Personalizing Stroke Patient Education

Susie M. Kons, APRN
*Intermountain Medical Center Neurovascular Nurse Practitioner, Stroke Program - Stroke Specialist Nurse Practitioner; Intermountain Medical Center, Intermountain Healthcare; Salt Lake City, UT*

Objectives:
- Describe the practice of stroke nationally and locally
- Identify common stroke risk factors and identify guidelines
- Define factors that may influence stroke education
- Discuss components of personalized stroke education and procedure that should be practiced
Intermountain Health Care
Stroke Conference
Personalized Patient Stroke Education

Susan M Kons
FNP-BC, ACNP-BC, ANVP-BC
October 9th 2015
Objectives

• Describe the prevalence of stroke nationally and locally
• Identify barriers and factors that may influence stroke education
• Identify common stroke risk factors and treatment guidelines
• Define components of personalized stroke education and process that should be completed before a patient is discharge
Prevalence of Stroke

• About 795,000 people have a stroke every year.
• About 610,000 of these are first or new strokes
• About 185,000- nearly one of four- are in people who have had a previous stroke
• Stroke is a leading cause of disability.
• Stroke cost the US an estimated $34 billion each year.
Prevalence of stroke by age and sex

Percent of Population

Age (Years)

20-39
40-59
60-79
80+

0.2
1.9
6.1
15.8

0.7
2.2
5.2
14.0

Men
Women
Prevalence of Stroke

• Risk for stroke: American Indians, Alaska Natives, and Blacks >>> Hispanics>> Whites
• Stroke is the No. 5 cause of death in the U.S., killing nearly 129,000 people a year.
• In the last 10 years, the death rate of stroke has fallen by 35%.
• The highest death rates from stroke in the U.S. is in the southeastern states.
Proportion of patients dead 1 year after first stroke.
Proportion of patients dead within 5 years after first stroke.
Proportion of patients with recurrent stroke in 5 years after first stroke.

<table>
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<th>45-64 years of age</th>
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Prevalence of Stroke (Utah)

Leading Causes of death in Utah in 2010*

- Heart Disease 20%
- Cancer 19%
- Unintentional Injury 7%
- Chronic Low Respiratory Disease 5%
- Diabetes Mellitus 3%
- Suicide 3%
- Alzheimer's Disease 3%
- Influenza & Pneumonia 2%
- Nephritis 2%
- All Others 32%
- Stroke 5%
In 2013, the age-adjusted stroke death rate for Utah was 38.0 per 100,000. The last year of comparison data was 2011. In that year, the Utah rate was 37.8 and the U.S. rate was 38.0. The difference between the rates was not statistically significant.
Stroke Deaths by Age and Sex, Utah 2013
Rate per 100,000 Population
Stroke Education

What Steps can we take?
Elements of Stroke Education

• Are there any barriers to education/learning?
• What are the patient’s and families learning style preferences?
• Are there any ethnic/culture /religion /gender factors that may need to be consider regarding stroke education?
• Who is the patient’s significant other regarding discharge education and F/U care?
• What type of stroke did your patient have... ischemic or hemorrhagic stroke
• What are the patient’s non modifiable stroke risk factors?
• What was the primary source of stroke?
• What are the other stroke risk factors?
• What treatments are provided for patient’s stroke risk factors?
Elements of Stoke Education

- What medication education needs to be completed?
- What is the patient’s recommended diet?
- Does tobacco or polysubstance cessation education need to be completed?
- What is the disposition plan: Home, acute rehab, SNF, HH, LTAC
- What rehab therapies and home health needs does the patient have?
- What caregiver training needs to be completed?
- Does the patient have any social services/ community resources needs?
  - What are the patient’s F/U appointments after discharge?
  - What monitoring does the patient need to complete after discharge? (Afib, BP, Glucose, INRs)
  - Does the patient and family/caregiver know the stroke warning signs and to call 911 if they occur?
Now we are ready to take those steps!
Are There Any Barriers to Education/Learning?
Barriers to Education

- Literacy
- Language
- Cultural and Religious Variations
- Brain Function
- Learning Style (Personal Preferences)
- Personal Beliefs
- Psychosocial issues
  - Denial
  - Anger
  - Depression
- Financial/Social Support Limitations
Barriers to Education

• Literacy
  – 32 million adults in the US cannot read (14% of population)
  – 21% of adults in the US read below the 5th grade level
  – 19% of high school graduates can’t read
  – 70% of prison inmates can’t read
  15% of the US population have specific reading disorders
Demographics of Adults Regarding Reading Level

• Reading level of US adults:
  – Proficient  13%
  – Intermediate  44%
  – Basic  29%
  – Below Basic  14%
    – Hispanic  43%
    – Black  24%
    – White  9%
    – Other  13%
Health Literacy

Health literacy is the degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions.
October is Health Literacy Month

Finding the Right Words for Better Health

www.healthliteracymonth.org
Why is Health Literacy Important?

• Only 12% of adults have Proficient Health Literacy
• Nearly 9 out of 10 adults may lack the skills needed to manage their health and prevent disease.
• 14% of adults (30 million people) have below basic health literacy.
  – 42% are more likely to report their health as poor
  – 28% are more likely to lack health insurance than adults with proficient health literacy. (Kirsch, IS, Jungeblut A. Jenkins L. Kolstad A., 1993)
• Lack of health literacy leads to:
  – Greater use of services designed to treat complications of diseases.
    • Poor health outcomes
    • Higher rate of hospitalizations
  – Lesser use of services designed to prevent complications and disease
    • Less frequent use of preventative medicines.
Healthcare literacy affects peoples ability to:

• Navigate the healthcare system:
  – Filling out complex forms
  – Locating providers and services.

• Share personal information with providers:
  – Health history
  – Medications and prior treatments

• Understand the relationship of how the body works and disease

• Engage in self-care and chronic-disease management
  – Monitoring and diary keeping (weight, BP, Glucoses)
  – Medication compliance
    • 46% of American adults can not understand the labels on their prescriptions
  – F/U with health care providers

• Understand mathematical concepts:
  – Probability and risk
  – Choosing between health care plans and comparing prescription drug coverage requires calculating premiums, copays and deductibles
What can we do to help our patients?

- Improve our professional knowledge of health topics so that we can educate others
- Work on our communication skills to explain material in a way that the patient and their families will comprehend.
- Make time to provide education material and time for reinforcement of that education
- Incorporate education that will help the patient improve their health literacy
Cultural and Religious Variations

• Beliefs
• Values
• Attitudes
• Traditions
• Language preferences
• Health practices
• Communication styles
As health care professionals we have our own culture and language. Many of us adopt the "culture of medicine" and the language of our specialty as a result of our training and work environment. This can affect how we communicate with our patients.

We need to communicate in a manner that is linguistically and culturally appropriate.
We need to use Plain Language

• Use for written and verbal communication to make it easier to understand
• The user should be able to understand material provided the first time they read or hear it.
• A Plain language document should be one in which the patient with reasonable time and effort should be able to find what they need, understand what they find and act appropriately on that understanding.
  • www.plainlanguage.gov., 10/21/2005
Key elements of plain language

• Organizing information so that the most important points come first
• Breaking complex information into understandable chunks
• Using simple language and defining technical terms
Language Barrier to Education

• Assess all patients for their primary language and provide the interpreter services as needed.
• Available Services
  – In House Services
  – Stratus Video Interpreting
• Guidelines:
  – Both parties introduce each other
  – Inform the interpreter regarding the goal of the meeting
  – Ask the medical interpreter to clarify in her/his own words when there is misunderstanding due to cultural differences that might occur
  – For written material, always use a translator, if available to translate (into writing) basic instruction for the patient.
Stratus Video Interpreting
Touch Desired Language

Connects in less than 30 seconds
Brain Functioning Barriers to Education
Brain Function Required for Language and Reading
Brain Functioning Barriers to Education

• Deficits
  – Cognitive deficits:
    – Retention and short term memory
    – Reasoning,
    – Judgement
    – Impulsiveness
    – Attention
  – Receptive aphasia (language comprehension)
  – Expressive aphasia
  – Reading comprehension
  – Vision deficits
    • Cortical blindness
    • Visual cut
  – Apraxia

• We need to document the patient’s deficits that may hinder their understanding of stroke education
Learning Style Preference

• The patient’s deficits may influence the type of learning styles required for stroke education
• Learning styles are based on the strengths, weaknesses and preferences
  – Visual:
    • Personalized Patient Education Sheets
    • Stroke Booklet Educational Material
  – Auditory
    • Retains information through hearing and speaking
    • Often prefers to be told how to do things and then summarizes the main points
    • Discussions
  – Kinesthetic (demonstrating how to do things)
    • Likes a hands on approach
Personal Belief

• A belief is an idea that a person holds as being true.

• It is based on:
  – Person’s own experiences
  – Other people experiences they know
  – About how we expect thing to be
  – It is our attitudes that we have

• Our beliefs will make us either act or not act on a situation. This affects motivation.
Psychosocial Issues

• Denial (R hemispheric infarct)
• Anger
• Depression
  – Depression is very common after stroke
  – Every patient should be assessed for depression.
    • If suspected the PHQ-9 severity score should be completed
    • Consider Psych consultation
    • Provide treatment
Financial/Social Support Limitations

• Lack of resources to:
  – Purchase discharge medications
  – F/U appointments
  – Therapies (ST, OT and PT)
  – Complete further testing
    • Atrial fib monitoring

• Homeless

• Lack of significant others

• Lack of transportation
Before you start the patient’s education you need to determine the patient’s barriers.

Incorporate solutions of those barriers into the patient’s personalized stroke education plan.
What type of stroke did the patient have?
Identify the Patient’s Type of Event

• TIA
• Stroke
  – Ischemic Stroke (87%)
  – Hemorrhagic Stroke (13%)
(A) NECT scan in a patient 1 hour after onset of stroke symptoms is normal. Routine MR scan was normal, but DWI disclosed acute MCA infarct (B, arrows).
TIA

• Brief
• No permanent damage to brain
• Warning sign of risk for stroke
• Warrants aggressive evaluation
• Temporary focal brain deficits, caused by vascular disease
• Fits a known vascular territory (anterior or posterior)
• Clears completely in less than 24 hours, 90% clear within 10 minutes
Take Home Message (TIA)

- 23% of ischemic stroke patients report previous TIA
- 17% of strokes occurred on the same day as TIA
- 30% of patients who have a TIA go on to have a stroke within 5 years
- Goal is PREVENTION
- Every patient should undergo a comprehensive workup including telemetry
Ischemic Stroke (87%)

• Thrombotic 60%
  – Thrombus forms by clot in an artery that blocks blood flow
  – Arteries damaged by arteriosclerosis
  – Includes``Lacunar”

• Embolic 20%
  – Wandering clot (embolus)
  – Emboli develop in the heart or other area such as carotid artery that migrate to distal arteries.

• Systemic hypoperfusion 20%
  – Low blood flow
Lacunar Infarcts

• Accounts for 25% of all ischemic strokes
• Caused by microatheroma and thrombosis of the small penetrating arteries
• Forms small cavities called lacuna (<0.5 mm in diameter)
• Location: Basal ganglia, thalamus, internal capsule and pons
• Causes diverse symptoms- depending on location
Small (100 µm) artery within brain parenchyma showing typical pathologic changes secondary to hypertension. Vessel lumen almost completely obstructed by thickened media and enlarged to about three times normal size. Pink-staining fibrinoid material within walls.

Lacunar infarcts in base of pons interrupting some corticospinal (pyramidal) fibers. Such lesions cause mild hemiparesis.

Multiple bilateral lacunes and scars of healed lacunar infarcts in thalamus, putamen, globus pallidus, caudate nucleus and internal capsule. Such
Embolic Ischemic Strokes (20%)

• Wandering clot (emboli)
• Emboli develop in heart or vessel such as the carotid artery, then migrate to distal vessel
  – Cardioembolic (from heart)
  – Thromboembolic (from artery)
Cardioembolism (High-risk/Medium-risk)

**High-Risk sources:**
- Mechanical prosthetic valve
- Mitral stenosis with atrial fibrillation
- Atrial fibrillation (other than lone atrial fibrillation)
- Left atrial/atrial appendage thrombus
- Sick sinus syndrome
- Recent myocardial infarction (<4 weeks)
- Left ventricular thrombus
- Dilated cardiomyopathy
- Akinetic left ventricular segment
- Atrial myxoma
- Infective endocarditis

**Medium-risk sources:**
- Mitral valve prolapse
- Mitral annulus calcification
- Mitral stenosis without atrial fibrillation
- Left atrial turbulence (smoke)
- Atrial septal aneurysm
- Patent foramen ovale
- Atrial flutter
- Lone atrial fibrillation
- Bioprosthetic cardiac valve
- Nonbacterial thrombotic endocarditis
- Congestive heart failure
- Hypokinetic left ventricular segment
- Myocardial infarction (>4 weeks, <6 months)
Multifocal Embolic Infarcts

A  B  C
Other Embolic Sources

- Carotid plaque
- Hypercoagulability
- Air emboli (i.e. surgical procedure)
- Fat emboli (i.e. orthopedic trauma of the long bones)
- PFO (DVT)
- Carotid or vertebral artery dissections
Arterial Dissection: Pathology

- Usually arise from an intimal tear that allows the development of an intramural hematoma
CT Angiogram

- Most specific finding:
  - Double lumen (rare)
  - Intimal flap
- Intraluminal clots
- Flame-shaped tapering occlusions
- Vessel stenosis with string sign
- Dissecting aneurysm formation (occurs at non-bifurcation location)
Hypoperfusion Ischemic Stroke (20%) Watershed Infarction

• Area that occurs between the terminal distributions of two adjacent arteries
• Because terminal areas are at terminus of the vascular supply, they are subject to low, marginally adequate arterial perfusion under normal conditions
• When cerebral perfusion pressure (CPP) drops, infarction can occur
Hypoxia

Infarcts

Hypotension and poor cerebral perfusion: border zone infarcts, no vascular occlusion
Hemorrhagic Stroke
Hemorrhagic Stroke (13%)

• Higher fatality/poorer prognosis
• Younger
• +/- Severe headache, N/V
• Blood vessel ruptures disrupting blood flow
Types of Hemorrhagic Stroke

- Subarachnoid hemorrhage
- Primary intracranial hemorrhage
- Hemorrhagic transformation of ischemic stroke
Distribution of Congenital Cerebral Aneurysm

Diagram showing the distribution of congenital cerebral aneurysms.

- Anterior cerebral 30%
- Deep arterial 10%
- Anterior communicating 8%
- Internal carotid 30%
- Posterior communicating 8%
- Basilar 4%
- Basilar 4%
- Middle cerebral 30%
- Posterior cerebral 0%
- Posterior communicating 0%
- Verbal 15%
- Basilar 4%
- Basilar 4%
- Verbal – posterior arterial 15%
Multiple Aneurysms
Primary Intracranial Hemorrhage

- **Hypertension 40%**
- **Amyloid angiopathy 15-20%**
- **Vascular malformations 10-15%**
- **Intracranial Tumors 2%**
- **Vasculitis**
- **Anticoagulation therapy 1-2 %**
- **Bleeding diathesis < 1%**
  - DIC, ITP, PTT
  - Multiple myeloma, Leukemia, Sickle cell disease
- **Venous sinus thrombosis**
- **Stimulant abuse ( i.e. cocaine, amphetamines)**
- **Systemic disorders**
  - Sarcoidosis
  - CNS infections- particularly herpes zoster
  - Behcet syndrome.
Intracerebral hemorrhage
(hypertensive)
Hemorrhagic Stroke
Intraventricular Hemorrhage

Figure 119. Intraventricular hemorrhage
Arteriovenous Malformation
Hemorrhagic Transformation of Ischemic Infarction in L MCA distribution
Hemorrhagic transformation of ischemic stroke

- **Endocarditis**
  - Embolus initially obstructs an artery causing:
    - Brain and vessel wall (endothelium) ischemia
    - Blood may leak and sometimes cause gross hemorrhage through the damaged vessel.
  - Leakage of erythrocytes into the brain develops in 50% to 80% of patients with embolic infarcts (i.e. petechial hemorrhagic brain infarcts).
HSV with SAH and ICH
Venous system as a source for ischemic and hemorrhagic stroke
Dural Venous Sinuses
Cerebral Venous Thrombosis

- Incidence: Unknown
- Pathology:
  - Thrombus formation is due to
    - Venous stasis
    - Increase clotting tendency
    - Changes in the vessel wall
  - Thrombus formation causes:
    - Compromised venous drainage of the brain
    - Arterial flow creates back-pressure into the tissue capillaries causing
      - Capillary congestion
      - Interstitial (vasogenic) edema
      - Decrease tissue perfusion
      - Ultimately ischemia
      - Eventually, capillary rupture, causing hematomas to form
  - This process of cerebral venous congestion, infarction (not conforming to strict arterial territories) and hemorrhage, is the hallmark of cerebral sinus thrombosis.
Cerebral Venous Thrombosis

• Consequences of CVT:
  – Vary according to location and degree
    • No consequences (i.e. lateral sinus – isolated small thrombosis
    • Severe (i.e. propagation of a deep cerebral vein thrombosis- superior sagittal sinus thrombosis (SSST) extending into the posterior third of the sinus into the transverse sinus
  – Brain edema and increase ICP (i.e. SSST)
  – Occlusion of the cerebral veins may cause:
    • Venous infarct with hemorrhage
    • SAH
    • SDH
    • Intracerebral hematoma
    • Classic anatomic presentation of thrombosis of the SSS and it tributary cortical veins:
      – Extensive bilateral hemorrhagic infarcts located in the superior and internal parts of both hemispheres.
Bilateral hemorrhagic infarcts in superior sagittal sinus thrombosis
Causes of Venous Sinus Thrombosis

- Hypercoaguclable states
- Parameningeal infections of the face, eye, ear, mastoid, or sinuses
- Meningitis, subdural empyema, brain abscess
- Pregnancy, oral contraceptive medications
- Dehydration
- Infiltrative malignancies
- Trauma
- Ulcerative colitis
- Systemic lupus erythematosus
- Jugular trauma or canalization
- HIV infections
- Nephrotic syndrome
- Behcet disease
- *Multiple causes
What was the cause of the patient stroke?
TOAST CRITERIA
Classification of Subtypes of Acute Ischemic Strokes

• Large-artery atherosclerosis (embolus/thrombosis)*
• Cardioembolism (high-risk/medium-risk)*
• Small-vessel occlusion (lacunar)*
• Stroke of other determined etiology*
• Stroke of undetermined etiology
  a. Two or more causes identified
  b. Negative evaluation
  c. Incomplete evaluation

(TOAST, Trial of Org 10172 in Acute Stroke Treatment.)

*Possible or probable depending on results of ancillary studies.
What are the patient’s stroke risk factors?
Non-Modifiable Stroke Risk Factors

• Age – Increase incidence of stroke with age. After age of 55, every 10 years the stroke rate doubles

• Gender- incidence may vary according to age.
  – Men > Women. However, more women die from stroke.

• Ethnicity/Race: African American, Alaska Natives, American Indians >>> Hispanic >>> White

• Family History
Modifiable Stroke Risk Factors

• 90% of strokes can be explained by modifiable risk factors

• 80% of recurrent strokes can be prevented with optimal risk factor control and/or elimination

• **Hypertension** is the single most important risk factor for both hemorrhagic and ischemic strokes
Modifiable Stroke Risk Factors

- Extracranial/intracranial vessel disease
- Hypertension
- Hyperlipidemia
- Atrial fibrillation
- Coronary artery disease
- Peripheral vascular disease
- Patent foramen ovale (PFO)
- Diabetes mellitus
- Metabolic syndrome
- Obesity
- Physical Inactivity
- Obstructive sleep apnea
- Smoking
- Substance abuse: cocaine
- Excessive ETOH use
- Estrogen use
- Vasculitis
- Hypercoagulable disorders
- Migraine
Estimated 10-year stroke risk in adults 55 years of age according to levels of various risk factors (Framingham Heart Study).

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* - Closest ranges for women are: 95-104 and 115-124.
Stroke Workup

- Vital signs: Blood pressure (hypertension vs hypotension). Fever (endocarditis)
- Telemetry: Atrial fibrillation
- 12 lead EKG
- TTE/TEE
- Carotid US
- CT Brain, CTA Brain with perfusion, CTA Neck
- MRI Brain, MRA Brain, MRA Neck
- MR or CT venography
- Cerebral angiogram
- Troponin levels, Fasting lipid panel, HgbA1C
- Nocturnal sleep oximetry
- Hypercoagulable workup (at times)
Treatment of Stroke Risk Factors

• Evidence-Based
• Current
• Guidelines for all clinicians
• AHA/ASA Guidelines are written by a writing committee of experts from multiple disciplines (including nursing), that conduct a comprehensive review and synthesis of the relevant literature.
• All recommendations follow the AHA and American College of Cardiology (ACC) methods of classifying the level of certainty of the treatment effect and the class of evidence.
Guidelines for the Prevention of Stroke in Patients With Stroke and Transient Ischemic Attack
A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association

The American Academy of Neurology affirms the value of this guideline as an educational tool for neurologists.

Endorsed by the American Association of Neurological Surgeons and Congress of Neurological Surgeons

Walter N. Kernan, MD, Chair; Bruce Ovbiagele, MD, MSc, MAS, Vice Chair; Henry R. Black, MD; Dawn M. Bravata, MD; Marc I. Chimowitz, MBChB, FAHA; Michael D. Ezekowitz, MBChB, PhD; Margaret C. Fang, MD, MPH; Marc Fisher, MD, FAHA; Karen L. Furie, MD, MPH, FAHA; Donald V. Heck, MD; S. Claiborne (Clay) Johnston, MD, PhD; Scott E. Kasner, MD, FAHA; Steven J. Kittner, MD, MPH, FAHA; Pamela H. Mitchell, PhD, RN, FAHA; Michael W. Rich; MD; DeJuran Richardson, PhD; Lee H. Schwamm, MD, FAHA; John A. Wilson, MD; on behalf of the American Heart Association Stroke Council, Council on Cardiovascular and Stroke Nursing, Council on Clinical Cardiology, and Council on Peripheral Vascular Disease
Definition of Classes and Levels of Evidence Used in AHA/ASA Recommendations

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<th>CLASS I</th>
<th>Benefit &gt;&gt; Risk</th>
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<table>
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<tr>
<th>CLASS IIa</th>
<th>Benefit &gt;&gt; Risk</th>
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<td>Additional studies with focused objectives pursued</td>
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IT IS REASONABLE to perform procedure/administer treatment

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Procedure/Treatment MAY BE CONSIDERED

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<td>Treatment</td>
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**LEVEL A**
Multiple populations examined
Data derived from multiple randomized clinical trials or meta-analyses

- Recommendation that procedure or treatment is useful/effective
- Sufficient evidence from multiple randomized trials or meta-analyses

**LEVEL B**
Limited populations examined
Data derived from a single randomized trial or nonrandomized studies

- Recommendation that procedure or treatment is useful/effective
- Evidence from single randomized trial or nonrandomized studies
- Recommendation that procedure or treatment is not useful/effective and may be harmful

**LEVEL C**
Very limited populations examined
Only expert opinion, case studies, or standard of care

- Recommendation that procedure or treatment is useful/effective
- Only expert opinion, case studies, or standard of care

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Suggested phrase for writing recommendations:

should be recommended

is indicated

is not useful/effective/beneficial

is probably recommended or not indicated

may/might be reasonable

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<tr>
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<th>Harm</th>
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Comparative effectiveness phrase:

Treatment/strategy A is recommended/valuable in preference to treatment B (should be chosen over treatment B)

Treatment/strategy A is probably more effective/valuable in preference to treatment B (it is reasonable to choose treatment A over treatment B)
<table>
<thead>
<tr>
<th>Class</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Class I</td>
<td>Conditions for which there is evidence for and/or general agreement that the procedure or treatment is useful and effective</td>
</tr>
<tr>
<td>Class II</td>
<td>Conditions for which there is conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of a procedure or treatment</td>
</tr>
<tr>
<td>Class IIA</td>
<td>Weight of evidence or opinion is in favor of the procedure or treatment.</td>
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<tr>
<td>Class IIB</td>
<td>Usefulness/efficacy is less well established by evidence or opinion.</td>
</tr>
<tr>
<td>Class III</td>
<td>Conditions for which there is evidence and/or general agreement that the procedure or treatment is not useful/effective and in some cases may be harmful</td>
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<tr>
<th>Level of Evidence A</th>
<th>Data derived from multiple randomized clinical trials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of Evidence B</td>
<td>Data derived from a single randomized trial or nonrandomized studies</td>
</tr>
<tr>
<td>Level of Evidence C</td>
<td>Expert opinion or case studies</td>
</tr>
</tbody>
</table>
Medical Risk Factors

HYPERTENSION
Hypertension

• Risk factor control of Hypertension is the most important intervention for secondary prevention of ischemic stroke- present in approximately 70% of ischemic stroke.

• Hypertension is defined as SBP ≥ 140 mm HG or a DBP ≥ 90 mm HG

• The risk of first ischemic stroke is directly related to BP starting as low as 115 mm HG (Furie KL, 2011).
Prevalence of High Blood Pressure in adults ≥20 years of age
(NHANES: 2009–2012)
Age-Adjusted Prevalence Trends for High Blood Pressure in Adults, ≥20 years of age
Hypertension
(AHA/ASA 2014 Guidelines)

• Initiation of BP therapy is indicated for previously untreated patient with ischemic stroke, or TIA who, after the first several days, have an established SBP ≥ 140 or diastolic ≥ 90 (Class 1: Level of Evidence (LOE) B)

• Initiation of therapy for patients with SBP < 140 and DBP < 90 is of uncertain benefit. (Class IIb, LOE C).

• Resumption of BP therapy is indicated for previously treated patients with known HTN for both prevention of recurrent stroke and prevention of other vascular events in those who have had an ischemic stroke or TIA and are beyond the first several days. (Class 1, LOE A)
Hypertension
(AHA/ASA 2014 Guidelines)

• Goals of target level or reduction from pretreatment baseline are uncertain and should be individualized, but it is reasonable to achieve a SBP < 140 and DBP < 90 (Class IIa; LOE B).

• For patients with a recent lacunar stroke, it might be reasonable to target a SBP < 130 (Class IIb, LOE B)

• Several lifestyle modifications have been associated with BP reduction and are a reasonable part of a comprehensive therapy. Patients should be educated on salt restriction, weight loss, Mediterranean-type diet; regular aerobic physical activity, and limited ETOH consumption. (Class IIb, LOE C).
Hypertension
(AHA/ASA 2014 Guidelines)

• Optimal drug regimen to achieve the recommended level of reduction is uncertain because direct comparisons between regimens are limited. The available data indicate that diuretics or the combination of diuretics and ACE-I are useful. (Class I, LOE A)

• **Choice of specific drugs and targets should be individualized** on the basis of pharmacological properties, mechanism of action, and consideration of specific patient characteristics for which specific agents are probably indicated (e.g. extracranial cerebrovascular occlusive disease, renal impairment, cardiac disease and DM) (Class IIa, LOE A)
Antihypertension Therapy Considerations in Specific Subpopulations with Stroke and TIA Based on Joint National Committee-7 Guidelines

- Subpopulations/Preferred Drugs
  - CHF
    - Diuretics, ACE-I, ARB, BB and/or aldosterone antagonist
  - Post MI
    - BB, CCB, aldosterone antagonist
  - CAD
    - Diuretics, BB, CCB, ACE-I
  - DM
    - Diuretics, BB, CCB, ACE-I and/or ARB
  - Chronic Kidney Ds
    - ACE-I or ARB
  - AF Americans
    - Diuretics or CCB
  - LVH
    - Any class but avoid direct vasodilators (eg, Hydralazine/minoxidil)
Prevention Regimen for Effectively Avoiding Second Strokes (PRoFESS)

Post hoc analysis of this trial found that very low systolic BP (less than 120 mm Hg) after stroke was associated with increased risk of recurrent stroke compared with those with normal BP defined as 120 to 139 mmHg. This data suggest that a goal BP of approximately 120 to 140 mmHg (systolic) and 80 to 90 mm Hg (diastolic) may be ideal.
Dyslipidemia

• The benefit of aiming for a given LDL-C target has not been definitively established in a major randomized clinical trial (RCT)
• There is a modest link between high serum LDL-C and greater risk of ischemic stroke as well as a association of low LDL-C with increase risk for ICH.
Dyslipidemia

• SPARCL Trial
  – High dosage Atorvastatin (80 mg qhs):
    • Secondary stroke prevention - absolute reduction in risk of stroke was 2.2% over 4.9 year time frame.
    • Major cardiovascular events- the 5 year absolute reduction in risk was 3.5%
  – Higher incidence of hemorrhagic stroke 1.4% for statin tx vs placebo.
    • A Hx of ICH may identify a subset of stroke patients with greater propensity in whom statin should be used very judiciously, if at all.
Dyslipidemia

• Post hoc analysis of SPARCL trial:
  – Achieving an LDL-C level < 70 mg/dL was related to a 28% reduction in risk of stroke without a significant rise in risk of hemorrhagic stroke.
  – Also in Stroke and TIA patients with a ≥ 50% reduction in LDL-C had a 35% reduction in combined risk of nonfatal and fatal stroke.

*Because the analyses were exploratory, these results should be seen only as suggesting that the achievement of nominal targets or a specific degree of LDL-C lowering may be beneficial.
Dyslipidemia

- The Treat Stroke To Target (TST) evaluation of effects of targeted LDL-C should provide better evidence on management.
- The lipid sub-fractions have been shown to predict future vascular events with target LDL-C achieved.
  - Elevated triglycerides associated with ischemic stroke and large-artery atherosclerotic stroke
  - Low HDL-C linked to risk of ischemic stroke
  - Elevated lipoprotein (a) related to incident stroke
- Currently the efficacy of agents used to treat lipid sub-fractions has not been established.
Dyslipidemia  
(AHA/ASA 2014 Guidelines)

• Statin therapy with intensive lipid-lowering effects is recommended to reduce risk of stroke and cardiovascular event among patient’s with ischemic stroke or TIA presumed to be of atherosclerotic origin:
  – ... and an LDL-C level $\geq$ 100 mg/dL with or without evidence for other clinical ASCVD (Class I, LOE B)
  – ... and an LDL-C level $< 100$ mg/dL, and no evidence of other clinical ASCVD. (Class I; Level of Evidence C)
Dyslipidemia
AHA/ASA 2014 Guidelines

• Patients with ischemic stroke or TIA and other comorbid ASCVD should be otherwise managed according to the 2013 ACC/AHA cholesterol guidelines includes:
  – Lifestyle modification,
  – Dietary recommendations
  – Medication recommendation
(Class I; LOE A)
The ACC/AHA Guideline on the Treatment of Blood Cholesterol to Reduce Atherosclerotic Cardiovascular Risk in Adults (2013)

- This guideline moved away from reliance on cholesterol measurement to select individuals for therapy and guide drug dose
- Identifies 4 ```statin benefit groups” for drug therapy to reduce risk of atherosclerotic cardiovascular disease (ASCVD).
- Clinical arteriosclerotic cardiovascular disease (ASCVD, includes ischemic stroke and TIA patients):
  - High dose statin therapy ( i.e. reduces LDL-C by > 50%) is recommended in patients ≤ 75 yo, have LDL –C ≥ 190 mg/dL, or have DM and a 10 year risk of ASCVD estimated ≥ at 7.5%.
  - Moderate dose statin therapy ( i.e reduces LDL-C by ≈30% to 50% is recommended for other groups.
Glucose Disorders

• Principle disorders of glucose metabolism:
  – Type I DM (usually begins in childhood- 5% of adult DM)
  – Pre-DM:
    • HbA1C 5.7 to 6.4%, fasting glucose 100 to 125 and 2 hr glucose ≥ 140 to 199 range with 75 gram glucose tolerance test.
  – Type 2 DM:
    • HbA1C ≥ 6.5%, fasting glucose ≥ 126, and 2 hr glucose ≥ 200 range with 75 gram glucose tolerance test
Diabetes

• DM prevalence increases with age
• In the US, 11.2% of adults have diagnosis
  – 3.7% in adults (age 20 to 44)
  – 26.7% in adults ≥ 65 age
• Ethnicity/Race:
  – 7.1% non-Hispanic whites
  – 11.8% for Hispanic
  – 12.6 % Non-Hispanic blacks
Diabetes: Risk for Stroke

• Responsible for > 8% of first ischemic strokes
  – (DM associated with increase risk of 1st ischemic stroke, adjusted relative risk 1.5-3.7)
• Pre-DM is also a risk for stroke with values:
  – HbA1C between 6.0 to 6.4 range
  – Fasting glucose ≥ 110 to 120 range
• Incidence in ischemic stroke patients:
  – 28% have pre-DM
  – Up to 25 to 45% have overt DM
• DM itself is associated with increased risk for recurrent stroke (60% increase risk) with a sub-study group from the Cardiovascular Health Study.
AHA/ASA Guidelines 2014
Glucose Disorders

• After a TIA and ischemic strokes, all patients should probably be screened for DM with testing of fasting glucose, HgbA1C or an oral glucose tolerance test. HgbA1C may be more accurate than other screening test in the immediate post event period (Class IIa; LOE C)

• Use of existing guidelines from the ADA for glycemic control and cardiovascular risk factor management in patients with an ischemic stroke or TIA who also have DM or pre-DM. (Class 1; LOE B)
ADA recommendations

• HgbA1C ≤ 7.0
• Diet
• Exercise
• Medications (oral hypoglycemic drugs and insulin as needed)
• Aggressive targets for BP < 130/80
• Aggressive targets for LDL < 70
Prospective Pioglitazone Clinical Trail in Macrovascular Events (PROactive)

• In patient’s with hx of stroke, Pioglitazone (Actos) was associated with a 47% RR reduction in recurrent stroke and a 28% RR reduction in stroke, MI or vascular death.

• The potential effectiveness of pioglitazone for secondary stroke prevention is being examined in the Insulin Resistance Intervention After Stroke (IRIS) trial at this time.
Metabolic Syndrome

• A condition related to insulin resistance
• Defined as having 3 or more of the following factors:
  – Elevated Triglycerides $\geq 150$ mg/dL
  – Low HDL cholesterol:
    • Males $< 40$ mg/dL,
    • Females $< 50$ mg/dL
  – Elevated fasting glucose $\geq 100$ mg/dL
  – High BP: SBP $\geq 130$, DBP $\geq 85$
  – High waist circumference or abdominal obesity:
    • Males $\geq 40$ inches
    • Females $\geq 35$ inches
Metabolic Syndrome

• Metabolic Syndrome affects ≈ 22% of US adults aged > 20 years. (Rodriguez-Colon, 2009)
• Prevalence of metabolic syndrome in ischemic stroke patients is 30 to 50%. (Bang, OY, 2005)
• More than 15 cohort studies have reported statistically significant adjusted RRs for ischemic stroke ranging between 1.5 and 5.1 with most between 2.0 and 2.5. (AHA/ASA, 2014)
AHA/ASA Metabolic Syndrome Guidelines,(2014)

• Usefulness of screening patients for metabolic syndrome after stroke is unknown (Class IIb; LOE C).

• For patients who are screened and classified as having metabolic syndrome, management should focus on counseling for lifestyle modification (diet, exercise, weight loss) for vascular risk reduction (Class I, LOE C)

• Preventive care for patients with metabolic syndrome should include appropriate treatment for individual components of the syndrome, which are also stroke risk factors, particularly dyslipidemia and hypertension (Class I: LOE A).
Weight Loss in Metabolic Syndrome: Improves all cardinal features

- Improves insulin sensitivity
- Lowers plasma glucose
- Lowers plasma LDL
- Lower plasma Triglycerides
- Raises HDL
- Lowers BP
- Reduces inflammation
- Improves fibrinolysis
- Improves endothelial function
Over weight and Obesity

• Definitions:
  – Ideal Body mass index (BMI) of 18.5-25 kg/m²
  – Over weight BMI of > 25 to < 30 kg/m²
  – Obesity: Body mass index (BMI) ≥ 30 kg/m²
• Obesity is an established risk for CHD and premature mortality
• Obesity is diagnosed in 18% to 44% of patients with recent TIA or ischemic stroke.
• Obesity is associated with increased vascular risk factors. The association between obesity and increased risk for stroke is largely explained by intermediate vascular risk factors.
Age-adjusted prevalence of obesity in adults 20–74 years of age
AHA/ASA Obesity Recommendations (2014)

• All patients with TIA or strokes should be screened for obesity with measurement of BMI (Class I, LOC C)

• Despite the demonstrated beneficial effects of weight loss on cardiovascular risk factors:
  – the usefulness of weight loss among patients with a recent TIA or ischemic stroke and obesity is uncertain (Class IIb, LOC C).

• Given the demonstrated beneficial effects of weight loss on cardiovascular risk factors:
  – weight loss may be consider in patients with a recent TIA or ischemic stroke and obesity. (Class IIb, LOE C)
Physical Inactivity

• Fewer than 50% of US adults achieve the AHA and ACC recommendations for physical activity that includes:
  – 3 to 4 sessions of aerobic physical activity a week, lasting an average of 40 minutes duration
  – Moderate (brisk walking) or Vigorous (running)
Physical Inactivity

• Stroke survivors may have barriers in achieving these recommendations secondary to safety issue due to:
  – Motor weakness
  – Altered perception and balance
  – Impaired cognition

• High levels of leisure-time physical activity and moderate levels of occupational and physical therapy are associated with a 10% to 30% reduction in incidence of stroke and CHD.
AHA/ASA Physical Activity Guidelines (2014)

• For patients with ischemic stroke or TIA who are capable of engaging in physical activity:
  – At least 3 to 4 sessions per week of moderate to vigorous-intensity aerobic physical exercise are reasonable to reduce stroke risk.
  – Sessions should last an average of 40 minutes.
  – Moderate intensity exercise is typically defined as sufficient to break a sweat or noticeably raise heart rate (eg, walking briskly, using an exercise bike).
  – Vigorous-intensity exercise includes activities such as jogging (Class IIa, LOC C).
AHA/ASA Physical Activity Guidelines (2014)

• For patients who are able and willing to initiate increased physical activity:
  – referral to a comprehensive, behaviorally oriented program is reasonable (Class IIa, LOC).

• For individuals with disabilities after ischemic stroke:
  – supervision by a healthcare professional such as a physical therapist or cardiac rehabilitation, may be considered (Class IIb; LOC).
Nutrition

• 3 challenges:
  – Undernutrition
  – Micronutrient deficiency or surfeit
  – Choice of optimal dietary patterns

• For patients with Hx of ischemic stroke or TIA:
  – It is reasonable to conduct a nutritional assessment looking for signs of overnutrition or undernutrition (Class IIa; LOC C).
  – Patients with signs of undernutrition should be referred for individualized nutritional counseling. (Class I, LOC A)

• Routine supplementation with a single vitamin or combination of vitamins is not recommended (Class III, LOC A)

• It is reasonable to recommend that patients with history of stroke or TIA reduce their sodium intake to less that ≈ 2.4 grams/daily. Further reduction to < 1.5 grams/daily is also reasonable and is associated with even greater BP reduction (Class II, LOC).

• It is reasonable to counsel patients with a history of stroke or TIA to follow the Mediterranean-type diet instead of a low-fat diet. The Mediterranean diet emphasizes vegetables, fruits, and whole grains and includes low-fat dairy products, poultry, fish, legumes, olive oil and nuts. It limits intake of sweets and red meats. (Class IIa: LOE C)
Mediterranean Diet and the Incidence of Stroke in the California Teachers Study

Ayesha Sherzai, Huiyan Ma, Pamela Horn-Ross, Alison Canchola, Jenna Voutsinas, Joshua Willey, Yian Gu, Nikolaos Scarmeas, Dean Sherzai, Leslie Bernstein, Mitchell Elkind, Sophia Wang

Columbia University Medical Center, New York, NY
City of Hope, Duarte, CA
Mediterranean Diet

Summary

- Greater adherence to Mediterranean dietary pattern is associated with 10-18% decreased risk in total, and ischemic stroke incidence
- There was no significant association with hemorrhagic stroke

- Study strengths
  - Large cohort of women
  - Extensive detail on risk factors such as physical activity, hormonal status etc. over time
  - Statistical models adjusted for known clinical and behavioral risk factors
- Study limitations
  - Effects of individual diet components not explored
  - Study restricted to women, Californians, teachers
Weigh to Health Program

The Weigh to Health program

The Weigh to Health curriculum is the same at all participating Intermountain Healthcare facilities. These include:
- American Fork Hospital 801-855-3461
- Cassia Regional Medical Center 208-677-6290
- Hurricane Clinic 435-251-3793
- Intermountain Medical Center 801-507-3253
- Layton Clinic 801-389-2467
- Live Well Center Park City 435-658-7119
- Live Well Center St. George 435-701-3790
- Logan Regional Medical Center 435-716-5310
- McKay-Dee Hospital Center 801-387-7854
- Riverton Hospital 801-507-3253
- TOSH: The Orthopedic Specialty Hospital 801-507-3253
- Utah Valley Regional Medical Center 801-357-4143
- Valley View Medical Center 435-868-5335

NUTRITION COUNSELING

Your insurance may also cover one-on-one nutrition counseling with a registered dietitian for diet-related conditions (separate from The Weigh to Health program). No referral is necessary. SelectHealth members are eligible for five one-on-one outpatient visits per year at no cost. Nutrition counseling is offered at most of the facilities listed above, as well as:
- Alto View Hospital 801-507-3253
- Bear River Valley Hospital 435-716-5310
- Delta Community Medical Center 435-854-5591
- Fillmore Community Medical Center 435-748-5591
- Garfield Hospital 435-676-1258
- Heber Valley Medical Center 435-657-4311
- Live Well Center Salt Lake City 385-282-2700
- Saratov Valley Hospital 435-462-4620
- Sevier Valley Hospital 435-893-0569
- Sunset Clinic 435-634-6010

For more information visit
www.intermountainhealthcare.org/nutrition
Weigh to Health Program
Obstructive Sleep Apnea

• Independent stroke risk factor
• Incidence: 50 to 75% of stroke and TIA patients
• The odds ratio for stroke incident was 2.24 in meta-analysis and risk correlates with the severity of OSA. (Redline S, 2010)
• OSA may cause hypertension, cardiac structural changes and atrial fibrillation all risk factors that increase risk for stroke.
• Post stroke OSA may increase morbidity and mortality after stroke (Mansukhani, 2011).
Obstructive Sleep Apnea

• Associated with poor outcome among patients with cerebrovascular disease with higher mortality, delirium, depressed mood and worse functional status.
• The dx is made on the basis of the apnea-hypopnea index (AHI), which describes the number of respiratory events (cessations or reductions in air flow per hour). AHI ≥ 5 events per hour indicates increasing sleep apnea severity.
• In a meta-analysis of 29 studies (2343 Stroke / TIA patients:
  – 72% had AHI > 5 events per hr.
  – 63% had AHI > 10 events per hr.
  – 38% had AHI > 20 event per hr.
  • (Johnson K., Johnson D, 2010) (268)
• A sleep study might be consider for patients with ischemic stroke or TIA on the basis of the very high prevalence of sleep apnea in this population and the strength of the evidence that the treatment of sleep apnea improves outcomes in the general population (Class IIb; LOE B).

• Treatment with CPAP might be considered in Ischemic stroke or TIA given the emerging evidence in support of improved outcomes (Class IIb; LOE B).
Tobacco Use Disorder

• 16 % of students grades 9-12 report being current smokers.
• 20 % of adult men and 16 % of adult women are smokers.
• Among adults, those most likely to smoke were:
  – American Indian or Alaska Native men (26 %),
  – White men (22 %),
  – African-American men (21 %),
  – White women (19 percent),
  – American Indian or Alaska Native women (17 %),
  – Hispanic men (17 %),
  – African-American women (15 %),
  – Asian men (15 %),
  – Hispanic women (7 %),
  – Asian women (5 %).
• In 2012 there were approximately 6,300 new cigarette smokers every day.
Tobacco Use Disorder

• Cigarette smoking is a risk factor for first ischemic stroke and increased risk for silent brain infarctions.

• Exposure to environmental tobacco smoke and passive (``secondhand'') smoke also increasing risk of stroke. (Oono IP, 2011)

• In the Framingham study, investigator found the relative risk of stroke in smokers, after adjusting for age and HTN:
  – Men RR 2.3
  – Women RR 3.1

    A significant dose response relationship was found with double the risk for stroke in heavy smokers compared to light smokers. (Probhakaran, MD, 2014)

• THE GOOD NEWS: After 5 years of smoking cessation, stroke risk returned to nonsmoker levels. (Wolf PA, 1988)
AHA/ASA Cigarette Smoking Guidelines (2014)

• Healthcare providers should strongly advise every patient with stroke or TIA who has smoked in the past year to quit (Class I; LOE C).

• It is reasonable to advise patients after stroke or TIA to avoid environmental (passive) tobacco smoke (Class IIa; LOE B)

• Counseling, nicotine products and oral smoking cessation medications are effective in helping smokers to quit (Class I; LOE A)
Tobacco Cessation Handout
Alcohol Consumption

• In general, light or moderate alcohol consumption may be stroke protective and may be related to increase levels of HDL, apolipoproteins A1, and adiponectin, as well as decrease levels of fibrinogen and decreased platelet aggregation. (Brien S., 2011; Mukamal K., 2005)

• Heavy alcohol use may increase stroke risk through increasing risks for HTN, AF, cardiomyopathy and DM. (Briasoulis A., 2012; Kodama S., 2011; Baliunas DO, 2009)

• Risk of hemorrhagic stroke increases with any alcohol consumption, with greatest risk with heavy use. (North American Symptomatic Carotid Endarectomy Trialist Collabators. 1991)
AHA/ASA Alcohol Consumption Guidelines (2014)

• Patients with ischemic stroke, TIA or hemorrhagic stroke who are heavy drinkers should eliminate or reduce their consumption of alcohol (Class I, LOC C)

• Light or moderate amounts of alcohol consumption may be reasonable, although nondrinkers should not be counseled to start drinking.
  – Men: up to 2 drinks per day
  – Nonpregnant women: up to 1 drink daily.
Atrial Fibrillation (AF)

• Affects about 2.7 million Americans
• Increasing prevalence with age; leading heart arrhythmia in the elderly
• In the US this arrhythmia is responsible for > 70,000 ischemic strokes/yearly (about 10%-12% of all ischemic strokes)
• About 10% of patients with acute ischemic stroke or TIA will have new AF detected during their hospitalization
• In additional 11% may be found to have AF (if tested) within 30 days of discharge by continuous ECG monitoring.
• In stroke or TIA patients with pacemakers, interrogation of the pacemaker device identified a 28% incidence of AF during 1 year.
AHA/ASA Atrial Fibrillation Guideline (2014)

• For patients who have experienced an acute ischemic stroke or TIA with no other apparent etiology, prolonged rhythm monitoring (approximately 30 days) for AF is reasonable within six months of the index event (Class IIa, LOE C)

• Vitamin K agonist (VKA) (Class I, LOE A), apixaban (Class I, LOE A), and dabigatran (Class I, LOE B) are all indicated for the prevention of first and recurrent stroke in patients with nonvalvular AF, paroxysmal or permanent. The selection of an antithrombotic agent should be individualized on the basis of risk factor, cost, tolerability, patient preference, potential for drug interactions, and other clinical characteristics (i.e. renal function and time in INR therapeutic range if the patient has been taking VKA therapy.
AHA/ASA Atrial Fibrillation Guidelines (2014)

- Rivaroxaban (Xarelto) is reasonable for the prevention of first and recurrent stroke in patients with nonvalvular AF (Class IIa, LOE B)
- The combination of oral anticoagulation (i.e., warfarin or one of the newer agents) with antiplatelet therapy is not recommended for all patients after ischemic stroke or TIA but is reasonable in patients with clinically apparent coronary artery disease, particularly an acute coronary syndrome or stent placement. (Class IIb, LOE C)
- The addition of clopidogrel to aspirin therapy, compared with aspirin therapy alone, is of uncertain net benefit for patients with a contraindication to VKA therapy. (Class IIB, LOE B)
AHA/ASA Atrial Fibrillation Guidelines (2014)

• For most patients with a stroke or TIA in the setting of AF, it is reasonable to initiate oral anticoagulation within 14 days after the onset of neurological symptoms. (Class IIa, LOE B).

• In the presence of high risk for hemorrhagic conversion (i.e., large infarct, hemorrhagic transformation on initial imaging, uncontrolled hypertension, or hemorrhage tendency), it is reasonable to delay initiation of oral anticoagulation beyond 14 days. (Class IIa, LOE B).

• The usefulness is uncertain for closure of the left atrial appendage with the WATCHMAN device in patients with ischemic stroke or TIA and atrial fibrillation. (Class IIb, LOE B)
Other Stroke Risk Factors covered in the AHA/ASA Guidelines for the Prevention of Stroke in Patients with Stroke and TIA (2014)

• Symptomatic Extracranial Carotid Disease
• Intracranial Atherosclerosis
• Extracranial Atherosclerosis
• Acute MI and Thrombus
• Cardiomyopathy
• Valvular Heart Disease
• Aortic Arch Atheroma
• Arterial Dissections
Other Stroke Risk Factors covered in the AHA/ASA Guidelines for the Prevention of Stroke in Patients with Stroke and TIA (2014)

- Patent Foramen Ovale
- Hyperhomocysteinemia
- Hypercoagulable States
- Antiphospholipid Antibodies
- Sickle Cell Disease
- Cerebral Venous Sinus Thrombosis
- Pregnancy and Breast Feeding
- Use of anticoagulation after intracranial hemorrhage
- Special Approaches to Implementing Guidelines and Their Use in High-Risk Populations
Antiplatelet Therapy for Noncardioembolic Stroke or TIA

• 4 antiplatelet agents have been approved by the FDA for prevention of vascular events among patients with ischemic stroke and TIA.
  – ASA, combination ASA/dipyridamole (Aggrenox), Clopidogrel or Ticlopidine.
  – On average, these agents reduce the RR of stroke, MI or death by about 22%.
  – There are important difference between these medications that have direct implications for therapeutic selection.
Antiplatelet Therapy Recommendations

• The combination of aspirin and clopidogrel might be considered within 24 hours of a minor ischemic stroke or TIA and continuation for 90 days. (Class IIb, LOE B)

• For patients with a history of ischemic stroke or TIA, AF and CAD, the usefulness of adding antiplatelet therapy to VKA therapy is uncertain for purposes of reducing the risk of ischemic cardiovascular and cerebrovascular events. (Class IIb, LOE C). Unstable angina and coronary artery stenting represent special circumstances where management may warrant DAPT/VKA therapy.
Sex Specific Recommendations (2014)

AHA/ASA Guideline

Guidelines for the Prevention of Stroke in Women
A Statement for Healthcare Professionals From the American Heart Association/American Stroke Association

The American Academy of Neurology affirms the value of this guideline as an educational tool for neurologists. Endorsed by the American Association of Neurological Surgeons and Congress of Neurological Surgeons

Cheryl Bushnell, MD, MHS, FAHA, Chair; Louise D. McCullough, MD, PhD, FAHA, Vice-Chair; Issam A. Awad, MD, MSc; Monique V. Chireau, MD, MPH, FAHA; Wende N. Fedder, DNP, RN, FAHA; Karen L. Furie, MD, MPH, FAHA; Virginia J. Howard, PhD, MSPH, FAHA; Judith H. Lichtman, PhD, MPH; Lynda D. Lisabeth, PhD, MPH, FAHA; Ileana L. Piña, MD, MPH, FAHA; Mathew J. Reeves, PhD, DVM, FAHA; Kathryn M. Rexrode, MD, MPH; Gustavo Saposnik, MD, MSc, FAHA; Vineeta Singh, MD, FAHA; Amytis Towfighi, MD; Viola Vaccarino, MD, PhD; Matthew R. Walters, MD, MBChB, MSc; on behalf of the American Heart Association Stroke Council, Council on Cardiovascular and Stroke Nursing, Council on Clinical Cardiology, Council on Epidemiology and Prevention, and Council for High Blood Pressure Research
Stroke Risk Factors
Sex Specific For Women

- Pregnancy
- Preeclampsia
- Gestational Diabetes
- Oral contraceptives
- Post menopausal hormone use
- Changes in hormonal status
Stroke Risk Factors
More Prevalent in Women

• Migraine with aura
• Atrial Fibrillation
• Diabetes Mellitus
• Hypertension
• Depression
• Psychosocial
Stroke Risk Factors
Similar Prevalence in Men and Women

• Physical inactivity
• Age
• Prior cardiovascular disease
• Obesity
• Diet
• Smoking
• Metabolic syndrome
Other Guidelines (2014)

AHA/ASA Guideline

Guidelines for the Primary Prevention of Stroke
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Endorsed by the American Association of Neurological Surgeons, the Congress of Neurological Surgeons, and the Preventive Cardiovascular Nurses Association

James F. Meschia, MD, FAHA, Chair; Cheryl Bushnell, MD, MHS, FAHA, Vice-Chair; Bernadette Boden-Albala, MPH, DrPH; Lynne T. Braun, PhD, CNP, FAHA; Dawn M. Bravata, MD; Seemant Chaturvedi, MD, FAHA; Mark A. Creager, MD, FAHA; Robert H. Eckel, MD, FAHA; Mitchell S.V. Elkind, MD, MS, FAAN, FAHA; Myriam Fornage, PhD, FAHA; Larry B. Goldstein, MD, FAHA; Steven M. Greenberg, MD, PhD, FAHA; Susanna E. Horvath, MD; Costantino Iadecola, MD; Edward C. Jauch. MD. MS. FAHA: Wesley S. Moore. MD. FAHA: John A. Wilson. MD:
Medication Compliance

• Maintaining adherence has been associated with lower risk of vascular events. (Perreault S, 2012)
• Some causes of medication noncompliance:
  – Lack of understanding of reason and how to take medication
  – Too many medications
  – Lack of availability
  – Self and family attitude regarding the medication
  – Side effects
  – Drug to Drug interactions
  – Lack of F/U with physicians after discharge
  – Cost
Methods to Improve Medication Compliance

• Discuss stroke risk factor and treatment (medications)
  – Atrial Fibrillation, tx Coumadin. Goal INR is 2-3 range. You will need to F/U with the CPAS program in the AM at the clinic to have your INR lab test completed. For now, continue both ASA and Coumadin. When your INR is ≥ 2.0, you may discontinue your ASA 81 mg daily and continue Coumadin. The CPAS clinic will keep you informed regarding your daily Coumadin dosage and when to stop taking the aspirin.

• Discuss dosage, when to take medication, side effects and potential drug interactions

• Provide medication education sheets if available.

• Fill prescriptions before discharge (especially Apixaban)

• Answer any questions from patient’s and families before discharge

• Involve your pharmacist to help provide discharge medication education
Methods to Improve Medication Compliance

• Make sure the patient will be seen by their primary care provider within a short time frame after discharge so that they can make sure the patient is compliant with his medication and they can provide timely refills.
• If there is any issues regarding the medications ordered, involve the discharging physician so that they can resolve the issue.
• If there is financial hardship regarding the patient being able to obtain the medications at the time of discharge, consult with the case manager. At times, the medications can be posted to the hospital bill.
Do you need help paying for your medications? Please contact Jan Bird at 801-507-8321 Monday through Thursday between 8 AM and 3 PM. Jan can help you apply for prescription assistance programs that may help pay part or all of your prescription medication costs.
Need to be knowledgeable of stroke symptoms
Stroke Signs and Symptoms

- Sudden severe headache with no known cause
- Sudden trouble seeing in one or both eyes
- Sudden confusion, trouble speaking or understanding
- Sudden numbness or weakness of the face, arm, or leg, especially on one side of the body
- Sudden trouble walking, dizziness, loss of balance or coordination
Right vs. Left Hemispheric Stroke

- **Left Side Stroke**
  - Aphasia (left dominant)
  - Slow, cautious behavior, depression
  - R visual field deficit
  - R motor deficits
  - R sensory deficits
  - Cerebellar = L clumsy

- **Right Side Stroke**
  - Spatial – perceptual deficits
  - Denial/neglect
  - Impulsivity/ poor judgment
  - L visual fields deficit
  - L motor deficits
  - L sensory deficits
  - Cerebellar = R clumsy
You want to review with the patient and caregiver the patient’s deficits
Teach the patient

BE FAST
STROKE KILLS.
BE FAST! Call 911.

Know the Signs:
- Balance: sudden loss of balance or coordination
- Eyes: sudden change in vision
- Face: sudden weakness of the face
- Arms: sudden weakness of an arm or leg
- Speech: sudden difficulty speaking
- Time: time the symptoms started

During a stroke 32,000 brain cells die every second.

BE FAST!
Call 911.
Stroke and TIA: What You Need to Know and Do

Stroke is the leading cause of disability for adults and the fourth leading cause of death in the United States. This fact sheet tells you what you need to know and do to recognize and prevent stroke.

What is stroke? What is a TIA?
A stroke is when blood flow to part of your brain suddenly stops. It can happen because of a blood clot that blocks a blood vessel (ischemic stroke) or because a blood vessel in your brain bursts (hemorrhagic stroke). Your brain cells need oxygen and nutrients carried by the blood, so when a stroke happens, brain cells begin to die within minutes.

A transient ischemic attack — TIA for short — happens when a blood clot temporarily blocks a blood vessel leading to your brain. Sometimes called a “mini-stroke,” a TIA can cause some of the same symptoms as a stroke, though they’re temporary and cause no permanent damage. A TIA often happens before a stroke, and should never be ignored.

What are the signs and symptoms?
Stroke signs and symptoms are sudden:
- Sudden numbness or weakness of the face, arm or leg, especially on one side of the body
- Sudden confusion, trouble speaking or understanding
- Sudden trouble seeing in one or both eyes
- Sudden trouble walking, dizziness or loss of balance or coordination
- Sudden and severe headache, with no known cause

If you notice any of these signs and symptoms, call 911 immediately. Note the exact time the symptoms started (or when the person was last seen well) and give this time to the paramedics or hospital staff. This information is important and can affect treatment decisions.

During a stroke, every second counts.
B.E. F.A.S.T.! Call 911 if you see any of the stroke symptoms below:

B - BALANCE.
Is there a sudden loss of balance or coordination?
(To check, ask the person to walk a straight line or touch each finger to their nose.)

E - EYES.
Are there sudden vision changes?
(To check, ask if the person has double vision or cannot see out of one eye.)

F - FACE.
Does one side of the face droop?
(To check, ask the person to smile.)

A - ARM.
Does one arm drift downward?
(To check, ask the person to raise both arms.)

S - SPEECH.
Are the words slurred? Is speech confused?
(To check, ask the person to repeat a sentence.)

T - TIME THE SYMPTOMS BEGAN.
When was the person last seen looking or acting normally?
Write down the exact time symptoms began. Give this information to paramedics.
Multidisciplinary approach to patient education

Providers that give Stroke Education needs to cover many different angles.
Nursing

• Involve patient’s family/caregiver in assessment of post discharge needs and decision making and treatment planning

• Encourage the patient’s family/caregivers to participate in the rehabilitation sessions and to be trained to assist the patient with functional activities.

• Regular review of individual patient and caregivers psychosocial and support needs
Pharmacist

- Medication reconciliation
- Evaluate for drug interactions
- Management of diabetes and anticoagulation therapy during hospitalization
- Transition Warfarin anticoagulation therapy in the outpatient setting (CPAS)
- Provide medication education
  - Coumadin education
Speech therapist

- Dysphagia evaluation
- Advancement of diet by repeat dysphagia evaluations
- MBS or FEES studies
- Cognitive and higher cognitive /behavioral assessment
  - Mini-Mental Status Exam (MMSE)
  - Neurobehavioral Cognitive Status Examination (NCSE)
  - Montreal Cognitive Assessment (MoCA)
- Help with establishing a communication pattern with the patient’s family/caregiver before discharge
  - Communication boards
- Help assess the level of supervision required after discharge.
Occupational therapist

- Assess patient’s ability to participate in ADLs and other functional capabilities
- Occupational-based interventions to improve ADLs
- Repetitive task training to improve UE function, balance, and mobility/activity for treatment of motor impairments.
- Visual scanning training to improve compensation for unilateral neglect
- Task-oriented training interventions to promote self-directed independent practice
- Incorporate the patient and family/caregiver into the treatment plan.
Physical Therapist

• Treat disabilities related to motor and sensory impairments
• Assess the patients strength, endurance, range of motion, gait abnormalities and sensory deficit to design an individualized rehab program aimed at regaining control over motor function.
• Teach compensation strategies to reduce the effect of remaining deficits and establish ongoing exercise programs to help patients retain their newly learned skills.
• Repetitive use of extremities encourage brain plasticity and reduces disabilities
• Gait training
• Assess patient’s discharge needs and equipment
• Need to teach family/caregivers
Case Manager/Social Worker

• Help with disposition planning and placement
• Review the patient and caregivers psychosocial and support needs
• Provide substance abuse education and counseling
• Evaluate for financial issues and provide resources
• Liaison with community providers, linkage with appropriate resources
Outpatient Rehab

• ST
• OT
• PT
• Home Health ST
• Home Health OT
• Home Health OT safety evaluation
• Home Health PT
• Home Health PT safety evaluation
• Home Health RN medication, BP management
• Home Health aid
• Hearing and Balance Center
Inpatient Acute Rehab

• Highest level of rehab
• The patient needs to be able to participate in at least 3 hours of therapy
• The patient needs to have enough deficits to qualify for inpatient therapy
• The patient needs to have a caregiver that will provide supervision and care after discharge from rehab. This caregiver needs to be available for training while the patient is in rehab.
• Strict guidelines
Skilled Nursing Facilities

• Less intense rehab
• Still provides ST, OT and PT, however less than 3 hours of therapy daily
• At times, a patient can go from a SNF back to acute rehab as his functional capabilities and participation with rehab improves
Nutrition Services

• Provides nutrition assessment and recommendations regarding enteral and po nutrition and fluid needs.
• Provides weight loss education
  – Weigh to Health Program
• Provides education regarding the Mediterranean diet.
Mediterranean Diet
The Weigh to Health Program
Weigh to Health Program

LIFESTYLE & WEIGHT MANAGEMENT PROGRAM

REGISTRATION
To register, please contact your local facility listed on the back of this brochure. Orientation classes are generally offered once a month. Pre-registration is required as enrollment is limited and classes fill quickly.

WHY THIS PROGRAM WORKS
The Weigh to Health® helps you learn not just what to do, but how to do it. You'll learn:
- How to shop for and prepare food that's nutritious, affordable, and great tasting
- How to be more physically active — and enjoy it.
- How to set goals you can reach.
- How to keep track of your own diet, exercise, and weight in a way that will help you reach your weight loss goals.

We provide plenty of support to help you reach your goals, including:
- Regular consultation with your program instructor
- A group exercise program at many facilities (for an additional fee)

WHY CHOOSE The Weigh to Health®?
- Personalized. You choose the classes that will help you.
- Professional. The program is led by registered dietitians with proven weight loss experience in working with both adults who want to lose weight, improve their health, and feel better every day. This program works because:
- Personal. You choose the classes that will help you.
- Professional. The program is led by registered dietitians with proven weight loss experience in working with both adults who want to lose weight, improve their health, and feel better every day. This program works because:

WHAT'S THE PLAN?
You'll attend 12 (or more) sessions over a 6-month period, including:
- An orientation class, where you'll learn about basic principles of weight management.
- Two 30-minute sessions with a dietitian trained in weight management. Together you'll review your personal plan for weight loss and discuss:
  - Your main motivation for and barriers to weight loss right now
  - Your personal strategy for healthier eating
  - Your current weight management goals
- At least nine 30-minute group classes. Based on your personal plan, you choose the classes that will help you most. Topics include:
  - Physical activity (required)
  - Behavior change (required)
  - Meal planning
  - Emotional eating
  - Label reading
  - Reading a food label
  - Intuitive eating
  - Stress management
  - Shopping on a budget
  - Healthy fighting
  - Eating out
  - 写

For more information, please contact the local facility listed on the back of this brochure.
Diabetic Educator

• Provide Education regarding
  – Glucose monitoring and equipment use
  – ADA diet management
  – Oral medications
  – Insulin use
  – CHOH counting and insulin use
  – Treatment of hypoglycemia
Respiratory Therapy
Tobacco Cessation

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7 GETTING READY TO QUIT
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E-cigarettes: Not a safe option .......... 9
Set a quit date .......... 9

10 STAYING QUIT
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14 RESOURCES FOR HELPING YOU QUIT
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Smokeless = safe? No.
There's no such thing as safe tobacco
Smokeless tobacco is chew, snuff, snus, dip, and plug. It's e-cigarettes and dissolvable "mints in your mouth." Tobacco strips, sticks, and lozenges. These products are sometimes said as safe alternatives to smoking. They're not safe. Same with using nicotine using e-cigarettes: definitely NOT a safe alternative. (See more on page 9.)

Smokeless tobacco is still tobacco, and it's still bad for your health. You're still at risk for various types of cancer and for stroke and heart attack. You're more likely to have mouth sores, bad breath, and tooth loss. And just like a smoker, you may have to work hard to quit the tobacco habit.

This booklet can help. The strategies presented here can help you quit tobacco (and nicotine addiction) in all its forms.
Patient Follow Up Care

- Primary Care Physician
- Neurologist
- Cardiologist
- Sleep Consultation
- Vascular surgeon
- Vascular interventionist
- Physiatrist
- Psychiatrist
Patients without primary care provider

• Case managers / Social workers can give the patient and caregiver a list of free and low cost medical clinics. There are a total of 81 clinics in Utah with 19 clinics in SLC.
  – Maliheh Free Clinic
  – Hope Clinic
  – Polizzi Clinic
• Find a Doctor Program for IHC
• IHC Outpatient Clinics
• F/U with insurance company for coverage
• Obtain referrals from family and friends
4 Weeks Atrial Fibrillation Monitoring

- Started at time of discharge home
- MD/APC need to complete form at time of ordering test
- Patient and caregiver will receive education regarding use of the monitoring equipment before discharge.
- Unable to complete test when patient’s are discharged to acute rehab, SNF or LTAC.
Patient Education Handouts

• Be aware of all your options regarding stroke education materials at your hospital
• Make sure to use language appropriate educational materials
• Make sure that you give the handouts to both the patient and family/caregiver at the same time.
• Give handouts during the early course of patients admission so that the patient and family/caregivers can read the material and ask questions during the patient’s admission.
Stroke Education Folder
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Conclusion

Putting it all together!
Putting it all together

Elements of Patient Stroke Education

• Recognize if there are any **barriers to education/learning** and format a plan to deal with those barriers.

• Recognize the patient’s and families **language of choice**. Use interpreters and language appropriate educational materials.

• Recognize the patient’s and families **learning style preferences** and incorporate them in your education format.

• Recognize if there are **ethnic/culture /religion /gender factors** that may need to be considered regarding stroke education.

• Make sure you **provide stroke education to the patient’s significant other** regarding discharge education and F/U care.
Elements of Patient Stroke Education

• Provide education regarding what **type of stroke** your patient stroke had... ischemic or hemorrhagic

• Provide education of patient’s **non modifiable stroke risk factors**

• Provide education regarding the patient’s **primary source of stroke**

• Provide education regarding the patient’s **other stroke risk factors**.
Elements of Patient Stroke Education

• Provide education regarding **treatment of stroke risk factors and stroke prevention measures.**
  – Antiplatelet therapy
  – Anticoagulation therapy (if needed)
  – Statin therapy
  – HTN management and parameters, Keeping BP diary and F/U with PCP
  – Diabetes treatment and diet
  – Weight loss program
  – Exercise
  – OSA treatment (O2 therapy vs CPAP)
Elements of Stroke Education

• Provide education regarding **discharge medications:**
  – Reason for taking the medication
  – Dosage
  – Side effects etc.
  – Filling of prescriptions prior to discharge (Apixaban)
  – Medication compliance

• Provide education regarding **diet:**
  – Dysphagia restrictions (NDD1, NDD2, NDD3, thick or thin)
    • Explain diet in simple terms
  – Type of diet: ADA, Kcal restricted, Mediterranean diet

• Provide education regarding **tobacco or polysubstance cessation:**
  – RT tobacco cessation education
  – SW providing counseling and education
Elements of Stroke Education

• Help determine **disposition planning**: Home, acute rehab, SNF, HH

• Help determine and reinforce therapies that will need to continue after discharge. (Outpatient, Home Health needs, acute rehab, SNF,
  - ST
  - OT
  - PT
  - HH RN Medications, diabetes, hypertension
  - HH ADLs aid

• Provide Caregiver training (multidisciplinary education) about communication strategies if the patient is aphasic, positioning and handling transfers, shoulder care, how to promote independence, according to individual patient’s strengths and limitations).
Elements of Stroke Education

- Social Services: Community Resources
  - Meals on Wheels
  - ETOH/Polysubstance abuse
  - Mental Health Services
- F/U appointments
  - PCP
  - Neurologist
  - Other
- Monitoring
  - 4 weeks Atrial fibrillation monitoring
  - BP monitoring, once or twice daily, keep diary and F/U with PCP
  - Glucose monitoring: AC and HS, keep diary and F/U with PCP
  - INR monitoring: CPAS
Elements of Stroke Education

• Review how the patient arrived at the hospital (EMS vs nonEMS).
  – Reinforce EMS transport
• Reinforce the incidence of recurrent stroke after initial stroke
  – Annual risk for future ischemic stroke or TIA is about 3-4%
• Review signs and symptoms of stroke.
  – BE FAST
  – Call 911 if they occur.
• Ask the patient and family if they have any questions.
  – Provide time for reinforcement of stroke education
As Health Care Providers…
By working together as a team...

We can improve patient care and outcomes.