Stroke Treatment in Critical Access and Community Hospitals

NeuroOnCall Network

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Stroke in Michigan

Age-adjusted five-year mortality rates for stroke by county, 2002-2006.
Source: MDCH Vital Statistics

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Stroke

- Medical emergency - death of brain tissue.
- Time dependent.
  - 3-4.5 hours for IV tPA
  - 6-10 hours for IA treatment
- Specialist evaluation - stroke mimics, contraindications to tPA.
- Diagnostic testing - labs and radiologic.
NeuroOnCall Network

- Telehealth technology - patient evaluation
- 24/7 specialist availability
  - Neurology
  - Neurosurgery/Neuroendovascular
- One call evaluation/treatment/transfer
- Evidence based protocols for stroke treatment

Stroke Network Implementation

- Acute Ischemic Stroke Algorithm
- Education
  - Nursing Staff
  - Emergency Medical Services
  - Medical staff - Emergency Services
- Mock Code Stroke Events
- Community Education Events
Stroke Telehealth Evaluations
NeuroOncall Network

![Graph showing telehealth consults, transfers, TPA, and intervention for FY 2012 and FY 2013 (first quarter).]

Stroke Telehealth Evaluations
CAH & Community Hospital

![Graph showing telehealth consults, transfers, TPA, and intervention for FY 2012 and FY 2013.]

Stroke Network Outcomes 2012

<table>
<thead>
<tr>
<th>Treatment Type</th>
<th>Age</th>
<th>Pre NIHSS</th>
<th>Post NIHSS</th>
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</thead>
<tbody>
<tr>
<td>Medical Management</td>
<td>62</td>
<td>5.3</td>
<td>2</td>
</tr>
<tr>
<td>TPA</td>
<td>78</td>
<td>20</td>
<td>12.75</td>
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<tr>
<td>Intervention</td>
<td>70</td>
<td>11.5</td>
<td>2.5</td>
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</table>
Reason for Non treatment with Thrombolytics

<table>
<thead>
<tr>
<th>Reason</th>
<th>Count</th>
</tr>
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<tbody>
<tr>
<td>Coagulopathy</td>
<td>1</td>
</tr>
<tr>
<td>Dissection</td>
<td>1</td>
</tr>
<tr>
<td>Hemorrhage</td>
<td>3</td>
</tr>
<tr>
<td>Minor symptoms</td>
<td>1</td>
</tr>
<tr>
<td>Not a stroke</td>
<td>2</td>
</tr>
<tr>
<td>Seizure</td>
<td>3</td>
</tr>
<tr>
<td>Resolved</td>
<td>6</td>
</tr>
<tr>
<td>Time</td>
<td>5</td>
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</table>

Stroke Network Outcomes 2012

<table>
<thead>
<tr>
<th></th>
<th>Home</th>
<th>IPR</th>
<th>SIPR</th>
<th>Hospice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Management</td>
<td>17</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>TPA</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Intervention</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Patient Presentation

67 year old female awoke with expressive speech difficulty and weakness of the right arm and leg.
Transported to Carson City Hospital.
PMH - HTN, hyperlipidemia, thyroid disease

Clinical Findings

Cerebral Blood Flow reduced
Cerebral blood volume reduced
Increased mean transit time

Outcome

Thank you for the referral!

St John Providence NeuroOnCall
888-885-STAT
### Patient Presentation

#### Clinical Findings

- **84 year old male** - last known normal at 7:10 am found at 8:00 to be with facial droop and right sided weakness.
- Transported by EMS to McKenzie Health System

#### Cerebral Blood Flow

- Cerebral Blood Volume
- Mean Transit Time

#### Outcome

- Non contrast CT - admission
- Non contrast CT - 4 hour

#### Intervention

- Blood pressure maintained.
- IV administered.
- Non-contrast CT ordered.

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### Patient Presentation

#### Clinical Findings

- **73 year old male** with acute onset while driving of right upper and lower extremity weakness.
- Flagged down another motorist to call EMS.

#### Cerebral Blood Flow

- Cerebral Blood Volume
- Mean Transit Time

#### Outcome

- Non-contrast CT - admission
- Non-contrast CT - 4 hour

#### Intervention

- Right dense hemiparesis.
- Expressive Dysarthria
- NIHSS = 11

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### Patient Presentation

#### Clinical Findings

- **84 year old male** with a history of one week headache, weakness, numbness and difficulty walking.
- Noted an increase in symptoms over last couple days.
- Developed double vision this morning.
- On Coumadin for a history of DVT & PE
- Presented to McKenzie Memorial Hospital.

#### Outcome

- Right ptosis with sluggish pupil reaction - suggesting 3rd nerve palsy.
- INR 3.79
- CT scan mixed density Subdural hematoma
- Bilateral Right > Left with 6mm shift.

#### Intervention

- Transported to Providence Hospital.
- FFP and vitamin K for reversal of coagulopathy.
- Repeat CT scan in 24 hours revealed increase in size of subdural hematomas.
- Taken to the OR for bilateral frontal crainotomy with drainage of subdurals and subdural drain placement.
- IV filter placed as no longer a candidate for anticoagulation therapy.
- Discharge in 7 days.
- Symptoms improved with exception of 3rd nerve palsy.
- Follow up with repeat CT, Neurosurgery, Neuro-ophthamology and PCP.

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### Patient Presentation

#### Clinical Findings

- **13 year old male** with acute onset while driving of right upper and lower extremity weakness.
- Flagged down another motorist to call EMS.

#### Outcome

- Non-contrast CT - admission
- Non-contrast CT - 4 hour

#### Intervention

- Right dense hemiparesis.
- Expressive Dysarthria
- NIHSS = 11
- CT scan negative

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Stroke Care Benchmarks

![Chart showing arrival times and transfer data before and after Telehealth support]

Stroke Care Reimbursement

<table>
<thead>
<tr>
<th>Level of intervention</th>
<th>MS-DRG</th>
<th>Encounter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Stroke</td>
<td>64, 65, 66</td>
<td>$3797</td>
</tr>
<tr>
<td>Medical Stroke TPA (ship &amp; drip)</td>
<td>61, 62, 63 V45.88</td>
<td>$6247</td>
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</tbody>
</table>

Summary

- Stroke can be treated effectively by CAH and community hospitals with specialist support.
- Patient outcomes are improved with rapid treatment by CAH and community hospitals.
- Reduction in unnecessary transfers. Retaining local revenue.
- Reimbursement for tPA patients.
Next Steps

- Expand Current Stroke Network
- Expand Service Lines
  - Behavioral Health
  - Medical Intensive Care
  - Trauma
- Virtual Clinics
  - Specialty Clinics

Thank You!

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