Role of the Registered Nurse in Stroke Care

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Director Medical Operations
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Disclosure

- Speaker has nothing to disclose
Objective

- Describe the roles of a registered nurse in the different clinical areas of a stroke center.

- Discuss competencies required for nurses caring for the complex stroke patient.

- Describe the role of the RN in preventing complications in the complex stroke patient.
Nursing Care of the Stroke Patient

Comprehensive Overview of Nursing and Interdisciplinary Care of the Acute Ischemic Stroke Patient: A Scientific Statement From the American Heart Association

Comprehensive Overview of Nursing and Interdisciplinary Rehabilitation Care of the Stroke Patient: A Scientific Statement From the American Heart Association
Elaine L. Miller, Laura Murray, Lorie Richards, Richard D. Zorowitz, Tamilyn Bakas, Patricia Clark and Sandra A. Billinger
Stroke Systems of Care

PSC

CSC

ASRH
TIME MATTERS

In a typical acute ischemic stroke, every minute the brain loses…

- 1.9 million neurons
- 14 billion synapses
- 7.5 miles myelinated fibers

-- Saver, Stroke 2006
Stroke Care Stakeholders

- Stroke Center Director & CNS
- Inpatient Neuro Areas
- Acute Inpatient Rehab
- Skilled Transitional Units
- Inpatient Rehab Specialists
- Home Health
- Outpatient Clinic
Stroke Care Continuum

- **Rapid Diagnosis & Treatment**
  - Stroke Alert & RRT Stroke Alert
  - Telestroke support to spoke sites
  - Transport Team

- **Individualized Plan of Care**
  - Improved referrals to resources (rehab, home care, stroke clinic)
  - Aggressive education on risk factors and medications

- **Return to Community and PCP Medical Home**

**Defect Free Care**
P4P Projects
Value Based
Meaningful Use

**8 Core**

**D2CT ≤ 25 min**

**D2N ≤ 60min**

**LOS= ?**

**Eval Rehab**
Nursing Influence

- Transfer Center
- Flight Team
- Emergency Department
- Interventional Radiology
- Intensive Care Unit
- Medical Surgical Unit
- Research
- Rehab
- Stroke Program
**Care is Interdisciplinary...**

<table>
<thead>
<tr>
<th>DEPARTMENT</th>
<th>ROLES</th>
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<tbody>
<tr>
<td>Emergency Medicine Physician</td>
<td>Triage patient, Initiate work-up, call Neurospecialist</td>
</tr>
<tr>
<td>Radiology</td>
<td>Neuro-imaging/ rapid CT read; multi-modality Neuro-imaging</td>
</tr>
<tr>
<td>Nursing</td>
<td>Monitor Neuro/VS, lines, foley, diagnostics, medications, pt./family education</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>Prepare and deliver tPA</td>
</tr>
<tr>
<td>Lab</td>
<td>Rapid processing of CBC, Chem 7, Coag Profile</td>
</tr>
<tr>
<td>Neurosurgery</td>
<td>Surgical evaluation for hemorrhagic stroke, ICP /EVD</td>
</tr>
<tr>
<td>Interventional Radiology</td>
<td>Reperfusion Therapy, diagnostic angiogram</td>
</tr>
<tr>
<td>Medical Director</td>
<td>Physician champion clinical oversight, strategic planning</td>
</tr>
<tr>
<td>Stroke Nurse Coordinator</td>
<td>Oversight of clinical coordination of care, regulatory compliance</td>
</tr>
<tr>
<td>Stroke Data Nurse</td>
<td>Abstract and analyze data, trend core measures</td>
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</tbody>
</table>
Beyond Acute Management...

**Acute Event**
- Cause
- Risk Factors
- Other Medical diagnosis

**Restorative Phase**
- Stroke deficits & rehab therapy
- Prevention Plan
- Road to recovery

**Survivorship**
- Post Stroke ADL's
- Anxiety/Depression
- Reclaiming Quality of life

**SPANNING THE CONTINUUM**

9/30/15
Smooth Transitions Need:

- Hand off Communication (SBAR)
  - Neuro assessment
  - Plan of Care
- Medication Reconciliation
  - What has been given?
- Critical Testing Values
- Documentation
- Patient and Family Teaching
Moving to Next Level of Care

Requirements:

- Communication of patient status and plan for discharge
- Involvement of patient and family - mutually agreed upon goals
- Community resources
- Insurance issues
Participation in Care

- Family Presence
  - Palliative Care Program
- Participation in Plan of Care
  - Bedside Shift Report
  - Daily Patient Roadmap
  - Hourly Rounding
  - Collaborative Rounds
  - Communications Board
  - Teachback
  - Safety Huddles
- Individualized discharge plan
  - Respite Services Offered
- Post Hospital Support Group
Benefits of Collaboration

- Develop Relationships to Support Stroke Patients
  - Examine Current Partners for Care
  - Create Community of Care Team

- Enhance Health Care Team Communication
  - Eliminate barriers for handoffs
  - Ensure post hospital patient follow up

- Bridge Transitions for Post Hospital Care Delivery
  - Meet needs of complex stroke patient
  - Reduce early readmissions
Stroke Systems of Care

PSC

CSC

ASRH
Every Hospital Needs a Plan

- Treat with IV tPA
  - Recognize when to refer acute stroke
- Manage by evidenced based guidelines
Maximizing Resources

- Access Emergency Department
- Neuro Expertise & Expert Opinions
  - Physician and Nursing
- Stroke Care Areas
- Access to Needed Information
Prehospital Management & Field Treatment

- Access via EMS
- Arriving < 3-hour window
- Benefits
  - ↓ time to MD exam, CT imaging & neuro evaluation
  - EMS transport to most appropriate facility
    - Include pre-notification
    - Triage
  - Begin treatment and gather history
    - Use of prehospital scale (Class IIa)
      - Los Angeles Prehospital Stroke Scale
      - Cincinnati Prehospital Stroke Scale
Triage
Getting the patient story...

- Time of Onset
- Stroke Symptoms
- Medical History Facts
- Do we have family?
Initial Assessment

- Begins pre-hospital
  - Get Family Contact before EMS leaves!

- Treated as an acute event
  - Neurological assessment
    - Large Vessel Occlusion
  - Where do we go with this patient?
Emergency Nursing Role

■ Focused Neuro Triage:
  – Arrival EMS vs. Walk-in
  – When did symptoms start?
    • Anterior vs. Posterior Stroke Symptoms
  – What is the stroke scale?
    • Triage Severity Score

■ Does the patient meet criteria for reperfusion?
  – < 3 hours from onset of symptoms IV tPA
Symptoms of Stroke

- **Time of onset** is defined as the last time person was known to be normal.
- **Single most important information**
- If symptoms resolve- the therapeutic clock is RESET.
ABCD’s of Stroke Care

■ A = Airway
  – Can patient protect airway?
  – Does the patient have dysphagia?

■ B = Breathing
  – Is the O2 saturation ≥ 92%?

■ C = Circulation
  – Does the patient have adequate blood pressure?

■ D = Disability and Dextrose
  – What is the extent of deficit?
  – What is the blood sugar?

J Emergency Nurs. 2007. 33:228-34
NIH-recommended Emergency Department response times

The “golden hour” for evaluating and treating acute stroke

**door-to-needle ≤60 min**

- Suspected stroke patient arrives at ED
- ≤10 min Initial MD evaluation (including patient history, lab work initiation, and NIH Stroke Scale assessment)
- ≤15 min Stroke team notified (including neurologic expertise)
- ≤25 min CT scan initiated
- ≤45 min CT & labs interpreted
- ≤60 min Activase® (Alteplase, t-PA) given if patient is eligible

Initial Diagnostic Studies

- Stroke Bundle:
  - Non contrast brain CT
  - Blood glucose
  - Chemistry
  - EKG
  - Markers of cardiac ischemia
  - CBC
  - PT/INR/PTT
  - Oxygen saturation
Immediate priorities

- **Initiate Stroke Orders**
  - Start lines/foley
  - Ensure diagnostics done
  - Administer tPA/ drugs

- **Monitor and evaluate treatments**
  - Serial Neuro assessments
  - Ensure provider/family communication
What information is needed to give tPA?

- Baseline labs (CBC, PT/PTT/INR, Glucose)
  - Door to Lab 45 min
- Non-contrast CT scan
  - Door to CT 45 min
- EKG
- Patient weight
- 2 large bore IV sites
tPA administration

- Dose 0.9 mg./kg.
  - 10% bolus over 1-2 min. IV push
  - Hang remainder over 1 hour using volume control device
- Maximum dose 90 mg.
  - Waste excess
  - Door to Drug - Target < 60 minutes

Treatment within 90 minutes of symptoms more likely to result in favorable outcome
What to watch for?

■ Signs of ICH
  – ↑ Blood pressure
  – Nausea/Vomit
  – Change in level of consciousness

■ Signs of angioedema
  – hives/swelling
  – inspect tongue, oropharynx
Role of Neuroimaging
Is the patient a candidate for reperfusion treatment?
Mechanical Endovascular Intervention

- Proven to optimize recannilization
- Requires access to neurointerventional specialists
- Should never delay start of treatment with intravenous tPA
It’s not *can* you open the vessel...

...it’s *how fast* can you open the vessel?
Ongoing Nursing Focus

- Trending & Monitoring:
  - Patient assessment
  - Blood pressure management
  - Secondary injury prevention

- Recognition and minimize complications

- Risk Factor identification and management
Nursing Care Reminders

- Vital Signs and Neuro Checks q 15 min during first 2 hours, then every 30min q 6 hr and then q 1 for first 24 hours
- Delay placement of lines/tubes
- Follow-up CT at 24 hours
- Call any worsening to treating physician
  - Anticipate need for Stat CT of head
Blood Pressure Management

- *Impaired autoregulation in stroke*
  - tPA: goal BP <185/110 mm Hg.
  - No tPA goal BP <220/120 mm Hg.

- Short-acting titratable agents
  - labetalol
  - enalapril
  - cardene
  - *Not* nifedipine
  - nitroglycerine
  - nitroprusside
Blood Pressure Dosing

- Labetalol 10-20 mg IV over 1-2 min, May repeat or double every 10 min (max. dose 300 mg)

- Nicardipine 5mg/hr IV infusion as initial dose; titrate ↑ 2.5mg/hr every 5 min to max 15mg/hr
Circle of Willis provides collateral circulation

Anterior Communicating Artery
Anterior Cerebral Artery
Middle Cerebral Artery
Posterior Communicating Artery
Internal Carotid Artery
Posterior Cerebral Artery
Basilar Artery
Superior Cerebral Artery
Posterior Inferior Cerebellar Artery
Vertebral Artery

Courtesy of Genentech, Inc.
How low should BP go?

- Effect of hypotension on collateral circulation

  - Target numbers - when too worry
    - Less than 100 mmHg systolic
    - Less than 70 mmHg diastolic
  
  - Treating low pressure
    - Fluids first line - NSS
What about the role of HOB?

- Vertebral-basilar region stroke
- High grade carotid lesion stroke
- High grade MCA stenosis
Neurologic Assessments

- Serial Assessment
- Glasgow coma score
- Stroke Severity Scales
  - * Timing of documentation is tracked
- Neuro imaging
Time is Brain, what if we don’t have a neurologist??
LVHN Telestroke

HIPPA/HITECH compliant:

High definition video systems
Imaging Cloud
Neuro Critical Alert Algorithm
Do Not Delay Transport

**Critical Neuro**
- CT Finds
- Cerebellar infarct
- Cerebellar hemorrhage
- SAH-R/O aneurysm
- Large stroke with midline shift
- Acute SDH
- EDH
- Obstructive hydrocephalus
- Cord compression

**Acute Neuro Change**
If suspected head trauma
Consider CT neck with CT head

**Stroke Alerts and other ED admits with Critical Neuro CT result**

**Neuro Critical Alert**
- Burst page in department
- AP calls Transfer Center
- Fax EMS form

**ABC’s and Stabilize**

**Prepare for transfer**
Copy chart

**Call report to Receiving Unit**

**Stabilization**
- If GCS < 8 - Consider Intubation
- Two large bore IV’s
- Foley
- Coag INR > 1.7
- Reverse FFP / Vit K / PCC
- Neuro / vital signs every
- 15 minutes
- Treat nausea / vomiting
- Consider Mannitol / Lasix
- If FFP not finished, send with patient

<table>
<thead>
<tr>
<th>Pre-implementation</th>
<th>Post-implementation</th>
</tr>
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<tbody>
<tr>
<td>&lt;br&gt;227 minutes&lt;br&gt;Range: 120 - 560 minutes</td>
<td>&lt;br&gt;134 minutes&lt;br&gt;Range: 64 - 255 minutes</td>
</tr>
<tr>
<td>BAC Target</td>
<td>120 minutes to Neurosurgery</td>
</tr>
<tr>
<td>% Change</td>
<td>41% drop in intrafacility transfer time</td>
</tr>
<tr>
<td>Minutes Saved</td>
<td>93 minutes reduction on average</td>
</tr>
</tbody>
</table>
Role of Neuro ICU

- Close monitoring
  - Frequent assessment of vital signs and neuro exam
  - Invasive monitoring
    - ICP monitoring & CSF drainage
  - Pharmacologic interventions
Medical Stabilization

- Arterial Hypotension
- Hypoglycemia
- Hyperglycemia
- Assessment of Swallow
- Treat Fever
Role of Stroke Unit

- Assist with developing a comprehensive plan of care:
  - Further workup
  - Monitoring Interventions
  - Post Stroke Complications and Sequelae
  - Prepare for discharge
  - Educate patient and family
Importance of Nursing Assessment

- Ongoing neuro exam: 30% of stroke patients deteriorate in 1st 24 hours
  - Bleeding, edema, stroke in evolution; seizures; side effects of treatment

- VS trending
  - BP goals, temperature management, cardiac monitoring, oxygenation, blood glucose monitoring
Nurses Impact Care

- Research
- APC
  - NP & CNS
- Rehab
- Case Management
- Navigators
- Quality
- Informatics
Nursing Role of Preventing Complications

- VTE, Pneumonia
- Nutritional deficiency
- Aspiration
- Bowel or bladder dysfunction, UTI
- Contractures/joint abnormalities
- Skin breakdown
- Depression
- Falls
Nursing Management Summary

- Assess for worsening of existing deficit
  - Monitor for increase in ICP, progression of disease
- Trend patient parameters
  - BP, temperature, and glucose
- Prevent complications
  - VTE, Pneumonia
  - Monitor nutritional status
  - Bowel/bladder considerations
  - Effects of immobility
- Prepare for next steps
The LVHN Care Continuum

Ambulatory & Community Care
- Ambulatory Procedure Center
- Specialist Care
- Express CARE

Primary Care Offices & Clinics
- PCMH & CCT Initiatives

TeleHealth
(Primary Care thru Home Health)

Acute Care
Tertiary/Quaternary and Community Hospitals

Post-Acute Care
- LVHN OP Rehab
- LVHN Home Health Services
- TSU or External SNF

Wellness, Fitness & Education
- Preventive Care @ Home
- Diagnostics, Imaging, OP Rehab

Express CARE
- LVHN OP Rehab

OACIS
- LVHN Hospice
- IP Rehab *Not LVHN

Preventive Care @ Home Health
- LVHN Home Health Services
- OACIS
New Era Competencies

- Engage patients: robust care management
- Form effective teams for care delivery
- Coordinate care across settings
- Build in quality, reduce “waste”
- Create & sustain community partnerships
- Develop IT tools, utilize patient data sets
- Focus on health of population, not just disease
Monitoring for Improvement

- Continue to re-evaluate your system
  - Reduce unnecessary readmissions
  - Patient and family satisfaction
- Standardize Discharge
- Patient Education Programs
- Home Monitoring & Outpatient Follow up
Thank you for all you do!

Email: claranne.mathiesen@lvhn.org
References