Inpatient Code Neuro: Checklist Guided Treatment of In-Hospital Stroke
Inpatient Code Neuro Evaluation

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  – Regional Stroke Program Coordinator, CHI Franciscan Health

> Financial & Ethical Disclosures:
Objectives

- Identify the regulatory requirements for in-hospital stroke
- Describe the Inpatient Code Neuro process at Harrison Medical Center
- Analyze staff perceptions of the Inpatient Code Neuro program and checklist
- Examine data from in-hospital stroke events and their associated patient outcomes
- Discuss program evaluation findings and recommended next steps
About Harrison Medical Center

> Founded in 1918
> Campuses in Bremerton, Silverdale, Port Orchard, Bainbridge Island and Belfair with clinics spread throughout Kitsap, Mason, Jefferson, and Clallam counties
> 242 licensed beds at the main Bremerton campus
  – Over 300 beds planned for Silverdale main campus transition in 2020
> Level I cardiac, Level II stroke, Level III trauma centers
> Joint Commission Primary Stroke Center since 2016
Harrison’s Primary Stroke Center Journey

> April 2015 – Stroke Steering Committee commits to pursuing Primary Stroke Center certification for Harrison Bremerton
> September 2015 – Interdisciplinary 3 day workout to develop new ED acute care stroke standards and workflow
> December 2015 – Launch of Code Neuro at both Harrison emergency departments
> January 2016 – Interdisciplinary 2 day workout to develop Inpatient Code Neuro workflow, checklist and, policy
> May 2016 – Inpatient Code Neuro debut on the Bremerton campus
In-Hospital Stroke Guidance and Regulations

> American Heart & Stroke Associations:

> Brain Attack Coalition:

> American Academy of Neurology:

> The Joint Commission:
  – DSPR.5: 6.a. The primary stroke center has designated practitioners knowledgeable in the diagnosis and treatment of stroke who are responsible for responding to patients with an acute stroke 24 hours a day, 7 days a week.¹
In-Hospital Stroke Burden

> 2.2% to 17% of all ischemic strokes occur during hospitalization\(^2-9\)

> Get With the Guidelines: patient location when stroke discovered…

> Ultimately, we need more data!
Inpatient Code Neuro Process

> So what did we develop?
  - Process benchmarks
  - Frontline nursing or provider activation
  - Integrated overhead and device paging
  - A no-judgment culture for mistaken activations
  - A response team comprised of the stroke floor charge nurse, RRT nurse, pharmacist, and attending provider
  - A code neuro packet containing important documents and education
  - An evidence-based checklist required for all activations
  - Education for nursing and providers
  - Inpatient Code Neuro Policy and Procedure
# Inpatient Code Neuro Benchmarks

<table>
<thead>
<tr>
<th>Goal Times for Inpatient Code Neuro</th>
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<tbody>
<tr>
<td>Symptom recognition to provider assessment</td>
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<tr>
<td>Symptom recognition to CT start</td>
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<tr>
<td>Symptom recognition to lab results (if ordered)</td>
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<tr>
<td>Symptom recognition to CT interpretation and reporting</td>
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<tr>
<td>Symptom recognition to t-PA administration</td>
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<tr>
<td>Symptom recognition to stroke unit admission or transfer to higher level of care</td>
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Inpatient Code Neuro Activation

**Code Neuro applies to any patient with new stroke symptoms for <6 hours duration.**

Specific criteria must be met prior to activation:
- Positive FAST exam.
  - Facial droop or
  - Arm (or leg) weakness or
  - Speech difficulties (slurred or unable to speak) with
  - Time that patient was last well is <6 hours.
- Point of care blood glucose (BGL) >60 mg/dL.

**For a new positive FAST and blood glucose > 60 mg/dL:**

**Activate Code Neuro: Call 5555**
Inpatient Code Neuro Checklist
Inpatient Code Neuro Checklist

Inpatient Code Neuro Care and Documentation Checklist

<table>
<thead>
<tr>
<th>Name</th>
<th>Date &amp; Time of Arrival @ Bedside</th>
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<tbody>
<tr>
<td>Physician</td>
<td></td>
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<tr>
<td>PCU East Charge Nurse</td>
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<tr>
<td>Rapid Response Nurse</td>
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<tr>
<td>Pharmacist</td>
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</tbody>
</table>

☐ PCU East charge nurse responds with Code Neuro toolkit

   Verify the following:
   ☐ Positive FAST Exam
   ☐ Blood glucose >60 mg/dL
   ☐ Confirmed time last known well is <6 hours

☐ Verify the attending or covering physician has been notified and is en route

☐ Obtain and enter STAT verbal order for “CT Head STROKE,” or ensure physician has entered order in Epic

☐ RRT RN or PCU East charge nurse accompanies patient to CT

Patient Label

CHI Franciscan
Inpatient Code Neuro Checklist

Once CT is complete patient returns to their original unit and room for completion of the following:

- Physician consults Neurointerventional Radiologist (NIR) once CT results are received [888-200-9022]
- NIHSS completed ASAP without delaying head CT. NIHSS performed by responding RN and physician
  - NIHSS charted in Epic on NIHSS flowsheet by responding RN
- Physician documents NIHSS score in their progress note
- Assess vital signs and document in Epic
- Obtain orders for labs if not performed within the last 24 hours and notify Lab of Code Neuro lab orders
  - CBC
  - CMP
  - PT/INR
- Fibrinolytic Checklist completed by physician with responding RN or pharmacist assistance
  - Checklist is completed by physician but entered into Epic by responding RN
  - Physician documents Fibrinolytic Checklist completion in their progress note
Inpatient Code Neuro Checklist

TPA Administration:

☐ Physician counsels patient and/or family on risks vs. benefits of tPA
  ☐ Physician obtains verbal consent from patient/family
    - NOTE: Implied consent can be used within 3 hour window if patient has cognitive deficits and consenting parties are not available
  ☐ Written consent obtained for patients in the extended 3 – 4.5 hour window
  ☐ Completed Fibrinolytic Checklist reviewed
☐ Activate Code Neuro Phase 1 by calling code line
☐ Physician orders tPA order set in Epic
☐ TIME OUT performed prior to administration
☐ File an IRIS and direct it to the Quality department

THIS CHECKLIST IS NOT PART OF THE MEDICAL RECORD

Forward completed checklist to Stroke Coordinator (MS 300-67) or scan to “Stroke Admit.”

04/25/2018
Inpatient Code Neuro Packet
Inpatient Code Neuro: What You Need to Know

1. Harrison Medical Center is applying for Primary Stroke Center Certification this summer.
2. It is a requirement by The Joint Commission to have a “process in place” for acute strokes that occur in the in-patient setting.
3. What do you need to know as an attending physician at Harrison Medical Center when an “In-patient Code Neuro” is called on your patient?

   1. You must enter or give a verbal order for a STAT non-contrast head CT scan.
   2. You must review the thrombolytic exclusion criteria with the RN, who will document your responses in Epic.
   3. You must evaluate the patient in person within 10 minutes if in-house, or return immediately to the hospital to evaluate the patient.
   4. If there are no exclusion criteria to thrombolytics, you must review risks and benefits of tPA with the patient/family; NOTE: when the patient cannot verbally provide consent, implied consent may be used, as tPA is the standard of care for ischemic stroke (AHA/ASA Class I, Level A recommendation in stroke patients last known well less than 3 hours).
   5. The charge nurse or HUC will call the Neuro Interventional Radiologist on call to assist you in the decision-making process regarding tPA administration.
   6. You must enter the order for tPA using the tPA Order Set, then arrange transfer to the ICU after speaking to the on-call intensivist.
   7. You must document in your note a detailed neuro exam, the NIH score, and that there were no exclusion criteria for the administration of tPA, as well as “the risks and benefits of tPA were discussed with the patient and/or family and they wish to proceed.”

Questions? Please contact the Harrison Stroke Coordinator Josh Snively at 360-744-6616, or the on-call stroke coordinator after hours at 253-291-0517.
Evaluation of the Checklist and Program

> Project objectives
  - Evaluate staff satisfaction with the checklist
  - Assess diagnostic accuracy for CVA & TIA
  - Assess for changes in treatment rate
  - Evaluate patient outcomes
  - Refine checklist as indicated by survey results, outcome data, or other findings
  - Disseminate findings and formal recommendations to the Harrison Stroke Steering Committee
Survey Responses

RRT and stroke floor charge nurses (N=41) were surveyed between December 11 and December 22, 2018.

- 14 total questions, 10 multiple choice, 4 free text
- 18 complete responses received (44%)

Have you responded to a code neuro in the last 12 months? 89% Yes, 11% No
Are you aware of the checklist? 94% Yes, 6% No
Do you understand all of the steps of the checklist? 94% Yes, 6% No
Is the checklist user friendly? 100% Yes, 0% No
### Free Text Survey Responses

<table>
<thead>
<tr>
<th>Checklist comments</th>
<th>step-by-step instructions, clear, easy to use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code Neuro comments</td>
<td>higher level of urgency paid to new stroke symptoms; a unified team response; a clear algorithm for care; ordering of only essential diagnostic exams; having rapid access to computed tomography; post-incident feedback; and bedside nursing staff activation</td>
</tr>
<tr>
<td>Areas for improvement</td>
<td>slow physician response; physician refusal to use the checklist; false or inaccurate code activation; physicians not seeking expert consultation; responder time away from primary responsibilities; lack of primary nurse involvement after activation.</td>
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Chart Review and Data Analysis

> Review completed January, 2019
> Charts selected were from August 2015 to December 2018
  – Inpatient Code Neuro implemented May, 2016
> 207 charts selected for review, 168 met criteria for inclusion

<table>
<thead>
<tr>
<th></th>
<th>August 2015 – April 2016</th>
<th>May 2016 – December 2018</th>
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</thead>
<tbody>
<tr>
<td>Events</td>
<td>18</td>
<td>150</td>
</tr>
<tr>
<td>Diagnosed CVA/TIA</td>
<td>13</td>
<td>109</td>
</tr>
<tr>
<td>Treated</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Med. length of stay</td>
<td>7 days</td>
<td>7 days</td>
</tr>
</tbody>
</table>
Chart review and data analysis

- Neurovascular diagnosis: 72.2% Pre-Implementation, 72.7% Post-Implementation
- Treatment rate: 0% Pre-Implementation, 11% Post-Implementation
- Mortality: 23.1% Pre-Implementation, 14.7% Post-Implementation
- Disability at discharge: 62.1% Post-Implementation

CHI Franciscan
Chart review and data analysis

PRE-IMPLEMENTATION BURDEN

Out-of-hospital Stroke 97% n=465

In-hospital Stroke 3% n=13

POST-IMPLEMENTATION BURDEN

Out-of-hospital Stroke 93% n=1578

In-hospital Stroke 7% n=109

P < 0.05
Next steps

- Survey for provider satisfaction
- Education for providers with emphasis on the importance of checklists in low frequency, high acuity situations
- Accountability for situations where ego > process
- Continued collection of in-hospital stroke event data, preferably into GWTG
- Implementation of the modified Rankin Scale as a standardized stroke disability assessment tool prior to and after discharge
Acknowledgements

> DNP Committee Members
  – Hilaire Thompson, PhD, RN, ARNP, CNRN, AGACNP-BC, FAAN
  – Elizabeth Bridges, PhD, RN, CCNS, FCCM, FAAN
  – Joelle Fathi, DNP, RN, ARNP, CTTS

> Susan Unterbrink, MBA, BSHI, RN, RHIA

> Trish Niehl, Executive Director of Neurosciences, CHI Franciscan

> CHI Franciscan Stroke Team
References

Dog Tax / Questions