Don’t forget about the head while caring for the heart!

Kimberly Gray RN, MSN, CNRN
March 4th, 2013

Disclosure

• Speaker’s Bureau for Genentech
• Not receiving any funding/financial support to participate in this presentation
Objectives

- Review current evidence in the treatment of stroke
- Discuss requirements of Joint Commission Primary Stroke Centers
- Compare and contrast support systems for stroke survivors and their caregivers

Stroke Demographics

- There are more than 795,000 new or recurring strokes each year, at a cost exceeding $73 billion. The total annual cost for stroke care includes the cost of health care services, medications, and lost productivity.
- As our population ages, organizations providing stroke care need to be able to address a growing population of at-risk patients.
- The chance of having a stroke more than doubles for each decade of life after age 55
- Nearly three-quarters of all strokes occur in people over the age of 65
- In addition to those older stroke patients, a growing number of younger patients are having a stroke - one-fourth
How often do strokes occur?

- 2010
  - Stroke is the 3rd cause of death in the US
  - Almost 795,000 strokes
    - 610,000 are first attacks
    - 185,000 are recurrent
  - Over 165,000 deaths from stroke
  - A stroke occurs every 40 seconds and a death from stroke every 4 minutes
  - Over 4.5 million stroke survivors
  - Annual cost estimated at >$52 billion
  - Blacks have twice the risk of first ever strokes when whites and Hispanics also have a higher incidence than whites

Types of Strokes

- Ischemic (83%)
- Blood clot
- Atherosclerosis
Hemorrhagic (Bleeding Stroke)  
17% of all strokes

- It results from a weakened vessel that ruptures and bleeds into the surrounding brain.
- The blood accumulates and compresses the surrounding brain tissue.
- This may be a result of an aneurysm.

Transient Ischemic Attack (TIA)

- Commonly called a ‘mini-stroke’
- ‘Warning-stroke’ – like chest pain without myocardial infarction
- No damage to the brain
- Transient ischemic attack (TIA): a transient episode of neurological dysfunction caused by focal brain, spinal cord, or retinal ischemia, without acute infarction.
- Removed the 24 hour timeframe. Specifically focused on the absence of ischemia.
- By using a tissue rather than time criterion, this revised definition recognizes TIA as a pathophysiological entity.

http://stroke.ahajournals.org/content/40/6/2276.full.pdf
Similar to chest pain without the heart attack!

- A TIA is a "warning stroke" or "mini-stroke" that produces stroke-like symptoms but no lasting damage. Sometimes symptoms only last 5 minutes or less.
- Most strokes aren't preceded by TIAs.
- However, of the people who've had one or more TIAs, more than a third will later have a stroke. A person who's had one or more TIAs is almost 10 times more likely to have a stroke than someone of the same age and sex who hasn't.
- TIAs occur when a blood clot temporarily clogs an artery, and part of the brain doesn't get the blood it needs. The symptoms occur rapidly and last a relatively short time.
- Stroke and TIA symptoms are the same!
- TIAs
  - 5% of individuals with a TIA will have a true stroke within 48 hours. Getting medical attention is crucial to preventing a stroke!
  - 11% within 90 days
  - 14% within a year
Stroke Risk Factors

- Controlling risk factors is the first step in prevention! Education and adopting risk reduction strategies are crucial to prevent a recurrent stroke
  - TIA
  - Diabetes
  - High cholesterol and lipids
  - High blood pressure
  - Overweight/obesity and physical activity
  - Tobacco - Don't smoke
  - Atrial fibrillation
  - Heart disease (cardiomyopathy)
  - Sickle cell disease and some other blood disorders
  - Alcohol abuse
  - Recreational drug use (cocaïne, heroin)

Symptoms of a Stroke

- If you see someone having any of these symptoms, call 9-1-1 immediately or activate your Rapid Response Team
- Sudden numbness or weakness of the face, arm or leg, especially on one side of the body
- Sudden confusion or trouble speaking or understanding
- Sudden trouble seeing in one or both eyes
- Sudden trouble walking, dizziness, loss of balance or coordination
- Sudden, severe headache with no known cause
- Do not wait to see if the symptoms will disappear! Even if the symptoms only last a short time.
Penumbra

- A primary goal of acute stroke care is to restore blood flow to the penumbra to decrease the amount of tissue and function that is lost as the infarct size can ‘extend’ to encompass the penumbra and increase the amount of dead brain cells.
- That is one of the critical goals of tPA-Alteplase therapy.
- Other processes must also be controlled besides just restoration of blood flow (Blood pressure, blood glucose, temperature, etc.)

Alteplase (t-PA)

- Shown to reduce neurological and functional disability at 3 months
  - The initial study (NINDS-Part 1, n=291) evaluated neurological improvement at 24 hours after stroke onset. The primary endpoint, the proportion of patients with a 4 or more point improvement in the National Institutes of Health Stroke Scale (NIHSS) score or complete recovery (NIHSS score = 0), was not significantly different between treatment groups. (tpa vs placebo)
  - A second study (NINDS-Part 2, n=333) assessed clinical outcome at 3 months as the primary outcome. A favorable outcome was defined as minimal or no disability using the four stroke assessment scales: Barthel Index (score ≥ 95), Modified Rankin Scale (score ≤ 1), Glasgow Outcome Scale (score = 1), and NIHSS (score ≤ 1).
  - Depending upon the scale, the favorable outcome of minimal or no disability occurred in at least 11 per 100 more patients treated with Activase than those receiving placebo. Secondary analyses demonstrated consistent functional and neurological improvement within all four stroke scales
- No statistically different change in mortality- ICH patients were included.
- Increased risk of Intracranial hemorrhage for patients that receive it vs. placebo (6.4% vs. 0.6%)
- Meta-analyses since show risk is approximately 4-5%
Risk of bleeding after tPA/Alteplase

Off-label use of IV Alteplase

- The European Cooperative Acute Stroke Study (ECASS III) tested the efficacy and safety of alteplase administered between 3 and 4.5 hours after the onset of stroke symptoms.
- The study showed a favorable outcome at 90 days, in 52.4% of treated patients versus 45.2% in controls.
- The inclusion and exclusion criteria for ECASS III were comparable to the original NINDS study except that those with NIH stroke scale >25, oral anticoagulant use (regardless of INR), the presence of both diabetes mellitus and a previous stroke, and age >80 years were excluded.
- The American Heart Association/American Stroke Association has published a scientific advisory statement recommending its use 3 to 4.5 hours from acute ischemic stroke symptom onset for eligible patients without contraindications and recommended adding the additional exclusions as those patients were excluded from the research.
  - http://stroke.ahajournals.org/content/40/8/2945.full
  - Since the advisory statement, many organizations have adopted this practice across the country.
  - The US FDA did not approve IV tPA for use beyond 3 hours.
Risk with tPA 3-4.5 hours

<table>
<thead>
<tr>
<th>T-PA from 3-4.5 hours</th>
<th>t-PA</th>
<th>Placebo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete or near complete recovery at 3 months</td>
<td>52%</td>
<td>45%</td>
</tr>
<tr>
<td>Symptomatic ICH (overall)</td>
<td>7.9%</td>
<td>3.5%</td>
</tr>
<tr>
<td>3 month mortality</td>
<td>7.7%</td>
<td>8.4%</td>
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The changing landscape of stroke care

- Healthcare organizations also need to be prepared for financial incentives or penalties for compliance with evidence-based stroke performance/core measures from payors as with other disease states.
- With data transparency to websites such as Leapfrog or Healthgrades, patients have the ability to look up outcomes and pick and choose to some extent where they wish to have their care.
- They will also be encouraged to choose providers that meet quality and cost metrics by insurance companies.
- Primary Stroke Centers help to develop a framework steeped in evidence that promotes performance improvement.
### Disease-Specific Certification

**Joint Commission**

- Joint Commission’s Advanced Disease-Specific Certification for Primary Stroke Centers provides an organized framework for standardizing processes known to improve patient outcomes, ensure performance measurement and improvement activities specific to stroke and other diseases.
- Ensures compliance with performance measures/core measures.
- Ensures use of evidence-based practice guidelines to manage and optimize care.
- They come at your request and verify that you are doing what you say you are doing and in accordance with the evidence.
- Well trained staff.

### Others that can accredit hospitals and have stroke certifications

- Health Care Facilities Accreditation Program (HFAP)
- Det Norske Veritas (DNV) (headquarters is in Norway)
- Each program have similarities to the other because all utilize the Brain Attack Coalition recommendations to some level.
- State initiatives- similar to Trauma designation for Stroke
  - New York, Massachusetts, Florida, Maryland, Texas
  - Some accept another certifying bodies requirements, others have additional or different ones
  - Michigan is in the works!
Benefits of PSCs

Coordinated care approach can improve stroke outcomes
• Decreased Mortality
• Increased return to home
• Increased t-PA utilization

Journal of American Medical Association - JAMA

• 2011
• Evaluated impact of Primary Stroke Centers vs. non-designated PSCs
• http://jama.ama-assn.org/content/305/4/373.full
• Main Outcome: 30 day all cause mortality
• Additional studied outcomes –tPA use, 1 day, 7 day and 1 year mortality
• Similar 30 day all cause mortality rates although slightly lower for PSCs. (10.8% vs. 12.5%)
• TPA use rates significantly higher in PSCs
  – 4.8% vs. 1.7% p<0.01
Acute Stroke Protocol

targeted so team can decide treatment course
• Stroke severity must be assessed with NIH stroke scale (maximum score 42). Patients with a score above 22 are considered high risk for hemorrhagic conversion due to the probability of a large infarcted area.
• Patients with a score less than 4 have only minor neurologic deficits, for which thrombolytic therapy is not indicated.
• This is because of uncertain risk to benefit ratio.

The level of stroke severity as measured by the NIH stroke scale scoring system:

- 0= no stroke
- 1-4= minor stroke
- 5-15= moderate stroke
- 15-20= moderate/severe stroke
- 21-42= severe stroke

Things to think about

- A posterior circulation stroke with severe ataxia could be very debilitating and score 3
- Lawyer with aphasia 1-2 – life altering
- Other contraindications have had some real-time use since 1996 and are more considered cautions (BG 50 or less for example)
- Inclusion/Exclusion criteria were based on inclusions and exclusions to the NINDS trials that were used for researching tPA efficacy.
- About approx. 25% of all patients that arrive to the hospital with rapidly resolving symptoms develop severe subsequent deterioration or death.
- Rapidly resolving or minor symptoms are frequently listed as a reason to not give tPA.

http://stroke.ahajournals.org/content/36/11/2497.abstract?ijkey=41a20e4d80eb730b7c0a9ae5524e45e0233be00f&keytype2=tf_ipsecsha
http://www.neurology.org/content/56/8/1015.abstract?ijkey=6574c6f857029f8b52e243e8e0c9a3ea3d&keytype2=tf_ipsecsha

Alteplase Label
The safety and efficacy of treatment with Activase in patients with minor neurological deficit or with rapidly improving symptoms prior to the start of Activase administration has not been evaluated. Therefore, treatment of patients with minor neurological deficit or with rapidly improving symptoms is not recommended.
Comprehensive stroke centers

- Certification requirements just released by the Joint Commission
- Requires the organization to be a Primary Stroke Center or meet the requirements plus:
  - Advanced Imaging
  - Post hospital care coordination
  - Volume of cases to ensure competency to care for SAH- coiling, aneurysmal clipping and endovascular coiling
    - Didn’t see a IA intervention requirement
  - Dedicated neuro ICU beds
  - Peer review process
  - Participation in stroke research
  - Additional still in development CSC performance metrics

Process of care measures

Hospitals can reduce the risk of stroke by making sure they provide care that’s known to get the best results for most patients. Stroke process/ core / performance measures – endorsed October 1st, 2009

STK-1: Venous Thromboembolism (VTE) Prophylaxis
STK-2: Discharged on Antithrombotic Therapy
STK-3: Anticoagulation Therapy for Atrial Fibrillation/Flutter
STK-4: Thrombolytic Therapy
STK-5: Antithrombotic Therapy by End of Hospital Day 2
STK-6: Discharged on Statin Medication
STK-8: Stroke Education
STK-10: Assessed for Rehabilitation
Outcome measures

- 30-day Mortality rates
- In-hospital death rates
- 30-day readmission rates
- Recurrent stroke rates
- Complication rates (DVT, CAUTI, PE, Pneumonia)
- Other examples can for your facilities can include functional or neurological recovery or adjusted mortality rates
- Implication is that if you provide defect-free process measures with evidence well known to improve stroke outcomes, your death rates and re-admission rates will be lower.
- Also want to track stroke patient satisfaction results

First Outpatient stroke core measure

- Data collection for all eight stroke measures is required for Primary Stroke Center Certification.
- In addition to the 8 stroke core measures, a new outpatient core measure is also currently being collected.
- CT or MRI Scan results should be available to expedite medical decision making if the time last known is within 2 hours of arrival. Measure captures cases in which the tests are performed and results are available within 45 minutes of arrival.
- Implications for drip and ship facilities
Why monitor retired core measures?

Still considered best practice
- Why was dysphagia removed?
- Everyone’s screen was a little different
- Didn’t have the enough evidence that it was decreasing pneumonia rates or other complications.
- Dysphagia screening and smoking cessation were retired but still as a PSC need to be collected!
  - Need to still screen because it is part of EB guidelines for stroke
- Smoking doubles the risk for stroke when compared to a nonsmoker. It reduces the amount of oxygen in the blood, causing the heart to work harder and allowing blood clots to form more easily. Smoking also increases the amount of build-up in the arteries, which may block the flow of blood to the brain, causing a stroke. The good news is that smoking-induced strokes and overall stroke risk can greatly reduced by quitting smoking.
  - Smoking cessation has been covered under the other core measures for some time.

Transparency

JC, Healthgrades, Leapfrog, CMS Hospital Compare
Stroke rehabilitation

- Will likely see a push from payors around this as the growing need for rehabilitation services for stroke survivors will continue.
  - Already have 2 new core measures for inpatient rehab! CAUTI and Pressure Ulcers
- Can be certified as a stroke rehabilitation center by JC now under disease specific certification. (does focus on inpatient)
- What we do know is the rehabilitation improves outcomes. Strong clinical recommendation for early rehab and a core measure.
- Also important is providing opportunities for stroke survivors after discharge through support groups/services.
  - Trying to live with new disability
  - Often self-absorbed as they are the ones that changed
  - Not only need to compensate, need to know that they can recover function years after a stroke/neuroplasticity – so if don’t use it, lose it!
- As important as it is for them, growing research shows that it is equally important that we empower caregivers/carepartners to care not only for the stroke survivor but themselves. This equates to better outcomes for both.
  - Difficulty managing their illness
  - Not used to being a caregiver and the overwhelming changes/fatigue
  - Grieving for what they used to have and what is lost (friends, work)
  - Local resources for stroke support groups

Why do people join support groups?

- Need help adjusting to changes in their lives
- Sharing similar problems help to learn to live with the changes
- Offers a chance to support and learn from one another
- Unite around a common theme or experience to find a solution
- Find a new sense of community with others with similar experience
- Self-empowerment
  - Motivates
  - Uncover hidden strengths, even with disability
### Changes after Stroke: Stroke Survivors

- **For Stroke Survivors**
  - Relationships can change drastically after a stroke
    - Discomfort in social situations
    - Change in perception of family in friends which can contribute to social isolation
  - Simple things are not always so simple anymore
    - Sometimes they are obstacles – opening doors
    - Sometimes they are dangerous – cooking
    - Sometimes they will never again be able to do things they enjoyed in the past - driving, mowing the lawn
  - Need to accept that their body has changed

### Changes after Stroke: Caregivers

- **For Caregivers**
  - Feelings of frustration, confusion, isolation and fatigue can further strain a relationship
  - Change in the relationship
    - Children caring for parents
    - Financial – other person now has to be primary breadwinner, disability pay
    - Spouses under strain
      - “He’s not the man I married 30 years ago”
Caregiver burden/ fatigue
When are they burnt out?

- Overgeneralization - thinking that an isolated caregiving mistake makes you a poor caregiver
- "All-or-nothing" thinking - seeing your efforts either as successes or failures
  - An issue because often the stroke survivor can only at least initially focus on themselves
- Negativistic thinking - ignoring the positive and focusing only on the negative
- Catastrophizing - exaggerating the importance of your own failures or someone else's successes
- Important organizations evaluate caregiver abilities and fatigue

What is the benefit for Stroke Survivors?

- Social support is important in stroke recovery. Social isolation has been called a risk factor for a poor outcome after stroke.
- Family and friends provide important support for many survivors, but stroke support groups can also play a vital role in stroke recovery.
- Support groups can decrease the isolation of both survivors and family, and introduce new friends to replace those often lost after the stroke.
- Stroke survivors not only face new disabilities, but also possible medical complications and the need to prevent recurrent strokes.
  - A stroke support group that empowers members with information and provides emotional support can promote both good health and a good quality of life.
**What is the benefit for Caregivers?**

- Help them learn more about their loved one’s condition, including treatments, prognosis and what the future may hold.
- Provide information about the best community resources (including day-care centers, assisted-living services and home-care nursing), the most responsive professionals and the latest equipment.
- Provide an opportunity to joke and laugh about their circumstances with people who really understand and won’t judge them.
- Give them an opportunity to cry and even complain without others making them feel guilty about having their own needs and pain.
- Give them some time to focus on themselves.
- Alleviate their aloneness by introducing them to new friends who understand.
- Help them brainstorm solutions to problems.
- Relieve stress and help them feel more in control of their lives.
- Give them hope as they listen to how others have coped in similar situations.

**Challenges to running a successful support group**

- Lack of volunteers
- Lack of attention from the coordinators
- Fail to establish regular meeting times
- Need to be realistic about what you can provide
- Learn from the mistakes of others
- Finding members
December 2008

• Collected and wrapped gifts for 16 children
Benefits of Peer Mentors

- Help those with new disabilities grip the realization that they will need to make changes in their lives as a result of their stroke
- Help cushion the realization that even with disability they can be productive
- Can learn from those with similar experiences
- Help decrease social isolation and encourage participation in activities with others that understand
Peer Mentoring

- Meet in the community or in the hospital
- Able to answer questions about what it is like after discharge
- Alleviate fears or help stroke survivor ask different questions
- Encourage participation on a larger community support group
- Volunteer services- including safety, TB, badging and HIPAA
- Meet to go over case scenarios

Online education and support
American Stroke Association

Online support and support group search
Online education and support
National Stroke Association

Support groups