

STROKE
DISEASE SPECIFIC CARE PERFORMANCE MEASURES

Set Measure	Disease Specific Care Performance Measure Name
Stroke-1*	DVT Prophylaxis
Stroke-2*	Discharged on Antithrombotics
Stroke-3*	Patients with Atrial Fibrillation Receiving Anticoagulation Therapy
Stroke-4*	Tissue Plasminogen Activator (t-PA) Considered
Stroke-5	Antithrombotic Medication within 48 Hours of Hospitalization
Stroke-6	Lipid Profile
Stroke-7	Screen for Dysphagia
Stroke-8	Stroke Education
Stroke-9	Smoking Cessation
Stoke-10	A Plan for Rehabilitation was Considered

*Initial standardized stroke measure set

NOTE: All 10 measures comprise set for pilot testing

GENERAL POPULATION IDENTIFICATION DISEASE SPECIFIC MEASURES - STROKE

The identification of patients/participants for inclusion in the performance measures related to stroke begins with a core set of data elements. These variables must be collected to determine eligibility for inclusion in any of the measure populations as well as record identification for analysis purposes. The first data elements listed are for administrative purposes in the dataset.

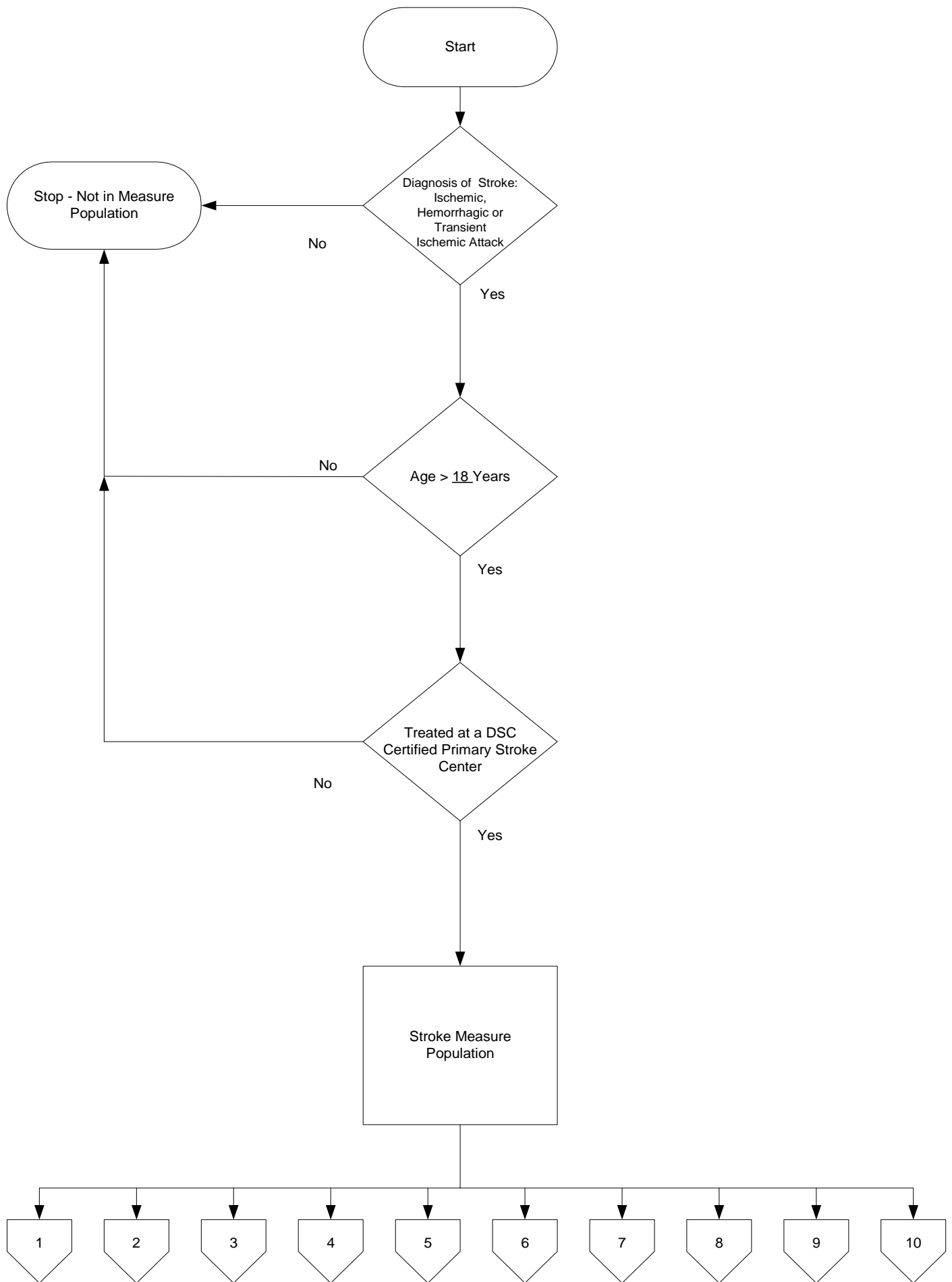
- **Record Identifier**
- **Gender**

The data elements listed next define the general pool of patients/participants who are eligible for consideration in each of the stroke measure populations. A flowchart follows that depicts the evaluation process for inclusion in the general population.

- **Diagnosis of Ischemic Stroke, Hemorrhagic Stroke, or Transient Ischemic Attack (TIA) ***
- **(ICD-9-CM Principal Diagnosis Code)**
- **Birth date (age 18 or older)**
- **Treated at a Primary Stroke Center that is a certified Disease Specific Care (DSC) Program**

*This measure set is applicable to patients with a diagnosis of ischemic stroke, hemorrhagic stroke, or transient ischemic attack (TIA). Each measure includes patients from one or more of these three groups. The ICD-9-CM Principal Diagnosis Code that is used to identify each diagnostic group is provided in tables found in the appendices. The following table identifies the diagnostic group(s) included in each measure:

No.	Measure	Ischemic	Hemorrhagic	TIA
STK-1	Deep Vein Thrombosis (DVT) Prophylaxis	X		
STK-2	Discharged on Antithrombotics	X		X
STK-3	Patients with Atrial Fibrillation Receiving Anticoagulation Therapy	X		
STK-4	Tissue Plasminogen Activator (t-PA) Considered	X		
STK-5	Antithrombotic Medication Within 48 Hours of Hospitalization	X		X
STK-6	Lipid Profile	X		X
STK-7	Screen for Dysphagia	X	X	
STK-8	Stroke Education	X	X	X
STK-9	Smoking Cessation	X	X	X
STK-10	A Plan for Rehabilitation was Considered	X	X	



Measure Information Form

DSC Measure Set: Stroke

Candidate Measure ID: DSC/Stroke-1

Performance Measure Name: Deep Vein Thrombosis (DVT) Prophylaxis

Patients with an ischemic stroke and who are non-ambulatory should start receiving DVT prophylaxis by end of hospital day two.

Rationale:

Patients experiencing a stroke that involves a paretic or paralyzed lower extremity are at increased risk of developing deep vein thrombosis (DVT). One study noted proximal deep vein thrombosis in more than a third of patients with moderately severe stroke. Reported rates of occurrence vary depending on the type of screening used. Prevention of DVT, through the use of prophylactic strategies, in at risk patients is a noted recommendation in numerous clinical practice guidelines. Non-pharmacologic approaches include early mobilization and use of intermittent pneumatic compression stockings. Pharmacologic approaches involve early anticoagulant therapy including the administration of subcutaneous unfractionated heparin, low-molecular-weight (LMW) heparins and heparinoids if there are no contraindications. While the number of randomized trials is limited, reviews of published trials have shown in general that the frequency of DVT in acute stroke patients is decreased with the use of anticoagulant therapy. In a report by the Joint Stroke Guideline Committee of the American Academy of Neurology and the American Stroke Association, it is noted that in considering the use of subcutaneous unfractionated heparin, low-molecular-weight (LMW) heparins and heparinoids for DVT prophylaxis, “the relative benefits of these agents must be weighed against the risk of systemic and intracerebral hemorrhage.” However, most guidelines recommend the administration of low-dose unfractionated heparin, low-molecular-weight heparin or heparinoids if not contraindicated or, intermittent pneumatic compression stockings for acute stroke patients at high risk for DVT.

Clinical Practice Guidelines Supporting Measure:

- ASA Scientific Statement - Guidelines for the Early Management of Patients with Ischemic Stroke, American Heart Association, 2003
- Guidelines for the Management of Patients with Acute Ischemic Stroke: A statement for healthcare professionals from a special writing group of the stroke council, American Heart Association, 1994
- Post-Stroke Rehabilitation Guideline No.16, Agency for Healthcare Policy and Research (Now known as Agency for Healthcare Research and Quality), 1995

Type of Measure: Process

Improvement Noted As: An increase in rate

Numerator Statement: Non-ambulatory ischemic stroke patients who had DVT prophylaxis initiated by end of hospital day two.

Included Populations: Not applicable

Excluded Populations: None

Data Elements:

- DVT Prophylaxis Initiated by End of Hospital Day Two

Denominator Statement: Ischemic stroke patients who are non-ambulatory at the end of hospital day 2.

Included Populations:

- Patients with a diagnosis of ischemic stroke. Refer to Appendices, Table 1 for ICD-9-CM principal diagnosis codes for ischemic stroke.
- Patients who are non-ambulatory by end hospital day 2.

Excluded Populations:

- Patients discharged before hospital day two:
 - Patients who are discharged/transferred to another short term general hospital for inpatient care before hospital day two
 - Patients who expire before hospital day two

Data Elements:

- Patient Ambulatory at End of Hospital Day Two
- Admission Date
- Discharge Date
- Discharge Status
- ICD-9-CM Principal Diagnosis Code

Risk Adjustment: No

Data Collection Approach: Concurrent and retrospective data collection through administrative data/claims data, and medical record.

Data Accuracy:

ICD-9-CM Codes: Variation may exist in the assignment of ICD-9-CM codes; therefore, coding practices may require evaluation to ensure consistency.

Age Groups: ≥ 18

Data Reported As: Proportion

Setting: Inpatient Hospital - Primary Stroke Centers

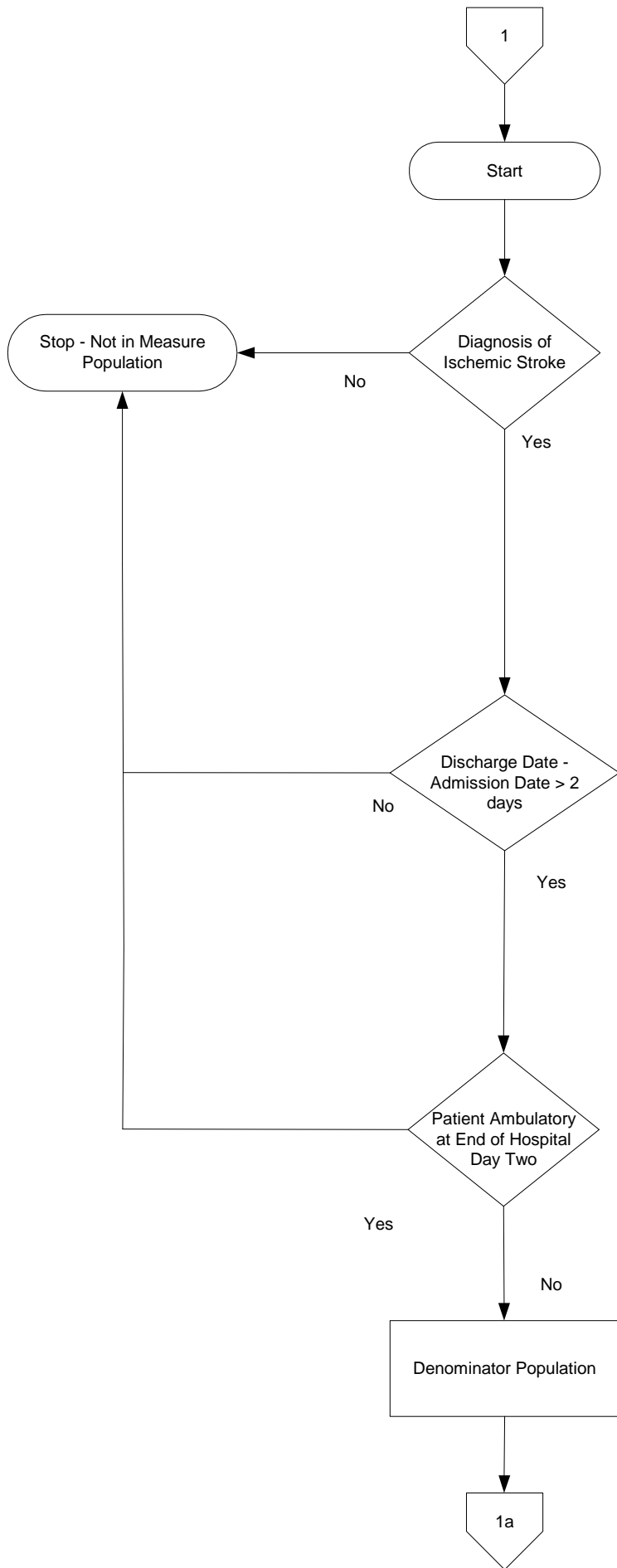
Report Period: Quarterly

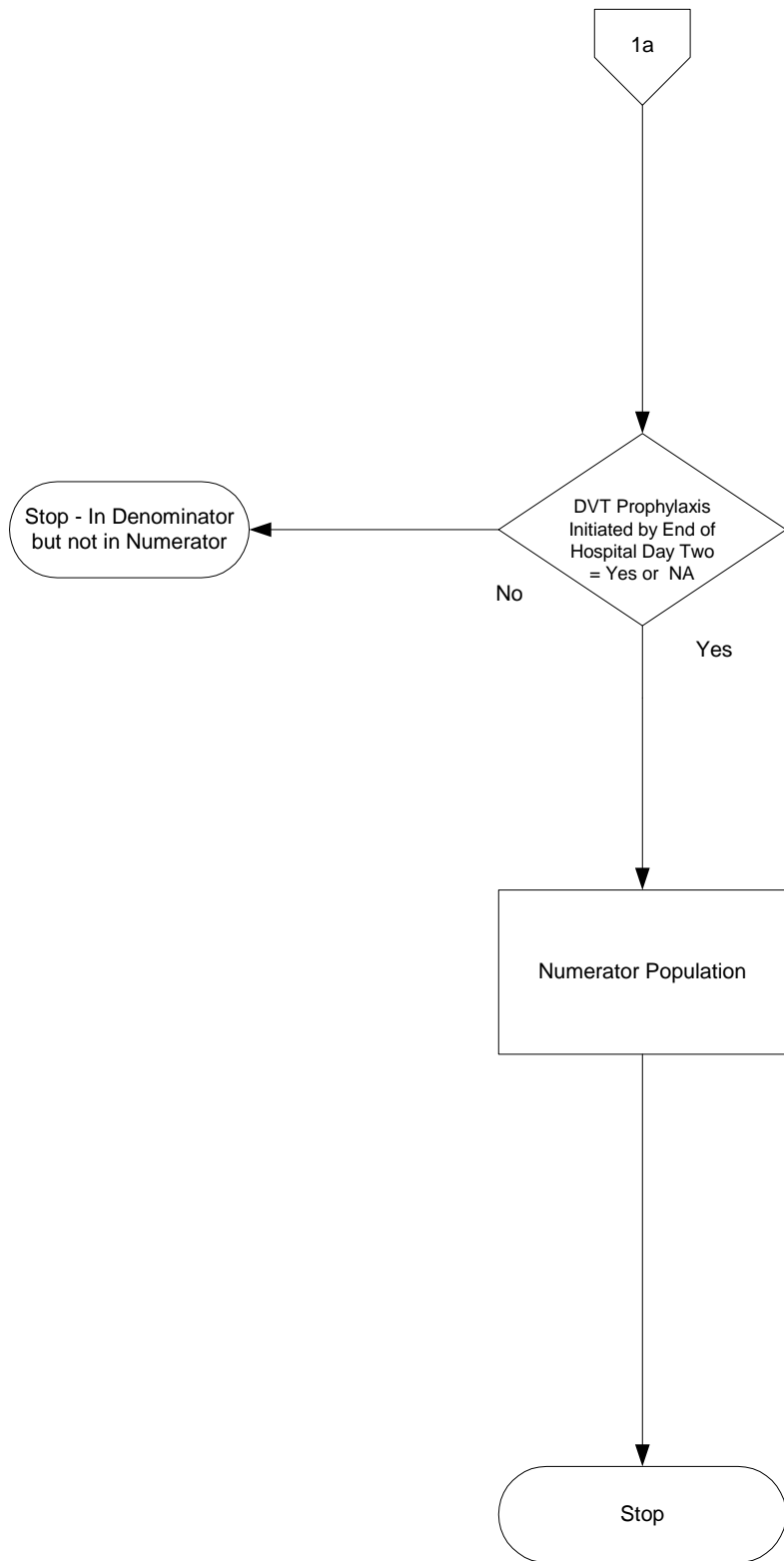
Selected References:

Albers GW, Amarenco P, Easton JD, Sacco RL & Teal, P. Antithrombotic and Thrombolytic Therapy for Ischemic Stroke. *Chest*. 2001;119:300S320S.

Coull BM, Williams LS, Goldstein LB, et al. Anticoagulants and Antiplatelet Agents in Acute Ischemic Stroke. Report of the Joint Stroke Guideline Development Committee of the American Academy of Neurology and the American Stroke Association (a Division of the American Heart Association) *Stroke*. 2002;33:1934 -1942.

Desmukh M., Bisignami M, Landau P, Orchard TJ. Deep vein thrombosis in rehabilitating stroke patients: incidence, risk factors and prophylaxis. *American Journal Physical Medicine Rehabilitation*. 1991; 70:313-316.





Measure Information Form

DSC Measure Set: Stroke

Measure ID: DSC/Stroke-2

Performance Measure Name: Discharged on Antithrombotics

Patients with a transient ischemic attack (TIA) or an ischemic stroke should be prescribed antithrombotic therapy at discharge unless contraindicated

Rationale: The patient recovering from a mild stroke or who has had a recent TIA is at high risk of stroke recurrence, physical and intellectual disability, long-term institutionalization, and death. Antithrombotic drugs are an important part of the care of patients with ischemic stroke because it is largely due to embolic or thrombotic arterial occlusion. 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, some evidence is available from completed studies. In a review of selected randomized clinical trials, it was concluded that aspirin (ASA) (160 mg or 325 mg daily) resulted in a small but statistically significant reduction in death and disability when given within 48 hours of ischemic stroke. A daily dose of aspirin has demonstrated benefit for those patients with TIA or mild stroke who do not have atrial fibrillation or moderate-to-severe carotid stenosis. In addition, ASA was found to decrease the risk of early recurrent ischemic stroke when given within 48 hours of stroke onset but it also increased the risk of hemorrhagic stroke. Data at this time suggest that ASA should be initiated within 48 hours of symptom onset in acute ischemic stroke patients to reduce stroke mortality and morbidity as long as no contraindications exist and the patient has not or will not be treated with recombinant tissue plasminogen activator (rtPA). Antiplatelet therapy is also recommended for the majority of patients with transient ischemic attacks (TIA). For patients with a stroke due to a cardioembolic source (e.g., atrial fibrillation, mechanical heart valve), warfarin is generally recommended unless contraindicated. Warfarin is not recommended for secondary stroke prevention in patients presumed to have a non-cardioembolic stroke or TIA.

Clinical Practice Guidelines Supporting Measure:

- AHA Scientific Statement - Preventing Ischemic Stroke in Patients With Prior Stroke and Transient Ischemic Attack, American Heart Association, 1999
- Antithrombotic and Thrombolytic Therapy for Ischemic Stroke. In: Sixth ACCP Consensus Conference on Antithrombotic Therapy, American College of Chest Physicians (ACCP), 1998
- ASA Scientific Statement - Guidelines for Early Management of Patients with Ischemic Stroke, American Heart Association, 2003
- ASA/AAN Scientific Statement - Anticoagulants and Antiplatelet Agents in Acute Ischemic Stroke
- Guideline on the Use of Aspirin as Secondary Prophylaxis for Vascular Disease in Primary Care, Centre for Health Services Research University of Newcastle upon Tyne, & Centre for Health Economics of York, 1998
- Guidelines for Medical Treatment for Stroke Prevention, American College of Physicians, 1994

Type of Measure: Process

Improvement Noted As: An increase in rate

Numerator Statement: Patients who were prescribed antithrombotics at hospital discharge

Included Populations: Not applicable

Excluded Populations: None

Data Elements:

- Antithrombotic Therapy
(Prescribed at Discharge)

Denominator Statement: All patients with ischemic stroke or transient ischemic attack (TIA)

Included Populations:

- Patients with a diagnosis of ischemic stroke. Refer to Appendices, Table 1 for ICD-9-CM principal diagnosis codes for ischemic stroke.
- Patients with a diagnosis of TIA. Refer to Appendices, Table 3 for ICD-9-CM principal diagnosis codes for TIA.

Excluded Populations:

- Patients discharged/transferred to another short term general hospital for inpatient care
- Patients who expired
- Patients who left against medical advice
- Patients with contraindications/possible reasons for not receiving Antithrombotics

Data Elements:

- Contraindications/possible reasons for not Administering Antithrombotic Therapy
- Discharge Status
- ICD-9-CM Principal Diagnosis Code

Risk Adjustment: No

Data Collection Approach: Concurrent and retrospective data collection through administrative data/claims data, and medical record.

Data Accuracy:

ICD-9-CM Codes: Variation may exist in the assignment of ICD-9-CM codes; therefore, coding practices may require evaluation to ensure consistency.

Age Groups: ≥ 18

Data Reported As: Proportion

Setting: Inpatient Hospital - Primary Stroke Centers

Report Period: Quarterly

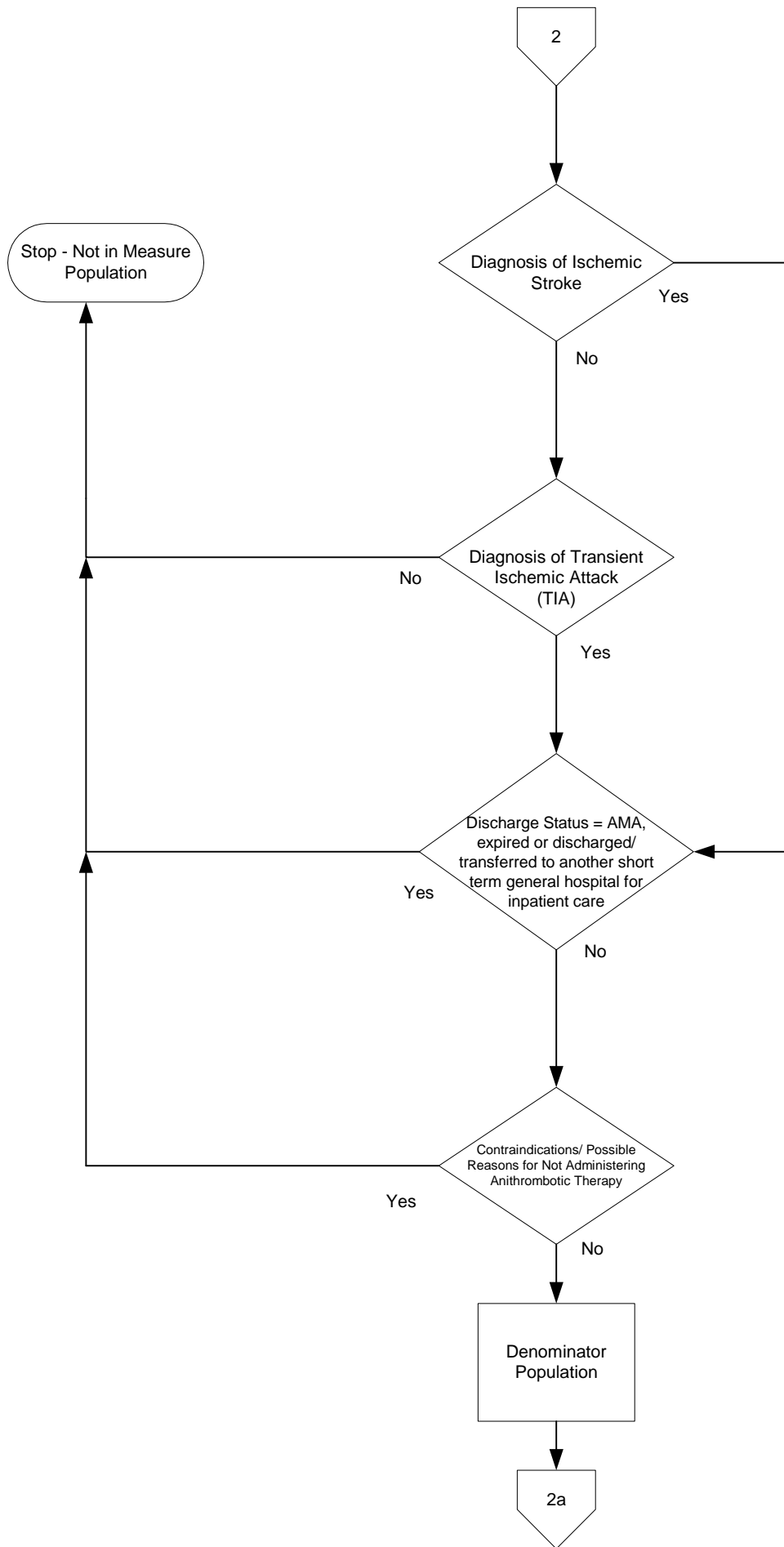
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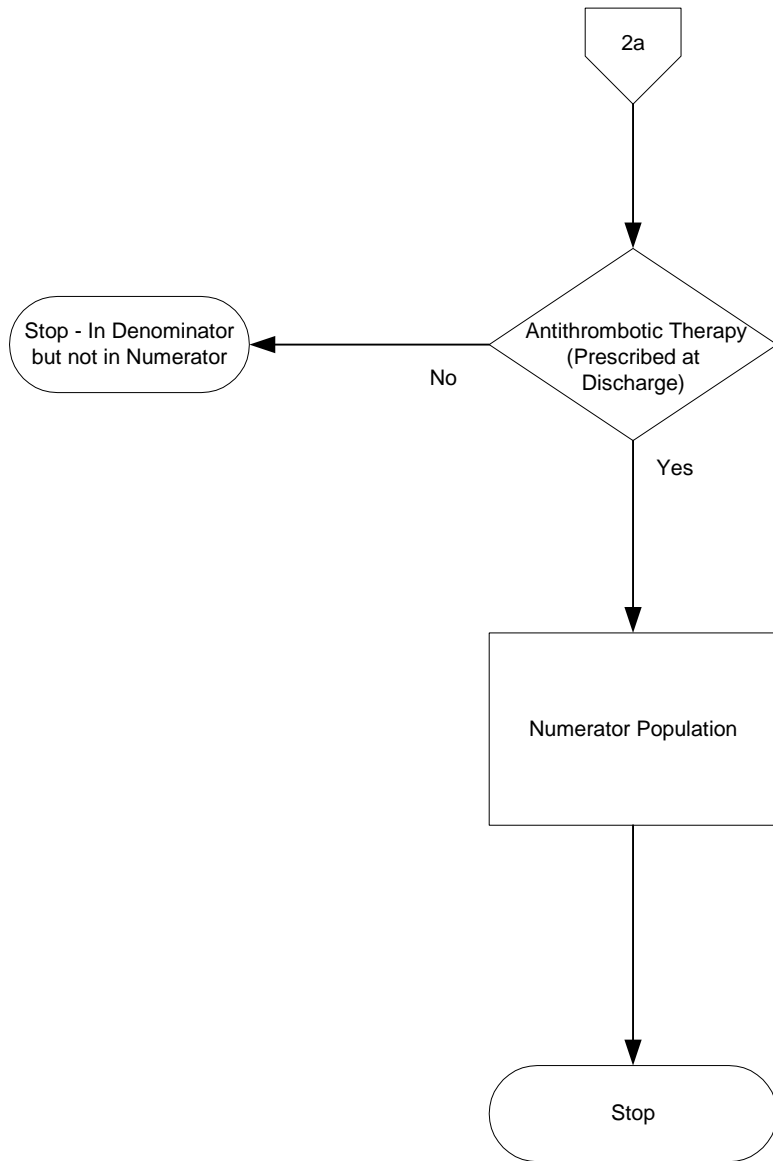
Adams HP, Adams RJ, Brott T, et al. Guidelines for the early management of patients with ischemic stroke, A scientific statement from the stroke council of the American stroke association. *Stroke*. 2003;34:1056-1083.

Brodt TG, Clark WM, Grotta JC, et al. Stroke the first hours. Guidelines for acute treatment. Consensus Statement. National Stroke Association. 2000.

Chen ZM, Sandercock P, Pan HC, et al. Indications for early aspirin use in acute ischemic stroke: a combined analysis of 40,000 randomized patients from the Chinese acute stroke trial and the international stroke trial. On behalf of the CAST and IST collaborative groups, *Stroke* 2000;31:1240-1249

Coull BM, Williams LS, Goldstein LB, et al. Anticoagulants and Antiplatelet Agents in Acute Ischemic Stroke. Report of the Joint Stroke Guideline Development Committee of the American Academy of Neurology and the American Stroke Association (a Division of the American Heart Association) *Stroke*. 2002;33:1934 -1942.





Measure Information Form

DSC Measure Set: Stroke

Candidate Measure ID: DSC/Stroke-3

Performance Measure Name: Patients with Atrial Fibrillation Receiving Anticoagulation Therapy

Patients with an ischemic stroke with atrial fibrillation discharged on anticoagulation therapy unless it is contraindicated.

Rationale: Nonvalvular atrial fibrillation (NVAF) is a common arrhythmia and an important risk factor for stroke. It is one of several conditions and lifestyle factors that have been identified as risk factors for stroke. It has been estimated that over 2 million adults in the United States have NVAF. While the median age of patients with atrial fibrillation is 75 years, the incidence increases with advancing age. For example, The Framingham Heart Study noted a dramatic increase in stroke risk associated with atrial fibrillation with advancing age, from 1.5% for those 50 to 59 years of age to 23.5% for those 80 to 89 years of age. Furthermore, a prior stroke or transient ischemic attack (TIA) are among a limited number of predictors of high stroke risk within the population of patients with atrial fibrillation. Therefore, much emphasis has been placed on identifying methods for preventing recurrent ischemic stroke as well as preventing first stroke. Prevention strategies focus on the modifiable risk factors such as hypertension, smoking, and atrial fibrillation. Analysis of five placebo-controlled clinical trials investigating the efficacy of warfarin in the primary prevention of thromboembolic stroke, found the relative risk of thromboembolic stroke was reduced by 68% for atrial fibrillation patients treated with warfarin. The administration of antithrombotic therapy, unless there are contraindications, is an established effective strategy in preventing recurrent stroke in high stroke risk-atrial fibrillation patients with TIA or prior stroke.

Clinical Practice Guidelines Supporting Measure:

- ACC/AHA/ESC Guidelines for the Management of Patients with Atrial Fibrillation, American College of Cardiology, American Heart Association, and European Society of Cardiology, 2001
- AHA Scientific Statement - Preventing Ischemic Stroke in Patients With Prior Stroke and Transient Ischemic Attack, American Heart Association, 1999
- AHA Scientific Statement - Primary Prevention of Ischemic Stroke, American Heart Association, 2001

Type of Measure: Process

Improvement Noted As: An increase in rate

Numerator Statement: Patients discharged on Anticoagulation Therapy

Included Populations: Not applicable

Excluded Populations: None

Data Elements:

- Patient discharged on Anticoagulation Therapy

Denominator Statement: Patients with a diagnosis of ischemic stroke with documented atrial fibrillation during hospitalization and without contraindications to anticoagulation therapy.

Included Populations:

- Patients with a diagnosis of ischemic stroke. Refer to Appendices, Table 1 for ICD-9-CM Principal Diagnosis Codes for ischemic stroke.
- Patients with an “other” diagnosis of atrial fibrillation: ICD-9-CM Diagnosis Code 427.31.

Excluded Populations:

- Patients discharged/transferred to another short term general hospital for inpatient care
- Patients who expire
- Patients who left against medical advice
- Patients with contraindications/possible reasons for not receiving anticoagulation therapy

Data Elements:

- Contraindications/Possible Reasons for not Administering Anticoagulation Therapy
- Discharge Status
- ICD-9-CM Principal Diagnosis Code
- ICD-9-CM Other Diagnosis
- Atrial Fibrillation During Hospitalization

Risk Adjustment: No

Data Accuracy:

ICD-9-CM Codes: Variation may exist in the assignment of ICD-9-CM codes; therefore, coding practices may require evaluation to ensure consistency.

Data Collection Approach: Concurrent and retrospective data collection through administrative data/claims data, and medical record.

Age Groups: ≥ 18

Data Reported As: Proportion

Setting: Inpatient Hospital - Primary Stroke Centers

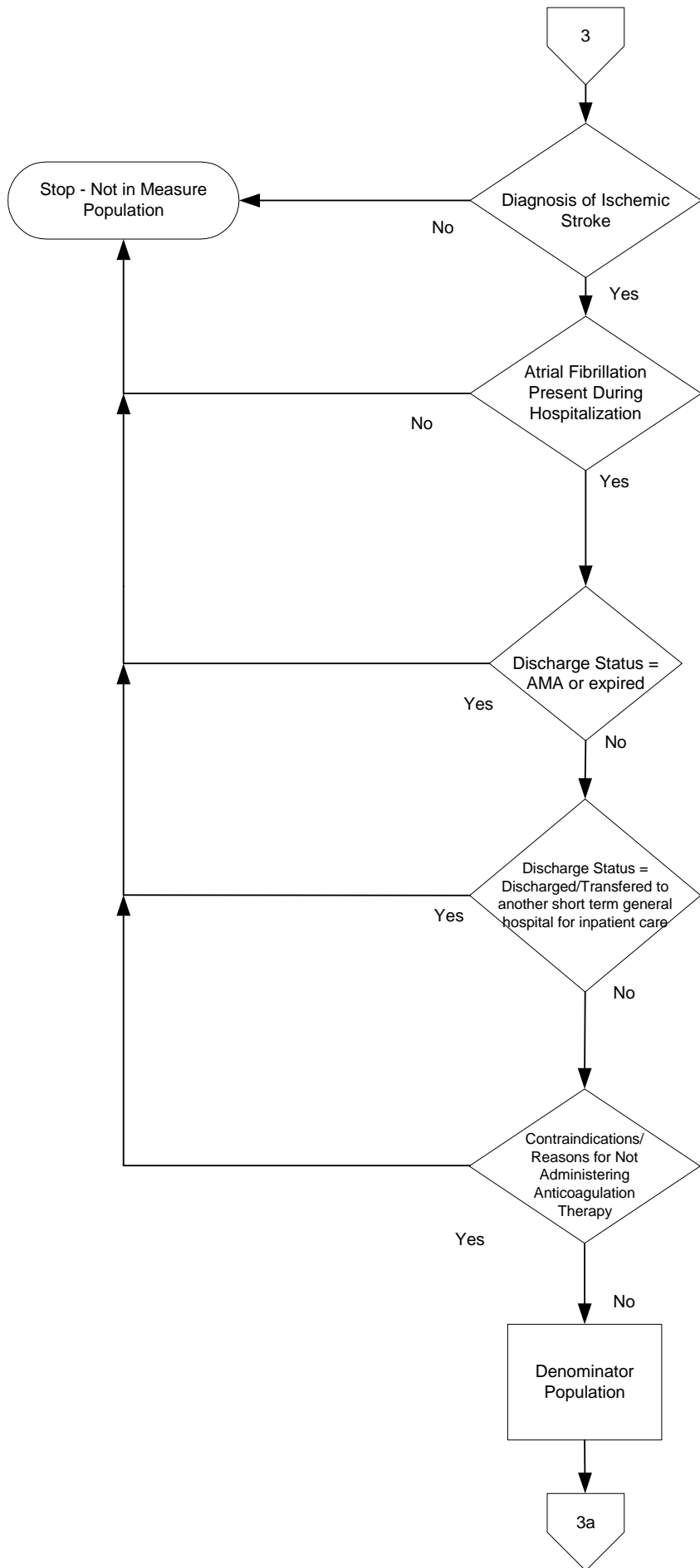
Report Period: Quarterly

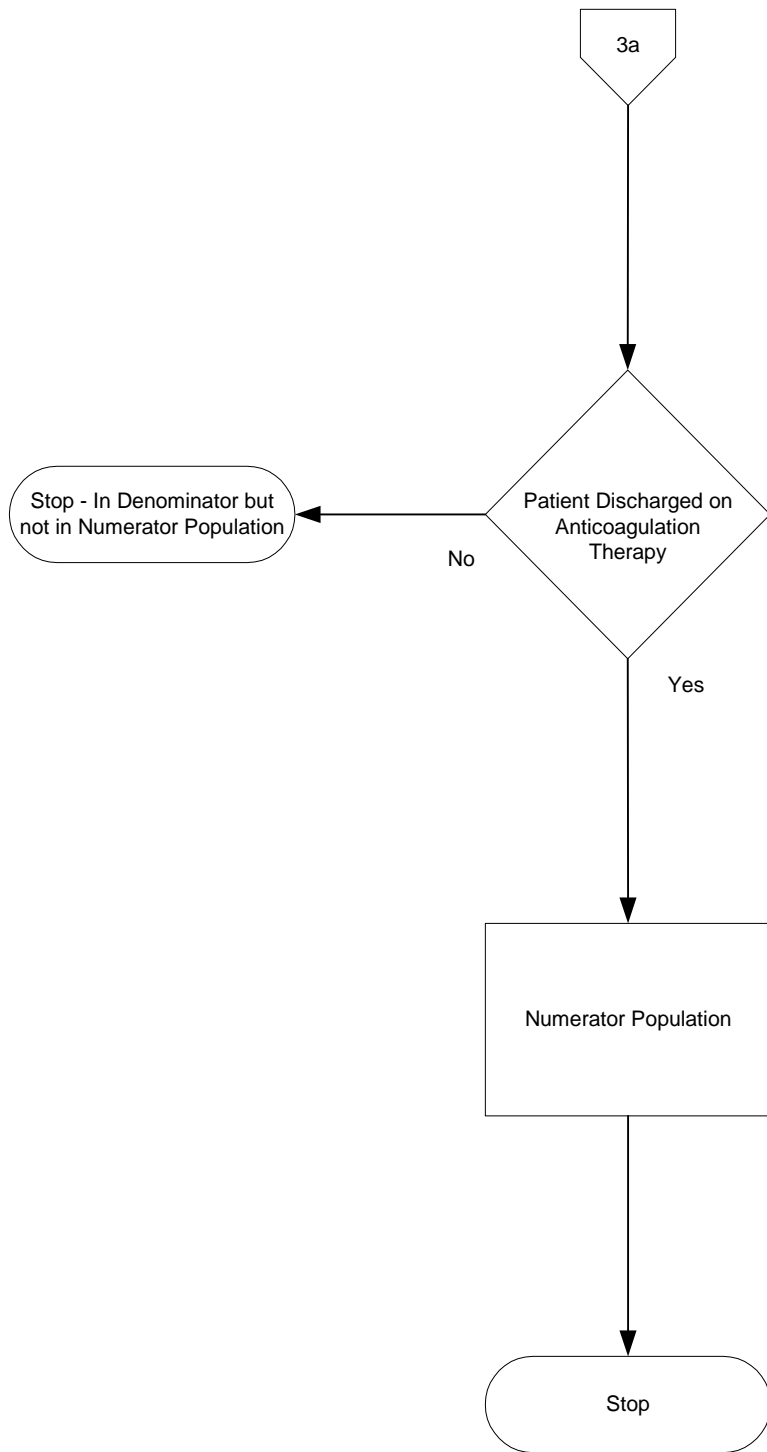
Selected References:

Preventing Ischemic Stroke in Patients With Prior Stroke and Transient Ischemic Attack. A Statement for Healthcare Professionals From the Stroke Council of the American Heart Association. *Stroke*. 1999;30:1991-1994

Prevention of a First Stroke: A Review of Guidelines and a Multidisciplinary Consensus Statement from the National Stroke Association. National Stroke Association.

Primary Prevention of Ischemic Stroke. A Statement for Healthcare Professional From the Stroke Council of the American Heart Association. *Circulation*. 2001;103:163-182.





Measure Information Form

DSC Measure Set: Stroke

Candidate Measure ID: DSC/Stroke-4

Performance Measure Name: Tissue Plasminogen Activator (t-PA) Considered

All patients who present at a hospital with symptoms of an ischemic stroke with symptom onset of 3 hours or less should be *considered* to receive intravenous (IV) t-PA.

Rationale: The administration of thrombolytic agents to carefully screened, eligible patients with acute ischemic stroke has been shown to be beneficial in some recent clinical trials. These included two positive randomized controlled trials in the United States; The National Institute of Neurological Disorders and Stroke (NINDS) Studies, Part I and Part II. Based on the results of these studies, the Food and Drug Administration approved the use of intravenous recombinant tissue plasminogen activator (IV r-TPA or t-PA) for the treatment of acute ischemic stroke when given within 3 hours of stroke symptom onset. The findings of the NINDS Study showed improved outcomes for these selected patients when intravenous t-PA was administered following the defined protocol. However, results of other studies are conflicting. For example, two randomized controlled trials in Europe, the European Cooperative Acute Stroke Studies (ECASS I and II), did not show a benefit of IV t-PA for patients with acute ischemic stroke. The ECASS study protocol differed in that it did enroll patients within 6 hours of stroke and many persons were treated more than 3 hours after stroke. While controversy still exists among some specialists, most practice guidelines developed in the United States advocate the consideration or use of IV t-PA for eligible patients within strictly defined criteria, and when administered by experienced physicians in healthcare centers with appropriate expertise.

Clinical Practice Guidelines Supporting Measure:

- ASA Scientific Statement-Guidelines for Early Management of Patients with Ischemic Stroke, American Heart Association, 2003.
- Diagnosis and Initial Treatment of Ischemic Stroke, Institute for Clinical Systems Improvement (ICSI), 2001.
- Guidelines for Thrombolytic Therapy for Acute Stroke: A supplement to the guidelines for the management of patients with acute ischemic stroke, American Heart Association, 1996.
- Management of Patients with Stroke. Assessment, investigation, immediate management and secondary prevention, Scottish Intercollegiate Guidelines Network, 1997.
- STROKE the First Hours Guidelines for Acute Treatment, National Stroke Association, 2000.

Type of Measure: Process

Improvement Noted As: An increase in rate

NOTE: This measure will be stratified to report:

I) Primary Rate

The number of patients who were **considered** for IV t-PA administration. This includes:

1. Patients who were considered but determined to be ineligible to receive IV t-PA
2. Patients who were offered IV t-PA
3. Patients who received IV t-PA

II) Secondary Rate

The number of patients who **received** IV t-PA

Primary Rate

Numerator Statement: The number of patients who were **considered** for IV t-PA administration

Included Populations: Not applicable

Excluded Populations: None

Data Elements:

- IV t-PA Administration Considered

Denominator Statement: All patients with acute ischemic stroke whose time from symptom onset to arrival in the emergency department is less than (<) 3 hrs.

Included Populations:

- Patients with a diagnosis of ischemic stroke. Refer to Appendices, Table 1 for ICD-9-CM principal diagnosis codes for ischemic stroke.
- Symptom onset of < 3 hours.

Excluded Populations:

- Time of symptom onset to arrival in Emergency Department greater than (>) 3 hours
- Time of symptom onset unknown

Data Elements:

- Date of Onset of Stroke Symptoms
- ICD-9-CM Principal Diagnosis Code
- Time of Onset of Stroke Symptoms to Arrival in the Emergency Department Greater than (>) 3 Hours
- Arrival Time

Secondary Rate

Numerator Statement: The number of patients who received IV t-PA

Included Populations: Not applicable

Excluded Populations: None

Data Elements:

- IV t-PA Administered at This Hospital

Denominator Statement: All patients with acute ischemic stroke whose time from symptom onset is less than (<) 3 hrs. and without documented contraindications/possible reasons for not receiving IV t-PA.

Included Populations:

- Patients with a diagnosis of ischemic stroke. Refer to Appendices, Table 1 for ICD-9-CM principal diagnosis codes for ischemic stroke.
- Symptom onset of < 3 hours.

Excluded Populations:

- Patients with contraindications/possible reasons for not receiving IV t-PA
- Time of symptom onset to arrival in the emergency department greater than (>) 3 hours
- Time of symptom onset unknown

Data Elements:

- Contraindications/possible reasons for not administering IV t-PA
- Date of Onset of Stroke Symptoms ICD-9-CM Principal Diagnosis Code
- Time of Onset of Stroke Symptoms
- Arrival Time

Risk Adjustment: No

Data Collection Approach: Concurrent and retrospective data collection through administrative data/claims data, and medical record.

Data Accuracy:

ICD-9-CM Codes: Variation may exist in the assignment of ICD-9-CM codes; therefore, coding practices may require evaluation to ensure consistency.

Age Groups: ≥ 18

Data Reported As: Proportion

Setting: Inpatient Hospital - Primary Stroke Centers

Report Period: Quarterly

Selected References:

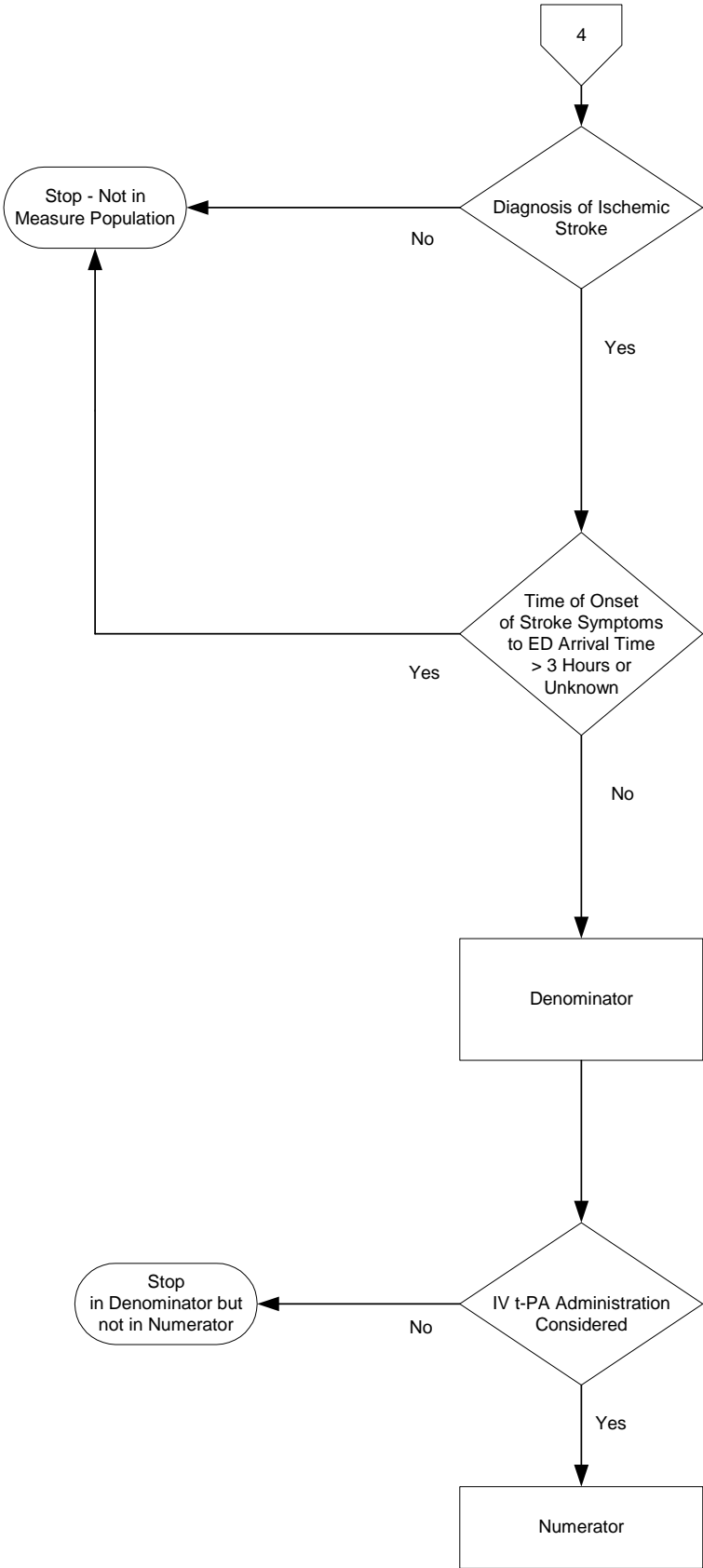
Hacke W, Kaste M, Fieschi C, et al. Intravenous thrombolysis with recombinant tissue plasminogen activator for acute hemispheric stroke. The European Cooperative Acute Stroke Study (ECASS). *JAMA* 1995;274:1017-1025.

Marler JR, Tilley BC, Lu M, Brott TG, Lyden PC, Grotta JC, Broderick JP, Levine SR, Frankel MP, Horowitz SH, Haley EC, Lewandowski CA, Kwiatkowski TP. Early Stroke treatment associated with better outcome The NINDS rt-PA Stroke Study. *Neurology* 2000;55:1649-1655.

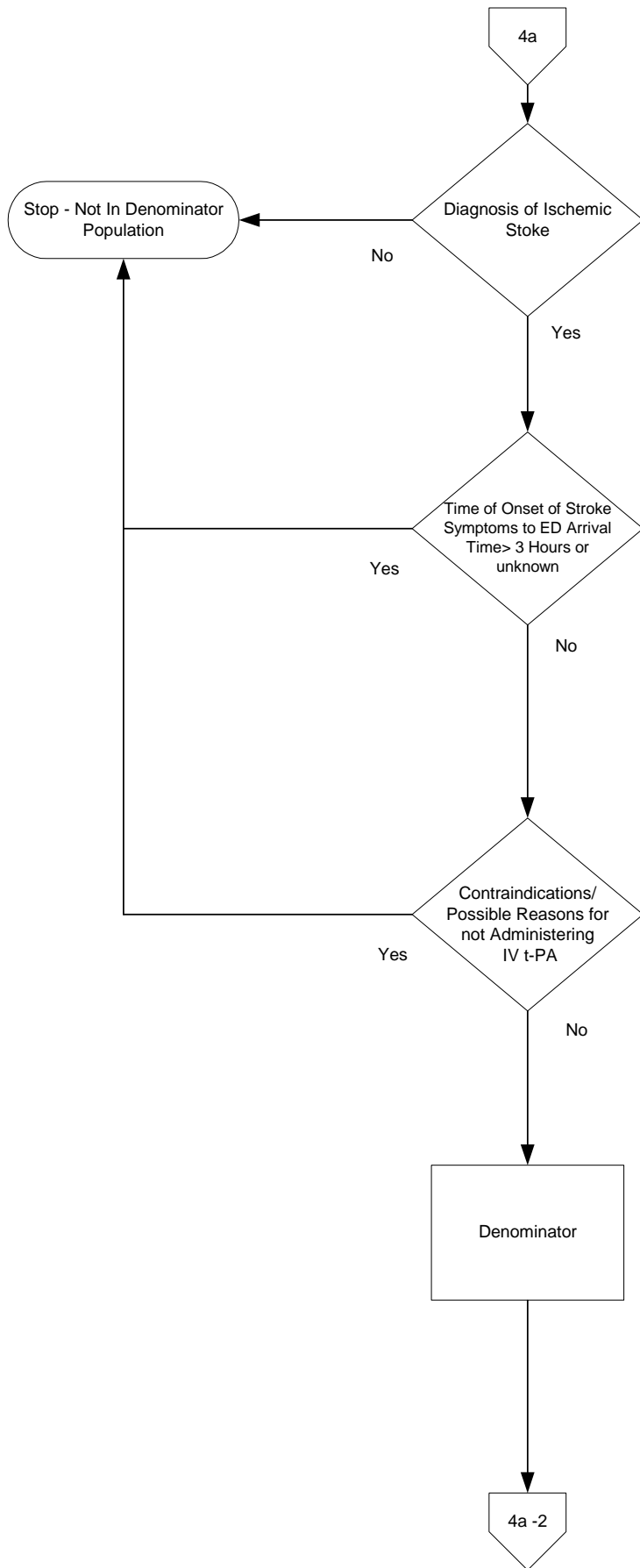
The ATLANTIS, ECASS, and NINDS rt-PA Study Group Investigators. Association of Outcome with early stroke treatment: pooled analysis of ATLANTIS, ECASS, and NINDS rt-PA stroke Trials. *Lancet* 2004;363:768-774.

The National Institute of Neurological Disorders and Stroke rt-PA Stroke Study Group. Tissue plasminogen activator for acute ischemic stroke. The National Institute of Neurological Disorders and Stroke rt-PA Stroke Study Group. *New England Journal of Medicine* 1995;333:1581-1587.

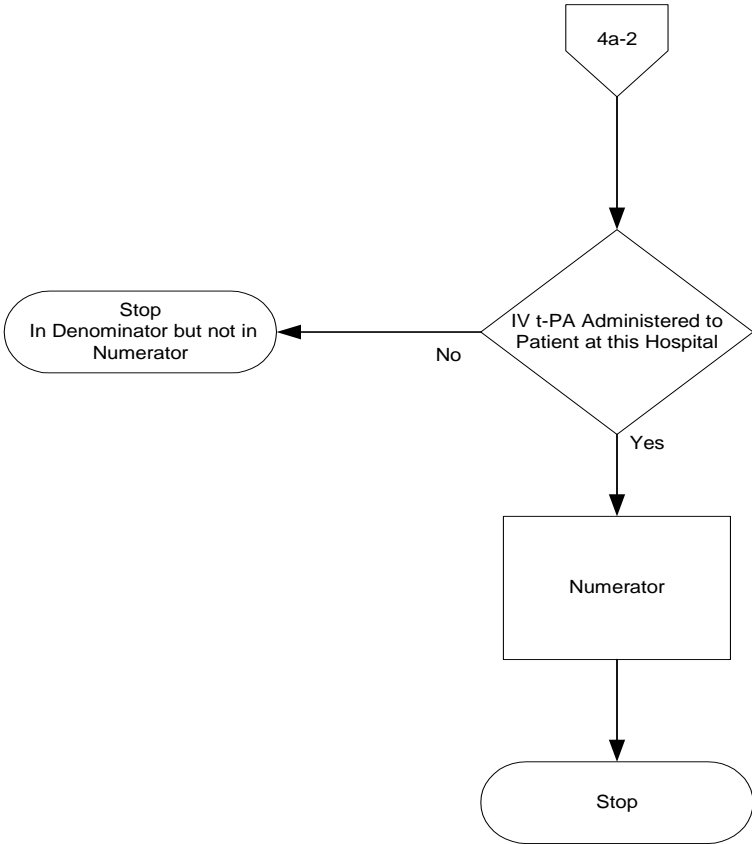
Primary Rate



Secondary Rate



Secondary Rate



Measure Information Form

DSC Measure Set: Stroke

Candidate Measure ID: DSC/Stroke-5

Performance Measure Name: Antithrombotic Medication within 48 Hours of Hospitalization

Patients with ischemic stroke or transient ischemic attack (TIA) who receive antithrombotic medication within 48 hours of hospitalization

Rationale: The patient recovering from a mild stroke or who has had a recent TIA is at high risk of stroke recurrence, physical and intellectual disability, long-term institutionalization, and death. Antithrombotic drugs are an important part of the care of patients with ischemic stroke because it is largely due to embolic or thrombotic arterial occlusion. 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, some evidence is available from completed studies. In a review of selected randomized clinical trials, it was concluded that aspirin (ASA) (160 mg or 325 mg daily) resulted in a small but statistically significant reduction in death and disability when given within 48 hours of ischemic stroke. A daily dose of aspirin has demonstrated benefit for those patients with TIA or mild stroke who do not have atrial fibrillation or moderate-to-severe carotid stenosis. In addition, ASA was found to decrease the risk of early recurrent ischemic stroke when given within 48 hours of stroke onset but it also increased the risk of hemorrhagic stroke. Data at this time suggest that ASA should be initiated within 48 hours of symptom onset in acute ischemic stroke patients to reduce stroke mortality and morbidity as long as no contraindications exist and the patient has not or will not be treated with recombinant tissue plasminogen activator (rtPA). Antiplatelet therapy is also recommended for the majority of patients with transient ischemic attacks (TIA). For patients with a stroke due to a cardioembolic source (e.g., atrial fibrillation, mechanical heart valve), warfarin is generally recommended unless contraindicated. Warfarin is not recommended for secondary stroke prevention in patients presumed to have a non-cardioembolic stroke or TIA.

Clinical Practice Guidelines Supporting Measure:

- AHA Scientific Statement - Preventing Ischemic Stroke in Patients With Prior Stroke and Transient Ischemic Attack, American Heart Association, 1999
- Antithrombotic and thrombolytic therapy for ischemic stroke. In: Sixth ACCP Consensus Conference on Antithrombotic Therapy, American College of Chest Physicians (ACCP), 1998
- ASA Scientific Statement - Guidelines for the Early Management of Patients with Ischemic Stroke, American Heart Association, 2003
- ASA/AAN Scientific Statement - Anticoagulants and Antiplatelet Agents in Acute Ischemic Stroke, 2002
- Guideline on the Use of Aspirin as Secondary Prophylaxis for Vascular Disease in Primary Care, Centre for Health Services Research University of Newcastle upon Tyne, & Centre for Health Economics of York, 1998
- Guidelines for Medical Treatment for Stroke Prevention, American College of Physicians, 1994

Type of Measure: Process

Improvement Noted As: An increase in rate

Numerator Statement: Patients who receive antithrombotic medication within 48 hours of hospitalization.

Included Populations: Not applicable

Excluded Populations: None

Data Elements:

- Antithrombotic Therapy
(Administered Within 48 hours of Hospitalization)

Denominator Statement: All patients with ischemic stroke or transient ischemic attack (TIA)

Included Populations:

- Patients with a diagnosis of ischemic stroke. Refer to Appendices, Table 1 for ICD-9-CM principal diagnosis codes for ischemic stroke.
- Patients with a diagnosis of TIA. Refer to Appendices, Table 3 for ICD-9-CM principal diagnosis codes for TIA.

Excluded Populations:

- Patients discharged within 48 hours of hospitalization
 - Patients who are discharged/transferred to another short term general hospital for inpatient care within 48 hours of hospitalization within 48 hours of hospitalization
 - Patients who expire within 48 hours of hospitalization
 - Patients who left against medical advice within 48 hours of hospitalization
- Patients with contraindications/possible reasons for not receiving Antithrombotics

Data Elements:

- Discharged within 48 hours of hospitalization
- Contraindications/possible reasons for not administering Antithrombotic Therapy
- Discharge Status
- ICD-9-CM Principal Diagnosis Code

Risk Adjustment: No

Data Collection Approach: Concurrent and retrospective data collection through administrative data/claims data, and medical record.

Data Accuracy:

ICD-9-CM Codes: Variation may exist in the assignment of ICD-9-CM codes; therefore, coding practices may require evaluation to ensure consistency.

Age Groups: ≥ 18

Data Reported As: Proportion

Setting: Inpatient Hospital - Primary Stroke Centers

Report Period: Quarterly

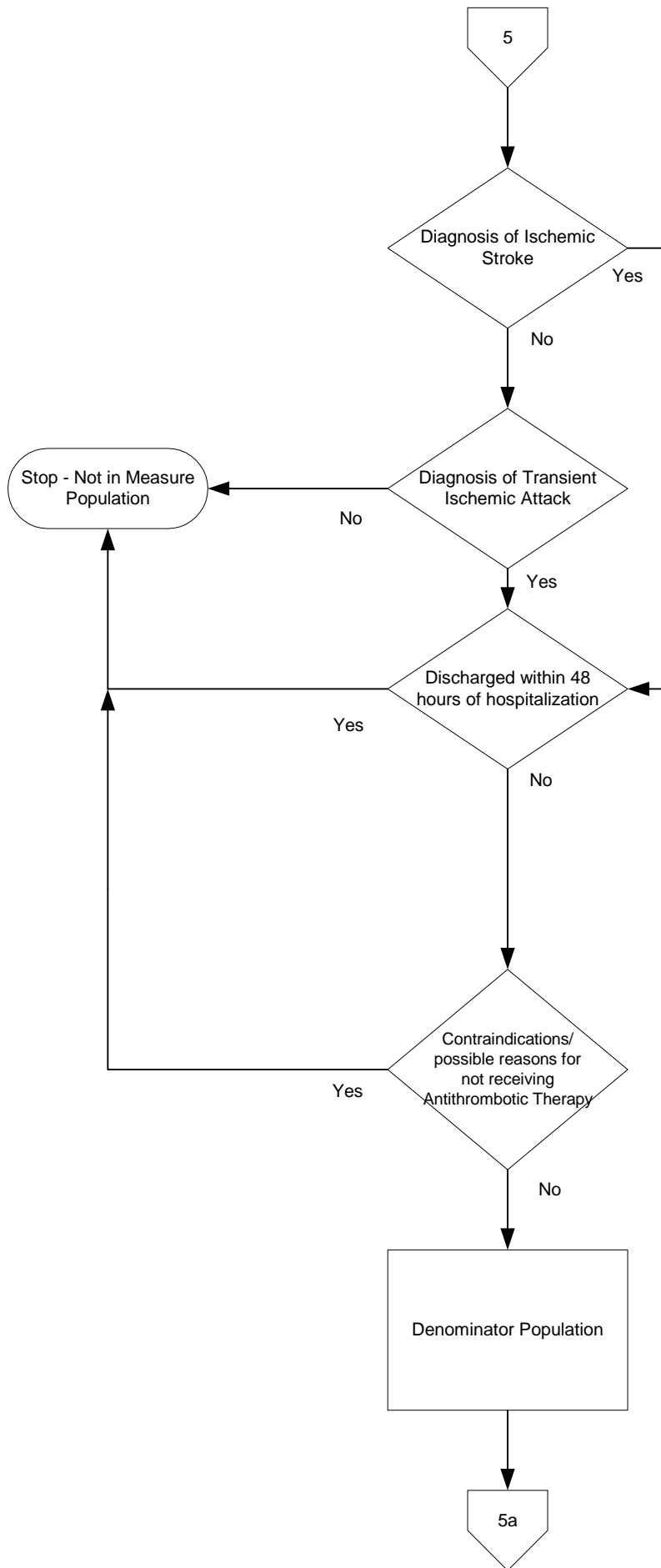
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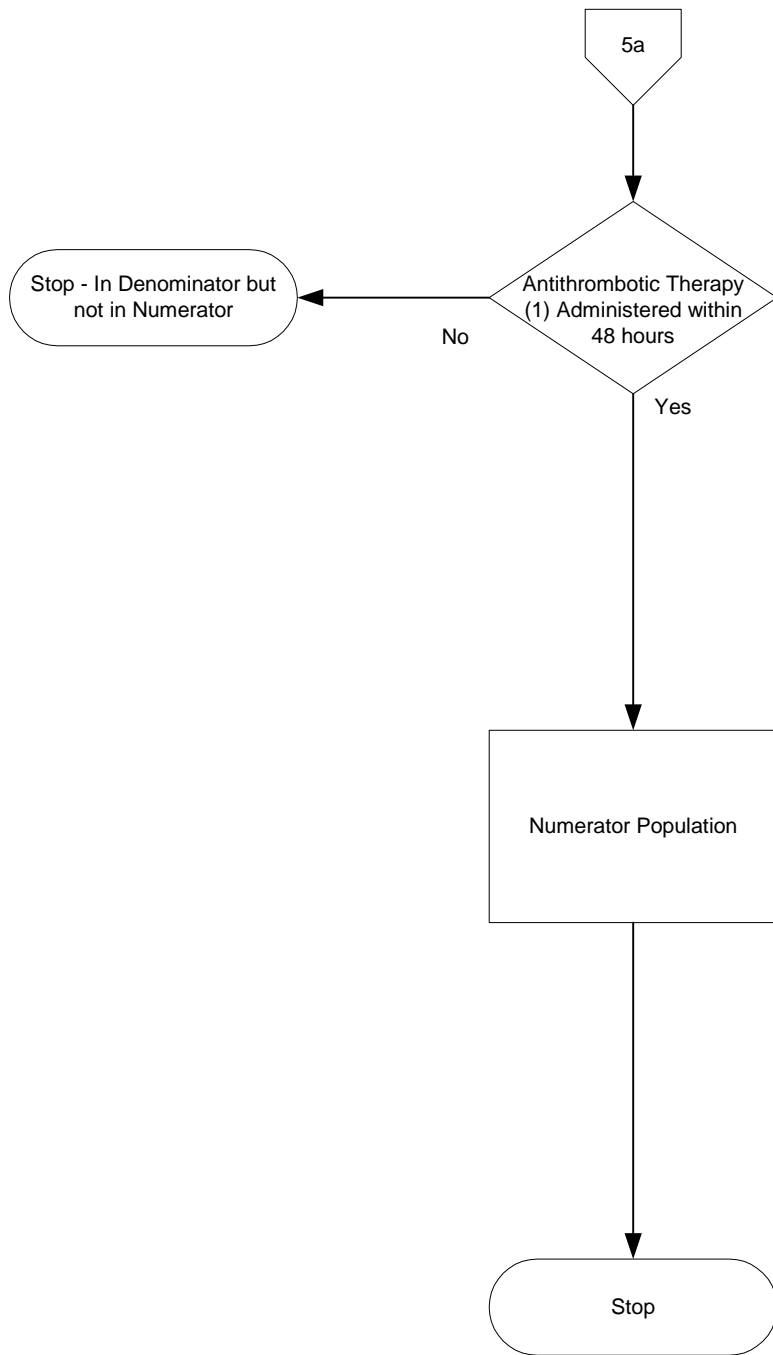
Adams HP, Adams RJ, Brott T, et al. Guidelines for the early management of patients with ischemic stroke, A scientific statement from the stroke council of the American stroke association. *Stroke*. 2003;34:1056-1083.

Brott TG, Clark WM, Grotta JC, et al. Stroke the first hours. Guidelines for acute treatment. Consensus Statement. National Stroke Association. 2000.

Chen ZM, Sandercock P, Pan HC, et al. Indications for early aspirin use in acute ischemic stroke: a combined analysis of 40,000 randomized patients from the Chinese acute stroke trial and the international stroke trial. On behalf of the CAST and IST collaborative groups, *Stroke* 2000;31:1240-1249

Coull BM, Williams LS, Goldstein LB, et al. Anticoagulants and Antiplatelet Agents in Acute Ischemic Stroke. Report of the Joint Stroke Guideline Development Committee of the American Academy of Neurology and the American Stroke Association (a Division of the American Heart Association) *Stroke*. 2002;33:1934 -1942.





Measure Information Form

DSC Measure Set: Stroke

Candidate Measure ID: DSC/Stroke-6

Performance Measure Name: **Lipid Profile**

Patients with Ischemic Stroke/Transient Ischemic Attack (TIA) who had a lipid profile performed.

Rationale: An elevated serum lipid level has been a well-documented risk factor for coronary artery disease (CAD). Recently, there has been an increased focus on examining the relationship between elevated lipid levels and the incidence of stroke. In particular, some recent clinical trials have analyzed the association between lipids and non-hemorrhagic stroke. The reduction of LDL cholesterol, through lifestyle modification and drug therapy, for the prevention of strokes and other vascular events is recommended for patients with CAD in the National Cholesterol Education Program III (NCEPIII) Guidelines.

Clinical Practice Guideline Supporting Measure:

- AHA Scientific Statement-Preventing Ischemic Stroke in Patients with Prior Stroke and Transient Ischemic Attack, American Heart Association, 1999.
- Guidelines for the Management of Transient Ischemic Attacks, American Heart Association, 1999.
- Sixth ACCP Consensus Conference on Antithrombotic Therapy, American College of Chest Physicians (ACCP), 2001.

Type of Measure: Process

Improvement Noted As: An increase in rate

Numerator Statement: Ischemic Stroke/TIA patient who had a lipid profile performed during hospitalization or within 30 days prior to hospitalization

Included Populations: Not applicable

Excluded Populations: None

Data Elements:

- Admission Date
- Discharge Date
- Lipid Profile (performed during hospitalization or within 30 days prior)

Denominator Statement: All Ischemic stroke/TIA patients

Included Populations:

- Patients with a diagnosis of ischemic stroke. Refer to Appendices, Table 1 for ICD-9-CM principal diagnosis codes for ischemic stroke.
- Patients with a diagnosis of Transient Ischemic Attack (TIA). Refer to Appendices, Table 3 ICD-9-CM for principal diagnosis codes for TIA.

Excluded Populations

- Patients who expired
- Patients who left against medical advice

Data Elements:

- Discharge Status
- ICD-9-CM Principal Diagnosis Code

Risk Adjustment: No

Data Collection Approach: Concurrent and retrospective data collection through administrative data/claims data, and medical record.

Age Groups: ≥ 18

Data Reported As: Proportion

Setting: Inpatient Hospital - Primary Stroke Centers

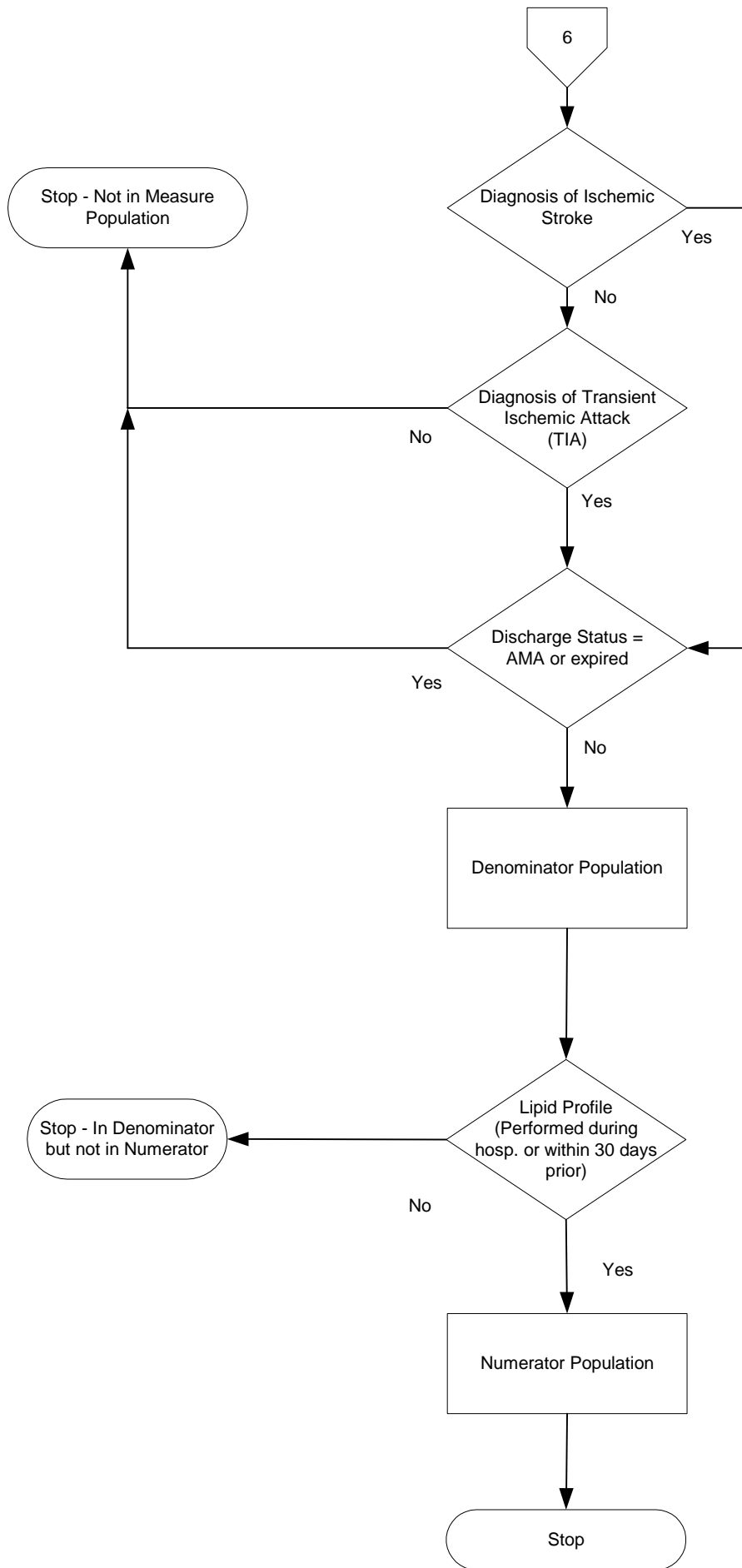
Report Period: Quarterly

Selected References:

Feinberg WM, Albers GW, Barnett HJM, et al. Guidelines for the Management of Transient Ischemic Attacks. From the Ad Hoc Committee on Guidelines for the Management of Transient Ischemic Attacks of the Stroke Council of the American Heart Association. 1994.

National Institutes of Health. Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III) Final Report. National Cholesterol Education Program National Heart, Lung, and Blood Institute National Institutes of Health. NIH Publication No. 12-5215. 2002

Wolf PA, Clagett GP, Easton JD, et al. Preventing ischemic stroke in patients with prior stroke and transient ischemic attack. A Statement for Healthcare Professional from the Council of the American Heart Association. Stroke 1999;30:1991-1994



Measure Information Form

DSC Measure Set: Stroke

Candidate Measure ID: DSC/Stroke - 7

Performance Measure Name: Screen for Dysphagia

A screen for dysphagia should be performed on all ischemic/hemorrhagic stroke patients before being given food, fluids, or medication by mouth.

Rationale: Dysphagia is a potentially serious outcome of stroke. The importance of assessing a patient's ability to swallow, before approving the oral intake of fluids or food, has been noted in multiple practice guidelines including the Agency for Healthcare Research and Quality (AHRQ) Post-Stroke Rehabilitation guideline. It has been estimated that 27-50% of stroke patients develop dysphagia. Furthermore, 43-54% of stroke patients with dysphagia will experience aspiration and of those patients 37% will develop pneumonia. If not part of a dysphagia diagnosis and treatment program, 3.8% of those with pneumonia will die. Other adverse outcomes include malnutrition, and increased length of hospital stay. Most guidelines include a recommendation that all patients be screened for their ability to swallow and those with abnormal results be referred for a complete examination. Findings indicate that pneumonia rates in this population may be reduced when a systematic program of diagnosis and treatment of dysphagia is included in an acute stroke management plan.

Clinical Practice Guideline Supporting Measure:

- Post-Stroke Rehabilitation Guideline, Agency for Healthcare Research and Quality (formerly Agency for Health Care Policy and Research), 1995
- Management of Patients with Stroke, Assessment, investigation, immediate management and secondary prevention, Scottish Intercollegiate Guideline Network, 1997
- Management of Patients with Stroke, Identification and Management of Dysphagia Scottish Intercollegiate Guideline Network, 1997
- Kaiser Permanente Clinical Practice Guidelines for Acute Stroke Quartet III Inpatient Management, 1998
- VA/DoD Clinical Practice Guideline for the Management of Stroke Rehabilitation in the Primary Care Setting, Department of Veteran Affairs Department of Defense, 2003

Type of Measure: Process

Improvement Noted As: An increase in rate

Numerator Statement: Patients who were screened for dysphagia before taking any food, fluids, or medications by mouth

Included Populations: Not applicable

Excluded Populations: None

Data Elements:

- Dysphagia Screen Performed Prior to Oral Intake

Denominator Statement: All patients with acute ischemic/hemorrhagic stroke

Included Populations:

- Patients with a diagnosis of ischemic stroke. Refer to Appendices, Table 1 for ICD-9-CM principal diagnosis codes for ischemic stroke.
- Patients with a diagnosis of hemorrhagic stroke. Refer to Appendices, Table 2 ICD-9-CM for principal diagnosis codes for hemorrhagic stroke.

Excluded Populations:

- Reasons for not performing dysphagia screen

Data Elements:

- Reasons for not performing dysphagia screen
- ICD-9-CM Principal Diagnosis Code

Risk Adjustment: No

Data Collection Approach: Concurrent and retrospective data collection through administrative data/claims data, and medical record.

Data Accuracy:

ICD-9-CM Codes: Variation may exist in the assignment of ICD-9-CM codes; therefore, coding practices may require evaluation to ensure consistency.

Age Groups: Age \geq 18

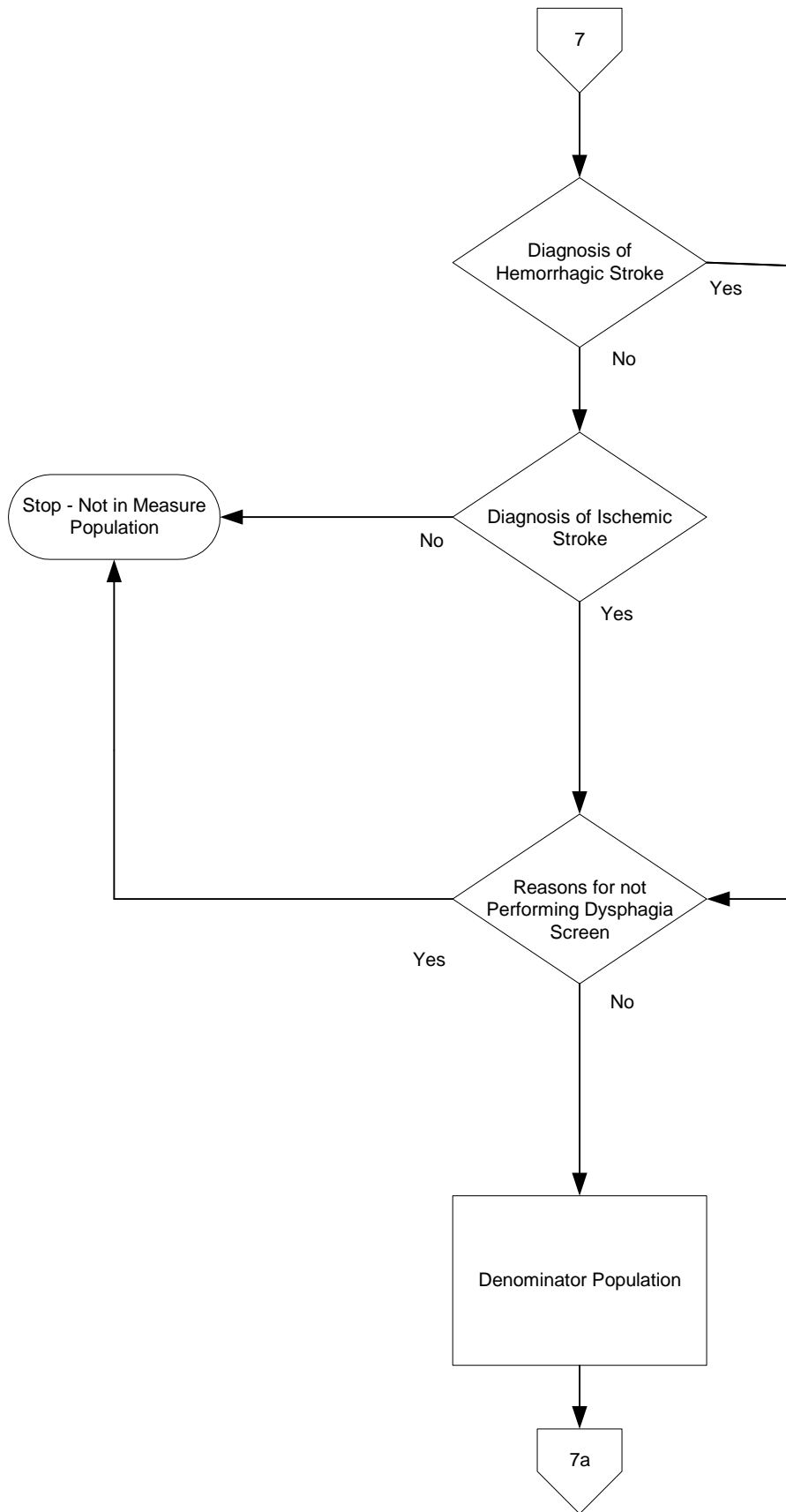
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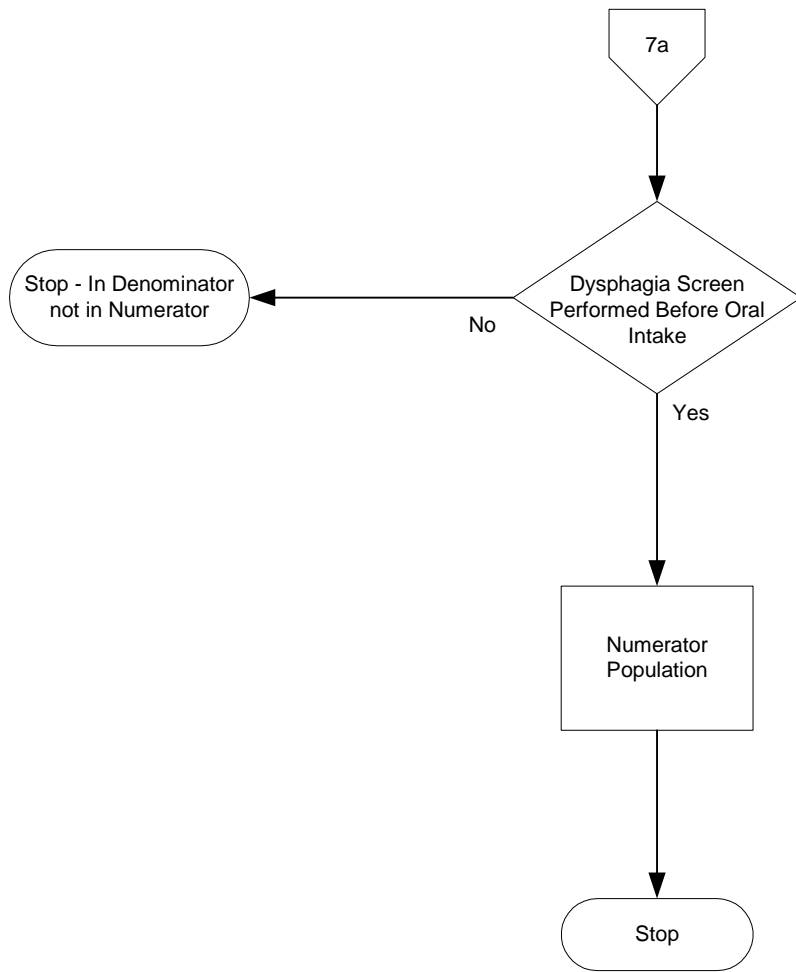
Setting: Primary Stroke Centers

Report Period: Quarterly

Selected References:

ECRI Investigators. Diagnosis and treatment of swallowing disorders (dysphagia) in acute-care stroke. Agency for Health Care Policy and Research. Evidence Report/Technology Assessment: Number 8. 1999.





Measure Information Form

DSC Measure Set: Stroke

Candidate Measure ID: DSC/Stroke-8

Performance Measure Name: Stroke Education

Stroke education and/or resources received by patient and/or caregiver for patients with ischemic stroke, hemorrhagic stroke, or transient ischemic attack (TIA).

Rationale: There are many examples of how patient education programs for specific chronic conditions have increased healthful behaviors, improved health status, and/or decreased health care costs of their participants. Clinical practice guidelines include recommendations for patient and family education during hospitalization as well as information about resources for social support services. Some clinical trials have shown measurable benefits in patient and caregiver outcomes with the application of education and support strategies. The advent of a stroke will have a significant impact on both the patient and the family. The type of stroke experienced and the resulting outcomes will play a large role in determining not only the course of treatment but also what education will be required. Patient education should include information about the event (e.g., cause, treatment, risk factors) as well as desirable lifestyle modification. Family/caregivers will also need guidance in planning effective and realistic care strategies appropriate to the patient's prognosis and potential rehabilitation in the home setting.

Clinical Practice Guideline Supporting Measure:

- Kaiser Permanente Clinical Practice Guidelines for Acute Stroke, Kaiser Permanente Medical Group, 1998
- Post Stroke Rehabilitation, Clinical Practice Guideline No.16, Agency for Health Care Policy and Research (now known as Agency for Healthcare Research and Quality), 1995

Type of Measure: Process

Improvement Noted As: An increase in rate

Numerator Statement: Patients and/or caregivers who received education and/or resource materials during hospitalization.

Included Populations: Not applicable

Excluded Populations: None

Data Elements:

- Stroke Education

Denominator Statement: All patients with ischemic stroke, hemorrhagic stroke, or transient ischemic attack (TIA)

Included Populations:

- Patients with a diagnosis of ischemic stroke. Refer to Appendices, Table 1 for ICD-9-CM principal diagnosis codes for ischemic stroke.
- Patients with a diagnosis of hemorrhagic stroke. Refer to Appendices, Table 2 ICD-9-CM for principal diagnosis codes for hemorrhagic stroke.
- Patients with a diagnosis of TIA. Refer to Appendices, Table 3 ICD-9-CM for principal diagnosis codes for TIA.

Excluded Populations:

- Patients who expired
- Patients discharged against medical advice
- Patients discharged/transferred to another short term hospital for inpatient care

Data Elements:

- ICD-9-CM Principal Diagnosis Code
- Discharge Status

Risk Adjustment: No

Data Collection Approach: Concurrent and retrospective data collection through administrative data/claims data, and medical record.

Age Groups: Age \geq 18

Data Reported As: Proportion

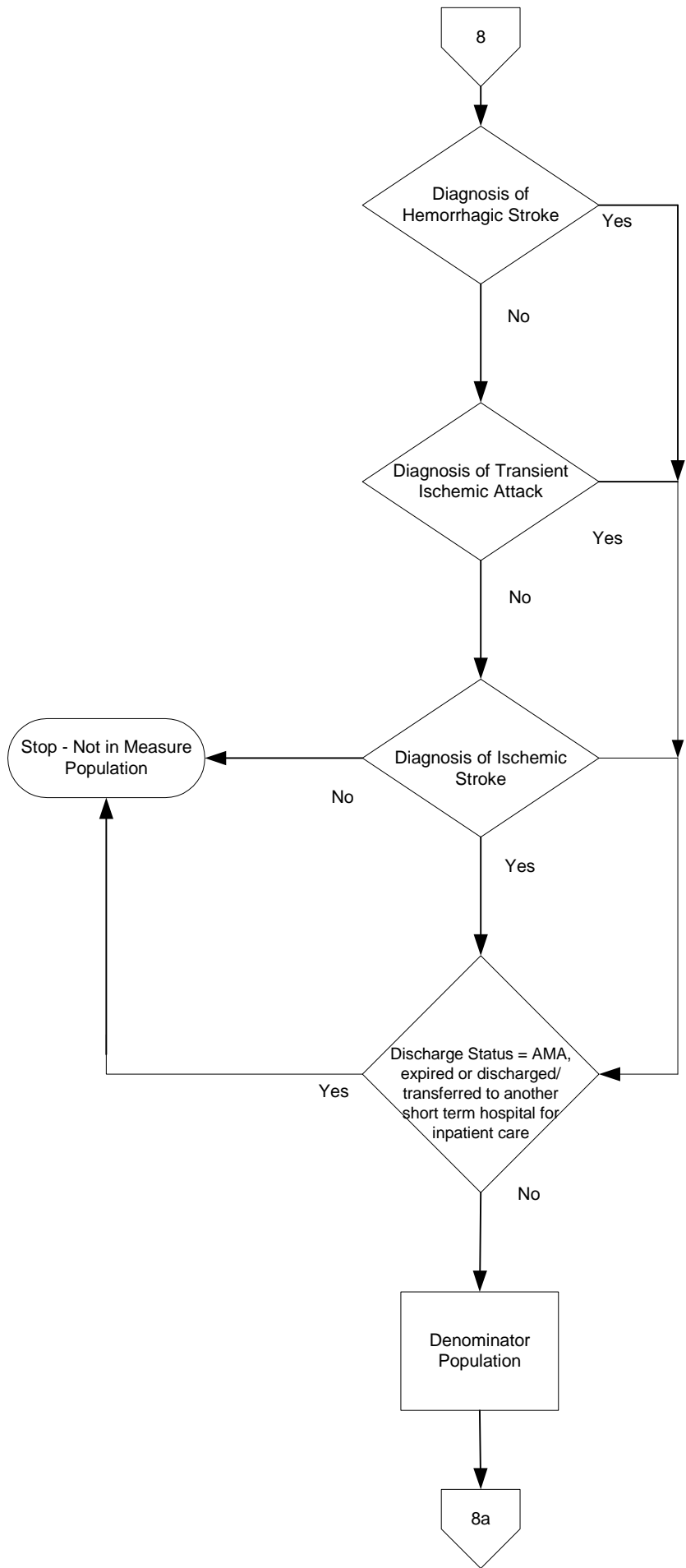
Setting: Inpatient Hospital - Primary Stroke Centers

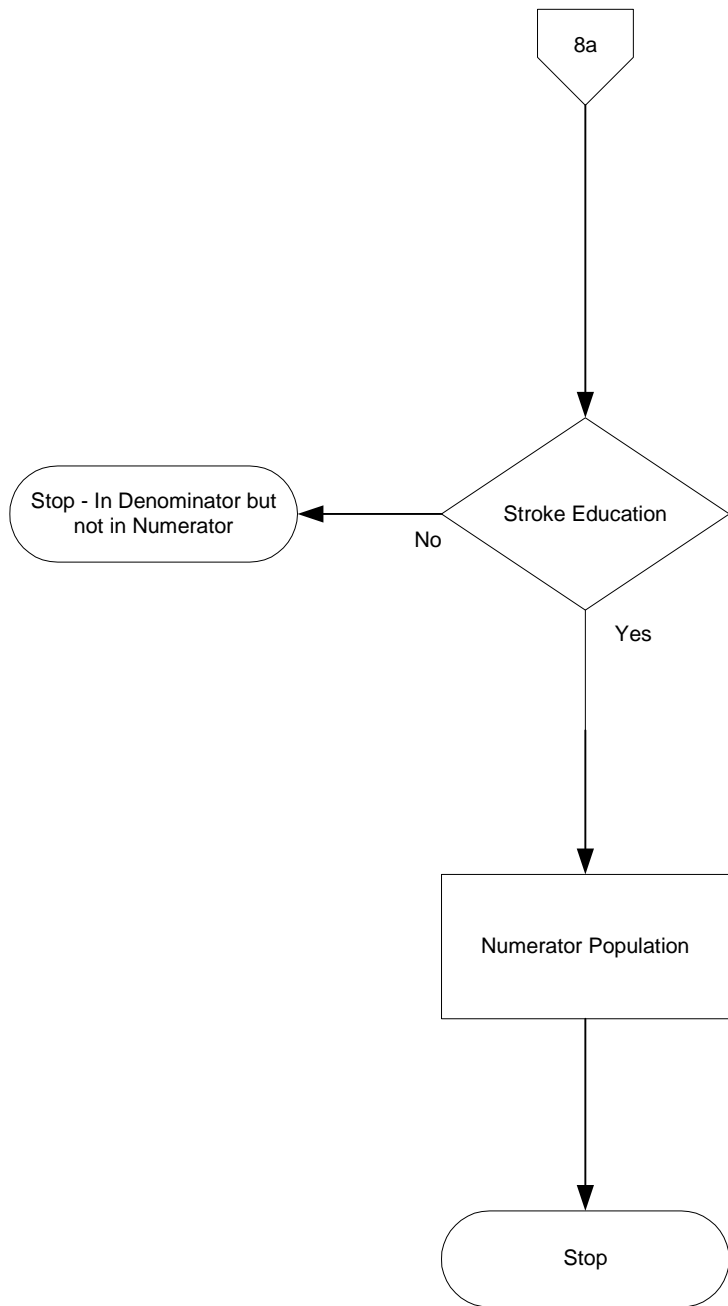
Report Period: Quarterly

Selected References:

Evans RL, Matlock AL, Bishop DS, Stranahan S, Pederson C. Family intervention after stroke: Does counseling or education help? *Stroke* 1988;19:1243-1249.

Loring KR, Sobel DS, Stewart AL, et al. Evidence suggesting that a chronic disease self-management program can improve health status while reducing hospitalization: A randomized trial. *Medical Care* 1999;37:5-14.





Measure Information Form

DSC Measure Set: Stroke

Candidate Measure ID: DSC/Stroke-9

Smoking Cessation Performance Measure Name: Smoking Cessation

Adult smoking cessation advice/counseling for patients with ischemic stroke, hemorrhagic stroke, or transient ischemic attack (TIA).

Rationale: 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.

Clinical Practice Guideline Supporting Measure:

- AHA Scientific Statement - Guidelines for Carotid Endarterectomy: A statement of healthcare professionals from a special writing group of the stroke council, American Heart Association, 1998
- Management of Patients with Stroke. Rehabilitation, Prevention and Management of Complications and Discharge Planning, Scottish Intercollegiate Guidelines network, 2002
- Smoking Cessation. Clinical Practice Guideline No. 18. U.S. Department of Health and Human Services and Public Health Service, Agency for Health Care Policy and Research, 1996

Type of Measure: Process

Improvement Noted As: An increase in rate.

Numerator Statement: Stroke patients who receive smoking cessation advice or counseling during hospitalization.

Included Populations: Not applicable

Excluded Populations: None

Data Elements:

- Adult Smoking Cessation Counseling

Denominator Statement: Acute ischemic stroke, hemorrhagic stroke or transient ischemic attack (TIA) patients with a history of smoking cigarettes in the year prior to hospital admission.

Included Populations:

- Patients with a diagnosis of ischemic stroke. Refer to Appendices, Table 1 for ICD-9-CM principal diagnosis codes for ischemic stroke.
- Patients with a diagnosis of hemorrhagic stroke. Refer to Appendices, Table 2 ICD-9-CM for principal diagnosis codes for hemorrhagic stroke.
- Patients with a diagnosis of TIA. Refer to Appendices, Table 3 ICD-9-CM for principal diagnosis codes for TIA.
- Stroke/TIA patients with a history of smoking cigarettes in the year prior to admission.

Excluded Populations:

- Patients discharged/transferred to another short term hospital for inpatient care
- Patients who expired
- Patients who left against medical advice
- Patients discharged to hospice
- Reasons for not conducting smoking cessation counseling

Data Elements:

- ICD-9-CM Principal Diagnosis Code
- Adult Smoking History
- Discharge Status
- Reasons for not providing smoking cessation counseling

Risk Adjustment: No

Data Collection Approach: Concurrent and retrospective data collection through administrative data/claims data, and medical record.

Age Groups: ≥ 18

Data Reported As: Proportion

Setting: Inpatient Hospital - Primary Stroke Centers

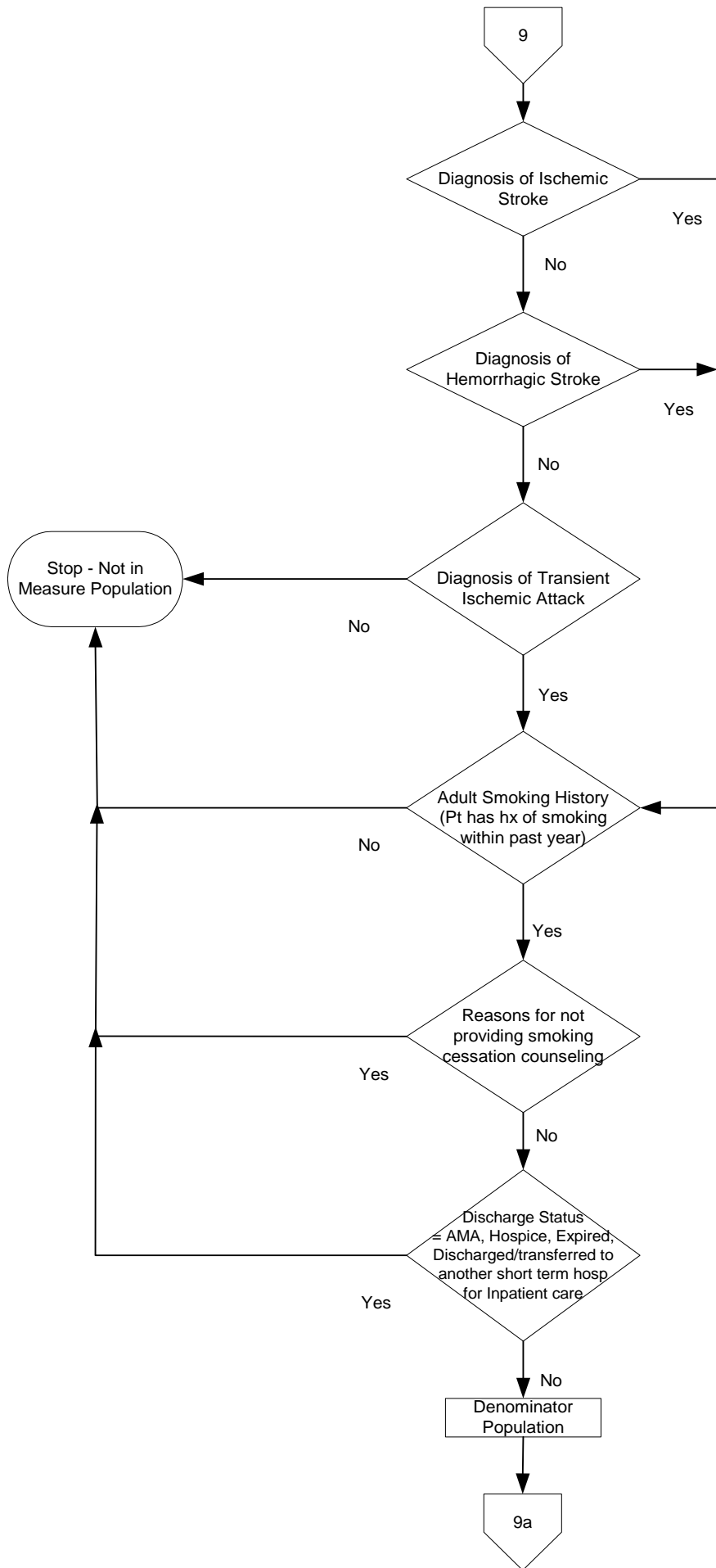
Report Period: Quarterly

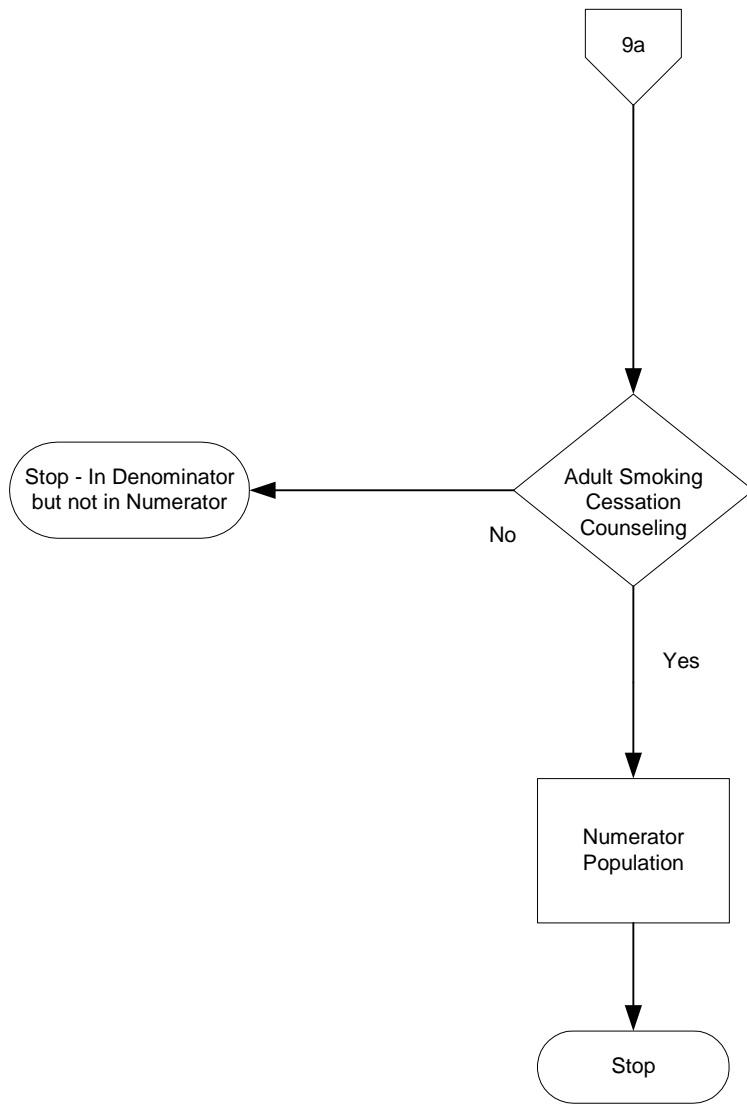
Selected References:

Ockene IS, Miller NH. Cigarette Smoking, Cardiovascular Disease and Stroke. *Circulation* 1997;96:3243-3247.

Smith, PEM. Smoking and stroke: a causative role. (Editorial) *Br Med J* 1998;317:962-3

Wolf P, Kannel W, Bonita R, Belanger A. Cigarette smoking as a risk factor for stroke: The Framingham Study. *JAMA* 1988;259:1025-1029.





Measure Information Form

DSC Measure Set: Stroke

Candidate Measure ID: DSC/Stroke-10

Performance Measure Name: A Plan for Rehabilitation Was Considered

Patients with an ischemic stroke or hemorrhagic stroke who were assessed for or received rehabilitation services.

Rationale: Each year about 700,000 people experience a new or recurrent stroke, which is the nation's third leading cause of death. Approximately two thirds of these individuals survive and require rehabilitation. Stroke is a leading cause of serious, long-term disability in the United States, with about 4.4 million stroke survivors alive today. Forty percent of stroke patients are left with moderate functional impairment and 15 to 30 percent with severe disability. More than 60% of those who have experienced stroke, serious injury, or a disabling disease have never received rehabilitation. Stroke rehabilitation should begin as soon as the diagnosis of stroke is established and life-threatening problems are under control. Among the high priorities for stroke are to mobilize the patient and encourage resumption of self-care activities as soon as possible. A considerable body of evidence indicates better clinical outcomes when patients with stroke are treated in a setting that provides coordinated, multidisciplinary stroke-related evaluation and services. Effective rehabilitation interventions initiated early following stroke can enhance the recovery process and minimize functional disability. The primary goal of rehabilitation is to prevent complications, minimize impairments, and maximize function.

Clinical Practice Guidelines Supporting Measure:

- VA/DoD Clinical Practice Guideline for the Management of Stroke Rehabilitation in the Primary Care Setting, 2003
- Post Stroke Rehabilitation, Clinical Practice Guideline No.16, Agency for Health Care Policy and Research (now known as Agency for Healthcare Research and Quality), 1995
- Management of patients with stroke. Rehabilitation, prevention and management of complications, and discharge planning, Scottish Intercollegiate network Guidelines Network (SIGN), 2002

Type of Measure: Process

Improvement Noted As: An increase in rate

Numerator Statement: Patients who were assessed for or received rehabilitation services

Included Populations: Not applicable

Excluded Populations: None

Data Elements:

- Patients Assessed for or Received Rehabilitation Services

Denominator Statement: All patients with ischemic stroke, or hemorrhagic stroke

Included Populations:

- Patients with a diagnosis of ischemic stroke. Refer to Appendices, Table 1 for ICD-9-CM principal diagnosis codes for ischemic stroke.
- Patients with a diagnosis of hemorrhagic stroke. Refer to Appendices, Table 2 ICD-9-CM for principal diagnosis codes for hemorrhagic stroke.
- Age \geq 18 years

Excluded Populations:

- Patients discharged/transferred to another short term hospital for inpatient care
- Patients who expired
- Patients who left against medical advice

Data Elements:

- Discharge Status
- ICD-9-CM Principal Diagnosis Code

Risk Adjustment: No

Data Collection Approach: Concurrent and retrospective data collection through administrative data/claims data, and medical record.

Age Groups: \geq 18

Data Reported As: Proportion

Setting: Inpatient Hospital - Primary Stroke Centers

Report Period: Quarterly

Selected References:

American Academy of Physical Medicine and Rehabilitation. *Rehabilitation Helps Stroke Patients Recover Skills*. AAPM&R Chicago, IL Office: Author. Retrieved July 7, 2004 from World Wide Web: <http://www.aapmr.org/condtreat/rehab/recover.htm>.

American Academy of Physical Medicine and Rehabilitation. *Urgency Key But Persistence Pays Off*. AAPM&R Chicago, IL Office: Author. Retrieved July 7, 2004 from World Wide Web: <http://www.aapmr.org/condtreat/rehab/recover.htm>.

American Academy of Physical Medicine and Rehabilitation. *Rehabilitation Helps Stroke Patients Recover Skills Therapy Helps in Regaining Coordination, Full Speech, and Other Abilities*. AAPM&R Chicago, IL Office: Author. Retrieved July 7, 2004 from World Wide Web: <http://www.aapmr.org/condtreat/rehab/recover.htm>.

National Institute of Neurological Disorders. *Post-Stroke Rehabilitation Fact Sheet*. National Institute of Neurological Disorders Bethesda, MD Office: Author. Retrieved July 7, 2004 from World Wide Web: http://www.ninds.nih.gov/health_and_medical/pubs/poststrokerehab.htm

