Defect Free Acute Inpatient Ischemic Stroke Measure Bundle

<table>
<thead>
<tr>
<th>Measure Description</th>
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<tr>
<td>Percentage of patients aged 18 years and older with a diagnosis of ischemic stroke OR transient ischemic attack who were admitted to the hospital for inpatient care and received all appropriate intervention for optimal care (i.e., early antithrombotic administered, discharged on antithrombotic, and smoking cessation addressed) prior to discharge.</td>
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<thead>
<tr>
<th>Measure Specifications</th>
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<tr>
<td>Numerator Statement</td>
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<tr>
<td>Patients aged 18 years and older with a diagnosis of ischemic stroke or transient ischemic attack who were admitted to the hospital for inpatient care and received all 3 component interventions:</td>
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<tr>
<td><strong>Component 1: Early Antithrombotic</strong></td>
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<tr>
<td>Antithrombotic therapy received by end of hospital day two OR documentation of medical/patient exception</td>
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<tr>
<td><strong>Component 2: Discharged on Appropriate Antithrombotic</strong></td>
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<tr>
<td>Antithrombotic therapy prescribed at discharge:</td>
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<tr>
<td>o Appropriate antithrombotic for patients with stroke AND nonvalvular atrial fibrillation using therapeutic anticoagulation (warfarin, LMWH or direct factor inhibitors as approved by FDA), OR documentation of medical/patient exception,</td>
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<tr>
<td>o Appropriate antithrombotic for patients with stroke AND mechanical heart valve or valvular atrial fibrillation using anticoagulation with warfarin OR documentation of medical/patient exception, OR</td>
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<tr>
<td>o Appropriate antithrombotic for all other patients with stroke using antiplatelet or therapeutic anticoagulation</td>
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<tr>
<td><strong>Component 3: Tobacco use management</strong></td>
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<tr>
<td>Patients with ischemic stroke who have documentation of active smoking status OR former smoker with quit date less than 1 year from time of assessment provided counseling on the bad effects of tobacco, the benefit of quitting AND at least one of the following:</td>
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<td>▪ Referral back to PCP for tobacco cessation support, AND/OR</td>
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<td>▪ Referral to tobacco cessation clinic or tobacco dependence telephone quitline, AND/OR</td>
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<tr>
<td>▪ Prescription of tobacco dependence medications including nicotine replacement therapies products, bupropion SR or Varenicline, or any FDA-approved drugs for tobacco dependence therapies or referral to PCP</td>
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<tr>
<td>Documentation of never smoker or former smoker with quit date more than a year from time of assessment fulfills this component.</td>
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Definitions:  
Antithrombotic therapy - includes FDA approved antiplatelet for secondary stroke prevention (aspirin, combination aspirin/dipyridamole, clopidogrel and ticlopidine) and anticoagulants (warfarin, therapeutic LMWH, direct factor inhibitors)  
Prescribed - May include prescription given to the patient for antithrombotic therapy at discharge or antithrombotic therapy to be continued after discharge as documented in the discharge medication list.
### Denominator

**Statement**

All acute ischemic stroke and transient ischemic attack patients aged 18 years and older admitted for inpatient care.

### Denominator Exceptions

**For all components**

- Patients discharged to hospice
- Patients who were placed on comfort measures by end of hospital day two
- Patient died by end of hospital day two.
- Patient enrolled in a clinical trial
- Patient declines treatment or discharged against medical advice by end of hospital day two.
- Patients with documented contraindication to specific intervention.

### Exception Justification

Exceptions are warranted for individuals discharged to hospice, receiving comfort measures, enrolled in clinical trial, and who died as treatment plans required for measure are not clinically appropriate for these populations. Additionally, treatment cannot be provided to those who refuse or leave AMA. Patients with documented contraindication for the specific intervention justifies exception as well.

### Supporting Guideline & Other References

The following clinical recommendation statements are quoted verbatim from the referenced clinical guidelines and represent the evidence base for the measure:

**Component 1: Early Antithrombotic**

- “Oral administration of aspirin (initial dose is 325 mg) within 24–48 h after stroke onset is recommended for treatment of most patients (Class I; Level of Evidence A).”(1)

**Component 2: Discharged on Appropriate Antithrombotic Appropriate antithrombotic for patients with AF or mechanical heart valve:**

- “VKA [Vitamin K Antagonist] therapy (Class I; Level of Evidence A), apixaban (Class I; Level of Evidence A), and dabigatran (Class I; Level of Evidence B) are all indicated for the prevention of recurrent stroke in patients with nonvalvular AF, whether paroxysmal or permanent. The selection of an antithrombotic agent should be individualized on the basis of risk factors, cost, tolerability, patient preference, potential for drug interactions, and other clinical characteristics, including renal function and time in INR therapeutic range if the patient has been taking VKA therapy.”(2)
- “Rivaroxaban is reasonable for the prevention of recurrent stroke in patients with nonvalvular AF (Class Iib; Level of Evidence B).”(2)
- “For patients with ischemic stroke or TIA and AF who are unable to take oral anticoagulants, aspirin alone is recommended (Class I; Level of Evidence A).”(2)
- “The addition of clopidogrel to aspirin therapy, compared with aspirin therapy alone, might be reasonable (Class IIb; Level of Evidence B).”(2)
- “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 Iib; Level of Evidence B).”(2)
- “In the presence of high risk for hemorrhagic conversion (ie, 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 Iib; Level of Evidence B).”(2)
“For patients with ischemic stroke or TIA who have rheumatic mitral valve disease and AF, longterm VKA therapy with an INR target of 2.5 (range, 2.0–3.0) is recommended (Class I; Level of Evidence A).” (2)

“For patients with a mechanical aortic valve and a history of ischemic stroke or TIA before its insertion, VKA therapy is recommended with an INR target of 2.5 (range, 2.0–3.0) (Class I; Level of Evidence B).” (2)

“For patients with a mechanical mitral valve and a history of ischemic stroke or TIA before its insertion, VKA therapy is recommended with an INR target of 3.0 (range, 2.5–3.5) (Class I; Level of Evidence C).” (2)

**Appropriate antithrombotic for all other stroke patients:**

- “For patients with noncardioembolic ischemic stroke or TIA, the use of antiplatelet agents rather than oral anticoagulation is recommended to reduce the risk of recurrent stroke and other cardiovascular events (Class I; Level of Evidence A).” (2)
- “Aspirin (50–325 mg/d) monotherapy (Class I; Level of Evidence A) or the combination of aspirin 25 mg and extended-release dipyridamole 200 mg twice daily (Class I; Level of Evidence B) is indicated as initial therapy after TIA or ischemic stroke for prevention of future stroke.” (2)
- “Clopidogrel (75 mg) monotherapy is a reasonable option for secondary prevention of stroke in place of aspirin or combination aspirin/dipyridamole (Class IIa; Level of Evidence B). This recommendation also applies to patients who are allergic to aspirin.” (2)

**Component 3: Tobacco use management**

- “Patients Healthcare providers should strongly advise every patient with stroke or TIA who has smoked in the past year to quit (Class I; Level of Evidence C).” (2)
- “It is reasonable to advise patients after TIA or ischemic stroke to avoid environmental (passive) tobacco smoke (Class IIa; Level of Evidence B).” (2)
- “Counseling, nicotine products, and oral smoking cessation medications are effective in helping smokers to quit (Class I; Level of Evidence A).” (2)
- “It is essential that clinicians and health care delivery systems consistently identify and document tobacco use status and treat every tobacco user seen in a health care setting.” (3)
- “Individual, group, and telephone counseling are effective, and their effectiveness increases with treatment intensity.” (3)
- “Numerous effective medications are available for tobacco dependence, and clinicians should encourage their use by all patients attempting to quit smoking—except when medically contraindicated or with specific populations for which there is insufficient evidence of effectiveness (i.e., pregnant women, smokeless tobacco users, light smokers, and adolescents).” (3)
- “Counseling and medication are effective when used by themselves for treating tobacco dependence. The combination of counseling and...”
medication, however, is more effective than either alone. Thus, clinicians should encourage all individuals making a quit attempt to use both counseling and medication.”(3)

- “Telephone quitline counseling is effective with diverse populations and has broad reach. Therefore, clinicians and health care delivery systems should both ensure patient access to quitlines and promote quitline use.”(3)

| Relationship to Desired Outcome | Component 1: The effectiveness of antithrombotic agents in reducing stroke mortality, stroke-related morbidity and recurrence rates has been studied in several large clinical trials. While the use of these agents for patients with acute ischemic stroke and transient ischemic attacks continues to be the subject of study, substantial evidence is available from completed studies. Data at this time suggest that antithrombotic therapy should be administered within 2 days of symptom onset in acute ischemic stroke patients to reduce stroke mortality and morbidity as long as no contraindications exist. Two large trials each demonstrated a nonsignificant trend in reduction in death or disability when treatment with aspirin was begun within 48 h of stroke; when data from the trials were combined, a modest but statistically significant benefit was seen.

Component 2: The effectiveness of antithrombotic agents in reducing stroke mortality, stroke-related morbidity and recurrence rates has been studied in several large clinical trials. While the use of these agents for patients with acute ischemic stroke and transient ischemic attacks continues to be the subject of study, substantial evidence is available from completed studies. Data at this time suggest that antithrombotic therapy should be prescribed at discharge following acute ischemic stroke to reduce stroke mortality and morbidity as long as no contraindications exist.

For patients with a stroke due to a cardioembolic source (e.g., atrial fibrillation, mechanical heart valve), warfarin is recommended unless contraindicated. In recent years, novel oral anticoagulants (NOACs) have been developed and approved by the U.S. Food and Drug Administration (FDA) for stroke prevention, and may be considered as an alternative to warfarin for select patients. Anticoagulation therapy is not generally recommended for secondary stroke prevention in patients presumed to have a non-cardioembolic stroke.

Anticoagulants at doses to prevent venous thromboembolism are insufficient antithrombotic therapy to prevent recurrent ischemic stroke or TIA.

Component 3: Cigarette smoking is the single most alterable risk factor contributing to premature morbidity and mortality, accounting for approximately 430,000 deaths in the United States. Smoking nearly doubles the risk of ischemic stroke. Numerous prospective investigations have demonstrated substantial decrease in coronary heart disease mortality for former smokers, and similar rapid decreases in risk with smoking are seen for ischemic stroke. The Framingham Heart Study concluded that smoking made a significant independent contribution to the risk of stroke. Although no randomized controlled trials have been performed, there is very strong consensus that patients who smoke should be counseled to stop smoking to decrease the risk of stroke. Research indicates that patients who receive even brief smoking cessation advice from their physicians are more likely to quit than those receiving no counseling at all. Addressing smoking habits and initiating cessation efforts are reasonable interventions during hospitalization for acute stroke and may promote the patient’s medical recovery.
A recent study showed that optimal combination of secondary prevention medication after recent non-cardioembolic stroke is noted in only 51% of eligible patients, but is associated with significantly lower risk of stroke, major vascular events and death compared with none or single secondary preventive medication.(4) Individual performance measures on acute inpatient stroke care process have been consistently high since the development of stroke certification by hospitals, some of which has reached a ceiling effect over the years. However, achievement of defect-free care for individual patient remains low, ranging between 21.9% among non-primary stroke center certified hospitals to between 45-52% among stroke center certified hospitals.(5)

### National Quality Strategy Domains

<table>
<thead>
<tr>
<th>Domain</th>
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<tbody>
<tr>
<td>☐ Patient and Family Engagement</td>
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<tr>
<td>☐ Patient Safety</td>
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<tr>
<td>☐ Care Coordination</td>
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<td>☐ Population/Public Health</td>
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<tr>
<td>☐ Efficient Use of Healthcare Resources</td>
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<tr>
<td>☒ Clinical Process/Effectiveness</td>
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### Harmonization with Existing Measures

The definitions and specifications used in the components of this measure are similar to those collected in the commonly employed stroke measures (i.e., Joint Commission and/or AHA/ASA), ensuring parsimony in data collection strategies. A separate measure is being created to monitor global performance for quality improvement.

### Measure Purpose

- ☒ Quality improvement
- ☒ Accountability

### Type of Measure

- ☒ Process
- ☐ Outcome
- ☐ Structure

### Level of Measurement

- ☒ Individual Provider
- ☒ Practice
- ☒ System

### Care Setting

- ☐ Emergency Departments
- ☒ Inpatient
- ☐ Outpatient
- ☐ Post-Acute Care

### Data Source

- ☒ Electronic health record (EHR) data
- ☐ Administrative Data/Claims
- ☒ Chart Review
- ☒ Registry

### References


