UPDATE ON DIAGNOSTIC EVALUATION FOR SECONDARY STROKE PREVENTION

Mehdi Farhoudi,

Professor of Neurology, Tabriz University of Medical Sciences,

WSO Board Member

Stroke

AHA/ASA GUIDELINE

2021 Guideline for the Prevention of Stroke in Patients With Stroke and Transient Ischemic Attack

A Guideline From the American Heart Association/American Stroke Association

Reviewed for evidence-based integrity and endorsed by the American Association of Neurological Surgeons and Congress of Neurological Surgeons.

Endorsed by the Society of Vascular and Interventional Neurology

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

Dawn O. Kleindorfer, MD, FAHA, Chair; Amytis Towfighi, MD, FAHA, Vice Chair; Seemant Chaturvedi, MD, FAHA; Kevin M. Cockroft, MD, MSc, FAHA; Jose Gutierrez, MD, MPH; Debbie Lombardi-Hill, BS, FAHA; Hooman Kamel, MD; Walter N. Kernan, MD*; Steven J. Kittner, MD, MPH, FAHA; Enrique C. Leira, MD, MS, FAHA; Olive Lennon, PhD; James F. Meschia, MD, FAHA; Thanh N. Nguyen, MD, FAHA; Peter M. Pollak, MD; Pasquale Santangeli, MD, PhD; Anjail Z. Sharrief, MD, MPH, FAHA; Sidney C. Smith Jr, MD, FAHA; Tanya N. Turan, MD, MS, FAHA†; Linda S. Williams, MD, FAHA

Key Words: AHA Scientific Statements ■ ischemic attack, transient ■ secondary prevention ■ stroke

CLASS (STRENGTH) OF RECOMMENDATION

CLASS (STRENGTH) OF RECOMMENDATION

CLASS I (STRONG) — **Benefit >>> Risk**

Suggested phrases for writing recommendations:
- Is recommended
- Is indicated/useful/effective/beneficial
- Should be performed/administered/other
- Comparative-Effectiveness Phrases†:
  - Treatment/strategy A is recommended/indicated in preference to treatment B
  - Treatment A should be chosen over treatment B

CLASS IIa (MODERATE) — **Benefit >> Risk**

Suggested phrases for writing recommendations:
- Is reasonable
- Can be useful/effective/beneficial
- Comparative-Effectiveness Phrases†:
  - Treatment/strategy A is probably recommended/indicated in preference to treatment B
  - It is reasonable to choose treatment A over treatment B

CLASS IIb (WEAK) — **Benefit ≥ Risk**

Suggested phrases for writing recommendations:
- May/might be reasonable
- May/might be considered
- Usefulness/effectiveness is unknown/unclear/uncertain or not well established

CLASS III: No Benefit (MODERATE) — **Benefit = Risk**

(Generally, LOE A or B use only)

Suggested phrases for writing recommendations:
- Is not recommended
- Is not indicated/useful/effective/beneficial
- Should not be performed/administered/other

CLASS III: Harm (STRONG) — **Risk > Benefit**

Suggested phrases for writing recommendations:
- Potentially harmful
- Causes harm
- Associated with excess morbidity/mortality
- Should not be performed/administered/other

LEVEL OF EVIDENCE

LEVEL A

- High-quality evidence‡ from more than 1 RCT
- Meta-analyses of high-quality RCTs
- One or more RCTs corroborated by high-quality registry studies

LEVEL B-R (Randomized)

- Moderate-quality evidence‡ from 1 or more RCTs
- Meta-analyses of moderate-quality RCTs

LEVEL B-NR (Nonrandomized)

- Moderate-quality evidence‡ from 1 or more well-designed, well-executed nonrandomized studies, observational studies, or registry studies
- Meta-analyses of such studies

LEVEL C-LD (Limited Data)

- Randomized or nonrandomized observational or registry studies with limitations of design or execution
- Meta-analyses of such studies
- Physiological or mechanistic studies in human subjects

LEVEL C-EO (Expert Opinion)

Consensus of expert opinion based on clinical experience

ECG IN STROKE

COR:1	LOE: B-R
▪ In patients suspected of having a stroke or TIA, an ECG is recommended to screen for atrial fibrillation (AF) and atrial flutter and to assess for other concomitant cardiac conditions.	

OPTIMAL TIME IN STROKE PLANNING

COR:1	LOE: B-NR
▪ In patients with ischemic stroke or TIA, a diagnostic evaluation is recommended for gaining insights into the etiology of and planning optimal strategies for preventing recurrent stroke, with testing completed or underway within 48 hours of onset of stroke symptoms.	

SCREENING OF STENOSIS IN STROKE

COR:1	LOE: B-NR

- In patients with symptomatic anterior circulation cerebral infarction or TIA who are candidates for revascularization, noninvasive cervical carotid imaging with carotid ultrasonography, CT angiography (CTA), or magnetic resonance angiography (MRA) is recommended to screen for stenosis.

CONFIRMATION OF SYMPTOMATIC AIS

COR:1	LOE:B-NR
▪ In patients suspected of having a stroke or TIA, CT or MRI of the brain is recommended to confirm the diagnosis of symptomatic ischemic cerebral vascular disease.	

RISK FACTORS EVALUATION OF SYMPTOMATIC AIS

COR:1	LOE:B-NR
In patients with a confirmed diagnosis of symptomatic ischemic cerebrovascular disease, blood tests, including complete blood count, prothrombin time, partial thromboplastin time, glucose, HbA1c, creatinine, and fasting or nonfasting lipid profile, are recommended to gain insight into risk factors for stroke and to inform therapeutic goals.	

ECHOCARDIOGRAPHY IN AIS

COR:2a	LOE: B-R
• In patients with cryptogenic stroke, echocardiography with or without contrast is reason able to evaluate for possible cardiac sources of or transcardiac pathways for cerebral embolism.	

AF DETECTION IN AIS

COR: 2a	LOE: B-R
• In patients with cryptogenic stroke who do not have a contraindication to anticoagulation, long-term rhythm monitoring with mobile cardiac outpatient telemetry, implantable loop recorder, or other approach is reasonable to detect intermittent AF.	

FOLLOW-UP IMAGINGS IN AIS

COR:2a	LOE: B-NR
• In patients suspected of having **ischemic stroke**, if CT or MRI does not demonstrate symptomatic cerebral infarct, follow-up CT or MRI of the brain is reasonable to confirm diagnosis.	

FOLLOW-UP IMAGINGS IN TIA

COR:2a	LOE: B-NR
• In patients suspected of having had a **TIA**, if the initial head imaging (CT or MRI) does not demonstrate a symptomatic cerebral infarct, follow-up MRI is reasonable to predict risk of early stroke and to support the diagnosis	

EVALUATION OF CRYPTOGENIC STROKE

COR:2a	LOE: C-LD

- In patients with cryptogenic stroke, tests for inherited or acquired Hypercoagulable state, bloodstream or cerebral spinal fluid infections, infections that can cause central nervous system (CNS) vasculitis (eg, HIV and syphilis), drug use (eg, cocaine and amphetamines), and markers of systemic inflammation and genetic tests for inherited diseases associated with stroke are reason able to perform as clinically indicated to identify contributors to or relevant risk factors for stroke.

NONINVASIVE IMAGING OF THE INTRACRANIAL AND EXTRACRANIAL LARGE ARTERIES

COR:2a	LOE: C-LD

- In patients with ischemic stroke or TIA, noninvasive imaging of the intracranial large arteries and imaging of the extracranial vertebrobasilar arterial system with MRA or CTA can be effective to identify atherosclerotic disease, dissection, moyamoya, or other etiologically relevant vasculopathies.

BRAIN IMAGING BEFORE ANTICOAGULATION

COR:2b	LOE: B-NR

- In patients with ischemic stroke and a treatment plan that includes anticoagulant therapy, CT or MRI of the brain before therapy is started may be considered to assess for hemorrhagic transformation and final size of infarction.

MORE EVALUATION IN ESUS

COR:2b	LOE: C-LD

- In patients with ESUS, transesophageal echocardiography (TEE), cardiac CT, or cardiac MRI might be reasonable to identify possible cardioaortic sources of or transcardiac pathways for cerebral embolism.

TCD FOR PFO EVALUATION BEFORE CLOSURE

COR:2b	LOE: C-LD

- In patients with ischemic stroke or TIA in whom patent foramen ovale (PFO) closure would be contemplated, TCD (Transcranial Doppler) with embolus detection might be reasonable to screen for right-to-left shunt.

Thank you