

## STROKE

### DISEASE-SPECIFIC CARE STAGE II PERFORMANCE MEASURES

Set No.	Harmonized DSC Stroke Measure Name
STK-1	Deep Vein Thrombosis (DVT) Prophylaxis
STK-2	Discharged on Antithrombotic Therapy
STK-3	Patients with Atrial Fibrillation/Flutter Receiving Anticoagulation Therapy
STK-4	Thrombolytic Therapy Administered
STK-5	Antithrombotic Therapy By End of Hospital Day Two
STK-6	Discharged on Statin Medication
STK-7	Dysphagia Screening
STK-8	Stroke Education
STK-9	Smoking Cessation / Advice / Counseling
STK-10	Assessed for Rehabilitation

**Note:** \* DSC Stroke Performance Measure Set following harmonization of measure specifications with the Paul Coverdell National Acute Stroke Registry and American Heart Association / American Stroke Association GET WITH THE GUIDELINES<sup>SM</sup>.

\*\* DSC certification for Primary Stroke Centers requires data collection for all 10 measures in the set.

## 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 case identification for analysis purposes. The first data elements listed are for administrative purposes in the dataset.

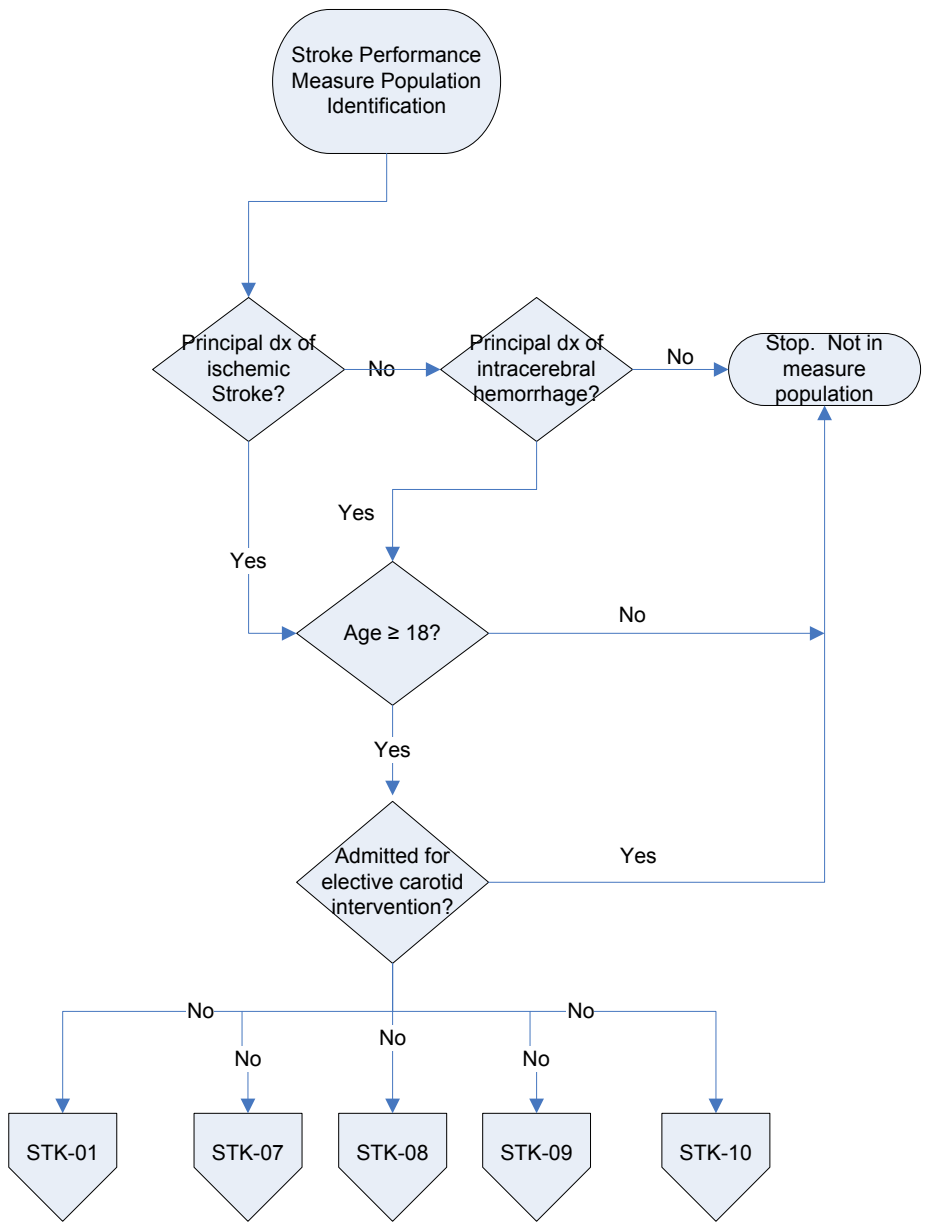
### **Case Identifier Gender**

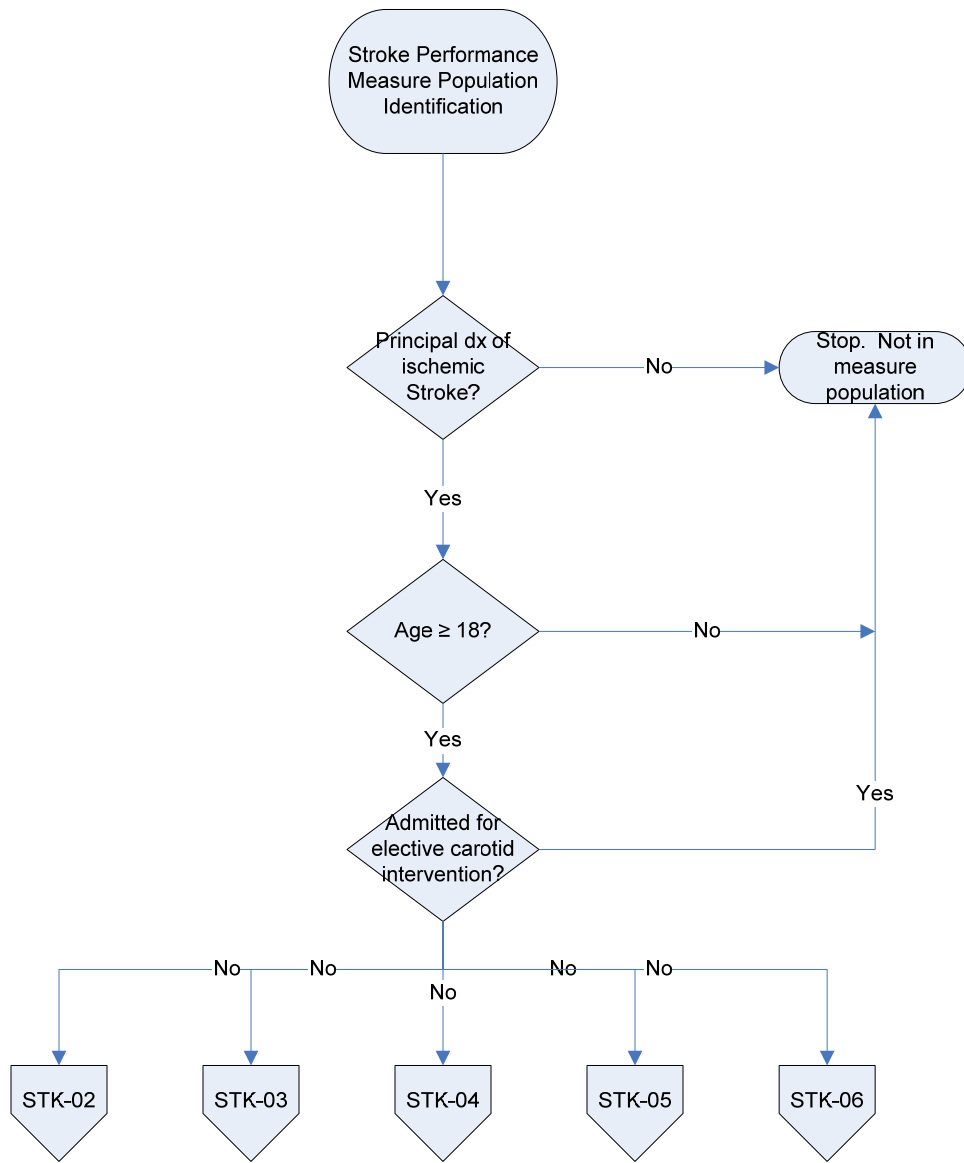
The data elements listed next define the general pool of patients/participants who are eligible for consideration in each of the stroke measure populations. A flowchart follows that depicts the evaluation process for inclusion in the general population.

### **Diagnosis of Ischemic Stroke or Hemorrhagic Stroke (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 diagnoses of ischemic stroke and hemorrhagic stroke. Each measure includes patients from one or both categories. The ICD-9-CM Principal Diagnosis Code that is used to identify the measure population is provided in tables found in the appendices (See Table 1 & Table 2). The following table identifies the population included in each measure:

<b>No.</b>	<b>Measure</b>	<b>Ischemic</b>	<b>Hemorrhagic</b>
STK-1	Deep Vein Thrombosis (DVT) Prophylaxis	X	X
STK-2	Discharged on Antithrombotic Therapy	X	
STK-3	Patients with Atrial Fibrillation/Flutter Receiving Anticoagulation Therapy	X	
STK-4	Thrombolytic Therapy Administered	X	
STK-5	Antithrombotic Therapy By End of Hospital Day Two	X	
STK-6	Discharged on Statin Medication	X	
STK-7	Dysphagia Screening	X	X
STK-8	Stroke Education	X	X
STK-9	Smoking Cessation / Advice / Counseling	X	X
STK-10	Assessed for Rehabilitation	X	X





## Measure Information Form

**DSC Measure Set:** Stroke

**Candidate Measure ID:** DSC/Stroke-01

**Performance Measure Name: Deep Vein Thrombosis (DVT) Prophylaxis**

Patients with an ischemic stroke or a hemorrhagic 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. Aspirin alone is not recommended as an agent to prevent DVT.

**Clinical Practice Guidelines Supporting Measure:**

Ralph L. Sacco, Robert Adams, Greg Albers, Mark J. Alberts, Oscar Benavente, ; Karen Furie, Larry B. Goldstein, Philip Gorelick, Jonathan Halperin, Robert Harbaugh, S. Claiborne Johnston, Irene Katzan, Margaret Kelly-Hayes, Edgar J. Kenton, Michael Marks, Lee H. Schwamm, Thomas Tomsick. Guidelines for Prevention of Stroke in Patients With Ischemic Stroke or Transient Ischemic Attack: A Statement for Healthcare Professionals From the American Heart Association/American Stroke Association Council on Stroke: Co-Sponsored by the Council on Cardiovascular Radiology and Intervention. *Stroke* Vol. 37, 2006:577  
Duncan et al, Stroke Rehabilitation Clinical Practice Guidelines (*Stroke*. 2005;36:e100-e143.)

Geerts WH, Pineo GF, Heit JA, et al. Prevention of venous thromboembolism: the Seventh ACCP Conference on Antithrombotic and Thrombolytic Therapy. *Chest*. Sep 2004;126(3 Suppl):338S-400S.

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 or hemorrhagic 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 2*

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

**Included Populations: \***

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

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

Patients who are non-ambulatory by end of hospital day 2

\* Refer to Get With The Guidelines & Coverdell specific processes for identifying populations for working rates

**Excluded Populations:**

Patients who are discharged prior to end of hospital day 2

Patients receiving comfort measures only by end of hospital day 2

Patients ambulating by end of hospital day 2

Patients admitted for the performance of elective carotid intervention

Patients less than 18 years of age

**Data Elements:****General data elements (applicable to all measures):**

*Admission Date*

*Arrival Date*

*Arrival Time*

*Birthdate*

*Case Identifier*

*Comfort Measures Only*

*Discharge Date*

*Discharge Status*

*Hispanic Ethnicity*

*ICD-9-CM Principal Diagnosis Code*

*Point of Origin for Admission or Visit*

*Race*

*Report Period*

*Sex*

**Clinical/measure specific data elements:**

*Patient Ambulatory at End of Hospital Day Two*

*Admitted for Elective Carotid Intervention*

**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:**  $\geq 18$

**Data Reported As:** Proportion

**Setting:** Inpatient Hospital - Primary Stroke Centers

**Report Period:** Quarterly with monthly data points

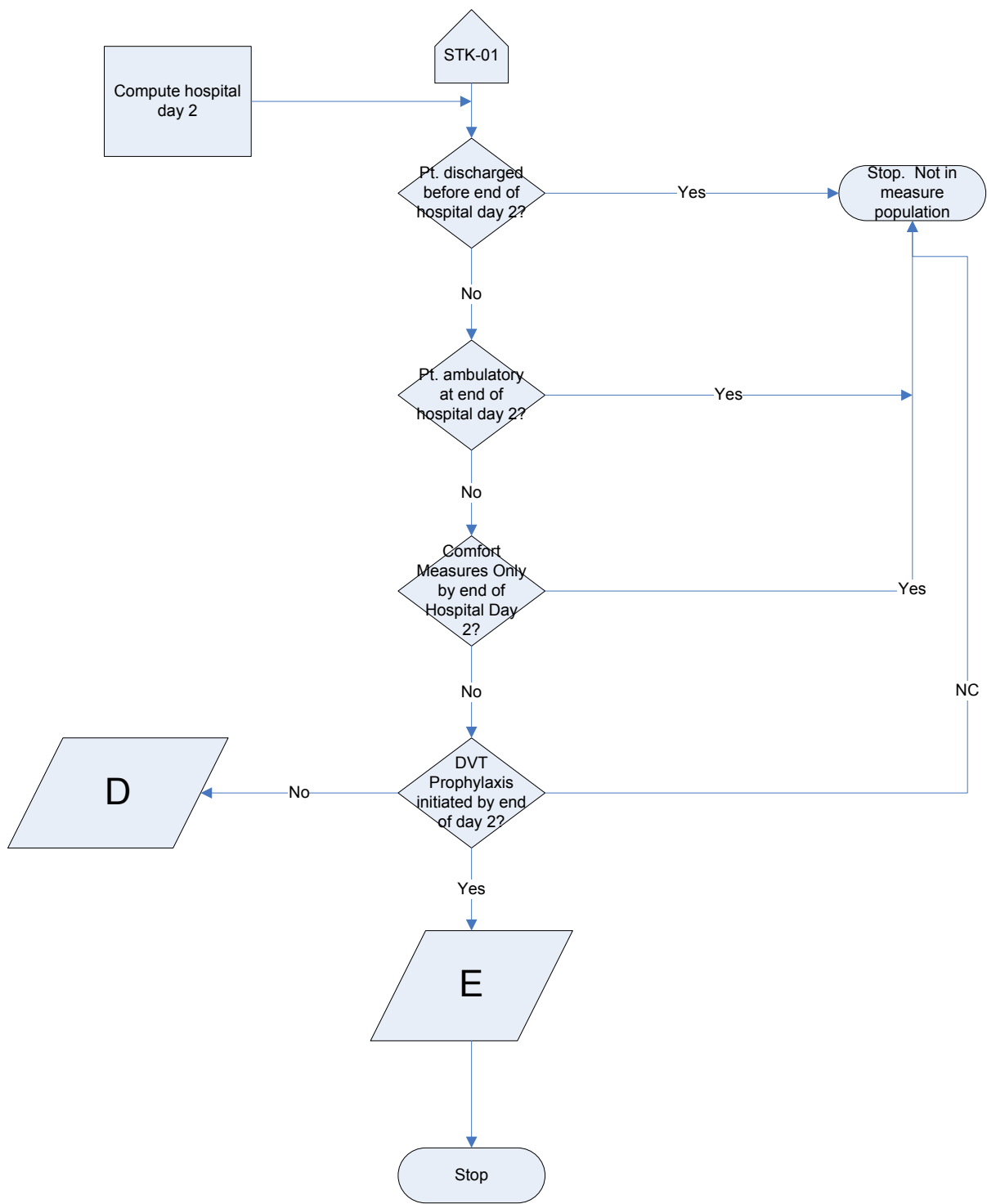
**Selected References:**

Gregory W. Albers, Pierre Amarenco, J. Donald Easton, Ralph L. Sacco, and Philip Teal  
Antithrombotic and Thrombolytic Therapy for Ischemic Stroke. *Chest* Vol. 119, 2001: 300-320

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.

# STK-01: DVT Prophylaxis



Rate =  $E / (D + E)$

## Measure Information Form

**DSC Measure Set:** Stroke

**Measure ID:** DSC/Stroke-02

**Performance Measure Name:** Discharged on Antithrombotic Therapy

Patients with an ischemic stroke prescribed antithrombotic therapy at discharge

**Rationale:** 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. Warfarin is not generally recommended for secondary stroke prevention in patients presumed to have a non-cardioembolic stroke.

Anticoagulants at doses to prevent deep vein thrombosis are insufficient antithrombotic therapy to prevent recurrent ischemic stroke or TIA.

### **Clinical Practice Guidelines Supporting Measure:**

Ralph L. Sacco, Robert Adams, Greg Albers, Mark J. Alberts, Oscar Benavente, ; Karen Furie, Larry B. Goldstein, Philip Gorelick, Jonathan Halperin, Robert Harbaugh, S. Claiborne Johnston, Irene Katzan, Margaret Kelly-Hayes, Edgar J. Kenton, Michael Marks, Lee H. Schwamm, Thomas Tomsick. Guidelines for Prevention of Stroke in Patients With Ischemic Stroke or Transient Ischemic Attack: A Statement for Healthcare Professionals From the American Heart Association/American Stroke Association Council on Stroke: Co-Sponsored by the Council on Cardiovascular Radiology and Intervention. *Stroke* Vol. 37, 2006:577

Gregory W. Albers, Pierre Amarenco, J. Donald Easton, Ralph L. Sacco, and Philip Teal Antithrombotic and Thrombolytic Therapy for Ischemic Stroke. *Chest* Vol. 119 2001: 300-320

Harold Adams, Robert Adams, Gregory Del Zoppo and Larry B. Goldstein. Guidelines for the Early Management of Patients With Ischemic Stroke: Guidelines Update A Scientific Statement From the Stroke Council of the American Heart Association/American Stroke Association. *Stroke* Vol. 36, 2005: 916:923

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.

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

**Type of Measure:** Process

**Improvement Noted As:** An increase in rate

**Numerator Statement:** Number of patients prescribed antithrombotic therapy at hospital discharge

**Included Populations:** Not applicable

**Excluded Populations:** None

**Data Elements:**

*Antithrombotic Therapy Prescribed at Discharge*

**Denominator Statement:** Number of patients with ischemic stroke

**Included Populations: \***

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

\* Refer to Get With The Guidelines & Coverdell specific processes for identifying populations for working rates

**Excluded Populations:**

Patients discharged/transferred to another short term general hospital for inpatient care

Patients who expired

Patients who left against medical advice

Patients discharged to hospice (home or facility)

Patients receiving comfort measures only

Patients for whom discharge destination cannot be determined or unknown

Patients admitted for the performance of elective carotid intervention

Patients less than 18 years of age

**Data Elements:**

**General data elements (applicable to all measures):**

*Admission Date*

*Arrival Date*

*Arrival Time*

*Birthdate*

*Case Identifier*

*Comfort Measures Only*

*Discharge Date*

*Discharge Status*

*Hispanic Ethnicity*

*ICD-9-CM Principal Diagnosis Code*

*Point of Origin for Admission or Visit*

*Race*

*Report Period*

*Sex*

**Clinical/measure specific data elements:**

*Admitted for Elective Carotid Intervention*

**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 with monthly data points

**Selected References:**

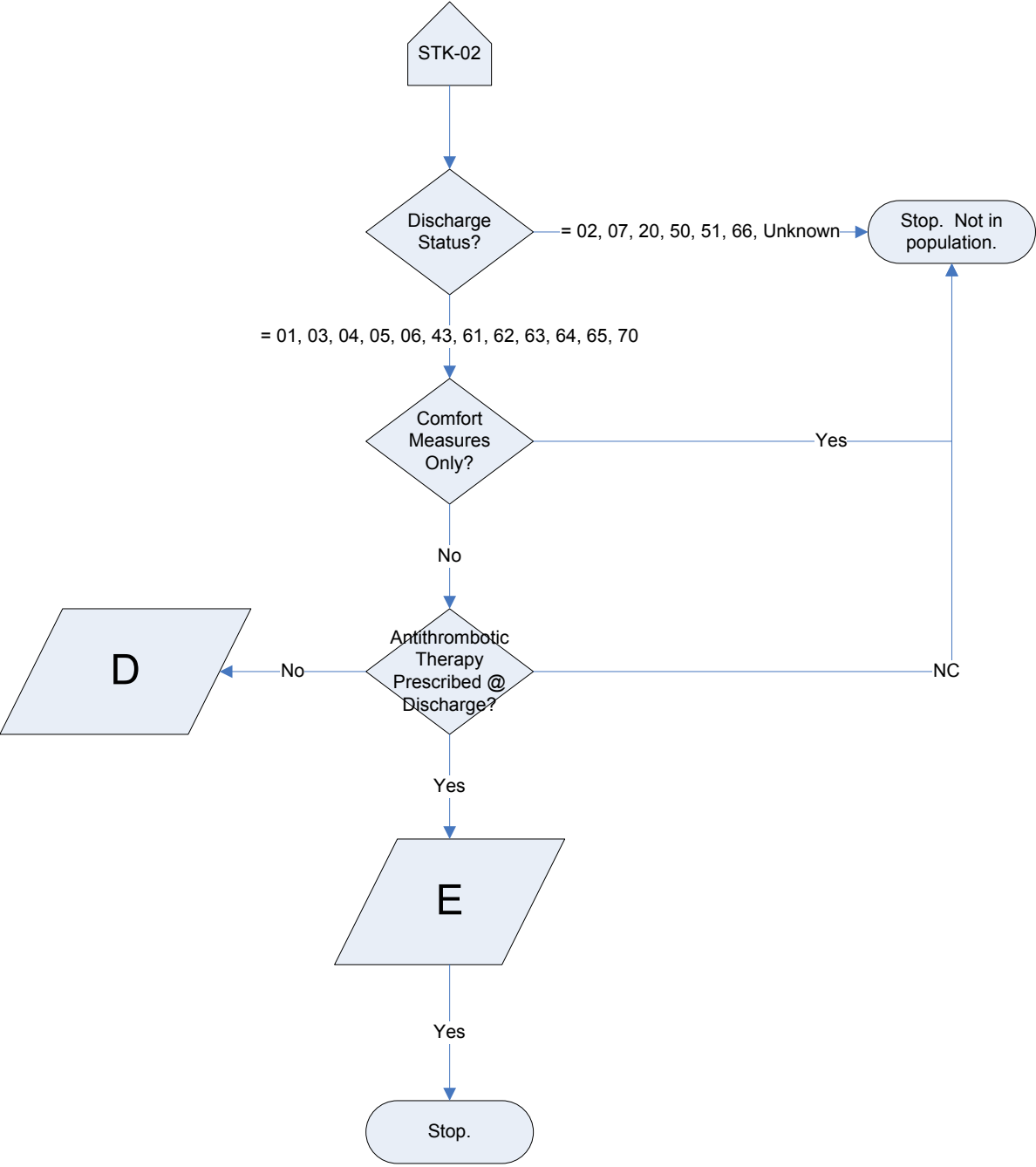
Harold Adams, Robert Adams, Gregory Del Zoppo and Larry B. Goldstein. Guidelines for the Early Management of Patients With Ischemic Stroke: Guidelines Update A Scientific Statement From the Stroke Council of the American Heart Association/American Stroke Association. *Stroke* Vol. 36, 2005: 916:923

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.

**STK-02: Discharged on Antithrombotic Therapy**



Rate =  $E / (D + E)$

## Measure Information Form

**DSC Measure Set:** Stroke

**Candidate Measure ID:** DSC/Stroke-03

**Performance Measure Name: Patients with Atrial Fibrillation/Flutter Receiving Anticoagulation Therapy**

Patients with an ischemic stroke with atrial fibrillation/flutter discharged on anticoagulation therapy.

**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 anticoagulation 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:**

Fuster et al., ACC/AHA/ESC Guidelines for the Management of Patients with Atrial Fibrillation, JACC Vol.38, August 2001:1231-6

Ralph L. Sacco, Robert Adams, Greg Albers, Mark J. Alberts, Oscar Benavente, ; Karen Furie, Larry B. Goldstein, Philip Gorelick, Jonathan Halperin, Robert Harbaugh, S. Claiborne Johnston, Irene Katzan, Margaret Kelly-Hayes, Edgar J. Kenton, Michael Marks, Lee H. Schwamm, Thomas Tomsick. Guidelines for Prevention of Stroke in Patients With Ischemic Stroke or Transient Ischemic Attack: A Statement for Healthcare Professionals From the American Heart Association/American Stroke Association Council on Stroke: Co-Sponsored by the Council on Cardiovascular Radiology and Intervention. *Stroke* Vol. 37, 2006:577  
Larry B. Goldstein, Chair; Robert Adams; Mark J. Albert; Lawrence J. Appel; Lawrence M. Brass; Cheryl D. Bushnell; Antonio Culebras; Thomas J. DeGrua; Philip B. Gorelick; John R. Guyton; Robert G. Hart; George Howard; Margaret Kelly-Hayes; J.V. (Ian) Nixon; Ralph L. Sacco. Primary Prevention of Ischemic Stroke: A Guideline From the American Heart Association/American Stroke Association Stroke Council: Cosponsored by the Atherosclerotic Peripheral Vascular Disease Interdisciplinary Working Group; Cardiovascular Nursing Council; Clinical Cardiology Council; Nutrition, Physical Activity, and Metabolism Council; and the Quality of Care and Outcomes Research Interdisciplinary Working Group: The American Academy of Neurology affirms the value of this guideline. *Stroke*. 2006;37:1583

**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/flutter.

**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 Codes 427.31 or 427.32.

\* Refer to Get With The Guidelines & Coverdell specific processes for identifying populations for working rates

**Excluded Populations:**

Patients discharged/transferred to another short term general hospital for inpatient care

Patients who expired

Patients who left against medical advice

Patients discharged to hospice (home or facility)

Patients receiving comfort measures only

Patients for whom discharge destination cannot be determined or unknown

Patients admitted for the performance of elective carotid intervention

Patients less than 18 years of age

**Data Elements:**

**General data elements (applicable to all measures):**

*Admission Date*

*Arrival Date*

*Arrival Time*

*Birthdate*

*Case Identifier*

*Comfort Measures Only*

*Discharge Date*

*Discharge Status*

*Hispanic Ethnicity*

*ICD-9-CM Principal Diagnosis Code*

*Point of Origin for Admission or Visit*

*Race*

*Report Period*

*Sex*

**Clinical/measure specific data elements:**

*Admitted for Elective Carotid Intervention*

*Atrial Fibrillation/Flutter*

**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

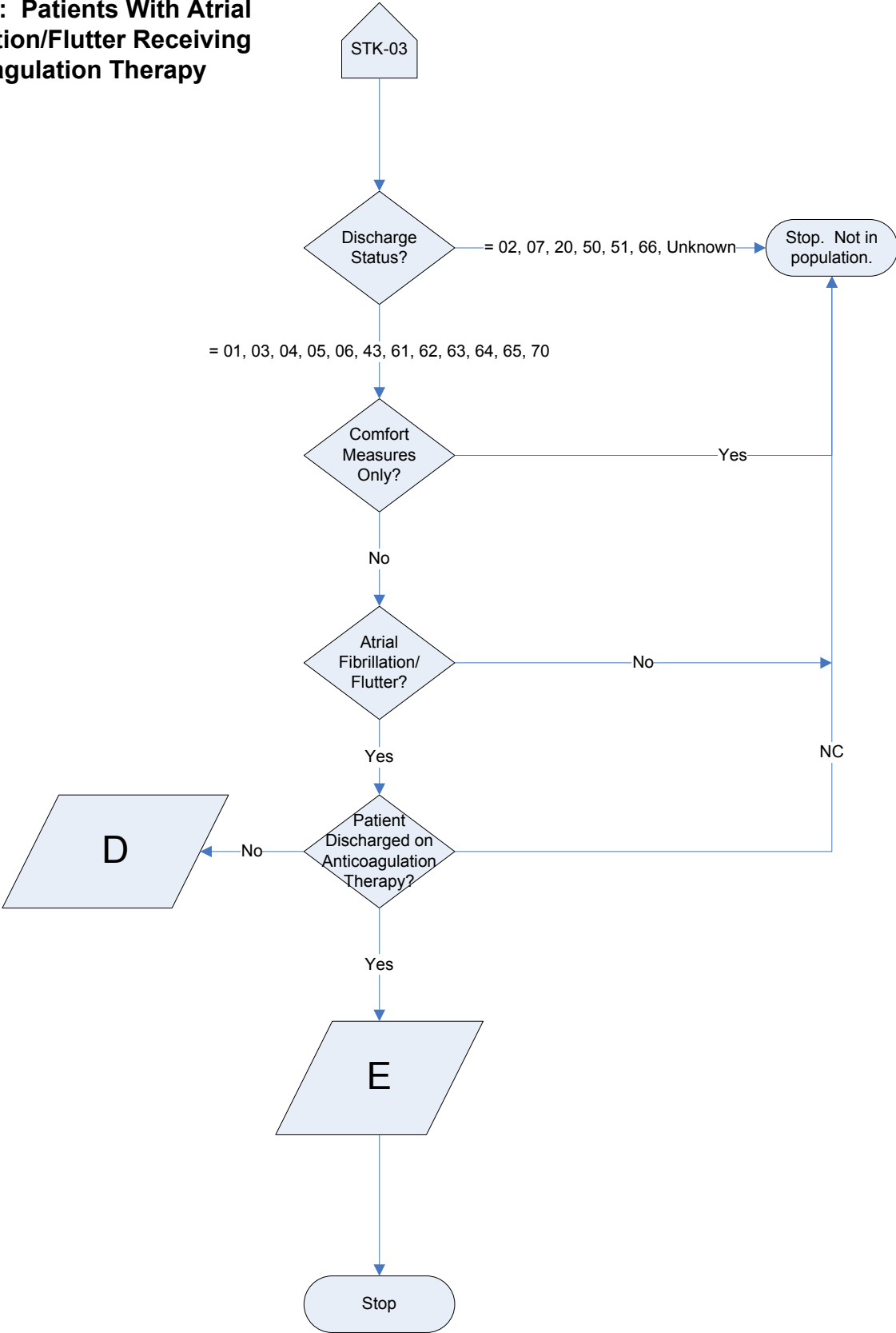
**Selected References:**

Ralph L. Sacco, Robert Adams, Greg Albers, Mark J. Alberts, Oscar Benavente, ; Karen Furie, Larry B. Goldstein, Philip Gorelick, Jonathan Halperin, Robert Harbaugh, S. Claiborne Johnston, Irene Katzan, Margaret Kelly-Hayes, Edgar J. Kenton, Michael Marks, Lee H. Schwamm, Thomas Tomsick. Guidelines for Prevention of Stroke in Patients With Ischemic Stroke or Transient Ischemic Attack: A Statement for Healthcare Professionals From the American Heart Association/American Stroke Association Council on Stroke: Co-Sponsored by the Council on Cardiovascular Radiology and Intervention. *Stroke* Vol. 37, 2006:577

Prevention of a First Stroke: A Review of Guidelines and a Multidisciplinary Consensus Statement from the National Stroke Association. National Stroke Association. *JAMA*. 1999;281:1112-1120.

Larry B. Goldstein, Chair; Robert Adams; Mark J. Albert; Lawrence J. Appel; Lawrence M. Brass; Cheryl D. Bushnell; Antonio Culebras; Thomas J. DeGraba; Philip B. Gorelick; John R. Guyton; Robert G. Hart; George Howard; Margaret Kelly-Hayes; J.V. (Ian) Nixon; Ralph L. Sacco. Primary Prevention of Ischemic Stroke: A Guideline From the American Heart Association/American Stroke Association Stroke Council: Cosponsored by the Atherosclerotic Peripheral Vascular Disease Interdisciplinary Working Group; Cardiovascular Nursing Council; Clinical Cardiology Council; Nutrition, Physical Activity, and Metabolism Council; and the Quality of Care and Outcomes Research Interdisciplinary Working Group: The American Academy of Neurology affirms the value of this guideline. *Stroke*. 2006;37:1583

**STK-03: Patients With Atrial Fibrillation/Flutter Receiving Anticoagulation Therapy**



Rate =  $E/(D + E)$

## Measure Information Form

**DSC Measure Set:** Stroke

**Candidate Measure ID:** DSC/Stroke-04: Thrombolytic Therapy Administered

**Performance Measure Name:** Acute ischemic stroke patients who arrive at the hospital within 120 minutes (2 hours) of time last known well and for whom IV t-PA was initiated at this hospital within 180 minutes (3 hours) of time last known well.

**Rationale:** The administration of thrombolytic agents to carefully screened, eligible patients with acute ischemic stroke has been shown to be beneficial in several 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. A large meta-analysis controlling for factors associated with stroke outcome confirmed the benefit of IV tPA in patients treated within 3 hours of symptom onset. While controversy still exists among some specialists, the major society practice guidelines developed in the United States all recommend the use of IV t-PA for eligible patients. Physicians with experience and skill in stroke management and the interpretation of CT scans should supervise treatment.

### **Clinical Practice Guidelines Supporting Measure:**

Ralph L. Sacco, Robert Adams, Greg Albers, Mark J. Alberts, Oscar Benavente, ; Karen Furie, Larry B. Goldstein, Philip Gorelick, Jonathan Halperin, Robert Harbaugh, S. Claiborne Johnston, Irene Katzan, Margaret Kelly-Hayes, Edgar J. Kenton, Michael Marks, Lee H. Schwamm, Thomas Tomsick. Guidelines for Prevention of Stroke in Patients With Ischemic Stroke or Transient Ischemic Attack: A Statement for Healthcare Professionals From the American Heart Association/American Stroke Association Council on Stroke: Co-Sponsored by the Council on Cardiovascular Radiology and Intervention. *Stroke* Vol. 37, 2006:577  
Harold Adams, Robert Adams, Gregory Del Zoppo and Larry B. Goldstein. American Heart Association/American Stroke Association Guidelines Update A Scientific Statement From the Stroke Council of the Guidelines for the Early Management of Patients With Ischemic Stroke: 2005, *Stroke* 2005;36:916-923.

Diagnosis and Initial Treatment of Ischemic Stroke, Institute for Clinical Systems Improvement (ICSI), 2001.

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.  
Antithrombotic and Thrombolytic Therapy for Ischemic Stroke The Seventh ACCP Conference on Antithrombotic and Thrombolytic Therapy. Gregory W. Albers, MD, Chair; Pierre Amarengo, MD; J. Donald Easton, MD; Ralph L. Sacco, MD; and Philip Teal, MD (CHEST 2004; 126:483S-512S)

**Type of Measure:** Process

**Improvement Noted As:** An increase in rate

**Numerator Statement:** The number of patients for whom IV thrombolytic therapy was initiated at this hospital within 3 hours ( $\leq$  180 minutes) of time last known well.

**Included Populations:** Not applicable

**Excluded Populations:** None

**Data Elements:**

*Date IV Thrombolytic Administered at This Hospital*  
*Date Last Known Well*  
*IV Thrombolytic Administered*  
*Time IV Thrombolytic Administered at This Hospital*  
*Time Last Known Well*

**Denominator Statement:** All patients with acute ischemic stroke whose time of arrival is within 2 hours (120 minutes) of time last known well.

**Included Populations: \***

Patients with a diagnosis of ischemic stroke. (Refer to Appendices, Table 1 for ICD-9-CM principal diagnosis codes for ischemic stroke)  
Time last known well  $\leq$  2 hours from arrival time

\* Refer to Get With The Guidelines & Coverdell specific processes for identifying populations for working rates

**Excluded Populations:**

Patients admitted for the performance of elective carotid intervention  
Patients less than 18 years of age  
Time last known well to arrival in the emergency department greater than (>) 2 hours or unknown

**Data Elements:**

**General data elements (applicable to all measures):**

*Admission Date*  
*Arrival Date*  
*Arrival Time*  
*Birthdate*  
*Case Identifier*  
*Comfort Measures Only*  
*Discharge Date*  
*Discharge Status*  
*Hispanic Ethnicity*  
*ICD-9-CM Principal Diagnosis Code*  
*Point of Origin for Admission or Visit*  
*Race*  
*Report Period*  
*Sex*

**Clinical/measure specific data elements:**

*Date Last Known Well*  
*Time Last Known Well*  
*Admitted for Elective Carotid Intervention*

**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:**  $\geq 18$

**Data Reported As:** Proportion

**Setting:** Inpatient Hospital - Primary Stroke Centers

**Report Period:** Quarterly with monthly data points

**Selected References:**

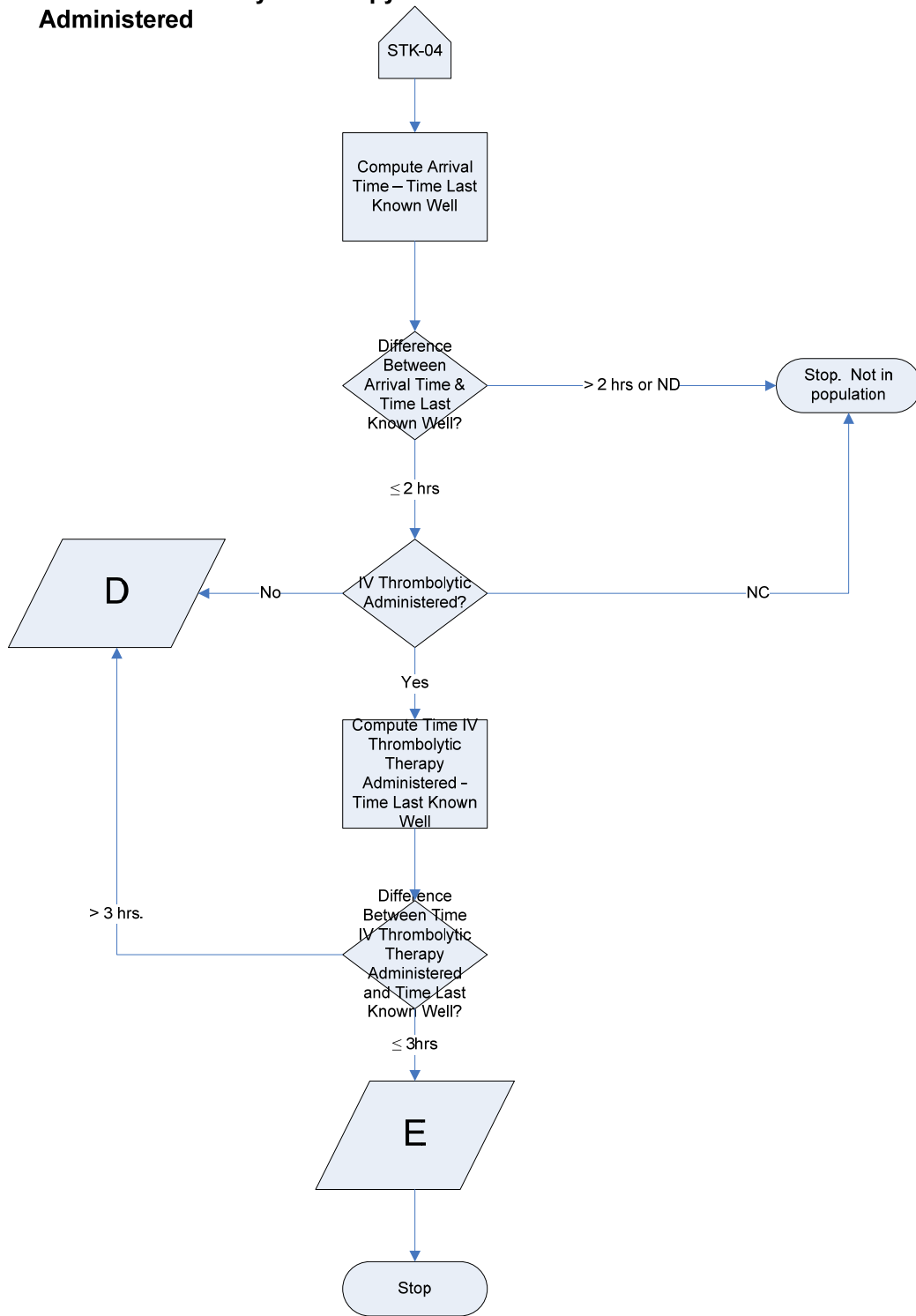
Hacke W, Kaste M, Fieschi C, et al. Intravenous thrombolysis with recombinant tissue plasminogen activator for acute hemispheric stroke. The European Cooperative Acute Stroke Study (ECASS). JAMA 1995;274:1017-1025.

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.

**STK-04: Thrombolytic Therapy Administered**



Rate =  $E/(D + E)$

## Measure Information Form

**DSC Measure Set:** Stroke

**Candidate Measure ID:** DSC/Stroke-05

**Performance Measure Name:** Antithrombotic Therapy By End of Hospital Day Two

Patients with ischemic stroke who receive antithrombotic therapy by the end of hospital day two.

**Rationale:** 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 initiated within 48 hours of symptom onset in acute ischemic stroke patients to reduce stroke mortality and morbidity as long as no contraindications exist.

Anticoagulants at doses to prevent deep vein thrombosis are insufficient antithrombotic therapy to prevent recurrent ischemic stroke or TIA.

### **Clinical Practice Guidelines Supporting Measure:**

Ralph L. Sacco, Robert Adams, Greg Albers, Mark J. Alberts, Oscar Benavente, ; Karen Furie, Larry B. Goldstein, Philip Gorelick, Jonathan Halperin, Robert Harbaugh, S. Claiborne Johnston, Irene Katzan, Margaret Kelly-Hayes, Edgar J. Kenton, Michael Marks, Lee H. Schwamm, Thomas Tomsick. Guidelines for Prevention of Stroke in Patients With Ischemic Stroke or Transient Ischemic Attack: A Statement for Healthcare Professionals From the American Heart Association/American Stroke Association Council on Stroke: Co-Sponsored by the Council on Cardiovascular Radiology and Intervention. *Stroke* Vol. 37, 2006:577  
Gregory W. Albers, Pierre Amarenco, J. Donald Easton, Ralph L. Sacco, and Philip Teal Antithrombotic and Thrombolytic Therapy for Ischemic Stroke. *Chest* Vol. 119 2001: 300-320

Harold Adams, Robert Adams, Gregory Del Zoppo and Larry B. Goldstein. American Heart Association/American Stroke Association Guidelines Update A Scientific Statement From the Stroke Council of the Guidelines for the Early Management of Patients With Ischemic Stroke: 2005, *Stroke* 2005;36:916-923.

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.

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

**Type of Measure:** Process

**Improvement Noted As:** An increase in rate

**Numerator Statement:** Patients with ischemic stroke who receive antithrombotic therapy by end of hospital day two

**Included Populations:** Not applicable

**Excluded Populations:** None

**Data Elements:**

*Antithrombotic Therapy Administered by End of Hospital Day Two*

**Denominator Statement:** All patients with ischemic 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.

\* Refer to Get With The Guidelines & Coverdell specific processes for identifying populations for working rates

**Excluded Populations:**

Patients who received IV or IA thrombolytic therapy at your hospital or another hospital

Patients discharged before the end of hospital day 2

Patients receiving comfort measures only by end of hospital day 2

Patients admitted for the performance of elective carotid intervention

Patients less than 18 years of age

**Data Elements:**

**General data elements (applicable to all measures):**

*Admission Date*

*Arrival Date*

*Arrival Time*

*Birthdate*

*Case Identifier*

*Comfort Measures Only*

*Discharge Date*

*Discharge Status*

*Hispanic Ethnicity*

*ICD-9-CM Principal Diagnosis Code*

*Point of Origin for Admission or Visit*

*Race*

*Report Period*

*Sex*

**Clinical/measure specific data elements:**

*Admitted for Elective Carotid Intervention*

*Patient Received IV/IA Thrombolytic Therapy*

**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 with monthly data points

**Selected References:**

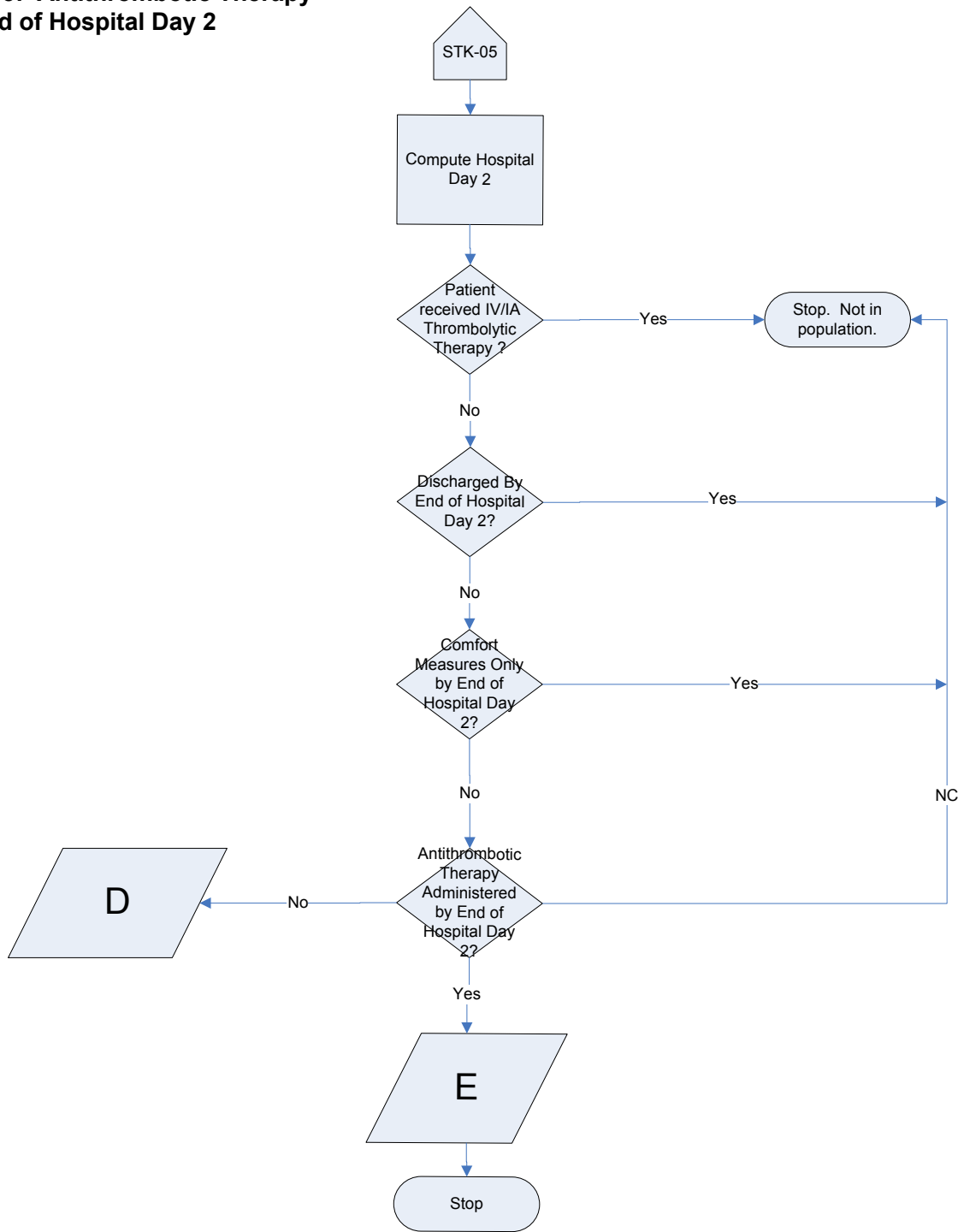
Harold Adams, Robert Adams, Gregory Del Zoppo and Larry B. Goldstein. Guidelines for the Early Management of Patients With Ischemic Stroke: Guidelines Update A Scientific Statement From the Stroke Council of the American Heart Association/American Stroke Association. *Stroke* Vol. 36, 2005: 916:923

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.

**STK-05: Antithrombotic Therapy by End of Hospital Day 2**



Rate =  $E / (D + E)$

## Measure Information Form

**DSC Measure Set:** Stroke

**Candidate Measure ID:** DSC/Stroke-06

**Performance Measure Name:** Discharged on Statin Medication

Ischemic stroke patients with LDL  $\geq$  100, or LDL not measured, or, who were on cholesterol reducing therapy prior to hospitalization are discharged on statin medication.

**Rationale:** An elevated serum lipid level has been a well-documented risk factor for coronary artery disease (CAD) and reflects an organ-specific manifestation of atherosclerosis which is a disease process that can affect the heart and the major and minor branches of the arterial tree. The reduction of LDL cholesterol, through lifestyle modification and drug therapy when appropriate, is recommended for the prevention of myocardial infarction and other major vascular events for patients with CAD (or coronary risk equivalent conditions) according to the National Cholesterol Education Program's Adult Treatment Panel III (NCEP ATP III) Guidelines. Recently, there has been an increased focus on the detection of patients with these risk factors when they present with other manifestations of atherosclerosis, and assuring that these patients are treated with lipid lowering medication if they meet NCEP ATP III guidelines. While symptomatic carotid artery disease is one of the recognized coronary disease risk equivalents that qualify patients for treatment under ATP III, there was little data until recently about the role of lipid lowering to prevent recurrent stroke or major vascular events in patients who presented with atherosclerotic stroke but did not otherwise qualify for treatment under ATP III. The Stroke Prevention by Aggressive Reduction in Cholesterol Levels (SPARCL) study examined the effects of statins to lower LDL cholesterol in patients with stroke or TIA of atherosclerotic origin who had no other reason for taking lipid lowering therapy (i.e., they were without prior CAD or risk equivalent conditions), and had a fasting LDL  $\geq$  100 mg/dL. The trial convincingly demonstrated that intensive lipid lowering therapy using statin medication was associated with a dramatic reduction in the rate of recurrent ischemic stroke and major coronary events. The treatment was well tolerated and cost effective. As a result, intensive lipid lowering therapy through use of a statin medication is now recommended for all patients with stroke or TIA of atherosclerotic origin who have an LDL  $\geq$  100 mg/dl (or with LDL < 100 mg/dl due to being on lipid lowering therapy prior to admission).

Based on these guidelines, all patients with ischemic stroke or TIA should have lipid profile measurement performed within 48 hours of admission unless outpatient results are available from within the past 30 days. A large body of evidence suggests that non-fasting lipid levels drawn in the first 48 hours after a major vascular event are reliable predictors of baseline lipid profiles, but after that time they may become unreliable. It is recommended that all patients with ischemic stroke or TIA with coronary heart disease or symptomatic atherosclerotic disease who have an LDL  $\geq$  100 mg/dl (or with LDL < 100 mg/dl due to being on lipid lowering therapy prior to admission) should be treated with a statin. The target goal for cholesterol lowering is an LDL-C level of <100 mg/dL. An LDL-C <70 mg/dL is recommended for very high-risk persons with multiple risk factors. For patients with stroke of atherosclerotic origin, intensive lipid lowering therapy with statins should be initiated in those who have an LDL  $\geq$  100 mg/dl (or with LDL < 100 mg/dl due to being on lipid lowering therapy prior to admission).

### **Clinical Practice Guideline Supporting Measure:**

Robert J. Adams, Greg Albers, Mark J. Alberts, Oscar Benavente, Karen Furie, Larry B. Goldstein, Philip Gorelick, Jonathan Halperin, Robert Harbaugh, S. Claiborne Johnston, Irene Katzan, Margaret Kelly-Hayes, Kenton EJ, Michael Marks, Ralph L. Sacco, Lee H.

Schwamm. Update to the AHA/ASA recommendations for the prevention of stroke in patients with stroke and transient ischemic attack. Stroke. 2008;39(5).

Ralph L. Sacco, Robert Adams, Greg Albers, Mark J. Alberts, Oscar Benavente, Karen Furie, Larry B. Goldstein, Philip Gorelick, Jonathan Halperin, Robert Harbaugh, S. Claiborne Johnston, Irene Katzan, Margaret Kelly-Hayes, Edgar J. Kenton, Michael Marks, Lee H. Schwamm, Thomas Tomsick. Guidelines for Prevention of Stroke in Patients With Ischemic Stroke or Transient Ischemic Attack: A Statement for Healthcare Professionals From the American Heart Association/American Stroke Association Council on Stroke: Co-Sponsored by the Council on Cardiovascular Radiology and Intervention. Stroke Vol. 37, 2006:577  
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 Circulation Vol. 106 2002: 3143-3421

High-Dose Atorvastatin after Stroke or Transient Ischemic Attack. (New England Journal of Medicine. NEJM Vol. 355 2006:549-559.

Update to the AHA/ASA Recommendations for the Prevention of Stroke in Patients With Stroke and Transient Ischemic Attack. Stroke Vol. 39, 2008.

**Type of Measure:** Process

**Improvement Noted As:** An increase in rate

**Numerator Statement:** Patients who were prescribed statin medication at hospital discharge

**Included Populations:** Not applicable

**Excluded Populations:** None

**Data Elements:**

*Statin medication prescribed at discharge*

**Denominator Statement:** All patients with an LDL  $\geq$  100 mg/dL, OR LDL not measured, OR who were on cholesterol reducing therapy prior to hospitalization

**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 LDL  $\geq$  100 mg/dL

Patients with LDL not measured

Patients who were on cholesterol reducing therapy prior to hospitalization. Refer to Appendices, Table 3 for a list of cholesterol-reducing medications.

\* Refer to Get With The Guidelines & Coverdell specific processes for identifying populations for working rates

**Excluded Populations**

Patients discharged/transferred to another short term general hospital for inpatient care

Patients who expired

Patients who left against medical advice

Patients discharged to hospice (home or facility)

Patients receiving comfort measures only

Patients for whom discharge destination cannot be determined or unknown

Patients admitted for the performance of elective carotid intervention

Patients less than 18 years of age

Patients with spontaneous LDL < 100 mg/dL  
Patients without evidence of atherosclerosis

**Data Elements:**

All general data elements AND:

*Admitted for elective carotid intervention*

*Cholesterol reducing therapy prior to hospitalization*

*Evidence of atherosclerosis*

*LDL measured*

*LDL ≥ 100 mg/dL*

**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 with monthly data points

**Selected References:**

Craig SR, Amin RV, Russell DW, Paradise NF. Blood cholesterol screening influence of fasting state on cholesterol results and management decisions. *J Gen Intern Med.* 2000 Jun;15(6):395-9.

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.

Gore JM, Goldberg RJ, Matsumoto AS, et al. Validity of serum total cholesterol level obtained within 24 hours of acute myocardial infarction. *Am J Cardiol.* 1984;54:722-725.

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.

Pitt B, Loscalzo, Ycas J, Raichlen JS. Lipid Levels After Acute Coronary Syndromes. *J Am Coll Cardiol* 2008;51;1440-1445.

Ralph L. Sacco, Robert Adams, Greg Albers, Mark J. Alberts, Oscar Benavente, ; Karen Furie, Larry B. Goldstein, Philip Gorelick, Jonathan Halperin, Robert Harbaugh, S. Claiborne Johnston, Irene Katzan, Margaret Kelly-Hayes, Edgar J. Kenton, Michael Marks, Lee H. Schwamm, Thomas Tomsick. Guidelines for Prevention of Stroke in Patients With Ischemic Stroke or Transient Ischemic Attack: A Statement for Healthcare Professionals From the American Heart Association/American Stroke Association Council on Stroke: Co-Sponsored by the Council on Cardiovascular Radiology and Intervention. *Stroke* Vol. 37, 2006:577.

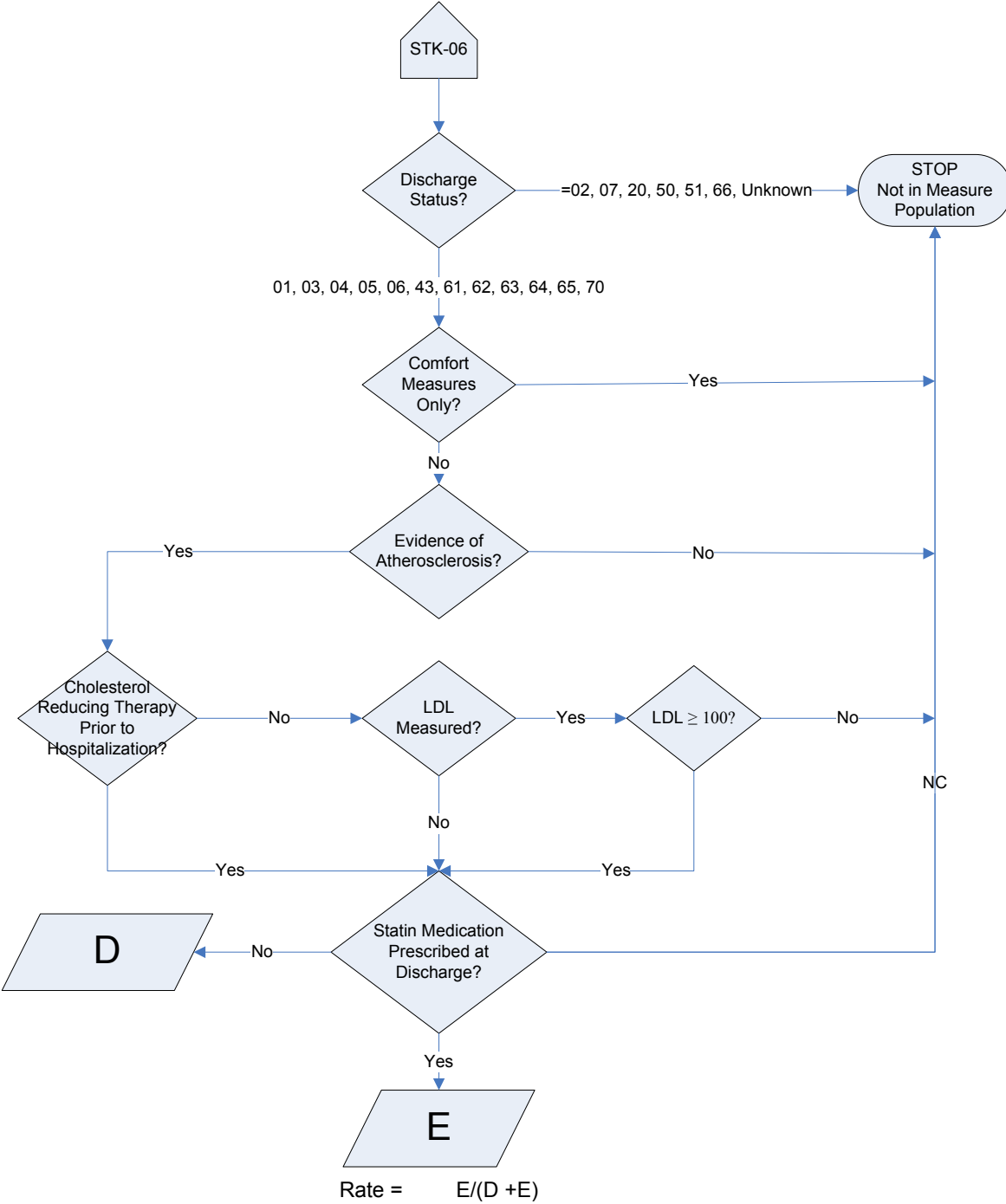
Robert J. Adams, Greg Albers, Mark J. Alberts, Oscar Benavente, Karen Furie, Larry B. Goldstein, Philip Gorelick, Jonathan Halperin, Robert Harbaugh, S. Claiborne Johnston, Irene Katzan, Margaret Kelly-Hayes, Kenton EJ, Michael Marks, Ralph L. Sacco, Lee H. Schwamm.

Update to the AHA/ASA recommendations for the prevention of stroke in patients with stroke and transient ischemic attack. *Stroke*. 2008;39(5).

Van Dis FJ, Keilson LM, Rundell CA, et al. Direct measurement of serum low-density lipoprotein cholesterol in patients with acute myocardial infarction on admission to the emergency room. *Am J Cardiol*. 1996;77:1232-1234.

Weiss R, Harder M, Rowe J. The relationship between nonfasting and fasting lipid measurements in patients with or without type 2 diabetes mellitus receiving treatment with 3-hydroxy-3-methylglutaryl-coenzyme A reductase inhibitors. *Clin Ther*. 2003 May;25(5):1490-7.

**STK-06: Discharged on Statin Medication**



## Measure Information Form

**DSC Measure Set:** Stroke

**Candidate Measure ID:** DSC/Stroke-07

**Performance Measure Name: Dysphagia Screening**

Patients with ischemic or hemorrhagic stroke who undergo screening for dysphagia with an evidence-based bedside testing protocol approved by the hospital before being given any food, fluids, or medication by mouth.

**Rationale:** Dysphagia is a potentially serious complication of stroke. The importance of assessing a patient's ability to swallow, before approving the oral intake of fluids, food or medication, 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. Dysphagia may contribute to 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 by a speech and language pathologist or other qualified individual. Recent evidence suggests that pneumonia rates in this population may be reduced when a systematic program of diagnosis and treatment of dysphagia is included in an ischemic 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, Identification and Management of Dysphagia Scottish Intercollegiate Guideline Network, 1997

Duncan et al, Stroke Rehabilitation Clinical Practice Guidelines (Stroke. 2005;36:e100-e143.)

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*

**Denominator Statement:** All patients with acute ischemic 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 for ICD-9-CM principal diagnosis codes for hemorrhagic stroke.

\* Refer to Get With The Guidelines & Coverdell specific processes for identifying populations for working rates

**Excluded Populations:**

Patients admitted for the performance of elective carotid intervention  
Patients less than 18 years of age  
Patients who are NPO throughout the hospital stay

**Data Elements:**

**General data elements (applicable to all measures):**

*Admission Date*  
*Arrival Date*  
*Arrival Time*  
*Birthdate*  
*Case Identifier*  
*Comfort Measures Only*  
*Discharge Date*  
*Discharge Status*  
*Hispanic Ethnicity*  
*ICD-9-CM Principal Diagnosis Code*  
*Point of Origin for Admission or Visit*  
*Race*  
*Report Period*  
*Sex*

**Measure specific data elements**

*NPO throughout the hospital stay*  
*Admitted for Elective Carotid Intervention*

**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

**Data Reported As:** Proportion

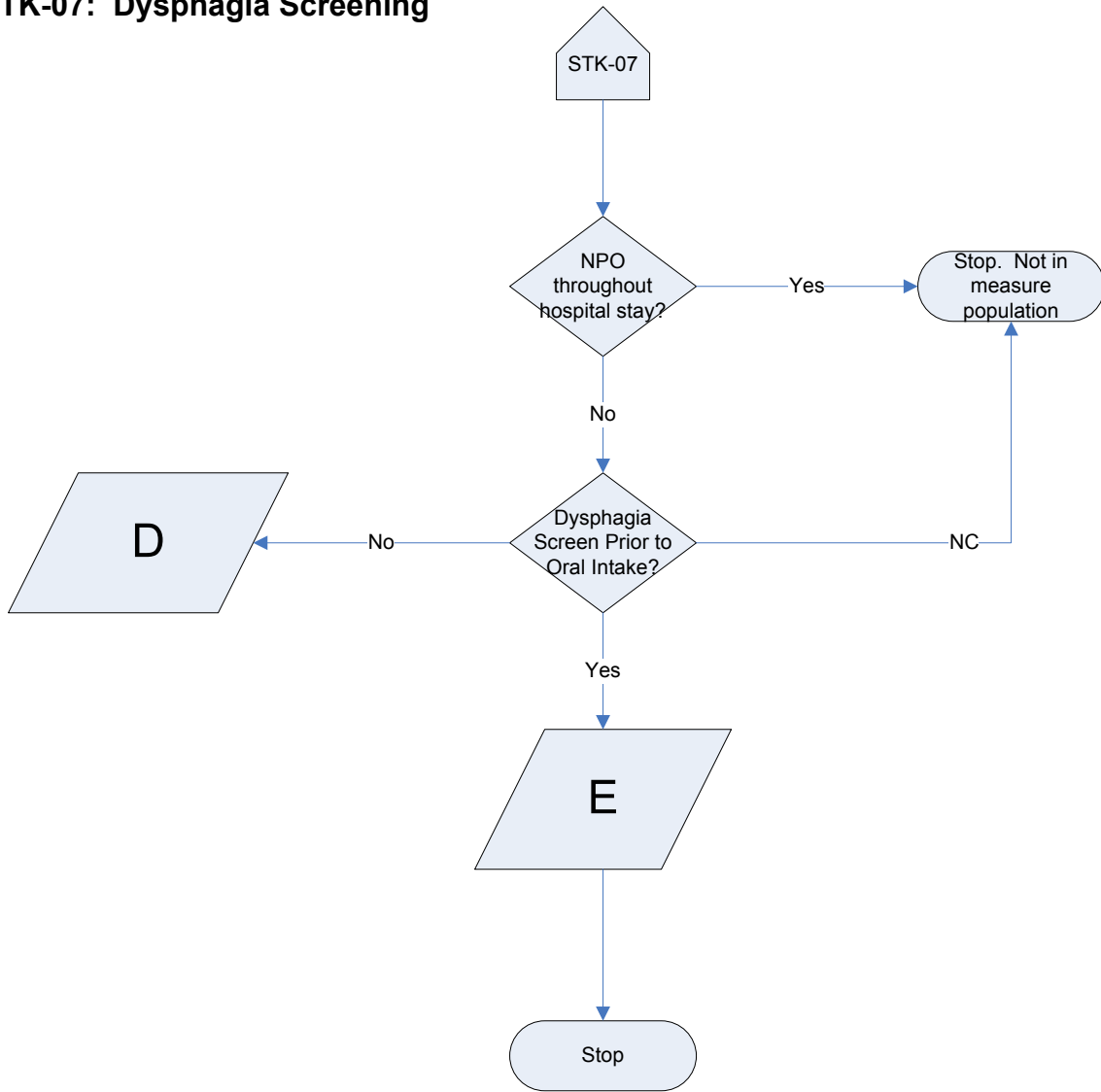
**Setting:** Primary Stroke Centers

**Report Period:** Quarterly with monthly data points

**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.

# STK-07: Dysphagia Screening



$$\text{Rate} = \frac{E}{D + E}$$

## Measure Information Form

**DSC Measure Set:** Stroke

**Candidate Measure ID:** DSC/Stroke-08

**Performance Measure Name: Stroke Education**

Patients with ischemic or hemorrhagic stroke or their caregivers who were given education and/or educational materials during the hospital stay addressing **all** of the following: personal risk factors for stroke, warning signs for stroke, activation of emergency medical system, need for follow-up after discharge, and medications prescribed at discharge.

**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 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, and risk factors), the role of various medications or strategies, as well as desirable lifestyle modifications to reduce risk or improve outcomes. Family/caregivers will also need guidance in planning effective and realistic care strategies appropriate to the patient's prognosis and potential for rehabilitation.

**Clinical Practice Guideline Supporting Measure:**

Kaiser Permanente Clinical Practice Guidelines for Acute Stroke, Kaiser Permanente Medical Group, 1998

Duncan et al, Stroke Rehabilitation Clinical Practice Guidelines (Stroke. 2005;36:e100-e143.)

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:** Stroke patients with documentation that they or their caregivers were given education and/or educational material addressing **all** of the following:

1. Personal risk factors for stroke
2. Warning signs for stroke
3. Activation of emergency medical system
4. Need for follow-up after discharge
5. Medications prescribed at discharge

**Included Populations:** Not applicable

**Excluded Populations:** None

**Data Elements:**

*Education addresses need for follow-up after discharge*  
*Education addresses medications prescribed at discharge*  
*Education addresses risk factors for stroke*  
*Education addresses warning signs and symptoms of stroke*  
*Education addresses activation of emergency medical system*

**Please Note:** The data elements for each of the 5 education components provide the opportunity to assess each component individually. However, completion of all 5 education categories is required for this composite measure.

**Denominator Statement:** 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 for ICD-9-CM principal diagnosis codes for hemorrhagic stroke.

\* Refer to Get With The Guidelines & Coverdell specific processes for identifying populations for working rates

**Excluded Populations:**

Patients discharged/transferred to another short term hospital for inpatient care  
Patients who expired  
Patients discharged against medical advice  
Patients discharged to hospice (home or facility)  
Patients receiving comfort measures only  
Patients for whom discharge destination cannot be determined or unknown  
Patients admitted for the performance of elective carotid intervention  
Patients less than 18 years of age

**Data Elements:****General data elements (applicable to all measures):**

*Admission Date*  
*Arrival Date*  
*Arrival Time*  
*Birthdate*  
*Case Identifier*  
*Comfort Measures Only*  
*Discharge Date*  
*Discharge Status*  
*Hispanic Ethnicity*  
*ICD-9-CM Principal Diagnosis Code*  
*Point of Origin for Admission or Visit*  
*Race*  
*Report Period*  
*Sex*

**Clinical/measure specific data elements:**

*Admitted for Elective Carotid Intervention*

**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

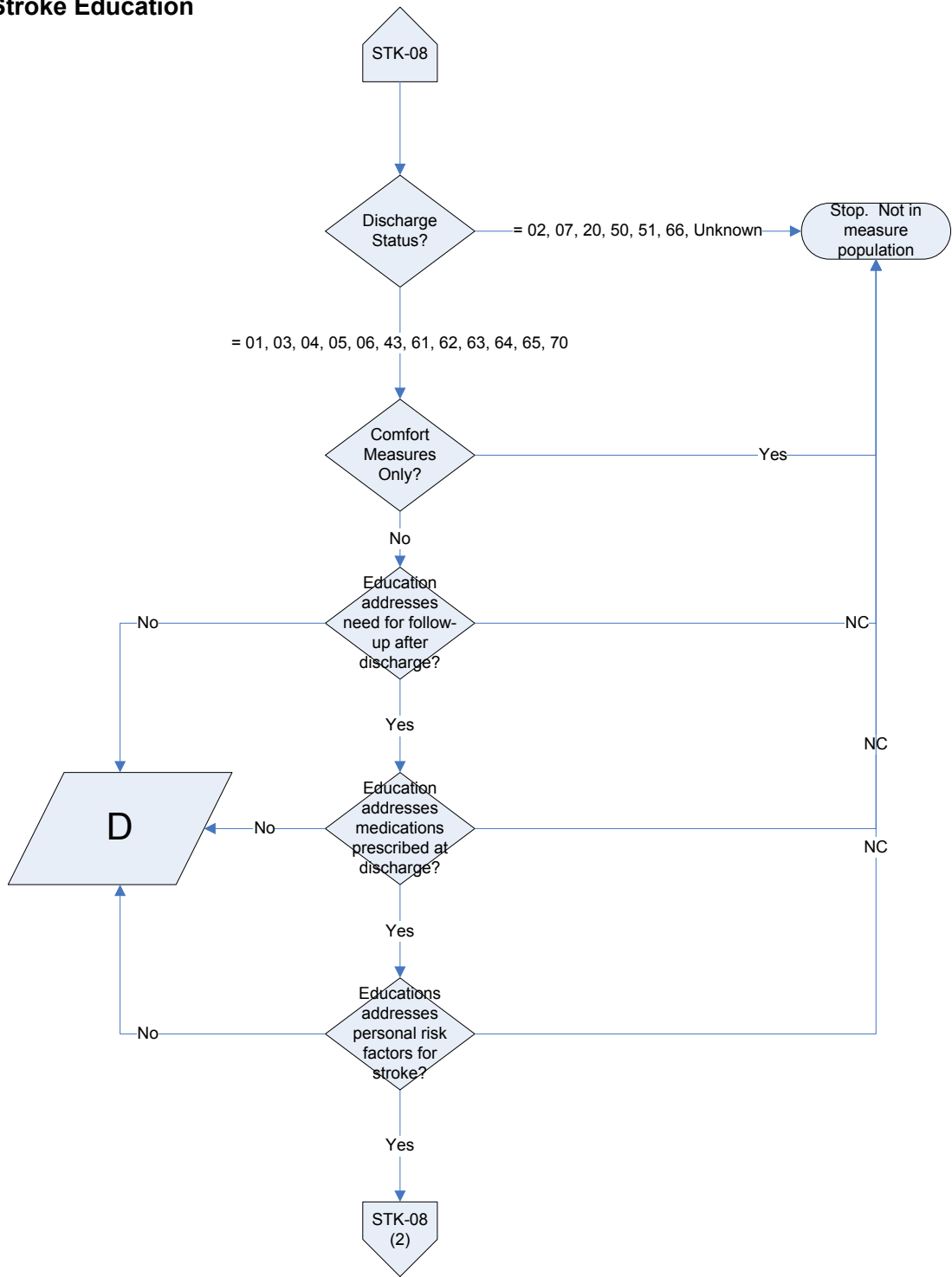
**Report Period:** Quarterly with monthly data points

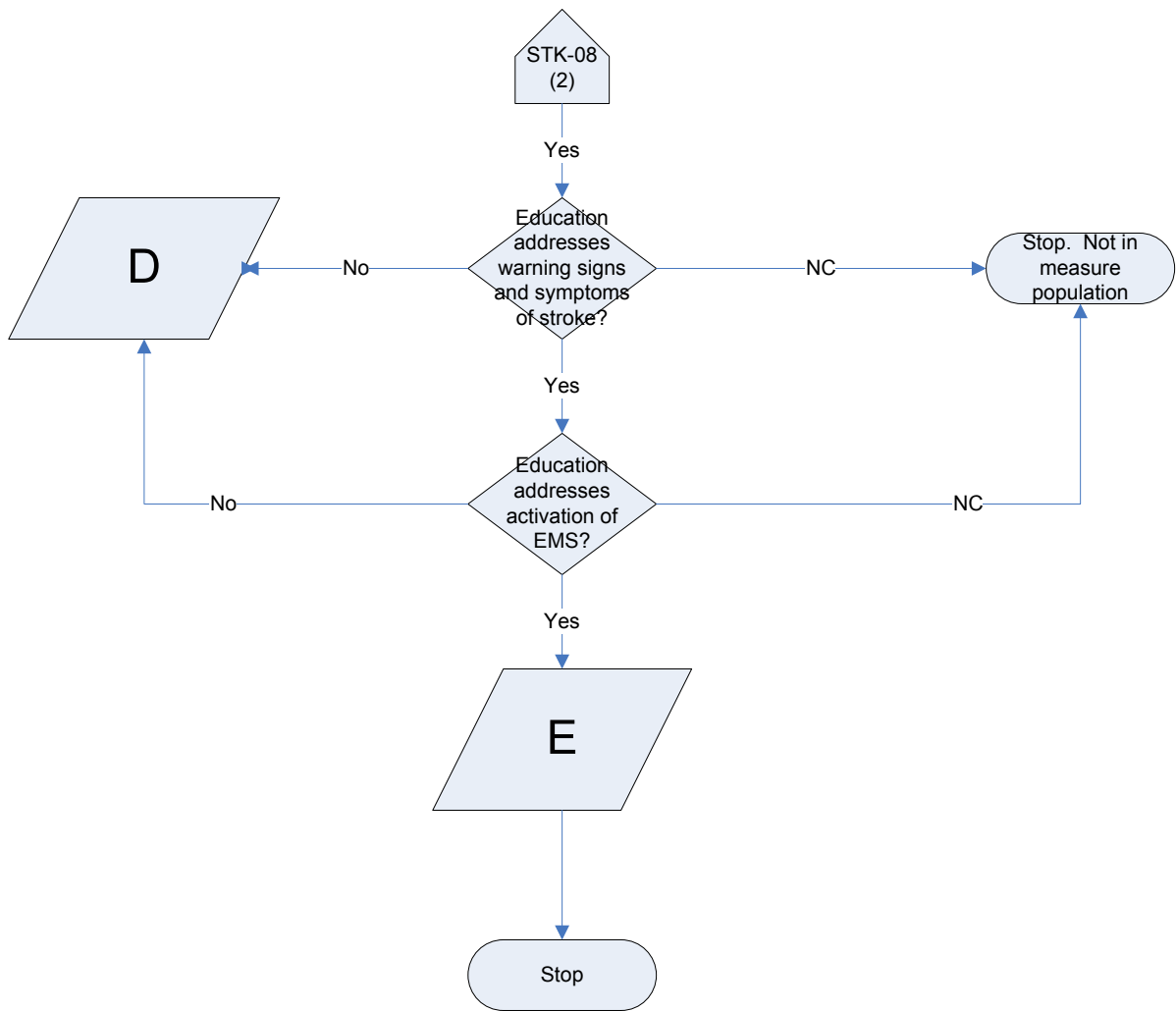
**Selected References:**

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

Lorig 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.

**STK-08: Stroke Education**





Rate =  $E/(D + E)$

## Measure Information Form

**DSC Measure Set:** Stroke

**Candidate Measure ID:** DSC/Stroke-09

### **Smoking Cessation Performance Measure Name: Smoking Cessation/ Advice/Counseling**

Patients with ischemic or hemorrhagic stroke with a history of smoking cigarettes, who are, or whose caregivers are, given smoking cessation advice or counseling during hospital stay. For the purposes of this measure, a smoker is defined as someone who has smoked cigarettes anytime during the year prior to hospital arrival.

**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:**

Billir, J., et. al. Guidelines for Carotid Endarterectomy: A statement of healthcare professionals from a special writing group of the stroke council, American Heart Association, *Circulation*. 1998 Feb 10;97(5):501-9

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

Ralph L. Sacco, Robert Adams, Greg Albers, Mark J. Alberts, Oscar Benavente, ; Karen Furie, Larry B. Goldstein, Philip Gorelick, Jonathan Halperin, Robert Harbaugh, S. Claiborne Johnston, Irene Katzan, Margaret Kelly-Hayes, Edgar J. Kenton, Michael Marks, Lee H. Schwamm, Thomas Tomsick. Guidelines for Prevention of Stroke in Patients With Ischemic Stroke or Transient Ischemic Attack: A Statement for Healthcare Professionals From the American Heart Association/American Stroke Association Council on Stroke: Co-Sponsored by the Council on Cardiovascular Radiology and Intervention. *Stroke* Vol. 37, 2006:577  
Ira S. Ockene and Nancy Houston Miller, Cigarette Smoking, Cardiovascular Disease, and Stroke : A Statement for Healthcare Professionals From the American Heart Association *Circulation*, Nov 1997; 96: 3243 - 3247.

**Type of Measure:** Process

**Improvement Noted As:** An increase in rate.

**Numerator Statement:** Stroke patients (cigarette smokers) who receive smoking cessation advice or counseling during hospital stay, or documentation that patient's caregiver was given smoking cessation advice or counseling during hospital stay.

**Included Populations:** Not applicable

**Excluded Populations:** None

**Data Elements:**

Adult Smoking Counseling

**Denominator Statement:** Ischemic stroke or hemorrhagic stroke patients with a history of smoking cigarettes anytime during the year prior to hospital arrival

**Included Populations:\***

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

History of smoking cigarettes anytime during the year prior to arrival

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

AND

History of smoking cigarettes anytime during the year prior to arrival

\* Refer to Get With The Guidelines & Coverdell specific processes for identifying populations for working rates

**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 (home or facility)

Patients receiving comfort measures only

Patients for whom discharge destination cannot be determined or unknown

Patients admitted for the performance of elective carotid intervention

Patients less than 18 years of age

**Data Elements:****General data elements (applicable to all measures):**

*Admission Date*

*Arrival Date*

*Arrival Time*

*Birthdate*

*Case Identifier*

*Comfort Measures Only*

*Discharge Date*

*Discharge Status*

*Hispanic Ethnicity*

*ICD-9-CM Principal Diagnosis Code*

*Point of Origin for Admission or Visit*

*Race*

*Report Period*

*Sex*

**Clinical/measure specific data elements:**

*Adult Smoking History*

*Admitted for Elective Carotid Intervention*

**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 with monthly data points

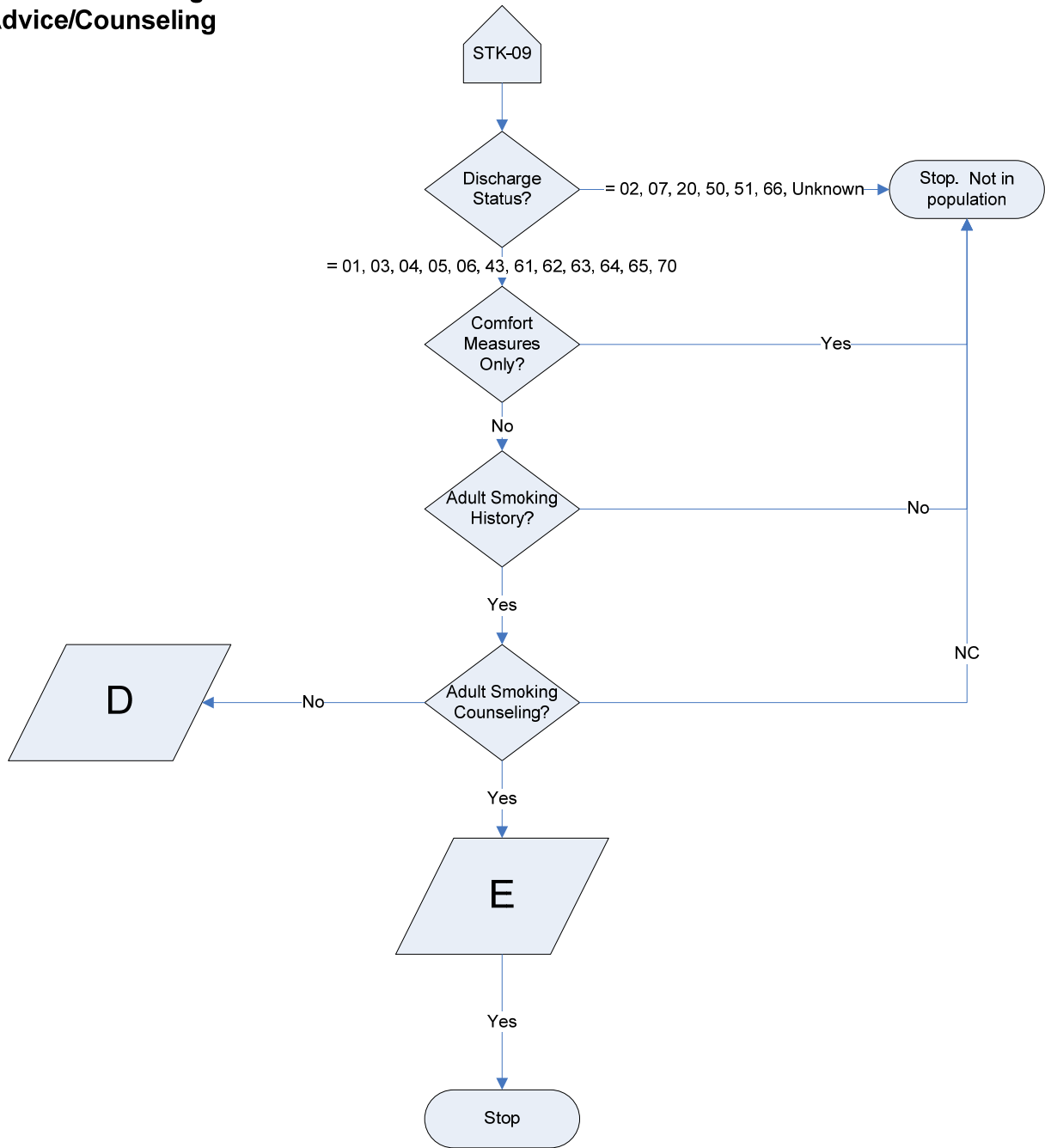
**Selected References:**

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.

**STK-09: Smoking Cessation/  
Advice/Counseling**



Rate =  $E / (D + E)$

## Measure Information Form

**DSC Measure Set:** Stroke

**Candidate Measure ID:** DSC/Stroke-10

**Performance Measure Name: Assessed for Rehabilitation**

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

**Included Populations:** Not applicable

**Excluded Populations:** None

**Data Elements:**

*Assessed for 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 for ICD-9-CM principal diagnosis codes for hemorrhagic stroke.

\* Refer to Get With The Guidelines & Coverdell specific processes for identifying populations for working rates

**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 (home or facility)  
Patients receiving comfort measures only  
Patients for whom discharge destination cannot be determined or unknown  
Patients admitted for the performance of elective carotid intervention  
Patients less than 18 years of age

**Data Elements:**

**General data elements (applicable to all measures):**

*Admission Date*  
*Arrival Date*  
*Arrival Time*  
*Birthdate*  
*Case Identifier*  
*Comfort Measures Only*  
*Discharge Date*  
*Discharge Status*  
*Hispanic Ethnicity*  
*ICD-9-CM Principal Diagnosis Code*  
*Point of Origin for Admission or Visit*  
*Race*  
*Report Period*  
*Sex*

**Clinical/measure specific data elements:**

*Admitted for Elective Carotid Intervention*

**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 with monthly data points

**Selected References:**

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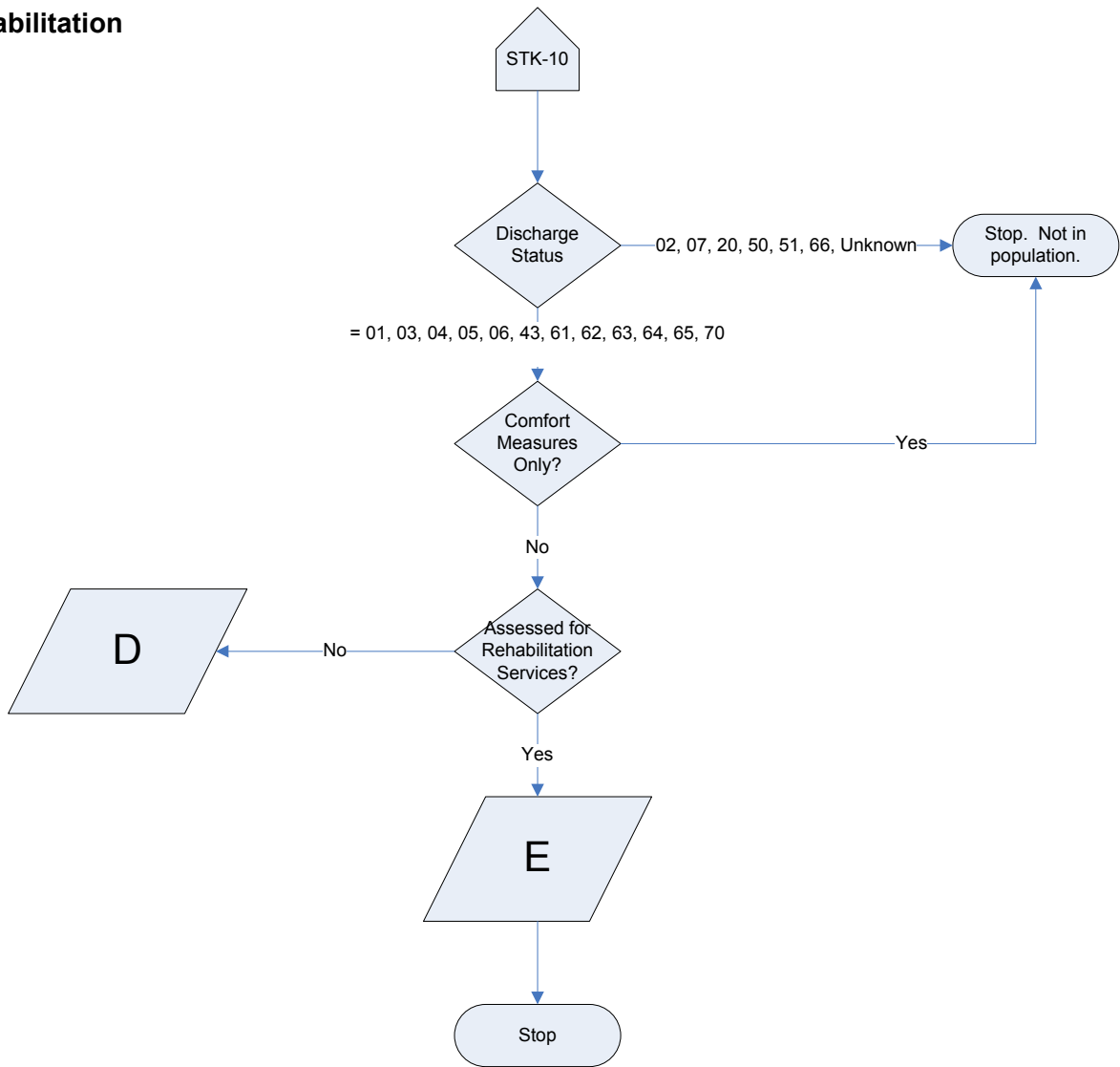
American Academy of Physical Medicine and Rehabilitation. *Urgency Key But Perseverance Pays Off*. AAPM&R Chicago, IL Office: Author. Retrieved July 7, 2004 from World Wide Web: <http://www.aapmr.org/condtreat/rehab/recover.htm>.

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Zorowitz RD, et al, the Post-Stroke Rehabilitation Outcomes Project (PSROP), Top Stroke Rehabil. 2005 Fall;12(4).

**STK-10: Assessed for Rehabilitation**



Rate =  $E/(D + E)$