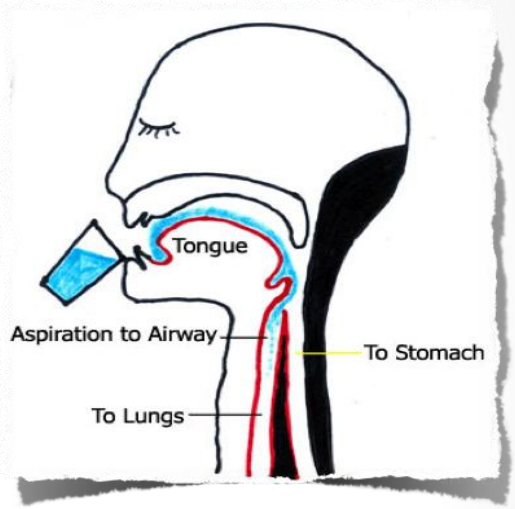
- **Cardiac Monitoring**
  - Monitoring includes HR and Rhythm
- **Blood work**
  - Electrolytes, glucose, hematology (CBC), coagulation (INR, aPTT), creatinine, glomerular filtration rate (GFR), BUN, lipid profile, liver panel, and troponin
  - Blood Glucose
    - BG checked immediately
    - Repeat BG measurement (Fasting blood glucose & HbAIC) if first random blood glucose (BG) > 11.0 mmol/L
- **IV**
  - Ensures hydration. Fluid status is assessed with vital sign checks

Evaluation & Management in ED

- **CT scan ASAP**
  - Brain and vascular imaging of the brain and neck arteries is done immediately
  - ???Thrombolysis (inclusion/exclusion criteria)
- **ECG**
  - Initial ECG in ED
  - Following initial ECG, daily ECGs x 72 h
- **CXR**
  - Completed in ED; should not delay decision-making for thrombolysis

Evaluation & Management in ED

- NPO (No PO medications) until dysphagia screen/assessment
- Swallowing and nutrition is screened ASAP-on admission day using a validated tool (e.g., STAND, TOR-BBST); should not delay thrombolysis
- Abnormal results prompt referral to SLP +/- dietitian
- Continue to monitor swallowing ability following screen



Evaluation & Management in ED

Seizure Assessment

- New onset within 24h should be treated using short-acting medications
- A single, self-limiting seizure should not be treated with long-term anticonvulsants
- Recurrent seizures should be treated as per other neurological conditions
- Prophylactic use of anticonvulsant medications is not recommended

Acute Stroke Care

- Stroke Unit care including early & intensive rehabilitation is a proactive approach that saves lives
- Easier to address many issues in a geographically consolidated stroke unit
- Interprofessional team, Protocols, Patient Order Sets & Clinical Pathway ensure issues are not overlooked
- Components of best practice stroke care involve doing simple strategies well
- What is done early to prevent and manage complications can have lasting positive effects over time

Operation Stroke

What you can do to reduce STROKE COMPLICATIONS

(especially in the first 72 hours)

FEVER

Triples the odds of dependency at 3 months

Why: Hyperthermia increases volume of infarcted tissue and depletes energy stores worsening brain injury. Patients with a temp >37.9 have a very high early risk of death.

What can you do about it?

- **Monitor temperature**
- **Target temperature <37.5**
- **Notify MD if temp >37.5**
- **Tylenol PRN**
- **Find/treat sources of infection**

PNEUMONIA

Quadruples the odds of 3 month mortality

WHY: Hypoxia and depletion of energy stores worsen brain injury

What can you do about it?

- **Raise HOB to 45^{O}**
- **Swallowing Screening**
- **Regular mouth care**
- **Supplemental O2 PRN**
- **Early & frequent mobilization**

URINARY TRACT INFECTION

Triples the odds of dependency at 3 months

Why: Indwelling catheters increase the risk of infection substantially.

Urinary Tract Infection is an independent risk factor for a poor stroke outcome.

What can you do about it?

- **Avoid indwelling catheters**
- **If used, remove ASAP**
- **In and out catheterization q4-6h PRN (if bladder scan volume > 300ml)**
- **Post void residuals PRN**

HYPOPERFUSION/DEHYDATION

Doubles the odds of mortality at 3 months

WHY: Maintaining cerebral perfusion is the best way to prevent infarct expansion.

Hydration = perfusion maintained = improvement of stroke deficit

Dehydration = perfusion not maintained = worsening of stroke deficit

What can you do about it?

- **IV hydration**
- **Avoid excessive BP reduction**
- **Screen swallow, then FEED**
- **Enteral feeds, if necessary**
- **SLP consult PRN**
- **Dietitian consult PRN**

HYPERGLYCEMIA/HYPOGLYCEMIA

Almost double the odds of poor functional outcome

WHY: Hyperglycemia leads to lactic acid in the brain which is damaging, promotes edema and promotes hemorrhagic conversion.

Hypoglycemia does not maintain energy stores for the brain.

What can you do about it?

- **Target glucose 5-10 mmol/L**
- **Maintain normal blood glucose**

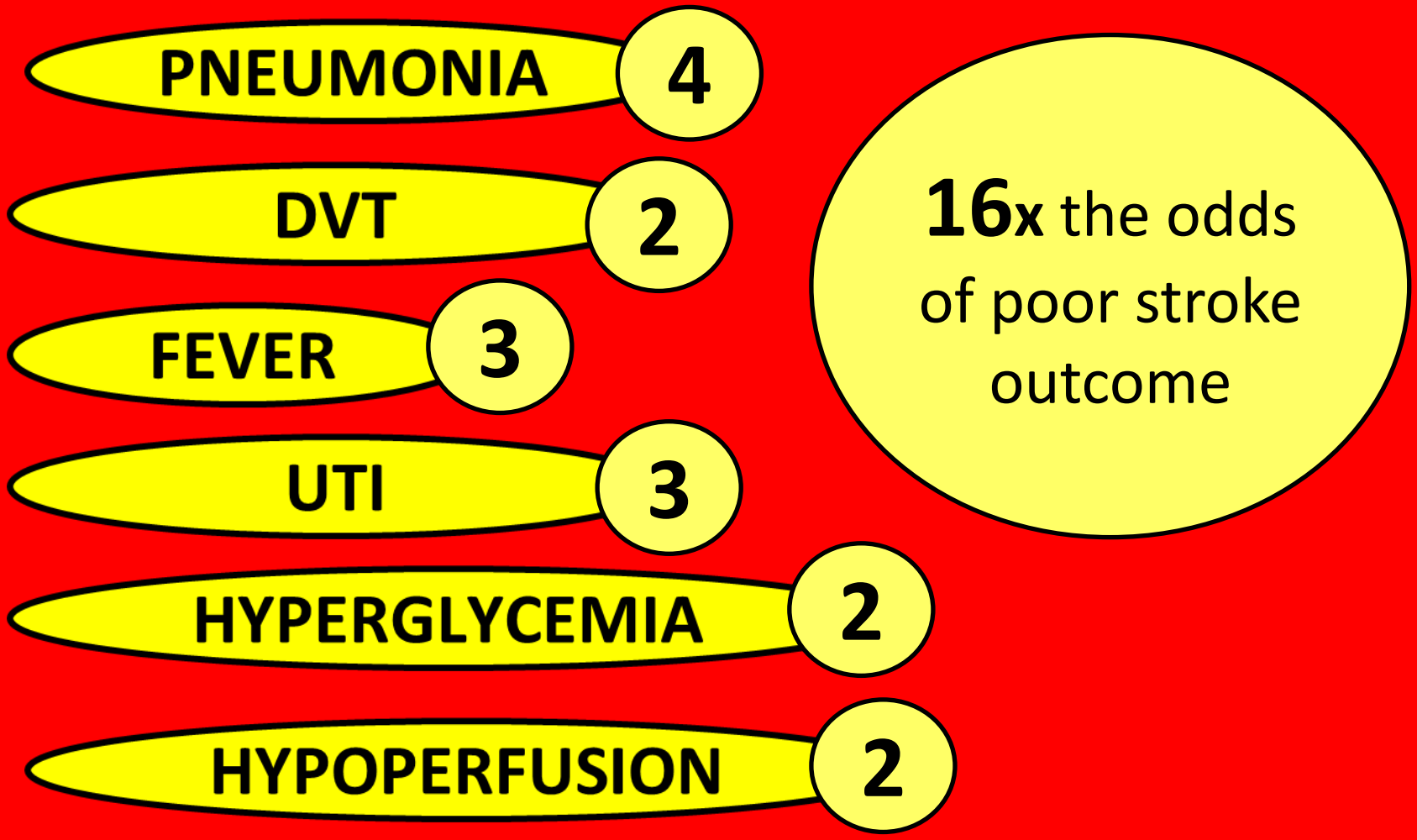
DVT

Doubles the odds of mortality at 3 months

WHY: Risk of DVT in stroke patients is 20-50%

What can you do about it?

- **Hydrate/nourish**
- **Early & frequent mobilization**
- **Mechanical and/or Pharmacological prophylaxis as ordered**


PNEUMONIA
4
DVT
2
FEVER
3
UTI
3
HYPERGLYCEMIA
2
HYPOPERFUSION
2
16x the odds of poor stroke outcome

Summary

- Being proactive in relation to preventing, recognizing, monitoring and managing complications:
  - Minimizes infarct size
  - Optimize stroke outcomes
- Visit Canadian Stroke Best Practice website to get the latest recommendations, summary of evidence and knowledge transfer tools

http://www.strokebestpractices.ca/

Canadian **Best Practice** Recommendations for **Stroke Care**

REHABILITATION

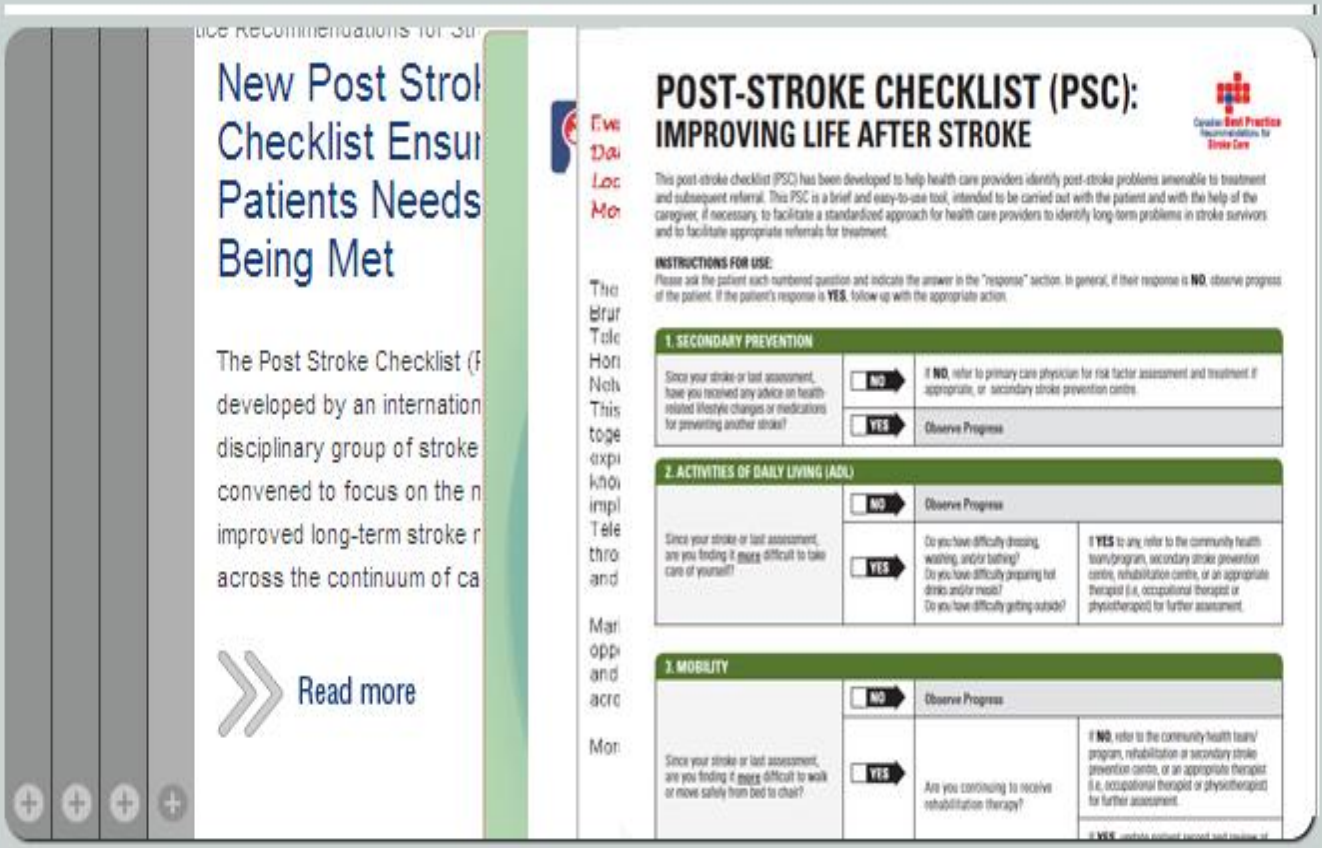
FRANÇAIS | PRINT

HOME | ABOUT US | NEWS | EVENTS | IMPLEMENTATION | CONTACT US

SEARCH

RECOMMENDATIONS:

- Overview
- Methods
- Knowledge (KT)
- Awareness
- Prevention *NEW!*
- Hyperacute
- Acute
- Rehabilitation
- Transitions
- Mood and Cognition *NEW!*
- Cross-Continuum
- Pediatric Stroke
- Appendices



TRANSITIONS OF CARE

UPCOMING EVENTS:

May 10 – 11, 2013
Telestroke Summit
Moncton, NB

May 28-31, 2013
European Stroke Conference
London, UK "Ongoing Trials" abstract deadline: 9 May 2013

June 11-14, 2013
Canadian Association for Neurological Nursing
Montreal, QC Abstract Deadline: December 15, 2012

October 17-20, 2013
Vascular 2013
Montreal, QC Abstract Deadline: May 3, 2013

Resources

www.strokenetworkseo.ca

www.strokebestpractices.ca

References

- Images retrieved from *Microsoft Clip Art 2003 & Microsoft Office 2010* **http://office.microsoft.com/en-ca/images/?CTT=6&ver=14&app=powerpnt.exe**
- Images retrieved from *Google Images 2013* **http://images.google.ca/**
- Heart and Stroke Foundation of Canada and the Canadian Stroke Network. (2013). *The Canadian best practice recommendations for stroke care.* Retrieved from **http://www.strokebestpractices.ca/**