Executive Summary

Beginning in April 2010, Massachusetts stakeholders and key informants participated in interviews and surveys to gather information about the current system of stroke patient care. Based on recommendations and gaps identified from this process, priority-consensus-building meetings were conducted with stakeholders in September 2010 with the aim of establishing priorities for each of the six domains of the stroke care continuum. Twenty-one top ranking priorities were developed into consensus recommendations for implementation in the Massachusetts Stroke System Plan. Project advisors and lead partners reviewed and amended the consensus recommendations by incorporating Centers for Disease Control (CDC) prevention priorities, current disease interventions, and clinical practice as appropriate. Below are the recommendations which were adopted and renamed the Massachusetts Stroke System 5-Year Goals.

Stroke System 5-Year Goals

Primary and Primordial Prevention

1. Northeast Cerebrovascular Consortium (NECC)\(^1\) public health partners, including state governments and nonprofit advocacy organizations, should continue to pursue public policies that encourage smoking cessation, promote physical activity and access to proper nutrition, programs that reduce sodium consumption and hypertension, and provide better access to health screening and disease prevention programs.
   Lead Partner: American Heart Association (AHA)

2. NECC public health partners, including state governments and nonprofit advocacy organizations, should dedicate resources to better educate at-risk patients about stroke and modifiable risk factors, join together to provide primary care providers with tools and resources that are necessary to fully educate their at-risk patients.
   Lead Partner: NECC

3. NECC public health partners, including state governments and nonprofit advocacy organizations, should pursue policy change to provide smoking cessation benefits comparable to those covered under Mass Health.
   Lead Partner: AHA

Community Education

\(^1\) The Northeast Cerebrovascular Consortium (NECC) was established as an independent organization in 2006 to bring together key stakeholders in the Northeast states (Connecticut, Massachusetts, Maine, New Hampshire, New Jersey, New York, Rhode Island, and Vermont) to examine regional disparities and recommend strategies to improve stroke care based on the Stroke Systems of Care Model.
1. Hospital or community-based prevention messaging should continue to be a required activity in any stroke center designation program within the NECC region.
   Lead Partner: Massachusetts Department of Public Health (MDPH), SCORE

2. Continue working with Primary Stroke Service hospitals to ensure regulatory compliance and follow-up with hospitals that are cited for non-compliance on community education.
   Lead Partner: Bureau of Healthcare Safety and Quality (BHCQ)

3. Advocacy organizations within the NECC region should continue to pursue state and federal public policy changes that focus on reducing or managing stroke risk factors; AHA/ASA’s public policy agenda includes efforts to address stroke risk factors.
   Lead Partner: AHA

**Emergency Medical Services**

1. EMS agencies should use a standardized set of criteria for pre-notifying hospital emergency departments of patients with possible stroke, develop a written policy, and provide advanced pre-notification.
   Lead Partner: MDPH, Office of Emergency Medical Services (OEMS), Heart Disease and Stroke Prevention (HSPC), EMS agencies in EMS Stroke QI Collaborative

2. EMS agencies should collect data on suspected stroke patients and report the data to the state in the Massachusetts Trip Record Information System (MATRIS).
   Lead Partner: MDPH, OEMS, HSPC, EMS agencies in EMS Stroke QI Collaborative

3. EMS agencies should collect objective, standardized stroke quality improvement measures. There are no accepted pre-hospital stroke measures nationally but EMS agencies participating in the EMS Stroke QI pilot are currently collecting QI measures.
   Lead Partner: MDPH, OEMS, HSPC, EMS agencies in EMS Stroke QI Collaborative

4. EMS agencies and receiving hospitals should develop communications plan and processes to exchange patient outcome information and explore use of MATRIS to accomplish this.
   Lead Partner: MDPH, OEMS, HSPC, EMS agencies in EMS Stroke QI Collaborative
5. EMS agencies should implement standardized, statewide protocols for inter-facility transport of patients who are completing or have just completed thrombolytic therapy. 
   Lead Partner: MDPH, BHCQ, OEMS

**Acute Treatment**

1. Hospitals should collaborate and coordinate acute stroke care with other facilities to ensure access to appropriate stroke care for all patients. 
   Lead Partner: MDPH

2. Legislation for reimbursement of the care of stroke patients receiving telemedicine services that broadens reimbursement for the care of stroke patients whether they are patients admitted in the hospital or receiving care via telemedicine. 
   Lead Partner: AHA

3. Primary Stroke Service hospitals should have pre-specified Inter-hospital transfer protocols for patients with stroke as appropriate. 
   Lead Partner: AHA

4. Standardized protocols to avoid delays in identification of acute stroke patients and decision-making algorithms need to be established for all ambulatory care, physician practice, and health clinics operating within the state. 
   Lead Partner: MDPH

**Sub-acute and Secondary Prevention**

1. Up-to-date educational resources and “best practices” for hospital-based stroke prevention and education should be gathered from hospitals across the northeast region. This material should be made freely available in a forum that supports interactive dialogue among individuals involved in stroke care. 
   Lead Partner: NECC

2. A uniform discharge packet should be developed that includes patient and caregiver education materials covering the 5 areas specified in the harmonized consensus measure set (AHA, Centers for Disease Control or CDC, The Joint Commission or TJC). Systems should be established to ensure that all patients have an opportunity for face-to-face discussion during the inpatient admission. 
   Lead Partner: NECC

3. Systems should be established with providers to ensure that all stroke patients and transient ischemic attack (TIA) patients and their families who have
questions have their questions answered and receive appropriate inpatient and discharge education on stroke and TIA.
Lead Partner: AHA

Rehabilitation

1. Every stroke patient’s functional status and rehabilitation needs should be assessed during inpatient hospitalization with a standardized screening and assessment tool.
   Lead Partner: NECC

2. Advocacy organizations should focus on ensuring that adequate rehabilitation resources exist.
   Lead Partner: MDPH, BHCQ

3. The State should identify reimbursement needs of stroke patients and advocate for health insurance payment reform to ensure that services are reimbursed for stroke patients throughout a patient’s incident or a patient’s transition from one environment to another.
   Lead Partner: AHA
Background and Need

The impact of stroke on Massachusetts residents and its rising costs are the primary reasons the Massachusetts Department of Public Health (MDPH) is leading the effort to improve the statewide system of care for stroke patients. Stroke is the third leading cause of death in Massachusetts\(^2\) and the U.S. Each year, stroke causes nearly 3,000 deaths and 18,500 hospitalizations in the Commonwealth.\(^3\) Approximately 3% of Massachusetts adults report ever having a stroke with the elderly and Hispanics being disproportionately affected.\(^4\) As a leading cause of disability, stroke is an economic burden not only in clinical treatment costs but also in lost productivity dollars. In 2009 alone, these costs reached 1.2 billion dollars and are expected to increase to almost 2 billion dollars by 2020.\(^5\)

In January 2010, the MDPH was awarded, a one-year grant by the Association of State and Territorial Health Officials (ASTHO) to develop a Stroke Systems of Care Plan. Situated in the Division of Prevention and Wellness at MDPH, the Heart Disease and Stroke Prevention and Control Program (HSPC) assumed project leadership for the project that has a dual aim of creating a model for other states to replicate. Based on its success in pre-hospital and hospital stroke collaborative quality improvement, statewide partnerships, and its evidence-based Stroke Heroes Act FAST media campaign for recognition of stroke signs and symptoms, HSPC is well-poised to effectively guide the implementation strategies for a comprehensive stroke system of care.

\[\text{Funded by the Centers for Disease Control (CDC), HSPC's mission is to provide statewide leadership to reduce disparities, disease, disability and death related to heart disease, stroke and corresponding risk factors through evidence-based policy and environmental changes, education, quality improvement, and partnerships.}\]

The major collaborators for the Stroke Systems Plan include:

- American Heart Association/American Stroke Association. AHA and HSPC are successful ongoing partners and provide joint leadership for the Paul Coverdell National Acute Stroke Registry and the Stroke Collaborative Reaching for Excellence (SCORE), the hospital quality improvement (QI) collaborative;
- Massachusetts Peer Review Organization (Masspro), the Federal subcontractor for the Centers for Medicare and Medicaid Services (CMS);

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\(^3\) Massachusetts Division of health Care Finance and Policy. Inpatient Hospital Case Mix and Charge Data, Fiscal Year 2008.


• Bureau of Health Care Safety and Quality (BHCQ), the lead agency within MDPH that regulates patient care in the in/outpatient, emergency department and rehabilitation settings; and
• MDPH’s Integration Demonstration Project (IDP), one of four pilot projects funded by CDC that aims to develop a model for the integration of chronic diseases (asthma, physical education and nutrition, heart disease and stroke prevention, tobacco, diabetes, and the healthy communities programs).

In a project kick-off meeting on February 18, 2010, MDPH Commissioner John Auerbach acknowledged the long-term goals of a coordinated stroke continuum of care is to improve the health of Massachusetts residents and save lives. Massachusetts is a leader among states and established a model for the nation in creating a path to achieve near universal health insurance coverage for its residents when it passed its landmark health reform law (Chapter 58 of the Acts of 2006, *An Act Providing Access to Affordable, Quality, Accountable Health Care*). The development of a statewide Stroke System supports MDPH’s commitment to health for all six and one-half million Massachusetts residents and its mission of “helping people lead healthy lives in healthy communities”.

**Current Stroke System of Care**

Massachusetts has a stroke system of care but, as stakeholders will acknowledge, the coordination of the existing system could be improved. To understand the current stroke system and identify needs, stakeholders and project partners agreed on the framework and vision set forth below.

**Stroke Continuum of Care**

![Stroke Continuum of Care Diagram](image-url)
A stroke system should coordinate and promote patient access to the full range of activities and services associated with stroke prevention, treatment and rehabilitation (Schwamm, Circulation, 2005).

The summary below begins with the regulatory components of the Massachusetts stroke system of care which include 9-1-1 dispatch, emergency medical services and the primary stroke services hospital designation. The domains of sub-acute and secondary prevention, rehabilitation, primary prevention and community education are non-regulated and include initiatives that are voluntary.

9-1-1 Dispatch

The Massachusetts 9-1-1 system currently has the capability to identify a caller’s location but not all 9-1-1 dispatchers are currently trained in handling medical emergencies with a standardized set of questions specific to a condition. This will change in the next several years as the State 9-1-1 Department, under the Executive Office of Public Safety, that regulates the Public Safety Answering Points (PSAP), promulgates training and certification requirements for emergency medical dispatch or EMD that were set in law in 2008. Starting in 2012, dispatchers will use a standardized set of questions for medical emergencies including pre-arrival instructions for possible stroke.

Emergency Medical Services

Once the dispatcher transfers the call to an ambulance service or EMS provider, the standards and protocols for pre-hospital patient care fall under regulations set forth by the Office of Emergency Medical Services (OEMS). OEMS is an office under the Bureau of Health Care Safety and Quality within the Department of Public Health. Regulated entities that do not follow the law, at any level, face potential disciplinary action by OEMS, in accordance with the regulations. Statewide treatment protocols and the point of entry plan for transporting patients with signs and symptoms of possible stroke can be found at the following link: http://www.mass.gov/dph/oems.

Under MDPH, the Heart Disease and Stroke Prevention and Control Program (HSPC) is leading an EMS Stroke Quality Improvement Initiative with ambulance services participating on a voluntary basis. Funded by the CDC, the dual aims of the initiative are to improve pre-hospital stroke patient care and implement a set of evidence-based pre-hospital stroke care quality measures to help ambulance services evaluate and improve patient care. Participants in the pilot are currently testing a standardized set of criteria for advanced notification of possible stroke to the hospital emergency departments.

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6 OEMS was established in 105 CMR 170.000.
Acute Care

The point of entry plan requires ambulance services to transport patients presenting with symptoms of acute stroke to the nearest designated Primary Stroke Service (PSS) hospital (bypassing non-PSS hospitals even if they are closer). Massachusetts established licensure regulations which specified the requirements for a hospital to become a designated PSS hospital in March 2004. Only hospitals that are licensed by the MDPH can apply for a PSS designation. Requirements are that hospitals follow very specific stroke protocols for patient assessment and care and provide community education on the warning signs and symptoms of stroke. As part of its PSS designation, a hospital must provide emergency diagnostic and therapeutic services 24 hours-a-day, seven days-a-week to patients presenting with symptoms of acute stroke. These services are needed to ensure that every patient who arrives within hours of the start of his/her stroke symptoms and is eligible can be treated with IV-tPA or intravenous tissue plasminogen activator, the blood clot-busting treatment. Currently, 69 out of 72 Massachusetts acute care hospitals have the PSS designation.

The Paul Coverdell National Acute Stroke Registry, implemented as the SCORE Collaborative in Massachusetts, is a non-regulatory initiative jointly led by HJSPC and AHA. Currently 57 of the 69 PSS-designated hospitals participate in SCORE and focus on improving the quality of hospital-based acute stroke care. Success of the collaborative is evidenced by significant improvement on behalf of participating hospitals in 8 of the 10 nationally endorsed stroke consensus measures.

Sub-acute and Secondary Prevention

HSPC developed the Stroke Hospital Discharge Checklist (intended to be used by hospital staff) which incorporates an itemized protocol for patient discharge, patient education, and communication with the patient’s primary care physician.

Improving the Accuracy of Blood Pressure Measurement is a pilot initiative conducted in 7 sites participating in the MDPH-funded Women’s Health Network/Men’s Health Partnership Care Coordination, a program funded under MDPH. In addition to providing technical assistance and training, the outcome of this initiative included development of a Policy and Procedure for Accurately Measuring Blood Pressure.

Rehabilitation

There is no system in place that links acute stroke care and post-stroke patient follow-up nor a directory or atlas for a patient and family to research available rehabilitation resources. Patients are discharged to multiple rehabilitation settings such as a skilled nursing facility (SNF), an independent rehabilitation facility (i.e., Spaulding Hospital), a

7 Primary Stroke Services regulations are in 105 CMR 130.1400-1413;
nursing home for long term care, or home care. These facilities are governed by different entities such as the Commission on Accreditation of Rehabilitation Facilities (CARF), the Joint Commission or the Centers for Medicare and Medicaid (CMS). In addition, insurance coverage for rehabilitation services varies by patients’ plans. Furthermore, there is no standard patient assessment tool used across both hospital and rehabilitation settings. As a result, information is a primary need including a map of types of care for patients at stroke rehabilitation facilities through two years of post-stroke follow-up. Currently, the NECC Rehabilitation Work Group is developing a pilot project that aims to assess a patient for discharge by using a standardized screening tool.

Primary Prevention

The Partnership for a Heart Healthy Stroke Free Massachusetts (the Partnership) is a statewide coalition committed to a statewide action plan to reduce modifiable stroke risk factors and improve patient care. The Partnership publishes the Statewide Plan, which contains the on-going objectives of the Partners, and an annual Progress Report of the Partners’ accomplishments.

Governor Patrick issued Executive Order 509, a directive which requires state agencies to follow specific nutrition standards including sodium reduction when contracting for the purchase of foods and beverages. The Executive Order is a component of Mass in Motion, a statewide obesity prevention and wellness effort launched in January 2009 that emphasizes creating conditions that support healthy eating and active living. Currently, there are 13 Mass in Motion/Municipal Wellness Leadership (MiM/MWL) funded communities in Massachusetts, each selected through a competitive application. The importance of healthy eating and physical activity is stressed using strategies that encourage, nurture and promote wellness. In addition to Executive Order 509, key elements of Mass in Motion include: a calorie posting regulation; a statewide school-based Body Mass Index (BMI) collection and reporting regulation; a coordinated media campaign; an expanded workplace wellness initiative; and the MiM-MWL focused on developing and implementing local policy and environmental changes that support healthy eating and active living. Each municipality has established a community-wide partnership, completed a comprehensive community-wide assessment using the CDC developed CHANGE tool, prioritized focus areas and developed a draft action plan. This existing structure lends itself well to adding a sodium reduction component.

MDPH is funding four community-based organizations to develop and implement an action plan with innovative and sustainable policy, systems, and environmental changes that link the community with healthcare to promote wellness and reduce chronic disease among men of color. Known as the Men of Color grant, the program aims to motivate changes in behaviors that contribute to the development of chronic diseases and their complications such as tobacco use, poor nutrition, lack of exercise, high blood pressure, high blood cholesterol and high blood sugar.
Community Education

HSPC developed the media campaign, Stroke Heroes Act FAST, to raise the public’s awareness of stroke signs and symptoms and the importance of calling 9-1-1. Deliverables for this initiative include a train-the-trainer module for community education in multiple languages that are culturally appropriate. Success is evidenced in the wide dissemination of the tools (46 states and 21 countries) and awards for the video animation and evaluation of message retention. Resource materials are available in English, Spanish, Portuguese and Khmer and accessible on-line at FAST Materials: www.maclearinghouse.com.

Stakeholder and Key Informant Recommendations

Beginning in April 2010, key informants and stakeholders in the stroke system as described above and recommended by the project partners were contacted to gather information on the Massachusetts stroke system of care. A survey tool was developed and these stakeholders and additional participants were asked to rate the NECC recommendations for developing a stroke system framework, gaps identified by the initial key informants, and given an opportunity to add their identified needs. In September 2010, priority-consensus-building meetings were conducted with the aim of establishing specific Massachusetts priorities for each of the domain areas in the stroke care continuum. The consensus recommendations that were agreed upon by teams in the September meetings and the first year activities developed in subsequent meetings with the team leads are described in full in Appendix A.

Dissemination Plan

The Partnership for a Heart Healthy Stroke Free Massachusetts will have this report available on the website: www.heartstrokema.org. On an annual basis beginning with the fiscal year July 2011 through June 2012, progress of lead partners on their activities will be made available in an annual progress report on the same website.

In addition, an infrastructure will be developed to ensure the building and adding new partners to achieve the stroke system of care goals. Partners will be contacted annually to update objectives and track accomplishments. This ensures that the stroke system plan is a “living document.” Progress and achievements will be disseminated through websites of partners including NECC, AHA, MDPH and other key stakeholders identified as the plan and activities are sustained.
Conclusion

Under the leadership of Commissioner John Auerbach, Massachusetts has made great strides to improve the health and wellness of its residents. As one of four CDC Integration Demonstration Project (IDP) states, MDPH is integrating resources from chronic disease programs including heart disease and stroke, diabetes, cancer, asthma, obesity, and related risk factor reduction programs as tobacco, nutrition and physical activity.

In addition, the 2006 Health Care Reform legislation established a Health Care Quality and Cost Council. The goals of this council are to improve health care quality and patient safety and to reduce racial and ethnic disparities. Massachusetts is one of three states participating in the STate Action on Avoidable Re-hospitalizations (STAAR) initiative which seeks to work across organizational boundaries to reduce avoidable re-hospitalizations, improve transitions of care and address systemic barriers. While Massachusetts is well-poised for further improvements in health and wellness, additional resources for sustaining stroke system goals will be required.
Appendix A

First Year Activities
July 2011 through June 2012

Primary and Primordial Prevention

1. Northeast Cerebrovascular Consortium (NECC) public health partners, including state governments and nonprofit advocacy organizations, should continue to pursue public policies that encourage smoking cessation, promote physical activity and access to proper nutrition, programs that reduce sodium consumption and hypertension, and provide better access to health screening and disease prevention programs.
   Lead Partner: American Heart Association (AHA)
   1.1 Expand smoking cessation benefits to those insured under Commonwealth Care and GIC
   1.2 Establish physical education standards and advocate for the inclusion of physical education as a required subject in schools
   1.3 Promote better access to health screening and disease prevention programs
   1.4 Ensure that disease prevention and public health programs are included in health care payment reform advocacy work

2. NECC public health partners, including state governments and nonprofit advocacy organizations, should dedicate resources to better educate at-risk patients about stroke and modifiable risk factors, join together to provide primary care providers with tools and resources that are necessary to fully educate their at-risk patients.
   Lead Partner: NECC
   2.1 Analyze the results from the NECC pilot program that is implementing a standardized primary care report card and spread the pilot if the results indicate an increase in risk management

3. NECC public health partners, including state governments and nonprofit advocacy organizations, should pursue policy change to provide smoking cessation benefits comparable to those covered under Mass Health.
   Lead Partner: AHA
   3.1 Continue to work with the Tobacco Free Massachusetts Coalition to convene partners to develop appropriate language and advocate for legislation in January 2011
Community Education

4. Hospital or community-based prevention messaging should continue to be a required activity in any stroke center designation program within the NECC region.
   Lead Partner: Massachusetts Department of Public Health (MDPH), SCORE
   
   4.1 Follow-up on the Frequently Asked Questions and Guidance for Community Education programs that were provided to PSS hospitals in December 2010
   4.2 Training programs and promising practices will be shared among hospitals

5. Continue working with Primary Stroke Service hospitals to ensure regulatory compliance and follow-up with hospitals that are cited for non-compliance on community education.
   Lead Partner: Bureau of Healthcare Safety and Quality (BHCQ)
   
   5.1 PSS hospital surveys were conducted beginning in April 2008 through April 2010; it is not certain whether surveys will be conducted again in 2012 but some follow-up will be conducted with the sites that were not in compliance on community education programs.

6. Advocacy organizations within the NECC region should continue to pursue state and federal public policy changes that focus on reducing or managing stroke risk factors; AHA/ASA’s public policy agenda includes efforts to address stroke risk factors.
   Lead Partner: AHA
   
   6.1 Ensure that stroke is a priority on the policy agenda. Convene partners and stakeholders as appropriate
Emergency Medical Services

7. EMS agencies should use a standardized set of criteria for pre-notifying hospital emergency departments of patients with possible stroke, develop a written policy, and provide advanced pre-notification.
   Lead Partner: MDPH, Office of Emergency Medical Services (OEMS), Heart Disease and Stroke Prevention (HSPC), EMS agencies in EMS Stroke QI Collaborative
   7.1 Evaluate the impact of the EMS Stroke QI Pilot initiative and modify criteria as appropriate
   7.2 Expand the pilot and engage stakeholder support for implementation of the criteria
   7.3 Get the buy in from OEMS and make an offer to present the pilot project and its implementation to EMCAB (proposed)

8. EMS agencies should collect data on suspected stroke patients and report the data to the state in the Massachusetts Trip Record Information System (MATRIS).
   Lead Partner: MDPH, OEMS, HSPC, EMS agencies in EMS Stroke QI Collaborative
   8.1 Continue and expand the EMS Stroke QI Pilot initiative to educate, train, identify suspected stroke patients, and transmit data
   8.2 Through partnerships, provide education on the importance of identifying patients with symptoms
   8.3 Share best practices in publication and other dissemination

9. EMS agencies should collect objective, standardized stroke quality improvement measures. There are no accepted pre-hospital stroke measures nationally but EMS agencies participating in the EMS Stroke QI pilot are currently collecting QI measures.
   Lead Partner: MDPH, OEMS, HSPC, EMS agencies in EMS Stroke QI Collaborative
   9.1 Reach out to more EMS agencies for pilot participation
   9.2 Educate others ongoing about the measures, collaborative activities
   9.3 Develop tools on measures, data collection, evaluation/review, generate reports and address barriers

10. EMS agencies and receiving hospitals should develop communications plan and processes to exchange patient outcome information and explore use of MATRIS to accomplish this.
    Lead Partner: MDPH, OEMS, HSPC, EMS agencies in EMS Stroke QI Collaborative
    10.1 Continue to bring hospitals together with EMS in SCORE, EMS QI Initiative and The Partnership to educate them on the importance of sharing outcome info (allowed under HIPAA)
    10.2 Explore use of MATRIS and technology to accomplish this

11. EMS agencies should implement standardized, statewide protocols for inter-facility transport of patients who are completing or have just completed thrombolytic therapy.
    Lead Partner: MDPH, BHCQ, OEMS
Acute Treatment

12. Hospitals should collaborate and coordinate acute stroke care with other facilities to ensure access to appropriate stroke care for all patients.
   Lead Partner: MDPH

   12.1 Through FY 12, two in-person Learning Sessions will be conducted in person
   12.2 Maintain e-mail distribution, provide ongoing web-sit access for tools, promising practices, sharing of best practices

13. Legislation for reimbursement of the care of stroke patients receiving telemedicine services should be filed; current legislation has been crafted that broadens reimbursement for the care of stroke patients whether they are patients admitted in the hospital or receiving care via telemedicine.
   Lead Partner: AHA

   13.1 Advocate for legislation
   13.2 Convene stakeholders with Commissioner Morales, DHCFP
   13.3 Ensure that the telemedicine study by DHCFP allocated for in the FY11 budget happens

14. Primary Stroke Service hospitals should have pre-specified Inter-hospital transfer protocols for patients with stroke as appropriate.
   Lead Partner: AHA

   14.1 Gather information to establish a baseline
   14.2 Get buy-in from stakeholders including OEMS and provide ongoing communication

15. Standardized protocols to avoid delays in identification of acute stroke patients and decision-making algorithms need to be established for all ambulatory care, physician practice, and health clinics operating within the state.
   Lead Partner: MDPH

   15.1 Define the issues
   15.2 Convince OEMS of the need for standardized protocols
   15.3 Develop the protocols
Sub-acute and Secondary Prevention

16. Up-to-date educational resources and “best practices” for hospital-based stroke prevention and education should be gathered from hospitals across the northeast region. This material should be made freely available in a forum that supports interactive dialogue among individuals involved in stroke care.
   Lead Partner: NECC

   16.1 Determine the best practices for education at discharge and for follow-up at 60 days
   16.2 Utilize the best practices from the pilot

17. A uniform discharge packet should be developed that includes patient and caregiver education materials covering the 5 areas specified in the harmonized consensus measure set (AHA, Centers for Disease Control or CDC, The Joint Commission or TJC). Systems should be established to ensure that all patients have an opportunity for face-to-face discussion during the inpatient admission.
   Lead Partner: AHA

   17.1 Review the best method
   17.2 SCORE could participate in the pilot and present on the results

18. Systems should be established with providers to ensure that all stroke patients and transient ischemic attack (TIA) patients and their families who have questions have their questions answered and receive appropriate inpatient and discharge education on stroke and TIA.
   Lead Partner: AHA

   18.1 Address the process starting with admission and going through discharge
   18.2 Review the best methods from the pilot
   18.3 Write the protocols
Rehabilitation

19. Every stroke patient’s functional status and rehabilitation needs should be assessed during inpatient hospitalization with a standardized screening and assessment tool.
   Lead Partner: NECC

   19.1 Collect and analyze the data from the pilot

20. Advocacy organizations should focus on ensuring that adequate rehabilitation resources exist.
   Lead Partner: MDPH, BHCQ

   20.1 Gather information
   20.2 Identify the gaps

21. The State should identify reimbursement needs of stroke patients and advocate for inclusion in any payment reform legislation to ensure that services are reimbursed for stroke patients throughout a patient’s incident or a patient’s transition from one environment to another.
   Lead Partner: AHA

   21.1 Convene a larger stakeholder group
   21.2 Monitor and advocate for in payment reform
   21.3 Ensure that rehabilitation is covered
Appendix B

Impact of Stroke in Massachusetts

- Stroke is the third leading cause of death in Massachusetts and the U.S.
- Each year, stroke causes nearly 4,000 deaths and 17,300 hospitalizations in the state of Massachusetts.

Stoke Hospitalization Rates in Massachusetts, 2008

Prevalence of Stroke Risk Factors in MA Adults 18+ by Age, 2009

Prevalence of Stroke in MA Adults 35+ by Race and Age, 2009

Estimated Direct and Indirect Costs of Stroke in Massachusetts, 2003-2009, 2020

Stroke is a leading cause of disability in Massachusetts and results in two substantial sources of economic burden: clinical treatment costs and lost productivity dollars. In 2009 alone, these costs reached 1.2 billion dollars and are expected to increase to almost 2 billion dollars by 2020.