OPTIMIZING STROKE CARE

CODE STROKE: THE THUNDER BAY EXPERIENCE
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PRESENTER DISCLOSURE

• Dr Ghazala Iffat Basir
• Relationships with commercial interests:
  "I have no conflict of interest or affiliations that have influenced this presentation to disclose."
  - Grants/Research Support: None
  - Speakers Bureau/Honoraria: None
  - Consulting Fees: None
  - Other: None
LEARNING OBJECTIVES

At the end of this presentation, participants will be able to:

- Describe the impact of implementing Code Stroke at Thunder Bay Regional Health Sciences in reducing door-to-needle time.

THUNDER BAY REGIONAL HEALTH SCIENCES CENTRE (TBRHSC)

- World-class acute care facility
- 375 beds
- Thunder Bay and Northwestern Ontario
Population
>236,000
Area
460,000 km²

Ontario stroke system

Fewer stroke
Better outcomes
STROKE BURDEN IN NWO

- Approximately **439 Stroke** patients last year.

| Number of Admissions to TBRHSC | 2014-15 | 2015-16 | 2016-17 | 2017-18*
<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Ischemic</td>
<td>249</td>
<td>305</td>
<td>315</td>
<td>299</td>
</tr>
<tr>
<td>Hemorrhagic</td>
<td>56</td>
<td>62</td>
<td>49</td>
<td>51</td>
</tr>
<tr>
<td>TIA</td>
<td>67</td>
<td>73</td>
<td>75</td>
<td>89</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>372</strong></td>
<td><strong>440</strong></td>
<td><strong>439</strong></td>
<td><strong>439</strong></td>
</tr>
</tbody>
</table>

Source: TBRHSC Health Records

*Note Q4 of 2017-18 from internal stroke database
IV ALTEPLASE (IV tPA) SHOULD BE GIVEN?

1. Within 3 hours of symptom onset
2. Within 6 hours of symptom onset
3. Within 4.5 hours of symptom onset
4. Within 24 hours of symptom onset

All patients with disabling acute ischemic stroke must be screened without delay by a physician with stroke expertise (either on-site or by telemedicine/telestroke consultation) to determine their eligibility for both medical treatment with intravenous tPA (within 4.5 h from stroke symptom onset) and interventional treatment with endovascular therapy (within a six-hour window from stroke symptom onset) [Evidence Level A] 1
TARGET DOOR TO NEEDLE TIME SHOULD BE?

1. Within 4.5 hours of arrival.
2. Within 45 minutes of arrival.
3. Within 60 minutes of arrival.
4. Within 30 minutes of arrival.

All eligible patients should receive intravenous tPA as soon as possible after hospital arrival [Evidence Level A] \(^1\) with a target door-to-needle time of less than 60 min in 90% of treated patients and a median door-to-needle time of 30 min [Evidence Level B] \(^1\).
How many neurons die per minute after a stroke?

1. 190 million
2. 1.9 million
3. 90000
4. 900 000

Time is Brain

Every minute in which a large vessel ischemic stroke is untreated, the average patient loses 1.9 million neurons, 13.8 billion synapses, and 12 km (7 miles) of axonal fibers. Each hour in which treatment fails to occur, the brain loses as many neurons as it does in almost 3.6 years of normal aging.
1.9 MILLION BRAIN CELLS DIE EVERY MINUTE AFTER STROKE

10 minutes
1 hour
6 hours

CRITICAL STEPS IN EARLY STROKE MANAGEMENT

1 RECOGNIZE SIGNS OF STROKE —
2 CALL 911 —
3 PARAMEDIC DISPATCH —
4 PARAMEDIC ON-SITE ASSESSMENT AND MANAGEMENT —
5 URGENT NEURORADIOLOGIC IMAGING —
6 ARRIVE AT EMERGENCY DEPARTMENT —
7 ACTIVATE STROKE PROTOCOL —
8 RAPIDITY AND TRANSFER TO HOSPITAL —
9 DIAGNOSIS —
10 INTERVENTIONS —
11 DISCHARGE FROM EMERGENCY DEPARTMENT TO COMMUNITY —
12 OR ADMIT TO HOSPITAL —

MIND AND MINDSIDE FOUNDATION
ACTIVATE STROKE PROTOCOL —

CODE STROKE VIDEO
- https://www.youtube.com/watch?v=mpmvRXoZQ64
STROKE WORK FLOW

Prehospital → In hospital → Door to Needle time

ER nurses, Phlebotomist, ECG tech, Stroke nurses, CT Tech

ER Physician  Neurologist  Radiologist  ICU Physician

- Implemented December 1, 2015
- Streamlined process at TBRHSC for activating the stroke team in response to a patient with a suspected stroke
- Patient with suspected stroke symptoms is assessed by nurse
- If time since last seen normal is less than 4.0 hours and patient meets criteria:
  - The nurse will dial 55 and activate Code Stroke
  - Overhead paging initiated by switchboard
TEAM IS WORKING IN PARALLEL FOR TIMELY ASSESSMENT AND TREATMENT

- **Acute Stroke Physician on Call:** calls involved department through switchboard
- **Emergency Department Physician:** immediately assesses patient presenting with stroke symptoms
- **In-patient Unit Staff from Involved Department:** Return if on break
- **CT Technologist:** Ensures the patient is “next on table”, calls the patient unit with instruction for transfer
- **Phlebotomist:** Responds to location announced, draws STAT blood work, lab tests drawn prior to transfer to CT
- **ECG Technician:** Respond to location announced, performs a STAT 12-lead ECG (will not delay transfer to CT)
- **Clinical Stroke Nurse:** When on shift, will respond to location, provide nursing support
- **Intensive Care Unit:** Will be aware of possible patient transfer
Median door-to-needle time among patients who received tPA (Minutes) Target = 30 min, Ontario Provincial Benchmark = 33 min

Code Stroke Initiated - December
2017-2018: Annual Door to Needle Data Summary
Thunder Bay Regional Health Sciences Centre

<table>
<thead>
<tr>
<th>Seen by ED Physician</th>
<th>INR Collected</th>
<th>Call to Stroke Physician</th>
<th>CT Started</th>
<th>Stroke Physician Arrival</th>
<th>tPA administered (Door to Needle Time)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median (minutes)</td>
<td>Median (minutes)</td>
<td>Median (minutes)</td>
<td>Median (minutes)</td>
<td>Median (minutes)</td>
<td>Median (minutes)</td>
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<tr>
<td>6 min</td>
<td>8 min</td>
<td>4 min</td>
<td>14 min</td>
<td>26 min</td>
<td>43 min</td>
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<td>Range: 0-207</td>
<td>Range: 0-124</td>
<td>Range: 0-114</td>
<td>Range: 6-111</td>
<td>Range: 0-159</td>
<td>Range: 31-144</td>
</tr>
<tr>
<td>Target within 10 min</td>
<td>Target within 10 min</td>
<td>Target within 15 min</td>
<td>Target within 15 min</td>
<td>Target within 10 min</td>
<td>Target median within 30 min</td>
</tr>
</tbody>
</table>

**Need to discuss changes to target times, to align with reduction in DTN target time from 60 min to 30 min**

**SUCCESSSES**

- Significant improvement in our tPA door to needle time.
- Better team approach to stroke care
CHALLENGES
FUTURE

- Effective and Equitable stroke care in NWO

THANK YOU
REFERENCES

2. The Heart and Stroke Foundation 2015 Stroke Report: *Access to Stroke Care: The Critical First Hours*

PLEASE COMPLETE THE ONLINE EVALUATION

- Your feedback is important to us!
- Your feedback will allow the Cardiovascular and Stroke Summit Planning Committee to evaluate the 2018 Summit, to provide feedback to the speakers, & develop future educational events

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