Making A Difference – Recognition and Management of the Acute Stroke Patient

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Objectives

• Create awareness of the Wisconsin Coverdell Stroke Program
• Appreciate the significance and impact of stroke
• Understand pathophysiology of stroke and appropriate prehospital care
• Understand the concept of “Time is Brain”
• Understand the role of EMS in care of the stroke patient
• Understand EMS expectations of facility staff
• Identify strategies to prevent or reduce stroke

Wisconsin Coverdell Stroke Program

• Nine states funded by CDC to improve state stroke systems of care
• Grant period: 2015-2020
• Administered by Wisconsin Department of Health Services, Division of Public Health
Wisconsin Coverdell Stroke Program

- Grantees provide dedicated QI support and resources, professional education and peer learning to EMS and Hospitals to advance care transitions along the care continuum.
- Grant focuses on developing comprehensive stroke systems of care to improve the quality of care for stroke patients.
- Grant concentrates on stroke prevention and community education, EMS and hospital practices, and post-discharge care.

Improved Stroke Systems Look Like....

Stroke Systems of Care

- Timely community stroke recognition and response
- Appropriate pre-hospital care with seamless EMS to ED transitions
- Increase ability to treat stroke at all levels
- Increased patient and caregiver education
- Increase awareness of and access to post-discharge services

Stroke Statistics

- Stroke is the fifth leading cause of death in the US
- Stroke is a leading cause of long term disability
- Stroke is the leading preventable cause of disability
- More than 795,000 people have a stroke each year in the United States – one stroke occurs every 40 seconds
- One person dies of a stroke every 4 minutes
- 32,000 brain cells die every second, 1.9 million/minute
- Total annual stroke costs to the nation are about $38.6 billion


Heart Disease and Stroke Statistics—2015 Update: A report from the American Heart Association [published online ahead of print].

Stroke Statistics

32,00 brain cells die every second, 1.9 million/minute....

Can we have a positive impact on this number and if so, how?

Strokes and TIA's

So let’s make certain we are all on the same page about strokes and review what is generally understood.

As we review these next few slides, think about what you already know about strokes. If your resident presented with these complaints, would you think stroke? Is it possible you might miss a stroke? Stroke signs and symptoms can be very subtle...especially in ischemic strokes.

What is a Stroke?

• A stroke is an emergency brain attack that cuts off or reduces the amount of blood and oxygen flow to the brain.

• Two primary types
  ° Ischemic
  ° Hemorrhagic

• Each causes a disruption in blood supply to a specific region of the brain.

• The region affected determines patient presentation
What is a Stroke?

Ischemic Stroke:
- Caused by a blockage in an artery stopping normal blood and oxygen flow to the brain
- 87% of strokes are ischemic
- There are two primary types of ischemic strokes that can occur:
  - Embolism: Blood clot or plaque fragment from elsewhere in the body gets lodged in the brain
  - Thrombosis: Blood clot formed in an artery that provides blood to the brain


What is a Stroke?

Ischemic Stroke:
- Rarely leads to death (in first few hours)
- Rarely cause a change in vital signs
- Signs can be very subtle


What is a Stroke?

CEREBRAL INFARCTION


**What is a Stroke?**

**Hemorrhagic Stroke:**
- Caused by a breakage in a blood vessel within the brain
- Can be the result of trauma or a ruptured aneurysm
- There are two primary types of hemorrhagic stroke:
  - **Intracerebral Hemorrhage:** A blood vessel bursts leaking blood into the brain
  - **Subarachnoid Hemorrhage:** Occurs when a blood vessel bursts near the surface of the brain and blood pours into the area outside of the brain
- Can be fatal at onset

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**What is a Stroke?**

**Hemorrhagic Stroke (cont’d.):**
- Most common cause of a subarachnoid hemorrhage is an aneurysm
- AVM’s account for about 5% of subarachnoid hemorrhages
- Hypertension leading cause of intracerebral hemorrhage
- Appear more seriously ill
- Deteriorate more rapidly

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**What is a Stroke?**

**CEREBRAL HEMORRHAGE**

- Intracerebral hemorrhage
- Focal cerebral hemorrhage
- Ruptured cerebral artery

Stroke Signs and Symptoms

Ischemic Stroke in the Left Hemisphere May Cause These Symptoms

• Speech Impairment or Lack of Speech
• Lack of Comprehension
• Left Gaze
• Right Facial Droop
• Right Sided Weakness

Ischemic Stroke in Right Hemisphere of Brain May Cause These Symptoms

• Slurred Speech
• Right Gaze
• Left Facial Droop
• Left Sided Weakness
• Left Sided Neglect

Ischemic Stroke in the Brainstem May Cause These Symptoms

• Abnormal Eye Movements
• Nausea, Vomiting or Vertigo
• Difficulty Speaking
• Difficulty Swallowing
• Decreased Consciousness
• Crossed Signs (ex: left side facial droop right side weakness)
Stroke Signs and Symptoms

Intracerebral Hemorrhagic Stroke Symptoms
- Nausea and Vomiting
- Headaches
- One Sided Weakness
- Decreased Consciousness

Subarachnoid Hemorrhagic Stroke Symptoms
- Worst Headache of Life
- Intolerance to Light
- Neck Stiffness or Pain

What is a TIA?
Transient Ischemic Attack (TIA)
- A “minor or mini stroke” that occurs when a blood clot blocks an artery for a short time
- The symptoms of a TIA are the same as those of a stroke but usually last less than 5 minutes
- No permanent injury to the brain
- About a third of people who experience TIA go on to have a stroke within a year
- Frequently present with normal neurological exam, diagnosis based on history


What is a TIA?

Transient Ischemic Attack (TIA) (cont’d.)
- Most important forecaster of impending stroke
- 5% of patients with TIA’s have stroke within first month
- Risk increases as time progresses

Stroke/TIA Mimics

- Alcohol Intoxication
- Cerebral Infections
- Drug Overdose
- Epidural Hematoma
- Hypoglycemia
- Metabolic Disorders
- Migraines
- Neuropathies (Bell’s Palsy)
- Seizure and Post Seizure
- Tumors
- Todd’s Paralysis

Think Stroke

So, we believe our resident is having or has had a stroke …… what do we do?
- Call 9-1-1….DO NOT DELAY CALLING 9-1-1
- Establish Last Known Well…when was the resident last known to be symptom free
- Have the residents chart ready for EMS questions
- DO NOT leave the resident alone or minimize time away from resident
- Be prepared to answer questions from EMS
Can We Make a Difference?

A simple but life changing concept...
Timely care is key...........TIME IS BRAIN
Timely care begins with early recognition and call to 9-1-1

Importance of Calling 911

Does hospital arrival mode really matter?

• Treatments available for stroke work best when you get to the hospital quickly
• Every second wasted is brain tissue lost, increasing the risk for death or disability.... Time is Brain
• EMS providers initiate appropriate patient assessment and care

Door to CT 35 minutes faster if arrive by EMS

How is that Possible?

EMS Pre-hospital Care:

• EMS providers are equipped with knowledge and resources that can save your life and can get you the treatment you need in the shortest amount of time
• Thorough assessment including Stroke Assessment – CPSS
  o If one new onset finding, 72% probability of a stroke
  o If three new onset findings, 87% probability of a stroke
• Stroke mimics and potential causes – Hypoglycemia, 12-lead
• The end result.......... Door to CT 35 minutes faster when arrive by EMS
Arrival Mode Does Matter

Comparing Hospital Time to tPA by Arrival Mode in Midwest Hospitals

<table>
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<th>Year</th>
<th>EMS-Median Minutes</th>
<th>POV-Median Minutes</th>
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<td>58</td>
<td>64</td>
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<td>2014</td>
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<td>59</td>
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<tr>
<td>2015</td>
<td>51</td>
<td>58</td>
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</tbody>
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Comparing Time to IV Alteplase Administration by Arrival Mode in Midwest Hospitals:
Paul Vilar MSN, RN, Lynn Mallas-Serdynski BSN, RN, Michelle Scharnott MPH, CPHQ, Dot Bluma BSN, RN, CPHQ, Mindy Cook BSN RN, David Fladten CCNRP

Importance to Wisconsin

Arrival Mode From Scene

After the 911 Call Has Been Made

So, what happens when EMS arrives? They will:
- Conduct an assessment
- Provide treatment
- Ask a lot of questions…., of the patient and YOU
  - Last known well
  - Medical history
  - Medications
  - Presence of advanced directives, DNR
  - Primary care physician
  - Next of kin, Healthcare POA
Prehospital Care of the Stroke Patient

EMS will:

- Verify and maintain ABC’s
- Obtain a set of vital signs which should include Blood Glucose and 12-lead
- Perform a Pre-hospital Stroke Scale – CPSS
  - If one new onset finding, 72% probability of a stroke
  - If three new onset findings, 87% probability of a stroke
- Obtain oxygen as Needed for Saturation >=94%
- HOB at 15-30 degrees as B/P allows
- Ask staff about recent vital signs

Target Stroke. Retrieved from http://www.strokeassociation.org/STROKEORG/Professionals/TargetStroke/TargetStroke_UCM_314495_SubHomePage.jsp

Prehospital Care of the Stroke Patient

EMS will also:

- Establish IV access...should be done in ambulance
- Establish Last Known Normal/Well Time
  - Some consider this to be one of the most important pieces of information EMS can determine
- Obtain family member information or other primary:
  - Contact Name and Phone Number
- Ask staff about residents:
  - Medical history, medications, normal neuro deficits..."What is normal for this patient and what is different today?"

Target Stroke. Retrieved from http://www.strokeassociation.org/STROKEORG/Professionals/TargetStroke/TargetStroke_UCM_314495_SubHomePage.jsp

Prehospital Care of the Stroke Patient

Cincinnati Prehospital Stroke Scale (CPSS)

Facial Droop
- Normal: Left and Right side of face move equally
- Abnormal: One side of face does not move at all

Arm Drift
- Normal: Both left and right arm move together or not at all
- Abnormal: One arm does not move equally with the other

Speech
- Normal: Patient uses correct words with no slurring
- Abnormal: Patient has slurred speech, uses inappropriate words or cannot speak

EMS Destination Considerations

- Patient Preference
- Hospitals’ Ability to Treat Stroke
- Transport Distances
- Transportation Options
- Last Known Well is critically important
- Stroke Severity

So....where do we go?

DO WHAT’S BEST FOR THE PATIENT

Stroke Guiding Principles

- Remember the concept... *Time is Brain*
- Everything that is done for a stroke patient is time sensitive
  - Recognition of a stroke...This is Where You Come In...
  - Call to 911...And Here...
  - EMS arrival
  - Therapies and interventions

1.9 million brain cells/minute...and here...
you can reduce this by early recognition and rapid call to 911
ED Best Practices

- Door to physician ≤ 10 minutes
- Door to stroke team ≤ 15 minutes
- Door to CT initiation ≤ 25 minutes
- Door to CT interpretation ≤ 45 minutes
- Door to drug ≤ 60 minutes
- Decision to transfer to PSC or CSC


In-Hospital Best Practices

- Door to drug DTN < 60 minutes < 45 minutes
  - Alteplase (commonly known as tPA)
    - Most effective within 3 hours of symptom onset
    - Can be used up 4 ½ hours from symptom onset
- Endovascular treatments
  - Used in conjunction with Alteplase
  - Used when Alteplase ineffective
  - Used when patient is not a candidate for Alteplase
  - Has a longer window of opportunity

Endovascular Treatments

- Mechanical thrombectomy is a procedure that can be used up to 8 hours after symptom onset for eligible patients
- Mechanical thrombectomy is used in patients with large vessel occlusions
- A study examining the rate of recanalization with IV-tPA demonstrated a low rate of revascularization that occurred.
- Revascularization is a strong indicator of good clinical outcomes in a patient
- The use of mechanical thrombectomy when medical management fails or the patient is not a candidate may help a patient achieve revascularization

Neurological outcomes are measured as mRS and are compared to the significant historical registries of Merci®, Penumbra™including Merci®, Multi-Merci®, Medtronic® Penumbra® Registry, Merci® Registry, P300, Penumbra® POST, Penumbra® 054 Speed.
Patient Access to Best Practices

- Of 370,351 AIS primary diagnosis discharges, 14,926 (4%) received IV t-PA and 1889 (0.5%) had endovascular therapy
- By ground, 81% had access to IV-capable hospitals within 60 minutes and 56% had access to endovascular-capable hospitals
- By air, 97% had access to IV-capable hospitals within 60 minutes and 85% had access to endovascular hospitals
- More than half of the US population has geographic access to hospitals that actually deliver acute stroke care but treatment rates remain low

MEDPAR Data. Access of the US population to IV and endovascular treatment for AIS was evaluated based on the Medicare Provider and Analysis Report.

Patient Access to Best Practices

What limits or delays access to timely definitive care?

- Early recognition of stroke symptoms
  - Failure to recognize subtle signs and symptoms of a stroke
  - “It’s probably nothing...I feel better already.”
  - “I’ll feel better after I take a nap.”

- Timely call to EMS and definitive medical care
Best Practices

Do these EMS and ED best practices make a difference?

Importance to Wisconsin

DTN in 60 Minutes or Less
January 2016-June 2016

Importance to Wisconsin

Treatment Data
January 2016-June 2016

This Set With The Guidelines™ Aggregate Data report was generated using the Quintiles PMT® system. Copy or distribution of the Set With The Guidelines™ Aggregate Data is prohibited without the prior written consent of the American Heart Association and Quintiles.
Importance to Wisconsin

![Importance to Wisconsin](image1)

Community Education

Can we prevent strokes or reduce long-term disability in our residents?

The answer is yes!!

Community Education

It starts with prevention and early recognition of stroke signs and symptoms and call to 9-1-1.
Stroke Chain of Survival

• The goal of stroke care is to minimize brain injury and maximize the patient’s recovery
• “Time is Brain”
  – Timing and a fast response are critical
  – A stroke is a brain attack where time lost is brain lost!
• The Stroke Chain of Survival links actions to be taken by patients, family members and healthcare providers to maximize stroke recovery


strokeChainofSurvival highlight 4

Stroke Chain of Survival links Include:
• Caregiver, family member, friend or bystander recognizes stroke warning signs and rapidly calls 9-1-1
• EMS rapidly arrives at scene and performs stroke assessment
• EMS rapidly notifies receiving hospital that patient will be arriving and EMS transports patient to the receiving hospital
• Hospital rapidly diagnoses and treats patient


Community Education

Why Education and Outreach?
• Stroke is the leading preventable cause of disability

Why Education and Outreach by EMS, hospitals and other healthcare facilities/providers?
• Who knows the community and residents better?
• Patient advocacy
• Who else is there?
Who is our Target Audience?

- At risk populations...our residents
- Elderly
- African-Americans
- Hispanics

How do we accomplish this?

- Share information and knowledge with our residents
- Share information and knowledge with their families
- Educate ALL facility staff on stroke signs and symptoms

FAST

- F - Facial droop, smile
- A - Arm drift
- S - Speech
- T - Time...importance of calling 9-1-1

SPOT A STROKE F.A.S.T.
**Community Education**

**Controllable Risk Factors**
- High Blood Pressure
- High Cholesterol
- Diabetes
- Tobacco Use
- Alcohol Use
- Physical Inactivity
- Obesity
- Atherosclerosis
- Atrial Fibrillation

**Non-Controllable Risk Factors**
- Age
- Gender
- Race
- Family History
- Previous Stroke or TIA
- Fibromuscular Displaysia
- Hypercoagulable states

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**Community Education**

**Why call 911?**
- Treatments available for stroke work best when you get to the hospital quickly
- Every second wasted is brain tissue lost, increasing the risk for death or disability
- EMS providers are equipped with knowledge and resources that can save your life and can get you the treatment you need in the shortest amount of time

*Door to CT 35 minutes faster*

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**Will We Make a Difference?**

It’s up to us if we will make a difference. The decision is ours....

What do our residents and their families expect from us?
Questions?
Thank You!
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