

Stroke and Cerebrovascular Disease

BOOSTER BLITZ: Geriatric Bootcamp - Managing Acute and Chronic Geriatric Medical Conditions

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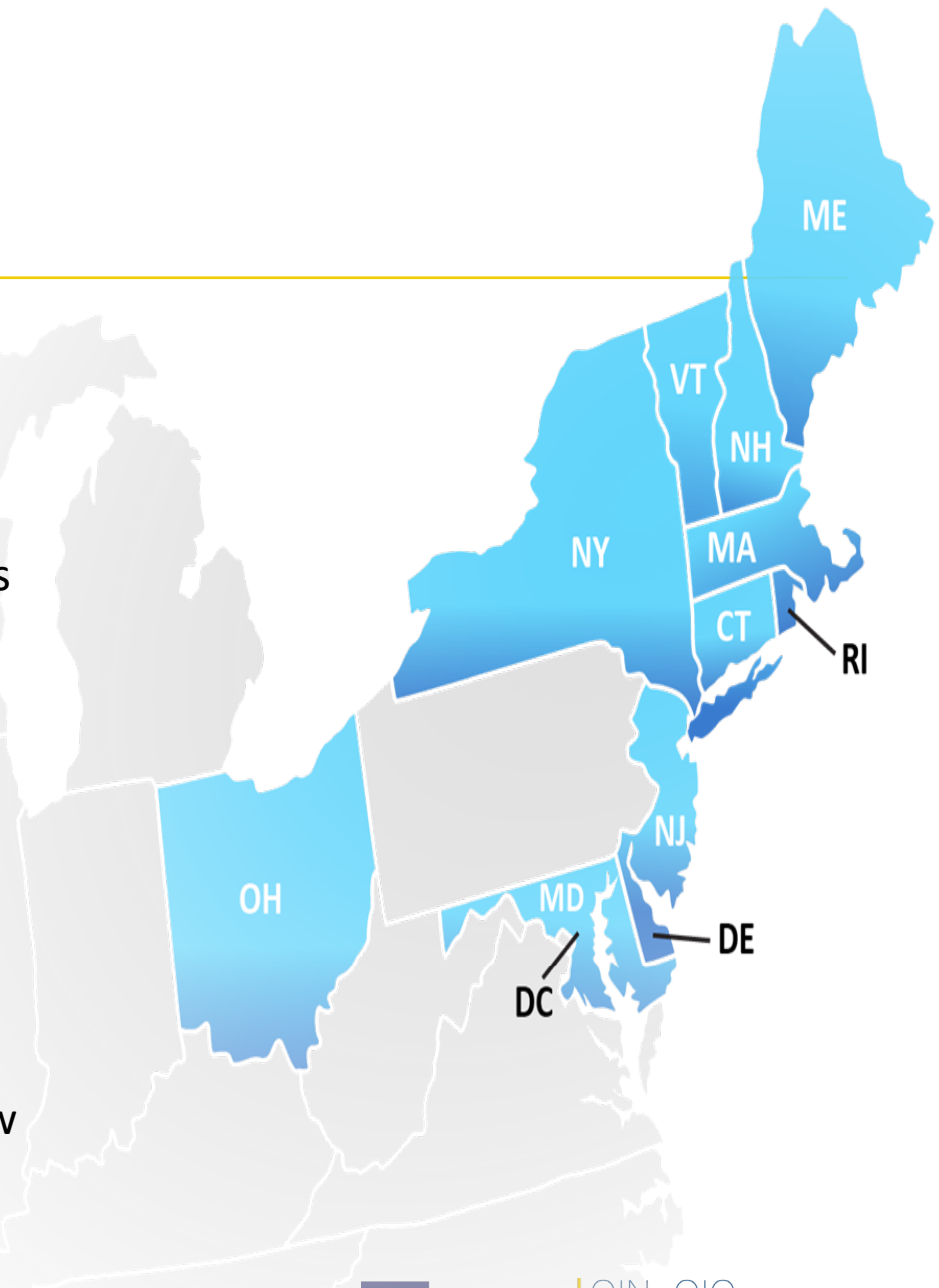
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STROKE AND CEREBROVASCULAR DISEASE

OBJECTIVES

The impact of cerebrovascular disease on older adults

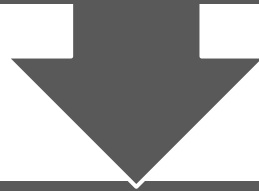
How to recognize a transient ischemic attack

Treatment and prevention of acute ischemic stroke

Treatment and prevention of hemorrhagic stroke

IMPACT OF CEREBROVASCULAR DISEASE

Incidence of stroke (\uparrow) with advancing age, (\sim) doubles each decade



Leading cause of disability and death among older adults

6 months after a stroke in those ≥ 65 , 26% are dependent in ADLs and 46% have measurable cognitive deficits

Fatality rate within 1 month of an acute stroke is 20%-30% across all age groups

Common medical causes of death associated with stroke are myocardial infarction, arrhythmia, heart failure, aspiration pneumonia, and pulmonary embolism

HOW MUCH IS THE FINANCIAL IMPACT?

COST OF STROKE:\$34 Billion
Annually

Hospital Costs, Medications, Lost
Wages

Statistics from the American Heart Association/American Stroke Association,
World Health Organization and Centers for Disease Control and Prevention.
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LEADING CAUSE OF DISABILITY


Rehabilitation Services for
Disabled



\$17,000 Annually per person

PREVELANCE


Prevalence of stroke by age and sex from National health and nutrition examination survey: 2009-2012(NHANES)




Lifetime risk of stroke is higher in **women** than men



Each year ~ 55,000 more women than men have a stroke



Stroke patient more than 85 years makes up to 17% of all stroke



African-Americans men and women have higher age-adjusted incidence of stroke/transient ischemic attack

Risk Factors

Conditions	Behaviors
Previous stroke or transient ischemic attack (TIA)	Unhealthy diet
Hypertension	Physical inactivity
Hyperlipidemia	Obesity
Cardiac disease	Tobacco abuse
Atrial fibrillation (A fib)	Alcohol abuse
Diabetes	
Sickle Cell disease	

Other Risk Factors
Age, gender, heredity, race or prior stroke

TRANSIENT ISCHEMIC ATTACK

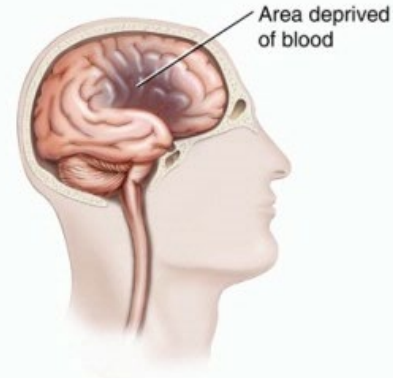
- ▶ Defined as a brief episode of neurologic dysfunction caused by focal ischemia to the brain or spinal cord that does not result in acute infarction
- ▶ Traditionally thought to last up to 24 hours
- ▶ **Newer imaging makes it clear: TIA typically lasts <1 to 2 hours**
 - Longer episodes are commonly associated with acute infarction
 - New definition: No evidence of infarction on brain imaging
- ▶ Major risk factor for subsequent stroke

MANAGEMENT FOLLOWING TIA

- ▶ TIA symptoms should be evaluated emergently
- ▶ Brain imaging, ideally with MRI, is important to determine whether there has been an acute stroke and, if one is found, its location and type
- ▶ Noninvasive imaging of the carotid arteries, EKG, and echocardiography are important to determine the most likely cause of ischemia
- ▶ Initiate treatment for secondary stroke prevention based on the results of the evaluation

Major Types of Strokes

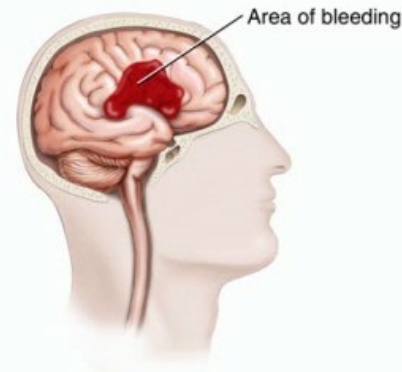
- ▶ Ischemic 85%
- ▶ Hemorrhagic 15%



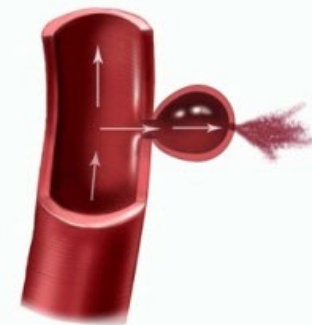
Ischemic Stroke



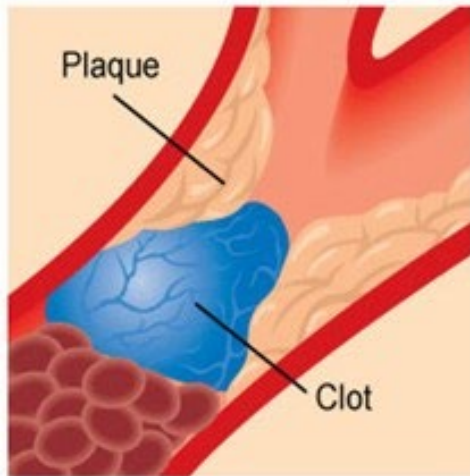
A thrombus or embolus blocks blood flow to part of the brain.



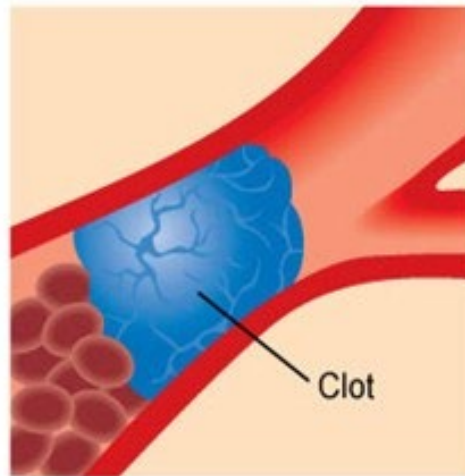
Hemorrhagic Stroke



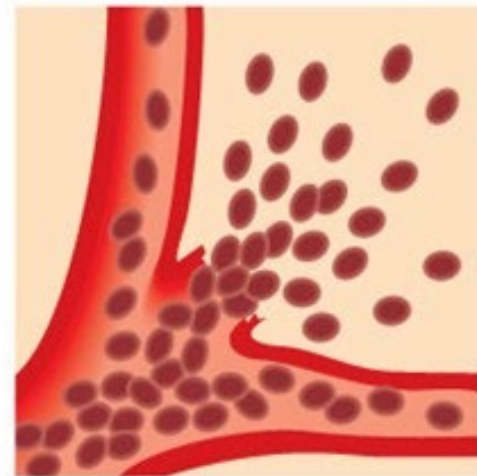
Blood spills out from break in blood vessel in brain.



Thrombotic stroke. The process of clot formation (thrombosis) results in a narrowing of the lumen, which blocks the passage of the blood through the artery.



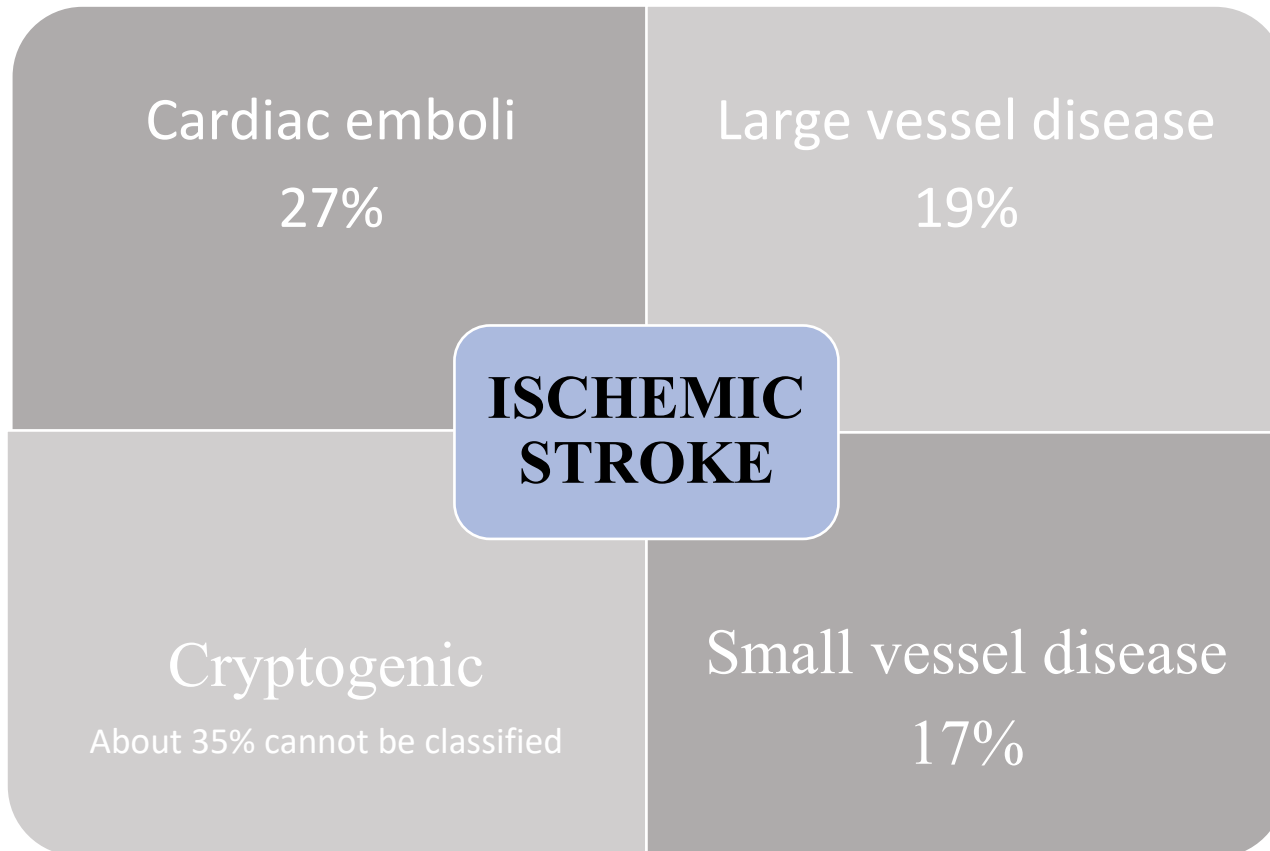
Embolic stroke. An embolus is a blood clot or other debris circulating in the blood. When it reaches an artery in the brain that is too narrow to pass through, it lodges there and blocks the flow of blood.



Hemorrhagic stroke. A burst blood vessel may allow blood to seep into and damage brain tissues until clotting shuts off the leak.

ISCHEMIC STROKE

- ▶ Caused by occlusion of cerebral blood vessel
- ▶ Accounts for approximately 80%–85% of strokes



CARDIOEMBOLIC STROKE

- ▶ Cardioembolism is an important, potentially preventable cause of ischemic stroke
- ▶ Atrial fibrillation (AF) is the most common cause
 - Associated with a 4- to 5-fold increased risk because of thrombus formation in the left atrial appendage and cardioembolism to cerebral vessels
 - Cardioembolic stroke due to AF accounts for 25%–30% of all ischemic strokes
- ▶ Cardioembolic stroke often occurs without preceding transient ischemic attack (TIA)

LARGE VESSEL DISEASE

- ▶ Most commonly caused by atherosclerosis
- ▶ Can cause progressive occlusion of cerebral vessels in the anterior and posterior circulation
- ▶ Can be identified by noninvasive imaging of the carotid arteries (Doppler ultrasonography, computer tomography angiography, or MR angiography) or conventional angiography
- ▶ Risk factors include hypertension, hyperlipidemia, diabetes, and smoking
- ▶ Higher morbidity and mortality strokes

SMALL VESSEL DISEASE

- ▶ Causes occlusion of small penetrating vessels due to:
 - Lipohyalinosis (lipid deposition and hyalinization) or
 - Local arteriosclerosis
- ▶ Causes ischemic strokes that are typically <1 cm, termed lacunar infarcts
- ▶ Risk factors: HTN, DM, smoking
- ▶ Lacunar strokes can occur concurrently with other mechanisms of ischemic stroke

CRYPTOGENIC STROKE

- ▶ Ischemic stroke that does not have a clearly identifiable cause
- ▶ **Use brain and vascular imaging** to assess the size of the vessel(s) involved
- ▶ **Consider atypical causes** of stroke, such as vasculitis, coagulopathy, mitochondrial disorder
- ▶ **Prolonged cardiac monitoring** is sometimes needed to capture intermittent AF as a potential cause of cryptogenic stroke

Face



Arm



Speech



Time



Recognizing Stroke: BEFAST

LEARN HOW TO RECOGNIZE STROKE



B

E

F

A

S

T



BALANCE

LOSS OF BALANCE,
HEADACHE
OR DIZZINESS



EYES

BLURRED VISION



FACE

ONE SIDE OF THE
FACE IS DROOPING



ARMS

ARM OR LEG
WEAKNESS



SPEECH

SPEECH DIFFICULTY



TIME

TIME TO CALL
FOR AMBULANCE
IMMEDIATELY

Cincinnati Pre-Hospital Stroke Scale

1. FACIAL DROOP: Have patient show teeth or smile.



Normal:
both sides
of the face
move equally



Abnormal:
one side of
face does not
move as well
as the other
side

2. ARM DRIFT: Patient closes eyes & holds both arms out for 10 sec.



Normal:
both arms
move the
same or both
arms do not
move at all



Abnormal:
one arm does
not move or
drifts down
compared to
the other

3. ABNORMAL SPEECH: Have the patient say "you can't teach an old dog new tricks."

Normal: patient uses correct words with no slurring

Abnormal: patient slurs words, uses the wrong words, or is unable to speak

IMMEDIATE TREATMENT OF ACUTE ISCHEMIC STROKE

- ▶ **Quickly use head CT imaging** to determine whether the patient is suffering from an ischemic or hemorrhagic event
- ▶ **Assess the severity and pattern** of neurologic deficits, such as by using the NIH Stroke Scale
- ▶ **Identify non-stroke causes** of acute neurologic dysfunction, such as migraine, seizure, and drug intoxication

Within 10 Minutes

- Immediate General Assessment
- ABCs
- Oxygen
- Vital signs
- Intravenous access and blood samples
- Blood glucose
- Neurologic assessment
- Activate the stroke team
- Order CT Scan/MRI per policy
- Obtain 12 Lead ECG
- Other
 - Head of bed at 30°
 - Head midline
 - Suction
 - NPO

NIH STROKE SCALE (NIHSS)

Item	Score
Level of consciousness	0-7
Best gaze	0-2
Visual fields	0-3
Facial palsy	0-3
Motor: arms	0-8
Motor: legs	0-8
Limb ataxia	0-2
Sensory	0-2
Best language	0-3
Dysarthria	0-2
Extinction and inattention	0-2
Total	0-42

Greater score reflects increased impairment:

<5 suggests very good prognosis
>20 suggests very poor prognosis,
high risk of major complications

Details about scoring each item
are at

<http://www.mdcalc.com/nih-stroke-scale-score-nihss/>

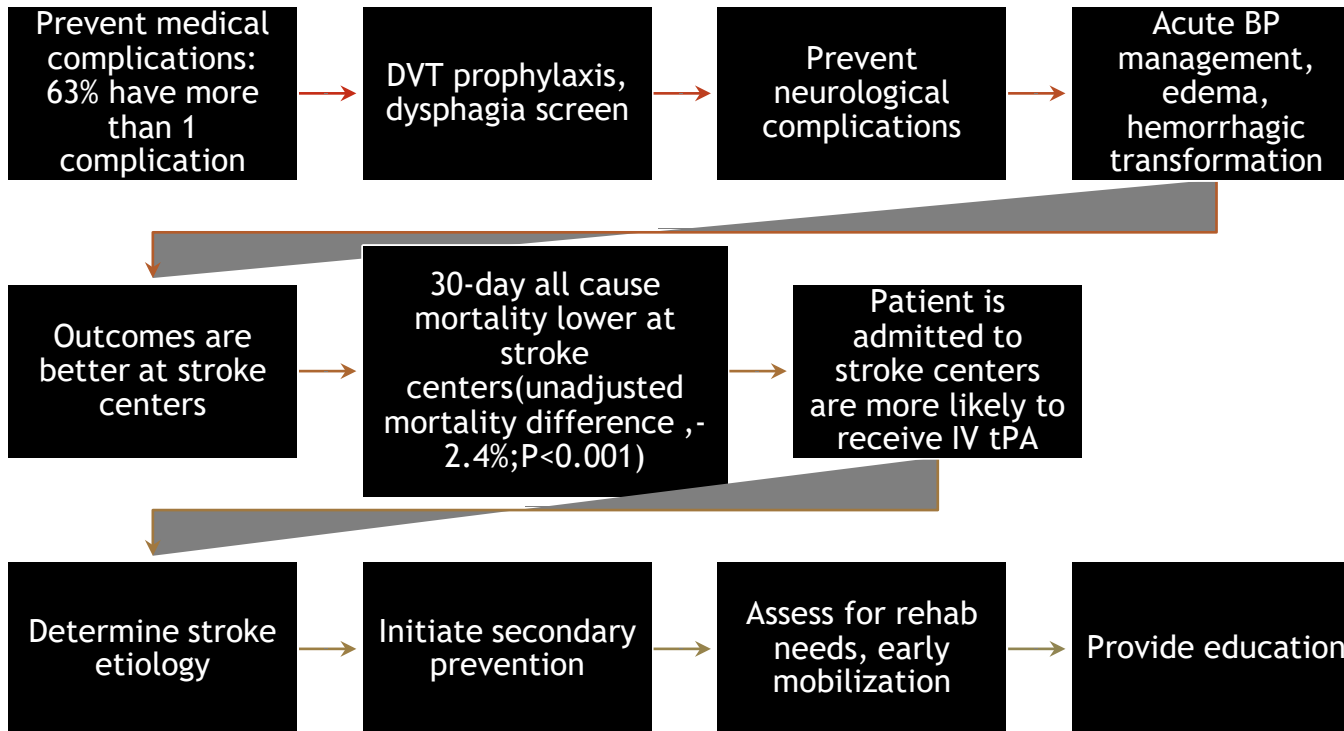
RECOMBINANT TISSUE–PLASMINOGEN ACTIVATOR (rt-PA) (ALTEPLASE)

- Consider when:
 - Patient presents within 3 hours of neurologic deficit
 - CT confirms absence of intracranial hemorrhage
- **AHA recommendation: Window** (3–4.5 hrs) for patients ≤ 80 years old who have NIHSS score ≤ 25 and no prior history of stroke or diabetes
- Use requires careful assessment by a clinician experienced in treatment of stroke
- Carries a 6% risk of intracerebral hemorrhage, usually among patients with severe strokes

ACUTE CARE OF THE OLDER STROKE PATIENT

- Optimize hydration status (gradually, to prevent cerebral edema)
- Control BP while avoiding hypotension
- Prevent deep-vein thrombosis
- Detect/treat coronary ischemia, heart failure, and cardiac arrhythmias
- Start long-term antiplatelet therapy or oral anticoagulation
- Normalize body temperature and blood glucose

Acute treatment and supportive care



PREVENTING ISCHEMIC STROKE

BP therapy to maintain systolic BP <140 mmHg and diastolic BP <90 mmHg for secondary stroke prevention (SOE=A) and for primary prevention in those with other risk factors, such as diabetes



Statin therapy for primary prevention in patients estimated to have a high 10-year risk of cardiovascular events based on AHA guidelines (SOE=A)

High-intensity statin therapy for patients who have had a TIA or stroke believed to be of atherosclerotic origin, regardless of the LDL-C level (SOE=B)

PREVENTING ISCHEMIC STROKE

- ▶ Several studies have confirmed a 2- to 4-fold increased risk of stroke in individuals with diabetes mellitus (SOE=A)
 - **Aggressive treatment of hypertension and hyperlipidemia in the diabetic population is crucial**
 - Some research suggests that tight control of blood glucose levels in healthier adults with diabetes might reduce the risk of stroke, although the evidence for reduction of other vascular complications (eg, retinopathy, nephropathy) is more compelling
- ▶ **Support cessation of smoking**, which increases the risk of stroke as much as 3-fold (SOE=A)

PREVENTING ISCHEMIC STROKE

- ▶ **Long-term oral anticoagulation therapy** is recommended for patients with valvular and nonvalvular AF at high risk of stroke and low risk of hemorrhagic complications (SOE=A)
 - For valvular AF: Warfarin dosed to a target INR of 2.0–3.0 (SOE=A)
 - For nonvalvular AF: First-line options are warfarin with INR 2.0–3.0 (SOE=A) or apixaban, edoxaban, or rivaroxaban, with dabigatran as an alternative (SOE=B)
- Consider aspirin for patients with nonvalvular AF and low risk of stroke (SOE=C)
- If possible, initiate oral anticoagulation within 14 days of the TIA or stroke in those with AF

PREVENTING ISCHEMIC STROKE

- ▶ Following noncardioembolic ischemic stroke, aspirin is the mainstay of antiplatelet therapy for secondary prevention (SOE=A)
- ▶ The minimal necessary dosage has not been determined
- Other antiplatelet medications have not shown consistent superiority to aspirin
 - Sustained-release dipyridamole combined with aspirin (SOE=A)
 - Clopidogrel (SOE=B) (but it is an option for patients who cannot tolerate aspirin)
 - Combining clopidogrel and aspirin (SOE=B)
- ▶ In two large trials, no benefit was found for the use of warfarin over aspirin for secondary prevention (SOE=A) in the setting of large vessel disease, including intracranial atherosclerotic disease

MANAGING ISCHEMIC STROKE

All patients with cerebral atherosclerotic disease: Target modifiable risk factors; prescribe daily antiplatelet agent and statin (SOE=B)

Patients with $\geq 70\%$ symptomatic carotid stenosis: Carotid endarterectomy (CEA)

Patients with recent TIA or ischemic stroke and ipsilateral moderate (50%-69%) carotid stenosis: Consider CEA

***Asymptomatic* patients who have $>70\%$ stenosis of the internal carotid artery: Consider CEA, or endovascular treatment with carotid artery angioplasty and stenting, but only if the perioperative risk of stroke, myocardial infarction, and death is very low ($<3\%$) (SOE=B)**

HEMORRHAGIC STROKE

(INTRACRANIAL HEMORRHAGE)

Accounts for 15%-20% of all strokes

4 main subtypes: intracerebral hemorrhage, subarachnoid hemorrhage, subdural hematoma, and epidural hematoma

Presents with abrupt onset of focal neurologic symptoms

Often associated with severe headache, vomiting, very high blood pressure, and coma or decreased level of consciousness

Carries a higher risk of mortality than ischemic stroke and is best treated in comprehensive stroke centers

Emergent brain imaging (eg, head CT) is needed to determine whether a stroke is hemorrhagic or ischemic

ACUTE CARE OF INTRACEREBRAL HEMORRHAGE (ICH)

**Patients with systolic BP of 150–220 mmHg:
Lower systolic BP to 140 mmHg (SOE=A)**

**Patients on warfarin: Intravenous vitamin K and
therapy to replace vitamin K-dependent clotting
factors to normalize the INR (SOE=B)**

**Patients with severe coagulation factor
deficiency or severe thrombocytopenia:
Factor replacement therapy or platelets as
needed (SOE=B)**

**All anticoagulant and antiplatelet therapies
should be stopped in the acute period**

MANAGEMENT FOLLOWING ICH

Control BP with a goal of <130 mmHg systolic and <80 mmHg diastolic (SOE=B)

In patients at high risk of future ischemic cerebrovascular events, such as those with mechanical heart valves and prior ischemic stroke, anticoagulation may need to be restarted within 2 weeks of the hemorrhage

In all others, withhold oral anticoagulation for at least 4 weeks to prevent recurrent hemorrhage (SOE=B)

SUBARACHNOID HEMORRHAGE (SAH)

Caused by a rupture of an intracranial aneurysm (80%-85% of cases) or another abnormality of a cerebral vessel (eg, arteriovenous malformation)

Risk factors for rupture: size of the aneurysm, older age, female gender, posterior circulation location, enlargement of the aneurysm over time, prior SAH

Patients with an aneurysm at higher risk of rupture should be referred to a neurosurgeon

Acute management of SAH is similar to that of ICH but includes surgical intervention, and focuses on detection and treatment of arterial vasospasm, a common complication

Nursing Care Planning & Goals

Improve mobility.

Avoidance of shoulder pain.

Achievement of self-care.

Relief of sensory and perceptual deprivation.

Prevention of aspiration.

Continence of bowel and bladder.

Improved thought processes.

Achieving a form of communication.

Maintaining skin integrity.

Restore family functioning.

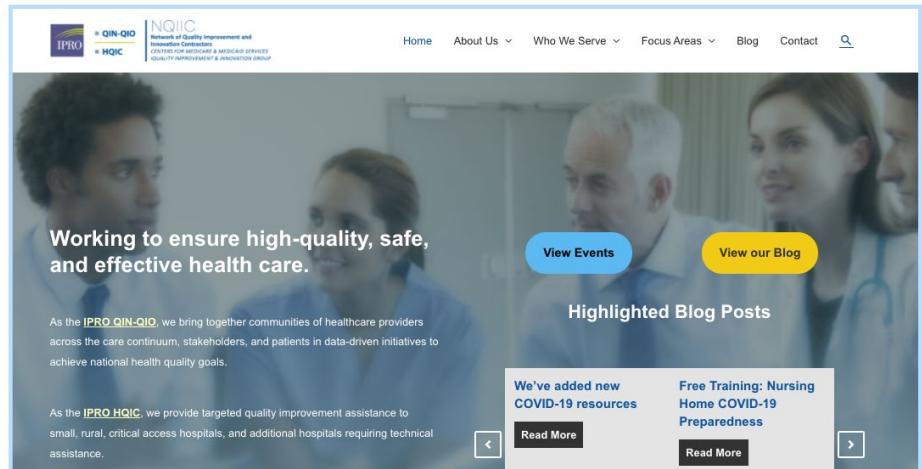
Improve sexual function.

Absence of complications.

SUMMARY

- Acute stroke treatments can effectively improve outcomes in patients, especially when care is provided soon after stroke symptoms begin and in a multidisciplinary stroke center
- Primary and secondary stroke prevention can significantly decrease the burden of cerebrovascular disease in older populations

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- Center of Excellence Behavioral Health in the Nursing Home

Our distinguished keynote speakers:

Moving Needles: Improving Adult Immunization Rates in Post-Acute and Long-Term Care Settings

Heather Rooney
Project Manager, AMDA,
The Society for Post-Acute and Long-Term Care
Medicine

Substance Use Disorders: What You Need to Know

Justin Alves, RN, MSN, FNP-C, ACRN, CARN, CNE
Kristin Wason, MSN, AGPCNP-BC, CARN
Project Manager, AMDA, Boston Medical Center
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