This PowerPoint file is a supplement to the video presentation. Some of the educational content of this program is not available solely through the PowerPoint file. Participants should use all materials to enhance the value of this continuing education program.

Advances in the Assessment and Care of Stroke Patients

Tim DiTirro, RN, BSN, CEN, NREMT-P
Clinical Educator
Moore County Hospital District
Dumas, Texas

Nursing I 310816
Goals

- Identify signs/symptoms of stroke
- Identify the difference between ischemic and hemorrhagic stroke
- Discuss current stroke protocols
- Utilize current protocols to identify acute treatment and secondary prevention for stroke
- Identify new diagnostic measures for mapping cerebral circulation
- Identify the elements of the acronym F.A.S.T. for stroke
- Identify the current elements of National Centers for Medicare & Medicaid Services (CMS) Hospital Inpatient Quality and Core Measures for Stroke

Introduction

- Each year in the United States about 795,000 people have a new or recurrent stroke
- Stroke remains a leading cause of death in the United States
- Early recognition of ischemic stroke is critical because IV (intravenous) fibrinolytic treatment should be provided generally within three hours of onset
- Most strokes occur at home and only half of acute stroke patients use Emergency Medical Services (EMS) for transport to the hospital
- Stroke patients often deny or try to rationalize their symptoms
Introduction

- Stroke patients often deny or try to rationalize their symptoms
- Even high risk patients, such as those with atrial fibrillation or hypertension, fail to recognize the signs of stroke – this delays activation of EMS and treatment, resulting in increased morbidity and mortality
- Community and professional education is essential

Myths vs Facts

<table>
<thead>
<tr>
<th>Myth</th>
<th>Fact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke cannot be prevented</td>
<td>Up to 80% of strokes are preventable</td>
</tr>
<tr>
<td>There is no treatment for stroke</td>
<td>For any sign of stroke call 911 immediately, treatment may be available</td>
</tr>
<tr>
<td>Stroke only affects the elderly</td>
<td>Stroke can happen to anyone, anytime</td>
</tr>
<tr>
<td>Stroke recovery only occurs for the first few months after a stroke</td>
<td>Stroke recovery is a lifelong process</td>
</tr>
<tr>
<td>Strokes are rare</td>
<td>Stroke is the 5th leading cause of death in the US</td>
</tr>
<tr>
<td>Strokes are not hereditary</td>
<td>Family history of stroke increases your chance for stroke</td>
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</tbody>
</table>
Stroke Nursing Care

PAST
• Utilize nursing process
• Assessment phase
• Diagnosing phase
• Planning phase
• Implementing phase
• Evaluation phase after all nursing interventions complete

PRESENT
• Still utilize nursing process
• Recognize stroke after 1st 10 minutes
• Assume immediate active role in activating stroke protocols and telemedicine system, if applicable
• Assure all interventions completed on time

Anatomy of the Brain

The Cerebrum: the largest part of the brain is divided into the following sections or lobes:
– the frontal lobe
– the parietal lobe
– the temporal lobe
– the occipital lobe
– left and right hemispheres
Anatomy of the Brain

• The Cerebellum
  – the second largest area
  – responsible for maintaining balance and further control of movement and coordination
  – a stroke involving the cerebellum may result in a lack of coordination, clumsiness, shaking, or other muscular difficulties

Anatomy of the Brain

• The Brain Stem
  – the final pathway between cerebral structures and the spinal cord
  – responsible for a variety of autonomic functions, such as control of respirations, heart rate, blood pressure (BP), wakefulness, arousal, and attention
  – strokes in the brain stem are usually due to basilar occlusion
Areas of Function

• The left hemisphere controls the right side of the body along with spoken language, number skills, written language, reasoning, and scientific functions.

• The right hemisphere controls the left side of the body along with creativity, music and art awareness, shape recognition, and insight.

Definition

• Also known as a cerebrovascular accident (CVA) or brain attack.

• A stroke occurs when the flow of oxygen-rich blood to a portion of the brain is blocked or is interrupted by sudden bleeding.

• Without oxygen, brain cells begin to die after a few minutes.

• When brain cells die or are damaged, symptoms occur in the parts of the body that these brain cells control.
Cerebral Circulation

- Vessels feeding the brain
- Normal function of the brain’s control centers is dependent upon adequate supply of oxygen and nutrients from blood vessels
- Blood is supplied to the brain, face, and scalp by two major sets of vessels
- Right/left common carotid arteries
- Right/left vertebral arteries

Cerebral Circulation

- Anterior circulation comes from the carotid arteries
- Posterior circulation comes from the vertebral arteries
- The anterior circulation of the brain is formed by the internal carotid arteries (ICAs) which supply 80% of the brain
Cerebral Circulation

• Posterior circulation of the brain is formed by the two vertebral arteries
• Vertebral arteries supply blood to the remaining 20% of the brain including the brain stem, cerebellum, and most of the posterior cerebral hemispheres

Cerebral Circulation

• Circle of Willis
  – located at the base of the brain
  – carotid and vertebrobasilar arteries form a circle of communicating arteries known as the circle of Willis
  – consists of the anterior cerebral artery, middle cerebral artery, and the posterior cerebral artery
Cerebral Circulation

• Current methods of imaging
  – **Computed Tomography (CT) without contrast**
    • to be performed and interpreted within 45 minutes of patient’s arrival (American Heart Association (AHA) and American Stroke Association (ASA) protocol 2016)
    • identifies ischemic vs. hemorrhagic stroke for possible tissue plasminogen activator (tPA) administration
  – **Magnetic Resonance Imaging (MRI)**
    • shows greater detail

Cerebral Circulation

• **Mapping Cerebral Circulation**
  – cerebral angiography
  – flow territory mapping of the cerebral arteries with regional perfusion MRI
  – 3D echo planar imaging and pulsed arterial tagging: provides whole-brain cerebral blood flow mapping and can be done in five minutes
Transient Ischemic Attack (TIA)

• Sometimes called a mini stroke
• Defined as a sudden focal neurological deficit affecting the brain, retina, or spinal cord of presumed vascular origin that is fully reversible within 24 hours and more typically within a few minutes or hours

Transient Ischemic Attack (TIA)

• The goal of TIA management is to prevent a future stroke
• The symptoms of stroke and TIA are identical at onset – while most people are aware of stroke, the awareness of TIA is poor
• Since the symptoms resolve in a short period of time, most people do not seek medical evaluation for a TIA
Transient Ischemic Attack (TIA)

- Guidelines for prevention of a future stroke
  - TIA assessed with the ABCD² scoring system
    - score of 6-7 = high risk
    - score of 4-5 = moderate risk
    - score of 0-3 = low risk
    - total score >4 should be evaluated for stroke prevention within 24 hours – antiplatelet and anticoagulant therapy should be considered

Stroke Pathology

- Ischemic
  - occlusion of a vessel by thrombosis or embolus
  - represents about 85% of strokes

- Hemorrhagic
  - rupture of a vessel
  - accounts for the remaining 15%
  - included in hemorrhagic is arteriovenous malformations
Ischemic Stroke

• The most common type of stroke
• Two types of ischemic stroke
  – Embolic Stroke: occurs when a blood clot or plaque fragment from the heart or other large arteries leading to the brain moves to the brain causing a blockage
  – Thrombotic Stroke: a clot that forms inside an artery that supplies the brain

Ischemic Stroke

• Pathophysiologic mechanisms
  – thrombosis is common in stroke; thrombus may form in the setting of ruptured atherosclerotic plaque or from an underlying hypercoagulable state
  – the type and severity of neurological deficits encompass a wide range of signs/symptoms, from minor to major
Ischemic Stroke

• Risk factors
  – non-modifiable factors – sex, age, race, ethnicity, genetics, sickle cell anemia
  – modifiable factors: cardiac risk – hypertension, cholesterol, coronary artery bypass graft (CABG), angioplasty, atrial fibrillation, narrowing of carotid
  – modifiable factors: other than cardiac – smoking, illicit drugs, estrogen/progesterone, alcohol, obesity, diabetes

Ischemic Stroke

• Presentation – stroke can mimic:
  – hypoglycemia
  – seizures
  – complicated migraines
  – hypertensive encephalopathy
  – Bell’s palsy
Ischemic Stroke

- Diagnostics: electrolyte level, complete blood count, liver and renal function studies, lipid panel, PT (prothrombin time), PTT (partial thromboplastin time), and INR (international normalized ratio), platelet count, serum glucose level, toxicology screen, CT SCAN without contrast immediately
- Complications: intracranial hemorrhage, seizures

Nursing Interventions

- General assessment within 10 minutes of patient arrival
- Activate stroke telemedicine unit, if applicable
- Notify CT and physician of possible stroke so arrangements can be made for immediate CT without contrast
Nursing Interventions

• Neurologic assessment within 25 minutes of patient arrival

• Perform screening for possible administration of fibrinolytic therapy to be administered within 60 minutes of Emergency Department (ED) arrival or within three hours of onset of symptoms

Nursing Interventions

• Thrombolytic therapy
  – Tissue plasminogen activators (tPAs) are the most often used
  – Activase® thrombolytic agent: alteplase
  – Given within three hours of onset is optimal
  – Strict guidelines for administration
  – CT scan to confirm no bleeding present
  – Physical exam and medical history
Nursing Interventions

• Maintain glucose of less than 140 mg/dl – this decreases risk of cerebral edema and hemorrhage

• Maintain hypovolemia or normovolemia normal saline (NS) with no glucose

• Antiplatelets, such as aspirin and Plavix®, to inhibit platelet aggregation and prevent recurrent stroke – initiate once hemorrhage is ruled out in patients not receiving thrombolytics
Ischemic Stroke

• **Surgical management**
  – carotid endarterectomy – remove plaque buildup in the carotid arteries
  – restore normal perfusion pressure to internal carotid system and removal of emboli
  – carotid stenting – opens arteries to increase blood flow in areas blocked by plaque
  – new approach to treating the worst strokes

• **Stent retrievers**
  – guidelines released by the AHA recommend using wire cage clot removal devices called stent retrievers
  – the procedure, called a mechanical thrombectomy, should be done within six hours of acute stroke symptoms and only after the patient receives tPA
  – already being used at 1,000 primary stroke centers across the US
Ischemic Stroke

• Stent retrievers
  – between 12,000 and 13,000 thrombectomies with stent retrievers were performed in 2015 in the US
  – an integrated system will need to be developed in which smaller community hospitals give tPA quickly, identify patients with large blood clots, and transfer them to a center which can perform this procedure

Ischemic Stroke

• Supportive care
  – maintain airway and oxygenation
  – maintain perfusion, reassess BP
  – ongoing assessment for cardiac arrhythmia, infarction
  – control fever
  – glycemia management
  – prevent complications
  – reeducate patient and family on secondary preventions
Secondary Prevention

• New AHA/ASA stroke secondary prevention guidelines
  – antiplatelets such as aspirin, Plavix®, extended release Persantine®, and aspirin and Aggrenox®
  – new recommendations to screen for diabetes
  – guidelines for lipid management

Secondary Prevention

• New AHA/ASA stroke secondary prevention guidelines
  – new recommendations on evaluating patients with sleep apnea; CPAP (continuous positive airway pressure) consideration for patients with previous stroke
  – guidelines for antihypertensive therapy
  – patients with BP >140 mmHg systolic or >90 mmHg diastolic require pharmacotherapy
Hemorrhagic Stroke

• Initial treatment is very difficult
• Occurs in 20% of strokes
• Bleeding into the brain or surrounding area
• Surgery is not generally used to control mild to moderate bleeding

Hemorrhagic Stroke

• Categories
  – Intracerebral Hemorrhage: within the cerebrum, caused by bleeding into the brain tissue as a result of rupture of a small artery (most common)
  – Subarachnoid Hemorrhage: sudden rupture of an artery, filling the space between the brain and the surrounding tissue with blood
Hemorrhagic Stroke

• Intracerebral hemorrhage
  – proximate cause of bleeding is a ruptured microaneurysm formed at sites of vascular branching
  – onset usually during activity
  – hypertension is the most common risk factor
  – occurs suddenly
  – severe headache, nausea, vomiting
  – loss of consciousness
  – contralateral hemiparesis/hemiplegia

Hemorrhagic Stroke

• Intracerebral hemorrhage diagnosis and treatment
  – non-contrast CT
  – if no space occupying lesion, consider lumbar puncture
  – BP control
  – correct coagulopathy
  – medical versus non-medical management, dependent on location and size of hemorrhage
Hemorrhagic Stroke

• Subarachnoid hemorrhage
  – usually occurs from an aneurysm located at bifurcations along the circle of Willis
  – may have minor aneurysms
  – may also occur at same area opposite the circle of Willis
  – occurs in 6-7 people per 100,000 in most populations

Hemorrhagic Stroke

• Subarachnoid hemorrhage signs and symptoms
  – “worst headache”
  – nausea, vomiting, dizziness
  – photophobia
  – painful neck and back
  – focal deficits
  – brief loss of consciousness
  – assess history
Cerebral Aneurysm

- Dilation of a cerebral artery due to weakness of the medial layer of the blood vessel
- Occur at bifurcations and small tortuous vessels
- Grow larger and weaker over time until they burst
- Leaks blood inside or around the brain

Cerebral Aneurysm

- **Saccular (Berry) Aneurysm**: the most common type
- **Giant (Fusiform) Aneurysm**: an out-pouching of a vessel
- **Dissecting Aneurysm**
  - initial layer is pulled away from the medial layer
  - blood is forced between the two layers
Cerebral Aneurysm

• Medical management
  – metal clip to clamp off the aneurysm and prevent renewed bleeding
  – endovascular coil embolization – inserting a small coil into the aneurysm to block it off
  – early vs late clipping
  – strict control of BP to prevent rebleeding

Nursing Interventions

• Strict control of BP to prevent rebleeding
• Triple H therapy (combination of induced hypertension, hypervolemia, and hemodilution)
• Calcium channel blockers
• Cerebral angioplasty and injections of papaverine
Nursing Interventions

• Pre-op clipping
  – head of bed elevated 30°
  – stool softeners
  – maintain normal body functions

Nursing Interventions

• Pre-op clipping
  – subarachnoid precautions
    • watch for cardiac and pulmonary complications
    • limit visitors
    • private room is a must
    • if intracranial pressure is increased pre-op, ventriculostomy is placed
    • manage ABCs (airway, breathing, circulation)
    • monitor BP
    • prevent rebleeding and prepare for surgery
Nursing Interventions

• **Post-op clipping**
  – assess neuro status
  – maintain ABCs
  – maintain systolic BP
  – drain cerebrospinal fluid via ventriculostomy for increased intracranial pressure
  – assess neuro status closely
  – monitor for vasospasm
  – monitor hydration (diuresis and drop in sodium)
  – assess surgical site for drainage and infection

Nursing Interventions

• **Other supportive care**
  – provide early nutrition
  – establish bowel and bladder program
  – range of motion therapy
  – deep vein thrombosis (DVT) prevention
  – good skin care
  – emotional support
Arteriovenous Malformation (AVM)

- An abnormal collection of arteries connected directly to veins without a capillary bridge
- The high pressure of the arteries causes low pressure veins to engorge, weaken, and rupture
- Assumed to be congenital
- Can occur at any age, but peaks between ages 50 and 60

Arteriovenous Malformation (AVM)

- The most common cause of hemorrhagic stroke in young adults
- Most common presentation
  - seizure (if large AVM)
  - hemorrhage (if small AVM)
- After emergency treatment for stroke, treatment focuses on rehab and preventing another stroke
Stroke Initial Assessment

• Demographics
  – age
  – history of hypertension
  – smoking
  – history of diabetes
  – cholesterol
  – presence of other vascular disease

Stroke Initial Assessment

• Nature of event
  – onset
  – course
  – focal vs general symptoms
  – loss of function associated symptoms
Stroke Initial Assessment

• Signs and symptoms
  – paralysis on one side of the body
  – facial droop
  – limb weakness
  – paresthesias/sensory loss
  – numbness or tingling
  – ataxia
  – gait disturbance
  – uncoordinated fine motor movements

Stroke Initial Assessment

• Signs and symptoms
  – aphasia – inability to speak
  – dysphasia – difficulty speaking
  – dysarthria – impairment of the tongue muscles essential to speech
  – nystagmus – involuntary jerking of the eyes
  – diplopia – double vision
  – monocular blindness – blindness in one eye
  – headache – “worst ever had”
  – confusion/agitation
Part of the Brain Affected

• Localization
  – depends on understanding of neuroanatomy
  – confirms the diagnosis of stroke
  – gives an indication of the cause
  – can give an indication of prognosis based on further assessment
  – may indicate what caused the stroke which may indicate a plan of action

Part of the Brain Affected

• Left or right
• Carotid territory which supplies most of the hemispheres and cortical deep white matter
• Vertebrobasilar system which supplies the brain stem, cerebellum, and occipital lobes
• Cerebral hemispheres or brain stem
• Cortex or deep white matter
Part of the Brain Affected

• Internal carotid artery strokes
  – anterior cerebral artery
    • affects frontal regions on the medial surface of ½ the brain, resulting in loss of discriminatory sensation and weakness/paralysis of the contralateral foot and leg
    • could cause deficits in the contralateral shoulder and arm

Part of the Brain Affected

• Internal carotid artery strokes
  – middle cerebral artery
    • the effects vary based on what branch of the artery is affected
    • motor and speech disabilities
Part of the Brain Affected

• Vertebral artery strokes
  – balance deficits
  – vertigo/vomiting
  – cranial nerve dysfunction
  – hypoglossal nerve dysfunction

Part of the Brain Affected

• Basilar artery stroke
  – bilateral neurological deficits
  – cerebellar/cranial nerve issues
  – stupor/coma
  – hemiparesis with contralateral cranial nerve dysfunction or with ipsilateral ataxia
Part of the Brain Affected

• Posterior cerebral artery stroke
  – sensory loss contralaterally
  – 3rd nerve palsy
  – movement disorders
  – visual loss

Part of the Brain Affected

• Brain stem
  – cranial nerve deficits
  – bilateral weakness or sensory deficit
  – ataxia
  – crossed signs (ipsilateral facial nerve deficit with contralateral hemiparesis)
  – loss of consciousness
Part of the Brain Affected

• Cortical location
  – aphasia (neglect of contralateral side)
  – hemianopia
  – forced eye deviation
  – hemiparesis or hemisensory deficit or both involving face, arm, or leg only

• Subcortical location
  – pure motor hemiparesis involving face, arm, and leg
  – pure hemisensory deficit involving face, arm, and leg
Residual Effects of Stroke

• Emotional instability
• Mood swings
• Depression
• Perceptual effects such as recognizing people, places, things, and understanding familiar objects
• Difficulty planning and carrying out simple tasks

Stroke Assessment Scales

• Modified National Institutes of Health Stroke Scale (mNIHSS)
  – serial measure of neurologic deficit on a 42 point scale across 11 categories (0-42)
  – modified from the original NIHSS scale to reduce redundancy
  – includes paralysis, speech difficulty, sensory and visual loss
  – the lower the score, the better the outcome
Stroke Assessment Scales

• Extended Glasgow Outcome Scale
  – global assessment of function from good to vegetative state and death (1-8)
  – consists of: death, vegetative state, lower and upper severe disability, lower and upper moderate disability, lower and upper good recovery
  – 1 = death; 8 = upper good recovery

• Barthel Index
  – measures the ability to perform
  – includes a score of 0, 5, and 10 for feeding, bathing, grooming, dressing, bowels, bladder, toilet use, transfers (bed to chair and back), mobility (on a level surface and stairs)
  – records what patient does
  – score ranges from 0-100; 100 = totally independent
Stroke Assessment Scales

• Modified Rankin Scale
  – simplified overall assessment of physical function
  – 0 = no symptoms, 1 = no significant disability, 2 = slight disability, 3 = moderate disability, 4 = moderately severe disability, 5 = severe disability, 6 = dead

Stroke Assessment Scales

• Cincinnati Prehospital Stroke Scale
  – used by EMS
  – EMS personnel can evaluate patient in less than one minute
  – identifies stroke on the basis of three physical findings
    • facial droop – have the patient smile or try to show teeth
    • arm drift – have patient close eyes and hold both arms out, palms up
    • abnormal speech – have the patient say “you can’t teach an old dog new tricks”
  – the presence of one finding has a sensitivity of 59% and a specificity of 89% when scored by prehospital providers
The Eight Ds of Stroke Care

- **Detection**: rapid recognition of stroke symptoms
- **Dispatch**: early activation and dispatch of EMS by 911
- **Delivery**: rapid EMS identification, management, and transport
- **Door**: appropriate triage to stroke center
- **Data**: rapid triage, evaluation, and management within the ED
- **Decision**: stroke expertise and therapy selection
- **Drug/Device**: fibrinolytic or endovascular therapy
- **Disposition**: rapid admission to the stroke unit or coronary care unit (CCU)

Critical Time Periods From Hospital Arrival

- Immediate General Assessment → 10 minutes
- Immediate neurologic assessment → 25 minutes
- Acquisition of CT of the head → 25 minutes
- Interpretation of CT scan → 45 minutes
- Administration of fibrinolytic therapy timed from ED arrival → 60 minutes
- Administration of fibrinolytic therapy timed from onset of symptoms → 3 hours or 4.5 hours in selected patients
- Administration of endovascular therapy timed → 6 hours in selected patients from onset of symptoms
- Admission to a monitored bed → 3 hours
Stroke Awareness

National CMS Hospital Inpatient Quality and Core Measures

• **STK-1: Venous Thromboembolism (VTE) Prophylaxis**
  – description: ischemic and hemorrhagic stroke patients who receive VTE prophylaxis or have documentation why no VTE prophylaxis was given the day of or the day after hospital admission
  – rationale: stroke patients are at increased risk of developing VTE
  – one study noted DVT in more than 1/3 of stroke patients
National CMS Hospital Inpatient Quality and Core Measures

• STK-1: Venous Thromboembolism (VTE) Prophylaxis
  – one study noted proximal DVT in more than 1/3 of patients with moderately severe stroke
  – for acutely ill stroke patients who are confined to bed, thromboprophylaxis with low-molecular-weight heparin – low dose unfractionated heparin or fondaparinux is recommended if there are no contraindications
  – aspirin alone is not recommended as an agent to prevent VTE

National CMS Hospital Inpatient Quality and Core Measures

• STK-2: Discharged on Antithrombotic Therapy
  – description: ischemic stroke patients prescribed antithrombotic therapy at hospital discharge
  – rationale: the effectiveness of antithrombotic agents in reducing stroke mortality, stroke-related morbidity, and recurrence rates has been studied in several clinical trials
  – for patients with a stroke due to a cardioembolic source warfarin is recommended unless contraindicated
National CMS Hospital Inpatient Quality and Core Measures
• STK-2: Discharged on Antithrombotic Therapy
  – while the use of these agents for patients with acute ischemic stroke and transient ischemic attacks continues to be the subject of study, substantial evidence is available from completed studies
  – data at this time suggest that antithrombotic therapy should be prescribed at discharge following acute ischemic stroke to reduce stroke mortality and morbidity as long as no contraindications exist

National CMS Hospital Inpatient Quality and Core Measures
• STK-3: Anticoagulation Therapy for Atrial Fibrillation/Flutter
  – description: ischemic stroke patients with atrial fibrillation/flutter who are prescribed anticoagulation therapy at hospital discharge
  – rationale: nonvalvular atrial fibrillation (NVAF) is a common arrhythmia and an important risk factor for stroke (it is one of several conditions and lifestyle factors that have been identified as risk factors for stroke)
National CMS Hospital Inpatient Quality and Core Measures

• STK-3: Anticoagulation Therapy for Atrial Fibrillation/Flutter
  – it has been estimated that over two million adults in the US have nonvalvular atrial fibrillation
  – while the median age of patients with atrial fibrillation is 75 years, the incidence increases with advancing age
  – for example, The Framingham Heart Study noted a dramatic increase in stroke risk associated with atrial fibrillation with advancing age from 1.5% for those 50-59 years of age to 23.5% for those 80-89 years of age

National CMS Hospital Inpatient Quality and Core Measures

• STK-4: Thrombolytic Therapy
  – description: acute ischemic stroke patients who arrive at the hospital within two hours of last known well time and for whom IV tPA was initiated at this hospital within three hours of last known well time
  – rationale: the administration of thrombolytic agents to carefully screened, eligible patients with acute ischemic stroke has proven to be beneficial in several clinical trials
National CMS Hospital Inpatient Quality and Core Measures

• STK-4: Thrombolytic Therapy
  – based on the results of the National Institute of Neurological Disorders and Stroke (NINDS) studies, part 1 and 2, the US Food and Drug Administration approved the use of intravenous recombinant tissue plasminogen activator for the treatment of acute ischemic stroke when given within three hours of stroke symptom onset
  – physicians with experience in stroke management and interpretation of CT scans should supervise treatment

National CMS Hospital Inpatient Quality and Core Measures

• STK-5: Antithrombotic Therapy by End of Hospital Day 2
  – description: ischemic stroke patients administered antithrombotic therapy by the end of hospital day two
  – rationale: the effectiveness of antithrombotic agents in reducing stroke mortality, stroke-related morbidity, and recurrence rates has been studied in several large clinical trials
National CMS Hospital Inpatient Quality and Core Measures

• STK-5: Antithrombotic Therapy by End of Hospital Day 2
  – while the use of these agents for patients with acute ischemic stroke and transient ischemic attacks continues to be the subject of study, substantial evidence is available from completed studies
  – data at this time suggests that antithrombotic therapy should be administered within two days of symptom onset in acute ischemic stroke patients to reduce stroke mortality and morbidity if no contraindications exist

National CMS Hospital Inpatient Quality and Core Measures

• STK-6: Discharged on Statin Medication
  – description: ischemic stroke patients with LDL (low-density lipoprotein) >100 mg/dl, or LDL not measured, or who were on a lipid-lowering medication prior to hospital arrival are prescribed statin medication at hospital discharge
  – rationale: an elevated serum lipid level has been a well-documented risk factor for coronary artery disease (CAD) and reflects an organ-specific manifestation of atherosclerosis which is a disease process that can affect the heart and the major and minor branches of the arterial tree
National CMS Hospital Inpatient Quality and Core Measures

• STK-6: Discharged on Statin Medication
  – intensive lipid-lowering therapy through use of a statin medication is recommended for all patients with stroke or TIA of atherosclerotic origin who have an LDL >100 or with LDL <100 mg/dl on lipid-lowering therapy

National CMS Hospital Inpatient Quality and Core Measures

• STK-8: Stroke Education
  – description: ischemic or hemorrhagic stroke patients or their caregivers who were given educational materials during the hospital stay, addressing all of the following:
    • activation of the emergency medical system
    • need for follow up after discharge/medications prescribed
    • risk factors for stroke
    • warning signs and symptoms of stroke
National CMS Hospital Inpatient Quality and Core Measures

• STK-8: Stroke Education
  – rationale: there are many examples of how patient education programs for specific chronic conditions have increased healthful behaviors, improved health status, and/or decreased healthcare costs of their participants
  – the type of stroke experienced and the resulting outcomes will play a large role in determining not only the course of treatment, but also education required

National CMS Hospital Inpatient Quality and Core Measures

• STK-10: Assessed for Rehabilitation
  – description: ischemic or hemorrhagic stroke patients who were assessed for rehabilitation services
  – rationale: each year about 700,000 people experience a new or recurrent stroke, which is the nation’s third leading cause of death
  – approximately 2/3 of these individuals survive and require rehabilitation
National CMS Hospital Inpatient Quality and Core Measures

• STK-10: Assessed for Rehabilitation
  – stroke rehabilitation should begin as soon as the diagnosis of stroke is established and life-threatening problems are under control
  – among the high priorities for stroke are to mobilize the patient and encourage resumption of self-care activities as soon as possible
  – the primary goal of rehabilitation is to prevent complications, minimize impairments, and maximize function

Conclusion

• Stroke is the leading cause of serious long-term disability in the United States
• 40% of stroke patients are left with moderate functional impairment and 15-30% with severe disability
• 1 in 7 strokes occur in adolescents and young adults, ages 15-49
• Stroke is preventable and treatable
Advances in the Assessment and Care of Stroke Patients

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