ND STROKE Coordinators
Case Studies
STEMI and Stroke Conference, Fargo, ND, August 5, 2014
STROKE Coordinator Case Study
Essentia Health, Fargo
Essentia Health Stroke Alert Process

- **Within 24 hours of Last Known Well**
  - Initiate when EMS pre-notifies of arrival
  - Straight to CT from EMS cart
  - Goal to give IV tPA within 45 minutes from arrival

Reduced Door to Drug time by **31 minutes** over 1 year!
2013: 63 minutes
2014: 32 minutes
Essentia Health Stroke Alert Process

• **Successes**
  ▫ Improved patient outcomes
  ▫ Reduction of door to drug times
  ▫ Excellent outcomes for tx of cerebral aneurysm
  ▫ Over 90 educational events from June 2012 to June 2014

• **Barriers**
  ▫ Culture change throughout the hospital
    • Stroke is an EMERGENCY!
Case Study 1: Drip and ship from CAH

- Presenting sx at CAH:
  - 80 y/o
  - Sudden onset L) sided weakness
  - Aphasia
  - NIHSS = 8 (approximate)
Case Study 1: Drip and ship from CAH

• Stroke work-up at CAH:
  • STAT head CT (result = no changes, no hemorrhage)
  • Labs drawn and sent
  • ECG completed
  • History / Exclusion criteria reviewed
  • Call to tertiary hospital = recommended to give IV tPA
  • **IV tPA administered within 63 minutes of arrival to CAH!**
  • Pt flown to Essentia immediately after IV tPA infusion began
  • **Outcome: Pt d/c’d home with NIHSS = 0**
Case Study 2: Missed tPA opportunity

- Last known well @ 0750
- EMS arrived @ 0859
- Arrival to CAH @ 0919
Case Study 2: Missed tPA opportunity

- Presenting sx at CAH:
  - Sudden R) sided weakness
  - Sudden onset aphasia / pt completely mute
  - NIHSS = 6
Case Study 2: Missed tPA opportunity

- Stroke work-up at CAH:
  - STAT head CT (result = no changes, no hemorrhage)
  - Labs drawn and sent
  - ECG completed
  - History / Exclusion criteria reviewed
  - Call to tertiary hospital = reported that symptoms were improving
  - Based on report, did not recommend IV tPA
  - Pt flown to Essentia Health
Case Study 2: Missed tPA opportunity

- Arrival at Essentia Health:
  - NIHSS = 6
  - Outside of IV tPA window; endovascular therapy not an option for this patient
  - Weakness improved, but severe aphasia persisted upon discharge
  - NIHSS at discharge = 3 (severe aphasia)
  - Pt will undergo outpatient speech therapy
  - Question: Could pt have benefitted from IV tPA at CAH?
Take Home Message

• IV tPA in 60 minutes *is possible* at a CAH

• “Minor” or “Rapidly Improving” deficits often times would benefit from IV tPA!
Questions?
Patient Information

63 year old male

History of:
- Obstructive Sleep Apnea (No CPAP)
- Tobacco use
- Chronic headaches
- Several TIAs (last one year ago)
- COPD (on home O2)

Family History:
- Mother deceased - stroke
- 2 deceased brothers - strokes
- 2 deceased sisters - strokes

Surgery History
- Left knee replacement
- Cardiac Cath - medical management
- Kidney Lithotripsy (2014)

Medications:
- Coumadin (TIAs)
- Lipitor
- Toprol-XL
- Few others
ER Presentation:

- Patient brought into ER by his wife
- Left sided weakness
- Facial droop
- Expressive aphagia
- Blurred vision in left eye
- BP 146/89 mmHg
- HR 58 BPM
- Initial NIHSS was 5
- 5’ 9” / 86.2 kg

CT scan:
- negative for and acute changes
- no bleed or mass noted

EKG:
- Normal Sinus Rhythm
- no ischemic changes noted

Labs:
- Glucose 110 mg/dL
- INR 1.0 (0.9-1.2)
  On Coumadin for prior TIAs

All other labs within normal limits
Timeline of Events

- 12:45 pm - Last Know Well (LKW)
- 1:27 am - Arrival at Altru Hospital
- 1:29 am – Stroke Code called
- 1:30 am – ECG completed
- 1:34 am – MD assessment
- 1:42 am – CT completed
- 1:45 am – Neurology Consulted
- 1:50 am – Discussion with patient about tPA
- 1:53 am – CT Interpretation
- 2:05 am – Neurology Consulted (Pt request)
- 2:25 am – Urology Consult (lithotripsy)
- 2:46 am – tPA administered

42 mins - LKW to arrival

15 mins – Door to CT completed
    (Goal < 25 mins)

26 mins - Door to CT interpretation
    (Goal < 45 mins)

79 mins – Door to tPA administered
    (Goal < 60 mins)

121 mins – LKW to tPA (Activase)
    (Goal < 180 mins)
Summary

• MRI revealed a right thalamus infarct
• < 12 hours post tPA - NIHSS of “2”
• At discharge NIHSS of “0”
• Full resolution of symptoms during stay
• No therapies recommended at discharge
Room for improvement

- Patient call EMS/911
- Stroke code ahead of time by EMS
- CT scan could have been completed/read quicker- straight to CT from ambulance

42 mins - LKW to arrival

15 mins – Door to CT completed
  (Goal < 25 mins)

26 mins - Door to CT interpretation
  (Goal < 45 mins)

79 mins – Door to tPA administered
  (Goal < 60 mins)

121 mins – LKW to tPA (Activase)
  (Goal < 180 mins)
Accurate Documentation

There was very detailed documentation by ER physician for the reason for the delay in administering tPA.

- In depth explanation to patient & wife about the risks and benefits of tPA.
- Wife wanted patient’s neurologist at another facility to be contacted prior to tPA being given.
- Urology consulted to verify the risk of recent lithotripsy procedure (< week ago)
- Repeat conversation with wife about the risks & benefits
- Wife agreed to the tPA after all physicians contacted and were in agreement that the benefits out weigh the risks.
Questions?
STROKE Coordinator Case Study
Trinity Health, Minot
EMS Transfer Patient

- 68 yo male with PMH of HTN, Renal Insufficiency, GERD
- Home Medications: Metoprolol, Enalapril, ASA
- Location approximately 90 miles from Stroke Center
- Onset of symptoms 1930
- Dispatch EMS 2000
- Arrival of EMS 2030
- Initial assessment shows patient with right side weakness, and inability to speak
EMS Transfer Patient

- Decision made to bypass CAH and go to Stroke Center
- Arrival Trinity at 2208
- Labs drawn 2213
- CT done at 2218 which was negative for a bleed
- tPA at 2233
- MRA showed stroke in left frontoparietal lobe
- Shortly after tPA, patient showed improvement in symptoms
- In hospital for 2 days then transferred to Rehab for 9 Days
- Follow up phone call 3 months after his stroke, patient doing well with no residual deficits
Critical Access Hospital Transfer Patient

- 53 yo male with PMH of smoking and Alcohol abuse
- Home Medications
- Patients location very remote approx 40 miles from CAH and 150 miles from Stroke Center
- LKN: 1425 was witnessed by co-workers
- Symptoms were left sided weakness and inability to speak
- CAH Arrival: 1618
- CT Scan: 1629 (11 minutes)
- TNKase given: 1744 (86 minutes) Staff at CAH did not know that they had tPA available for use.
- Transfer Time: 1803 (105 minutes)
Critical Access Hospital Transfer Patient

- Trinity Arrival: 1901
- CTA done on arrival showing hyperdense right Middle Cerebral Artery, no bleeding
- Admit to ICU for close observation and monitoring
- Repeat CT the next day showed significant cerebral edema with shift noted.
- Repeat CT on day 3 showed hemorrhagic conversion with increased shift
- Family decided on CMO
- Patient expired Day #3
Questions?
STROKE Coordinator Case Study
Sanford Health Bismarck
Patient Information

• 87 year old female

• Patient History:
  ▫ Obesity
  ▫ Deep Venous Thrombophlebitis
  ▫ Pulmonary Hypertension
  ▫ Diverticulitis
  ▫ Basal cell cancer

Surgical History:
  Left total knee

Medications:  none

None smoker/No alcohol use

Family History:
  Stroke and Liver Disease
Patient had a witnessed fall while outside. She was not able to get up. Husband noticed her eyes looked different and she had slurred speech. He called 911.

Presents to ED with acute onset of left sided weakness for approximately 30 minutes. Had left sided facial droop, left arm and left leg paralysis and garbled speech.

- Accu-check by EMS was 102
- BP 141/101, HR 101
- Initial NIHSS 18
- CT scan confirmed total right MCA (middle cerebral artery) occlusion.
- Labs- Glucose 108; INR 1.10

<table>
<thead>
<tr>
<th>PROCESS</th>
<th>TIME (* from arrival)</th>
<th>LENGTH OF TIME</th>
<th>GOAL</th>
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<tbody>
<tr>
<td>Patient Arrival Time</td>
<td>1147</td>
<td>NA</td>
<td>N/A</td>
</tr>
<tr>
<td>Time MD Saw</td>
<td>1147</td>
<td>Less than 1 minute</td>
<td>15 minutes</td>
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<tr>
<td>Stroke Code Paged</td>
<td>1147</td>
<td>Less than 1 minute</td>
<td>15 minutes</td>
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<tr>
<td>Door to CT</td>
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<td>7 minutes</td>
<td>25 minutes</td>
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<td>CT Reported (initial results)</td>
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<tr>
<td>Lab Response Time</td>
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<td>3 minutes</td>
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<td>Lab Result Time (page to report)</td>
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<td>6W RN for NIHSS Response Time</td>
<td>NIHSS 18</td>
<td>Yes</td>
<td>Yes/No</td>
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<tr>
<td>tPA Initiation Time</td>
<td>1307</td>
<td>80 minutes</td>
<td>60 minutes</td>
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tPA

- Neurologist paged during stroke code and informed of patient’s situation. After discussion with the patient and her husband about the risks, benefits and alternatives of IV-tPA, they opted to try this. Patient had no contraindications.
- Patient’s blood pressure remained stable. She was admitted to the ICU for close monitoring and observation. After 24 hours, she transferred to the stroke unit and had evaluation for therapies to begin. Repeat CT was done with no signs of bleeding. This patient did transfer to inpatient rehab for significant left sided neglect.

*Process improvement:* To better meet our GOAL of 60 minutes for DOOR TO NEEDLE. This was discussed at our Stroke Peer Review Committee and it was suggested use of a WATCH with time counting down to make all staff aware of TIME LOST. Further education of time management is needed.
Questions?
STROKE Coordinator Case Study
St. Alexius, Bismarck
Questions?