PAUL COVERDELL NATIONAL ACUTE STROKE PROGRAM

RESOURCE GUIDE

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DIVISION FOR HEART DISEASE AND STROKE PREVENTION

CENTERS FOR DISEASE CONTROL AND PREVENTION

Disclaimer

This resource manual for the Paul Coverdell National Acute Stroke Program, 2015-2020 constitutes a living document. Changes may occur in the program, which may necessitate changes in this document during the life of the program, as well as changes resulting from our collective experience. The Division for Heart Disease and Stroke Prevention, the Health Services Research and Registries Team or CDC shall not be held accountable for any consequences of these unanticipated changes.

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1.1. Mission of the Division for Heart Disease and Stroke Prevention (DHDSP)

To provide public health leadership to improve cardiovascular health for all, reduce the burden of stroke and heart disease; eliminate disparities in the burden of stroke and heart disease; and improve access to care for those with heart disease and stroke.

1.2. Mission of the Paul Coverdell National Acute Stroke Program (PCNASP)

- Measure, track, and improve the quality of care and access to care for stroke patients from onset of stroke symptoms through rehabilitation and recovery.
- Decrease rate of premature death and disability from stroke.
- Eliminate disparities in care.
- Support the comprehensive stroke system across the continuum of care.
- Improve access to rehabilitation and opportunities for recovery after stroke.
- Increase the workforce capacity and scientific knowledge of stroke care.

1.3. Background of the PCNASP

In 2001, Congress charged CDC with implementing state-based registries that measure and track acute stroke care and to use data from the registries in efforts to improve the quality of that care. Congress further directed that this project be named the Paul Coverdell National Acute Stroke Registry, after the late U.S. Senator Paul Coverdell of Georgia, who suffered a fatal stroke in 2000 while serving in Congress.

CDC, in consultation with stroke experts and organizations, piloted eight prototype registry projects, led by academic and medical institutions across the country, to test models for measuring the quality of care delivered to stroke patients. "Wave I" projects, funded in 2001, were located in Georgia, Massachusetts, Michigan, and Ohio. "Wave II" projects, funded in 2002, were located in California, Illinois, North Carolina, and Oregon. These prototype projects gathered data concerning each step of emergency and hospital care for stroke patients, from emergency response to the patients' eventual discharge from a hospital. At the end of the 3–year pilot period, the results showed that large gaps existed between generally recommended guidelines for treating stroke patients and actual hospital practices. Intensive quality improvement efforts are needed to close those gaps.

In June 2004, CDC provided funds to the state health departments of Georgia, Illinois, Massachusetts, and North Carolina to establish statewide Coverdell stroke registries for acute care hospitals in their states. The purpose of these registries was to develop and implement systems for collecting data on acute stroke care provided to patients, analyzing the collected data, and using the results of those analyses to guide quality improvement interventions at the hospital level through partnerships with hospital doctors, stroke-care teams, and administrators. All acute care hospitals serving the general population in participating states were eligible for the program.

In the first year of program activities, states established partnerships with leading medical experts, various hospital associations, local affiliates of the American Hospital Association, and other groups interested in improving health care for stroke patients; developed strategies for identifying and recruiting eligible hospitals; selected and implemented customized Web-based data collection systems for hospital use; and recruited hospitals to participate in the registry. In the second and third years, states reviewed collected data to identify specific areas of need for quality improvement, worked with hospitals to implement quality improvement interventions to improve care, and evaluated progress toward improving statewide acute stroke care and promoting long-term systemic changes in how that care is provided. By the end of the 2004–2007 project period, more than 180 hospitals were participating in a stroke registry and the percentages of total statewide stroke admissions treated by participating hospitals ranged from 40% to 79% among the four states.

In July 2007, CDC expanded funding to six state health departments in Georgia, Massachusetts, Michigan, Minnesota, Ohio, and North Carolina for the Paul Coverdell National Acute Stroke Registry for a new 5-year funding period. Illinois will continue to participate in stroke quality improvement activities and provide information to CDC on its progress. In 2007, CDC also came to an agreement with The Joint Commission's Primary Stroke Center Certification program and with the American Heart Association/American Stroke Association's Get With The Guidelines-Stroke program to jointly release a set of standardized stroke performance measures for use by all three programs. This effort helped reduce duplication, increase collaboration, and encouraged hospitals to participate in one or more of the programs. The National Quality Forum endorsed eight of these performance measures in 2008.

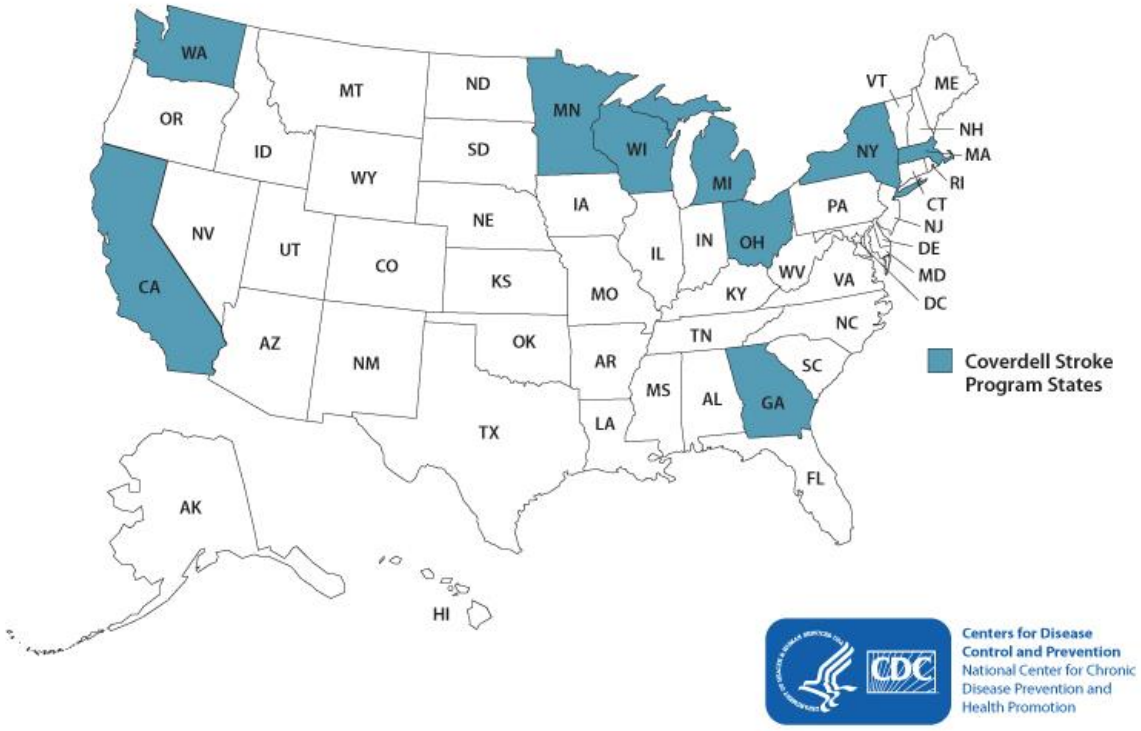
In July 2012, CDC expanded to 11 state health departments in Arkansas, California, Georgia, Iowa, Massachusetts, Michigan, Minnesota, New York, North Carolina, Ohio, and Wisconsin. Through the 3-year cooperative agreement, which ended in June 2015, states focused on improving the care given to stroke patients from the time they had a

stroke. Select states piloted working with emergency medical services (EMS) agencies to improve EMS care for suspected cases of stroke, the transition from EMS to hospital care, hospital care, and the transition from hospital to the next care setting.

In July 2015, CDC funded 9 state health departments in California, Georgia, Massachusetts, Michigan, Minnesota, New York, Ohio, Washington, and Wisconsin. Through this new 5-year cooperative agreement, funded states are working to develop comprehensive stroke systems to improve the quality of care for patients from the time they have a stroke until after they are discharged from the hospital and reintegrated with their primary care doctor. The goals of the new awards are to focus on pre-hospital quality of care as well as the post-hospital transition of care from hospital to home and the next care provider. All grantees will develop robust quality improvement programs for EMS that improve stroke diagnosis in the field and improve the transition from EMS to hospital emergency departments.

Currently funded PCNASP states are shown in blue on the map below and include California, Georgia, Massachusetts, Michigan, Minnesota, New York, Ohio, Washington, and Wisconsin.

Paul Coverdell National Acute Stroke Program States
Fiscal Year 2015



Centers for Disease Control and Prevention
National Center for Chronic Disease Prevention and Health Promotion

1.4. Goals of the Program

The **near-term goals** of the PCNASP are to—

- Encourage the development of statewide systems of care for stroke patients through coordination with emergency medical services and collaboration among statewide partners.
- Communicate with major stakeholders in stroke care to ensure ongoing improvement in the quality of that care.

The **long-term goal** of this program is to ensure that all Americans receive the highest quality of acute stroke care currently available and to reduce the number of untimely deaths attributable to stroke, prevent stroke-related disability, and prevent stroke patients from suffering recurrent strokes.

1.5. Activities

Funded states are working on improving the care given to patients experiencing a stroke from the onset of stroke symptoms. States will be working with emergency medical services (EMS) agencies to improve EMS care for suspected cases of stroke, the transition from EMS to hospital care, hospital care, and the transition from hospital to the next care setting. States are required to evaluate the effectiveness of implemented in-hospital and EMS QI interventions and transition from EMS to hospital; and transition of care (TOC) protocols from hospital to home and post-discharge supportive care systems (e.g. primary care provider, rehabilitation).

2 State Program Operations

2.1 Program Communications and Oversight

2.1.1 Individual State Conference Calls

The CDC PCNASP Team will hold conference calls with staff from individual state programs. The State will give updates on the progress of their program and CDC will provide information and technical assistance as requested. The calls will typically be forty-five minutes in length and include at a minimum the Subject Matter Expert and the State Coverdell program manager. Other members of the PCNASP staff from the State Program are welcome to attend. The calls will at a fixed time and date offered monthly to all states as needed in the initial 6 months of the grant cycle with the frequency re-evaluated for the remainder of the grant cycle.

2.1.2 Third Thursdays Conference Calls

An all-state conference call will be held at least bi-monthly for one hour on the third Thursday of every other month from 2:00pm to 3:00pm ET. The calls will include updates from funded states, updates from CDC, focused discussions of specific topics, and general questions and answers. All funded states are requested to attend this call and to include all relevant program staff and contractors.

2.1.3 SharePoint

SharePoint will be used by both CDC and state programs to share documents, meeting information and other resources useful across state programs. Knowledge sharing in this format can provide secure, easily accessible and modifiable materials. The new 2015 PCNASP share point site is available here: https://partner.cdc.gov/Sites/NCCDPHP/PCNASP/SitePages/Home.aspx

2.1.4 Email Listserv

The Coverdell listerv address is coverdell-registry@listserv.cdc.gov. All participants and partners are invited to have access to the listserv including current and past funded states, CDC staff and partner organizations. Typical postings to the listserv include sharing of tools, links to articles and resources, calls for abstracts/papers, etc. The listserv is not moderated and any member can post to it.

2.2 Progress Reports

Grantees are responsible for managing and monitoring each project, program, function, or activity supported by the award. Grantees are required to submit progress reports either annually, semi-annually, or quarterly. The Annual Performance Report is due no later than 120 days prior to the end of the budget period. The NOA will stipulate the frequency of the report submission.

Progress reports should generally contain the following information:

1. A comparison of actual accomplishments with the goals and objectives established for the period
   Reasons why established goals were not met, if appropriate
2. Documentation of successfully accomplishing the program performance measures for the appropriate time period
3. Other pertinent information including, when appropriate, analysis and explanation of cost overruns or high unit costs

The original performance report, with two signatures and dated cover letter, which references the award on each copy of the report, should be submitted to the GMS. A courtesy copy of the report may be sent to the PO, preferably by email. Both the GMS and PO will review the information contained in the Progress Report. The GMS will perform an analysis of the fiscal/business information in the report, and the PO will perform an analysis of the technical/programmatic information. The GMO/GMS must approve progress reports. Some of the factors considered in making a continuation award are: the results of the analysis, the availability of funds, and the best interest of the government. CDC may withhold an award due to delinquent reports, failure to show satisfactory progress, inadequate stewardship of Federal funds, or failure to meet the terms and conditions of the award.

Grantees shall immediately notify CDC of developments that have a significant impact on the award-supported activities and in the case of problems, delays, or adverse conditions which may materially impair the grantee's ability to meet the award objectives. The notification shall include a statement of the action taken or contemplated, and any assistance needed to resolve the situation. CDC may make site visits, as needed.

2.3 Federal Financial Report (FFR)

All CDC grantees are required to submit a report of expenditures for each budget period. The Annual Federal Financial Report (FFR) SF-425 is

required and must be submitted to the grants management specialist (GMS) no later than 90 days after the end of budget period. The FFR may be downloaded from the following website below and submitted to the GMS via email: https://www.whitehouse.gov/sites/default/files/omb/grants/approved_forms/SF-425.pdf

The FFR should only include those funds authorized and disbursed during the timeframe covered by the report. The final FFR must indicate the exact balance of unobligated funds and may not reflect any unliquidated obligations. There must be no discrepancies between the final FFR expenditure data and the Payment Management System's (PMS) cash transaction data. All Federal reporting in PMS is unchanged. Failure to submit the required information in a timely manner may adversely affect the future funding of the project.

2.4 Timeline

A timeline summarizing upcoming dates outlined above may be found in the Appendix.

2.5 Prior Approval of Expenditures Not Included in the Approved Budget

The grantee must submit these requests no later than 120 days prior to the budget period's end date. Any requests received that reflect only one signature will be returned to the grantee unprocessed. Additionally, any requests involving funding issues must include an itemized budget and a narrative justification of the request. The budget plan is the grantee's financial expression of the project or program as approved during the award process. It may include either the sum of the Federal and non-Federal shares, or only the Federal share, depending upon HHS awarding agency requirements, and or as stated in the NOA. It shall be related to performance for program evaluation purposes whenever appropriate. The primary reasons for prior-approval requirements are to:

1. Ensure that, for post-award changes, the project/program, as implemented by the recipient, retains a close connection with the project/program as approved by the CDC; and
2. Avoid inappropriate costs and possible audit disallowances.

Grantees shall obtain prior approvals from the GMO/GMS for any of the following: The following types of requests require prior approval.

- Use of unobligated funds from prior budget period (Carryover)

- Lift funding restriction, withholding, or disallowance
- Redirection of funds
- Change in scope
- Implement a new activity or enter into a sub-award that is not specified in the approved budget
- Apply for supplemental funds
- Change in key personnel
- Extensions
- Conferences or meetings that were not specified in the approved budget

3 Technical Overview

3.1 Scope of the Program

The mission of the Paul Coverdell National Acute Stroke Program is to measure, track, and improve the quality of care for acute stroke patients, thereby decreasing the rate of premature death and disability from acute stroke. It is a quality improvement program, not a research project. This cooperative agreement builds on existing successful activities and will further address improving the quality of care provided in pre-hospital care, emergency department, and in-hospital care as well as the post-hospital care transition. Activities will focus on enhancing the stroke system of care and integrating stroke care across the care continuum through: coordination of public stroke prevention messaging, coordination or partnerships, recruitment of local/regional EMS systems and hospitals, establishing data system infrastructure to measure, track and asses quality of care, analyze and use data, coordinate stroke care quality improvement efforts and coordinate program sustainability.

The registry is limited to patients age 18 and over. PCNASP collects all cases of acute hemorrhagic stroke, acute ischemic stroke, acute ill-defined stroke and TIA. See section 3.5.2 for information on case definition.

3.2 Topical Seminars

One on one calls were held with each grantee after the initial award. During these calls, states made recommendations regarding priority areas for learning and growth. With this in mind, virtual webinars highlighting these areas of learning are being held from October through December 2015 to address high priority needs in advance of the 2016 Atlanta In-Person Workshop. They are from 2-3PM EST on the first and third Thursdays (replacing All-State Conference Calls until 2016). Funded states are requested to attend and participate in this call and include relevant team members.

3.3 Work Groups

Pre-hospital Workgroup

This workgroup will initially address the finalization of the pre-hospital data elements and performance measures. Meetings will be held every other month and will be state-led through information sharing, topic/presenter recommendations and group problem solving. Relevant team members from each state are expected to attend and participate.

Post-hospital Workgroup

This workgroup will initially address the finalization of the post-hospital data elements and performance measures. Meetings will be held every other month and will be state-led through information sharing, topic/presenter recommendations and group problem solving. Relevant team members from each state are expected to attend and participate.

Evaluation Workgroup

This workgroup will provide technical guidance and further explore key concepts in evaluation. Meetings will be held every other month and relevant team members from each state are expected to attend.

Informatics and Data Elements Workgroup
This workgroups will be focused on providing guidance and enhancing knowledge around data collection tools, linkage and other topics.

Group for Communications and Publications
The Coverdell Team hopes to establish a writing group to help formulate and facilitate publications utilizing the Coverdell data. Updates and timing will be provided.

3.4 Case Ascertainment

3.4.1 Coverdell Case Inclusion

Coverdell case definition for inclusion is based on clinical diagnosis. This sometimes differs from the ICD-10-CM code assigned by hospital coders.

- Ischemic stroke
- Intracerebral hemorrhage
- Subarachnoid hemorrhage
- Transient ischemic attack

ED Observation cases are ideally collected for any of the above conditions, but not required.

3.4.2 Case Definition for PCNASP

Patients who are 18 years old or older and admitted to the hospital with a diagnosis of acute: ischemic stroke, stroke (type unspecified), intracerebral hemorrhage, subarachnoid hemorrhage, or TIA. All patients with a clinical diagnosis of one of the above should be included. Care should be taken to reconcile clinical diagnoses that are "no stroke" if the ICD-10-CM code is a stroke code. CDC does not include cases with a final clinical diagnosis of "No stroke" in analyses. We assume that these cases were included because of prospective case ascertainment and concurrent data collection. Patients who receive IV alteplase in an ED and are then transferred to another hospital for further care should be included in the registry of the transferring hospital even though they are not admitted to the hospital. They should also be included in the registry of the receiving hospital. Patients sent home from the ED do not need to be included, except where required by state law. Patients that are admitted to an observation unit, 23-hour admission, or 'boarding' are encouraged but not required to be included in the PCNASP. Patients admitted for elective carotid endarterectomy should not be included in the Registry. If hospitals wish to include in-patient stroke, they may include those patients, however they will not be included in analyses.

3.4.3 ICD-10-CM

CDC defines cases by the clinical diagnosis rather than by ICD codes. Thus, Coverdell will not exclude cases based on ICD code, but includes based on the clinical diagnosis. Coding is harmonized with TJC and GWTG biannually.

The CDC *does not* require case ascertainment based on ICD-10 codes; CDC *does* require the ICD -10-CM clinical diagnosis as the primary reason for admission to be recorded. ICD-10 codes for hospitals to report to state (updated annually, based on previous year's admissions, by category) include:

SAH = I60 Subarachnoid hemorrhage
ICH = I61 Intracerebral hemorrhage
IS = I63
TIA = G45, G46 Transient Ischemic Attack

Additional ICD-10 codes that *may* apply to stroke in pregnancy include: O99.411-O99.419

Tables of these relevant ICD-10 codes are provided in the Appendix. This listing of codes may change based on which of these newly released codes the coders actually use.

For ischemic and hemorrhagic stroke, the I60, I61 and I63 codes for stroke are included in The Specifications Manual for National Hospital Inpatient Quality Measures, Discharges 10-01-15 (4Q15) through 06-30-16 (2Q16), Appendix A1, Tables 8.1 and 8.2. TJC is not including I65 or I66 for stroke at this time, and CDC Coverdell supports that decision.

For TIA, CDC Coverdell and GWTG will use G45. Of note, we are waiting to see exactly how coders will code TIAs. We anticipate that G45.0, G45.1, G 45.2, G 45.8 and G45.9 will be the most likely TIA codes. There may be some G46 codes that get used for TIA, and we would not exclude those cases if the clinical diagnosis is TIA. TJC does not collect TIAs thus TIA codes are not defined by them.

ICD-9-CM may still be utilized as the healthcare system transitions.
Pertinent codes include:

SAH = 430 Subarachnoid hemorrhage
ICH = 431 Intracerebral hemorrhage
IS = 433.01, 433.11, 433.21, 433.31, 433.81, 433.91, 434.00, 434.01, 434.11, 434.91, 436
TIA = 435, 435.0, 435.1, 435.2, 435.8, 435.9 Transient Ischemic Attack

Additional ICD-9 codes that **may** apply to stroke in pregnancy

671.5X Cerebral venous sinus thrombosis during pregnancy or in the puerperium
674.0X Cerebrovascular complications of the puerperium

3.4.4 Rationale for Case Ascertainment Methodology

The Paul Coverdell National Acute Stroke Registry advocates prospective case ascertainment for presumptive cases of acute stroke and TIA patients presenting to the hospital. It is the intent of the Registry to include cases that are admitted to the hospital either through the Emergency Department (ED), or through direct admission, but not to include cases of in-hospital stroke. As noted above, if hospitals wish to include

in-hospital strokes, they may do so, and should indicate this in the 'Place of Occurrence' data element. In-hospital strokes are not included in PCNASP data analyses.

Additionally, it is important that all patients who receive t-PA be included in the Registry. Hospitals that begin t-PA administration in the ED and transfer the patient to another acute care facility should be sure to include the patient in the Registry for the hospital starting t-PA administration, if they are a participating hospital. They will indicate this using the variable asking whether the patient was transferred from my ED to another acute care hospital without being admitted to my hospital (2.7 EdTrans).

Hospitals that receive patients who had t-PA initiated at a transferring hospital should be included by the receiving hospital if they are a participating hospital. This may result in one patient being included in the Registry twice, but will allow both hospitals to review the quality of care which they provide.

Stroke and TIA patients who are ED observation patients or boarding patients that are not formally admitted to the hospital are not required to be entered into the Registry, although their inclusion is encouraged as part of providing high-quality care for all stroke and TIA cases.

If performing prospective case ascertainment and concurrent data collection, some cases entered may not turn out to be stroke or TIA. These cases do not need to be removed from the Registry. Their final diagnosis will exclude them from performance measures.

3.5 Coverdell Hospital Case Sampling Plan Guidelines

Section 1: INTRODUCTION

This document contains a sampling guidance to reduce the burden of data collection on hospitals participating in the Paul Coverdell Acute Stroke Program (PCNASP). Section 2 defines some common terms in sampling methodology. Section 3 discusses the sampling method proposed by the Joint Commission. Section 4 provides the recommendations from the CDC.

Section 2: TERMINOLOGY

This section establishes some of the commonly used terms used in sampling methodology. These terms will be used consistently throughout this document, and this section is intended to allow a level field for further discussion.

TARGET POPULATION

The **target population** is the collection of all eligible elements from which we can potentially sample. In the case of PCNASP, the target population is defined as the set of all patients admitted to hospitals in nine states to be treated for a primarily diagnosed stroke of a pre-specified type.

SAMPLING ELEMENT

Any unique individual in the target population which could be selected for inclusion into the sample. In the case of PCNASP, the **sampling element** is a single patient admitted to a hospital located in one of nine states to be treated for a primarily diagnosed stroke of a pre-specified type: ischemic stroke, stroke (type unspecified), intracerebral hemorrhage, subarachnoid hemorrhage, and TIA.

SAMPLING FRAME

A **sampling frame** is an enumerated list or process used for selection of sampling elements. In the case of PCNASP, an enumerated list would necessitate retrospective data collection, since the list of possible strokes for inclusion could only be made after the strokes occurred. An alternative process, more useful in capturing strokes prospectively, will be discussed below.

CLUSTERING

Clusters are naturally occurring groups of sampling elements in the target population. Clusters tend to be fairly homogenous, and should essentially be microcosms of the larger population. Cluster sampling occurs when clusters are randomly selected for measurement. Multistage designs begin with random selection of clusters, followed by random selection of sampling elements within each cluster. Analyzing data from a cluster sample requires special consideration. The clusters in the PCNASP frame are the participating hospitals/agencies in the nine states.

STRATIFICATION

Strata are artificially grouped sampling elements, arranged prior to selection into the sample. Prior knowledge of the frame is necessary to take advantage of stratification. Stratification can also occur during sampling, using different selection rates for different demographic groups. This kind of stratification, called **oversampling**, allows greater representation of certain demographic groups in the resulting data. This can lead to a sample which is less representative of the target population, and can introduce bias into any estimates made from the data collected. Sampling weights are used to correct this situation.

SYSTEMATIC SAMPLING

Systematic samples are a special case of cluster sampling. The frame of a systematic sample is a simple process by which a starting observation is randomly selected. Then, using a fixed sampling interval of k units, every k^{th} unit is selected. Consider a hospital in the PCNASP, using a systematic sample with a 15-unit interval. Using a random number generator, it is decided to begin with the eighth admitted stroke. That patient's data would be abstracted, and so would every fifteenth stroke patient after the first one included. This process is easy to implement, but leads to significant reduction in data quality and utility.

BINOMIAL SAMPLING

Simple random samples are the gold standard of sampling methods. They produce unbiased, representative samples, and require the fewest assumptions for proper analysis. **Binomial samples** use pre-specified selection probabilities for choosing elements for inclusion into the sample. Using a simple algorithm, each sampling unit receives a random number. If this random value is inside a certain range, the element is selected for abstraction.

Section 3: THE JOINT COMMISSION SAMPLING PLAN

The Joint Commission Sampling Plan (TJC) is described in the following link: https://manual.jointcommission.org/releases/TJC2016A/SamplingChapterTJC.html. The essence of the plan is a systematic sampling approach, with a fixed sample size based on the expected number of potentially eligible elements per month/quarter. The sampling interval for TJC is the ratio of the monthly/quarterly population size to the monthly/quarterly sample size. This interval is considered constant over the month/quarter, but may change based on increases or decreases in expected number of strokes.

TJC is a straightforward sampling plan, and is certainly easy to implement in any hospital setting. The TJC plan has some limitations, however, that can be detrimental to data quality and utility. The purpose of the PCNASP is to measure and improve quality of care in stroke patients. The limitations of the TJC can be quite detrimental to the success of this program.

First, the systematic sample can introduce significant bias into the data collected each month/quarter. For example, if there is a certain demographic group underrepresented in an area, a systematic sample may fail to collect any data on any of these individuals. TJC does not allow for perturbations in the selection probabilities, or a variable sampling interval, to allow for oversampling of these smaller demographic groups. A secondary concern, systematic samples require key assumptions for analysis. The systematic sample is, essentially, a cluster design, where one random selection is made, and the rest of the observations follow by design. It is a general assumption that this sample is as good as a random sample, but this may not always be a good or valid assumption to make, and there is no way to verify that the sample is as representative of the population as we would like.

Second, TJC describes, in some detail, the effect of sample size on precision. However, there appears to be very little discussion about the arbitrary sample sizes assigned based on expected population size. The arbitrary assignment ignores the variability in quality measures assessed (only 7% of Ischemic patients were eligible for receiving tPA, while 90% of all patients received DVT/VTE prophylaxis). There is also no discussion of the effect of clustering on these precision estimates, which can be quite significant in clustering.

Consider a small hospital, which only sees ten stroke cases a year. TJC suggests that all ten of these cases are selected for abstraction. In this hospital, only one specialist handles all of these cases at this hospital. Sampling all of the patients at this hospital to measure quality of care would be inefficient – the high degree of consistency in care across patients would lead to a huge loss in precision. One or two patients from this hospital would be sufficient to measure quality of care, and any more would be a waste of resources. TJC does not consider this loss of efficiency in their plan.

The design effect from a cluster sample depends on two quantities: the degree of homogeneity in the sampling elements in the cluster, and the number of sampling elements measured in each cluster. Design effects from cluster samples can be very large if one, or both, of these quantities are left uncontrolled. The second quantity is the average cluster size. This number will be minute in small hospitals, with ten or fewer sampled elements in the cluster. However, if the rate of homogeneity is high, which is very likely in hospitals like these, the effect can be immense. Proper analysis of the data from a design like this will produce interval estimates that are much wider than those one would see from a simple random sample of the same size. Analysis of data from this sample using traditional methods will result in interval estimates that are too narrow, leading to poor inference.

Finally, TJC does not provide information on sampling weights, which are necessary for unbiased estimates from this design. The probabilities of selection are not constant by hospital, where some hospitals are sampled completely (small hospitals) and the rest are sampled at various fractions depending on the expected number

of cases per month. Weights are used to balance the variability in representativeness inherent in diverse selection probabilities.

For example, consider two hospitals. The first one is small, seeing only eight stroke patients per month. The second hospital is larger, seeing 80 stroke patients per month. Without sampling weights, all patients' data would be considered equally. The eight patients from the small hospital will count exactly as much in the estimation process as the sixteen who represent a much larger slice of the stroke patient population. This gives more weight to the eight patients in the smaller hospital, introducing some real bias into estimates. If quality of care is associated with hospital size and stroke volume (which is not an unrealistic assumption), overweighting the observations from the smaller hospitals can lead to drastic underestimation of quality of care.

Section 4: COVERDELL SAMPLING RECOMMENDATIONS AND GUIDANCE

CDC recommends including in the Coverdell registry every patient that meets PCNASP inclusion criteria. Where that is not feasible, CDC will not implement a single sampling plan with which all states must comply. At a minimum, CDC still accepts The Joint Commission's sampling of cases as the minimum number of cases to be abstracted for Coverdell (Refer to Section 3 in the sampling guidelines). CDC prefers that any state wishing to implement any advanced sampling plan, creates a plan that follows the guidelines set forth by the statistical consultants, and agrees upon by your stroke advisory panels, program consultants, and PCNASP staff. Your plan must then be submitted to CDC for approval and should include detailed information on methodology, implementation, and analytic guidelines. The Statistical Unit within the Division for Heart Disease and Stroke Prevention will review your plan. If approved by the Statistical Unit, you will then be able to proceed with implementing your sampling plan. All data submitted to CDC must include weights for each case. An overview of how your state may design your sampling plan is below.

CDC provided some of the sampling limitations presented in the TJC. To ensure the sampling plan is in the desired level of precision and confidence, the proposed sampling plan needs to incorporate the following information.

(1) Rational of sampling

(2) Methodology. The sampling method needs to be described in detail. The states need to consider the variability of the patient population. Oversampling underrepresented demographic groups might be needed. As an example, if a state decides to do binomial sampling at a rate of 20% across the hospitals, but oversampling patients over 65 at a rate of 30%, and African-Americans at a rate of 25%. Each patient admitted to the hospital in this state will have demographic information entered into a data collection program (e.g. Get with the Guidelines). At this point, a uniform random number is generated for the case. Uniform random numbers (URN) can take on any real value between zero and one. If the URN is less than the specified probability of inclusion, that case would be included into the sample. If the URN is too large, the case would be excluded from the sample. In expectation, the proportion of cases in the sample would match the rates specified in the design – 30% of the patients over 65 will be included, 25% of all African-American patients would be included, and 20% of the rest of the patients in the state will be selected for inclusion. This is not a guaranteed rate – the actual number of inclusions could vary from month to month, but this rate is independent of the actual number of stroke cases seen in any given month.

(3) Sample size calculation. States need to provide the sample size calculations by presenting the tables showing the expected number of stroke cases per their defined sampling period.

(4) Data analysis plan. Sampling weights need to be assigned to account for the different selection probabilities which will result from varying the sampling rate in some demographic groups. Data should be analyzed using complex design software for the best results.

To alleviate some of the strains placed upon hospitals for collecting data on stroke patients; it makes sense to offer a system where they can provide adequate data on a reduced number of cases. While the sampling plan will allow hospitals to include fewer patients in the PCNASP, CDC would like to make sure that documenting care quality are at the same level as before. This decision of sampling is left completely up to the individual states and hospitals within those states. However, the states and hospitals need to be cautious adopting the sampling plan and need to make sure it is in the desired level of precision and confidence and how that is affected by the sampling period.

3.6 Chart Reabstraction

Minimum guidelines are set for chart reabstraction to ensure data quality.

For each hospital:

Total stroke cases in the last year*	Minimum # of charts to re-abstract per year
1-100	5
101-200	7
>200	10

** assumes the hospital is not sampling, but based on hospital case volume*

Adjustments to these minimum numbers may be considered:

- Oversampling certain types of cases is determined by state need, and not a requirement by CDC. In smaller hospitals with fewer patients receiving alteplase, it is possible for the alteplase cases to fall out of the reabstraction sample. With this in mind, CDC suggests that smaller hospitals that do give alteplase, ensure their abstraction includes at least one alteplase chart in the sample.
- Some adjustment should be made for total number of cases if the hospital is sampling. In most cases, this will be in deciding whether a minimum of 7 or 10 charts should be re-abstracted.
- If hospitals are doing reabstraction for The Joint Commission's Primary Stroke Center program, then the number of cases re-abstracted for The Joint Commission is acceptable. All re-abstractions should be submitted to the state program.

Not all data elements need to be re-abstracted. CDC provides a limited list of data elements for reabstraction (see Appendix).

**Regular training for hospital staff on case ascertainment and data abstraction is highly recommended.

4 Data Registry: Collection and Quality Improvement

4.1 Data Policies

The PCNASP data collection are conducted at patient level, primarily for continuous quality improvement of patient care, evaluation, and assessment of short-term patient health outcomes and transition of care from hospital to home. CDC does not collect direct patient identifiers or hospital identifiers. Hospitals are identified by a unique id assigned by state.

Data elements for EMS and TOC will be refined with states. CDC anticipates that each state will collect similar core data and optional data can be incorporated tailored to the needs for individual state.

Related Reporting Materials

The additional evaluation data, including the new performance measures and the individual state evaluation plans, are addressed in separate sections of 2015 Guidance documents.

4.2 Data Quality

The quality of the PCNASP depends on the quality of the data collected. PCNASP does not specify any particular data collection tool, but provides a complete list of quality data elements in the appendix and data abstraction guidelines to ensure consistency, quality and reliability of the data collected throughout the program.

States are required to assess the level of completeness and accuracy of data collected. Chart reabstraction for purposes of assessing completeness and accuracy should be an ongoing activity of the program. Some states have found it most useful to reabstract after a hospital has entered 5-10 records so that problems can be identified early, and steps can be taken to correct problems before they affect overall data quality. If this assessment is not done on a regular and ongoing manner, then problems in abstraction will have profound affects throughout the program. Completeness involves not only verifying the completeness of case inclusion, but also completeness of data elements in each chart.

Problems in data collection should be documented. For ongoing or significant problems, it would be helpful to discuss with from the team at CDC, as others may have similar issues.

CDC will provide the data summary report after each data uploading to each state identifying any data issues.

4.3 Data Elements and Abstraction Guidelines

There have been significant revisions to the list of PCNASP data elements since the previous funding cycles 2004-2007, 2008-2011, and 2012-2015. These changes have occurred for a variety of reasons including the alignment with AHA and The Joint Commission, and revision of data elements that were either too complex or too ambiguous for abstraction. Be certain that those who work with the data and those who teach abstractors are knowledgeable of the current PCNASP data elements and abstraction guidelines. It is expected that all PCNASP states, hospitals, and abstractors will use the guidelines

provided in the appendix of quality data elements regardless of the data collection tool used. This is to ensure compatibility of PCNASP data elements as well as comparable data collection and abstraction techniques across all PCNASP participated states.

Data elements are under continued refinement to continue to improve data collection for quality purposes. The list of data elements is fluid and will continually seek to harmonize with TJC and GWTG-Stroke, which are subject to changes 2-3 times per year. The most recent versions are included in the appendix of this resource guide.

The states will need to have the mapping of data elements used by their data collection tool and PCNASP approved by CDC's data management team prior to the implementation. Failure to do so could result in additional costs to the state program in order to restructure the data collection tool.

All data sent to CDC shall be compliant with CDC data element names, data type, and data field lengths. Only complete records should be sent to CDC.

4.4 Data Transfer

4.4.1 How and when to upload data to CDC

- States are required to submit data (pre-hospital care, in-hospital care and post-hospital transition of care data) to CDC using ***CDC's Secure Access Management Services (***SAMS) submission system. SAMS is a web site that allows public health partners and providers to access information. The SAMS user's guide can be found online: https://auth.cdc.gov/sams/SAMSUserGuide.pdf.
- We recommend that at least two people from each state should obtain the authorization of uploading data. If you are new to the SAMS, please contact the PCNASP data manager for instructions. The states used Quintiles as their venders can ask Quintiles to submit their data to CDC on their behalves.
- Data should be sent in SAS transport file format.
- Data will be sent to CDC every 3 months (March 31, June 30, September 30, and December 31) and need to be uploaded via SAMS within two weeks of each quarter. Data should be inspected for proper formatting and mapping to PCNASP data elements prior to uploading to CDC.

4.4.2 Field Formatting

Because the Coverdell data collection systems vary across the states and native storage for certain file types varies for different databases, the current "field type" definitions in the data elements list of the appendix are not adequate and need some clarification prior to importing the data into SAS format in order to ensure compatibility. For fields that specify numeric format, use the default SAS numeric field type. The default numeric SAS parameters are an 8-byte double precision floating format, which is automatically set for any numeric value unless it has been changed.

- All data elements should use the variable names specified in the appendix of this resource guide
- All data elements that have legal values (i.e. data elements #1.2, #1.4, #1.6, #2.1, etc) should be in numeric format as specified under "field type".
- Age variable (data element #1.1) will be a numeric field with the default SAS numeric parameters.
- NIH stroke scale (data element # 6.2) will be a numeric field with the default SAS numeric parameters.
- Four lipid level variables (data element # 12.8) will be a numeric field with the default SAS numeric parameters.
- All data elements with Yes/No values (i.e. 1.3, 1.5, 4.2, etc) should be in numeric format with length = 1. Since SAS does not support native Boolean format, "Negative/NO" responses will be coded as "0" and "positive/YES" responses will be coded as "1", in numeric format. This is a change from the 2004-2007 data dictionary.
- For date variables (presented as MM/DD/YYYY in "field type") use the SAS date format. Do not use numeric, character, or text.
- For time variables (presented as HHMM in "field type") use SAS time format. Do not use numeric, character, or text. If actual time is Midnight, please enter either 23:59 or 00:01 rather than 00:00. Do not use 00:00 as a legal time value. All times use a 24-hour time-clock.
- ICD-9-CM codes should be formatted as character fields with length = 6. Do not fill in with zeros unless a data abstractor has entered it. Use "." period as a divider after the first 3 characters if appropriate. It is suggested that your program provide a list of acceptable ICD-9-CM stroke codes as allowable values for stroke-related diagnoses in order to minimize abstraction of erroneous ICD-9-CM codes.
- Free text fields should be formatted as text fields with the appropriate lengths as defined under "field type" in the enclosed data elements documentation. Please note field length in quality data elements section of the appendix.

4.4.3 Additional Data Elements

There should be three additional variables to the current set of data elements in order to allow for record auditing and analysis:

1. <statenam> defines each state with a two-letter abbreviation (GA, MA, NY, etc.) This variable should be in character format, feed right justified with length = 2.
2. <hospital> defines hospital codes as specified by each state. Each state will keep reference tables that link the codes to the actual hospitals. These codes should be consistent with codes provided on the hospital survey in order to allow CDC to stratify data based on general hospital characteristics. This variable should be in character format, feed right justified with leading zeros and length = 5.
3. <patidnum> defines patients' identifier as prescribed by hospitals. The codes should not enable a patient to be identified outside the corresponding hospital. This variable should be in character format, feed right justified with leading zeros and length = 9.

Any questions or comments regarding these instructions should be directed to the CDC Data Manager. CDC will advise as needed for personnel changes.

4.5 In-Hospital Inventory

The purpose of the PCNASP in-hospital inventory survey is to understand the capacity and infrastructure of stroke care in participating PCNASP hospitals. This information is vital to CDC and grantees for a national and state perspective of stroke care capabilities.

The hospital inventory is provided in the appendix for grantees, and is subject to annual updates in the information required. The first page of the hospital inventory contains instructions for hospitals as well as a required statement from the Office of Management and Budget (OMB) about the reporting burden of the survey. The OMB statement cannot be edited and or removed from the first page when sending the survey to hospitals. The inventory consists of both required and optional modules and questions. All of the required sections must be submitted to CDC annually. The optional modules are meant to supplement the core survey with additional questions that may be of interest for states to collect.

Grantees must collect hospital inventory data from participating hospitals each program year, and submit the collected data to CDC on an annual basis, by the Quarter 2 reporting deadline (see Timeline in the Appendix). For example, each grantee will collect program year one data from their hospitals any time during June 30, 2015- June 29, 2016. This data must then be aggregated and submitted by grantees to CDC by the Quarter 2 reporting deadline, which is July 14, 2016.

All new hospitals should complete the inventory after becoming a participant in PCNASP. Grantees can choose to collect the information from hospitals in the manner of their choosing (e.g. paper form, electronic file). However, when submitting the data to CDC, it must be in the format of a single Excel file that is uploaded through the SAMS secure web portal. This file should contain the inventory data from each hospital in a single Excel file tab. The data must be de-identified of any hospital names, but retain the hospital's PCNASP hospital ID so that the inventory data can be linked to patient-level quality data.

4.6 Data Burden Statement

PCNASP is seeking approval from the Office of Management and Budget to conduct federally sponsored information collection. OMB reviews the request to ensure that the information that is collected is maximized in its utility and has the greatest possible public benefit to improve quality and use of federal information. The burden of data collection and submission by hospitals and grantees is estimated for OMB. Burden includes the transmission of pre- and post-hospital quality data by hospitals, primary data collection of hospital inventory data by hospitals, and transmission of quality data and hospital inventory data by grantees. ***These following statements are included on the first page of all data collection forms because OMB requires them. Please do not remove them from any of the forms.***

Submission of the Pre-hospital dataset, the In-hospital dataset, and the Post-hospital dataset (by grantees)
Public reporting burden of this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to CDC/ATSDR Reports Clearance Officer; 1600 Clifton Road NE, MS D-74, Atlanta, Georgia 30333; ATTN: PRA (0920-xxxx)

Submission of the Hospital Inventory dataset (by grantees)
Public reporting burden of this collection of information is estimated to average 8 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to CDC/ATSDR Reports Clearance Officer; 1600 Clifton Road NE, MS D-74, Atlanta, Georgia 30333; ATTN: PRA (0920-xxxx)

Submission of the Pre-hospital dataset and the Post-hospital dataset (by hospitals to grantees)
Public reporting burden of this collection of information is estimated to average 15 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to CDC/ATSDR Reports Clearance Officer; 1600 Clifton Road NE, MS D-74, Atlanta, Georgia 30333; ATTN: PRA (0920-xxxx)

Submission of Hospital Inventory dataset (by hospitals)
Public reporting burden of this collection of information is estimated to average 15 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a

currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to CDC/ATSDR Reports Clearance Officer; 1600 Clifton Road NE, MS D-74, Atlanta, Georgia 30333; ATTN: PRA (0920-xxxx)

4.7 Other Data Issues

While it may be helpful for hospitals to input baseline cases to gauge their level of performance prior to becoming PCNASP hospitals, inclusion of such cases contaminates the PCNASP database because this is not a requirement of PCNASP. If a state does allow hospitals to include those cases, all of those cases will need to be removed prior to every upload of quarterly data to CDC. If a state allows these cases in their data, the state will need to take note of the hospital code and earliest date when the hospital began entering data *after* signing on to the program in order to effectively exclude baseline cases. A baseline quarter for PCNASP is the first quarter that a hospital enters cases that were admitted after the hospital signed on to PCNASP and received their training. Cases that were admitted prior to a hospital becoming a PCNASP participated hospital are not to be included in data sent to CDC.

5 Evaluation

5. 1. Overview

e·val·u·a·tion (ə¦valyəˈwāSH(ə)n)
***noun*:** "the systemic investigation of the merit, worth, or significance of an object." – M. Scriven

Program evaluation and performance measurement are important required activities of this cooperative agreement. Evaluation allows both awarded programs and CDC to conduct ongoing monitoring of the programs, and to assess and show program effectiveness to all our key stakeholders. Evaluation and performance measurement also facilitates continuous quality and program improvement and can help us demonstrate program outcomes and impact.

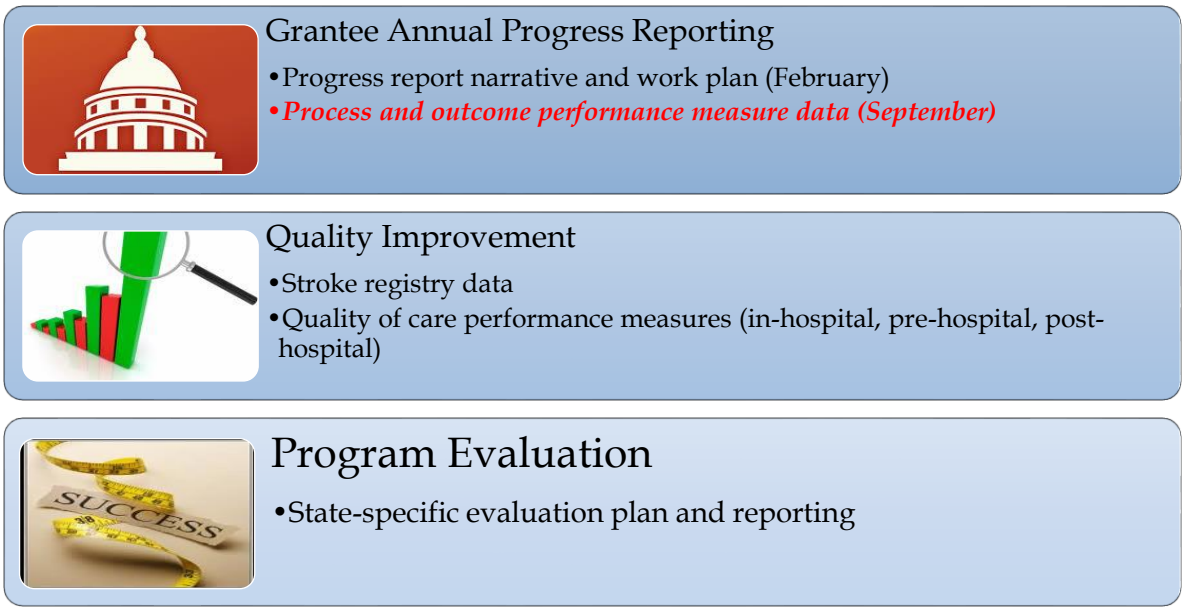
CDC's program evaluation efforts whether at the national level or at the local level are guided by the CDC evaluation framework for public health. (http://www.cdc.gov/eval/framework/) This model includes 6 key steps and 4 standards.

In order to have a comprehensive evaluation approach of all DHDSP programs, CDC evaluations tend to have 3 components: the local, grantee-specific evaluation plans; performance measures tied to programmatic activities and outcomes; and a CDC evaluation of the entire program (which may or may not include additional primary data collection outside of existing data sources). Each of these components tells a piece of the full story of Coverdell and allows the grantee and CDC to document information desired by key stakeholders.

The Coverdell process and outcome performance measures are quantitative in nature, and help demonstrate achievement of outcomes and drive continuous improvement through the monitoring and evaluating of these over time. They are also the only standardized measures that all Coverdell grantees report on related to programmatic activities and outcomes. State-specific evaluations allow for more qualitative information, complementary data to the performance measures around facilitators and barriers, and more information around the "how" and the "why" perhaps certain measures were or were not achieved. Lastly, to round out this

information, CDC may have additional resources to collect further data outside of the performance measures and grantee evaluations to speak to the value or importance of the Coverdell program as a whole.

The following graphic describes and organizes the three main activities in which grantees are collecting and reporting data: the annual progress report (APR), stroke care quality improvement, and program evaluation. Each of these activities has a unique purpose; however, it's likely that there could be some overlap and use of data to satisfy multiple purposes. This illustration helps to clarify the difference between the quality of care performance measures which are a key piece of this cooperative agreement, and the process and outcome performance measures. The process and outcome performance measures are part of the reporting requirements for recipients of CDC funds. And they are aligned with the activities and outcomes outlined in the Coverdell FOA logic model.



5. 2. State-specific Evaluation Plan Guidance

This section clarifies the expectations for the required state-specific evaluation plans (see Appendix L for handouts).

Guidelines for the state-specific evaluation plan.

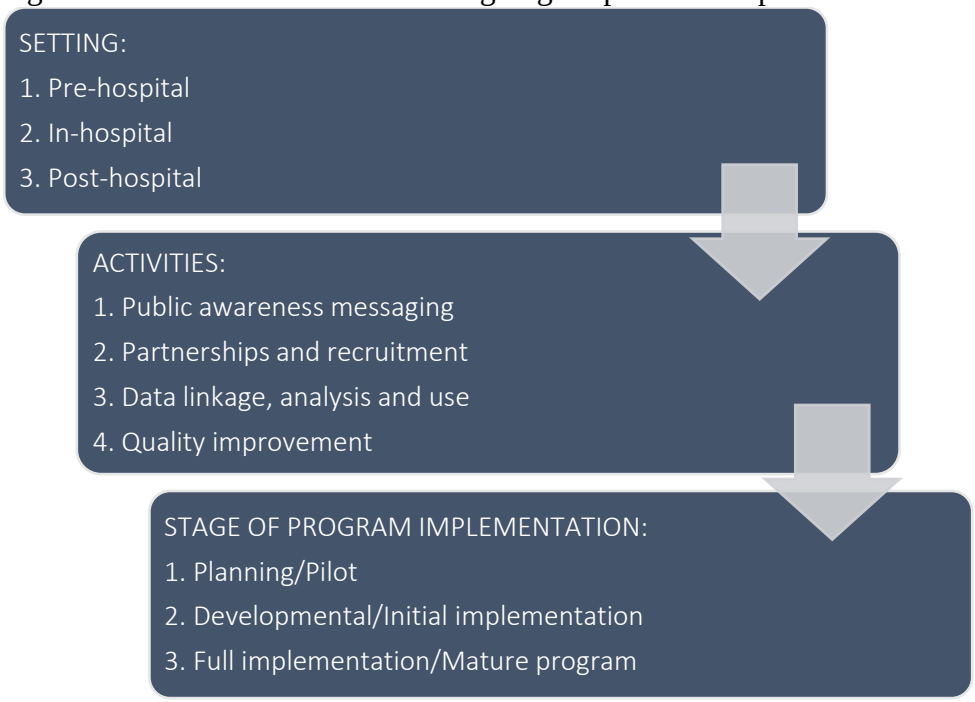
- CDC encourages programs to use the *Coverdell State-specific Evaluation Plan Template (*accompanying document) or a similar template that addresses all content areas (i.e. evaluation overview, context, stakeholders, design, indicators, data source, dissemination, etc).

- The evaluation plan should describe your overall evaluation goals and objectives for the five years of the cooperative agreement, and provide details of the evaluation focus and data collection activities for program year 2 (June 30, 2016 – June 29, 2017).

- Programs are encouraged to submit a logic model or conceptual model with the evaluation plan, illustrating the activities and outcomes the program will achieve through this cooperative agreement.

- When designing and focusing your evaluation, give consideration to 1) the particular setting, 2) the key program activities, and 3) the stage of program implementation. Based on your resources, select the components and activities to focus your evaluation and the type of evaluation approach most suited to the stage of the program. (See Figure 1.)

Figure. Factors to consider when designing scope of state-specific evaluation plan.



Process for finalizing state-specific evaluation plans.
CDC will review the draft state-specific evaluation plans and compile a list of the programmatic activities selected for evaluation and the proposed evaluation questions across all grantees. At the Coverdell Grantee Workshop in March 2016 there will be a forum for CDC evaluators and grantees to develop a menu of suggested evaluation questions for all programs to select from and incorporate into their final evaluation plans; resulting in some common areas of exploration, measurement and assessment across multiple programs.

Timeline.
The following are key dates for the submission of your evaluation plans and findings. (Note: Some dates may have changed since previous guidance):

- Draft evaluation plan submission – January 1, 2016
- Grantee Workshop; collaboratively refine evaluation focus areas – March 9-10, 2016
- Final evaluation plan submission – June 30, 2016 (last day of program year 1)
- Evaluation Report submission dates:
  - Year 2 evaluation results – September 30, 2017 reporting
  - Year 3 evaluation results – September 30, 2018 reporting
  - Year 4 evaluation results – September 30, 2019 reporting
  - Year 5 and final evaluation findings report – September 30, 2020 reporting

5. 3. Process and Outcome Performance Measures

Purpose.
To briefly clarify grantee reporting responsibility for the Paul Coverdell National Acute Stroke Program process and outcome performance measures. Four categories of reporting are described below and are numbered to align with the list of performance measures in the FOA (pages 8-11).

Process and outcome performance measures for evaluation.
The process and outcome performance measures for the Paul Coverdell National Acute Stroke Program standardize the assessment of program activities (e.g., public awareness, program reach, data linkages, and stroke systems of care) and outcomes across state programs. All the process and outcome performance measures described in the FOA are important for evaluating the national program across grantees.

Reporting responsibility and timeline.
The CDC team reviewed each process and outcome performance measure with the goal of clarifying reporting expectations and minimizing reporting burden for grantees. Tables 1-4 describe the reporting responsibility and methodology for each process and outcome performance measure. In summary, of the 50 measures defined in the FOA: 1) eighteen measures will be reported in a table format by the grantee quantitatively as a number, percent or proportion; 2) ten measures will be reported by the grantee qualitatively in a narrative; 3) eighteen quantitative measures will be reported by CDC on behalf of the grantees; and 4) five measures are optional.

> **Baseline data** are initial performance measurement data collected prior to the program intervention. Baseline data are essential to monitor and track program changes.
>
> **Targets** provide information on the desired level of change over a given time period. Setting a target involves knowing where you are now, what you are trying to achieve, and determining challenging but realistic amounts of improvement needed to get there.

February 29, 2016 – In the CDC-provided template, grantees report baselines and set targets for all required process and outcome performance measures. For the 18 grantee-reported quantitative measures, grantees will report baseline values, and set targets for Program Years 2 and 5. For the 10 grantee-reported qualitative measures, grantees will report a baseline narrative, and set program targets for Program Years 2 and 5. If possible, grantees should use previous trend data to establish baselines and inform targets for the measures that will be reported by CDC.
September 30, 2016 – Grantees submit updates to baseline data and Program Year 2 targets (if needed) and provide annual data for Program Year 1.
September 30 (annually) – Annual reporting on quantitative and qualitative process and outcome performance measures until the end of the cooperative agreement.

Figure 1. Grantees will report on process and outcome performance measures on February 29, 2016, September 30, 2016 and on September 30th annually for the remainder of the cooperative agreement. Additional reporting dates for other cooperative agreement evaluation requirements can be found in the *PCNASP Resource Guide*.

Process and outcome performance measure reporting	2/29/16	9/30/16	9/30/17	9/30/18	9/30/19	9/30/20
Report baseline data						
Set targets for Program Years 2 and 5						
Revise baseline data (if needed)						
Set or revise targets for following Program Year						
Report annual data						

Table 1. Measures that are reported quantitatively by grantees

Eighteen measures will be reported by the grantee quantitatively as a number, percent or proportion**:** 1, 2, 3, 4, 7, 13, 14, 15, 20, 21, 22, 23, 24, 27, 28, 29, 30, 39
1. #/(types) of activities that promote public awareness on signs and symptoms and appropriate emergency response
2. #/(types) of partnerships between state Coverdell Program and other stroke-related entities
3. # of local or regional EMS agencies recruited to participate in state Coverdell activities
4. # of hospitals recruited to participate in state Coverdell activities (in- and post-hospital care)
7. % of hospitals that submit 30-day post discharge data to an integrated data management system for the purposes of the Coverdell program's in-hospital data-driven QI activities and performance monitoring for acute stroke patients
13. #/type of stroke QI efforts implemented by state Coverdell program for EMS & hospital staff
14. % of EMS agencies that participated in stroke QI efforts implemented by state Coverdell program
15. % of hospitals that participated in stroke QI efforts implemented by state Coverdell program
20. % of state acute stroke admissions in participating hospitals
21. % of state acute stroke patients transported by EMS agencies participating in state Coverdell program
22. Proportion of EMS agencies that have data linked to in-hospital data
23. (%) # of EMS run sheets entered into in-hospital data collection tool
24. % concordance between original abstractor and re-abstractor for each specified data element
27. # and type of trainings provided to EMS and to hospital stroke professionals
28. Proportion of EMS and hospital stroke professionals with improved scores in pre and post tests administered during training events
29. % of hospitals that implemented changes in stroke care practices
30. % of EMS agencies that implemented changes in stroke care practices
39. % of EMS-hospital teams reporting use of feedback from hospital to EMS

Table 2. Measures that are reported qualitatively by grantees as a narrative

Ten measures will be reported by the grantee qualitatively: 1, 5, 6, 8, 9, 10, 11, 12, 16, 17	
1.	(# and) types of activities that promote public awareness on signs and symptoms and appropriate emergency response
5, 6.	% of EMS agencies/hospitals that submit data to an integrated data management system for the purposes of the Coverdell program's data-driven QI activities and performance monitoring for potential acute stroke patients *(instead of reporting percent, please describe the integrated data management system and strategy)*
8.	Submission of annual chart re-abstraction results according to CDC guidelines
9.	(# of) and types of reports created using quality of care data from EMS and hospitals
10.	(# and) type of systematic QI methods/interventions implemented by EMS agencies as a result of quality of care data reports
11.	(# and) types of systematic QI methods/interventions implemented by hospital staff as a result of quality of care data reports
12.	(# and) type of systematic QI methods/interventions implemented by hospital staff as a result of quality of care data reports to improve transition of care from hospital to home
16.	Sustainability plan submitted to CDC by end of Year 3
17.	Revisions/updates to sustainability plan in years 4 & 5 as necessary

Table 3. Measures that are reported by CDC on behalf of grantees

Eighteen quantitative measures will be reported by CDC on behalf of the grantees: 18, 19, 25, 26, 35, 37, 38, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50
The reporting responsibility for the measures enumerated here is shifted to CDC. Grantees already report sufficient data through existing mechanisms that CDC will be able to report these essential measures and reduce grantee reporting burden.

Table 4. Measures that are not required for reporting

Five measures are optional: 31, 32, 33, 34, 36
While these measures are not required for reporting, grantees are encouraged to include them in state level evaluation plans where appropriate and feasible.

Additional process and outcome performance measure guidance.

The measure reporting template will be provided to grantees with the APR template and guidance, prior to the February 29, 2106 reporting date. CDC will also disseminate a *Performance Measures Resource Guide* in early 2016 that will provide further clarification on process and outcome performance measures, including definitions of key terms, suggested operationalization, and guidance on target setting.

5. 4. Evaluation Technical Assistance

Kincaid Lowe and Joanna Elmi serve as main point of contacts to the awarded programs for evaluation technical assistance (TA). They will work closely with Jennifer, Sallyann and Sheila to provide evaluation technical assistance by email, during regularly scheduled 1:1 calls, and any other ad hoc requests.

There are three ways that CDC evaluators plan to deliver evaluation technical assistance: through diverse communication strategies, the provision of tools, and engaging in a collaborative process to determine priorities and focus areas.

Communication	Tools	Collaboration
1:1 monthly Calls; Ad hoc Calls Evaluators Listserv Evaluation workgroup Webinars/presentations Peer to peer sharing Lessons learned from 2012-2015	POPM Resource Guide Reporting templates Cost collection template	POPM prioritization Recommended evaluation questions

In addition to the Coverdell specific evaluation TA support, other DHDSP evaluation resources include the monthly coffee breaks that happen on the second Tuesday of every month and the DHDSP evaluation website (www.cdc.gov/dhdsp/evaluationresources.htm). For example, there is a helpful guide on how to evaluate partnerships, as well as a tip sheet on how to evaluate trainings, and a tip sheet on calculating reach and impact. You can also access archives of podcasts and webinars that may address a targeted area of interest for you.

Joanna provides TA for:
Michigan – Minnesota – Ohio – Washington - Wisconsin

Kincaid provides TA for:
California – Georgia – Massachusetts - New York

For questions about evaluation requirements and activities, please contact your CDC evaluation TA provider: Joanna (jelmi@cdc.gov) or Kincaid (klowe@cdc.gov).

6 Public Communications

A short-term goal of the Coverdell cooperative agreement is to increase public awareness of the signs and symptoms of stroke and the importance of using emergency medical services, or calling 9-1-1. DHDSP will provide technical assistance and support to help grantees achieve these goals. This section provides tools and resources you can use to develop and implement communication strategies and activities.

In 2015, DHDSP expanded its stroke communication portfolio by developing new videos, fact sheets and other consumer materials. Most of the products were released in May for American Stroke Month and in October to commemorate World Stroke Day. The new products are outlined below and are available on the DHDSP and Paul Coverdell National Acute Stroke Program (PCNASP) websites: http://www.cdc.gov/dhdsp/materials_for_patients.htm. Please feel free to highlight the products on your program's web site, incorporate into campaign activities, or modify to reach your target populations.

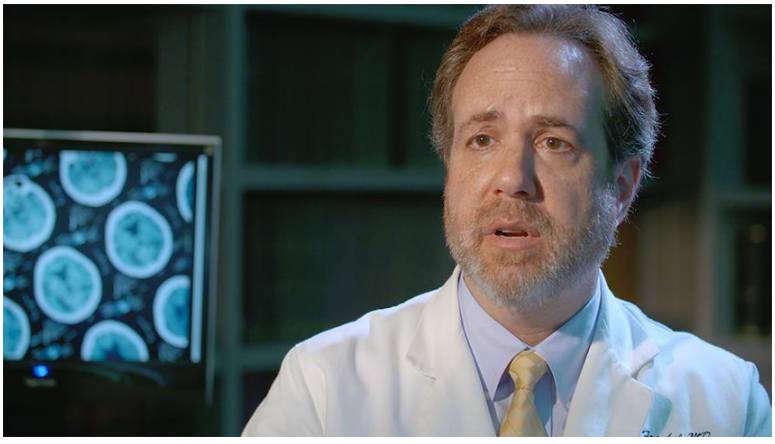
6.1 Stroke Materials and Resources

- Stroke Video Series (http://www.cdc.gov/stroke/media/videos.htm)

The stroke video series include four videos that highlight the signs and symptoms of stroke and the work supported by CDC's PCNASP or Coverdell.

Videos include:

1) Recognize the Signs and Symptoms of Stroke – A short animated video that highlights the signs and symptoms of stroke and the importance of getting to the hospital FAST. (This is an evergreen video that can be easily shared via social media on stroke observances and other occasions. Length: 2:32)
2) Dr. Frankel's Coverdell Story: Improving Stroke Care in Georgia – Dr. Michael Frankel, Chief of Neurology at the Marcus Stroke & Neuroscience Center at Grady Memorial Hospital in Atlanta, is a longtime champion of the Georgia Coverdell Registry and the PCNASP. In this documentary-style video, Dr. Frankel explains the strategies supported by Coverdell and how other health care providers can benefit from implementing the strategies to improve stroke care. (Length: 4:21)



3) Coverdell Stroke Program: Ensuring That All Americans Receive the Highest-Quality Care – This video provides an overview of the mission, goals, and accomplishments of the PCNASP and describes how the program works to improve stroke care and reduce stroke complications and deaths, particularly among those with the highest burden. (Length: 5:30)

4) Prince Quire's Stroke Story – In this video, Mr. Prince Quire, an African-American male from Georgia, recalls how he had a stroke at 39-years-old. African Americans have higher stroke risk than any other ethnic group in the United States. Mr. Quire was treated at Grady Memorial Hospital in Atlanta, a participating Coverdell hospital, and today is living an active, productive life. (Length: 3:51)

Additional Video Resource:

Tips From Former Smokers: Blanche's Story – In this video, Ms. Blanche Teal-Cruise, a spokesperson for CDC's TIPS campaign, shares her story about smoking cigarettes for more than 25 years and quitting after suffering a stroke. Ms. Teal-Cruise's story also is featured in the new Women and Stroke fact sheet. (Length: 1:42)

All videos are housed on DHDSP's website: http://www.cdc.gov/stroke/media/videos.htm.

The videos are available for grantees to promote as a part of stroke prevention campaign activities. For information about tagging the ads with your health department or agency logo, please contact Jacquie Dozier, DHDSP health communication specialist, at izd1@cdc.gov.

"Stroke and You" Fact Sheet series (http://www.cdc.gov/stroke/materials_for_patients.htm)
DHDSP published new stroke fact sheets geared toward consumers to highlight prevention strategies for populations most at risk for stroke. The fact sheets target the general population (adult men and women) African Americans, and Hispanics. The fact sheets highlight the prevention challenges these groups face and ways CDC is addressing them. The following fact sheets are available:

- Women and Stroke
- Men and Stroke
- African-American Women and Stroke
- African-American Men and Stroke
- Hispanic Women and Stroke (Coming soon in English and Spanish)
- Hispanic Men and Stroke (Coming soon in English and Spanish)

- PCNASP Success Stories (http://www.cdc.gov/dhdsp/programs/stroke_registry.htm)
  These success stories provide a snapshot of stroke care accomplishments within the Coverdell cooperative agreement program, during the 2012-2015 funding period. The series features Arkansas, Georgia, and Massachusetts.

- Infographics, Social Media Cards, and Blogs (http://www.cdc.gov/stroke/media/index.htm)

The Stroke prevention web tools include infographics, blogs, and social media cards you can use to promote and highlight your campaign activities. These items will link back to DHDSP's web site.

Materials include:

- Understanding Stroke Risk in Women Infographic (In English and Spanish)
- Social Media Cards
- Global Voices BLOG: CDC Recognizes Women and Stroke for World Stroke Day (available at http://blogs.cdc.gov/global/2015/10/29/cdc-recognizes-women-and-stroke-for-world-stroke-day/)

- PCNASP Logo and Grantee Map

PAUL Coverdell NATIONAL ACUTE STROKE PROGRAM

In 2012, as the Coverdell registry expanded to include more activities, CDC changed the name of the cooperative agreement to the Paul Coverdell National Acute Stroke Program. In 2014, as the program continued to evolve, the PCNASP updated its logo, which is reflected here.

***6.2** Guidelines for Using the Coverdell Design Element or Logo*

For purposes of this document, "Coverdell" refers to the Paul Coverdell National Acute Stroke Registry or Program.

1. The Coverdell Design Element may not be used to endorse any commercial product or service.
2. The Coverdell Design Element may not be used to solicit funds or other contributions of monetary value.
3. The Coverdell Design Element may not be used in any manner that could give rise to the appearance of such endorsement or solicitation; EXCEPT
    a. The Coverdell Design Element may be used for informational, educational, and historical purposes in connection with programs that promote information found on the Coverdell website.
    b. The Coverdell Design Element may be used by State-funded Coverdell grantees on participation certificates for hospitals, health care organizations, and EMS services that are participating in the Paul Coverdell Acute Stroke Registry or Program.
    c. Any other uses are not authorized.
    d. Grantees shall make requests to use the Coverdell Design Element in writing (email is sufficient) to the CDC Coverdell Program and obtain authorization prior to use.
4. This guidance does not include the use of the CDC or HHS logos.

6.3 Additional Communication Information

CDC Stroke Tweets can be found in the appendix.

For questions about communication support and assistance, please contact your CDC health communication specialist Jacquie Dozier at izd1@cdc.gov.

7 Informatics

7. 1. Overview

in·for·mat·ics (infərˈmadiks)
noun*: the *science of processing data for storage and retrieval; information ***science***.

Informatics plays an important role as part of this cooperative agreement. Informatics allows both awarded programs and CDC to identify ways to share and link data across different technology platforms, ensure data privacy and security, identify and remedy data-quality problems, and to identify information and sources that best measure, track, and improve the quality of care and access to care for stroke patients from onset of stroke symptoms through rehabilitation and recovery. In other words, informatics provides evidence-based scientific guidance to information aspects of a project. Informatics can also provide insights and opportunities to facilitate continuous data collection, linkage, sharing, storage, and retrieval and can help us demonstrate program outcomes and impact.

The field of stroke surveillance informatics presents both opportunities and challenges. One of the main challenges includes identifying applicable, informative data interchange standards. Another challenge is finding efficient and effective ways of combining multiple sources of complex data and information into meaningful, actionable knowledge in an environment with limited funding. In order to comprehensively collect high value data, information systems should: be able to manage a high quantity of heterogeneous data, be distributed widely, be able to coordinate both locally and nationally, be easily shared, be standardized, be user-friendly, and contain quality control measures. As challenges are met, opportunities arise to exchange high value data in a secure and timely manner for effective patient management, care improvement, and knowledge generation.

While the Coverdell program does not specify any particular data collection tool, the CDC encourages funded states to establish data system infrastructure for integrated data management system to measure, track, and assess quality of care. Grantee efforts related to informatics should be focused on enhancing and linking information systems within 3 domains: Pre-Hospital, In-Hospital, and Post-Hospital. The following sections expand on known informatics activities within each domain. CDC informatics will also work with the grantees in identifying potential tools, as well as, creating common, collaborative solutions.

7. 2. Pre-Hospital Information Systems

Suspected stroke cases require time sensitive treatments, so transport time to an appropriate facility is critical. However, we know that emergency medical service (EMS) systems are configured differently and vary by the size, demographics, geography, and politics of the local communities they serve. Emergency medical service systems may be delivered from multiple entities such as, community, emergency medical and healthcare personnel, public safety agencies, emergency facilities, and critical care units. Grantees are required to collect specific evidence-based pre-hospital data elements (located in Appendix L) which may involve one or more of the aforementioned service systems. Below is a depiction of the systems grantees are using to collect pre-hospital measures.

State	Data Source	Vendor Who Collects the Data	Data System
California	- Patient case report (PCR)	- EMS providers (e.g. ambulance crews, paramedics, firefighters)	NEMSIS

Georgia	-Patient case report (PCR)	- Image Trend	GEMSIS
Massachusetts	-Patient case report (PCR)	- Image Trend - AmbuPro - Zoll	MATRIS
Michigan	-Patient case report (PCR)	- Zoll - Physio/Sansio - Image Trend	MIEMSIS
Minnesota	-Patient case report (PCR)	- Emergency Medical Services Regulatory Board (EMSRB)	MNSTAR
New York	-Patient case report (PCR) -GWTG	- Image Trend - Quintiles	NEMSIS
Ohio	-Patient case report (PCR) -GWTG	- Firehouse - Open Incorporated - Zoll - Emergency reporting - ESO Solutions -Quintiles	-
Washington	-Patient case report (PCR) -GWTG	- Image Trend - Quintiles	WEMSIS
Wisconsin	-Patient case report (PCR)	- EMS providers (e.g. ambulance crews, paramedics, firefighters)	WEMSIS

7. 3. In-Hospital Information Systems

The success of a stroke system of care rests in large part on the ability of the various components of the stroke system to communicate effectively with one another. Collaboration between pre-hospital responders and hospital providers can help minimize the time required for stroke patients to receive evaluation, care, and urgent therapy once admitted to the hospital. Grantee required and optional evidence-based in-hospital data elements can be found in Appendix M. Grantees appear to collectively use "Get with the Guidelines" as the source to gather in-hospital measures.

State	Data Source	Vendor Who Collects the Data	Data System
California	-GWTG	- Quintiles	
Georgia	-GWTG	- Quintiles	
Massachusetts	-GWTG	- Quintiles	
Michigan	-GWTG	- Quintiles	
Minnesota	-GWTG	- Quintiles	
New York	-GWTG	- Quintiles	
Ohio	-GWTG	- Quintiles	
Washington	-GWTG	- Quintiles	
Wisconsin	-GWTG	- Quintiles	

7. 4. Post-Hospital Information Systems

After diagnosing, treating, and stabilizing the stroke patient in the hospital, secondary measures to prevent long-term complications and to provide rehabilitation, patient and family education, and family support are started. One of the main goals of this FOA is to improve access to rehabilitation and opportunities for recovery after stroke. Grantees are required to collect post-hospital data elements (see Appendix N); however, at this time grantees have not yet chosen specific post-hospital informatics sources/systems. As the FOA progresses, this section will be updated.

State	Data Source	Vendor Who Collects the Data	Data System
California	-	-	
Georgia	-	-	
Massachusetts	-	-	
Michigan	-	-	
Minnesota	-	-	
New York	-	-	
Ohio	-	-	
Washington	-	-	
Wisconsin	-	-	

7. 5. Summary: Proposed Informatics Tools and Linkages

Proposed Pilot Tools

States	Pre-Hospital	In-Hospital	Post-Hospital	EMR Systems
California	ePCR, NEMSIS	GWTG	TBD	To be surveyed
Georgia	Image Trend-NEMSIS	GWTG	TBD, RedCap?	To be surveyed
Massachusetts	ePCR, Image Trend-NEMSIS v2	GWTG	GWTG 30-day tab	Epic, Cerner, Meditech
Michigan	ePCR, Image Trend-NEMSIS	GWTG	30-day form, MOSAIC, RedCap?	Epic, Cerner
Minnesota	Image Trend-NEMSIS	GWTG	RedCap, MS-Access/MS-Excel?	Epic
New York	ePCR, Image Trend, GWTG EMS	GWTG, SPARCS	GWTG 30-day tab, others	Epic, Cerner, others
Ohio	ePCR, GWTG EMS Tab	GWTG	GWTG 30-day tab, others	Epic-50%, Cerner-11%, AllScripts, Eclipsys, MediTech, McKesson, and Siemans Soarian
Washington	ePCR-NEMSIS, Image Trend	GWTG	30-day form?	Epic, Healthland, CPSI
Wisconsin	ePCR, GWTG EMS Tab	GWTG	30-day form/GWTG 30-day tab	Epic-75%, Cerner-14%, McKesson-2%, Meditech-1%

Proposed Linkages

California		
Georgia	LongID	LongID
Massachusetts	Probabilistic	Probabilistic
Michigan	Probabilistic/Deterministic	Probabilistic/Deterministic
Minnesota	Probabilistic, EMS Run Number	Coverdell ID
New York	Matching Algorithm	Matching Algorithm
Ohio	Probabilistic	Probabilistic
Washington	ID#?	ID#?
Wisconsin		

7. 6. State Data Flow Diagrams

To provide a picture of what each grantee is proposing, individual state data flow diagrams can be found in Appendix W.

7. 7. Data Transfer Protocol

Data transfer from Grantees to CDC may be achieved in a variety of ways. The ones recommended by the project are:

1. Secure Access Management System (SAMS) - the most secure way to get project data delivered to CDC.
2. Grantees may also opt to send data via file-transfer protocol (ftp), but only after a secure, encrypted ftp site has been created for the project. Should this option be preferred, please inform project team lead or informatics lead.
3. ***No Personal Identifier Information*** (PII) ***should be sent in an email*** attachment, unless it is encrypted using CDC approved software (Note: Winzip is **not** an approved product)
4. **NOTE**: PII information for Paul Coverdell project arises due to the admission and discharge dates that are associated with the data received by CDC. These dates can provide potential ways to identifying individual hospitals or even patients.

7. 8. Data Use Policy/Guidelines

This section will be updated as soon as center policy gets finalized.

7. 9. Informatics Technical Assistance

Asha Krishnaswamy will serve as the main point of contact to the awarded programs for informatics technical assistance (TA).

For questions about evaluation requirements and activities, please contact Asha (fos3@cdc.gov).

8 Appendix

The appendix consists of documents that are helpful in the overall operations of the PCNASP.

A. Terms and Definitions

Commonly Used Terms and Definitions for State Program Operations

- **Allowable Cost** - a cost incurred by a recipient that is reasonable for the performance of the award.
- **Application** - a request for financial support of a project/activity, submitted to CDC on specified forms and in accordance with instructions provided by the GMO/GMS/GMS.
- **Appropriated Funds** - funds authorized by an act of Congress and signed by the President that provides authority to permit Federal agencies to incur obligations or to make payments out of the Treasury for specified purposes.
- **Approved Budget** - the financial expenditure plan (as shown in the Notice of Award), including any revisions approved by CDC for the grant-supported project. The approved budget may consist of Federal grant funds and/or non-Federal funds.
- **Award** - the provision of funds or direct assistance in lieu of funds based on an approved application and budget to provide general financial assistance to a recipient to carry out an activity or program.
- **Budget Period** - the interval of time (usually 12 months) into which the project period is divided for budgetary and funding purposes.
- **Carryover Balance** - unobligated funds from a previous funding period under a grant that are authorized for use to cover allowable costs in a current funding period.
- **Closeout** - the process by which CDC determines whether all applicable administrative actions and all work required by the grant have been completed by the recipient and the awarding agency for a project.
- **Cooperative Agreement** - an alternative assistance instrument that is used in lieu of a grant, where substantial Federal involvement is anticipated with the recipient during performance. The difference between grants and cooperative agreements is the degree of Federal programmatic involvement rather than the type of administrative requirements imposed.
- **Direct Cost** - any cost that can be identified specifically with a particular final cost objective (e.g., project, program).
- **Disallowed Cost** - a proposed cost that is determined to be unallowable by the GMO/GMS.
- **Equipment** - tangible nonexpendable personal property that has a useful life of more than 1 year and an acquisition cost of $5,000 or more per unit. However, consistent with recipient policy, lower limits may be established.
- **Financial Status Report** - a report of expenditures of the financial status of grants/cooperative agreements according to the official accounting records of the grantee organization.
- **Grant** -a financial assistance mechanism whereby money and/or direct assistance are provided to carry out approved activities. A grant is used whenever the awarding office anticipates no substantial performance with the recipient during performance of the financially assisted activities.
- **Grantee/Grant Recipient** - the organizational entity or individual to which a grant or cooperative agreement is awarded, and which is responsible and accountable for the use of the funds provided and for the performance of grant-supported activities.
- **Indirect Cost** - any cost that not directly identified with a single, final cost objective, but identified with two or more final cost objectives.
- **Monitoring** - a process whereby the programmatic and business management performance of a grant are continuously reviewed through the collection and assessment of information gathered from audit, financial, and progress reports; continuation applications;

correspondence; grantee Board minutes; newspaper articles; site visits; and other sources. Monitoring also includes taking corrective action, as needed.

- **Noncompeting Continuation** -CDC approval of additional time, not to exceed 12 months, to any budget period, including the final budget period, of a previously approved project period. The extension may be made with or without additional funds. Notice of extension must be made through the issuance of a revised NOA.
- **Outlays or Expenditures** - charges made to the CDC sponsored program, which may be reported on a cash or accrual basis.
- **Prior Approval** - the written permission provided by the CDC granting official before the recipient may deviate from the approved budget and program plans.
- **Program** - a coherent assembly of plans, project activities, and supporting resources contained within an administrative framework, whose purpose is to implement an organization's mission or some specific program-related aspect of that mission.
- **Progress Report** - a recipient report, which contains, for each grant/cooperative agreement, information on the comparison of actual accomplishments to objectives established for the period. In addition, where the output of the project can be quantified, a computation of the unit of output may be required.
- **Project Period** - the total time for which support of a project has been approved. A project period may consist of one or more budget periods. The total project period comprises the original project period and any extensions.
- **Redirection** - redirection of funds occurs when the grantee determines that a project can be improved if approved funds are moved from one budget category to another within the current budget period.
- **Restricted Cost or Funding Restriction** -a cost for which additional information is needed or additional requirements must be met by the recipient prior to spending or engaging in any activity associated with that funding.
- **Substantive Programmatic Work** - the primary project activities for which grant support is provided and/or a significant portion of the activities to be conducted under the grant.
- **Suspension** - a temporary withdrawal of the grantee's authority to obligate grant funds pending corrective action by the grantee as specified by CDC or a decision by CDC to terminate the grant.
- **Termination** - permanent withdrawal of a grantee's authority to obligate previously awarded grant funds before that authority would otherwise expire, including the voluntary relinquishment of that authority by the grantee.
- **Terms of Award** - all legal requirements imposed on a grant by the Federal government, whether by statute, regulation, or terms in the grant award document. Each NOA may include both standard and special provisions that are considered necessary to attain the objectives of the grant, facilitate post-award administration of the grant, conserve grant funds, or otherwise protect the Federal government's interests.
- **Unliquidated Obligation** - on a cash basis, this is the amount of obligations incurred by the recipient that has not been paid at the close of the budget period. On an accrued expenditure basis, it is the amount of obligations incurred by the recipient for which an outlay has not been recorded.
- **Unobligated Balance** - that portion of the funds awarded by CDC that has not been obligated by the recipient at the close of the budget period.

B. The CDC Paul Coverdell National Acute Stroke Program Team

CDC Role, Organizational and Contact Information

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Rob Merritt, MA | Chief of Epidemiology and Surveillance Branch | rem2@cdc.gov
Mary George, MD, MSPH | Senior Consultant | Assistant Associate Director of Science coq5@cdc.gov
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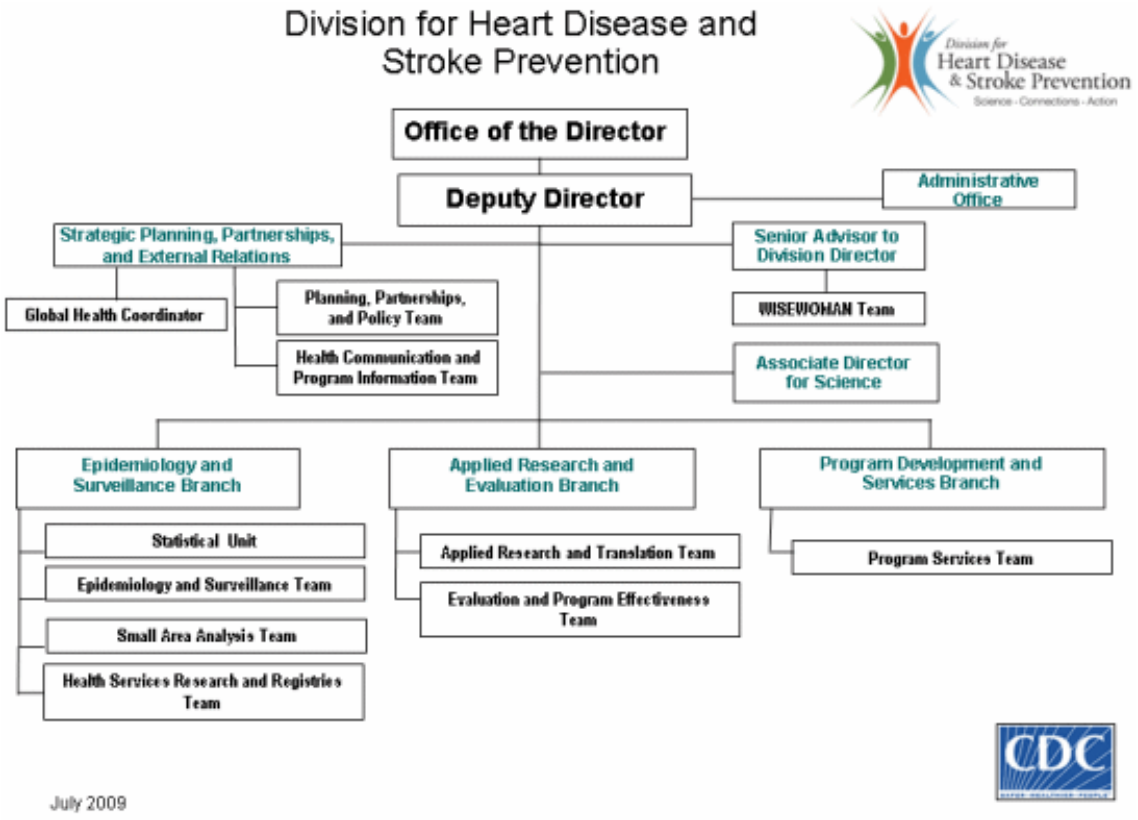
Cathleen Walsh, DrPH, MSPH | Acting Director for the Division of Heart Disease and Stroke Prevention | cmw0@cdc.gov


Division for Heart Disease and Stroke Prevention
Division for Heart Disease & Stroke Prevention
Science - Connections - Action
Office of the Director
Deputy Director
Administrative Office
Strategic Planning, Partnerships, and External Relations
Senior Advisor to Division Director
Global Health Coordinator
Planning, Partnerships, and Policy Team
WISEWOMAN Team
Health Communication and Program Information Team
Associate Director for Science
Epidemiology and Surveillance Branch
Applied Research and Evaluation Branch
Program Development and Services Branch
Statistical Unit
Applied Research and Translation Team
Program Services Team
Epidemiology and Surveillance Team
Evaluation and Program Effectiveness Team
Small Area Analysis Team
Health Services Research and Registries Team
CDC
July 2009

C. Grantee Primary Point of Contact List

California

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anita.Christie@state.ma.us
Website: www.mass.gov/dph
Blog: http://publichealth.blog.state.ma.us

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Michigan Department of Community Health: Grant # 5 NU58DP006076
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MOSAIC Co-PI
Director, Lifecourse Epidemiology and Genomics Division
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Riverview Center
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D. Adobe Connect Guidance

Guide for External Presenters:

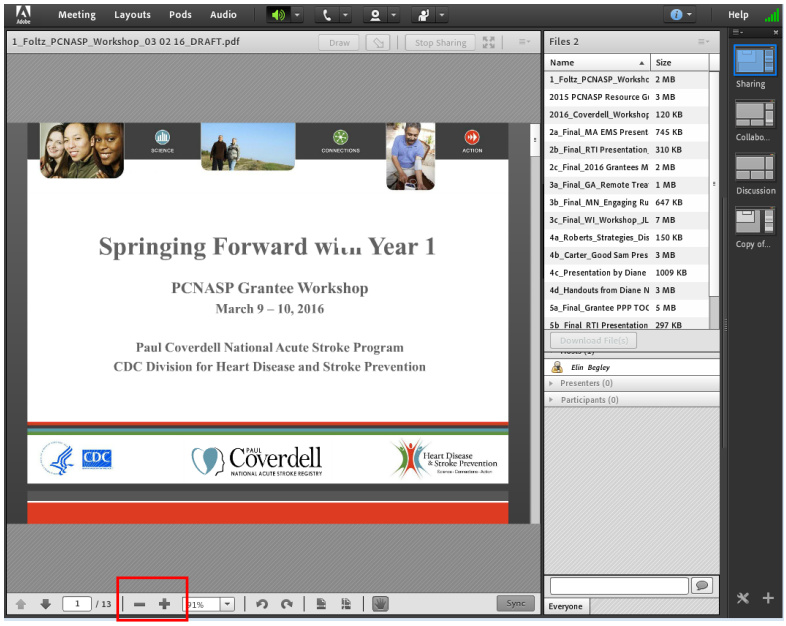
Adobe Connect will allow you to join the meeting, and only requires an internet connection and browser (no need to download any software). Below are a few tips to help make your presentation go smoothly:

Prior to the presentation:

- ✓ Verify connection speed. Attendee connection test (scroll up to the top of the page) - http://admin.adobeconnect.com/common/help/en/support/meeting_test.htm#Content
- ✓ Verify flash player is up to date. Flash player test - http://helpx.adobe.com/flash-player/kb/find-version-flash-player.html
- ✓ Connect directly to the fastest internet connection available (close any VPN connections).

On the day of your presentation:

- ✓ Try to arrive at least 30 minutes prior to session's designated start time for set up. We will have your presentation uploaded and ready to go.
- ✓ Enter the meeting by using the link provided to you in the calendar invitation.
- ✓ Enter the meeting as a Guest user by entering your First and Last Name in the Guest field
- ✓ When entering the room, if you receive a prompt that reads, "Would you like to start Audio Conference with this meeting?" click 'Start'.
    - You should receive a message "Audio Bridge Connected"
    - Click the "Mute my Speakers" under the green amplifier in the meeting room. Also please mute your computer's speakers during your presentation
- ✓ To connect to audio, please use your phone to dial into the conference. This is what you will use to listen to the meeting and speak during your presentation. When you are not speaking, please mute your phone line.
    - Conference line: 1-866-778-9221
    - Passcode: 85642167#
- ✓ Right before your presentation, we will change your status from a 'participant' to a 'presenter'. This will allow you to advance your slide using the following control in the bottom left-hand corner (see red box in the screenshot below). If you have any trouble advancing your slides, we are happy to do so for you. Please just let us know!



Guide for External Participants:

Adobe Connect will allow you to join the meeting, and only requires an internet connection and browser (no need to download any software). Below are a few tips to help make your presentation go smoothly:

Prior to the meeting:

- ✓ Verify connection speed. Attendee connection test (scroll up to the top of the page) - http://admin.adobeconnect.com/common/help/en/support/meeting_test.htm#Content
- ✓ Verify flash player is up to date. Flash player test - http://helpx.adobe.com/flash-player/kb/find-version-flash-player.html
- ✓ Connect directly to the fastest internet connection available (close any VPN connections).

On the day of the meeting:

- ✓ Arrive early to ensure that the system works properly for you
- ✓ Enter the meeting by using the link provided to you in the calendar invitation.
- ✓ Enter the meeting as a Guest user by entering your First and Last Name in the Guest field.
- ✓ When entering the room, if you receive a prompt that reads, "Would you like to start Audio Conference with this meeting?" click 'Start'.
    - You should receive a message "Audio Bridge Connected"
    - Click the "Mute my Speakers" under the green amplifier in the meeting room. Also please mute your computer's speakers during your presentation
- ✓ To connect to audio, please use your phone to dial into the conference. This is what you will use to listen to the meeting and speak. When you are not speaking, please mute your phone line.
    - Conference line: 1-866-778-9221
    - Passcode: 85642167#
- ✓ If you have any problems using Adobe Connect during the meeting, please feel free to use the chat box to send us a message, or 'raise your hand' using the icon in the top menu bar.

E. All-State Bi-Monthly Call Form

State to update form on sharepoint 10 days in advance of All-State Third Thursday calls.

Paul Coverdell National Acute Stroke Program
State Information Sharing

Date: _____

State: _____

I. Registry data status

Total number of cases entered	
Percent Incomplete cases	
Total number of hospitals Currently Participating (by Year 01, 02 etc.)	
Number of new hospitals since last call	
Number of Participating Hospitals that have Joint Commission PSC or state certification	

II. Major accomplishments (training, hospital surveys, workshops, staffing, etc):

-
-
-
-
-
-
-

III. Items for discussion:

1.
2.

F. Individual State Call Form

State to update and send form 2 days in advance of individual calls.

State: _____ Date: _____

I. FOA Performance Measures:

1. **Coordinate and/or promote public stroke prevention messaging**
   (Public Awareness: Percentage Complete: __%)
   Activities:

2. **Coordinate partnerships by establishing/maintaining a steering committee for the program that will advise and guide the work with 6 months of being awarded**
   (Partnerships: Percentage Complete: ___%)
   Activities:

3. **Recruit local/regional EMS systems and hospitals**
   (Recruitment: Percentage Complete: ___%)
   Activities:

4. **Establish Data Infrastructure by implementing an integrated data management system for measurement, tracking, and assessment of quality of care**
   (Data Infrastructure: Percentage Complete: ___%)
   Activities:

5. **Analyze and use data to improve care and transitions of care (EMS-Hospital, Hospital-Home)**
   (Data Use: Percentage Complete: ___%)
   Activities:

6. **Coordinate stroke care QI efforts**
   (Quality Improvement: Percentage Complete: ___%)
   Activities:

7. **Development of Sustainability Plan**
   (Sustainability: Percentage Complete: ___%)
   Activities:

8. **Development and Implementation of Evaluation and Performance Measurement Plan**
   (Evaluation: Percentage Complete: ___%)
   Activities:

II. Open Discussion Items:

1. **Named Staff and Percent of FTE (please denote FTE or contract):**
   Director of Office/Branch/etc. that supervises the State Stroke Program:
   PI:
   Program Manager/Coordinator:
   Quality Improvement Consultant:
   Evaluator:
   Epidemiologist:
   Fiscal manager:
   List other key staff members (update above as needed):

2. **Budget Topics:**

3. **Successes:**

4. **Other Challenges/Barriers/Issues/etc.:**

G. Annual Performance Report

New version released each year for spring reporting deadline.

H. Timeline

Below is a working table to reference for a compilation of important dates related to the PCNASP. Of note, this information is pulled from official documentation such as notice of awards that should be the ultimate authority of guidance.

Evaluation and reporting pieces are highlighted according to reporting type:

QI Registry Data with Quality Performance Measures (QPM)
Annual Progress Report (APR)
State-specific Program Evaluation and Process & Outcome Performance Measures (POPM)
Fiscal Report
Communications and Dissemination

Additionally, grantees are required to submit **Hospital Inventory Data** from participating hospitals on an annual basis. The date that the survey is administered and collected from participating hospitals is left up the grantees' discretion.

Along with date and deadline or event in columns 1 and 2, other important or explanatory related information is included in column 3.

Calendar Year is January 1st to December 31st. Calendar Year 1 starts 7/1/15 due to the beginning of the grant cycle (and is on Jan 1st in subsequent years) and runs through 12/31/15.

Program Year corresponds to the year of Coverdell project, and is June 30th to June 29th. Program year 1 is 6/30/15 – 6/29/16.

The **Budget Period** is a one-year time frame. Budget year 1 is 6/30/2015 – 6/29/16.

Timeline for the Paul Coverdell National Acute Stroke Program

Date	Event or Deadline	Data to be Submitted, Other Info
2015		
Oct 1	Fall Educational Seminars	Repeat in 2015 on 1st and 3rd Thursdays (replacing All-State Webinar). Leading to Pre-hospital and post-hospital workgroups. Addressing measures; engaging clinicians.
Oct 14	Q3 Registry Data reporting to CDC	Q3 data needs to be uploaded via SAMS within 2 weeks of the end of Q3 (State should not upload to SAMS until OMB clearance is obtained)
Oct 14	QCOR abstract deadline	
Oct 29	World Stroke Day	CDC release of stroke materials and blog
Nov	Individual state calls	Repeat bimonthly (additional monthly option is available for 2015)
2016		
Jan 1	Draft State-specific Eval Plan (& logic model) due	This will be emailed to the project officer, project lead, and assigned evaluator
Jan 14	Q4 Registry Data reporting to CDC	Q4 data needs to be uploaded via SAMS within 2 weeks of the end of Q4 (State should not upload to SAMS until OMB clearance is obtained)
Feb 17-19	International Stroke Conference	Coverdell material will be presented
Feb 18	All State Webinar	Repeat bimonthly on 3rd Thursdays
Feb 28-Mar 1	Quality of Care & Outcomes Research	Coverdell material will be presented
Feb 29	Annual Progress Report Due	Serves as the year 2 continuation application. APR narrative on calendar year 1 program and technical progress (required PGO deadline); POPM (core set) – baseline data (pre-DP15-1514 funding) and targets for programs year 2 & 5.
Mar 9-10	Grantee Workshop	Face to face meeting in Atlanta, GA. Workshops to take place on CDC Chamblee campus; lodging at Marriott Century Center.
Apr 14	Q1 Registry Data reporting to CDC	Q1 data needs to be uploaded via SAMS within 2 weeks of the end of Q1
June 29	Final state-specific Evaluation Plan due	Include evaluation plan details for program year 2 and broader evaluation goals for 5-year cooperative agreement
July 14	Q2 Registry Data reporting to CDC	Q2 data needs to be uploaded via SAMS within 2 weeks of the end of Q2
July 14	Annual Hospital Inventory data reporting to CDC	Program year 2 (June 30, 2015- June 29, 2016) hospital inventory data needs to be uploaded via SAMS
Sept 30	Evaluation Reporting Due	Report actual POPM values for program year 1 (July 1 2015-June 30 2016); may revise baseline and targets if necessary.
Sept 30	FRR Deadline	Due 90days after the budget period.
Oct 14	Q3 Registry Data reporting to CDC	Q3 data needs to be uploaded via SAMS within 2 weeks of the end of Q3
2017		
Jan 13	Q4 Registry Data reporting to CDC	Q4 data needs to be uploaded via SAMS within 2 weeks of the end of Q4
Feb 28	Annual Progress Report Due	Serves as the year 3 continuation application.

		Includes Calendar Year 2 program and technical progress.Submit revised evaluation plans for program year 3
Feb 28	Last day to submit carryover request	Must have a current FFR on file
Apr 14	Q1 Registry Data reporting to CDC	Q1 data needs to be uploaded via SAMS within 2 weeks of the end of Q1
July 14	Q2 Registry Data reporting to CDC	Q2 data needs to be uploaded via SAMS within 2 weeks of the end of Q2
July 14	Annual Hospital Inventory data reporting to CDC	Program year 2 (June 30, 2016- June 29, 2017) hospital inventory data needs to be uploaded via SAMS
Sept 30	Evaluation Reporting Due	Program Year 2 evaluation results and report (June 30, 2016-June 29, 2017)**;** Emailed to the project officer, project lead and assigned evaluator. Also, Program year 2 POPM actual values (June 30, 2016 – June 29, 2017).
Sept 30	FRR Deadline	due 90days after the budget period
Oct 13	Q3 Registry Data reporting to CDC	Q3 data needs to be uploaded via SAMS within 2 weeks of the end of Q3
2018		
Jan 12	Q4 Registry Data reporting to CDC	Q4 data needs to be uploaded via SAMS within 2 weeks of the end of Q4
Feb 28	Annual Progress Report Due	Serves as the year 4 continuation application. Includes Calendar Year 3 program and technical progress Submit revised evaluation plans for program year 4
Feb 28	Last day to submit carryover request	Must have a current FFR on file
Apr 13	Q1 Registry Data reporting to CDC	Q1 data needs to be uploaded via SAMS within 2 weeks of the end of Q1
July 13	Q2 Registry Data reporting to CDC	Q2 data needs to be uploaded via SAMS within 2 weeks of the end of Q2
July 13	Annual Hospital Inventory data reporting to CDC	Program year 3 (June 30, 2017- June 29, 2018) hospital inventory data needs to be uploaded via SAMS
Sept 30	Evaluation Reporting Due	Program Year 3 evaluation results and report (June 30, 2017-June 29, 2018); Emailed to the project officer, project lead, and assigned evaluator. Also, Program year 3 POPM actual values (June 30, 2017 – June 29, 2018).
Sept 30	FRR Deadline	due 90days after the budget period
Oct 12	Q3 Registry Data reporting to CDC	Q3 data needs to be uploaded via SAMS within 2 weeks of the end of Q3
2019		
Jan 14	Q4 Registry Data reporting to CDC	Q4 data needs to be uploaded via SAMS within 2 weeks of the end of Q4
Feb 28	Annual Progress Report Due	Serves as the year 5 continuation application. Includes Calendar Year 4 program and technical progress Submit revised evaluation plans for program year 5
Feb 28	Last day to submit carryover request	Must have a current FFR on file
Apr 12	Q1 Registry Data reporting to CDC	Q1 data needs to be uploaded via SAMS within 2 weeks of the end of Q1
July 12	Q2 Registry Data reporting to CDC	Q2 data needs to be uploaded via SAMS within 2 weeks of the end of Q2
July 12	Annual Hospital Inventory data reporting to CDC	Program year 4 (June 30, 2018- June 29, 2019) hospital inventory data needs to be uploaded via SAMS

Sept 30	Evaluation Reporting Due	Program Year 4 evaluation results and report (June 30, 2018-June 29, 2019); Emailed to the project officer, project lead and assigned evaluator. Also, Program year 4 POPM actual values (June 30, 2018 – June 29, 2019).
Sept 30	FRR Deadline	due 90days after the budget period
Oct 14	Q3 Registry Data reporting to CDC	Q3 data needs to be uploaded via SAMS within 2 weeks of the end of Q3
2020		
Jan 14	Q4 Registry Data reporting to CDC	Q4 data needs to be uploaded via SAMS within 2 weeks of the end of Q4
Feb 29	Annual Progress Report Due	Includes Calendar Year 5 program and technical progress
Apr 14	Q1 Registry Data reporting to CDC	Q1 data needs to be uploaded via SAMS within 2 weeks of the end of Q1
July 14	Q2 Registry Data reporting to CDC	Q2 data needs to be uploaded via SAMS within 2 weeks of the end of Q2
July 14	Annual Hospital Inventory data reporting to CDC	Program year 5 (June 30, 2019- June 29, 2020) hospital inventory data needs to be uploaded via SAMS
Sept 30	Final Report Due, include final evaluation report	Final summary report (July 2015-June 2020) emailed to the project officer, project lead and assigned evaluator. Program Year 5 evaluation results and report (June 30,2019-June 29, 2020) Also, Program year 5 POPM actual values (June 30,, 2019 – June 29, 2020).
Sept 30	FRR Deadline	Due 90days after the budget period

I. ICD-10-CM Stroke Codes

Hemorrhagic and Ischemic Stroke (The Joint Commission)

The Joint Commission's quality measures documents are available at the following link:
http://www.jointcommission.org/specifications_manual_for_national_hospital_inpatient_quality_measures.aspx

ICD-10-CM Principal Diagnosis Codes for Hemorrhagic Stroke (The Joint Commission)

I6000	Nontraumatic subarachnoid hemorrhage from unspecified carotid siphon and bifurcation
I6001	Nontraumatic subarachnoid hemorrhage from right carotid siphon and bifurcation
I6002	Nontraumatic subarachnoid hemorrhage from left carotid siphon and bifurcation
I6010	Nontraumatic subarachnoid hemorrhage from unspecified middle cerebral artery
I6011	Nontraumatic subarachnoid hemorrhage from right middle cerebral artery
I6012	Nontraumatic subarachnoid hemorrhage from left middle cerebral artery
I602	Nontraumatic subarachnoid hemorrhage from anterior communicating artery
I6030	Nontraumatic subarachnoid hemorrhage from unspecified posterior communicating artery
I6031	Nontraumatic subarachnoid hemorrhage from right posterior communicating artery
I6032	Nontraumatic subarachnoid hemorrhage from left posterior communicating artery
I604	Nontraumatic subarachnoid hemorrhage from basilar artery
I6050	Nontraumatic subarachnoid hemorrhage from unspecified vertebral artery
I6051	Nontraumatic subarachnoid hemorrhage from right vertebral artery
I6052	Nontraumatic subarachnoid hemorrhage from left vertebral artery
I606	Nontraumatic subarachnoid hemorrhage from other intracranial arteries
I607	Nontraumatic subarachnoid hemorrhage from unspecified intracranial artery
I608	Other nontraumatic subarachnoid hemorrhage
I609	Nontraumatic subarachnoid hemorrhage, unspecified
I610	Nontraumatic intracerebral hemorrhage in hemisphere, subcortical
I611	Nontraumatic intracerebral hemorrhage in hemisphere, cortical
I612	Nontraumatic intracerebral hemorrhage in hemisphere, unspecified
I613	Nontraumatic intracerebral hemorrhage in brain stem
I614	Nontraumatic intracerebral hemorrhage in cerebellum
I615	Nontraumatic intracerebral hemorrhage, intraventricular
I616	Nontraumatic intracerebral hemorrhage, multiple localized
I618	Other nontraumatic intracerebral hemorrhage
I619	Nontraumatic intracerebral hemorrhage, unspecified

ICD-10-CM Principal Diagnosis Codes for Ischemic Stroke (The Joint Commission)

I6300	Cerebral infarction due to thrombosis of unspecified precerebral artery
I63011	Cerebral infarction due to thrombosis of right vertebral artery
I63012	Cerebral infarction due to thrombosis of left vertebral artery
I63013	Cerebral infarction due to thrombosis of bilateral vertebral arteries
I63019	Cerebral infarction due to thrombosis of unspecified vertebral artery
I6302	Cerebral infarction due to thrombosis of basilar artery
I63031	Cerebral infarction due to thrombosis of right carotid artery
I63032	Cerebral infarction due to thrombosis of left carotid artery
I63033	Cerebral infarction due to thrombosis of bilateral carotid arteries
I63039	Cerebral infarction due to thrombosis of unspecified carotid artery
I6309	Cerebral infarction due to thrombosis of other precerebral artery
I6310	Cerebral infarction due to embolism of unspecified precerebral artery
I63111	Cerebral infarction due to embolism of right vertebral artery
I63112	Cerebral infarction due to embolism of left vertebral artery
I63113	Cerebral infarction due to embolism of bilateral vertebral arteries
I63119	Cerebral infarction due to embolism of unspecified vertebral artery
I6312	Cerebral infarction due to embolism of basilar artery
I63131	Cerebral infarction due to embolism of right carotid artery
I63132	Cerebral infarction due to embolism of left carotid artery
I63133	Cerebral infarction due to embolism of bilateral carotid arteries
I63139	Cerebral infarction due to embolism of unspecified carotid artery
I6319	Cerebral infarction due to embolism of other precerebral artery
I6320	Cerebral infarction due to unspecified occlusion or stenosis of unspecified precerebral arteries
I63211	Cerebral infarction due to unspecified occlusion or stenosis of right vertebral arteries
I63212	Cerebral infarction due to unspecified occlusion or stenosis of left vertebral arteries
I63213	Cerebral infarction due to unspecified occlusion or stenosis of bilateral vertebral arteries
I63219	Cerebral infarction due to unspecified occlusion or stenosis of unspecified vertebral arteries
I63231	Cerebral infarction due to unspecified occlusion or stenosis of right carotid arteries
I63232	Cerebral infarction due to unspecified occlusion or stenosis of left carotid arteries
I63233	Cerebral infarction due to unspecified occlusion or stenosis of bilateral carotid arteries
I63239	Cerebral infarction due to unspecified occlusion or stenosis of unspecified carotid arteries
I6329	Cerebral infarction due to unspecified occlusion or stenosis of other precerebral arteries
I6330	Cerebral infarction due to thrombosis of unspecified cerebral artery
I63311	Cerebral infarction due to thrombosis of right middle cerebral artery
I63312	Cerebral infarction due to thrombosis of left middle cerebral artery
I63313	Cerebral infarction due to thrombosis of bilateral middle cerebral arteries
I63319	Cerebral infarction due to thrombosis of unspecified middle cerebral artery
I63321	Cerebral infarction due to thrombosis of right anterior cerebral artery
I63322	Cerebral infarction due to thrombosis of left anterior cerebral artery
I63323	Cerebral infarction due to thrombosis of bilateral anterior arteries
I63329	Cerebral infarction due to thrombosis of unspecified anterior cerebral artery
I63331	Cerebral infarction due to thrombosis of right posterior cerebral artery
I63332	Cerebral infarction due to thrombosis of left posterior cerebral artery
I63333	Cerebral infarction to thrombosis of bilateral posterior arteries
I63339	Cerebral infarction due to thrombosis of unspecified posterior cerebral artery
I63341	Cerebral infarction due to thrombosis of right cerebellar artery
I63342	Cerebral infarction due to thrombosis of left cerebellar artery
I63343	Cerebral infarction to thrombosis of bilateral cerebellar arteries
I63349	Cerebral infarction due to thrombosis of unspecified cerebellar artery
I6339	Cerebral infarction due to thrombosis of other cerebral artery
I6340	Cerebral infarction due to embolism of unspecified cerebral artery

I63411	Cerebral infarction due to embolism of right middle cerebral artery
I63412	Cerebral infarction due to embolism of left middle cerebral artery
I63413	Cerebral infarction due to embolism of bilateral middle cerebral arteries
I63419	Cerebral infarction due to embolism of unspecified middle cerebral artery
I63421	Cerebral infarction due to embolism of right anterior cerebral artery
I63422	Cerebral infarction due to embolism of left anterior cerebral artery
I63423	Cerebral infarction due to embolism of bilateral anterior cerebral arteries
I63429	Cerebral infarction due to embolism of unspecified anterior cerebral artery
I63431	Cerebral infarction due to embolism of right posterior cerebral artery
I63432	Cerebral infarction due to embolism of left posterior cerebral artery
I63433	Cerebral infarction due to embolism of bilateral posterior cerebral arteries
I63439	Cerebral infarction due to embolism of unspecified posterior cerebral artery
I63441	Cerebral infarction due to embolism of right cerebellar artery
I63442	Cerebral infarction due to embolism of left cerebellar artery
I63443	Cerebral infarction due to embolism of bilateral cerebellar arteries
I63449	Cerebral infarction due to embolism of unspecified cerebellar artery
I6350	Cerebral infarction due to unspecified occlusion or stenosis of unspecified cerebral artery
I63511	Cerebral infarction due to unspecified occlusion or stenosis of right middle cerebral artery
I63512	Cerebral infarction due to unspecified occlusion or stenosis of left middle cerebral artery
I63513	Cerebral infarction due to unspecified occlusion or stenosis of bilateral middle arteries
I63519	Cerebral infarction due to unspecified occlusion or stenosis of unspecified middle cerebral artery
I63521	Cerebral infarction due to unspecified occlusion or stenosis of right anterior cerebral artery
I63522	Cerebral infarction due to unspecified occlusion or stenosis of left anterior cerebral artery
I63523	Cerebral infarction due to unspecified occlusion or stenosis of bilateral anterior arteries
I63529	Cerebral infarction due to unspecified occlusion or stenosis of unspecified anterior cerebral artery
I63531	Cerebral infarction due to unspecified occlusion or stenosis of right posterior cerebral artery
I63532	Cerebral infarction due to unspecified occlusion or stenosis of left posterior cerebral artery
I63533	Cerebral infarction due to unspecified occlusion or stenosis of bilateral posterior arteries
I63539	Cerebral infarction due to unspecified occlusion or stenosis of unspecified posterior cerebral artery
I63541	Cerebral infarction due to unspecified occlusion or stenosis of right cerebellar artery
I63542	Cerebral infarction due to unspecified occlusion or stenosis of left cerebellar artery
I63543	Cerebral infarction due to unspecified occlusion or stenosis of bilateral cerebellar arteries
I63549	Cerebral infarction due to unspecified occlusion or stenosis of unspecified cerebellar artery
I6359	Cerebral infarction due to unspecified occlusion or stenosis of other cerebral artery
I636	Cerebral infarction due to cerebral venous thrombosis, nonpyogenic
I638	Other cerebral infarction
I639	Cerebral infarction, unspecified

Transient Ischemic Attack

ICD-10-CM Principal Diagnosis Codes for TIA (not used by TJC)

G45.0	Vertebro-basilar artery syndrome
G45.1	Carotid artery syndrome (hemispheric)
G45.2	Multiple and bilateral precerebral artery syndromes
G45.8	Other transient cerebral ischemic attacks and related syndromes
G45.9	Transient cerebral ischemic attack, unspecified
G46.0	Middle cerebral artery syndrome
G46.1	Anterior cerebral artery syndrome
G46.2	Posterior cerebral artery syndrome

Pregnancy

Additional ICD-10-CM Principal Diagnosis Codes (not used by TJC)

O99.411	Diseases of the circulatory system complicating pregnancy- first trimester
O99.412	Diseases of the circulatory system complicating pregnancy- second trimester
O99.413	Diseases of the circulatory system complicating pregnancy- third trimester
O99.419	Diseases of the circulatory system complicating pregnancy- unspecified trimester

J. CMS and TJC Measures 2017

CMS has eliminated all stroke measures affecting 2019 payment determination based on data collected in 2017, as stated in the 2016 IPPS Final Rule. Note that STK-4 was included for FY 2016:.The rationale for removal is that the measure is topped out and too burdensome. Now there are no stroke measures remaining for CMS.

Stroke measures are still required for **The Joint Commission's** stroke center certification programs. Certified PSCs and CSCs are required to collect data for all 8 stroke measures:

STK-1	VTE prophylaxis (NQF 0434)
STK-2	Discharged on antithrombotic (NQF 0435)
STK-3	Anticoagulation for AFib/flutter (NQF 0436)
STK-4	Thrombolytic therapy (NQF 0437)
STK-5	Antithrombotic therapy by end of day 2 (NQF 0438)
STK-6	Discharged on statin medication (NQF 0439)
STK-8	Stroke education (NQF 0440)
STK-10	Assessed for rehabilitation (NQF 0441)

The Joint Commission Specifications Manual for National Quality Measures is available on the Joint Commission website at:
https://www.jointcommission.org/specifications_manual_joint_commission_national_quality_core_measures.aspx

The patient population for PSCs and CSCs includes both hemorrhagic and ischemic stroke patients.

K. Data Elements to Reabstract

Status <Variable name>	Text Prompt
	Pre-Hospital/Emergency Medical System (EMS) Data
<ArrMode>	How did the patient get to your hospital for treatment of their stroke?
	Hospital Arrival Data
<EDTriagD> <EDTriagT>	Date & time of arrival at your hospital What is the earliest documented time (military time) the patient arrived at the hospital? _ _ / _ _ / _ _ _ _ _ _: _ _
	Hospital admission data
<HospadD>	What is the hospital admission date? _ _ / _ _ / _ _ _ _
<AmbStatA>	Was patient ambulatory prior to the current stroke/TIA?
	Time of Signs and Symptoms
<LKWD> <LKWT> <LKWDNK> <LKWTNK>	When was the patient last known to be well (i.e., in their usual state of health or at their baseline), prior to the beginning of the current stroke or stroke-like symptoms? (To within 15 minutes of exact time is acceptable.) _ _/ _ _/ _ _ _ _ ___: ____ Date last known well is unknown/not documented/UTD Time last known well is unknown/not documented/UTD
	Thrombolytic Treatment
<TrmIVM> <TrmIVMD> <TrmIVMT> <TrmIVMDN> <TrmIVMTN>	Was IV alteplase initiated for this patient at this hospital? *If IV alteplase was initiated at this hospital or ED, please complete this section:* _ _/ _ _/ _ _ _ _ ___: ____ Date Not documented Time Not documented

<TrmIVT>	Was other thrombolytic therapy administered? IV alteplase at an outside hospital
<ThrmCmp> <ThrmCmpTX>	Complication of thrombolytic therapy Were there bleeding complications in a patient transferred after IV alteplase?
	NIH Stroke Scale Score
<NIHStrkS>	If performed, what is the first NIH Stroke Scale total score recorded by hospital personnel?

Status <Variable name>	Text Prompt
	Non-Treatment with Thrombolytics Section 8 completed only if thrombolytic therapy not given or started. Disclaimer: The reasons provided herein are not intended to supersede physician judgment, but serve as a guideline to abstractors. As always, the physician must exercise due caution in providing treatment, given the risks and benefits to the individual patient and the available information at the time of treatment decision. Reasons have been taken from the package insert for Activase, as well as those used in previous clinical trials.
<NonTrtC>	Were one or more of the following reasons for not administering IV thrombolytic therapy at this hospital explicitly documented by a physician, advanced practice nurse, or physician assistant's notes in the chart? (Check all that apply.) **Contraindications**, which include any of the following: SBP > 185 or DBP > 110 mmHg Seizure at onset Recent surgery/trauma (<15 days) Recent intracranial or spinal surgery, head trauma, or stroke (<3 mo.) History of intracranial hemorrhage or brain aneurysm or vascular malformation or brain tumor Active internal bleeding (<22 days) Platelets <100,000, PTT> 40 sec after heparin use, or PT > 15 or INR > 1.7, or known bleeding diathesis Suspicion of subarachnoid hemorrhage
<NonTrtCT>	CT findings (ICH, SAH, or major infarct signs)
<NonTrtWN>	**Warnings:** conditions that might lead to unfavorable outcomes: Stroke severity – Too severe (e.g., NIHSS >22) Glucose < 50 or > 400 mg/dl left heart thrombus Increased risk of bleeding due to: Acute (or recent) pericarditis Subacute bacterial endocarditis (SBE) Hemostatic defects including those secondary to severe hepatic or renal disease Pregnancy Diabetic hemorrhagic retinopathy, or other hemorrhagic ophthalmic conditions Septic thrombophlebitis or occluded AV cannula at seriously infected site Patients currently receiving oral anticoagulants, e.g., Warfarin sodium
<NonTrtAG>	Advanced age
<NonTrtSM>	Stroke severity too mild
<NonTrtRI>	Rapid improvement
<NonTrtIL>	Life expectancy < 1 year or severe co-morbid illness or CMO on admission
<NonTrtFR>	Pt./Family refused
<NonTrtNC>	Care-team unable to determine eligibility
<NonTrtOH>	IV or IA alteplase given at outside hospital
<IVtPADelay>	If IV alteplase was initiated greater than 60 minutes after hospital arrival, were eligibility or medical reasons documented as the cause for delay?
	Medical History
<MedHisST>	Documented past medical history of any of the following: (Check all that apply.) Is there a history of prior Stroke?
<MedHisTI>	Is there a history of TIA/Transient ischemic attack/VBI?
<MedHisDL>	Is there a history of dyslipidemia?
	In-Hospital Procedures and Treatment
<AThr2Day>	Was antithrombotic therapy received by the end of hospital day 2?

Status <Variable name>	Text Prompt
<VTELDUH> <VTELMWH> <VTEIPC> <VTEGCS> <VTEXaI> <VTEWar> <VTEVFP> <VTEOXaI> <VTEND>	Please check all of the following questions regarding type of VTE prophylaxis provided: Low dose unfractionated heparin (LDUH) Low molecular weight heparin (LMWH) Intermittent pneumatic compression devices Graduated compression stockings (GCS) Factor Xa Inhibitor Warfarin Venous foot pumps Oral Factor Xa Inhibitor Not Documented or none of the above
<VTEDate>	What date was the initial VTE prophylaxis administered?
<NoVTEDoc>	If not documented or none of the above types of prophylaxis apply, is there documentation why prophylaxis was not administered at hospital admission?
<NPO>	Was the patient NPO throughout the entire hospital stay? (That is, this patient never received food, fluids, or medication by mouth at any time. This includes any medications delivered in the Emergency Room phase of care.)
<DysphaYN>	Was patient screened for dysphagia prior to any oral intake, including food, fluids or medications?
	Other In-Hospital Complications
<DVTDocYN>	Did patient experience a DVT or pulmonary embolus (PE) during this admission?
<PneumYN>	Was there documentation that the patient was treated for hospital acquired pneumonia (pneumonia not present on admission) during this admission?
	Discharge Data
<ICD9PrDx>	Principle discharge ICD-9-CM diagnosis __ __ __ . __ __
<AdmDxSH> <AdmDxIH> <AdmDxIS> <AdmDxTIA> <AdmDxSNS> <AdmDxNoS>	Clinical hospital diagnosis related to stroke that was ultimately responsible for this admission (check only one item) Subarachnoid hemorrhage Intracerebral hemorrhage Ischemic stroke Transient ischemic attack Stroke not otherwise specified No stroke related diagnosis
<DschDisp>	Discharge disposition
<OHFType>	If discharged to another healthcare facility from the discharge disposition, what type of facility was it? *(conditional reabstraction)*

Status <Variable name>	Text Prompt
<mRSScore>	Modified Rankin Scale Score at discharge
<LipAdmYN>	Was patient on cholesterol reducing or cholesterol controlling medication prior to this hospitalization? Record lipid levels done within 48 hours of admission or within 30 days prior to admission.
<LipLDL>	LDL |__|__|__| mg/dl *Optional to reabstract*
<LipStatn>	Was a statin medication prescribed at discharge?
<StatnNC>	If statin not prescribed, was there a documented contraindication to statins?
<AthDscYN>	Was antithrombotic (antiplatelet or anticoagulant) medication prescribed at discharge?
<AFibRx>	If a history of atrial fibrillation/flutter or PAF is documented in the medical history or if the patient experienced atrial fibrillation/flutter or PAF during this episode of care, was patient prescribed anticoagulation medication upon discharge? ▪ Warfarin (Coumadin) ▪ Full dose unfractionated heparin IV ▪ Full dose LMW heparin ▪ Other (e.g., Lepirudin)
<EducRF> <EducSSx> <EducEMS> <EducCC> <EducMeds>	Was there documentation that the patient and/or caregiver received education and/or resource materials regarding all of the following: ▪ Risk factors for stroke ▪ Stroke Warning Signs and Symptoms ▪ How to activate EMS for stroke ▪ Need for follow-up after discharge ▪ Medications prescribed at discharge
<RehaPlan>	Is there documentation in the record that the patient was assessed for or received rehabilitation services?

L. Pre-Hospital Quality Data Elements

Instructions for Paul Coverdell National Acute Stroke Program (PCNASP) Pre-Hospital Data Elements

Operationalized Pre-hospital Quality Data Elements

The data elements will be reported by grantees to CDC on a quarterly basis in a SAS data set.

	Item	Variable Name	Text Prompt	Field Type	Legal Values	Notes
1	EMS Agency	<EMSName>	What is the EMS Agency Name	Text, 25 characters		
2	Run Sheet Number	<EMSRunNo>	What is the run sheet number given to the hospital?	Text, 15 characters		
3	Scene Arrival	<ScnArrD>	_ _/ _ _/ _ _ _ _	Date MMDDYYYY		
		<ScnArrT>	___: ____	Time HHMM		
4	Scene Departure	<ScnDptD>	_ _/ _ _/ _ _ _ _	Date MMDDYYYY		
		<ScnDptT>	___: ____	Time HHMM		
5	Hospital Arrival	<HospArrD>	_ _/ _ _/ _ _ _ _	Date MMDDYYYY		
		<HospArrT>	___: ____	Time HHMM		
6	Patient Age	<Age>	Age |__|__|__| years	Numeric ### = 3-digit	0 < age < 125	
7	Patient Gender	<Gender>	Gender	Numeric # = 1-digit	1 - Male; 2 - Female; 3 - Unknown	Select only 1 gender
8	EMS Diagnosis Impression	<EMSDiagn>	Did EMS think this was a possible stroke?	Numeric # = 1-digit	1 - Yes; 0 - No	
9	Hospital pre-notification Performed	<EMSPreNt>	Did EMS call the hospital to notify them of a possible stroke patient?	Numeric # = 1-digit	1 - Yes; 0 - No	
10	Pre-hospital stroke screen performed	<StkScnYN>	Did EMS perform a pre-hospital stroke scrreen?	Numeric # = 1-digit	1 - Yes; 0 - No	
11	Last Known Well	<LKWD>	_ _/ _ _/ _ _ _ _	Date MMDDYYYY		Leave blank if unknown or did not ask
		<LKWT>	___: ____	Time HHMM		
12	Time of discovery	<DiscD>	_ _/ _ _/ _ _ _ _	Date MMDDYYYY		
		<DiscT>	___: ____	Time HHMM		
13	Thrombolytic Checklist	<tPAChk>	Was a thrombolytic checklist done for possible alteplase eligibility?	Numeric # = 1-digit	1 - Yes; 0 - No/ND	
14	Glucose Checked	<GluChkYN>	Was glucose checked?	Numeric # = 1-digit	1 - Yes; 0 - No	
		<EMSGlu>	Glucose level	Numeric # = 3-digit		mg/dL
15	Destination Decision	<DestDscn>	How did EMS make the decision to come to this hospital?	Numeric # = 1-digit	1 = Protocol to nearest stroke center; 2 = protocol to nearest hospital; 3 = patient/family choice; 4 = enroute medical direction; 5 = nearest hospital; 6 = other or unknown;	
16	Follow-up	<EMSFUYN>	Did EMS receive hospital follow-up	Numeric # 1-digit	1 = Yes; 0 = No	
		<DiAgree>	If yes, did EMS diagnosis of a stroke agree with hospital diagnosis?	Numeric # 1-digit	1 = EMS & Hospital both diagnosed a stroke; 2 = EMS called a stroke and Hospital did not diagnose a stroke; 3 = EMS did not call a	

					stroke and Hospital diagnosed a stroke	

*Variables in the table with the green background are required data elements. Variables in the table with the blue background are optional data elements.

Performance Measures

The box below describes the reporting responsibility for each pre-hospital quality performance measure. In summary, of the 8 measures defined in the FOA: 1) Three are "core" measures; 2) Five measures are "non-core" or optional. The decision to make some measures core and others non-core is based on grantee feedback and internal and external expert review, taking into consideration grantee capacity and data reporting systems available at the time. Although some measures are considered optional (as of 4/20/2016), CDC reserves the right to change or update reporting criteria for the pre-hospital quality performance measures over the course of the grant cycle as grantee capacity, science, and data systems evolve. Grantees who currently have updated data systems and reporting capacity in place, should collect all available pre-hospital QPMs. Additionally, this is a "working" document and we realize that some data elements require the combination of multiple measures for final calculation. We have currently listed key data elements that are needed. Your feedback is welcome and will help improve the document as we move forward.

Box 1. Pre-hospital quality performance measures

Eight pre-hospital quality performance measures will be reported by the grantee as a number, percent or proportion		Coverdell Data Element Name	Optional/Required
1.	% of suspected-stroke transports with an on-scene time <15 minutes	<ScnArrD>, <ScnArrT>; <ScnDptD>, <ScnDptT>	O
2.	% of suspected-stroke transports with a blood glucose checked and recorded	<GluChkYN>, <EMSGlu>	R
3.	% of suspected-stroke transports where emergency medical services (EMS) called in a stroke alert pre-notification	<EMSPreNt>	R
4.	% of suspected-stroke transports that had a stroke screen completed and recorded	<StkScnYN>	R
5.	% of suspected-stroke transports that had a documented the time last known to be well	<LKWD>, <LKWT>	R
6.	% of suspected-stroke transports that had a documented time of discovery	<DiscD>; <DiscT>	O
7.	% of suspected-stroke transports that had a thrombolytic stroke check completed and documented	<tPAChk>	O

8.	% of suspected-stroke transports where EMS diagnosis agreed with hospital diagnosis	<EMSFUYN>, <DiAgree>	O

CDC will calculate the performance measures and share the programming codes with grantees. Performance measures will be calculated at the state and aggregate level. The tables below describe how the performance measures are operationalized and identifies the associated data element.

1. % of suspected-stroke transports with an on-scene time <15 minutes	
Purpose of Quality Performance Measure	• The purpose of this QPM is to assess timeliness once EMS has arrived on-scene, as an important link in the stroke chain of survival. The American Heart Association/American Stroke Association recommends an on-scene time of less than 15 minutes.
Coverdell Data Elements	• <ScnArrD>, <ScnArrT>; <ScnDptD>, <ScnDptT>
Unit of Analysis	• Hospital/EMS-agency level
Intended/Targeted Population	• Coverdell-participating EMS agencies within a PCNASP funded state
Calculation	• Numerator: # suspected-stroke transports with an on-scene time of <15 minutes • Denominator: all suspected-stroke transports
Potential Data Sources	• Scene arrival date/time; NEMSIS V3: eTimes.06; V2 E05_06; The date/time the responding unit arrived on the scene; that is, the time the vehicle stopped moving at the scene • Scene departure date/time; NEMSIS V3: eTimes.09; V2: E05_09; The date/time the responding unit left the scene with a patient (started moving).
Notes	1. Jauch EC, Saver JL, Adams HP, et al. Guidelines for the early management of patients with acute ischemic stroke. A guideline for healthcare professionals from the American Heart Association/American Stroke Association. Stroke. 2013;44:870-947

2. % of suspected-stroke transports with a blood glucose checked and recorded	
Purpose of Quality Performance Measure	• The purpose of this QPM is to identify assessment of blood glucose as an important pre-hospital intervention in the stroke chain of survival. Hypoglycemia is frequently found in patients with stroke-like symptoms; administering glucose may resolve

	neurological deficits.
Coverdell Data Elements	• <GluChkYN>, <EMSGlu>
Unit of Analysis	• Hospital/EMS-agency level
Intended/Targeted Population	• Coverdell-participating EMS agencies within a PCNASP funded state • May be specific to states/regions where EMS personnel have authorization to assess blood glucose
Calculation	• Numerator: # suspected-stroke transports with blood glucose checked and recorded • Denominator: all suspected-stroke transports
Potential Data Sources	• Blood glucose level; NEMSIS V3 eVitals.18, V2 E14_14
Notes	1. Jauch EC, Saver JL, Adams HP, et al. Guidelines for the early management of patients with acute ischemic stroke. A guideline for healthcare professionals from the American Heart Association/American Stroke Association. Stroke. 2013;44:870-947. 2. Millin MG, Gullett T, Daya MR. EMS management of acute stroke-out-of-hospital treatment and stroke system development (resource document to NAEMSP position statement). PREHOSPITAL EMERGENCY CARE 2007;11:318–325.

3. % of suspected-stroke transports where EMS called in a stroke alert pre-notification	
Purpose of Quality Performance Measure	• The purpose of this QPM is to identify the use of stroke alert pre-notifications by EMS. Stroke pre-notification is an important factor in reducing elapsed time before treatment and ensuring appropriate hospital resources are mobilized before patient arrival to the hospital.
Coverdell Data Elements	• <EMSPreNt>
Unit of Analysis	• Hospital/EMS-agency level
Intended/Targeted Population	• Coverdell-participating EMS agencies within a PCNASP funded state
Calculation	• Numerator: # suspected-stroke transports with a stroke alert pre-notification • Denominator: all suspected-stroke transports
Potential Data Sources	• Destination team pre-arrival alert or activation; NEMSIS V3 eDisposition.24
Notes	This is a Class I; Level of Evidence B recommendation: EMS personnel should provide prehospital notification to the receiving hospital that a potential stroke patient is en route so that the appropriate hospital resources may be mobilized before patient arrival. Studies have shown that prehospital notification by EMS of a potential stroke leads to significant reductions in hospital treatment times for delivery of thrombolytic patients. 1. Jauch EC, Saver JL, Adams HP, et al. Guidelines for the early management of patients with acute ischemic stroke. A guideline for healthcare professionals from the American Heart Association/American Stroke Association. Stroke. 2013;44:870-947. 2. NAEMSP. NAEMSP position statement. Prehospital Emergency Care. 2007;11(3):312. 3. Crocco TJ, Grotta JC, Jauch EC, et al. EMS management of acute stroke-Prehospital triage (resource document to NAEMSP position statement. Prehospital emergency care. 2007;11:313-317.

4. % of suspected-stroke transports that had a stroke screen completed and recorded	
Purpose of Quality Performance Measure	• The purpose of this QPM is to identify the use of stroke screening tools in the pre-hospital setting to ensure priority triage of suspected stroke patients.
Coverdell Data Elements	• <StkScnYN>
Unit of Analysis	• Hospital/EMS-agency level

Intended/Targeted Population	• Coverdell-participating EMS agencies within a PCNASP funded state
Calculation	• Numerator: # suspected-stroke transports with a complete and recorded stroke screen • Denominator: all suspected-stroke transports
Potential Data Sources	• stroke scale score NEMSIS V3 eVitals.29, V2 E14_24 • stroke scale type NEMSIS V3 eVitals.30
Notes	This is a Class I; Level of Evidence B recommendation: Prehospital care providers should use prehospital stroke assessment fools, such as the Los Angeles Prehospital Stroke Screen or Cincinnati Prehospital Stroke Scale. 1. Jauch EC, Saver JL, Adams HP, et al. Guidelines for the early management of patients with acute ischemic stroke. A guideline for healthcare professionals from the American Heart Association/American Stroke Association. Stroke. 2013;44:870-947. 2. NAEMSP. NAEMSP position statement. Prehospital emergency care: official journal of the National Association of EMS Physicians and the National Association of State EMS Directors. 2007;11:312. 3. Curfman D, Connor LT, Moy HP, et al. Accuracy of emergency medical services-reported last known normal times in patients suspected with acute stroke. Stroke. 2014;45:1275-1279. 4. Crocco TJ, Grotta JC, Jauch EC, et al. EMS management of acute stroke-Prehospital triage (resource document to NAEMSP position statement. Prehospital emergency care. 2007;11:313-317.

5. % of suspected-stroke transports that had a documented time last known to be well	
Purpose of Quality Performance Measure	• The purpose of this QPM is to assess EMS documentation of time last known to be well, without signs and symptoms of acute stroke/at baseline.
Coverdell Data Elements	• <LKWD>, <LKWT>
Unit of Analysis	• Hospital/EMS-agency level
Intended/Targeted Population	• Coverdell-participating EMS agencies within a PCNASP funded state
Calculation	• Numerator: # suspected-stroke transports with a time last known well documented • Denominator: all suspected-stroke transports
Potential Data Sources	• Date/time of symptom onset/last normal NEMSIS V3 eSituation.18

Notes	EMS professionals frequently have access to family members or other observers that can provide this information. This information is critical to determining next treatment steps, including eligibility for thrombolytic therapy. 1. Crocco TJ, Grotta JC, Jauch EC, et al. EMS management of acute stroke-Prehospital triage (resource document to NAEMSP position statement. Prehospital emergency care. 2007;11:313-317. 2. Curfman D, Connor LT, Moy HP, et al. Accuracy of emergency medical services-reported last known normal times in patients suspected with acute stroke. Stroke. 2014;45:1275-1279.

6. % of suspected-stroke transports that had a documented time of discovery	
Purpose of Quality Performance Measure	• The purpose of this QPM is to assess EMS documentation of time when symptoms were first discovered. Time of discovery is critical to determining next treatment steps, including eligibility for thrombolytic therapy.
Coverdell Data Elements	• <DiscD>; <DiscT>
Unit of Analysis	• Hospital/EMS-agency level
Intended/Targeted Population	• Coverdell-participating EMS agencies within a PCNASP funded state
Calculation	• Numerator: # suspected-stroke transports with a time of discovery documented • Denominator: all suspected-stroke transports
Potential Data Sources	• Date/time of symptom onset/last normal, NEMSIS V3 eSituation.01, V2 E05_01
Notes	EMS professionals frequently have access to family members or other observers that can provide this information. This information is critical to determining next treatment steps, including eligibility for thrombolytic therapy. 1. Curfman D, Connor LT, Moy HP, et al. Accuracy of emergency medical services-reported last known normal times in patients suspected with acute stroke. Stroke. 2014;45:1275-1279. 2. NAEMSP. NAEMSP position statement. Prehospital Emergency Care. 2007;11(3):312. 3. Crocco TJ, Grotta JC, Jauch EC, et al. EMS management of acute stroke-Prehospital triage (resource document to NAEMSP position statement. Prehospital emergency care. 2007;11:313-317.

7. % of suspected-stroke transports that had a thrombolytic stroke check completed	
Purpose of Quality Performance Measure	• The purpose of this QPM is to identify the use of thrombolytic stroke checklist tools in the pre-hospital setting. Thrombolytic stroke checks may help determine next treatment steps, including eligibility for thrombolytic therapy
Coverdell Data Elements	• <tPAChk>
Unit of Analysis	• Hospital/EMS-agency level
Intended/Targeted Population	• Coverdell-participating EMS agencies within a PCNASP funded state
Calculation	• Numerator: # suspected-stroke transports with a completed thrombolytic stroke check • Denominator: all suspected-stroke transports
Potential Data Sources	• Reperfusion checklist, V3 eVitals.31, V2 E14_25
Notes	This can provide additional information from the field. The development of a pre-hospital thrombolytic checklist was mandated in Indiana in 2008. Massachusetts, North Carolina, and Gloucester, VA (and many other EMS agencies in VA) have developed pre-hospital stroke thrombolytic checklists in the past. EMTs and paramedics are familiar with this from the efforts of Mission: Lifeline for STEMI.

8. % of suspected-stroke transports where EMS primary impression agreed with hospital diagnosis	
Purpose of Quality Performance Measure	• The purpose of this QPM is to assess agreement between EMS suspected-strokes and hospital confirmed strokes.
Coverdell Data Elements	• <EMSFUYN>, <DiAgree>
Unit of Analysis	• Hospital/EMS-agency level
Intended/Targeted Population	• Coverdell-participating EMS agencies and hospitals within a PCNASP funded state
Calculation	• Numerator: # suspected-stroke transports diagnosed by hospital as stroke • Denominator: all suspected-stroke transports

Potential Data Sources	• Provider's primary impression V3 eSituation.11, V2 e09_15
Notes	This is important for EMS education to gain further knowledge on possible presentations of acute stroke and to make the best possible triage decisions, and encourages feedback from ED to EMS.

Form Approved
OMB No. 0920-1108
Exp. Date 03/31/2019

M. In-Hospital Quality Data Elements

Instructions for Paul Coverdell National Acute Stroke Program (PCNASP) In-Hospital Data Elements

Item	Variable Name	Text Prompt	Field Type	Legal Values	Notes
Demographic Data	<Age>	Age |__|__|__| years	Numeric ### = 3-digit	0 < age < 125	
	<Gender>	Gender	Numeric # = 1-digit	1 - Male; 2 - Female; 3 - Unknown	Select only 1 gender
	<RaceW>	White	Numeric # = 1-digit	1 -Yes; 0 - No	Select all race options that apply. Default = 0
	<RaceAA>	Black or African American			
	<RaceAs>	Asian			
	<RaceHPI>	Native Hawaiian or Other Pacific Islander			
	<RaceAIAN>	American Indian or Alaskan Native			
	<RaceUnk>	Unknown or unable to determine			
	<Hisp>	Hispanic Ethnicity		1 – Hispanic or Latino; 0 - Not Hispanic or Latino, or unknown	Hispanic ethnicity is a separate question from race
	<HlthInsM>	Medicare/Medicare Advantage		1 -Yes; 0 - No	Default = 0
	<HlthInsC>	Medicaid			
	<HlthInsP>	Private/VA/Champus/Other			
	<HlthInsN>	Self Pay/No Insurance			
	<HlthInND>	Not Documented			
Comfort Measures	<CMODoc>	When is the earliest time that the physician, advanced practice nurse, or PA documented that patient was on comfort measures only?	Numeric # = 1-digit	1 – Day of arrival or first day after arrival ; 2 - 2nd day after arrival or later; 3 - Timing unclear; 4 - ND/UTD	
Pre-Hospital/Emergency Medical System (EMS) Data	<PlcOccur>	Where was the patient when stroke was detected or when symptoms were discovered? In the case of a patient transferred to your hospital where they were an inpatient, ED patient, or NH/long-term care resident, from where was the patient transferred?	Numeric # = 1-digit	1 – Not in a healthcare setting; 2 - Another acute care facility; 3 – Chronic health care facility; 4 - Stroke occurred while patient was an inpatient in your hospital; 5 - Outpatient healthcare setting; 9 - ND or cannot be determined	
	<InhospStk>	Did this stroke occur in an in-patient?	Numeric # = 1-digit	1 -Yes; 0 - No	

	<ArrMode>	How did the patient get to your hospital for treatment of their stroke?	Numeric # = 1-digit	1 – EMS from home or scene; 2 - Private transportation/taxi/other; 3 - transfer from another hospital; 9 - ND or unknown	
	<EMSNote>	Advance notification by EMS	Numeric # = 1-digit	1 -Yes; 0 - No/ND; 9-Not applicable	
Date & time of arrival at your hospital - What is the earliest documented time (military time) the patient arrived at the hospital?	<EDTriagD>	Date of arrival at your hospital	_ _ / _ _ / _ _ _ _	Date MMDDYYYY	
	<EDTriagT>	Time of arrival at your hospital	_ _: _ _	Time HHMM	
Patient Not Admitted	<NotAdmit>	Was the patient not admitted?	Numeric #=1-digit	1 - Not admitted; 0 = no, patient admitted as inpatient	
Reason Not Admitted	<WhyNoAdm>	Reasons that the patient was not admitted	Numeric #=1-digit	1 - discharged directly from ED to home or other location that is not an acute care hospital; 4 - Transferred from your ED to another acute care hosptial; 6 - died in ED; 7 - Left ED AMA; 8 - discharged from observation status without an inpatient admission; 0 - Other;	Answer this only if the patient was not admitted
Hospital admission data	<HospadD>	Date of hospital admission	_ _ / _ _ / _ _ _ _	Date MMDDYYYY	Admit date
	<AmbStatA>	Was patient ambulatory prior to the current stroke/TIA?	Numeric # = 1-digit	1 – Able to ambulate independently w/or w/o device; 2 - Yes but with assistance from another person; 3 - Unable to ambulate; 4 - ND	

	<sxresolv>	Did symptoms completely resolve prior to presentation?	Numeric # = 1-digit	1 - Yes; 0 - No; 9 - ND	
Initial Blood Pressure	<AdmSysBP>	If patient received IV alteplase, what was the first systolic blood pressure?	Numeric # = 3-digit		mmHg
	<AdmDiaBP>	If patient received IV alteplase, what was the first diastolic blood pressure?			mmHg
Initial Glucose	<AdmGlucose>	If patient received IV alteplase, what was the first blood glucose?			mg/dL
Medications currently taking prior to admission	<APltAdmYN>	Antiplatelet medication	Numeric # = 1-digit	1 -Yes; 0 - No/ND	antiplatelet medications include aspirin, aspirin/dipyridamol, clopidogrel, ticlopidine, others
	<ACoagAdmYN>	Anticoagulant	Numeric # = 1-digit		anticoagulant medications include heparin IV, full dose LMW heparin, warfarin, dabigatran, argatroban, desirudin, fondaparinux, rivaroxaban, lipirudin, others
	<HBPAdmYN>	Antihypertensive medication	Numeric # = 1-digit		
	<DprADMYN>	Antidepressant medication	Numeric # = 1-digit		
	<LipAdmYN>	Statin or other cholesterol reducer	Numeric # = 1-digit	1 -Yes; 0 - No/ND	
Imaging	<ImageYN>	Was Brain Imaging Performed at your hospital after arrival as part of the initial evaluation for this episode of care or this event?	Numeric # = 1-digit	1 - Yes; 0 - No/ND; 2 - NC - if outside imaging prior to transfer or patient is DNR/CMO	
	<ImageD>	Date of brain imaging	_ _/ _ _/ _ _ _ _	MMDDYYYY	Date of initial brain imaging
	<ImageT>	Time of brain imaging	_ _: _ _	Time HHMM	Time of initial brain imaging
	<ImageRes>	Initial brain imaging findings?	Numeric # = 1-digit	1 – Hemorrhage; 0 - No hemorrhage; 9 - ND or not available	

When was the patient last known to be well (i.e., in their usual state of health or at their baseline), prior to the beginning of the current stroke or stroke-like symptoms? (To within 15 minutes of exact time is acceptable.)	<LKWD>	What date was the patient last known to be well	_ _/ _ _/ _ _ _ _	Date MMDDYYYY	
	<LKWT>	What time was the patient last known to be well	___: ____	Time HHMM	
When was the patient first discovered to have the current stroke or stroke-like symptoms? (To within 15 minutes of exact time of discovery is acceptable.)	<DiscD>	What date was the patient first discovered to have the current stroke or stroke-like symptoms?	_ _/ _ _/ _ _ _ _	Date MMDDYYYY	
	<DiscT>	What time was the patient first discovered to have the current stroke or stroke-like symptoms?	___: ____	Time HHMM	
NIH Stroke Scale Score	<NIHSSYN>	Was NIH Stroke Scale score performed as part of the initial evaluation of the patient?	Numeric # = 1-digit	1 – Yes; 0 – No/ND	
	<NIHStrkS>	If performed, what is the first NIH Stroke Scale total score recorded by hospital personnel?	Numeric ## = 2-digit	Range 00-42	
Thrombolytic Treatment	<TrmIVM>	Was IV alteplase initiated for this patient at this hospital?	Numeric # = 1-digit	1 - Yes; 0 - No	
	<TrmIVMD>	What date was IV alteplase initiated for this patient at this hospital?	_ _/ _ _/ _ _ _ _	MMDDYYYY	If IV alteplase was initiated at this hospital or ED, please complete this section:
	<TrmIVMT>	What time was IV alteplase initiated for this patient at this hospital?	___: ____	Time HHMM	
	<TrmIVT>	IV alteplase at an outside hospital	Numeric # = 1-digit	1 - Yes; 0 - No	
	<TrmIAM>	IA catheter-based reperfusion at this hospital?	Numeric # = 1-digit	1 - Yes; 0 - No	IA catheter-based reperfusion at this hospital?
	<TrmIAMD>	Date of IA catheter-based reperfusion at this hospital	_ _/ _ _/ _ _ _ _	MMDDYYYY	
	<TrmIAMT>	Time of IA catheter-based reperfusion at this hospital	___: ____	Time HHMM	

Complications of thrombolytic therapy	<ThrmCmp>	Complication of thrombolytic therapy	Numeric # = 1-digit	0 – None; 1 – symptomatic ICH within 36 hours (< 36 hours) of alteplase; 2 - life threatening, serious systemic hemorrhage within 36 hours of alteplase; 3 - other serious complications; 9 – Unknown/Unable to Determine	
	<ThrmCmpTX>	Were there bleeding complications in a patient transferred after IV alteplase	Numeric # = 1-digit	1 - yes & detected prior to transfer; 2 - yes but detected after transfer; 3 - UTD; 9 - Not applicable	
Reasons for no alteplase - 0-3 hour window. Were one or more of the following contraindication or warning for not administering IV thrombolytic therapy at this hospital explicitly documented by a physician, advanced practice nurse, or physician assistant's notes in the chart?	<NonTrtC>	Contraindications, which include any of the following: SBP > 185 or DBP > 110 mmHg Seizure at onset; Recent surgery/trauma (<15 days) Recent intracranial or spinal surgery, head trauma, or stroke (<3 mo.) History of intracranial hemorrhage or brain aneurysm or vascular malformation or brain tumor; Active internal bleeding (<22 days) Platelets <100,000, PTT> 40 sec after heparin use, or PT > 15 or INR > 1.7, or known bleeding diathesis;	Numeric # = 1-digit	1 Yes; 0 No	
	<NonTrtCT>	Suspicion of subarachnoid hemorrhage (CT findings of ICH, SAH, or major infarct signs);	Numeric # = 1-digit	1 Yes; 0 No	
	<NonTrtWN>	**Warnings**: conditions that might lead to unfavorable outcomes: Stroke severity – too severe Glucose < 50 or > 400 mg/dl; left heart thrombus; increased risk of bleeding due to: acute (or recent) pericarditis, subacute bacterial endocarditis (SBE), hemostatic defects including those secondary to severe hepatic or renal disease, pregnancy, diabetic hemorrhagic retinopathy, or other hemorrhagic ophthalmic conditions , septic thrombophlebitis or occluded AV cannula at seriously infected site; patients currently receiving oral anticoagulants, e.g., Warfarin sodium;	Numeric # = 1-digit	1 Yes; 0 No	

	<NonTrtAG>	advanced age	Numeric # = 1-digit	1 Yes; 0 No	
	<NonTrtSM>	stroke severity too mild	Numeric # = 1-digit	1 Yes; 0 No	
	<NonTrtRI>	rapid improvement	Numeric # = 1-digit	1 Yes; 0 No	
	<NonTrtIL>	life expectancy < 1 year or severe co-morbid illness or CMO on admission	Numeric # = 1-digit	1 Yes; 0 No	
	<NonTrtFR>	family refusal	Numeric # = 1-digit	1 Yes; 0 No	
	<NonTrtNC>	care team unable to determine eligibility	Numeric # = 1-digit	1 Yes; 0 No	
	<NonTrtOH>	IV or IA alteplase given at outside hospital	Numeric # = 1-digit	1 Yes; 0 No	
Reasons for no alteplase - 3-4.5 hour window	<NonTrtC4>	Contraindications, which include any of the following: SBP > 185 or DBP > 110 mmHg Seizure at onset; Recent surgery/trauma (<15 days) Recent intracranial or spinal surgery, head trauma, or stroke (<3 mo.) History of intracranial hemorrhage or brain aneurysm or vascular malformation or brain tumor; Active internal bleeding (<22 days) Platelets <100,000, PTT> 40 sec after heparin use, or PT > 15 or INR > 1.7, or known bleeding diathesis;	Numeric # = 1-digit	1 Yes; 0 No	
	<NonTrtCT4>	Suspicion of subarachnoid hemorrhage (CT findings of ICH, SAH, or major infarct signs);	Numeric # = 1-digit	1 Yes; 0 No	
	<NonTrtWN4>	**Warnings**: conditions that might lead to unfavorable outcomes: Stroke severity – too severe Glucose < 50 or > 400 mg/dl; left heart thrombus; increased risk of bleeding due to: acute (or recent) pericarditis, subacute bacterial endocarditis (SBE), hemostatic defects including those secondary to severe hepatic or renal disease, pregnancy, diabetic hemorrhagic retinopathy, or other hemorrhagic ophthalmic conditions , septic thrombophlebitis or occluded AV cannula at seriously infected site; patients currently receiving oral anticoagulants, e.g., Warfarin sodium;	Numeric # = 1-digit	1 Yes; 0 No	
	<NonTrtAG4>	advanced age	Numeric # = 1-digit	1 Yes; 0 No	
	<NonTrtSM4>	stroke severity too mild	Numeric # = 1-digit	1 Yes; 0 No	
	<NonTrtRI4>	rapid improvement	Numeric # = 1-digit	1 Yes; 0 No	
	<NonTrtIL4>	life expectancy < 1 year or severe co-morbid illness or CMO on admission	Numeric # = 1-digit	1 Yes; 0 No	

	<NonTrtFR4>	family refusal	Numeric # = 1-digit	1 Yes; 0 No	
	<NonTrtNC4>	care team unable to determine eligibility	Numeric # = 1-digit	1 Yes; 0 No	
If no documented contraindications or warnings, do these factors apply in the 0-3 hour time window?	<NonTrtDX>	Unable to diagnose or did not diagnose in 3 hour time frame	Numeric # = 1-digit	1 - Yes; 0 - No	
	<NonTrtTD>	Inhospital Time Delay			
	<NonTrtA>	Delay in patient arrival			
	<NonTrtIV>	No IV access			
	<NonTrtOC>	Other:			
If no documented contraindications or warnings, do these factors apply in the 3-4.5 hour time window?	<NonTrtDX4>	Unable to diagnose or did not diagnose in 3 hour time frame	Numeric # = 1-digit	1 - Yes; 0 - No	
	<NonTrtTD4>	Inhospital Time Delay			
	<NonTrtA4>	Delay in patient arrival			
	<NonTrtIV4>	No IV access			
	<NonTrtOC4>	Other:			
Other warnings for patients treated in the 3-4.5 hour window?	<NonTrMCA>	Were there other documented warning conditions for patients treated in the 3-4.5 hour time window?	Numeric # = 1-digit	1 - Yes; 0 - No	CT findings of stroke involving more than 1/3 of middle carotid artery; age over 80; history of diabetes and a prior stroke
IV alteplase delay	<IVtPADelay>	If IV alteplase was initiated greater than 60 minutes after hospital arrival, were eligibility or medical reasons documented as the cause for delay?	Numeric # = 1-digit	1 - Yes; 0 - No	
Documented past medical history of any of the following: (check all that apply)	<MedHisDM>	Is there a history of Diabetes Mellitus (DM)?	Numeric # = 1-digit	1 - Yes; 0 - No/ND	Default = 0
	<MedHisST>	Is there a history of prior Stroke?			
	<MedHisTI>	Is there a history of TIA/Transient ischemic attack/VBI?			
	<MedHisCS>	Is there a history of carotid stenosis?			
	<MedHisMI>	Is there a history of myocardial infarction (MI) or coronary artery disease (CAD)?			
	<MedHisPA>	Is there a history of peripheral arterial disease (PAD)?			
	<MedHisVP>	Does the patient have a valve prosthesis (heart valve)?			

	<MedHisHF>	Is there a history of Heart Failure (CHF)?			
	<MedHisSS>	Does the patient have a history of sickle cell disease (sickle cell anemia)?			
	<MedHisPG>	Did this event occur during pregnancy or within 6 weeks after a delivery or termination of pregnancy?			
	MedHisAF	Is there documentation in the patient's medical history of atrial fibrillation/flutter?			
	<MedHisSM>	Is there documented past medical history of Smoking (at least one cigarette during the year prior to hospital arrival?)			
	<MedHisDL>	Is there a medical history of Dyslipidemia?			
	<MedHisHT>	Is there a documented past medical history of hypertension?			
	<MedhisDrug>	Drug or alcohol abuse?	Numeric # 1-digit	1 - Yes; 0 - No/ND	Default = 0
	<MedhisFHStk>	Family history of stroke			
	<MedHisHRT>	Hormone replacement therapy			
	<MedHisObese>	Obesity			
	<MedHisMig>	Migraines			
	<MedHisRenal>	Chronic renal insufficiency (serum creatinine > 2.0)?			
	<MedHisDP>	Depression			
	<MedHisSA>	Sleep Apnea			
Early Antithrombotics	<AThr2Day>	Was antithrombotic therapy received by the end of hospital day 2?	Numeric # 1-digit	1 - Yes; 0 - No; 2 - NC	
Dysphagia Screening	<NPO>	Was the patient NPO throughout the entire hospital stay? (That is, this patient never received food, fluids, or medication by mouth at any time. This includes any medications delivered in the Emergency Room phase of care.)	Numeric # 1-digit	1 – Yes; 0 - No or ND	
	<DysphaYN>	Was patient screened for dysphagia prior to any oral intake, including food, fluids or medications?		1 – Yes; 0 - No or ND; 2 - NC - a documented reason for not screening exists in the medical record	
	<DysphaPF>	If patient was screened for dysphagia, what were the results of the screen?	Numeric #1-digit	1 - Pass; 2 - Fail; 9 - ND	

Other In-Hospital Complications	<PneumYN>	Was there documentation that the patient was treated for hospital acquired pneumonia (pneumonia not present on admission) during this admission?	Numeric # 1-digit	1 – Yes; 0 - No or ND; 2 NC	
VTE Prophylaxis	<VTELDUH>	Low dose unfractionated heparin (LDUH)	Numeric #1-digit	1 - Yes; 0 - No	Select all therapies given
	<VTELMWH>	Low molecular weight heparin (LMWH)			
	<VTEIPC>	Intermittent pneumatic compression devices			
	<VTEGCS>	Graduated compression stockings (GCS)			
	<VTEXaI>	Factor Xa Inhibitor			
	<VTEWar>	Warfarin			
	<VTEVFP>	Venous foot pumps			
	<VTEOXaI>	Oral Factor Xa Inhibitor			
	<VTEAsprn>	Aspirin			
	<VTEND>	Not Documented or none of the above			
	<VTEDate>	What date was the initial VTE prophylaxis administered?	__/__/____	Date MMDDYYYY	
	<NoVTEDoc>	If not documented or none of the above types of prophylaxis apply, is there documentation why prophylaxis was not administered at hospital admission?	Numeric #1-digit	1 - Yes; 0 - No	
	<OFXaVTE Reason>	Is there a documented reason for using Oral Factor Xa Inhibitor for VTE?	Numeric #1-digit	1 - Yes; 0 - No	**New January 2013 for TJC**
Other Therapeutic Anticoagulation	<LDUHIV>	Unfractionated heparin IV	Numeric #1-digit	1 - Yes; 0 - No	
	<Dabigat>	Dabigatran (Pradaxa)			
	<Argatro>	Argatroban			
	<Desirud>	Desirudin (Iprivask)			
	<OralXaI>	Oral Factor Xa Inhibitors (e.g., rivaroxaban/Xarelto)			
	<Lepirud>	Lepirudin (Refludan)			
	<OthACoag>	Other Anticoagulant			
Other complications	<UTI>	Was patient treated for a urinary tract infection (UTI) during this admission?	Numeric # 1-digit	1 - Yes; 0 - No/ND	
	<UTIFoley>	If patient was treated for a UTI, did the patient have a Foley catheter during this admission?		1 - Yes, and patient had catheter in place on arrival; 2 - Yes, but only after admission; 0 - No; 9 - UTD	

	<DVTDocYN>	Did patient experience a DVT or pulmonary embolus (PE) during this admission?	Numeric # 1-digit	1 - Yes; 0 - No/ND	
Date of discharge from hospital	<DschrgD>	What date was the patient discharged from hospital?	_ _/ _ _/_ _ _ _	Date MMDDYYYY	
Principal discharge ICD-9-CM diagnosis	<ICD9PrDx>	Principal discharge ICD-9-CM code	— — — · — —	5 – digit, 2 decimal places	
Principal discharge ICD-10-CM diagnosis	<ICD10Dx>	Principal discharge ICD-10-CM code	_ _ _ · _ _ _ _	alphanumeric, 3 before decimal, 4 after decimal	
Clinical diagnosis related to stroke that was ultimately responsible for this admission (check only one item)	<AdmDxSH>	Subarachnoid hemorrhage	Numeric ## 1-digit	1 - Yes; 0 - No	
	<AdmDxIH>	Intracerebral hemorrhage			
	<AdmDxIS>	Ischemic stroke			
	<AdmDxTIA>	Transient ischemic attack			
	<AdmDxSNS>	Stroke not otherwise specified			
	<AdmDxNoS>	No stroke related diagnosis			
	<AdmCE>	Was patient admitted for the sole purpose of performance of a carotid intervention?	Numeric # = 1-digit	1 - Yes; 0 - No or UTD	
	<ClinTrial>	Was the patient enrolled in a stroke clinical trial?			
Discharge disposition	<DschDisp>	Discharge disposition (Check only one.)	Numeric ## 1-digit	1 Discharged to home or self care (routine discharge), with or without home health, discharged to jail or law enforcement, or to assisted living facility; 2 Discharged to home hospice; 3 Discharged to hospice in a health care facility; 4 Discharged to an acute care facility (includes critical access hospitals, cancer and children's hospitals, VA, and DOD hospitals; 5 Discharged to another healthcare facility; 6 Expired; 7 Left	

				against medical advice or discontinued care; 8 Not documented or unable to determine	
	<OHFType>	If discharged to another healthcare facility above (option 5), type of facility was it?	Numeric # = 1-digit	1 – Skilled nursing facility; 2 – Inpatient rehabilitation; 3 – Long-term care facility or, hospital; 4 - Intermediate care facility; 5 - Other	
Functional status at discharge	<mRSDone>	Was Modified Rankin Scale done at discharge?	Numeric # 1-digit	1 - Yes; 0 - No/ND	
	<mRSScore>	Modified Rankin Scale Score	Numeric # 1-digit	0 - No symptoms; 1 - no significant disability despite symptoms; 2 slight disability; 3 - moderate disability, can walk without assistance; 4 - moderate to severe disability, needs assistance to walk; 5 - severe disability, bedridden; 6 - death	
	<AmbStatD>	Ambulatory status at discharge		1 – Able to ambulate independently w/or w/o device; 2 - with assistance from another person; 3 - unable to ambulate; 9 - not documented	
Antihypertensive treatment at discharge	<HBPTreat>	Is there documentation that antihypertensive medication was prescribed at discharge?	Numeric # 1-digit	1 - Yes; 0 - No/ND; 2 - NC	Antihypertensive medications include ACE inhibitors, ARBs, beta-blockers, calcium channel blockers, diuretics, and others

Antidepressant medication at discharge	<DprDCYN>	Was the patient prescribed an antidepressant medication at discharge?	Numeric # 1-digit	1 - Yes - SSRI; 2 - Yes - Other antidepressant; 0 - No/ND;	
Lipid Treatment	<LipLDL>	LDL |__|__|__| mg/dl	Numeric ### 3-digit		
	<LipStatn>	Was a statin medication prescribed at discharge?	Numeric # 1-digit	1 - Yes; 0 - No/ND	
	<StatnNC>	If statin not prescribed, was there a documented contraindication to statins?	Numeric # 1-digit	1 - Yes; 0 - No/ND	
Atrial Fibrillation	<AFibYN>	Was atrial fibrillation/flutter or paroxysmal atrial fibrillation (PAF), documented during this episode of care?	Numeric # 1-digit	1 - Yes; 0 - No/ND	
	<AFibRx>	If a history of atrial fibrillation/flutter or PAF is documented in the medical history or if the patient experienced atrial fibrillation/flutter or PAF during this episode of care, was patient prescribed anticoagulation medication upon discharge?	Numeric # 1-digit	1 - Yes; 0 - No/ND; 2 - NC	
Antithrombotics at Discharge	<AthDscYN>	Was antithrombotic (antiplatelet or anticoagulant) medication prescribed at discharge?	Numeric # = 1-digit	1 - Yes; 0 - No/ND; 2 - NC	
	<AthDCPlts>	If patient was discharged on an antithrombotic medication, was it an antiplatelet?	Numeric # = 1-digit	1 - Yes; 0 - No/ND	antiplatelet medications include aspirin, aspirin/dipyridamol, clopidogrel, ticlopidine, others
	<AthDCCoag>	If patient was discharged on an antithrombotic medication, was it an anticoagulant?	Numeric # = 1-digit		anticoagulant medications include heparin IV, full dose LMW heparin, warfarin, dabigatran, argatroban, desirudin, fondaparinux, rivaroxaban, lipirudin, others
Smoking Counseling	<SmkCesYN>	If past medical history of smoking is checked as yes, was the adult patient or their care giver given smoking cessation advice or counseling during the hospital stay?	Numeric # 1-digit	1 – Yes; 0 - No or not documented in the medical record; 2 - NC a documented	

				reason exists for not performing counseling	
Stroke Education	<EducRF>	Risk factors for stroke	Numeric # 1-digit	1 - Yes; 0 - No/ND	
	<EducSSx>	Stroke Warning Signs and Symptoms			
	<EducEMS>	How to activate EMS for stroke			
	<EducCC>	Need for follow-up after discharge			
	<EducMeds>	Medications prescribed at discharge			
Rehabilitation	<RehaPlan>	Is there documentation in the record that the patient was assessed for or received rehabilitation services?	Numeric # 1-digit	1 - Yes; 0 - No	

*Variables in the table with the green background are required data elements. Variables in the table with the blue background are optional data elements.

N. Post-Hospital Quality Data Elements

Nine Post-hospital quality performance measures will be reported by the grantee as a number, percent or proportion		Coverdell Data Element Name	30 day measure	Optional/Required
1	% of patients identified as tobacco users on hospital admission for acute stroke who are still using tobacco at 30-days post hospital discharge	<TobacUse>, <CurTobac>	*	R
2	% of stroke patients who were seen in the ED within 30 days of hospital discharge	<EDYN30>	*	R
3	% of stroke patients checking BP outside of their healthcare provider office visits (at home or in the community)	<BPMonitr>		R
4	% of stroke patients reporting blood pressure (BP) >140 systolic or >90 diastolic among those checking their BP outside of their healthcare provider office visits	<BPMonitr>, <BPSys>, <BPDia>		O
5	% of stroke patients reporting 2 or more falls within 30 days of discharge	<Fall30>, <FallNum>	*	R
6	% of stroke patients who stopped taking medications within 30 days of discharge without being told to do so by their medical provider	<StpMed30>	*	R
7	% of stroke patients that had a follow-up appointment scheduled prior to discharge	<DApptYN>		R
8	% of stroke patients who were readmitted to a hospital within 30 days of discharge	<ReAd30D>	*	R
9	% of stroke patients discharged to home who have died by 30 days	<Die30d>	*	R

Form Approved
OMB No. 0920-1108
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Instructions for Paul Coverdell National Acute Stroke Program (PCNASP) Post-Hospital Quality of Care Data Elements

		****All data elements will require information on date and method of follow up used**			**Color Key:**	Required year 2 Optional year 2
		Data Element			Method Ideally Gathered	
Item	**Post-Hospital Quality of Care Performance Measures**	**Text Prompt**	**Variable Name**	**Legal Values**	**Timing of collection**	**Ideal Source**
Hospital Discharge Date		Patient's date of hospital discharge	<DschDate>	Date MMDDYYYY	Early or 30 day element	Discharge Summary: Chart
Hospital Admission Date (part of inhospital dataset)		Hospital Admission Date (part of inhospital dataset)	<HospadD>	Date MMDDYYYY	Early or 30 day element	EHR
Follow up		Follow up Conducted (check all that apply): 1. phone, 2. in home, 3. chart review, 4. At a health facility, 5. EHR/chart abstraction, 6.Other, 7. Unable to reach	<FLMTHD>	1=Phone call, 2= in home, 3= chart review, 4= health facility, 5= EHR/chart abstraction, 6=other, 7= unable to reach	As follow up occurs	Data collection tool
		If phone call conducted, date:	<FLPhone>	Date MMDDYYYY	As follow up occurs	Data collection tool
		If in home follow up conducted, date:	<FLHOME>	Date MMDDYYYY	As follow up occurs	Data collection tool
		If chart review conducted, date:	<FLChart>	Date MMDDYYYY	As follow up occurs	Data collection tool
		If follow conducted at a health facility, date:	<FLHealth>	Date MMDDYYYY	As follow up occurs	Data collection tool
Location of patient at time of follow up?		Where is the patient at the time of follow-up?	<CurrLoc>	1 = Home with services; 2 = Home without services; 3=Hospital or Acute care facility; 4=long term care facility; 5=Acute Rehabilitation; 6=Skilled nursing facility;7= Can't determine	As follow up occurs	Data collection tool
Location of patient at 30 days post discharge?		Where is the patient 30 days after discharge?	<CurLoc30>	1 = Home; 2 = Hospital or Acute care facility; 3=long term care; 5=Acute Rehab; 6=Skilled nursing facility;7= can't determine	30 day element	Phone call or inperson follow up

Informant		Who provided responses to this follow-up?	<Informant>	1 = Patient; 2 = Family Member; 3 = Other Lay Caregiver; 4 = Home Health Aide; 5= EMS; 6 = Other;	As follow up occurs	Data collection tool
Rehab		Did or is patient receiving rehabilitation	<Rehab>	1 = Outpatient; 2 = In the home; 3 = Inpatient; 4 = Was at discharge but stopped; 5=Declined rehab, 0 = No	Early or 30 day element	EHR, phone or in person follow up
Rankin		What is the level of the patient's disability at 30 days? This is the 30-day modified Rankin Scale score	<mRS30Day>	0 = No symptoms; 1 = Some symptoms but able to carry out all usual duties and activities; 2 = Some disability, unable to carry out all previous activities, but able to look after own affairs without assistance; 3 = Moderate disability; requiring some help, but able to walk without assistance; 4 = Moderately severe disability; unable to walk without assistance and unable to attend to own bodily needs without assistance; 5 = Severe disability; bedridden, incontinent, and requiring constant nursing care and attention.	30 days	EHR, phone or in person follow up
Tobacco	% of patients identified as tobacco users on hospital admission for acute stroke who are still using tobacco at 30-days post	Was patient identified as a tobacco user at time of stroke? (tobacco use includes: cigarettes, cigars/cigarillos, little cigars, pipes, smokeless tobacco (chew, dip, snuff, snus), hookah/waterpipe, and electronic vapor products (e-	<TobacUse>	1 = Yes; 0 = No; 2 = Not sure	Early or 30 day element	phone call, inperson follow up

	hospital discharge	cigarettes, e-hookah, vape pens).				
		If patient was identified as a tobacco user at the time of their stroke, have they used tobacco (cigarettes, cigars/cigarillos, little cigars, pipes, smokeless tobacco (chew, dip, snuff, snus), hookah/waterpipe, and electronic vapor products (e-cigarettes, e-hookah, vape pens) since discharge?	<CurTobac>	1 = Yes; 0 = No; 2 = Not sure	30 day element	Phone call, inperson follow up
		Is the patient using tobacco products (cigarettes, cigars/cigarillos, little cigars, pipes, smokeless tobacco (chew, dip, snuff, snus), hookah/waterpipe, and electronic vapor products (e-cigarettes, e-hookah, vape pens)every day or some days?	<CurTobDa>	1=everyday; 2=some days; 3=not sure	30 day element	phone call

		If patient was a tobacco user (cigarettes, cigars/cigarillos, little cigars, pipes, smokeless tobacco (chew, dip, snuff, snus), hookah/waterpipe, and electronic vapor products (e-cigarettes, e-hookah, vape pens) at the time of their stroke, are they using any medications to stop using tobacco?	<SmkMeds>	1 = Yes; 0 = No; 2 = Not sure	30 day element	EHR
		Has the patient EVER stopped smoking for one day or longer because they were trying to quit smoking?	<StopSmk>	1=Yes; 0=No; 2=Not sure	30 day element	Phone call or inperson follow up
		If yes, how many times?	<Quitat>	1-100	30 day element	Phone call or inperson follow up
		Was the patient provided tobacco cessation counseling and/or referred to a cessation program	<TobEdu>	1 = Yes; 0 = No; 2 = Not sure	Early or 30 day element	EHR
ED visits		Has patient been seen in ED since discharge?	<EDYN>	1 = Yes; 0 = No; 2 = Not sure	Early Check In	Patient Phone call, inperson follow up, EHR, State ED summary
		If seen in the ED since discharge, date information about ED visits gathered if before 30 days.	<EDGaDate>	Date MMDDYYYY	Early Check In	Patient Phone call, inperson follow up, EHR, State ED summary
	% of stroke patients who were seen in the ED within 30 days of hospital discharge	Has the patient been seen in ED within 30 days of hospital discharge?	<EDYN30>	1=Yes; 0=No; 2=Not sure	30 day	Patient Phone call, inperson follow up, EHR, State ED summary
		How many ED visits since discharge?	<EDNum>	1 = 1; 2 = 2; 3 = 3 or more; 4 = unknown or not sure	30 day	Patient Phone call, inperson follow up, EHR, State ED summary

		If yes, Date of first ED visit	<EDDate>	Date MMDDYYYY	30 day	Patient Phone call, inperson follow up, EHR, State ED summary
		If yes, was reason for first ED visit: 1. Fall, 2. Trans ischemic attack, 3. Stroke, 4. Pneumonia, 5. urinary tract infection, 6. Deep venous thrombosis/Pulmonary embolism/blood clot, 7. Acute Myocardial Infarction, 8. Heart Failure, 9. Infection/sepsis, 10. pneumonia, 11. surgery, 12. Other	<EDReasn>	1=Fall, 2= TIA, 3= Stroke, 4=Pneumonia, 5= UTI, 6=VTE, 7=Other	30 day	Patient Phone call, inperson follow up, EHR, State ED summary
		Was the patient admitted to hospital, discharged to home, discharged to SNF or other institutional long term care, or held for observation and then discharged?	<EDDisp>	1 = Discharged to home; 0 = Admitted to hospital;2= Discharged to SNF or other institutional long term care; 3=Held for observation	30 day	Patient Phone call, inperson follow up, EHR, State ED summary
Blood Pressure	% of stroke patients checking BP outside of their healthcare provider office visits (at home or in the community)	Has the patient been monitoring their blood pressure outside of their healthcare provider office visits (at home or in the community)	<BPMonitr>	1 = Yes; 0 = No; 2=Not sure	Early check in and 30 days	Patient phone call, inperson follow up
	% of stroke patients reporting blood pressure (BP) >140 systolic or >90 diastolic among those checking their BP outside of	If yes, most recent systolic blood pressure	<BPSys>	Number: (Range; 50-220)	Early check in and 30 days	Patient phone call, inperson follow up
		If yes, most recent diastolic blood pressure	<BPDia>	Number (Range: 30-160)	Early check in and 30 days	Patient phone call, inperson follow up

	their healthcare provider office visits					
		If yes, have they reported their blood pressure to their health care provider since discharge?	<BPReport>	1 = Yes; 0 = No; 2=Not sure	Early check in and 30 days	Patient phone call, inperson follow up
		Is this blood pressure usual for you?	<BPUsual>	1=Yes; 0=No; 2 = Not sure	Early check in and 30 days	Patient phone call, inperson follow up
Falls		Has the patient fallen since discharge?	<DCFalls>	1=Yes; 0=No; 2 = Not sure	Early Check-In	Patient phone call, inperson follow up
	% of stroke patients reporting 2 or more falls within 30 days of discharge	Has the patient fallen within 30 days of discharge?	<Fall30>	1=Yes; 0=No; 2 = Not sure	30 day	Patient phone call, inperson follow up
		If yes, number of falls?	<FallNum>	Number (Range: 1-99)	30 day	Patient phone call, inperson follow up
		Was your fall reported to a healthcare provider?	<FallRep>	1=Yes; 0=No; 2 = Not sure	30 day	Patient phone call, inperson follow up
Medication		**Medications prescribed at discharge?**				
		Antihypertensive	<DCBPMed>	1 = Yes; 0 = No; 2 = Not sure	Early check in or 30 days	EHR (Discharge Summary)
		Statin	<DCStatn>			
		Antidiabetic agent	<DCDiab>			
		Aspirin or other antiplatelet	<DCAsprn>			
		Anticoagulant	<DCACoag>			
		Are you currently taking:				
		Antihypertensive	<BPMedNow>		Early check in and 30 days	Patient phone call or inperson follow up.
		Statin	<StatnNow>			
		Antidiabetic agent	<DiabNow>			
		Aspirin or other antiplatelet	<AsprnNow>			
		Anticoagulant	<ACoagNow>			
		Did staff review your medications with you before discharge?	<RevMed>	1 = Yes; 0 = No; 2 = Not sure	Early check in	Patient phone call or inperson follow up

	% of stroke patients who stopped taking medications within 30 days of discharge without being told to do so by their medical provider	Have you stopped any medications in the 30 days since hospital discharge without being told to do so by your medical provider?	<StpMed30>	1 = Yes; 0 = No; 2 = Not sure	30 day;	Patient phone call or inperson follow up
		If yes, which meds?				
		Antihypertensive	<StopBP>	0= No; 1 = Yes - side effects; 2 = Yes - cost; 3 = Yes - no transportation; 4 = Yes - healthcare provider told them to stop; 5 = Yes - forget to take them; 6 =Yes-Ran out; 7= Yes-Was away from home; 8=Yes- Other	Early check in and 30 days	Patient phone call or inperson follow up
		Statin	<StopStn>			
		Antidiabetic agent	<StopDiab>			
		Aspirin or other antiplatelet	<StopASA>			
		Anticoagulant	<StopCoag>			
		Stopped taking another medication	<StopOth>	75 character text	Early check in and 30 days	Patient phone call or inperson follow up
		Have you stopped any medications in the 60 days since hospital discharge without being told to do so by your medical provider?	<StpMed60>	1 = Yes; 0 = No; 2 = Not sure	60 days	Patient phone call or inperson follow up
		Have you stopped any medications in the 90 days since hospital discharge without being told to do so by your medical provider?	<StpMed90>	1 = Yes; 0 = No; 2 = Not sure	90 days	Patient phone call or inperson follow up
Follow up appointment	% of stroke patients that had a follow-up appointment scheduled prior to discharge	Was an appointment made prior to discharge to follow up with a healthcare provider?	<DApptYN>	1 = Yes; 0 = No; 2 = Not sure	Early check in or 30 days	EHR, patient phone call or inperson follow up

		If yes, was: The appointment kept?	<DAppKep>	1 = Kept and attended visit; 0= Kept and visit Pending; 2= not sure	30 days	EHR, patient phone call or inperson follow up
		If yes, was the appointment rescheduled?	<DAppRes>	1=Rescheduled and attended; 0=Rescheduled and pending; 2=not sure	30 days	EHR, patient phone call or inperson follow up
		If yes, was the appointment not kept:	<DAppNKep>	1=Not kept; 0=not kept and not rescheduled; 2=not sure	30 days	EHR, patient phone call or inperson follow up
		If no, has an appointment been scheduled since discharge?	<DAppPend>	1 = Yes; 0 = No; 2 = Not sure	Early check in and 30 days	EHR, patient phone call or inperson follow up
		Who did patient see or will see?	<DAppType>	1 = Stroke Specialist; 2 = Primary Care Provider; 3 =both; 4= Other;	30 days	EHR, patient phone call or inperson follow up
		If the appointment wasn't attended, why?	<DAppWhy>	1=no transportation;2=didn't know about/remember appointment;3= scheduling conflict; 4=sick; 5=other	Early check in or 30 days	Patient phone call or inperson follow up
		Date of first follow up appointment	<DAppDate>	Date MMDDYYYY	Early check in or 30 days	Patient phone call or inperson follow up
Readmissions post discharge		Has patient been readmitted to a hospital since discharge?	< ReAd>	1 = Yes; 0 = No; 2 = Not sure	Early check in	EHR, state admissions database, patient phone call, or inperson
	% of stroke patients who were readmitted to a hospital within 30 days of discharge	Was the patient readmitted to a hospital within 30 days of discharge?	<ReAd30D>	1 = Yes; 0 = No; 2 = Not sure	30 days	EHR, state admissions database, patient phone call, or inperson
		If yes, date of first readmission	<ReAdDate>	Date MMDDYYYY	30 day follow up	EHR, state admissions database, patient phone call, or inperson

		If yes, were any of readmissions due to: 1. Fall, 2. Deep vein thrombosis/pulmonary embolism/blood clot, 3. Carotid Intervention, 4. Acute Myocardial Infarction, 5. Heart Failure, 6. Infection/Sepsis, 7. Blood pressure, 8. Pneumonia, 9. Trans Ischemic Attack, 10. Atrial Fibrillation, 11. Other cardiac survey event, 12. Other surgical procedure, 13. urinary tract infection, 14. Unknown, 15= Other	<ReAdWhy>	1= Fall, 2=Deep vein thrombosis/pulmonary embolism/blood clot, 3=Carotid Intervention, 4=Acute Myocardial Infarction, 5=Heart Failure, 6= Infection/Sepsis, 7=Blood pressure, 8= Pneumonia, 9=Trans Ischemic Attack, 10= Atrial Fibrillation, 11=Other cardiac survey event, 12= Other surgical procedure, 13=urinary tract infection, 14= Unknown, 15= Other	30 day follow up	EHR, state admissions database, patient phone call, or inperson
		If yes, how many readmissions since discharge?	<ReAdNum>	1 = 1; 2 = 2; 3 = 3 or more; 4 = unknown or not sure	30 day follow up	EHR, state admissions database, patient phone call, or inperson
Died	% of stroke patients discharged to home who have died by 30 days	Has patient died?	<Die30d>	1 = Yes; 0 = No; 2 = Not sure	30 day	State Death File, National Death Index
		If patient died, date of death	<DieDate>	Date MMDDYYYY	30 day	State Death File, National Death Index
		If patient died, cause of death	<DieCause>	1 = new ischemic stroke; 2 = Pneumonia/Respiratory Failure; 3 = myocardial infarction; 4 = Heart Failure; 5=Other Cardiovascular; 6=Deep vein thrombosis or pulmonary embolism; 7= Sepsis/Infection; 8=Intracranial hemorrhage (SAH, ICH, SDH, etc); 9=Other; 10=Unknown	30 day	State Death File, National Death Index

Mental Health		Over the past 2 weeks how often have you been bothered by any of the following problems: Not at all, several days, more than half the days, nearly every day.				
		Little interest or pleasure in doing things	<MenHea1>	0=not at all, 1= Several days, 2=More than half the days, 3=Nearly everyday	Early or 30 day element	Patient phone call or inperson follow up
		Felling down, depressed, or hopeless	<MenHea2>	0=not at all, 1= Several days, 2=More than half the days, 3=Nearly everyday	Early or 30 day element	Patient phone call or inperson follow up
		Trouble falling asleep, staying asleep or sleeping too much	<MenHea3>	0=not at all, 1= Several days, 2=More than half the days, 3=Nearly everyday	Early or 30 day element	Patient phone call or inperson follow up
		Feeling tired or having little energy	<MenHea4>	0=not at all, 1= Several days, 2=More than half the days, 3=Nearly everyday	Early or 30 day element	Patient phone call or inperson follow up
		Poor appetite or overeating	<MenHea5>	0=not at all, 1= Several days, 2=More than half the days, 3=Nearly everyday	Early or 30 day element	Patient phone call or inperson follow up
		Felling bad about yourself or that you're a failure or have let yourself or your family down	<MenHea6>	0=not at all, 1= Several days, 2=More than half the days, 3=Nearly everyday	Early or 30 day element	Patient phone call or inperson follow up
		Trouble concentrating on things, such as reading the newspaper or watching television	<MenHea7>	0=not at all, 1= Several days, 2=More than half the days, 3=Nearly everyday	Early or 30 day element	Patient phone call or inperson follow up
		Moving or speaking so slowly that others could have noticed. Or, the opposite, being so fidgety or restless that you have been moving around more than usual	<MenHea8>	0=not at all, 1= Several days, 2=More than half the days, 3=Nearly everyday	Early or 30 day element	Patient phone call or inperson follow up

		Thoughts that you would be better off dead or of hurting yourself in some way	<MenHea9>	0=not at all, 1= Several days, 2=More than half the days, 3=Nearly everyday	Early or 30 day element	Patient phone call or inperson follow up

Coverdell Stroke Program: Post Hospital Data Element/Performance Measures FAQ

General:

- Does CDC want raw data? Yes, please.
- Hospitals may be more confident about using resources to collect this data if they're reminded that this is data to be used for intervention to enhance the patients visit, recovery, reduce readmissions (hopefully) and improve their quality of life.

ER visits:

- May be hard for the patient to remember the date of their

Hospitalizations:

Falls:

- Range for the number of falls is 1-99 but its not likely that the patient would remember the number if there is a large number of falls.
    - Will limit falls to 1-50 and re-evaluate to see if this should be further modified.

Tobacco:

- Valid range for number of times patient has tried to quit is listed as 1-100. Again patients won't remember this exact number if they've tried to quit multiple times.
    - Will limit quit attempts to 25 and re-evaluate with data to determine if this should be further modified.
- In the listing of types of tobacco the "t" was left off in the words "little cigar"
    - (cigarettes, cigars/cigarillos, little cigars, pipes, smokeless tobacco (chew, dip, snuff, snus), hookah/waterpipe, and electronic vapor products (e-cigarettes, e-hookah, vape pens) at the time of their stroke, are they using any medications to stop using tobacco?

O. Flow Charts for Calculating Performance Measures

Please reference The Joint Commission's website for the most updated version of the technical specifications manual and flow charts for the Stroke National Hospital Inpatient Quality Measures:

https://www.jointcommission.org/specifications_manual_for_national_hospital_inpatient_quality_measures.aspx

P. SAS Code for Performance Measures

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/*     SAS Code for In-hospital Performance Measures


1. For STK-1, STK-2, STK-3, STK-4, STK-5, STK-6, STK-8, and STK-10, CDC
follows The Joint Commission algorithms.  These algorithms exclude when the
patient was less than 18 years old, when the record was part of a clinical
trial, when the patient was admitted for a carotid endarterectomy, in-
hospital strokes, and when the patient was not admitted.  TJC also excludes
records when there are missing values to critical data elements.

2. For Door-to-needle time measures, CDC follows the flow diagram for this
measure in the NQF #1952 documentation.

3. In general, for non-TJC measures, CDC follows TJC practice of excluding
patients admitted for a carotid endarterectomy, in-hospital strokes, and when
the patient was not admitted.

4. This does not include TIA patients. See separate code for TIA calculations
at the end.


*/


%macro dtconv(dtout, din, tin); * Macro to combine date and time;
      if (&din > .) & (&tin > .) then do;
            tempdt = put(&din, date9.) || " " || put(&tin, time14.2);
            &dtout = input(tempdt, datetime25.);
      end;
      else
            &dtout = .;
%mend;

data pm_analysis; set mydata; * Data step to create new variables;
                              * Replace mydata with the name of your dataset;

n_ICD9prdx=input(ICD9prdx, 8.2);
ICD10_first3=substr(PRICD10d,1,3);

* Re-group stroke type;
if AdmDxSH=1 or AdmDxIH=1  then Adm_Dxgrp=1; /*Hemorrhagic*/
else if AdmDxIS =1 or (AdmDxSNS=1 and n_ICD9prdx in (433.01, 433.11, 433.21,
433.31, 433.81, 433.91, 434.01, 434.11, 434.91, 436))
then Adm_Dxgrp=2; /*Ischemic, using ICD-9-CM code*/
else if AdmDxIS =1 or (AdmDxSNS=1 and ICD10_first3='I63') then Adm_Dxgrp=2;
/*Ischemic, using ICD-10-CM code*/
else if AdmDxSNS=1         then Adm_Dxgrp=3; /*Ill-defined*/
else if AdmDxTIA=1         then Adm_Dxgrp=4; /*TIA*/
else if AdmDxNos=1         then Adm_Dxgrp=5; /*No stroke*/
else                            Adm_Dxgrp=6; /*Unable to classify*/

CMODoc_grp=CMODoc;
if CMODoc=0 or CMODoc=. then CMODoc_grp=4;
      /* CMODoc_grp = 1 - Day of arrival or first day after arrival
                      2 - 2nd day after arrival or later
```

```
                    3 - Timing unclear;
                    4 - ND/UTD
      */


%dtconv(TRMIVMDT, TRMIVMD, TRMIVMT);
%dtconv(LKWDT, LKWD, LKWT);
%dtconv(EDTriagDT, EDTriagD, EDTriagT);

run;

*******************************************************************************;
*******************************************************************************;

*1.  VTE/DVT Prophylaxis (STK-1);

/*
Description: Ischemic, Subarachnoid or Intracerebral hemorrhage stroke
patients who received VTE prophylaxis or have documentation why no VTE
prophylaxis was given the day of or the day after hospital admission.

Inclusions: Ischemic stroke, Subarachnoid hemorrhage, Intracerebral
hemorrhage, stroke not otherwise specified.

Exclusions: Length of Stay less than 2 days or greater than 120 days,
CMO by Day 2.
*/

data pmcalc;set pm_analysis;
if NotAdmit^=1 & PlcOccur^=4 & AdmCE^=1 & ClnTrial^=1 & Adm_Dxgrp in (1, 2,
3) & CMODoc_grp in (2, 3, 4) & 2<=(DschrgD - HospadD)<=120
& (VTEDate-HospadD)>=0;
pm_vte=(((VTELDUH=1 | VTELMWH=1 | VTEIPC=1 | VTEXaI=1 | VTEWar=1 | VTEVFP=1 |
(VTEOXaI=1 & OFXaVTE=1) | VTEASPRN=1) & ((VTEDate-HospadD) in (0, 1)))
| (((VTELDUH=0 & VTELMWH=0 & VTEIPC=0 & VTEXaI=0 & VTEWar=0 & VTEVFP=0 &
VTEOXaI=0) & (VTEGCS=1 | VTEND=1)) & NoVTEDoc=1));
run;


*******************************************************************************;
*******************************************************************************;

*2.  Antithrombotic therapy at discharge (STK-2);

/*
Description: Ischemic stroke patients prescribed antithrombotic therapy at
hospital discharge.

Inclusions:  Ischemic stroke.

Exclusions:  Length of Stay greater than 120 days, Comfort Measures Only
documented, enrolled in clinical trials, admitted for Elective Carotid
Intervention, documented reason for not receiving antithrombotic at
discharge, discharged to home for hospice, left AMA, expired, transferred to
another short-term care facility, patients with unknown discharge location.
*/
```

```
data pmcalc;set pm_analysis;
if NotAdmit^=1 & PlcOccur^=4 & Adm_Dxgrp=2 & AdmCE^=1 & ClnTrial^=1 &
DschDisp in (1, 5, 8) & CMODoc_grp=4
& 0<= (DschrgD - HospadD) <=120 & AthDscYN not in ( ., 2) ;
pm_athdsc = (AthdscYN=1);
run;



*************************************************************************;
*************************************************************************;

*3.  Anticoagulation for AF (STK-3);

/*
Description: Ischemic stroke patients with atrial fibrillation/flutter who
are prescribed anticoagulation therapy at hospital discharge.

Inclusions:  Ischemic stroke and atrial fibrillation during the current
hospitalization.

Exclusions:  Length of Stay greater than 120 days, Comfort Measures Only
documented, enrolled in clinical trials, admitted for Elective Carotid
Intervention, documented reason for not receiving anticoagulation, discharged
to home for hospice, left AMA, expired, transferred to another short-term
care facility, patients with unknown discharge location.
*/


data pmcalc;set pm_analysis;
if NotAdmit^=1 & PlcOccur^=4 & Adm_Dxgrp=2 & AdmCE^=1 & ClnTrial^=1 &
DschDisp in (1, 5, 8)
& CMODoc_grp = 4 & 0<= (DschrgD - HospadD) <=120 & (MedHisAF = 1 | AFibYN =
1) & AFibRx not in (., 2);
pm_af = (AFibRx =1);
run;



*************************************************************************;
*************************************************************************;

*4. tPA Given(STK-4);

/* This code assumes that missing date and time values are represented as.,
rather than 00:00 etc.
Not all of the reasons for not providing tPA in the data dictionary are valid
reasons for this performance measure.  Therefore, TrmIVM = 2 may not be
appropriate for coding to calculate this measure.  A calculated variable
(TrmIVM2) is created to correct for this.

Description: Acute ischemic stroke patients who arrived at the hospital
within 120 minutes (2 hours) for 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.
```

```
Inclusions:  Ischemic stroke, arrived in ED within 2 hours of last known well
time.
Exclusions:  Patients with documented reason for extending the initiation of
IV Thrombolytic. Patients with a documented reason for not initiating IV
Thrombolytic.
*/



data pmcalc_1; set pm_analysis;
if 0<(EDTriagDT - LKWDT) / 3600 <= 2.0
 then timing1=1;
else if (EDTriagDT - LKWDT) / 3600 > 2.0 then timing1=0;
run;

data pmcalc_2; set pmcalc_1;
if timing1=1;
if TrmIVM=1 then TrmIVM2=1; /*Patients received tPA*/
else if (TrmIVT = 1 | NonTrtOH = 1 | NonTrtCT = 1 | NonTrtNC = 1 | NonTrtSM =
1 | NonTrtIL = 1 | NonTrtC = 1 |
NonTrtWN = 1 | NonTrtAG=1 | NonTrtFR=1 | NonTrtRI=1) then TrmIVM2 = 9;
/*Patients had contraindication*/
else TrmIVM2 = 0; /*Patients did not received tPA*/
run;

data pmcalc_3; set pmcalc_2;
if TrmIVM2 in (0,1);
if TrmIVM2=0 then timing2=4;
if TrmIVM2=1 & 0<(TrmIVMDT-LKWDT) / 3600 <= 3.0 then timing2=1; /*0-3 hours
window*/
else If (TrmIVM2=1 & 3.0<(TrmIVMDT-LKWDT) / 3600 <= 4.5)  then timing2=2;/*3-
4.5 hours window*/
else If TrmIVM2=1 & (TrmIVMDT-LKWDT) / 3600 > 4.5 then timing2=3 ;/*>4.5
hours window*/
else if TrmIVM2=1 & ((TrmIVMDT-LKWDT) < 0.0 or (TrmIVMDT-LKWDT)  ^= .)  then
timing2=9;
run;

data pmcalc; set pmcalc_3;
if Adm_Dxgrp = 2 &  NotAdmit^=1 & PlcOccur^=4 &  AdmCE^=1 & Clntrial^=1 &
NIHStrks^=0 & sxresolv ^= 1 ;
if timing2 in (1,3,4) | (timing2=2 & IVtPADel=0);
pm_tpa= (TrmIVM2=1 and timing2 =1); /*tPA at 0-3 hours window */
run;


data pmcalc; set pmcalc_3;
if Adm_Dxgrp = 2 &  NotAdmit^=1 & PlcOccur^=4 &  AdmCE^=1 & Clntrial^=1 &
NIHStrks^=0 & sxresolv ^= 1 ;
if timing2 in (1,3,4) | (timing2=2 & IVtPADel=0);
pm_tpa_ext=(TrmIVM2=1 and timing2 in (1,2)); /*tPA at 0-4.5 hours window */
run;


*************************************************************************;
*************************************************************************;
```

```
*5.  Antithrombotic therapy at end of hospital day 2(STK-5);

/*
Description: Ischemic stroke patients administered antithrombotic therapy by
the end of hospital day 2.

Inclusions:  Ischemic stroke.

Exclusions:  Length of Stay less than 2 days or greater than 120 days.
Patients with IV tPA administered at this hospital or within 24 hours prior
to arrival. Patients with a documented reason for not administering
antithrombotic therapy by the end of hospital day 2.
*/


data pmcalc;set pm_analysis;
if NotAdmit^=1 & PlcOccur^=4 & Adm_Dxgrp = 2 & AdmCE^=1 & ClnTrial^=1 &
2<=(DschrgD - HospadD)<= 120 & CMODoc_grp in (2, 3, 4)
& TrmIVT^=1 & TrmIAM^=1 & TrmIVM^=1 & TrmIAT^=1 & AThr2Day not in (., 2) &
(DschrgD - EDTriagD) >= 2;
pm_ath48h = (AThr2Day =1);
run;


*************************************************************************;
*************************************************************************;

*6.  Discharge on stain medication (STK-6);

/*
Description: Ischemic stroke patients who are prescribed statin medication at
hospital discharge.

Inclusions:  Ischemic stroke.

Exclusions:  Length of Stay greater than 120 days. Patients discharged to
another hospital, left AMA, expired, discharged to home for hospice care,
discharged to a health care facility for hospice care. Patients with a reason
for not prescribing statin mediation at discharge.

*/


data pmcalc; set pm_analysis;
if NotAdmit^=1 & PlcOccur^=4 & Adm_Dxgrp = 2 & AdmCE^=1 & ClnTrial^=1 &
0<=(DschrgD - HospadD)<= 120
& CMODoc_grp = 4 & DschDisp in (1, 5, 8)
& (LipStatn=1 | ( LipStatn=0 & StatnNc= 0)) ;
pm_statin = (LipStatn=1);
run;

*************************************************************************;
*************************************************************************;

*7.  Dysphagia screening (STK-7);
```

```
/*
Description: Acute stroke patients screened for dysphagia prior to any oral
intake.

Inclusions:  Ischemic stroke, Subarachnoid hemorrhage, Intracerebral
hemorrhage, stroke not otherwise specified.

Exclusions:  Those who are NPO throughout entire hospital stay and those who
have a documented reason in the medical record that screening is not
required.
*/


data pmcalc; set pm_analysis;
if NotAdmit^=1 & PlcOccur^=4 & Adm_Dxgrp in (1, 2, 3) & AdmCE^=1 &
ClnTrial^=1 & 0<=(DschrgD - HospadD)<= 120 & NPO ^= 1
& (DysphaYN NOT in (2,.));
pm_dyspha = (DysphaYN = 1);
run;


*******************************************************************************;
*******************************************************************************;

*8. Stroke Education (STK-8);
/*
Description: Ischemic, Subarachnoid hemorrhage, Intracerebral hemorrhage
patients or their caregivers who were given educational materials during the
hospital stay addressing all of the following: activation of emergency
medical system, need for follow-up after discharge, medications prescribed at
discharge, risk factors for stroke, and warning signs and symptoms of stroke.

Inclusions:  Ischemic stroke, Subarachnoid hemorrhage, Intracerebral
hemorrhage, stroke not otherwise specified.

Exclusions:  Length of Stay greater than 120 days. Patients with Comfort
Measures only documented.
*/

data pmcalc;set pm_analysis;
if NotAdmit^=1 & PlcOccur^=4 & Adm_Dxgrp in (1, 2, 3) & AdmCE^=1 &
ClnTrial^=1 &
  ^(EducCC=. & EducEMS=. & EducMeds=. & EducRF=. & EducSSx=.)  & DschDisp in
(1, 8)
  & 0<= (DschrgD - HospadD)<= 120 & CMODoc_grp = 4;
pm_educ = (EducCC=1 & EducEMS=1 & EducMeds=1 & EducRF=1 & EducSSx=1);
run;




*******************************************************************************;
*******************************************************************************;


*9.  Smoking Cessation Counseling (STK-9);
/*
```

```
Description: Ischemic, Subarachnoid hemorrhage, Intracerebral hemorrhage
patients who receive smoking cessation recommendations or medication at
discharge.

Inclusions:  Ischemic stroke, Subarachnoid hemorrhage, Intracerebral
hemorrhage, stroke not otherwise specified.

Exclusions:  Discharge to hospice, or another short term hospital for
inpatient care, left AMA, expired, or receiving comfort measures only, or
when discharge location is unknown.  Also exclude those who are too impaired
to smoke or are otherwise unable to engage in smoking.
*/

data pmcalc; set pm_analysis;
if NotAdmit^=1 & PlcOccur^=4 & Adm_Dxgrp in (1, 2, 3) & AdmCE^=1 &
ClnTrial^=1 & 0<=(DschrgD - HospadD)<= 120 & DschDisp in (1, 8)
& CMODoc_grp = 4 & SmkCesYn not in (., 2) & MedHisSM=1;
pm_smoke = (SmkCesYn = 1);
run;


*************************************************************************;
*************************************************************************;

*10.  Rehabilitation Plan (STK-10);

/*
Description: Ischemic or hemorrhagic stroke patients who were assessed for
rehabilitation services.

Inclusions:  Ischemic stroke, Subarachnoid hemorrhage, Intracerebral
hemorrhage, stroke not otherwise specified.

Exclusions:  Patients discharged to hospice, left AMA, expired, transferred
to another short-term care facility, patients with unknown discharge
location, receiving CMO.
*/


data pmcalc;set pm_analysis;
if NotAdmit^=1 & PlcOccur^=4 & Adm_Dxgrp in (1, 2, 3) & AdmCE^=1 &
ClnTrial^=1 & DschDisp in (1, 5, 8)
& 0<= (DschrgD - HospadD ) <= 120 & CMODoc_grp = 4 & RehaPlan ^= .;
pm_rehab = (RehaPlan =1);
run;




*************************************************************************;
*************************************************************************;

*11. IV tPA within 60 minutes of ED Arrival (door to needle);
/*
Description: Ischemic stroke patients who receive IV tPA within 60 minutes of
ED Arrival.
```

```
Inclusions: Ischemic stroke, tPA given within 4.5 hours of last known well
time.

Exclusions: Patients transfered from another hospital or ND/unknown place.
*/



data pmcalc; set pm_analysis;
If Adm_Dxgrp = 2 & TrmIVM=1 & PlcOccur^=4  & ArrMode not in (., 3, 9) &
(TrmIVMdt-EdTriagdt) >= 0.0
& 0.0 <= ((TrmIVMDT-LKWDT)/3600) <= 4.5 & IVtPAdel^=1;
pm_doorTPA = 0.0 <= ((TrmIVMDT-EdTriagDT)/60) <= 60.0;
run;

*************************************************************************;
*************************************************************************;

*12. Median of door to needle time;
/*
Description: Median of door to needle time for Ischemic stroke patients who
receive IV tPA.

Inclusions: Ischemic stroke, tPA given.

Exclusions: Patients transferred from another hospital or ND/unknown place.
*/

data pmcalc; set pm_analysis;
If Adm_Dxgrp = 2 & TrmIVM=1 & PlcOccur^=4 & ArrMode not in (., 3, 9);
DToTPA = (TrmIVMDT - EDTriagDT) / 3600; *door to tPA time - hours;
If DToTPA>=240 or DToTPA<0 then DToTPA=.;
run;

proc means data=pmcalc ;
var DToTPA ;
output out=DToTPA_median mean=mean median=median min=min max=max ;
run;

*************************************************************************;
*************************************************************************;

*13. NIHSS score;

/*
Description: Ischemic stroke patients who have NIH Stroke Scale score
performed as part of the initial evaluation.

Inclusions:  Ischemic stroke.
*/


data pmcalc; set pm_analysis;
If Adm_Dxgrp=2 & PlcOccur^=4 ;
pm_NIHSS= (NIHSSYN=1 | 0<=NIHStrkS<=42);
run;
```

```
*************************************************************************;
*************************************************************************;
*************************************************************************;
*************************************************************************;



/*     SAS Code of Performance Measurement calculations for TIA patients */



*************************************************************************;
*************************************************************************;

*2.  Antithrombotic therapy at discharge (STK-2);

/*
Description: TIA stroke patients prescribed antithrombotic therapy at
hospital discharge.

Inclusions:  TIA.

Exclusions:  Length of Stay greater than 120 days, Comfort Measures Only
documented, enrolled in clinical trials, admitted for Elective Carotid
Intervention, documented reason for not receiving antithrombotic at
discharge, discharged to home for hospice, left AMA, expired, transferred to
another short-term care facility, patients with unknown discharge location.
*/


data pmcalc;set pm_analysis;
if NotAdmit^=1 & PlcOccur^=4 & Adm_Dxgrp= 4 & AdmCE^=1 & ClnTrial^=1 &
DschDisp in (1, 5, 8) & CMODoc_grp=4
& 0<= (DschrgD - HospadD) <=120 & AthDscYN not in ( ., 2) ;
pm_athdsc = (AthdscYN=1);
run;



*************************************************************************;
*************************************************************************;

*3.  Anticoagulation for AF (STK-3);
```

```
/*
Description: TIA patients with atrial fibrillation/flutter who are prescribed
anticoagulation therapy at hospital discharge.

Inclusions:  TIA and atrial fibrillation during the current hospitalization.

Exclusions:  Length of Stay greater than 120 days, Comfort Measures Only
documented, enrolled in clinical trials, admitted for Elective Carotid
Intervention, documented reason for not receiving anticoagulation, discharged
to home for hospice, left AMA, expired, transferred to another short-term
care facility, patients with unknown discharge location.
*/


data pmcalc;set pm_analysis;
if NotAdmit^=1 & PlcOccur^=4 & Adm_Dxgrp= 4 & AdmCE^=1 & ClnTrial^=1 &
DschDisp in (1, 5, 8)
& CMODoc_grp = 4 & 0<= (DschrgD - HospadD) <=120 & (MedHisAF = 1 | AFibYN =
1) & AFibRx not in (., 2);
pm_af = (AFibRx =1);
run;




*******************************************************************************;
*******************************************************************************;

*5.  Antithrombotic therapy at end of hospital day 2(STK-5);

/*
Description: TIA patients administered antithrombotic therapy by the end of
hospital day 2.

Inclusions:  TIA

Exclusions:  Length of Stay less than 2 days or greater than 120 days.
Patients with IV tPA administered at this hospital or within 24 hours prior
to arrival. Patients with a documented reason for not administering
antithrombotic therapy by the end of hospital day 2.
*/


data pmcalc;set pm_analysis;
if NotAdmit^=1 & PlcOccur^=4 & Adm_Dxgrp = 4 & AdmCE^=1 & ClnTrial^=1 &
2<=(DschrgD - HospadD)<= 120 & CMODoc_grp in (2, 3, 4)
& TrmIVT^=1 & TrmIAM^=1 & TrmIVM^=1 & TrmIAT^=1 & AThr2Day not in (., 2) &
(DschrgD - EDTriagD) >= 2;
pm_ath48h = (AThr2Day =1);
run;


*******************************************************************************;
*******************************************************************************;

*6.  Discharge on stain medication (STK-6);
```

```
/*
Description: TIA patients who are prescribed statin medication at hospital
discharge.

Inclusions:  TIA

Exclusions:  Length of Stay greater than 120 days. Patients discharged to
another hospital, left AMA, expired, discharged to home for hospice care,
discharged to a health care facility for hospice care. Patients with a reason
for not prescribing statin mediation at discharge.

*/


data pmcalc; set pm_analysis;
if NotAdmit^=1 & PlcOccur^=4 & Adm_Dxgrp = 4 & AdmCE^=1 & ClnTrial^=1 &
0<=(DschrgD - HospadD)<= 120
& CMODoc_grp = 4 & DschDisp in (1, 5, 8)
& ( LipStatn=1 | ( LipStatn=0 & StatnNc= 0)) ;
pm_statin = (LipStatn=1);
run;


*************************************************************************;
*************************************************************************;

*8. Stroke Education (STK-8);
/*
Description: TIA patients or their caregivers who were given educational
materials during the hospital stay addressing all of the following:
activation of emergency medical system, need for follow-up after discharge,
medications prescribed at discharge, risk factors for stroke, and warning
signs and symptoms of stroke.

Inclusions:  TIA

Exclusions:  Length of Stay greater than 120 days. Patients with Comfort
Measures only documented.
*/

data pmcalc;set pm_analysis;
if NotAdmit^=1 & PlcOccur^=4 & Adm_Dxgrp= 4 & AdmCE^=1 & ClnTrial^=1 &
  ^(EducCC=. & EducEMS=. & EducMeds=. & EducRF=. & EducSSx=.)  & DschDisp in
(1, 8)
  & 0<= (DschrgD - HospadD)<= 120 & CMODoc_grp = 4;
pm_educ = (EducCC=1 & EducEMS=1 & EducMeds=1 & EducRF=1 & EducSSx=1);
run;




*************************************************************************;
*************************************************************************;


*9.  Smoking Cessation Counseling (STK-9);
/*
```

```
Description: TIA patients who receive smoking cessation recommendations or
medication at discharge.

Inclusions:  TIA

Exclusions:  Discharge to hospice, or another short term hospital for
inpatient care, left AMA, expired, or receiving comfort measures only, or
when discharge location is unknown.  Also exclude those who are too impaired
to smoke or are otherwise unable to enMAge in smoking.
*/

data pmcalc; set pm_analysis;
if NotAdmit^=1 & PlcOccur^=4 & Adm_Dxgrp= 4 & AdmCE^=1 & ClnTrial^=1 &
0<=(DschrgD - HospadD)<= 120 & DschDisp in (1, 8)
& CMODoc_grp = 4 & SmkCesYn not in (., 2) & MedHisSM='1';
pm_smoke = (SmkCesYn = 1);
run;
```

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Q. Hospital Inventory for Paul Coverdell National Acute Stroke Program

NOTE: The hospital inventory is subject to annual updates.

Instructions for Paul Coverdell National Acute Stroke Program (PCNASP) Hospital Inventory Survey

The intent of the Paul Coverdell National Acute Stroke Program hospital inventory is to better understand issues associated with acute stoke care. Responses will be used to identify what types of QI interventions work in particular settings, where gaps exist, and how we can better help hospitals with fewer resources. Additionally, this survey will provide vital information to both CDC and State Health Departments about the capacity of hospitals for stroke care. When this survey is submitted to CDC by State Health Departments, it does not contain identifiable hospital information to protect the confidentiality of hospitals. Responses will be aggregated and may be used as additional information to patient-level data collected as part of PCNASP.

This survey should be filled out, or at least reviewed, by the stroke coordinator or other designee involved in stroke care. Because of the goals of the inventory, please base your answers on practical availability and use of the procedures and resources. For example, your hospital might have written care protocols that are used in less than 50% of cases. If so, then the answer to questions in B.2 would be "No". Alternatively, some procedures employed at your hospital (pre-notification from EMS) might not be formalized, but regularly take place. In this situation, the answer to question C.2 would be "Always"/ "Sometimes". Throughout the survey, circle radio buttons indicate that you should select one best answer; checkboxes indicate that you should select all answers that apply. This hospital inventory survey is completed by hospitals and then transmitted to their respective State Health Department (PCNASP awardee) as an electronic file or paper form, based on the request of your State Health Department.

A. Hospital Infrastructure

1. Hospital code (as assigned through the PCNASP):_____

2. Current hospital size (number of licensed beds): _____

3. Total number of inpatient discharges in the most recent calendar year: _____

4. Total number of acute stroke discharges (primary diagnosis only; see list of ICD-9 and ICD-10 codes in the appendix) in the most recent calendar year: _____

    a. *[Optional]* Total number of acute ischemic stroke discharges in the most recent calendar year: _____
    b. *[Optional]* Total number of TIA discharges in the most recent calendar year: _____
    c. *[Optional]* Total number of subarachnoid hemorrhagic stroke discharges in the most recent calendar year: _____
    d. *[Optional]* Total number of intracerebral hemorrhagic stroke discharges in the most recent calendar year: _____
    e. *[Optional] Total number of stroke (type unspecified) discharges in the most recent calendar year:* _____

B. Acute Stroke Care

1. Does your hospital have a designated acute stroke team? (*A stroke team includes at least one physician and one other health care provider such as a nurse or physician extender. The team is available 24 hours per day and can see patients within 15 minutes of being called. The physician can be a neurologist, emergency physician or another specialist, but must have experience and expertise in diagnosing and treating cerebrovascular disease*.)

    ○ Yes
    ○ No

2. Does your hospital have a written protocol or care pathway in place for the following? (*select 'yes' for all that apply*)

    a. Emergency care of ischemic strokes (including diagnostic imaging and labs)

    ○ Yes *[[IF YES, GO TO 2ai]]*
    ○ No *[[IF NO, GO TO 2b]]*

i. If yes to (2a), does it include (*select all that apply*):

- ☐ Initial stabilization
- ☐ Diagnostic imaging
- ☐ Treatment
- ☐ Labs

b. Emergency care of hemorrhagic strokes (including diagnostic imaging and labs)

- ○ Yes *[[IF YES, GO TO 2bi]]*
- ○ No *[[IF NO, GO TO 2c]]*

i. If yes to (2b), does it include (*select all that apply*):

- ☐ Initial stabilization
- ☐ Diagnostic imaging
- ☐ Treatment
- ☐ Labs

c. Alteplase (IV tPA)

- ○ Yes
- ○ No

d. Endovascular therapy

- ○ Yes
- ○ No

e. Admission orders

- ○ Yes
- ○ No

f. Dysphagia screening

- ○ Yes
- ○ No

g. Discharge planning protocols

- ○ Yes
- ○ No

h. Post-discharge follow-up care protocols

- ○ Yes

○ No

3. Does your hospital have a neuro- intensive care unit?
   ○ Yes
   ○ No

4. Does your hospital have a neurointensivist to manage care for stroke patients?
   ○ Yes
   ○ No

5. Do all stroke patients receive continuous ECG monitoring for at least 24 hours during admission?
   ○ Yes
   ○ No

6. Does your hospital have neurosurgical services on-staff?
   ○ Yes *[[IF YES, GO TO 6a]]*
   ○ No *[[IF NO, GO TO 7]]*

   a. If yes to (6), does your hospital have neurosurgical services available 24/7 (may be on-site or at a remote location)?
      ○ Always *[[IF ALWAYS, GO TO 7]]*
      ○ Sometimes *[[IF SOMETIMES, GO TO 7]]*
      ○ Never *[[IF NEVER, GO TO 6b]]*

   b. If never to (6a), does your hospital have neurosurgical services available within 2 hours of patient arrival (may be on-site or at a remote location)?
      ○ Always
      ○ Sometimes
      ○ Never

7. Does your hospital have stroke neurointerventional capabilities?
   ○ Yes
   ○ No

8. Does your hospital provide neurointerventional treatment for stroke (capability to give intra-arterial tPA or use of catheter-based neurointerventional reperfusion)?
   ○ Yes
   ○ No

C. Emergency Medical Services (EMS) Integration

1. Is there a written plan for receiving patients with suspected stroke via EMS (*This should include how the ED receives a call in advance of arrival and may include other information on assigning high priority code to ensure rapid evaluation and transport.*)?
    - ○ Yes
    - ○ No

2. Does pre-notification by EMS regarding a suspected stroke case lead to activation of the stroke team?
    - ○ Always
    - ○ Sometimes
    - ○ Never
    - ○ No pre-notification

3. Does pre-notification lead to activation of written stroke care protocols (e.g. notification to pharmacy, "clearing" of CT scanner)?
    - ○ Always
    - ○ Sometimes
    - ○ Never
    - ○ No pre-notification

4. Does your hospital enter EMS run sheets into the Coverdell in-hospital record?
    - ○ Always
    - ○ Sometimes
    - ○ Rarely
    - ○ Never

5. Do you have a formal process for data feedback to EMS agencies?
    - ○ Yes *[[IF YES, GO TO 5a and 5b]]*
    - ○ No *[[IF NO, GO TO 6]]*

    a. If yes to (5), how is the feedback provided to EMS agencies? *(select all that apply)*
    - ☐ Fax
    - ☐ Email
    - ☐ Phone
    - ☐ In-person (for example, at a meeting or during a case review)
    - ☐ Other (please specify): _____

b. If yes to (5), for what patient population is feedback provided? *(select all that apply)*
   - ☐ Patients transported by EMS with a final diagnosis of stroke with pre-notification of possible stroke
   - ☐ Patients transported by EMS with a final diagnosis of stroke without pre-notification of possible stroke
   - ☐ Possible stroke patients for whom EMS pre-notified the hospital, regardless of the final diagnosis
   - ☐ Unknown
   - ☐ Other (please specify): _____

6. Does your hospital have an EMS coordinator?
   - ○ Yes
   - ○ No

D. Transitions of Care

1. Do you utilize a transition of care summary with stroke patients during discharge? (*The National Transitions of Care Coalition (NTOCC) defines a transition of care summary as a method of communication between sending and receiving providers and patient/family/caregivers. Use of a transition of care summary has been proven to reduce readmission rates and decrease medical errors.*)
   - ○ Always
   - ○ Sometimes
   - ○ Rarely
   - ○ Never

2. Does your hospital conduct post-discharge follow-up on patients discharged to home?
   - ○ Yes *[[IF YES, GO TO 2a]]*
   - ○ No *[[IF NO, GO TO NEXT SECTION]]*

   a. If yes to (2), how long after discharge does this follow-up typically take place?
      - ○ 1-7 days
      - ○ 8-14 days
      - ○ 15-21 days
      - ○ 22-30 days
      - ○ >30 days

E. Certification and Education

1. Does your hospital have the following residency or fellowship programs?

a. Neurology
○ Yes
○ No

b. Other residency/ fellowship program
○ Yes
○ No

2. Is your hospital certified as a Joint Commission Acute Stroke Ready Hospital (JC ASRH), Joint Commission Primary Stroke Center (JC PSC), Joint Commission Comprehensive Stroke Center (JC CSC), or other similar organization such as Det Norske Veritas (DNV) or Healthcare Facilities Accreditation Program (HFAP)? *(select all that apply)*

☐ JC ASRH
☐ JC PSC
☐ DNV PSC
☐ HFAP PSC
☐ JC CSC
☐ DNV CSC

a. If your hospital is certified by any one of the organizations above, what is the year of your most recent certification? _____

3. Does your state/county/region/locality have a stroke designation program? *(select all that apply)*

☐ Yes, state stroke designation program *[[IF YES, GO TO 3a]]*
☐ Yes, county/regional/local-level stroke designation *[[IF YES, GO TO 3a]]*
☐ No, there is no state/county/regional/local-level designation program *[[IF NO, GO TO 4]]*

a. If yes to (3), is your hospital designated by that entity as a stroke center or stroke capable/ready hospital? *(select all that apply)*
☐ Stroke Center (State designation)
☐ Stroke Capable/Ready (State designation)
☐ Stroke Center (County/regional/local designation)
☐ Stroke Capable/Ready (County/regional/local designation)

b. If designated in 3a, what is the date of the most recent certification(s)?: _____

4. Does your hospital receive stroke consultation services from another hospital via telemedicine?
    - ○ Yes, only when in-house neurology is not available *[[IF YES, GO TO 4a]]*
    - ○ Yes, because we do not have in-house neurology *[[IF YES, GO TO 4a]]*
    - ○ No, we have 24/7 in-house neurology coverage *[[IF NO, GO TO 5]]*

    a. *[Optional]* If yes to (4), what mode does the telemedicine consult take place? *(select all that apply)*
        - ☐ Telephone
        - ☐ Videoconference
        - ☐ Other (please specify): _____

5. *[Optional]* Does your hospital provide community education on stroke signs and symptoms and importance of calling 911?
    - ○ Yes
    - ○ No

F. Data Abstraction

1. What process is used for case identification? *(select one best answer)*
    - ○ Prospective only
    - ○ Retrospective only
    - ○ Combination

2. Who is responsible for data abstraction? *(select all that apply)*
    - ☐ Physician
    - ☐ Stroke nursing staff/stroke team member
    - ☐ Medical records staff
    - ☐ QI department staff
    - ☐ Other (e.g. outsourced, other staff)

3. What process is used for data abstraction? *(select one best answer)*
    - ○ Mostly or completely concurrent with care
    - ○ Mostly or completely retrospective
    - ○ Roughly equal-- data collected concurrent with care and retrospective

4. Does your hospital sample cases to abstract for data that is submitted to Coverdell?
    - ○ Yes *[[IF YES, GO TO 4a]]*
    - ○ No *[[IF NO, GO TO 5]]*

    a. If yes to (4), please briefly describe your sampling method (e.g. following The Joint Commission's requirements), including the percentage of cases that are sampled.

_____
_____

5. What electronic health record system does your hospital use for stroke cases?
    - ○ Allscripts
    - ○ Centricity
    - ○ Cerner
    - ○ Computer Programs and Systems Inc (CPSI)
    - ○ eClinicalWorks
    - ○ Epic Systems
    - ○ McKesson
    - ○ Meditech
    - ○ NextGen Healthcare
    - ○ Other (please specify): _____

G. Data Use

1. Who receives data reports on your stroke quality of care? *(select all that apply)*
    - ☐ Hospital CEO/ upper management
    - ☐ Hospital Board
    - ☐ Chief Nursing Officer (CNO)
    - ☐ Stroke Team
    - ☐ Physician Stroke Champion
    - ☐ Chief of Medicine
    - ☐ Other (please specify): _____

2. How many systematic quality improvement interventions were implemented by hospital staff as a result of quality of care data reports? *Please briefly describe each one (e.g. if there was one that was particularly successful, and if it addressed a specific problem).*
   Number: _____

   Description:
   _____
   _____
   _____

3. *[Optional]* In the most recent calendar year, have you run additional analyses (beyond what was required for reporting) on your hospital's own stroke data?
    - ○ Yes *[[IF YES, GO TO 4]]*
    - ○ No *[[IF NO, GO TO 5]]*

4. *[Optional]* If yes to (3),
    a. In the most recent calendar year, how frequently have you run and used the analyses generated? *(select one best answer)*
        ○ Weekly
        ○ Monthly
        ○ Less than monthly but more than 1-2 times
        ○ 1-2 times

    b. In the most recent calendar year, what reports did you run? *(select all that apply)*
        ☐ Pre-programmed/automated reports in the data collection tool (e.g. GWTG)
        ☐ Additional reports beyond pre-programmed reports from the tool

    c. How do you use these analyses/ reports?
        ☐ Inform quality improvement (QI) efforts and/or plan "action items"
            If yes, what action items / QI efforts did you plan as a result of these reports? _____
        ☐ Report to management/administration on our progress
        ☐ Other (please describe): _____

5. *[Optional]* If no to (3),
    a. What is the main reason you do not run your own additional analyses? *(select one best answer)*
        ○ Not sure how to run analyses
        ○ Not sure what analyses are needed/would be helpful
        ○ Lack of time
        ○ Lack of interest from the stroke care team
        ○ All of the analyses we need are provided by the state
        ○ Other: _____

6. *[Optional]* In this past year, approximately how many presentations (either using state-provided reports or data reports you have run internally) were made?
        ○ None
        ○ 1
        ○ 2-4
        ○ 5-12
        ○ More than 12

    a. What were the topics of the presentations?
        _____

b. To whom were presentations made (including abstracts presented at meetings)? *(select all that apply)*

☐ Stroke Team
☐ Grand Rounds
☐ CEO, CNO, Upper Management
☐ Hospital Board
☐ Local, State, or Regional Stroke Meeting or Quality Improvement Meeting
☐ National or International Stroke Meeting or Quality Improvement Meeting

7. *[Optional]* Are data presentations a standing agenda item during your "Stroke Team Meetings"?

○ Yes
○ No

8. *[Optional]* What other data or information do you need (that current data reports/queries are not providing) in order to help you plan QI efforts at your hospital?

_____

H. Quality Improvement (QI) Participation

1. Did you participate in any QI activities (e.g. QI training, networking meetings, learning collaboratives) offered through the State health department Coverdell program?

○ Yes *[[IF YES, GO TO 1a]]*
○ No *[[IF NO, GO TO NEXT SECTION]]*

a. If yes to (1), how many? _____

I. Hospital Retention

1. What reasons or incentives are most important in your hospital's decision to participate in (if new) or continue to participate in the Coverdell Stroke Registry? *(select the three most important reasons)*

☐ Opportunities for professional development/learning (conference calls, journal articles, etc)
☐ Opportunities for networking/information sharing with other hospitals
☐ Desire/Need to enhance the quality of stroke care we provide
☐ Financial incentive / opportunity to compete for additional funds
☐ Allows/facilitates my hospital becoming/maintaining Stroke Center designation
☐ Access to and/or training on the GWTG tool
☐ Request/interest from upper management/administration

☐ Opportunity to benchmark my hospital against others in the state
☐ Hospital recognition
☐ Other: _____

J. Contact Information

(This information is not forwarded beyond the State Health Department staff, is not entered into any database, and will only be used to contact you if we have questions about your inventory.)

Name: _____
Position / Title: _____
Phone: _____
Email: _____
What is the best way to reach you?

○ Phone
○ Email

If by phone, when are the best days and times to reach you?

_____

Optional Modules *These following modules are not required to be forwarded to CDC. States may elect to collect this information and can modify the questions to suit their program's needs*

K. *[Optional]* Data Reports

1. To what extent are data reports provided by the state:
    a. Understandable?
        ○ Very
        ○ Somewhat
        ○ Not at all

    b. Useful?
        ○ Very
        ○ Somewhat
        ○ Not at all

    c. Applicable / Relevant to the needs of your hospital?
        ○ Very
        ○ Somewhat
        ○ Not at all

    d. Timely/Provided at the right time interval?
        ○ Very
        ○ Somewhat
        ○ Not at all

2. What could be done to make the reports more useful for your hospital? *(select all that apply)*
    ☐ Provide in a different format (specify format): _____
    ☐ Contain additional analyses (specify the analyses):_____
    ☐ Be provided more frequently (specify how frequently): _____
    ☐ Be provided less frequently (specify how frequently): _____
    ☐ Other: _____

3. What additional reports would you like to receive from the State that you do not already have or receive?

    _____

L. *[Optional]* Quality Improvement

1. Has your stroke team implemented structured quality improvement strategies (e.g. PDSA (Plan-Do-Study-Act) cycles, small tests of change, lean, six-sigma) to improve quality of care in the most recent calendaryear?
   - ○ Yes *[[IF YES, GO TO 1a]]*
   - ○ No *[[IF NO, GO TO 2]]*

   a. If yes to (1),
   - i. Describe the problem(s) addressed _____
   - ii. Briefly describe results _____
   - iii. Was this a helpful way to address the problem?
     - ○ Yes
     - ○ No
   - iv. Why or why not? _____
   - v. What challenges did you encounter? _____
     _____

2. Has your stroke team used other types of quality improvement methods other than PDSA?
   - ○ Yes *[[IF YES, GO TO 2a]]*
   - ○ No *[[IF NO, GO TO 3]]*

   a. If yes to (2), please name or describe:
   _____

3. As a result of participating in the registry the most recent calendar year, what policy or system changes has your hospital implemented?
   _____

   a. Of those that were implemented, how many (or which) have been maintained?
   _____

   b. Have you assessed the impact of any of these changes, for example, by examining changes in data/performance measures?
   - ○ Yes
   - ○ No

4. To what extent do you have buy-in from upper management (i.e. hospital CEO/board/upper management) to implement stroke QI initiatives? *(select one best answer)*
    - ○ A great deal of support
    - ○ A fair amount of support
    - ○ Little support
    - ○ No support

5. Do you have other QI initiatives that are not directly related to stroke care at your hospital?
    - ○ Yes *[[IF YES, GO TO 6a-6c]]*
    - ○ No *[[IF NO, GO TO NEXT SECTION]]*

    a. If yes to (6), are your stroke QI initiatives integrated with other QI initiatives in your hospital?
        - ○ Yes
        - ○ No

    b. If yes to (6), compared to other QI initiatives, how important/prioritized are QI initiatives around stroke?
        - ○ Much more important
        - ○ A little more important
        - ○ Equally important
        - ○ A little less important
        - ○ A lot less important

    c. If yes to (6), how do you think other hospital QI initiatives affect your stroke QI initiatives?
        - ○ Complement
        - ○ Hinder
        - ○ Do not affect

M. *[Optional]* QI trainings

1. To what extent was the QI support offered by the State (e.g. in person training, conference calls/webinars, individual TA for your hospital)
    a. Understandable?
        - ○ Very
        - ○ Somewhat
        - ○ Not at all

    b. Applicable / Relevant to the needs of your hospital?
        - ○ Very
        - ○ Somewhat
        - ○ Not at all

c. Provided at the right time interval?
   - ○ Very
   - ○ Somewhat
   - ○ Not at all

d. Additional comments
   _____

2. What topics or areas would you like to receive future training on? _____
   _____

3. What mediums (e.g., PowerPoint slides, videos, conference calls, face-to-face meetings) do you find most effective to receive trainings? _____
   _____

4. How could the QI support offered by the State be more beneficial? *(check all that apply)*
   - ☐ Contain additional topics (specify topics):_____
   - ☐ Be more tailored to my hospital's specific needs (specify needs):
     _____
   - ☐ Be provided more frequently (specify how often): _____
   - ☐ Be provided less frequently (specify how often): _____
   - ☐ Provide in a different format (specify format): _____
   - ☐ Other: _____

N. *[Optional]* EMS Interaction

1. To what extent has the interaction between the ED and EMS service providers changed during the past calendar year, compared to the prior calendar year, with respect to the following:

   a. Communication
      - ○ Substantial improvement
      - ○ Minimal improvements
      - ○ No improvement
      - ○ Minimal decline
      - ○ Substantial decline

   b. Data exchange
      - ○ Substantial improvement
      - ○ Minimal improvements
      - ○ No improvement
      - ○ Minimal decline
      - ○ Substantial decline

R. CDC Guidance for CDC-DP15-1514 Grantee State-specific Evaluation Plan

Purpose of document.
To clarify the expectations for the required grantee state-specific evaluation plans (draft plan due January 1, 2016). To meet evaluation requirements stated in the FOA, grantees will also report on standardized process and outcome performance measures and participate in a cross-site national evaluation (if funded); please refer to other current and future guidance for those requirements.

Guidelines for the state-specific evaluation plan.
 CDC encourages programs to use the *Coverdell State-specific Evaluation Plan Template (*accompanying document) or a similar template that addresses all content areas (i.e. evaluation overview, context, stakeholders, design, indicators, data source, dissemination, etc).

 The evaluation plan should describe your overall evaluation goals and objectives for the five years of the cooperative agreement, and provide details of the evaluation focus and data collection activities for program year 2 (June 30, 2016 – June 29, 2017).

 Programs are encouraged to submit a logic model or conceptual model with the evaluation plan, illustrating the activities and outcomes the program will achieve through this cooperative agreement.

 When designing and focusing your evaluation, give consideration to 1) the particular setting, 2) the key program activities, and 3) the stage of program implementation. Based on your resources, select the components and activities to focus your evaluation and the type of evaluation approach most suited to the stage of the program. (See Figure 1.)

Figure 1. Factors to consider when designing scope of state-specific evaluation plan.

Why evaluate?

Tell your story. Conducting an evaluation will help gather the information needed to tell the story of your program's implementation and highlight your success in achieving the desired outcomes.

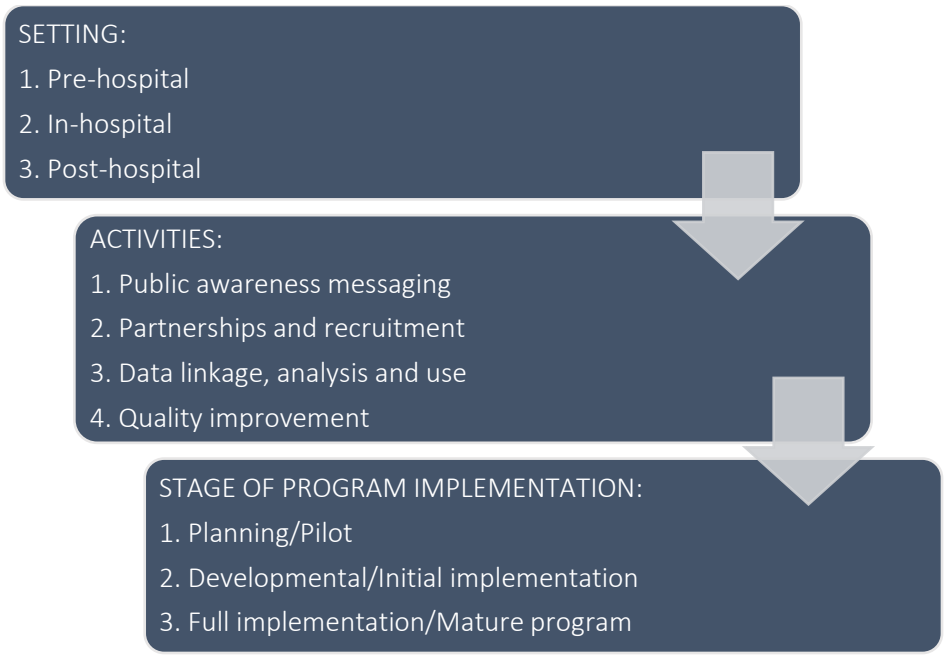
Program improvement. Evaluation results may be used to make decisions about what parts of your program need to be adjusted, as well as identify any gaps or unmet needs.

Accountability. Funds are limited, and funders are more likely to continue funding if a program demonstrates the impact achieved with the funding provided.

Funding requirements. Page 8 of the FOA describes three levels of evaluation that grantees are required to engage in:

- Develop and implement a state-specific evaluation plan.
- Report on CDC process and outcome performance measures.
- Participate in a cross-site national evaluation (if funded).

Data source for national evaluation. If a cross-site national evaluation is funded by CDC, the state-specific evaluation plans will serve as a potential data source to help



Process for finalizing state-specific evaluation plans.
CDC will review the draft state-specific evaluation plans and compile a list of the programmatic activities selected for evaluation and the proposed evaluation questions across all grantees. At the Coverdell Grantee Workshop in March 2016 there will be a forum for CDC evaluators and grantees to develop a menu of suggested evaluation questions for all programs to select from and incorporate into their final evaluation plans; resulting in some common areas of exploration, measurement and assessment across multiple programs.

Timeline.
The following are key dates for the submission of your evaluation plans and findings. (Note: Some dates may have changed since previous guidance):

- Draft evaluation plan submission – January 1, 2016
- Grantee Workshop; collaboratively refine evaluation focus areas – March 9-10, 2016
- Final evaluation plan submission – June 29, 2016 (last day of program year 1)
- Evaluation Report submission dates:
  - Year 2 evaluation results – September 30, 2017 reporting
  - Year 3 evaluation results – September 30, 2018 reporting
  - Year 4 evaluation results – September 30, 2019 reporting
  - Year 5 and final evaluation findings report – September 30, 2020 reporting

For questions or assistance with completing the evaluation plan please contact your CDC evaluation TA provider (Joanna – jelmi@cdc.gov, Kincaid – klowe@cdc.gov).

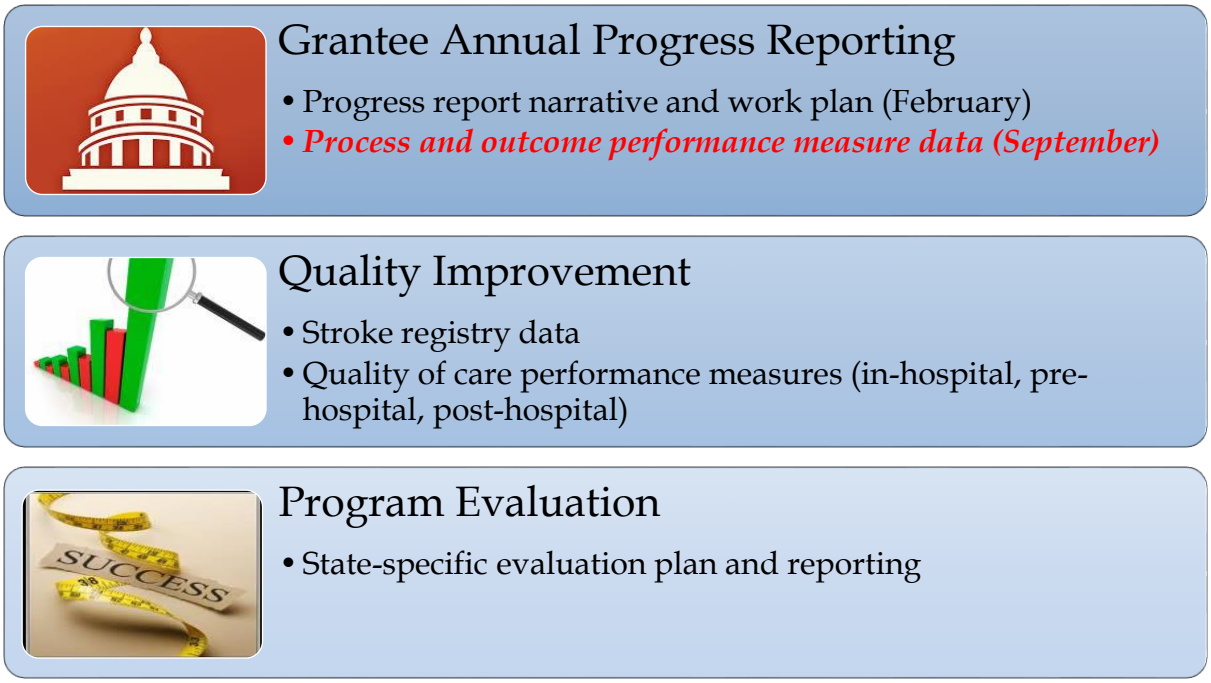
S. Process and Outcome Performance Measures Guidance – Version 2.1

Introduction

During the 2015-2020 funding cycle, the CDC-funded Paul Coverdell National Acute Stroke Program (PCNASP) grantees will implement programmatic activities that address stroke prevention and care across the stroke system of care continuum. For the first time and as part of the cooperative agreement, grantees are required to report on process and outcome performance measures annually to demonstrate their progress towards program outcomes and for continuous program improvement.

Figure 1 describes three main activities for which grantees are collecting and reporting data: annual performance reporting, quality improvement, and program evaluation. Each of these activities has a unique purpose; however, it is likely that there will be some overlap and use of data to satisfy multiple purposes. The process and outcome performance measures are part of the grantee annual reporting requirement for recipients of CDC funds. These measures are aligned with the program activities and short and intermediate outcomes outlined in the PCNASP logic model (Appendix C). The process and outcome performance measures are standardized quantitative information that all PCNASP grantees are asked to report to CDC, in order for CDC to monitor program implementation across all grantees.

Figure 1. Three Types of Grantee Reporting for PCNASP DP15-1514 (2015-2020)



Purpose of the Document

The purpose of this Process and Outcome Performance Measures Guidance Document is to provide clarification for grantees on the reporting requirements for key PCNASP process and outcome performance measures. The Guidance Document identifies the core measures for grantee reporting from the initial list of measures listed in the FOA (FOA pages 8-11), describes the reporting timeline, operationalizes key process and outcome performance measures, and offers tips on reporting baseline data and setting target values.

Reporting Requirements

The process and outcome performance measures for PCNASP standardize the assessment of program activities (e.g., public awareness, data linkages, and stroke systems of care) and outcomes across state programs. All the process and outcome performance measures described in the FOA are important for monitoring program performance at the national level. As part of annual reporting to CDC, grantees are only required to report on core process and outcome performance measures quantitatively (Box 1) and qualitatively (Box 2). The remaining measures will be reported by CDC on behalf of the grantees. Grantees will complete the Excel *Process and Outcome Performance Measure Reporting Table* each year with actual performance measure data, target values, and data sources.

Reporting Timeline

Grantees will report baseline data, Year 2 and Year 5 target values for the 29 core process and outcome performance measures to CDC on February 29, 2016. On September 29, 2016, grantees will report the first round of actual performance data for program year 1. Annual performance measure data reporting will continue to be on September 29th every year for the remainder of the cooperative agreement. This is the same reporting date as the state-specific evaluation plan and findings. Additional reporting dates for other cooperative agreement evaluation requirements can be found in the *PCNASP Resource Guide*.

February 29, 2016 – In the CDC-provided Excel *Process and Outcome Performance Measure Reporting Table*, grantees report baselines and set targets for all core process and outcome performance measures. For the 17 grantee-reported quantitative measures, grantees will report baseline data, and set targets for Program Years 2 and 5. For the 12 grantee-reported qualitative measures, grantees will report a baseline narrative, and set program targets for Program Years 2 and 5.

September 29, 2016 – Grantees provide annual data for Program Year 1 and submit updates to baseline data and Program Year 2 and Year 5 targets (if needed).

September 29 (annually) – Report data for core quantitative and qualitative process and outcome performance measures until the end of the cooperative agreement.

Table 1. Timeline for Process and Outcome Performance Measures Reporting By Grantees

Reporting Requirements for Core Measures	Date					
	2/29/16	9/29/16	9/29/17	9/29/18	9/29/19	9/29/20
Report baseline data	■					
Set targets for Program Years 2 and 5	■					
Revise baseline data (if needed)		■				
Set or revise targets for following Program Year		■	■	■	■	
Report annual data		■	■	■	■	■

PCNASP Process and Outcome Performance Measures

The four boxes below describe the reporting responsibility and method for each process and outcome performance measure listed in the PCNASP FOA. In summary, of the 50 measures listed in the FOA: 1) seventeen measures will be reported in a table format by the grantee quantitatively as a number, percent or proportion; 2) twelve measures will be reported by the grantee qualitatively in a narrative; 3) eighteen quantitative measures will be reported by CDC on behalf of the grantees; and 4) five measures are optional.

Box 1. Measures that are reported quantitatively by grantees

Process and Outcome Performance Measures: 1, 2, 3, 4, 13, 14, 15, 20, 21, 22, 23, 24, 27, 28, 29, 30, 39
1. #/(types) of activities that promote public awareness on signs and symptoms and appropriate emergency response
2. #/(types) of partnerships between state Coverdell program and other stroke-related entities
3. # of local or regional EMS agencies recruited to participate in state Coverdell activities
4. # of hospitals recruited to participate in state Coverdell activities (in- and post-hospital care) (4a, b)
13. #/type of stroke QI efforts implemented by state Coverdell program for EMS & hospital staff (13a, b, c)
14. % of EMS agencies that have participated in stroke QI efforts implemented by state Coverdell program
15. % of hospitals that have participated in stroke QI efforts implemented by state Coverdell program
20. % of state acute stroke admissions in participating hospitals
21. % of state acute stroke patients transported by EMS agencies participating in state Coverdell program
22. Proportion of EMS agencies that have data linked to in-hospital data
23. (%) # of EMS run sheets entered into in-hospital data collection tool
24. % concordance between original abstractor and re-abstractor for each specified data element
27. # and type of trainings provided to EMS and to hospital stroke professionals
28. Proportion of EMS and hospital stroke professionals with improved scores in pre and post tests administered during training events
29. % of hospitals that implemented changes in stroke care practices (29a: post-hospital measure)
30. % of EMS agencies that implemented changes in stroke care practices
39. % of EMS-hospital teams reporting use of feedback from hospital to EMS

Box 2. Measures that are reported qualitatively by grantees as a narrative

Process and Outcome Performance Measures: 1, 2, 5, 6, 7, 8, 9, 10, 11, 12, 16, 17	
1.	(# and) types of activities that promote public awareness on signs and symptoms and appropriate emergency response
2.	#/(types) of partnerships between state Coverdell program and other stroke-related entities
5, 6, 7.	% of EMS agencies/hospitals that submit data (including 30-day post discharge data) to an integrated data management system for the purposes of the Coverdell program's data-driven QI activities and performance monitoring for potential acute stroke patients *(instead of reporting percent, please describe the integrated data management system and strategy)*
8.	Submission of annual chart re-abstraction results according to CDC guidelines
9.	(# of) and types of reports created using quality of care data from EMS and hospitals
10.	(# and) type of systematic QI methods/interventions implemented by EMS agencies as a result of quality of care data reports
11.	(# and) types of systematic QI methods/interventions implemented by hospital staff as a result of quality of care data reports
12.	(# and) type of systematic QI methods/interventions implemented by hospital staff as a result of quality of care data reports to improve transition of care from hospital to home
16,17.	Sustainability plan submitted to CDC by end of Year 3. Revisions/updates to sustainability plan in years 4 & 5 as necessary

Box 3. Measures that are reported by CDC on behalf of grantees

Process and Outcome Performance Measures: 18, 19, 25, 26, 35, 37, 38, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50
The reporting responsibility for the measures enumerated here is shifted to CDC. Grantees already report sufficient data through existing mechanisms that CDC will be able to report these essential measures and reduce grantee reporting burden.

Box 4. Measures that are optional for reporting

Process and Outcome Performance Measures: 31, 32, 33, 34, 36
While these measures are not required for reporting, grantees are encouraged to include them in state level evaluation plans where appropriate and feasible.

Operationalized Core Process and Outcome Performance Measures

The following profile tables provide details on how CDC operationalized each of the 17 core grantee-reported performance measures. Each profile provides the purpose of the measure,

unit of analysis, intended/targeted population, guidance on calculating the measure, potential data sources[1], and additional notes that are important and relevant to the measure. Additional description and clarity regarding the 12 core qualitative measures follow the profile tables.

Profiles for Performance Measures Reported Quantitatively by Grantee

Public Awareness	
1. #/(types) of activities that promote public awareness on signs and symptoms and appropriate emergency response	
Purpose of Performance Measure	• The purpose of this performance measure is to assess the intensity and extent of the PCNASP state-wide efforts to promote public messaging in order to increase awareness of the signs and symptoms of stroke and the appropriate emergency response. Ultimately, greater public awareness of signs of stroke may improve time to treatment.
Unit of Analysis	• Category of public awareness activity (billboards, TV or radio PSAs, flyers, print/web ads, book marks, community outreach events, etc)
Intended/Targeted Population	• State population
Calculation	• Count of the unique type or mode used to promote public awareness of signs and symptoms of stroke supported by the PCNASP grantee. • For example: purchasing of billboard signs=1, sponsoring PSAs on TV=1, flyers=1. The total count reported for this measure would be 3. • Inclusion: PCNASP grantee must support the activity with grant funds or in-kind contributions.
Frequency of Data Collection	• Annually
Potential Data Sources	• Program records • Finance or purchasing records • Hospital community outreach survey
Notes	• The unit of analysis for this measure does not capture or convey all the nuances of all the activities undertaken by the grantee to promote public awareness of the signs and symptoms of stroke. Please provide additional detail in the sub-rows in the performance measures reporting template for activities that are a focus area for your program. For example, if a significant effort is to sponsor multiple billboards, one sub-row should be

[1] The profiles may not serve as a comprehensive list of all possible data sources. Over time, and as the Coverdell program becomes more established, additional data sources may be identified.

	used to track all billboard signs. Use the Measure Notes cell to provide further detail or clarification. • Multiple materials (i.e., magenets and flyers) that are a part of a single messaging packet, pacakage, or kit should be counted as 1. • Patient and caregiver education should not be counted in this measure. Patient and caregiver education is reported in performance measure #35 (reported by CDC on behalf of the grantee) and should be collected in post-discharge tools. • Use the fourth tab in the Excel *Process and Outcome Performance Measure Reporting Table* to provide descriptive information on the "types" of activities. (Also see the section on qualitative reporting in this document.) • The state-specific evaluations may provide an opportunity to evaluate the population reach and effectiveness of the messaging.

Partnerships	
2. #/(types) of partnerships between state Coverdell Program and other stroke-related entities	
Purpose of Performance Measure	• The purpose of this performance measure is to assess the strength and reach of the PCNASP state-wide partnerships with other organizations that promote stroke systems of care, and stroke prevention and treatment for patients. This measure will help capture the partnerships in place that PCNASP grantees leverage to advance progress towards achieving goals and objectives of the program.
Unit of Analysis	• Organization-level
Intended/Targeted Population	• Stroke prevention and treatment organizations; Organizations that promote stroke quality of care
Calculation	• Count of the unique number of organizations that have a formal/informal relationship with the PCNASP grantee to advance progress towards achieving objectives of the PCNASP. • For example: state quality improvement organization=1, state university research group=1, health department quality of care division=1. The total count reported for this measure would be 3. Notes: • For this measure, CDC is interested in the number of organizations (or perspectives) involved in the PCNASP work, not the number of individuals. • Do not include the number of individual hospitals or individual EMS agencies recruited into PCNASP in this measure. These data are reported with measures 3 and 4. • If reporting on coalitions, steering committees, and/or task forces, report the number of unique organizations involved in these groups, do not count the group of organizations as one partnership.
Frequency of Data Collection	• Annually
Potential Data Sources	• Program records • Letters of support • Memorandums of agreement/understanding • Contractual agreements • Committee meeting rosters/attendance records
Notes	• Grantees may wish to use the additional sub-rows in the performance measures reporting template to capture specific partnerships. For example, tracking partners within a specific group, such as the state stroke task force. Or use the rows to

	track partners by setting (pre-hospital, in-hospital, post-hospital). • For many grantees, partnerships with EMS are multi-level. State-level and regional EMS partners that are policy and decision makers may be counted in the parnterships for this measure. Grantees may report the regional or centralized EMS programs or authorities that partner with the state program in this measure. Local EMS agencies that are delivering transport services, patient care, and are participating in data collection and quality improvement should be counted in performance measure #3. • Use the fourth tab in the Excel *Process and Outcome Performance Measure Reporting Table* to provide descriptive information on the "types" of partnerships. (Also see the section on qualitative reporting in this document.) • The state-specific evaluations may provide an opportunity to evaluate the actual participation/level of engagement and effectiveness of the partnerships.

Recruitment	
3. # of local or regional EMS agencies recruited to participate in state Coverdell activities	
Purpose of Performance Measure	• The purpose of this performance measure is to assess the reach of the PCNASP state-wide recruitment efforts to engage EMS agencies in program activities to improve pre-hospital stroke care and transitions of care from EMS to hospitals. This measure will help capture EMS agency participation in PCNASP and provide insight into EMS agency structure at the state level.
Unit of Analysis	• Organization-level (i.e., EMS agency-level)
Intended/Targeted Population	• Coverdell-participating EMS agencies within a PCNASP funded state
Calculation	• Count of the unique number of EMS agencies that have a formal relationship with the PCNASP grantee to advance progress towards achieving objectives of the PCNASP. • For example: States with a centralized EMS system may only have one agency partnership (e.g., centralized state run EMS agency=1), whereas other states with decentralized systems may have 50 independently run EMS agencies (e.g., decentralized state EMS agencies=50). Notes: • For this measure, CDC is interested in the number of organizations (or perspectives) involved in the PCNASP work, not the number of individuals representing EMS agencies.

	• This measure is distinct from measure #2. The number of EMS agencies that are influenced or reached by a cenetralized EMS program may be reported for this measure.
Frequency of Data Collection	• Annually
Potential Data Sources	• Program records • Letters of support • Memorandums of agreement/understanding • Contractual agreements • Data Use Agreements • Committee meeting rosters/attendance records
Notes	• Grantees may wish to use the additional sub-rows in the performance measures reporting template to document EMS entities within a regional or centralized EMS program. For example, some states with regional or centralized EMS programs may want to enumerate the EMS agencies under its authority to to provide more detail on recruitment efforts. • A state may have an EMS system with multiple regional EMS authorities. Rather than report "1" for recruitment of the local authority, the grantee should report the number of EMS agencies within the local EMS system that are Coverdell participating agencies. • The state-specific evaluations may provide an opportunity to evaluate the actual participation/level of engagement and reach of EMS agency recruitment and partnership. • The CDC is interested in understanding the organizational reach of participating EMS agencies in the state. If the data are available, grantees may choose to voluntarily share the percent of EMS agencies recruited to participate in state Coverdell activities (the denominator would be the total number of EMS agencies in the state). This percent can be shared in the measurement notes field for this measure in the Excel reporting table.

Recruitment	
4a. # of hospitals recruited to participate in state Coverdell activities (in-hospital care)	
Purpose of Performance Measure	• The purpose of this performance measure is to assess the reach of the PCNASP state-wide recruitment efforts to engage hospitals in program activities to improve stroke care in hospitals. This measure will help capture hospital participation in PCNASP and provide insight into number of stroke patients reached by PCNASP hospital programs.
Unit of Analysis	• Organization-level (i.e., hospital-level)

Intended/Targeted Population	• Coverdell-participating hospitals within a PCNASP funded state
Calculation	• Count of the unique number of hospitals that have a formal relationship with the state Coverdell program. • For example: If a grantee recruits 5 independently operating hospitals for participation and partnership in PCNASP, the count for this measure will be 5. If a grantee recruits 2 hospitals and 1 health system that has 4 hospital entities, the count for this measure will be 6.
Frequency of Data Collection	• Annually
Potential Data Sources	• Program records • Letters of support • Memorandums of agreement/understanding • Contractual agreements • Data Use Agreements • Committee meeting rosters/attendance records
Notes	• The state-specific evaluations may provide an opportunity to evaluate the actual participation/level of engagement and reach of hospital recruitment and partnership. • Reference measure 4b to capture the # of hospitals recruited to participate in state Coverdell post-hospital care activities.

Recruitment	
4b. # of hospitals recruited to participate in state Coverdell activities (post-hospital care)	
Purpose of Performance Measure	• The purpose of this performance measure is to assess the reach of the PCNASP state-wide recruitment efforts to engage hospitals or integrated healthcare systems (e.g. accountable care orgs, integrated in-patient/out-patient healthcare systems) in program activities to support the improvement of early post-discharge transition from hospital to home. Participation will include collecting post-hospital data for 30-day follow-up in order to improve transition of care.
Unit of Analysis	• Organization-level (i.e., hospital-level)
Intended/Targeted Population	• Coverdell-participating hospitals within a PCNASP funded state collecting 30-day follow-up data
Calculation	• Count of the unique number of hospitals that have a formal relationship with the state Coverdell program and collect 30-day follow-up data. • For example: If a grantee recruits 5 independently operating hospitals for participation and partnership in PCNASP post-hospital efforts, the count for this measure will be 5. If a grantee recruits 2 hospitals and 1 health system that has 4 hospital entities, the count for this measure will be 6.

Frequency of Data Collection	• Annually
Potential Data Sources	• Program records • Letters of support • Memorandums of agreement/understanding • Contractual agreements • Data Use Agreements • Committee meeting rosters/attendance records
Notes	• Measure 4b is intended to capture the number of hospitals that the Coverdell-funded health department is working with to improve early post-hospital discharge care. CDC interprets this definition of participating hospitals in post-hospital care broadly and, at this time, can include hospitals that do not yet have the capacity to report 30-day follow up data but are still conducting QI work to improve processes such as improving scheduling of follow-up appointments, etc. CDC asks that the grantee document how many hospitals are only doing QI with no data collection, and those that are also collecting post hospital data in the measurement notes. • The FOA requires grantees to recruit at least 3 hospitals or integrated healthcare systems by Year 2. • The state-specific evaluations may provide an opportunity to evaluate the actual participation/level of engagement and reach of hospital recruitment and partnership. • Reference measure 4a to capture the # of hospitals recruited to participate in state Coverdell in-hospital care activities.

Quality Improvement	
13a. # and type of stroke QI efforts implemented by state Coverdell program for EMS staff	
Purpose of Performance Measure	• The purpose of this performance measure is to assess the intensity of implementation and the focus areas of stroke QI efforts for EMS settings. CDC wishes to know the count of each QI activity implemented by PCNASP funded grantees and the topic or outcome of focus (i.e. destination protocols, door to needle time, etc) of the activity.
Unit of Analysis	• Stroke quality improvement activities
Intended/Targeted Population	• Coverdell-participating EMS agencies within a PCNASP funded state
Calculation	• Count of the total number of distinct stroke QI efforts (across all QI activity types) by the state Coverdell program for EMS agencies. • For example: in-person workshops=5, webinars=4, awards program=1. The total count reported for this measure would be 10. Notes: • CDC requests that grantees use the additional sub-rows in the performance measures reporting template to report the specific types of stroke QI efforts. For each sub-row, enter the objective the QI activity addressed (e.g., pre-notification) and note the modalities in which these activities were delivered (e.g., webinar, in person) in the Measure Notes cell.
Frequency of Data Collection	• Annually
Potential Data Sources	• Program records (training event agendas, webinar dates, site visit logs, workshop and conference call schedules) • Work plan • QI plan • QI event tracking forms
Notes	• This performance measure will be used in conjunction with CDC cost tools to estimate costs associated with various QI efforts. Therefore, the additional data regarding types of QI efforts in addition to the overall count is useful. • Some grantees may establish partnerships with or fund EMS regional programs that agree to provide QI-related trainings to EMS agencies. Coverdell grantees may report the total number of QI trainings supported by the Coverdell program along with all other QI efforts. For example, a Coverdell-funded state health department may offer 4 QI workshops per year and sponsor an EMS regional partner grant program. If the EMS

	regional partners deliver a total of 10 trainings a year through the grant program, the health department may report a total of 14 QI activities for this measure. Coverdell grantees may utilize the sub-rows in the reporting table to distinguish these grant-supported QI trainings.

Quality Improvement	
13b. # and type of stroke QI efforts implemented by state Coverdell program for hospital staff	
Purpose of Performance Measure	• The purpose of this performance measure is to assess the intensity of implementation and the focus areas of stroke QI efforts in hospital settings. CDC wishes to know the count of each QI activity implemented by PCNASP funded grantees and the topic or outcome of focus (i.e. defect free care, etc) of the activity.
Unit of Analysis	• Stroke quality improvement activities
Intended/Targeted Population	• Coverdell-participating hospitals within a PCNASP funded state
Calculation	• Count of the total number of distinct stroke QI efforts (across all QI activity types) by the state Coverdell program for hospital settings. • For example: in-person workshops=5, webinars=4, awards program=1. The total count reported for this measure would be 10. Notes: • CDC requests that grantees use the additional sub-rows in the performance measures reporting template to report the specific types of stroke QI efforts. For each sub-row, enter the objective the QI activity addressed (e.g., protocol development) and note the modalities in which these activities were delivered (e.g., webinar, in person) in the Measure Notes cell.
Frequency of Data Collection	• Annually
Potential Data Sources	• Program records (training event agendas, webinar dates, site visit logs, workshop and conference call schedules) • Work plan • QI plan • QI event tracking forms
Notes	• This performance measure will be used in conjunction with CDC cost tools to estimate costs associated with various QI efforts. Therefore, the additional data regarding types of QI efforts in addition to the overall count is needed. • Hospital site visits may be an important QI strategy for grantee programs. Grantees may include hospital site visits in the count of QI activities delivered. Grantees may count each hospital site visit in this measure where the focus of the site visit is to support a hospitals' quality and delivery of stroke care in the hospital setting. Site visits that are exclusively for non-QI related purposes (i.e, site visit to recruit participation or establish a partnership) should not be counted in this measure.

Quality Improvement	
13c. # and type of stroke QI efforts implemented by state Coverdell program for discharge hospital staff	
Purpose of Performance Measure	• The purpose of this performance measure is to assess the intensity of implementation and focus areas of stroke QI efforts for hospital settings working to improve post-discharge transitions from hospital to home. CDC wishes to know the count of each QI activity implemented by PCNASP funded grantees and the topic or outcome of focus (i.e. schedule appointments, etc) of the activity.
Unit of Analysis	• Stroke quality improvement activities
Intended/Targeted Population	• Coverdell-participating hospitals within a PCNASP funded state
Calculation	• Count of the total number of distinct stroke QI efforts (across all QI activity types) by the state Coverdell program for hospitals reporting 30-day follow-up data. • For example: in-person workshops=5 and webinars=4. The total count reported for this measure would be 9. Notes: • CDC requests that grantees use the additional sub-rows in the performance measures reporting template to report the specific types of stroke QI efforts. For each sub-row, enter the objective the QI activity addressed (e.g., follow-up appointment scheduling) and note the modalities in which these activities were delivered (e.g., webinar, in person) in the Measure Notes cell.
Frequency of Data Collection	• Annually
Potential Data Sources	• Program records (training event agendas, webinar dates, site visit logs, workshop and conference call schedules) • Work plan • QI plan • QI event tracking forms
Notes	• This performance measure will be used in conjunction with CDC cost tools to estimate costs associated with various QI efforts. Therefore, the additional data regarding types of QI efforts in addition to the overall count is needed.

Quality Improvement	
14. % of EMS agencies that have participated in stroke QI efforts implemented by the state Coverdell program	
Purpose of Performance Measure	• The purpose of this performance measure is to assess the extent to which Coverdell-participating EMS agencies participated in Coverdell-supported stroke QI efforts. EMS participation in stroke QI efforts provides insight into the reach of Coverdell activities and the potential number of patients reached by QI efforts in the EMS setting.
Unit of Analysis	• Organization-level (i.e., EMS agency)
Intended/Targeted Population	• Coverdell-participating EMS agencies within a PCNASP funded state
Calculation	• Numerator: Count of the number of EMS agencies that participate in at least one stroke QI effort implemented by the state Coverdell program in the program year. • Denominator: Total number of Coverdell-participating EMS agencies in the state.
Frequency of Data Collection	• Annually
Potential Data Sources	• EMS inventory survey • EMS PDSA action plan • EMS QI tracking database • Meeting rosters/attendance logs
Notes	• The denominator for this measure should be consistent with the number of EMS agencies reported in performance measure #3.

Quality Improvement	
15. % of hospitals that have participated in stroke QI efforts implemented by the state Coverdell program	
Purpose of Performance Measure	• The purpose of this performance measure is to assess the extent to which Coverdell-participating hospitals participated in Coverdell-supported stroke QI efforts. Hospital participation in stroke QI efforts provides insight into the reach of Coverdell activities and the potential number of patients reached by QI efforts in the hospital setting.
Unit of Analysis	• Organization-level (i.e., hospital)
Intended/Targeted Population	• Coverdell-participating hospitals within a PCNASP funded state
Calculation	• Numerator: Count of the number of hospitals agencies that participate in at least one stroke QI effort implemented by the state Coverdell program. • Denominator: Total number of Coverdell-participating hospitals in the state.
Frequency of Data Collection	• Annually
Potential Data Sources	• Hospital inventory survey • Hospital PDSA action plan • Hospital QI tracking database • Meeting rosters/attendance logs
Notes	• While some grantees encourage quality improvement among a wider group of hosptials in the state, plese restrict reporting on this measure to Coverdell-participating hospitals. Grantees may provide further details regarding the wider reach of the state Coverdell program's QI activities in the Measure Notes section.

Reach	
20. % of state acute stroke admissions in participating hospitals	
Purpose of Performance Measure	• The purpose of this performance measure is to assess the overall reach of Coverdell program activities related to hospital care of acute stroke patients. Specifically, this measure provides insight into the proportion of stroke patients in a PCNASP funded state that are affected by Coverdell program activities in the hospital setting, including QI efforts across the continuum of stroke care.
Unit of Analysis	• Patient-level (i.e., acute stroke admissions)
Intended/Targeted Population	• Stroke patients admitted to Coverdell-participating hospitals within a PCNASP funded state
Calculation	• Numerator: Count of the number of stroke patients admitted to Coverdell-participating hospitals in a state. • Denominator: Total number of stroke patients admitted to all hospitals in a state. • Patients included in both the numerator and denominator must be admitted to a hospital as an acute stroke patient. Patients that are not admitted or do not have a confirmed stroke diagnosis should not be counted in the numerator or denominator for this calculation. • Administrative codes available through hospital-level and state-level databases should be used for this calculation (i.e., ICD-9, ICD-10).
Frequency of Data Collection	• Annually
Potential Data Sources	• Hospital stroke registry/in-patient database • State-level databases
Notes	• Grantees should avoid using GWTG data to report on this measure because some hospitals may use sampling techniques to import data into the GWTG system.

Reach	
21. % of state acute stroke patients transported by EMS agencies participating in state Coverdell program	
Purpose of Performance Measure	• The purpose of this performance measure is to assess the overall reach of Coverdell program activities related to EMS care and transport of acute stroke patients. Specifically, this measure provides insight into the proportion of suspected stroke patients that are transported by Coverdell-participating EMS agencies and subsequent program activities that occur in the EMS setting including QI efforts and linkage of patient data.
Unit of Analysis	• Patient-level (i.e., acute stroke patients transported by EMS)
Intended/Targeted Population	• Stroke patients transported by Covedell-participating EMS agency
Calculation	• Numerator: Count of the number of suspected stroke patients transported by a Coverdell-participating EMS agency to a Coverdell-participating hospital. • Denominator: Total number of suspected stroke patients transported by all EMS agencies in the state. • Patients included in this measure may have a confirmed stroke diagnosis based on admission data from a hospital or emergency department, or a suspected stroke diagnosis based on EMS records. Additionally, the EMS agency must be participating in Coverdell, however, the hospital that the EMS agency brings a patient to does not need to be a Coverdell-participating hospital.
Frequency of Data Collection	• Annually
Potential Data Sources	• Hospital registry system • EMS run sheets • State-level EMS information system or database • State health department's EMS participating agency tracking form
Notes	• While the EMS agency must be participating in Coverdell, the hospital that the EMS agency brings a patient to does not need to be a Coverdell-participating hospital. The receiving hospital may be any primary stroke or acute stroke ready hospital.

Data Linkages	
22. Proportion of EMS agencies that have data linked to in-hospital data	
Purpose of Performance Measure	• The purpose of this performance measure is to provide information on states' progress toward linking EMS and hospital data. Linking data between EMS and hospital settings ensures that patient-level data sharing is occurring between stroke care systems. These data linkages between EMS and hospital will allow for an increase in data sharing and usage to drive quality improvement efforts for care of acute stroke patients.
Unit of Analysis	• Organization-level (i.e., EMS agency, hospital)
Intended/Targeted Population	• Hospital and EMS staff
Calculation	• Numerator: Count of the number of Coverdell-participating EMS agencies that have demonstrated a link between their data system and partnering hospitals. • Denominator: Total number of Coverdell-participating EMS agencies. Note: Include agencies in the numerator that have a data linkage established, not just an MOU or intention to link data.
Frequency of Data Collection	• Annually
Potential Data Sources	• In-hospital registry database • State-level EMS information system or database • State health department's data linkage tracking forms
Notes	• A state may have an EMS system with multiple local EMS authorities. If data linkage occurs at this local EMS authority level, rather than report "1" for the local authority, the grantee should report the number of EMS agencies within that local EMS system that are impacted by that system change.

Data Linkages	
23. (%) # of EMS run sheets entered into in-hospital data collection tool	
Purpose of Performance Measure	• The purpose of this performance measure is to assess the extent to which patient-level data sharing is occurring between stroke care systems (EMS and hospitals). These data linkages between EMS and hospital will allow for an increase in data sharing and usage to drive quality improvement efforts for care of acute stroke patients. (Note: The percent of EMS run sheets entered will be calculated by CDC. The grantee is asked to report only the number entered.) • Note: This performance measure may not be aligned with the activities of all PCNASP grantees.
Unit of Analysis	• EMS run sheets (patient-level)
Intended/Targeted Population	• Hospital registry staff
Calculation	• Ideal measure: Count the number of EMS run sheets of acute stroke patients that were entered into the Coverdell in-hospital registry system for the program year. If the above data are not available, you may report on the following proxy measure until capacity is built toward reporting the "ideal" measure above: • Proxy measure: • Numerator: Count of the number of hospitals that report they "always" enter EMS run sheets into the Coverdell in-hospital record. • Denominator: Total number of Coverdell-participating hospitals.
Frequency of Data Collection	• Annually
Potential Data Sources	• In-hospital registry database • Hospital registry tracking forms • Proxy measure: Hospital inventory survey. The hospital inventory survey includes a question "Does your hospital enter EMS run sheets into the Coverdell in-hospital record?" "Always", "Sometimes", "Rarely", "Never".
Notes	• The information required from the grantee for this measure has been slightly altered to the "number of EMS runs sheets", rather than "percent". CDC may calculate the percent using the number submitted by the grantee as the numerator and the denominator "number of acute stroke patients arrived by EMS." • Some programs may be in the process of building a data infrastructure to be able to report the extent to which data are

	linked using EMS run sheets. In this case, grantees may consider utilizing the proxy measure that is listed. Report the proxy measure data in the first sub-row for Performance Measure #23 in the Excel *Process and Outcome Performance Measure Reporting Table*. • If a program has fully linked data systems between EMS and hospitals using electronic data sharing strategies and utilizing run sheets is deemed unnecessary, grantees may opt to leave this measure blank and describe the linked data system in the measure notes section of the reporting table.

Data Reliability/Validity	
24. % concordance between original abstractor and re-abstractor for each specified data element ***(revised: aggregate % concordance for all Coverdell hospitals)***	
Purpose of Performance Measure	• The purpose of this performance measure is to assess the reliability of Coverdell stroke registry data as determined through annual data agreement procedures of select and highly important data elements, as well as quarterly data quality reviews. Thereby ensuring that decisions about how to improve hospital care for acute stroke patients are driven by accurate data.
Unit of Analysis	• Coverdell hospital inter-reliability agreement score
Intended/Targeted Population	• Coverdell hospitals and stroke registry staff
Calculation	Note: Grantees are not required to report a numerator and denominator for this measure. The total concordance rate for all hospitals should be available in grantees' annual chart audit data reliability report. • For each Coverdell participating hospital, assess the concordance (Cohen's kappa coefficient, intra class correlation coefficient, Item Specific Perfect Agreement) between data elements included in the chart data audit/re-abstraction process. • Aggregate the total percent agreement from all Coverdell hospital inter-rater reliability rates.
Frequency of Data Collection	• Annually
Potential Data Sources	• Coverdell program annual chart audit data reliability reports (internal or external) • Coverdell program evaluation report
Notes	• Reporting on this measure is *not* a substitute for completing the reabstraction inter-rater reliability test for each data element in the registry. The percent concordance between original

	abstractor and re-abstractor for each specified data element is required. • See the Coverdell Resource Guide for further guidance on data abstraction requirements and guidelines.

Workforce Capacity	
27. # and type of trainings provided to EMS and to hospital stroke professionals (ED staff)	
Purpose of Performance Measure	• The purpose of this performance measure is to assess the amount and focus of PCNASP's concentrated efforts to increase workforce capacity and scientific knowledge for care of acute stroke patients within stroke systems of care. This measure is tied to activities focused on supporting, and disseminating scientific knowledge between EMS and emergency department (ED) hospital staff to work together as a team.
Unit of Analysis	• Acute stroke care trainings
Intended/Targeted Population	• EMS professionals and ED hospital stroke professionals
Calculation	• Count the number of trainings delivered by the state PCNASP to EMS and ED hospital stroke professionals in the past program year to disseminate scientific knowledge about stroke, not to support QI. Note: Count trainings such as Advanced Stroke Life Support (ASLS), and or joint EMS/ED video conference calls, and toolkits aimed at EMS providers. • Do not include trainings solely sponsored or delivered by other organizations like The Joint Commission or the American Heart Association.
Frequency of Data Collection	• Annually
Potential Data Sources	• Program records • Training/education plan • Training agenda or lesson plan
Notes	• Report the type of trainings in the corresponding "Measurement Notes" field in the grantee Excel process and outcome performance measure reporting template - table #27. • Where possible, please report data distinctly associated with increasing the scientific knowledge of EMS and ED hospital staff and not QI activities. QI activity data are reported with Performance measure #13a. • It is appropriate to include trainings for non-Coverdell participating EMS agencies as well as Coverdell-participating EMS agencies in the count for POPM #27. Grantees may choose to use the sub-rows to report trainings targeted either to non-Coverdell participating agencies or to Coverdell agencies as separate groups.

Workforce Capacity	
28. Number of trainings for EMS and hospital stroke professionals that were evaluated for knowledge gained. (Revised by CDC; Listed in FOA as "Proportion of EMS and hospital stroke professionals with improved scores in pre and post tests administered during training events.")	
Purpose of Performance Measure	• The purpose of this performance measure is to track the educational events where participants' (EMS and hospital stroke professionals) knowledge of stroke care practices is measured before and after the training. Increased knowledge from these training's will contribute to greater workforce capacity and scientific knowledge for care of acute stroke patients within stroke systems of care.
Unit of Analysis	• Trainings delivered
Intended/Targeted Population	• EMS and hospital stroke professionals
Calculation	• Count the number of trainings delivered by the state PCNASP to EMS and hospital stroke professionals in the past program year where participants' knowledge was evaluated. • Do not include trainings solely sponsored or delivered by other organizations like The Joint Commission or the American Heart Association.
Frequency of Data Collection	• Annually
Potential Data Sources	• Program records • Training/education plan • Evaluation plan and report
Notes	• The language of the original performance measure was re-worded for simplicity and clarity.

Stroke Care	
29. % of Coverdell hospitals that implemented changes in stroke care practices	
Purpose of Performance Measure	• The purpose of this performance measure is to document the extent to which hospitals have actively taken programmatic steps toward improving quality of care for acute and suspected stroke patients and increasing efficiencies and effectiveness of stroke care practices and resources. Calculating a percentage is important for understanding the extent to which Coverdell-participating hospitals in the state have made active change(s) in stroke care practices.
Unit of Analysis	• Organization-level (i.e. hospitals)
Intended/Targeted Population	• Acute and suspected stroke patients
Calculation	• Numerator: Number of Coverdell-participating hospitals in the state that have implemented change(s) in stroke care practices. • Denominator: Total number of Coverdell-participating hospitals in the state. • Definitions: Implemented changes: To have put into action at least one program or activity that is demonstrably different from what was present previously. Actions must have occurred – plans or preparations for action do not count toward this definition. Stroke care practices: Any program or activity that treats acute or suspected stroke patients.
Frequency of Data Collection	• Annually
Potential Data Sources	• Hospital inventory survey • Hospital PDSA action plan
Notes	• Please refer to measure 29a for reporting for Coverdell hospitals working on post-hospital transitions of care. • In order to be counted towards the numerator of this measure, a hospital should have initiated some type of action, and not solely have a "plan" to take action. CDC will accept any reliable evidence that hospitals implemented changes or took some action towards making a change. Confirmation may be verbally reported, reported in writing by the hospital, but it does not have to be an audit, for example. Grantees may provide examples of the types of implemented changes in the "Measure Notes" field.

Stroke Care	
29a. % of Coverdell hospitals that implemented changes in stroke post-hospital transitions of care practices	
Purpose of Performance Measure	• The purpose of this performance measure is to document the extent to which hospitals have actively taken programmatic steps toward improving post-hospital transitions of care for acute stroke patients and increasing efficiencies and effectiveness of post-hospital stroke care practices and resources.
Unit of Analysis	• Hospitals addressing post-hospital transitions of care
Intended/Targeted Population	• Acute stroke patients
Calculation	• Numerator: Number of Coverdell-participating hospitals in the state that have implemented change(s) in stroke post-hospital transition of care practices • Denominator: Total number of Coverdell-participating hospitals in the state addressing post-hospital transitions of care • Definitions: Implemented changes: To have put into action at least one program or activity that is demonstrably different from what was present previously. Actions must have occurred – plans or preparations for action do not count toward this definition. Stroke post-hospital transitions of care practices: Any program or activity implemented by the hospital to discharge or transfer responsibility of care of the treated acute stroke patient.
Frequency of Data Collection	• Annually
Potential Data Sources	• Hospital inventory survey • Hospital PDSA action plan
Notes	• Please refer to measure 29 for reporting on implemented changes in stroke care practices. • In order to be counted towards the numerator of this measure, a hospital should have initiated some type of action, and not solely have a "plan" to take action. CDC will accept any reliable evidence that hospitals implemented changes or took some action towards making a change. Confirmation may be collected through a state-specific question on the hospital inventory, verbally reported, reported in writing by the hospital, but it does not have to be an audit, for example. Grantees may provide examples of the types of implemented changes in the "Measure Notes" field.

Stroke Care	
30. % of Coverdell-participating EMS agencies that implemented changes in stroke care practices	
Purpose of Performance Measure	• The purpose of this performance measure is to document the extent to which EMS agencies have actively taken programmatic steps toward improving quality of care for acute and suspected stroke patients and increasing efficiencies and effectiveness of stroke care practices and resources. This measure will capture the proportion of EMS agencies that implement changes to improve quality of stroke care, and will provide insight into the intensity and reach of PCNASP activities in the EMS setting. Calculating a percentage is important for understanding the extent to which Coverdell-participating EMS agencies in the state have made active change(s) in stroke care practices.
Unit of Analysis	• EMS agencies
Intended/Targeted Population	• Acute and suspected stroke patients
Calculation	• Numerator: Number of Coverdell-participating EMS agencies in the state that have implemented change(s) in stroke care practices • Denominator: Total number of Coverdell-participating EMS agencies in the state • Definitions: Implemented changes: To have put into action at least one program or activity that is demonstrably different from what was present previously. Actions must have occurred – plans or preparations for action do not count toward this definition. Stroke care practices: Any program or activity that treats acute or suspected stroke patients.
Frequency of Data Collection	• Annually
Potential Data Sources	• EMS inventory survey • EMS PDSA action plan
Notes	• Please refer to measure 29 and 29a for reporting for Coverdell hospitals and implemented changes in stroke care practices

Systems of Stroke Care	
39. % of EMS-hospital teams reporting use of feedback from hospital to EMS	
Purpose of Performance Measure	• The purpose of this performance measure is to track the extent to which Coverdell participating hospitals and EMS agencies have a systematic feedback loop to share information and data on acute and suspected stroke patients. Through receipt of this information, EMS professionals will improve their ability to identify and treat acute stroke patients, and reduce time to treatment.
Unit of Analysis	• Organization-level (i.e., hospitals)
Intended/Targeted Population	• Acute and suspected stroke patients
Calculation	• Numerator: Count of the number of Coverdell-participating hospitals in the state that report having a formal processing for providing feedback (i.e., patient diagnosis, etc) to EMS agencies. • Denominator: Total number of Coverdell-participating hospitals in the state • Definitions: Feedback: Feedback may be delivered in the form of faxes, emails, phone calls, in-person (i.e., at a meeting or during a case review), or through another mechanism.
Frequency of Data Collection	• Annually
Potential Data Sources	• Hospital inventory survey
Notes	• The state-specific evaluations may provide an opportunity to evaluate the level of participation (formal or informal) and the usefulness of the feedback between EMS and hospital organizations. • Please provide additional detail in the sub-rows in the performance measures reporting template to describe the strategies used by hospitals to deliver feedback to EMS or that are a focus area for your state program. Also, grantees may provide further detail or clarification in the Measure Notes cell.

Profiles for Performance Measures Reported Qualitatively by Grantee

This section provides additional clarification on the twelve core process measures grantees will report on qualitatively. These data will be reported in the worksheet of the Excel *Process and Outcome Performance Measure Reporting Table* labeled "Qualitative Measures". Grantees will report a baseline narrative, and set program targets for Program Years 2 and 5 (or subsequent years). For each measure, use the unlimited open text cell to describe the types of activities, reports, interventions, etc as they existed prior to the initiation of the Coverdell

2015-2020 cooperative agreement (June 30, 2015). This description will serve as the baseline narrative. Within the same cell continue on to describe what you hope to achieve for the measure by Program Year 2 and by Program Year 5. Clearly designate the beginning of each statement with the following: "Baseline:", "Yr 2 Target:", and "Yr 5 Target:".

Public Awareness

1. (# and) types of activities that promote public awareness on signs and symptoms and appropriate emergency response.

- The "number of activities promoted…" is reported in the worksheet of the Excel *Process and Outcome Performance Measure Reporting Table* labeled "Quantitative Measures". On the "Qualitative Measures" worksheet, grantees have the opportunity to describe the "types" of activities. Include a description of the method or mode (PSAs, flyers, community outreach events, etc), the key messages promoted, and the target audience. Additonally, please describe the intended audience or target population of promotion efforts.

Public Awareness

2. (# and) types of partnerships between state Coverdell program and other stroke-related entities.

- The "number of partnerships…" is reported in the worksheet of the Excel *Process and Outcome Performance Measure Reporting Table* labeled "Quantitative Measures". On the "Qualitative Measures" worksheet grantees have the opportunity to describe the "types" of partnerships in more detail. Types of partnerships may include coalitions, steering committees, and/or task forces. Do not include partnerships with hospitals or EMS agencies; these partnerships are captured by measures 3 and 4.

Data Infrastructure

5, 6, 7. % of EMS agencies/hospitals that submit data (including 30-day post discharge data) to an integrated data management system for the purposes of the Coverdell program's data-driven QI activities and performance monitoring for potential acute stroke patients.

- Instead of reporting percent, please describe the integrated data management system and strategy. If possible, aim to provide the following:
  - # Coverdell-particpating EMS agencies linked to # hospitals
  - # Coverdell-participating hospitals linked to # EMS agencies
  - # hospitals linked to # follow up physicians
  - # EMS agencies, # hospitals, and # follow up physicians linked to the health dept
- **Measure Notes:** Depending on the structure of a grantee's Coverdell program, there may be variation in the number of Coverdell-particpating hospitals with data linkages

to EMS agencies versus the number of Coverdell-participating EMS agencies with data linkages to hospitals. The grantee may document the differences qualitatively or quantitatively for this measure.

Data Infrastructure
8. Submission of annual chart re-abstraction results according to CDC guidelines. ➢ Report Yes or No.

Data Use
9. (# of) and types of reports created using quality of care data from EMS and hospitals. ➢ Describe the "types" of reports (the number of reports is not required). This might include the data, the audience of the report, and key messages or data presented in the report.

Data Use
10. (# and) type of systematic QI methods/interventions implemented by EMS agencies as a result of quality of care data reports. ➢ Describe the "types" of QI methods/interventions. (The number of interventions implemented is not required.)

Data Use
11. (# and) types of systematic QI methods/interventions implemented by hospital staff as a result of quality of care data reports. ➢ Describe the "types" of QI methods/interventions. This is similar to measure #10 but these QI methods/interventions resulted from the sharing and review of the quality of care data reports. (This measure is focused on in-hospital quality of care data reports. Refer to measure #12 for data reports for post-hospital care.) (The number of interventions implemented is not required.)

Data Use
12. (# and) type of systematic QI methods/interventions implemented by hospital staff as a result of quality of care data reports to improve transition of care from hospital to home. ➢ Describe the "types" of QI methods/interventions. This is similar to measure #11 but the quality of care data reports are focused on post-hospital care. (The number of interventions implemented is not required.)

Sustainability
16, 17. Sustainability plan submitted to CDC by end of Year 3. Revisions/updates to sustainability plan in years 4 & 5 as necessary ➢ Report Yes or No. ➢ This measure is required in Year 3. The grantee may enter "No" for Years 1 and 2 unless the program creates a sustainability plan prior to Year 3. ➢ Revisions/updates to sustainability plan in years 4 & 5 as necessary

Additional Considerations for POPM Reporting

Cumulative versus Annual Reporting

For the POPMs that are reported quantitatively by the grantee, grantees should report a Year 2 target that is a discrete *annual* count, percent, or proportion for June 30, 2016 - June 29, 2017. Grantees will also report actual performance measure data as an annual value for these measures. There will be a column in the revised POPM reporting template[2] to indicate how many "units" (E.g. activities or settings) were initiated in that year so CDC can clearly track activities or settings that span multiple years. Grantees should report the Year 5 target as a *cumulative* value. This is for goal setting purposes; to establish for your program, stakeholders, and CDC the total reach or impact that you aim to achieve over the life of the cooperative agreement. In September 2019 you will have the opportunity to state the annual target for Year 5.

Definitions

- *Annual* reporting values should reflect progress accomplished within a specified program year.
- *Cumulative* reporting values should reflect the progress accomplished since the initiation of the cooperative agreement.

[2] A revised reporting template will be sent out to grantees in late summer 2016 for reporting of program year 1 performance measure data, and revised baseline and target values on September 29, 2016.

Reporting Multiple Data Sources

In general, the examples of data sources listed in the POPM Guidance V2.1 are kept generic so that the guidance is relevant to all nine Coverdell grantees. To the best of your ability please identify the particular type of program record you use that is specific to your program. Remember that you can have data from multiple data sources. If this is the case, you can document up to three separate data sources per measure in the POPM reporting template. In some cases, you may have a programmatic file or list that consolidates the data from many different data sources or program records. You may report the name of this programmatic file/list.

Defining Activities and Efforts

"Efforts" or "activities" are defined as those activities that are in your Coverdell work plan and what CDC PCNASP funding supports. A program "initiative" may encompass multiple activities; therefore we ask grantees to report counts of each activity, and not the initiative, in order to capture the true extent of all grantee efforts. Report the total number of activities (across all initiatives) in the primary reporting row for the measure. Use the remaining sub-rows to report or track activities by initiative.

The definition for "participating agencies" may vary across states on how each are defining "participating", "recruited" or "enrolled". In general we are referencing the agencies that are enrolled in the state Coverdell program or have some form of agreement with the state health department to work towards Coverdell-related outcomes. If the health department is working through Coverdell participating hospitals to provide education, training, quality improvement to their partnering EMS agencies, then the health department may count and report those EMS agencies. However, the health department must develop a formal and systematic system to identify those EMS agencies to prevent the possibility of double-counting EMS agencies if the health department also carries out direct activities to EMS agencies. The grantee is encouraged to document what "participating" means within the context of their program.

Reporting Baselines

In general, baseline is prior to the initiation of this cycle of Coverdell funding (prior to June 30, 2015).[3] Ideally, baseline data will reflect the 12 months prior to June 30, 2015 (July 2014-June 2015). However, some data sources may have data available for the calendar year only (January-December 2015). If data are available only for a calendar year time frame, please establish the baseline using data from the 2014 calendar year if possible. If a baseline is impossible to capture (no pre-existing trend data, etc.) then leave this cell empty. When CDC analyzes the data, we will use Year 1 data as a proxy for baseline.

If you do not know the exact date (month) that the baseline data was collected you may report a default date of June 29, 2015 (the last day prior to initiation of this Coverdell funding cycle).

[3] Note: The program initiation date has been revised since the release of previous guidance. The revised program year dates are based on the Notice of Awards. The first day of the program was June 30, 2015, not July 1, 2015 as previously stated. Keep in mind that all reporting dates are one day earlier than originally stated.

Establishing Baseline and Target Measures
Performance measurement helps demonstrate achievement of program outcomes and drives continuous program improvement. In order to accurately monitor progress, performance measures require sound baselines and valid target measures. Below is general guidance to assist grantees in establishing baselines and setting targets for required program performance measures. Remember always check with your CDC Project Officer and Evaluation Liaison if you need additional support establishing baselines and targets for your program.

Baseline Data
Baseline data are initial performance measurement data collected prior to the program intervention. Baseline data are essential to enable grantees to monitor and track program changes. The purpose of collecting baseline data is to: 1) compare what happens before and after an intervention or program has been implemented; 2) assess the effect of a program; and 3) provide a foundation for showing performance improvement. Without baseline data it is difficult to estimate changes in progress, or establish targets. Grantees are expected to report baseline data for the priority program performance measures in February 29, 2016 and will have the opportunity to revise baselines on September 30, 2016.

Target Data
Target data provide information on the desired level of change over a given time period that represents success at achieving program outcomes. Setting a target is not about *guessing* what you can achieve. It involves knowing where you are now, what you are trying to achieve, and determining challenging but realistic amounts of improvement needed to get there. Targets should be motivational and ambitious but realistic and achievable, keeping in mind the feasibility of data collection. The most important criteria to use when establishing baselines and setting targets are: 1) data availability; and 2) use of an informed and systematic approach. On February 29, 2016, grantees are expected to submit targets for Program Year 2 and 5. Targets may be revised on September 30, 2016. Each year on September 30 grantees will set targets for the following program year.

For additional guidance on establishing baseline data and estimating targets, see below.

Conclusion
The process and outcome performance measures for the PCNASP standardize the assessment of program activities (e.g., public awareness, data linkages, and stroke systems of care) and outcomes across state programs. Reporting these measures is an important part of monitoring program performance at the national level.

For questions or assistance with reporting process and outcome performance measures, please contact your CDC evaluation TA provider (Joanna Elmi– jelmi@cdc.gov, Kincaid Lowe Beasley– klowe@cdc.gov).

Process and Outcome Performance Measures as listed in FOA

PCNASP Process and Outcome Performance Measures	
Process-Level Performance Measures	
Public Awareness	1. # and types of activities that promote public awareness on signs and symptoms and appropriate emergency response
Partnerships	2. # of partnerships and types of partnerships between state Coverdell Program and other stroke-related entities
Recruitment	3. # of local or regional EMS agencies recruited to participate in state Coverdell activities
	4. # of hospitals recruited to participate in state Coverdell activities (in-hospital care; post-hospital care)
Data Infrastructure	5. % of EMS agencies that submit data to an integrated data management system for the purposes of the Coverdell program's EMS data-driven QI activities and performance monitoring for potential acute stroke patients
	6. % of hospitals that submit data to an integrated data management system for the purposes of the Coverdell program's in-hospital data-driven QI activities and performance monitoring for acute stroke patients
	7. % of hospitals that submit 30-day post discharge data to an integrated data management system for the purposes of the Coverdell program's in-hospital data-driven QI activities and performance monitoring for acute stroke patients
	8. Submission of annual chart re-abstraction results according to CDC guidelines
Data Use	9. # of and types of reports created using quality of care data from EMS and hospitals
	10. # and type of systematic QI methods/interventions implemented by EMS agencies as a result of quality of care data reports
	11. # and types of systematic QI methods/interventions implemented by hospital staff as a result of quality of care data reports
	12. # and type of systematic QI methods/interventions implemented by hospital staff as a result of quality of care data reports to improve transition of care from hospital to home
Quality Improvement	13. # and type of stroke QI efforts implemented by state Coverdell program for EMS and hospital staff
	14. % of EMS agencies that have participated in stroke QI efforts implemented by state Coverdell program
	15. % of hospitals that have participated in stroke QI efforts implemented by state Coverdell program
Sustainability	16. Sustainability plan submitted to CDC by end of Year 3
	17. Revisions/updates to sustainability plan in years 4 & 5 as necessary

Short-term Outcome Performance Measures	
Public Awareness	18. % of patients with acute stroke presenting to an ED that arrive by EMS
	19. % of patients with acute stroke who arrive within 3 hours of time last known to be well
Reach	20. % of state acute stroke admissions in participating hospitals
	21. % of state acute stroke patients transported by EMS agencies participating in state Coverdell program
Data Linkages	22. Proportion of EMS agencies that have data linked to in-hospital data
	23. % of EMS run sheets entered into in-hospital data collection tool
Data Reliability/Validity	24. % concordance between original abstractor and re-abstractor for each specified data element
	25. % missing data for select data elements by calendar quarter
	26. # of cases with improbable dates/times by calendar quarter
Workforce Capacity	27. # and type of trainings provided to EMS and to hospital stroke professionals
	28. Proportion of EMS and hospital stroke professionals with improved scores in pre and post tests administered during training events
Stroke Care	29. % of hospitals that implemented changes in stroke care practices
	30. % of EMS agencies that implemented changes in stroke care practices
	31. % (or #) of hospital QI interventions that resulted in an improvement in a select performance measure of care
	32. % (or #) of EMS QI interventions that resulted in an improvement in a select performance measure of care
	33. % of hospitals with improvement in a select performance measure of care
	34. % of EMS agencies with improvement in a select performance measure of care
Patient Education	35. % of patients and/or caregiver that received educational materials during the hospital stay addressing all stroke education areas (i.e., activation of emergency medical system, follow-up after discharge, medications adherence, risk factors, signs and symptoms of stroke)
	36. % of hospitals implementing the use of teach back (or other methods) to determine patient and/or caregiver understanding of stroke education
Intermediate Outcome Performance Measures	
Systems of Stroke Care	37. Median door-to-needle time by calendar quarter
	38. % of patients with door-to-needle time within 60 minutes by calendar quarter
	39. % of EMS-hospital teams reporting use of feedback from hospital to EMS
	40. % of stroke patients that had a follow-up appointment scheduled prior to hospital discharge
Stroke Care	41. % adherence to Coverdell patient-level performance measures of care for EMS
	42. % of adherence to Coverdell patient-level performance measures of care for in-hospital and transition of care

	43. % of patients with defect-free in-hospital care
	44. % of patients with defect-free care by EMS
	45. # of EMS, in-hospital, or TOC performance measures with significant race (black, white) or gender disparities.
Health Outcomes	46. % of patients identified as smokers on hospital admission for acute stroke who are still smoking at 30-days post hospital discharge
	47. % adherence to discharge medications at 30 days (for each medication class: antihypertension, statins, anticoagulant, antiplatelet)
	48. % of patients readmitted within 30 days after hospital discharge for acute stroke (crude, and risk-adjusted for demographics and stroke severity)
	49. % of patients presenting to the emergency department within 30 days after hospital discharge for acute stroke (crude, and risk-adjusted for demographics and stroke severity)
	50. 30-day mortality rate after acute stroke by stroke type (crude, and risk adjusted for demographics an stroke severity)

Approaches to Establishing Baseline and Target Measures

Several approaches can be used to establish benchmarks and set targets. These include:

a. Past performance - examining the past performance of the proposed PCNASP or a similar program provides a good estimate of what the current baseline could be and as well as estimates of progress that can be made in the future.
b. Change in performance over time - examining changes in performance over the past few years (the more years to establish trends, the better) of a particular program/intervention or similar programs/interventions provides a good source to establish current baseline and future performance targets. Averages from previous years can be used to estimate target measures.
c. Desired targets (our internal aspirations) – often, agency strategic planning documents provide information to establish baselines and targets. Does the planning document identify current statistics and desired outcomes for the program or initiative? If so, this information can be used to estimate baseline and target measures.
d. Benchmarks from peer agencies/jurisdictions/settings - data from similar agencies, jurisdictions or settings can assist in establishing baseline and target measures. These data can be particularly useful if there are several years' worth of data to help establish trends. Be sure that the entities you use are similar to your agency, community or location in order to insure more valid estimates. Age, poverty distribution, demographic characteristics, and diversity are examples of factors that can be used to identify peer agencies, jurisdictions or settings.

Establishing Baseline Measures

It can be helpful to use data that your unit has already gathered to establish a baseline, or starting point, for your target. Also, it's important to carefully evaluate the historical data you are considering using as your baseline. Look at the data for a particular period and see whether there has been an abrupt change in performance or data collection methodology. If there has been, investigate the reasons for the change. If there were unusual circumstances during that period (such as a recession), the figure may not be a good reference point and you may want to consider using data from a different period to inform your target.

When you do not have historical data, you might consider using information from outside data sources to benchmark, or compare your performance data with those of other comparable universities/departments /programs/organizations. Then set targets that seem reasonable in light of the benchmarking information you have gathered.

Finally, in some cases the baseline information may not exist or may be too costly to determine. In those special cases, the initial performance of the system will have to serve as the baseline from which future performance is measured. In this case, one to two years of performance measure data can be used to validate baselines. Baseline measures should be developed at the beginning of the program. However, those baseline estimates can be updated and finalized after a few years of data collection.

Setting Target Measures

In addition to approaches listed above, targets can be set based on 1) what is recognized as good practice in the field. Often judgments by experts or published literature can identify these practices; 2) the opinions of those who are leaders or those who have been directly involved with the activities or organizations for which targets are to be set. These people can give you a realistic idea of what is achievable or what staff should strive for or can achieve.

A number of contextual factors can impact your target setting. It is important to take these into account when setting target measures. Factors include:

- Environmental pressures - what is working for or against the target
- Policy - federal, state, local and agency shifts in how and what is done
- Focus - strategic and programmatic
- Resources - dollars, staff, facilities, equipment
- Capacity - training, supervision and leadership

In setting targets, the following should be considered:

1. Know what you are trying to achieve
   a. Be clear about the purpose of the target and the type of target you need. Is it aspirational or a realistic assessment of what can be achieved?
   b. Be clear in articulating the outcome that you are trying to achieve.
   c. Be clear about the time period you will need to achieve the objective.

2. Clearly define where you are now and where you want to be
   a. Review trends and history
   b. Consider variations in performance (e.g., peaks, seasonal factors, etc.)
   c. Project forward taking into account known changes ahead in the environment
   d. Take account of national targets, program strategies, etc.
   e. Use comparisons to help build a feasible measure
   f. Take into account your ability to influence the outcomes (do you depend on partners, etc.?)

3. Identify measures
   a. Check if there are indicators already in existence – developing new indicators is difficult so always check whether one already exists
   b. Consider the type of target that is most appropriate (e.g., number or percentage, etc.). There are no hard and fast rules for which is appropriate.

4. Set targets in consultation with staff, other members of the organization, or partners
   a. Involve those who will have to deliver the target and who will be held accountable. You will need their knowledge, experience, ownership and understanding
   b. Be clear who the target is for – is it an individual, group of persons, setting or geographic area?
   c. As well as setting the target, consider how you will reach it. Do you expect a steady line of progress or will there be inconsistencies in the level of accomplishment the program can make?

5. Develop an action plan to achieve the target
   a. Consider the time period for achievement of the target
   b. Clarify the action needed to achieve the target in the designated time period
   c. Produce an action plan with those responsible, costs and timeline

T. PCNASP Logic Model

INTEGRATING STROKE CARE ACROSS THE CONTINUUM FROM ONSET OF STROKE TO HOSPITAL DISCHARGE.

Funded Programs Strategies/Activities

Coordinate public stroke prevention messaging

Coordinate Partnerships by establishing/maintaining:
- Steering committee to include stroke systems of care partners (emergency services [EMS], acute stroke care hospitals, and post-hospital settings) and major stroke partners/stakeholders
- Collaborations with existing state-based stroke councils, coalitions, or stroke professional organizations
- Collaboration with state or regional EMS Director(s)

Recruit local/regional EMS systems and hospitals to:
- Participate in EMS, in-hospital, and post-hospital data collection
- Engage in quality improvement (QI) activities
- Focus on coordinating effective hand-offs and improving care transitions

Establish data system infrastructure for integrated data management system to measure, track, and assess quality of care, specifically:
- Establish data collection for pre-, in-, and post-hospital settings
- Develop and implement data linkages of all data collected in specified care settings
- Conduct annual analysis of data quality
- Disseminate select findings from data collection efforts

Analyze and use data to:
- Provide feedback to EMS and hospitals on quality of care
- Identify gaps in care in all settings and address through QI methods/interventions (e.g., PDSA, Lean, Six Sigma, etc.)
- Identify methods/models to improve transitions and patient outcomes post-discharge to home
- Disseminate select findings from data collection efforts

Coordinate Stroke Care QI Efforts
- Implement intensive trainings, QI learning sessions, regular workshops, monthly QI calls, site visits
- Provide resources/tools, guidance, technical assistance, customized data results feedback, coaching to program partners
- Promote use of stroke protocols and team-based acute stroke care

Coordinate program sustainability

Short Term Outcomes (1-2 years)*

- **Increased public awareness of signs and symptoms and appropriate emergency response**
- **Broad and/or increased state-wide reach of acute stroke patients in the program**
- **Increased data usage and sharing between stroke care systems**
  - **Improved reliability and validity of data**
- **Increased workforce capacity and scientific knowledge for stroke care within stroke systems of care**
  - **Increased implementation of QI strategies for acute stroke care across the continuum**
  - **Increased pre-notification of hospitals of suspected stroke patients**
  - **Increased efficiencies and effectiveness of pre-hospital, in-hospital, and post-hospital stroke care practices and resources**
- **Improved patient/caregiver receipt of education on ongoing post-stroke care needs**
  - Improved patient/caregiver understanding of ongoing post-stroke care needs

Intermediate Outcomes (3+ years)*

Systems of Stroke Care
- **Improved transition of care from EMS to hospital emergency department (ED)**
- **Reduced time to treatment for acute stroke events**
- **Improved transition of care from hospital to home to include:** improved **reintegration with primary care provider, enhanced patient/caregiver education, and secondary prevention**
- Improved access to community services and rehab
- Improved coordination of recurrent stroke prevention & care activities

Stroke Care
- **Improved quality of EMS care for possible stroke patients**
- **Improved quality of acute and subacute ED and hospital stroke care** as measured by adherence to established guidelines for care and quality metrics
- **Improved defect free care for acute stroke patients**
- **Reduced disparities in stroke care**
- Strengthened state-wide infrastructure and increased financial resources to support registry and QI

Health Outcomes
- **Improved tobacco control/reduction in smoking**
- **Improved medication adherence post-hospital**
- Reduced hospital acquired conditions
- **Reduced 30-day hospital readmissions and ED visits for complications after stroke**
- **Reduced 30-day mortality after acute stroke**

Long Term Outcomes

- Improved cholesterol and hypertension control among stroke patients
- Reduced recurrent stroke
- Reduced disparities in death and disability due to stroke
- Reduced death and disability due to stroke
- Reduced costs related to stroke care
- Sustainable state-wide infrastructure across the continuum of stroke care
- Prevent first stroke

Contextual Factors: National standards/guidelines Practice based evidence Trends in stroke burden QI trends in health care system Funding environment State policy environment

Coverdell 2015-2020 Process and Outcome Performance Measures (POPMs)
Frequently Asked Questions (FAQ) Document
Released August 2016

Q1. Should the targets for the POPMs be reported as a cumulative value across all years or as an annual value?
A1. CDC has given this question additional thought and offers the following guidance: For the POPMs that are reported quantitatively by the grantee[4] (see Box 1 on page 4 of the POPM Guidance V2 document), grantees should report a Year 2 target that is a discrete *annual* count, percent, or proportion for June 30, 2016 - June 29, 2017. Grantees will also report actual performance measure data as an annual value for these measures. There will be a column in the revised POPM reporting template[5] to indicate how many "units" (E.g. activities or settings) were initiated in that year so CDC can clearly track activities or settings that span multiple years. Grantees should report the Year 5 target as a *cumulative* value. This is for goal setting purposes; to establish for your program, stakeholders, and CDC the total reach or impact that you aim to achieve over the life of the cooperative agreement. In September 2019 you will have the opportunity to state the annual target for Year 5.

Definitions

- *Annual* reporting values should reflect progress accomplished within a specified program year.
- *Cumulative* reporting values should reflect the progress accomplished since the initiation of the cooperative agreement.

Additional reporting guidance will be communicated along with the revised POPM reporting template in late summer 2016.

Q2. Program records are an important data source, particularly for our process measures. Does CDC require that we specify which specific program records we use as data sources? We selected from the example data sources listed in the POPM guidance but are there others that we can use?
A2. In general, the examples of data sources listed in the POPM Guidance V2 are kept generic so that the guidance is relevant to all nine Coverdell grantees. To the best of your ability please identify the particular type of program record you use that is specific to your program. Remember that you can have data from multiple data sources. If this is the case, you can document up to three separate data sources per measure in the POPM reporting template. In

[4] This includes POPMs #1, 2, 3, 4, 13, 14, 15, 20, 21, 22, 23, 24, 27, 28, 29, 30, 39.
[5] A revised reporting template will be sent out to grantees in late summer 2016 for reporting of program year 1 performance measure data, and revised baseline data and target values on September 29, 2016.

some cases, you may have a programmatic file or list that consolidates the data from many different data sources or program records. You may report the name of this programmatic file/list.

Q3. Please provide definitions of "efforts/activities" and "participating agencies"; these phrases are used frequently across all the POPMs.
A3. "Efforts" or "activities" are defined as those activities that are in your Coverdell work plan and what CDC PCNASP funding supports. A program "initiative" may encompass multiple activities; therefore we ask grantees to report counts of each activity, and not the initiative, in order to capture the true extent of all grantee efforts. Report the total number of activities (across all initiatives) in the primary reporting row for the measure. Use the remaining sub-rows to report or track activities by initiative.

The definition for "participating agencies" may vary across states on how each are defining "participating", "recruited" or "enrolled". In general we are referencing the agencies that are enrolled in the state Coverdell program or have some form of agreement with the state health department to work towards Coverdell-related outcomes. If the health department is working through Coverdell participating hospitals to provide education, training, quality improvement to their partnering EMS agencies, then the health department may count and report those EMS agencies. However, the health department must develop a formal and systematic system to identify those EMS agencies to prevent the possibility of double-counting EMS agencies if the health department also carries out direct activities to EMS agencies. The grantee is encouraged to document what "participating" means within the context of their program.

Q4. Is Year 1 generally considered our Baseline?
A4. No, in general, baseline is prior to the initiation of this cycle of Coverdell funding (prior to June 30, 2015).[6] Ideally, baseline data will reflect the 12 months prior to June 30, 2015 (July 2014-June 2015). However, some data sources may have data available for the calendar year only (January-December 2015). If data are available only for a calendar year time frame, please establish the baseline using data from the 2014 calendar year if possible. If a baseline is impossible to capture (no pre-existing trend data, etc.) then leave this cell empty. When CDC analyzes the data, we will use Year 1 data as a proxy for baseline.

Q5. I don't know the exact date that the baseline data that I'm reporting was collected. Is there a default date that can be used?
A5. Yes, you may use June 29, 2015 (the last day prior to initiation of this Coverdell funding cycle) as a default date if you do not know the exact date the data were collected.

Q6. We are partnering with 8 regional EMS programs to recruit EMS agencies. The 8 programs collectively serve 300 EMS agencies. How do I report these partnerships and recruited agencies between POPM #2 and #3?

[6] Note: The program initiation date has been revised since the release of previous guidance. The revised program year dates are based on the Notice of Awards. The first day of the program was June 30, 2015, not July 1, 2015 as previously stated. Keep in mind that all reporting dates are one day earlier than originally stated.

A6. A number of Coverdell funded state health departments are strategically partnering with regional or centralized EMS programs or authorities and working with these partners to then reach the EMS agencies they serve. This can be a more feasible and efficient approach than working with each of the 300 EMS agencies separately. For reporting on the POPMs, you may report the regional or centralized EMS programs or authorities that you partner with in POPM #2: "*Number of partnerships between state Coverdell Program and other stroke-related entities*". As the partnership with each centralized program yields an agreement to work with the EMS agencies under its authority (i.e. to utilize data to inform quality improvement efforts to improve stroke transitions, etc.) then you may report the total number of EMS agencies that are influenced or reached by that umbrella centralized EMS program in POPM #3: "*Number of local or regional EMS agencies recruited to participate in state Coverdell activities*". While the language of the measure includes both "local" or "regional EMS agencies", the expectation is to report the number of EMS agencies at the most granular level to demonstrate the full extent of the reach of the Coverdell program.

Perhaps hospital partnerships versus recruitment can serve as an analogous example for further explanation. Recruiting health systems can be a strategy for recruiting individual hospitals – if there are 5 hospitals in a single health system, the hospital recruitment count would be 5 (not 1). Similarly, some local EMS agencies may be united by different types of "system-level" mechanisms. Report the system/regional level count within partnerships and report the most granular count of individual EMS agencies for the recruitment measure. CDC encourages using the sub-rows in either POPM #2 or #3 to report the "system-level" partnerships that achieved the total EMS agency count.

Q7. For POPM #4b (*# of hospitals recruited to participate in state Coverdell activities (post-hospital care))* the performance measure description does not seem to align with the calculation. The measure is to recruit hospitals to work on post-hospital care activities. But the Intended/Targeted Population and Calculation include that the hospitals have to be collecting 30-day follow-up data. And the Notes section for that PM include that the FOA required grantees to recruit at least 3 hospitals or integrated healthcare systems by Year 2. The actual FOA Strategy/Activity listed is to "3b. Recruit at least 3 hospitals or integrated healthcare systems by Year to participate in the activities listed in 3.b. (EMS to ED) and also participate in post-hospital data collection for 30 day follow-up, that will support improving the early post-discharge transition from hospital to home." So is this PM actually focused on how many hospitals we recruit to work and collect data across the continuum of care from EMS to ED to Acute Care to Post-hospital?
A7. Good question. Measure 4b is not meant to focus on hospitals recruited to collect data across the complete continuum of care. This is a process-level measure and as stated on page 8 of the FOA there are two measures, one for EMS and the other for in-hospital and post-hospital. At the process level, CDC intends to capture the recruitment in each of the three areas separately (pre-hospital, in-hospital, post-hospital). Evidence of hospitals that have the complete continuum of care established will take time and could be a subsequent outcome of initial recruitment efforts.

Measure 4b is intended to capture the number of hospitals that the Coverdell-funded health department is working with to improve early post-hospital discharge care. CDC interprets this definition of participating hospitals in post-hospital care broadly and at this time can include

hospitals that don't yet have the capacity to report 30-day follow up data but are still conducting QI work to improve processes such as improving scheduling of follow-up appointments, etc. CDC asks that the grantee document how many hospitals are only doing QI with no data collection, and those that are also collecting post hospital data in the measurement notes.

Q8. Part of our QI activities is a grants program to the EMS regional program partners. They provide trainings to EMS agencies on our behalf. The content of the trainings are related to QI and we don't provide any additional resources or support besides the grant money. Can we count these trainings through the grant program in POPM #13a *(# and type of stroke QI implemented by state Coverdell program for EMS staff)*?
A8. Yes. Report the total number of QI trainings supported by the Coverdell program along with all other QI efforts. For example, a Coverdell-funded state health department may offer 4 QI workshops per year and sponsor an EMS regional partner grant program. If the EMS regional partners deliver a total of 10 trainings a year through the grant program, you may report a count of "14" for POPM #13a. If desired, you may report the aggregate count on the primary row and document the grant-supported EMS trainings as a sub-set of the total in a sub-row.

Q9. Hospital site visits are an important way that our state program supports QI activities for Coverdell participating hospitals. For measures 13b *(# and type of stroke QI efforts implemented by state Coverdell program for hospital staff),* how should we count our site visits to hospitals in this measure?
A9. Hospital site visits may be an important QI strategy for grantee programs. You may include hospital site visits in your count of QI activities delivered. The POPM Guide states: "The purpose of this performance measure is to assess the intensity of implementation and the focus areas of stroke QI efforts in hospital settings." Additionally, the guidance for calculating this measure states: "Count of the total number of distinct stroke QI efforts (across all QI activity types) by the state Coverdell program for hospital settings." Therefore, you may count each hospital site visit in this measure where the focus of the site visit is to support a hospitals' quality and delivery of stroke care in the hospital setting and for the purpose of supporting QI activities for hospital staff. Site visits that are exclusively for non-QI related purposes (i.e, site visit to recruit participation or establish a partnership) should not be counted in this measure.

Q10. For POPM #21 (*% of state acute stroke patients transported by EMS agencies participating in state Coverdell program),* how are Coverdell participating EMS agencies defined?
A10. See POPM Guidance V2, measure #3: *# of local or regional EMS agencies recruited to participate in state Coverdell activities.* Coverdell-participating EMS agencies are defined as "hav[ing] a formal relationship with the PCNASP grantee to advance progress towards achieving objectives of the PCNASP." Please also refer to FAQ #3 for relevant information.

While the EMS agency must be participating in Coverdell, the hospital that the EMS agency brings a patient to does not need to be a Coverdell-participating hospital. The receiving hospital may be any primary stroke or acute stroke ready hospital.

It is likely that the data for POPM #21 will come from an EMS data source which may include a state-level EMS database.

Q11. For POPM #23 (*% of EMS run sheets entered into in-hospital data collection tool*), how do I report on this measure if using run sheets is not a strategy to link data in our state program?
A11. The purpose of measure 23 is to assess the extent to which patient-level data sharing is occurring between stroke care systems (EMS and hospitals). State programs are creating data linkages between EMS and hospitals using a variety of strategies. Ideally, a program will be able to report a count of the number of EMS run sheets of acute stroke patients that were entered into the Coverdell in-hospital registry system for the program year. If a program has fully linked data systems between EMS and hospitals using electronic data sharing strategies and utilizing run sheets is deemed unnecessary, you may opt to leave this measure blank and describe your linked data system in the measure notes section of the reporting table. Other programs may be in the process of building a data infrastructure to be able to report the extent to which data are linked using EMS run sheets and may therefore report a proxy measure (listed in the POPM Guidance V2).

Q12. For POPM #24 (*% concordance between original abstractor and re-abstractor for each specified data element),* the concordance for each data element may not align very well with the true validity of the data. We have concerns about the definitions of Inter Rater Reliability and validity and how they relate to reporting on this performance measure.
A12. This measure captures the aggregate inter-rater reliability agreement of re-abstraction for stroke patient records. A formal validation process is not required for reporting this measure. Further guidance on re-abstracting data elements may be found in the Coverdell Resource Guide, Appendix K.

Q13. Can CDC clarify whether POPM #27 (*# and type of trainings provided to EMS and hospital stroke professionals*) is operationalized to only include Coverdell-participating EMS agencies? The profile does not specify trainings that are for Coverdell participating agencies. We include trainings for non-Coverdell participating EMS agencies in this measure.
A13. It is appropriate to include trainings for non-Coverdell participating EMS agencies as well as Coverdell-participating EMS agencies in the count for POPM #27. You may choose to use the sub-rows to report trainings targeted either to non-Coverdell participating agencies or to Coverdell agencies as separate groups.

Q14. For POPM #29a *(% of hospitals that implemented changes in stroke post-hospital transitions of care practices),* what type of assurance of implemented changes is CDC looking for? For example, we have a state-specific question we added to the hospital inventory survey "What activities have you worked on in the past year?"
A14. CDC's guidance makes the distinction between activities or changes that are planned versus actions undertaken by hospitals. In order to be counted towards the numerator of this measure, a hospital should have initiated some type of action, and not solely have a "plan" to take action. CDC will accept any reliable evidence that hospitals implemented changes or took some action towards making a change. The state-specific hospital inventory question seems like it aligns well with this measure. It can be verbally reported, reported in writing by the hospital,

but it doesn't have to be an audit, for example. You may provide examples of the types of implemented changes in the "Measure Notes" field.

Note: The Process and Outcome Performance Measures Guide V2.1 has been updated with the information included in this FAQ document and is saved on the Coverdell SharePoint site under the Evaluation folder.

U. CDC Stroke Tweet Bank

CDC Tweets
Tweet Bank: #abcDRBchat (10/27) and #StrokeChat (10/29)

Q1: What is a stroke? #StrokeTalk

1. A1: #Stroke is a "brain attack" that occurs when blood flow to the brain becomes interrupted. #StrokeChat http://1.usa.gov/1Gqfjt4
2. A1: DYK? There are different types of #stroke: ischemic, hemorrhagic, & transient ischemic attack. http://1.usa.gov/1Gqfjt4 #StrokeChat
3. A1: Brains need oxygen to work properly. If blood & oxygen flow to the brain is blocked, this can cause a #stroke. #StrokeChat
4. A1: #Stroke is the 5th leading cause of death in the U.S. & kills nearly 130,000 Americans a year. #StrokeChat http://1.usa.gov/1IJzORa
5. A1: On average, one American dies from #stroke every 4 minutes. #StrokeChat http://1.usa.gov/1IJzORa

Q2: What are the symptoms of a stroke? #StrokeTalk

6. A2: FAST is a good way to help you remember the signs and symptoms of a #stroke. #StrokeChat http://bit.ly/1zwwHdb

7. A2: Recognize signs & act FAST: Face drooping, Arm/leg weakness, Speech difficulty, Time to call 9-1-1. #StrokeChat. http://1.usa.gov/1yWgvSa
8. A2: Signs of #stroke: numbness, confusion, trouble seeing, trouble walking, & headache. #StrokeChat http://1.usa.gov/1yWgvSa
9. A2: Every 40 seconds someone in the US has a #stroke. Be prepared, learn the signs & symptoms. VIDEO: http://bit.ly/208s3wk #StrokeChat
10. A2: Numbness, confusion, blurred vision, & headache are all symptoms of a #stroke. VIDEO → http://bit.ly/208s3wk #StrokeChat

Q3: What should you do if you or someone you know is having a stroke? #StrokeTalk

11. A3: When a #stroke happens, it is important to recognize the symptoms & call 9-1-1. VIDEO → http://bit.ly/208s3wk #StrokeChat
12. A3: If you or someone you know shows any symptoms of a #stroke, get to a hospital quickly to begin treatment. #StrokeChat
13. A3: Every minute counts. Act FAST if you recognize signs of #stroke. Call 9-1-1 & get to a hospital quickly. #StrokeChat

Q4: Who is most likely to have a stroke? #StrokeTalk

14. A4: Some minority groups are more likely to be affected by #stroke than others. #StrokeChat http://1.usa.gov/1bvbG8j
15. A4: 1 in 5 women will have a #stroke. Women may also experience different #stroke symptoms. http://1.usa.gov/1FDygJq #StrokeChat
16. A4: If you have #HighBloodPressure, you may be at greater risk for stroke. Make control your goal! #StrokeChat http://1.usa.gov/1S6Mi8r
17. A4: #Stroke is more common as you get older, but can happen at any age. #StrokeChat http://bit.ly/1KcSwyZ

Image:

18. Every 40 seconds, someone in the U.S. has a stroke. One of those people was Prince Quire. Video → http://bit.ly/1OWHJz0 #StrokeChat
19. You can have a #stroke at any age. Prince had a stroke when he was 40 years old. His story: http://bit.ly/1OWHJz0 #StrokeChat

20. Women have unique stroke risk factors. Learn more with our women & stroke #infographic. http://1.usa.gov/1ej35GR #StrokeChat

Q5: What are the treatable stroke risk factors? #StrokeTalk

21. A5: You can take small steps toward preventing #stroke, like eating better & exercising. Little things add up. #StrokeChat
22. A5: Reduce the risk of stroke by remembering your ABCS when you talk to your doctor. #StrokeChat http://1.usa.gov/1KBgVfT
23. A5: The ABCS: Aspirin for people at risk, blood pressure control, cholesterol management & smoking cessation. #StrokeChat
24. A5: If #BloodPressure is higher than 140/90, talk w/ your doctor about how to get it under control. #StrokeChat http://1.usa.gov/1QreFyq

Q6: What research is being conducted to learn more about how to treat and prevent strokes? #StrokeTalk

25. A6: Current research @NICHD_NIH looks at rehabilitation therapies after #stroke. #StrokeChat http://1.usa.gov/1DY3gzx
26. A6: @CDCgov is working w/ state health departments to improve access & care for stroke patients. #StrokeChat http://1.usa.gov/1IdquWJ
27. A6: Important research from the NINDS studies brain damage resulting from #stroke. @NINDSnews http://1.usa.gov/1HwdMC5 #StrokeChat
28. A6: Video: Learn how @MillionHeartsUS & @CDCgov are helping to improve #stroke care nationwide: http://bit.ly/1LAR2ka #StrokeChat
29. A6: @CDCgov Coverdell program works to improve access & care for #stroke patients. Watch our video: http://bit.ly/1LAR2ka #StrokeChat
30. The @CDCgov Coverdell program works across Georgia to connect #stroke patients to care. Video: http://bit.ly/1LC4bJK #StrokeChat

Q7: How can we keep our brains healthy? #StrokeTalk

31. A7: Ask your doctor for tips on managing #BloodPressure, including annual checkups. #StrokeChat http://1.usa.gov/1GtM8Xw
32. A7: Brain food: Maintain a healthy diet that is low in salt, saturated fat & cholesterol, and rich in vegetables & fruit. #StrokeChat
33. A7: Get Moving! Phys. activity is healthy for your brain & can reduce your risk of #stroke. Aim for 150 mins/wk. #StrokeChat

Q8: Where can you get more information about stroke prevention and treatment? #StrokeTalk

34. A8: Know the facts about #stroke. Visit @CDCgov for info on #stroke, risk factors, & treatment. #StrokeChat http://1.usa.gov/1Hwea3C

35. A8: Make control your goal with our #BloodPressure toolkit! #StrokeChat http://1.usa.gov/1GEo1VD

    Image:

36. A8: Check out @CDCgov's website to learn more about what your #BloodPressure numbers mean: http://1.usa.gov/1QreFyq #StrokeChat
37. A8: Our fact sheet gives tips on how to talk with your loved ones about managing #BloodPressure. #StrokeChat http://1.usa.gov/1jLWOqn
38. #Stroke affects everyone differently. View our new fact sheets to learn your risks: [Insert link] #StrokeChat
39. Check out our new #stroke video series to learn more about the signs & symptoms of stroke: http://bit.ly/1Hbd3SD #StrokeChat
40. Stroke kills 2x as many women as breast cancer every year. Understand your risks. http://1.usa.gov/1FDygJq #StrokeChat

    Image:

Additional Tweets:

41. Thanks for all of the great #StrokeChat! Visit our #WorldStrokeDay page for videos, fact sheets, & infographics. http://1.usa.gov/1MhhPze
42. Great #StrokeChat today! Visit our #WorldStrokeDay event page for more resources, videos, & fact sheets. http://1.usa.gov/1MhhPze

V. Post Discharge Data Collection Technical Guidance

In an effort to facilitate the understanding of currently available options for post-discharge data collection a technical guidance document was created with information on a range of data collection options categorized by low, moderate and higher cost and the resources needed for implementation. Grantees are not limited to the technology alternatives presented but are encouraged to utilize a data collection option that meets the needs of the state. At the end of the document, a **comparative analysis** of the technology options is provided. Here, criteria (cost, reliability, ease of delivering upgrades…) are weighted according to feedback from the Coverdell team however the excel spreadsheet is also included to allow grantees to change the weights to meet their needs.

Outline

Data Driven Improvements to Reduce Stroke Readmission

This document contains guidance to help implement DHDSP FOA (CDC-DP15-15-14) technology options for Data Driven Improvements to Reduce Stroke Readmissions.
The information provided is not intended to be comprehensive. The purpose of the information is to facilitate understanding of some of the current technology options available to grantees. Information includes a range of technology options categorized by low, moderate, and higher cost and resources needed for implementation. Grantees should review the technology alternatives presented and choose a technology option (not limited to the options presented) that best meets the identified needs. Further information is provided in Appendix A which is attached to this document.

As part of evaluating which technology solution to implement, each grantee should work with their participating hospitals to determine current technical capabilities and available resources,

and align that with the requirements provided in the requirements guidance document (CDC-DP15-1514) for the FOA. See (Appendix A) for comparative analysis of technology options. Grantees are expected to use the chosen technology to implement a 30-day follow-up data collection at participating hospitals, transmit these data to state health departments. At a future date, states are expected to merge these data with the American Heart Association's "Get with the Guidelines" data.

Low Cost Technology Alternatives

Survey Tool: Epi Info™ with Microsoft Access Database on Backend

Epi Info™ is a simple tool that allows the rapid creation of data collection instruments, data analysis, visualization, and reporting using epidemiologic methods. Epi Info™ is easily used in places with limited network connectivity or limited resources for commercial software and professional IT support. This is a free tool developed by CDC to be used for data collection by physicians, nurses, and epidemiologists and is available as a free download at the link here . The Epi Info™ product is provided as a suite of tools and is built to use Microsoft Access as the backend database. Training is available for anyone designing data collection instruments, and is recommended. Also available is product call "OpenEpi", OpenEpi (www.OpenEpi) can be thought of as an important companion to Epi Info and to other programs such as SAS, PSPP, SPSS, Stata, SYSTAT, Minitab, Epidata, and R.

Data Collection: For the 30-day collection of data from Stoke patients, the Form Designer module of Epi Info™ can be used to create a survey instrument and data entry forms. With Form Designer, users place questions and data entry fields on one or many pages and tailor the data entry process with conditional skip patterns, data validation, and custom calculations programmed by the user using Form Designer's Check Code. The Enter module of Epi Info™ automatically creates a Microsoft Access database from the questionnaire in Form Designer. So as part of data collection users enter data, modify existing data, and/or search for records. Using the Enter module, the Forms are displayed and users perform the data entry while the Check Code validates the data or performs any automatic calculations that were specified in Form Designer. All of the data entered via the Form Designer module will be saved to the Microsoft Access database.

Submit to Health Department: The following low cost options can be utilized to transmit the Data from the Microsoft Access Database to the State Health Department:

1. Exported into an Excel, XML or text format and sent to the State Health Department via "Secure Mail."
2. Encrypt the Microsoft Access Database and send encrypted database to the State Health Department.

***Merge Data with "Get with the Guidelines Product":** Since the data collected is stored can be provided in various formats including as an Access database, at the state health department an Access Database can be used to import external data (e.g. Data from the "Get with the Guidelines" product), along with the data received from hospitals. The data can be joined using a query created in Access, utilizing the Hospital Identifier along with the Patient Identifier from both sets of data. Consolidated data can be exported from Access as Excel, XML, TEXT or .PDF format to meet whatever format is needed for further data analytics by external tools like Excel, SAS, SPSS or other third party software.

Reports and Analytics: Epi Info™ provides an Analysis module that can be used to read and analyze data entered with the Enter module or data imported from 24 different data formats. Epidemiologic statistics, tables, graphs, and maps are produced with simple commands such as READ, FREQ, LIST, TABLES, GRAPH, and MAP. As each command is run, it is saved to the program editor where it can be customized and saved, shared, and used in the future as data are revised. In addition, data can be exported from the Access as Excel, XML, TEXT or .PDF format to meet whatever format is needed for further data analytics by external tools like Excel, SAS, SPSS or other third party software.

Cost Summary:

Item	Approximate Cost
Epi Info™	Free download from CDC website
MS Access can be purchased as part of a Microsoft Office Professional bundle	$399.00
Development of Survey, Queries, Basic Reports	160 Man hours
On-Going Support	40 Man hours semi-annually

Installation and additional details: http://wwwn.cdc.gov/epiinfo/ ; http://www.openepi.com/BriefDoc/UsingOpenEpi.htm

"Disclaimer: Cost estimates are based on expert opinion. Note that true cost will depend on many factors, including experience and detailed planning. True cost may vary from estimates here. These estimates are best considered as a relative measure of cost and effort."

Survey Tool: Epi Info™ with Web-Enabled Data Collection

The Epi Info™ web product suite includes the Epi Info™ Web Survey System and two products that are expected for release in September 2015: Epi Info™ Web Analytics & Visualization and Epi Info™ Web Enter. These open source tools allow a survey designer to create and distribute survey questionnaires via web interfaces to collect information from participants over the internet, and selectively allow enclaves of data management, analysis, and collaboration. The ability to distribute and collect surveys remotely is unique to Epi Info™ 7 and provides survey designers access to a wide variety and number of participants. Questionnaires can be published to any properly configured web server hosted by your institution or an outside party. Surveys can be posted for anonymous data collection using Web Survey, or individual enclaves can be created using Web Enter where an organization can securely enter and manage data that is shared with a central host (such as a state). Mobile devices are supported. Web Analytics & Visualization allows configurable data sets to be accessed and incorporated into analytic dashboards, which can be shared with other users. At the central host, all data can be accessed from the traditional Epi Info desktop tool, with all of the included analysis and data export capabilities. Training is available for anyone designing data collection instruments, and is recommended.

Data Collection: The Epi Info desktop application is used to design questionnaires, including data validation check codes. Respondents access the questionnaire through a web interface, enter data and can manage previously entered data. All data is stored in a central SQL server at the host site. Security is configurable, e.g., if several organizations are participating security can be configured so that members

within one organization can see each other's data while data entered by other organizations is hidden. The host can see all data.

Submit to Health Department: When the health department hosts the web products, they have access to all data immediately as it is entered.

***Merge Data with "Get with the Guidelines Product":** Data can be exported in a variety of formats for merge with GWTG. Alternatively, since the data will be in a SQL database, the data can be joined using a query utilizing the Hospital Identifier along with the Patient Identifier from both sets of data. Consolidated data can be exported from Epi Info as Excel, XML, TEXT or .PDF format to meet whatever format is needed for further data analytics by external tools like Excel, SAS, SPSS or other third party software.

Reports and Analytics: Epi Info™ Web Analytics & Visualization provides a web analysis capability that can be used to read and analyze data entered with the Web Enter module or data otherwise imported. Dashboards consisting of the same set of Epi Info epidemiologic statistics, tables, graphs, and maps are produced via point and click. Dashboards can be saved and shared with other users. Saved dashboards update as the data is updated. Particular organizations can be configured to see and analyze only their own data.

Cost Summary:

Item	Approximate Cost
Epi Info™ Web Products	Free download from CDC website
Development of Survey, Queries, Basic Reports	160 Man hours
Web Server, OS, SQL Server	$2,400 per year
IT Support for Install	24 Man hours
IT Support for Operations & Maintenance	80 Man hours per year

Installation and additional details: http://wwwn.cdc.gov/epiinfo/ ; http://www.openepi.com/BriefDoc/UsingOpenEpi.htm

"Disclaimer: Cost estimates are based on expert opinion. Note that true cost will depend on many factors, including experience and detailed planning. True cost may vary from estimates here. These estimates are best considered as a relative measure of cost and effort."

Survey Tool: Mobile Devices

Mobile devices such as phones, tablets, and netbooks can be used efficiently for various types of surveillance and data collection including in-hospital quality-of-care surveys to field-based epidemiologic contact tracing. There are many survey software and platforms that allow an organization to build a customizable mobile data collection (MDC) survey ("apps") that meet the specific organizational and survey requirements. Mobile data collection has many advantages over tradition methods of data collection. "End-to-end" MDC makes make the data collection process easier and less resource intensive primarily by eliminating paper data transcription; data are cleaner because limits and skip logic can be built into the survey and inaccurate answers can be disallowed; entering and aggregating data are easier; costs are

reduced because there are no printing and transporting of paper surveys, and double entry and data cleaning are not necessary. To complement the benefits, MDC also introduces several issues. Determination of the survey software or platform requires well understood organization and survey requirements as well as performing a technology assessment by knowledgeable technical resources. Anticipate a learning curve and higher time/cost overheads compared to traditional methods for creating initial surveys. Data security and privacy are ever present concerns, especially for transmission of data over wireless connections. Physical security of mobile devices in busy follow-up clinics may be an issue. Advantages and issues must be considered and advice from a knowledgeable programmer or consultant is recommended.

Data Collection: There are many available platforms for MDC with different characteristics, ranging from open source to commercial-off-the-shelf (COTS) products. Once a software platform is selected, data collection devices bought, and a survey created, data collection can begin. A transactional database at the "backend" captures data from devices. At regular intervals, these data are imported to a master database, warehouse, or datamart. Transmission from mobile devices depends on the security requirements of the campaign, but a majority of data collection is sufficiently secure using the ubiquitous wireless internet protocols.
Submit to Health Department: Exporting data from the mobile device or the "backend" database can be done through Excel files or a CSV format. It is common practice, and required by HIPPA, to encrypt data from point-to-destinations. There are a variety of data security tools. The use of encryption at both the device level and during transmission can greatly mitigate security and privacy risks, but the use of digital data security tools, protocols, and good practices also are of great benefit. When data are sent over a network connection (e.g., wireless internet), it is recommended that the platform encryption should be 256-bit AES.
***Merge Data with "Get with the Guidelines Product":** Since data from the mobile device can be extracted using various formats, including an Excel database, it is straight forward to merge data at the state health department. An Excel, Access, or other similar databases can be used to import external data from the "Get with the Guidelines" tool. The Hospital Identifier and the Patient Identifier from both sets of data are then used to match the data.
Reports and Analysis: Almost all platforms provide some basic analysis and visualization tools. However, consolidated data can be exported as CSV, Excel, Access, XML, TEXT or .PDF format for further data analysis and reports using external tools such as SAS, SPSS, or open source software such as R.

Cost Summary:

Item	Approximate Cost
Low cost devices with limited capabilities can be purchased if desired	Varies with type of device
Programming Requirements	100 Man hours
On-Going Support	40 Man hours semi-annually

Survey Tool: Microsoft Office SharePoint Server

SharePoint is used worldwide to centralize knowledge, increase collaboration, develop applications on top of it, and realize actionable intelligence. SharePoint 2013 represents a major new release and contains additional functionality.

Data Collection: For the 30-day collection of data from stroke patients, SharePoint Server 2013 can be used to configure usage and health data to a logging folder and the logging database. The Health Data Collection Service Application collects data about usage. This information is used for health monitoring and also required for running the Web Analytics Service. Below are the methods to execute these functions:

- Configure usage and health data collection by using Central Administration
- Configure usage data collection by using Windows PowerShell
- Configure usage data collection for a specific event type by using Windows PowerShell
- Log usage data in a different logging database by using Windows PowerShell

Submit to Health Department: This low cost option can be utilized to transmit data from the SharePoint Server to the state health department by using Share Office Excel 2013. You can export a site, list, or document library in SharePoint 2013 by using the SharePoint Central Administration website or Windows PowerShell. The backup tool depends on the kind of environment deployed, backup schedule requirements, and service level agreements.

***Merge 30-day Follow-up Data with the "Get with the Guidelines Product:**

Reports and Analysis: Using SharePoint as a platform for data collection and reporting has expanded in the 2013 release. Integration between SharePoint and Excel is even tighter.

Cost Summary:

Item	Approximate Cost
Programming Requirements	
On-Going Support	

Additional Details about Office SharePoint Server 2013: http://www.c-sharpcorner.com/UploadFile/Roji.Joy/configure-usage-and-health-data-collection-sharepoint-2013/

Moderate Cost Technology Alternatives

Survey Tool: Access Database

In general, a Microsoft Access database can be used to develop relational database applications quickly and easily to help with collection and management of information. An Access database can be used to help track any kind of information, such as inventory, professional contacts, or business processes. Access comes with templates that you can use immediately to track a variety of information, making the process easy even for a beginner. Microsoft Access is one of the tools packaged in the professional suite of Microsoft Office tools. It can be installed optionally and utilized to provide data entry forms as well as

data storage. MS Access was built to support small groups (e.g., 2-10 concurrent users over a LAN, not for using over the web).

Data Collection: For the 30-day collection of data from Stroke patients, Access provides a wide variety of templates that can be used to speed up the database creation process. A template is a ready-to-use database that contains all of the tables, queries, forms, and reports needed to perform a specific task. For additional sophistication, macros and the Visual Basic Code for Applications (VBA code) can be modified to provide the required functionality. Forms can be designed with questions and data entry fields on one or more pages and the data entry process can be tailored with conditional skip patterns, data validation, and custom calculations programmed by the VBA developer. As part of data collection, hospital staff can enter data, modify existing data, and search for records. All data entered from forms created using Access are saved to the Access database as well.

Submit to Health Department: The following low cost options can be utilized to transmit the data from the Microsoft Access Database to the State Health Department:

1. Export into an Excel, XML or text format and sent to the State Health Department via Secure Mail
2. Export into an XML format and utilize PHINMS as a secure protocol to transmit the data
3. Encrypt the Microsoft Access Database and send encrypted database to the State Health Department

***Merge Data with the "Get with the Guidelines Product":** At the state health department an Access Database can be used to import external data along with data received from hospitals. Data can be joined using a query created in Access utilizing the Hospital Identifier along with the Patient Identifier from both sets of data. Consolidated data can be exported from Access as Excel, XML, TEXT or .PDF format to meet whatever format is required for further data analysis by external tools such as Excel, SAS, SPSS or other third party software.

Reports and Analysis: Access can be used to generate simple reports. Consolidated data can be exported from Access as Excel, XML, TEXT or .PDF format to meet whatever format is needed for further data analysis using external tools like Excel, SAS, SPSS or other third party software.

Cost Summary:

Item	Approximate Cost
MS Access can be purchased as part of a Microsoft Office Professional bundle	$399.00
Development of Survey, Queries, Basic Reports	200 Man hours
On-Going Support	40 Man hours semi-annually

Installation and Additional Details: Installation and Additional Details: http://office.microsoft.com/en-us/access-help/access-2010-database-tasks-HA101829991.aspx

Survey Tool: Basic Web Portal

A basic web portal can be used to collect and manage 30-day follow-up data. A variety of technologies could be used for this purpose including but not limited to PHP, JAVA and .Net with a back end database of MySQL, SQL Server or Oracle. While a web portal gives you complete flexibility in creating a user interface, one approach could be to leverage Open Source Survey packages like Survey™ to help create this portal. A user authentication mechanism can be built to manage hospital and health department staff to access the same portal.

Data Collection: For the 30-day collection of data from stroke patients, a variety of open source tools are available to speed up the survey module development process. Once an application is created based on this tool, changes can be made to tweak the code to perform a specific task or meet a specific requirement. Forms can be designed with questions and data entry fields on one or more pages and the data entry process can be tailored with conditional skip patterns, data validation, and custom calculations programmed by the developer. As part of data collection, hospital staff can enter data, modify existing data, and/or search for records.

Submit to Health Department: The following low cost options can be utilized for data transmission:

1. **Host the database at the State Health Department**. This hosting option will eliminate the need for data transmission from the hospital to the state health department. Both the hospital and the state health department will have varying levels of access to the data using the portal and will be able to download the data in a specific format.
2. **Host the database at a partner site that multiple state health departments could leverage**. This option will help by distributing costs. It will also eliminate the need for data transmission from the hospitals to the State Health Departments. Both the hospital and the state health department will have varying levels of access to the data using the portal to maintain data security and integrity and will be able to download data in a specific format.

***Merge Data with the "Get with the Guidelines Product":** A backend of choice can be used to import external data along with data received from hospitals. Data can be joined using a query, the hospital identifier, and the patient Identifier from both sets of data.

Reports and Analysis: A simple reporting tool could be added on to the web portal to generate reports. Depending on the technology chosen to build out the web portal, a variety of options are available. These reports would be used to generate simple reports to be used by hospital or state health department staff. Consolidated data can be exported from the Web Portal as Excel, XML, TEXT or .CSV formats to meet whatever format is needed for further data analysis by external tools like Excel, SAS, SPSS, or other third party software.

Cost Summary:

Item	Approximate Cost
Programming Requirements	
On-Going Support	

Higher Cost Technology Alternative

Survey Tool: Integrated Web Portal

An integrated web portal that interfaces with other systems can be used to automate many important but menial tasks that can otherwise frustrate fast-paced workers. A classic problem is referred to as "duplicate data entry," which often causes data entry errors. In the particular case of data collection for the stroke registry, duplicate data entry could occur if a nurse interviewer needs to collect 3-30 day data on a patient using a survey system that does not interface with the hospital EHR system. Questions asked for the survey are entered into the survey system, but they may have medical relevance requiring them to also be entered in the EHR system. In the case of a survey, where the same set of questions are asked to each patient, it can be pleasant and cost effective to automate the task of copying information from one system to the other. Simple rules can be sufficient to implement a filter that determines which data are copied.

Further integration with an analytics engine will allow seamless, accurate feedback to hospitals, showing their own summary data in addition to broader summary data (e.g., state-wide summary data). The value of implementing analysis into the data collection system is convenient feedback. Users can receive immediate feedback showing their own history, and if desired, the state can allow users to see any subset of the available data (e.g., only data that has been vetted by health department staff).

Data Collection: The integrated web portal will use the same collection methods as the web portal solution --a mixture of existing survey tools and minor development work-- however, this solution would be integrated with the hospital EHR, so basic patient information that is available in the hospital EHR will be able to pre-populate fields inside the web-based survey tool.

Submit to Health Department: (see web portal solution)

***Reports and Analysis:** Integrated analysis allows users at state health departments and hospitals to access, explore, and drill down into collected data with minimal delay to identify variances, anomalies, and trends. Analysis engines for this task can be brought in from low-cost startups such as Tableau, Pentaho, and SpagoBI or from stalwarts Oracle, IBM, and Microstrategy.

Security: EHR integration with a web-based solution can be accomplished securely using a variety of architectures to segregate access to the EHR from the wider internet and prevent exfiltration of sensitive data. Most importantly, each hospital's chief information security officer (CISO) would need to evaluate and accept a solution. A state that is considering this solution should contact CISOs at partner hospitals early in the planning process.

Cost Summary:

Item	Approximate Cost
Basic Web Portal Development	<copy from basic web portal when available>
EHR Integration	200 Man-hours per EHR system
Analytics Integration	120 Man-hours
On-Going Support	80 Man hours semi-annually

Survey Tool: Autodialer

Integrated automatic dialing was pioneered and matured in call center environments as a productivity enhancement for employees who spent significant effort making phone calls to clients. Without an autodialer, valuable time is spent looking up and dialing numbers, waiting for someone to answer, and verifying who has answered. Also consider that only a fraction of calls are answered. A well-regarded study in Operations Research[7] estimated that manual dialing typically results in useful phone interview time of 40 minutes per hour (33% idle time), while automated dialing can increase utilization to 57 minutes per hour (5% idle time). Due to the prodigious growth of the call center industry and related computer assisted telephone interviewing technologies, there are over 30 COTS vendors and six open source and academic options available. Here are a few options from academia, open source, and COTS products.

Data Collection: All options provide automated dialing, a full-featured user-friendly interface for data entry, and back-end survey support like versioning, complex analysis, and data export. COTS products such as SurveySystem and WinCati also make it possible for the state to host the system. With a hosted solution, individual hospitals would utilize the system via secure internet login. HIPPA-compliant options are available.

***Data Transmission, Submission to Health Department:** Solutions can be hosted at the state, where role-specific access is assigned so that a particular hospital has access to only the data that it collected, while the state may have access to all collected data. Since the data is collected and stored on state servers, there is no need to transmit, and submission may be a simple as a state employee accessing the data for reporting or export.

Reports and Analytics: COTS autodialer options have built-in reporting capabilities for telephone interviewing to monitor study progress and costs. Full analytics integration is available at extra cost, but generally is not included in this solution.

Cost Summary:

Item	Approximate Cost
Software Licensing	$52,000 startup and then $10,000 annual maintenance for 15 supervisor and 30 interviewing stations using WinCati solution hosted on state servers
Configuration	40 hours
On-Going Support	Included with software license

**Note: The hospital identifier and patient identifier must be provided as data entry fields to support linking these data to data collected previously by the "Get with the Guidelines" product when the stroke patient was discharged originally.*

[7] Douglas A. Samuelson, Interfaces, 29:5 September-October, 1999 (pp. 66-81)

Appendix: Comparative Analysis

Descriptions of Criteria Used for Comparative Analysis

Collect 30-day Follow-up Data
Technical solution allows hospitals to collect 3-30 day post-discharge data and transmit data to state health department. The format must allow the state to merge data from participating hospitals and conduct data analysis. It must be flexible enough to allow survey questions to be adjusted as necessary without compromising the analysis. This criterion is meant to encompass all business requirements not represented explicitly elsewhere in this list.

Telephone Interviews
Data collection is conducted over the phone by a hospital staff member with a patient or patient representative allowing for additional medical follow-up by hospital staff to identify and prevent complications.

Secure Data Transmission
Data transmission must use secure transport protocols to protect patient data. This criteria includes all relevant functionality, including message tracking, notification of receipt, and error reporting.

Data Privacy
Data not only are encrypted during transmission, but also while "at rest" whether the data are on a hard drive or any other medium.

Role-Based Security
Role-based authorization is required for users where roles may include (based on the selected implementation): System Administrator, Hospital Registry Staff, Data Analyst, and Report User.

Recoverability
The system must have basic backup functionality (i.e., it must be recoverable either through regular back-ups, mirroring, or other techniques employed by the state).

Implementation Cost
Estimated relative cost to implement the solution

Operations and Maintenance Costs
Estimated relative cost to operate and maintain the solution

Usability
The solution must be easy for hospital staff to learn and use

Reliability
Solution will function correctly without unforeseen outages for maintenance

Scalability
The system must be scalable to support new hospitals

Option Confidence
Overall confidence of the authoring team of experts in the solution's appropriate, predictable performance to satisfy business requirements

Easy to Deliver Upgrades
New system versions must be easy to distribute (or make available) to hospitals and synchronize across hospitals

Backwards Compatibility
System versions requiring changes to question sets should strive to be backwards compatible to support ongoing data analysis. If a new system version is not backwards compatible, this change should be discussed in advance and the strategy for handling the disparate data sets should be agreed upon by CDC staff and appropriate stakeholders.

Speed of Data Delivery
Delay by hospitals in delivery of data to state health department; highest standard considered for delivery within minutes, while satisfactory delay is within 24 hours.

Standards-Based Transmission
Solutions that require data transmission must structure the content in accordance with National standards, where available

Analytics Integration
Engine for data analysis is included with the solution

Auto-dialer Integration
The system could integrate with a CATI solution to automate call initiation, thereby reducing the time spent by hospital registry staff attempting to contact patients, and maximize the time spent conducting interviews once a patient was successfully reached by the CATI system

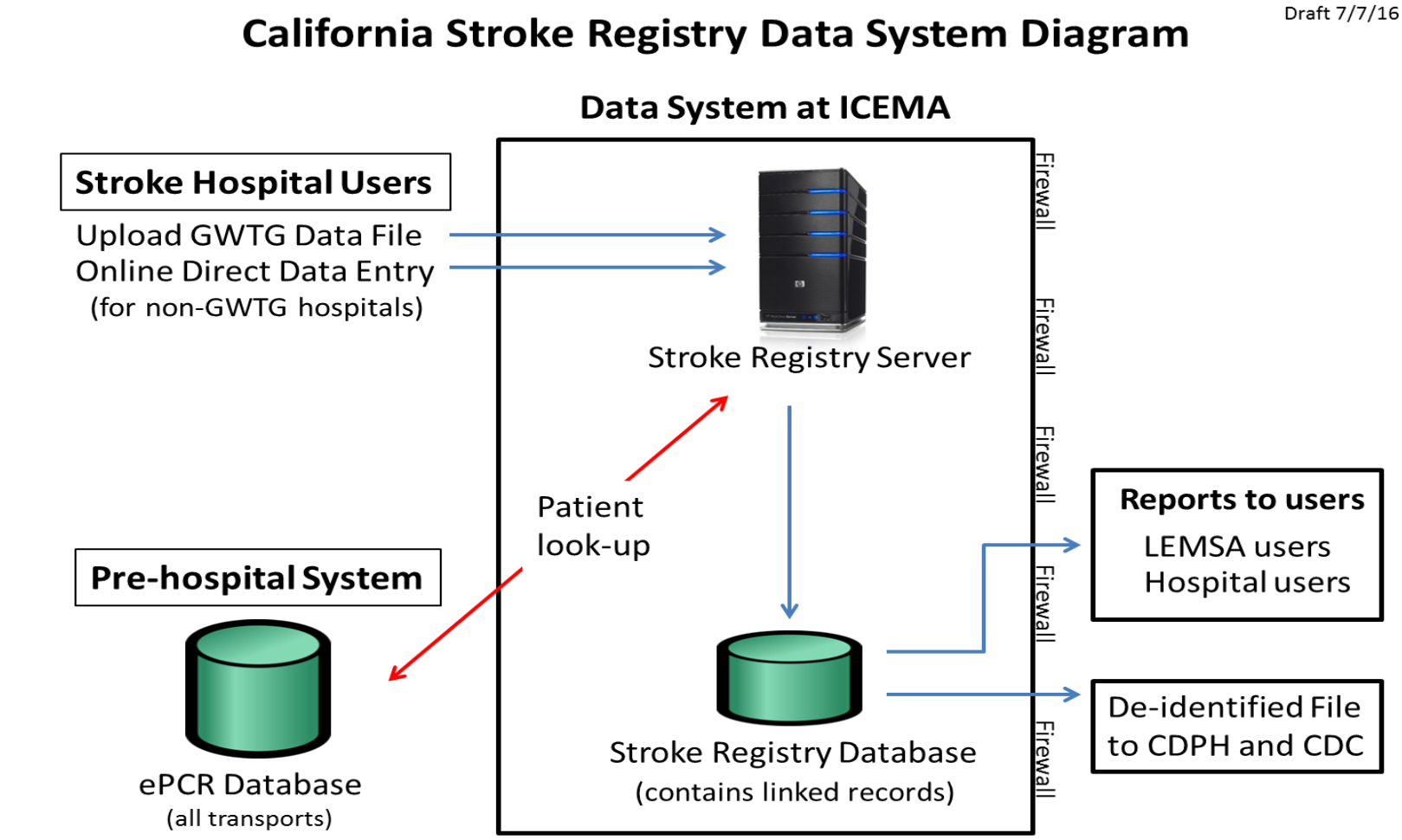
Comparative Analysis

Evaluation Criteria			Alternative Solutions							
			Low Cost			Moderate Cost			Higher Cost	
	Criterion	Weight	Survey Tool Freeware, Epi-Info	Epi Info Web-Enabled Product Suite	SharePoint Form	Basic Mobile Hardware Solution	Access DB	Web portal	Integrated Web Portal	Autodialer integration, aka CATI
Table Stakes	Collect 30-day follow-up data	n/a	✓	✓	✓	✓	✓	✓	✓	✓
	Telephone Interviews	n/a	✓	✓	✓	✓	✓	✓	✓	✓
	Secure Data Transmission	n/a	✓	✓	✓	✓	✓	✓	✓	✓
	Data Privacy	n/a	✓	✓	✓	✓	✓	✓	✓	✓
	Role-Based Security	n/a	✓	✓	✓	✓	✓	✓	✓	✓
	Recoverability	n/a	✓	✓	✓	✓	✓	✓	✓	✓
Must-Have Differentiators	Implementation cost	14.9%	10	8	7.5	2.5	5	5	2.5	2.5
	O&M costs	16.5%	10	8.5	2.5	7.5	7.5	7.5	5	5
	Usability	13.3%	5	7.5	5	7.5	5	5	7.5	10
	Reliability	10.2%	10	10	10	10	7.5	7.5	7.5	7.5
	Scalability	8.5%	7.5	10	7.5	2.5	2.5	10	10	10
	Option Confidence	18.1%	10	7.5	5	5	5	7.5	7.5	7.5
	Easy to deliver upgrades	9.0%	5	10	5	10	2.5	10	10	10
Nice-to-Have Differentiators	Backwards Compatibility	3.2%	7.5	8	5	5	5	5	5	10
	Speed of data delivery	1.4%	5	10	10	10	7.5	10	10	10
	Standards-Based Trans.	0.5%	2.5	7.5	2.5	7.5	7.5	7.5	7.5	10
	Analytics Integration	1.5%	5	10	2.5	2.5	0	0	10	0
	Auto-dialer integration	2.7%	0	0	0	0	0	0	0	10
Weighted Score			8.1	8.4	5.6	6.0	5.1	6.9	6.6	7.2
					** Scores on 0-10 scale, where			10 is highest and 0 is lowest		

Figure 1 Comparative Analysis of Technology Alternatives

W. Informatics Data Flow Diagrams for Each State

California:



Notes: The Patient look-up is performed by hospital personnel.
ICEMA is Inland Counties Emergency Medical Agency, a local EMS Agency (LEMSA) and the data system contractor.

Information to accompany the data flow diagram (especially the patient look up part):

We're building a "new" system (by adding a stroke module to an existing, working data system infrastructure for trauma, launched a couple of years ago at the state level here in CA). It includes a "patient look-up" feature, once the pre- and in- data are brought into the system – as well as a "reporting side" from which registered users (EMS and hospital personnel) can run semi-customizable "canned reports" when/how they want. For stroke, for the data system's "patient look-up" feature (designed to link, at the patient level for all EMS-transported patients, the in-hospital data [from GTWG] and the pre-hospital data [from the ePCR database]), the patient's first name and last name will need to be available (along with some other parameters already in the data). Since (we know that) hospital personnel, for the most part (or perhaps 100%), are not entering first name and last name into GWTG data (and only "relying on" the GWTG patient ID), the data system will not be able to do this linkage automatically. The thinking is that at the time of the patient look-up (once the pre- and in- data are in the system), the hospital staff member (performing the look-up) will have, locally, at her/his fingertips, some kind of a "codebook" (perhaps an Excel spreadsheet) which contains the GWTG patient ID as well as the first and last names. Then, when logged into the system (in order to do the patient look-up), that hospital staff member will (a) select an EMS-transported stroke patient from the GWTG database; (b) note that patient's GWTG patient ID; (c) get, from the codebook (which is separate – i.e., not in or a part of the system), the first and last name of the patient of interest (whose GWTG patient ID was just noted); (d) enter into the system the first and last names (i.e., fill in some "blanks" -- first and last name prompts -- within the system's graphical user interface); (e) "ask" for the system to locate and suggest the likely "match" from the ePCR database (which contains first and last names); (f) evaluate the system's suggestion(s); (g) "highlight" (i.e., select) the "match" for the given patient (if presented by the system); and (h) click on some sort of a "LINK" button. Then the system will make that linkage and write the record (containing both pre- and in- data) to a database. That resultant database will then be used for reporting out (i.e., via semi-customizable "canned reports" and as a datafile [stripped of identifiers]). The output (stripped) datasets could be used for analyses (both to drive QI and support tracking and research)…and can be used to meet the quarterly reporting requirements of the CDC.

- Note that our pre-hospital data source is the State's ePCR database – CA's NEMSIS data, which, as of 1/1/17 should be version 3.4 compliant, as per California Assembly Bill 1129 – California Health and Safety Code 1797.227; these data are collected by EMS providers (i.e., ambulance crews, firefighters, paramedics) and reported to the local EMS agencies – which, then, "build" the ePCR database as they report the data.

- Our in-hospital data standard is GWTG (all current CA Coverdell hospitals are GWTG hospitals) – and non-GWTG hospitals will be able to do direct data entry into the system, via an online data entry portal (that's part of the system).

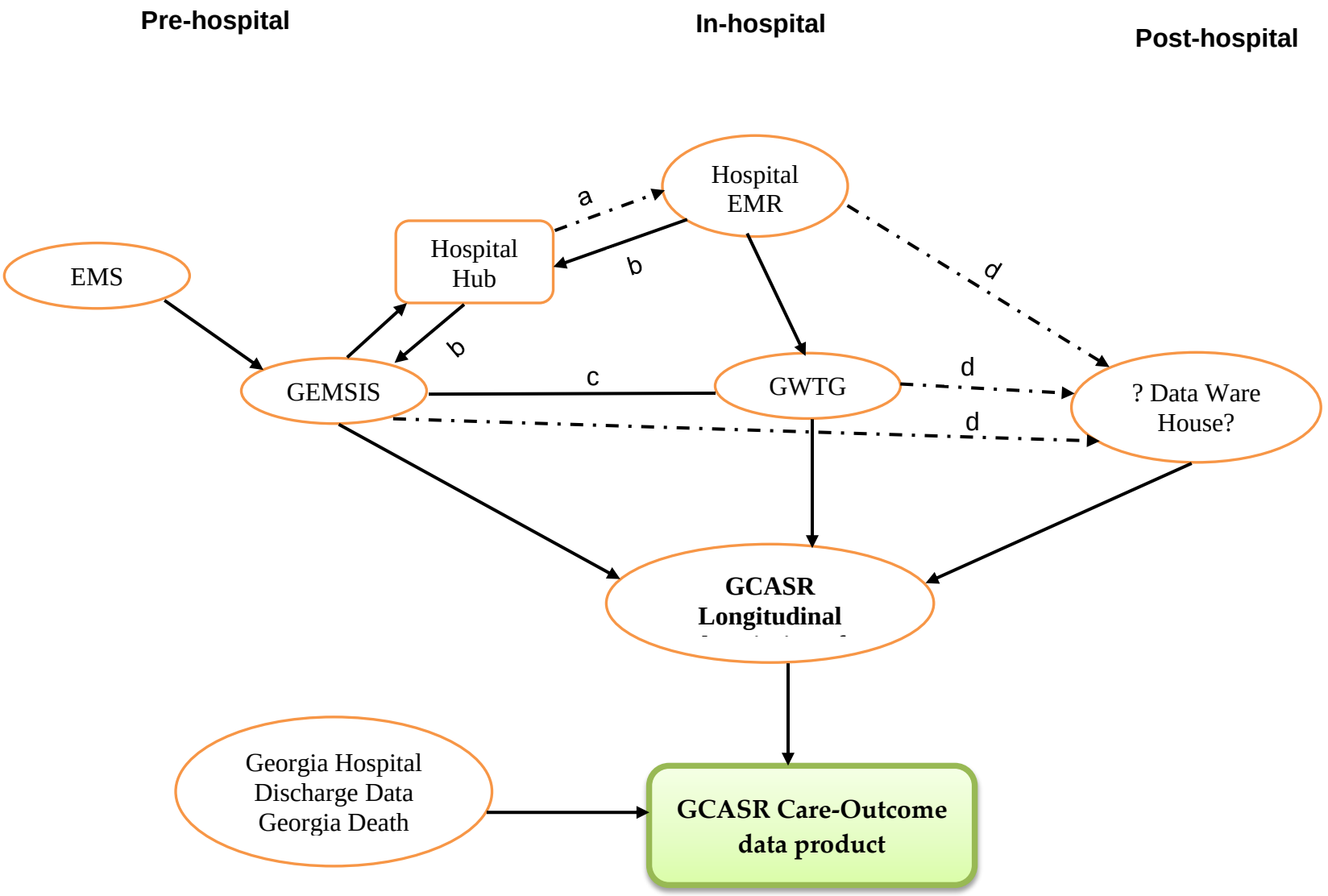
- The post-hospital piece, at this point, is not very developed and, therefore, not explicitly on this diagram…though our plan, at present, is to have a few partner hospitals collect these data and report them (into the system) using the same file upload/direct data entry options (shown on the diagram under Stroke Hospital Users).

- This system is being built by ICEMA, the Inland Counties Emergency Medical Agency – which is a local EMS agency here in CA with a high level of tech/scientific capacity (it's the same agency contracted to do the state's trauma system), under a contract with our Program. ImageTrend is ICEMA's subcontractor.

- Note that all of the data will reside on servers at ICEMA, which is operating under the auspices of the State EMS Authority (which is separate from Public Health, wherein the CA's Coverdell Program resides). The output data will be stripped of identifiers before they leave the ICEMA servers (i.e., before crossing the firewall) and are made available to the "outside" registered users).

At this time, we do not know the proportion of partner hospitals using Epic, Cerner, or any other system – this is a question on our hospital inventory and we're still receiving responses to that inventory (which is a Survey Monkey survey).

Georgia:


Pre-hospital
In-hospital
Post-hospital
Hospital EMR
Hospital Hub
EMS
GEMSIS
GWTG
? Data Ware House?
a
b
b
c
d
d
GCASR Longitudinal
Georgia Hospital Discharge Data Georgia Death
GCASR Care-Outcome data product

Note:-

a. The hospital hub serves a window for hospitals to look at information while patients are en-route to their door provided that the EMS enters the PCR data the GMSIS (the state EMS data ware house run by ImageTrend). However, as it currently stands, hospitals can't extract data electronically from GEMSIS through the hospital hub.
b. The hospital hub serves as a tool to give feedback to EMS agencies and hospital can enter information, including the Georgia LONGID a data element that will be used for data linkage, into GEMSIS.
c. The Georgia GWTG data has the Georgia LONGID as a data element so it would be feasible to link GEMSIS with the GWTG data.
d. What constitutes post-hospital stroke care, who provides post-hospital care and in what set-up, which care processes are amenable to quality improvement activities and which data elements need to be collected for measuring and monitoring the quality of post-hospital care are not yet clearly defined. So it has not yet been decided on the data structure and modality of data collection. We are in the early phase of conducting inventory of the current practices and we may end up having different services delivered by different professional groups and entities. Therefore, it is possible that we may collect data from current GCASR hospitals either directly or through GWTG, community paramedics via ImageTrend and directly from care providers.

- Listing EMS, inhospital and post hospital vendors (for data collection) that states are planning to work with.

  We do not have a plan to work with any one the vendors, except ImageTrend, in the short-term. We use GWTG for in-hospital data and the hospital inventory would inform us what electronic health record system each hospital is using. I have attached the list of vendors for the pre-hospital care component and the number of EMS agencies served by each vendor. Each EMS agency is required to dump their data to the state EMS data system (GEMSIS) which is supported by ImageTrend.
  We are in the process of identifying the components of post-hospital stroke care, including rehabilitation, hospice care and home care, and determining who provides these services. The next step will be defining the care components that are amenable to evidence-based quality improvement initiatives and gather related data useful for monitoring the quality of care. We believe, the post-hospital care components are diverse, and each care component and provider would have different information need and data collection system. Therefore, we need to determine the services before entertaining the use of any data platform.
- Examining the various tool options and updating the categories section based on your experiences. New categories can also be added if any are missing.

  The purpose of integrating the different data sources are two:
  - To make patient-related information readily available for clinicians caring for patients. Therefore, ED personnel (in-hospital care) need to get access to information on what the paramedics did (pre-hospital care) enroute to the hospital. Likewise, post-hospital care providers (rehab personnel, PCPs, social workers, speech therapist, community paramedics, etc.) need to get access to the information related to in-hospital and pre-hospital care.

- To establish a static database capturing the longitudinal care of stroke patients to monitor the quality of care at each phase and evaluate the impact of quality improvement on patient outcome.

  In line with this, we would say a section on the dynamic nature of data integration is missing. For the static data, we would suggest inclusion of hospital discharge data and death data as an excellent source of patient outcome.

- Determining the percentage of Coverdell hospitals use Epic and/or Cerner systems in your state

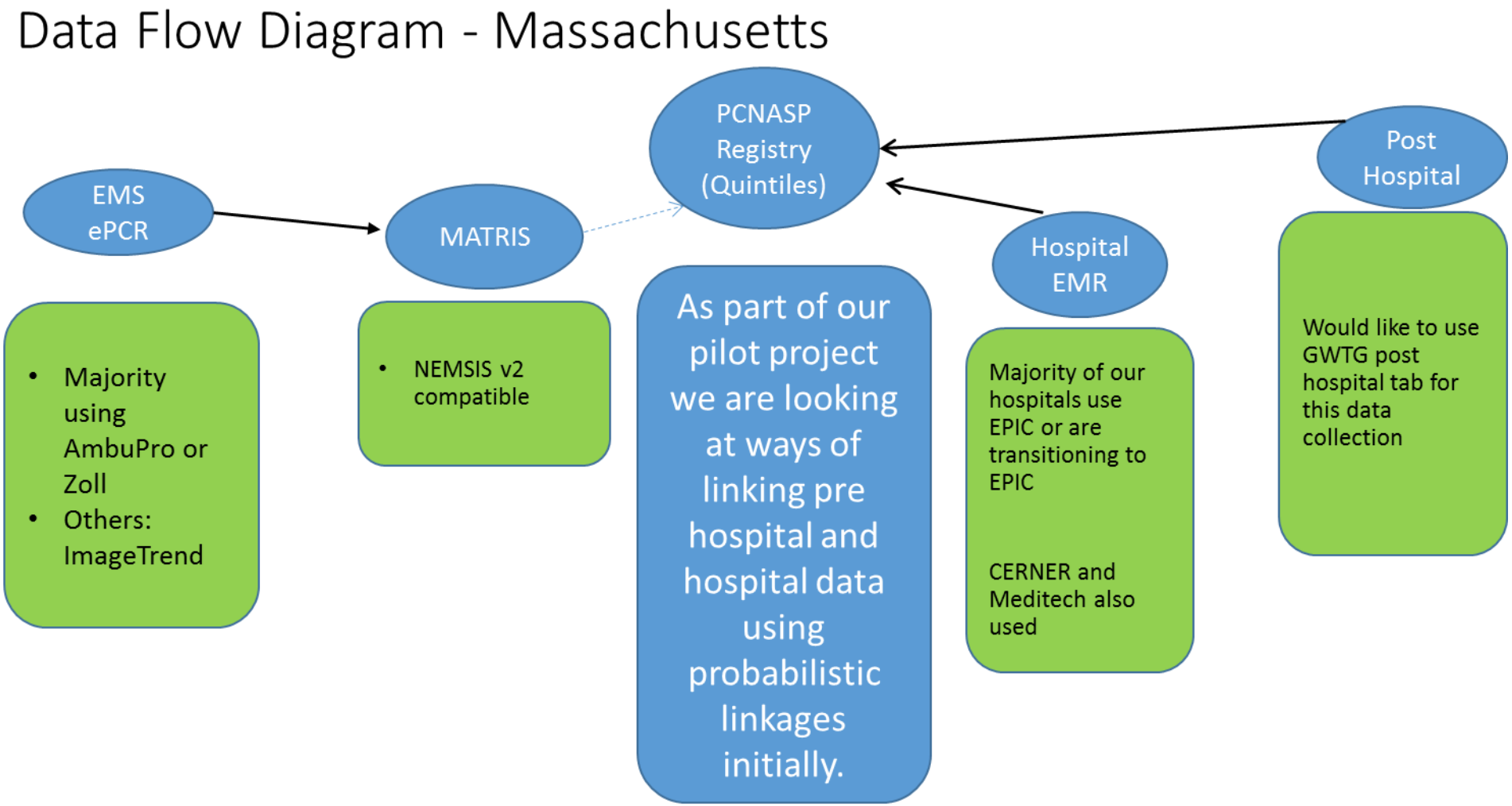
  We have to wait for the hospital inventory to be completed to get the right answer.

- Mention interest, if any, in setting up a webinar to discuss any tool/partner in particular – like Image Trend, RedCap, NEMSIS, GWTG etc.

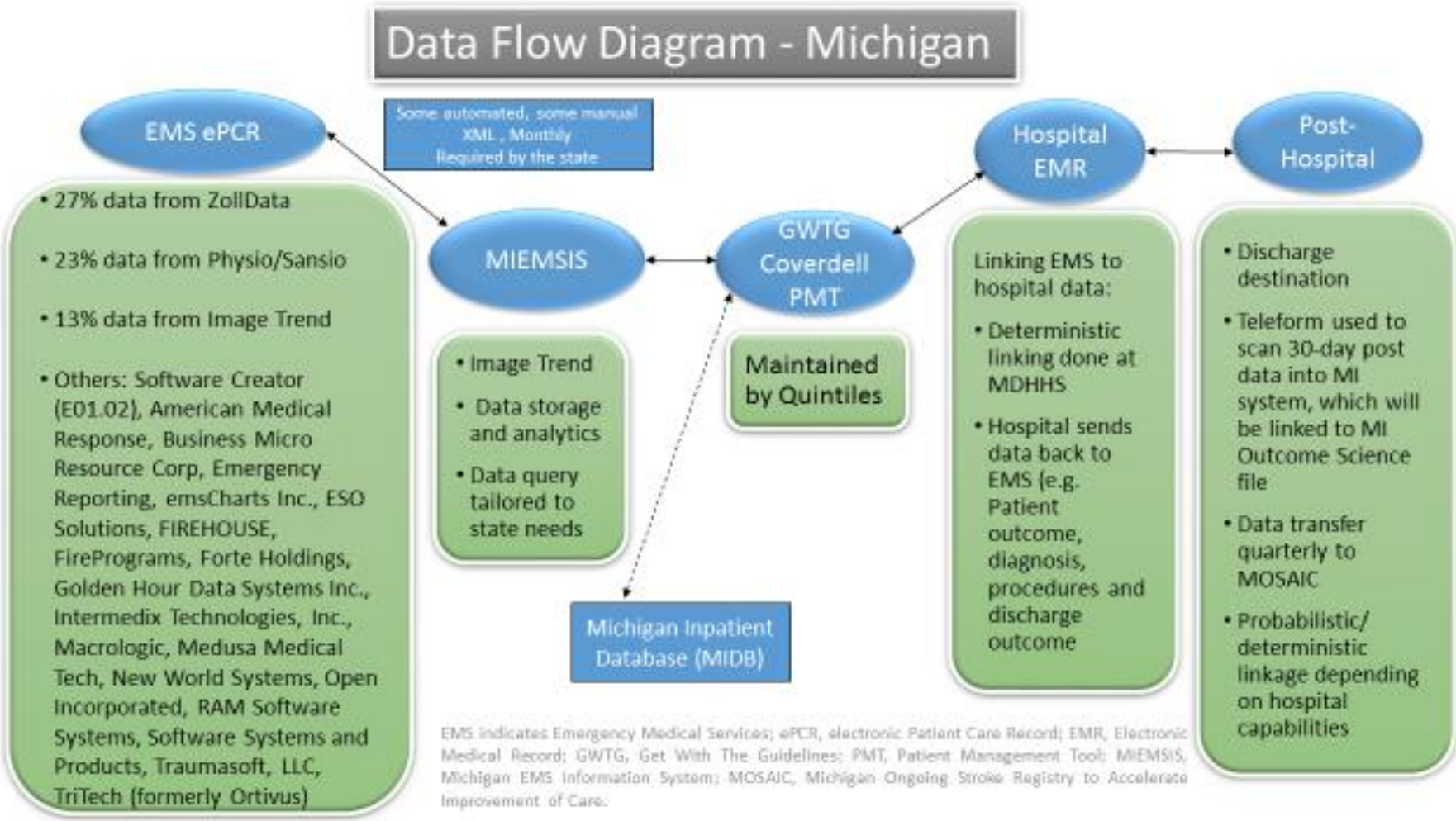
  Members of our team are out of office at this time, I will report on this when they return

NOTE: EMS vendors who work with Paul Coverdell hospitals in GA are listed in an excel file called “GA EMS Software Vendors.xlsx”.

Massachusetts:

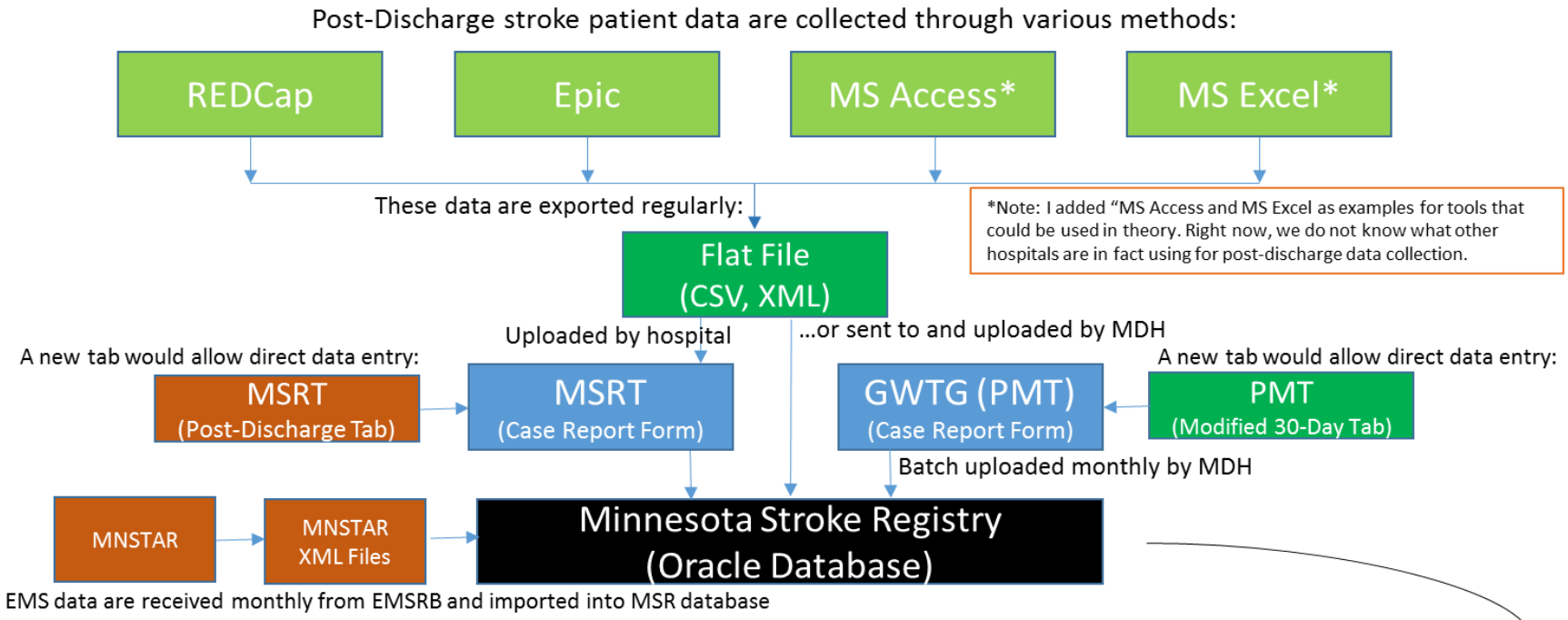


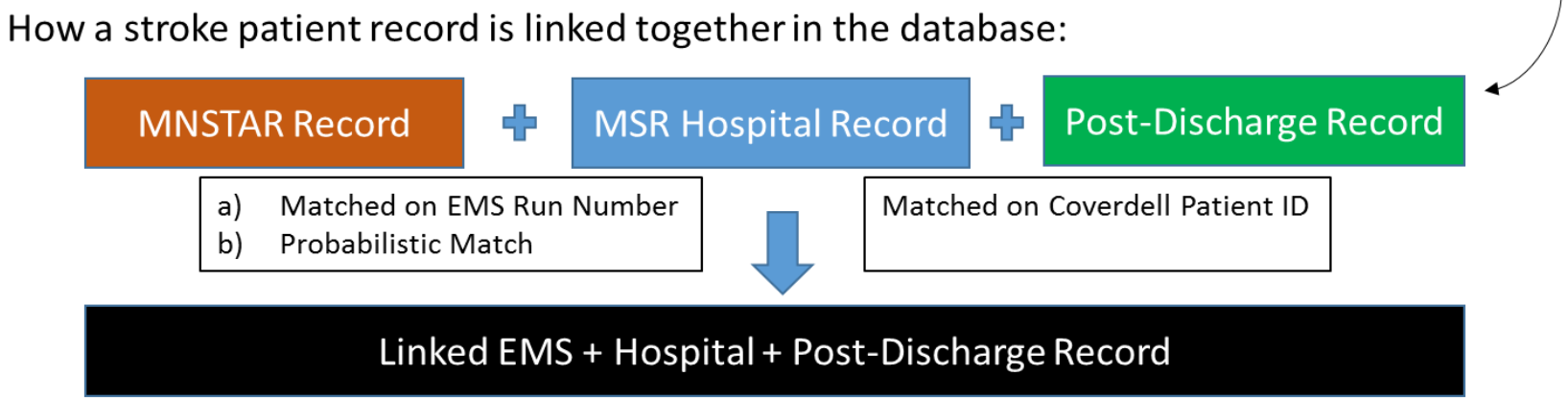
Michigan:


Data Flow Diagram - Michigan
EMS ePCR
Some automated, some manual
XML , Monthly
Required by the state
Hospital EMR
Post-Hospital
• 27% data from ZollData
• 23% data from Physio/Sansio
• 13% data from Image Trend
• Others: Software Creator (E01.02), American Medical Response, Business Micro Resource Corp, Emergency Reporting, emsCharts Inc., ESO Solutions, FIREHOUSE, FirePrograms, Forte Holdings, Golden Hour Data Systems Inc., Intermedix Technologies, Inc., Macrologic, Medusa Medical Tech, New World Systems, Open Incorporated, RAM Software Systems, Software Systems and Products, Traumasoft, LLC, TriTech (formerly Ortivus)
MIEMSIS
GWTG Coverdell PMT
• Image Trend
• Data storage and analytics
• Data query tailored to state needs
Maintained by Quintiles
Michigan Inpatient Database (MIDB)
Linking EMS to hospital data:
• Deterministic linking done at MDHHS
• Hospital sends data back to EMS (e.g. Patient outcome, diagnosis, procedures and discharge outcome
• Discharge destination
• Teleform used to scan 30-day post data into MI system, which will be linked to MI Outcome Science file
• Data transfer quarterly to MOSAIC
• Probabilistic/ deterministic linkage depending on hospital capabilities
EMS indicates Emergency Medical Services; ePCR, electronic Patient Care Record; EMR, Electronic Medical Record; GWTG, Get With The Guidelines; PMT, Patient Management Tool; MIEMSIS, Michigan EMS Information System; MOSAIC, Michigan Ongoing Stroke Registry to Accelerate Improvement of Care.

1. Drafting a flow diagram based on the general model presented or create their own.	**See state diagram**
2. Listing EMS, in hospital and post hospital vendors (for data collection) that states are planning to work with.	**See state diagram**
3. Determining the percentage of Coverdell hospitals use Epic and/or Cerner systems in your state.	**We include this question in the Inventory survey.** **(Epic 25%)** **(Cerner 25%)** **The percentage will be updated when we receive additional data.**
4. Setting up a webinar to discuss any tool/partner in particular – like Image Trend, RedCap, NEMSIS, GWTG etc.	**We are interested in exploring all options for linked data sources.**

Minnesota


Post-Discharge stroke patient data are collected through various methods:
REDCap
Epic
MS Access*
MS Excel*
These data are exported regularly:
*Note: I added "MS Access and MS Excel as examples for tools that could be used in theory. Right now, we do not know what other hospitals are in fact using for post-discharge data collection.
Flat File (CSV, XML)
Uploaded by hospital
...or sent to and uploaded by MDH
A new tab would allow direct data entry:
MSRT (Post-Discharge Tab)
MSRT (Case Report Form)
GWTG (PMT) (Case Report Form)
A new tab would allow direct data entry:
PMT (Modified 30-Day Tab)
Batch uploaded monthly by MDH
MNSTAR
MNSTAR XML Files
Minnesota Stroke Registry (Oracle Database)
EMS data are received monthly from EMSRB and imported into MSR database


How a stroke patient record is linked together in the database:
MNSTAR Record
MSR Hospital Record
Post-Discharge Record
a) Matched on EMS Run Number
b) Probabilistic Match
Matched on Coverdell Patient ID
Linked EMS + Hospital + Post-Discharge Record

1) Examine the various tool options and update the categories section based on your experiences. New categories can also be added if any are missing.

   No additions at this time.

2) List EMS, in-hospital and post-hospital vendors (for data collection) that states are planning to work with.

   - EMS vendor is our MNSTAR system. In-hospital is the Minnesota Stroke Registry Tool and Patient Management Tool. Post-Hospital will be the Minnesota Stroke Registry Tool, receiving data from REDCap and exported data from Epic.

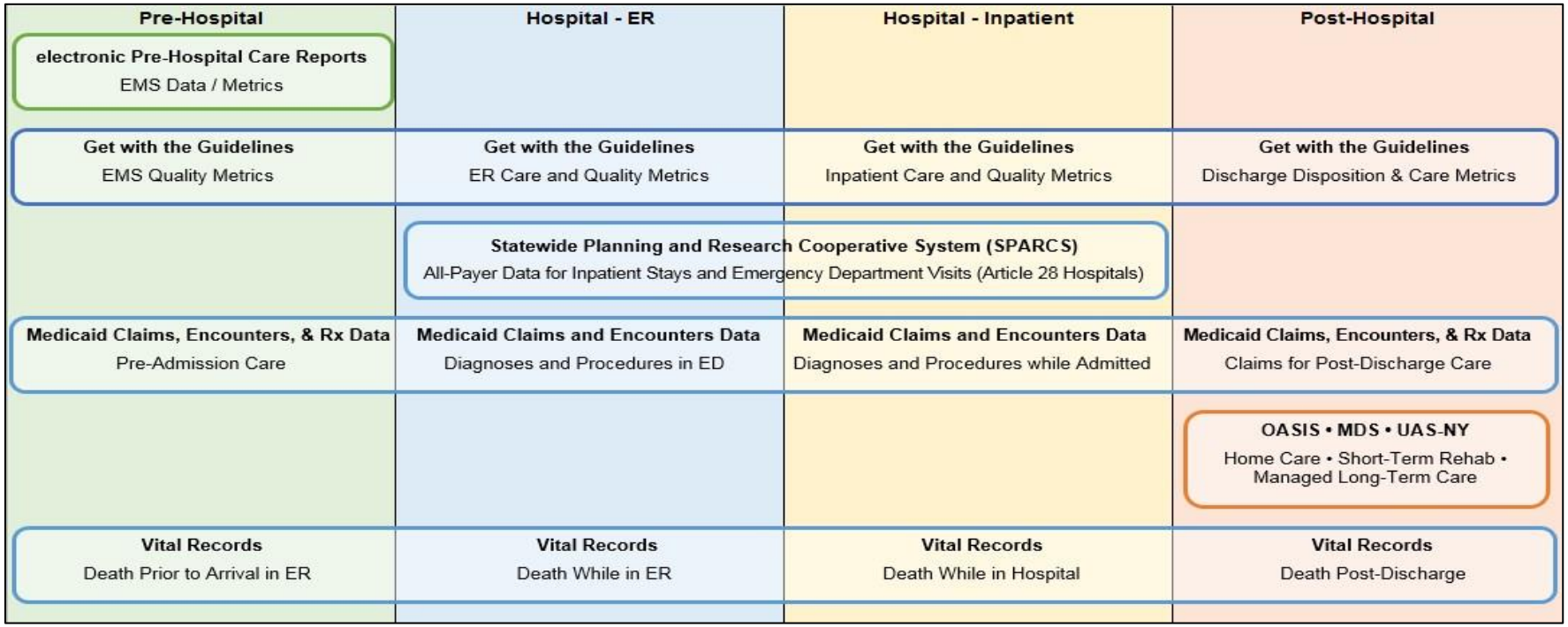
3) Determine the percentage of Coverdell hospitals use Epic and/or Cerner systems in your state.

   - Of 64 Coverdell hospitals, I estimate 90% are using Epic. I'm not aware that any are using Cerner.

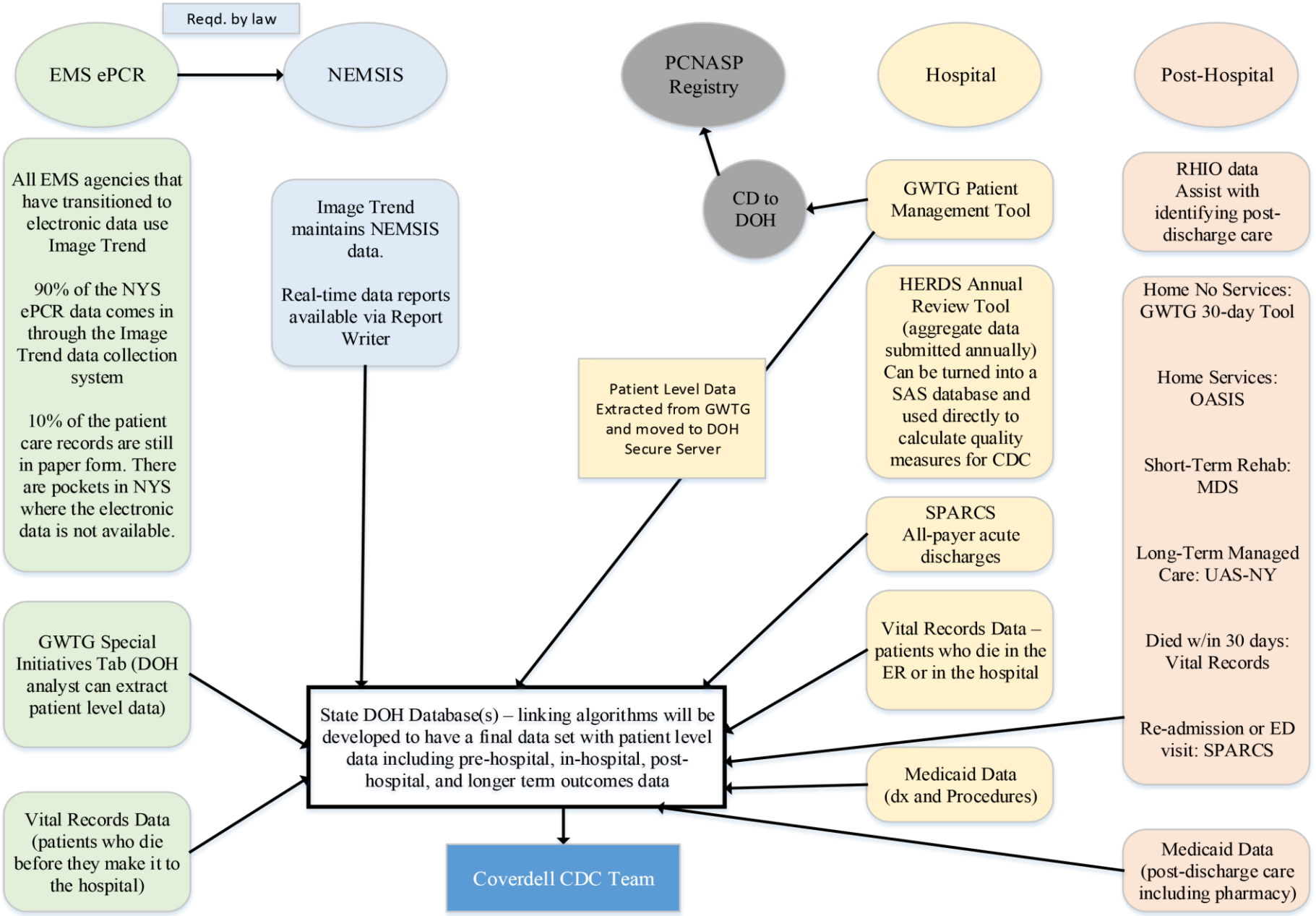
4) Mention interest, if any, in setting up a webinar to discuss any tool/partner in particular – like Image Trend, RedCap, NEMSIS, GWTG etc.

New York

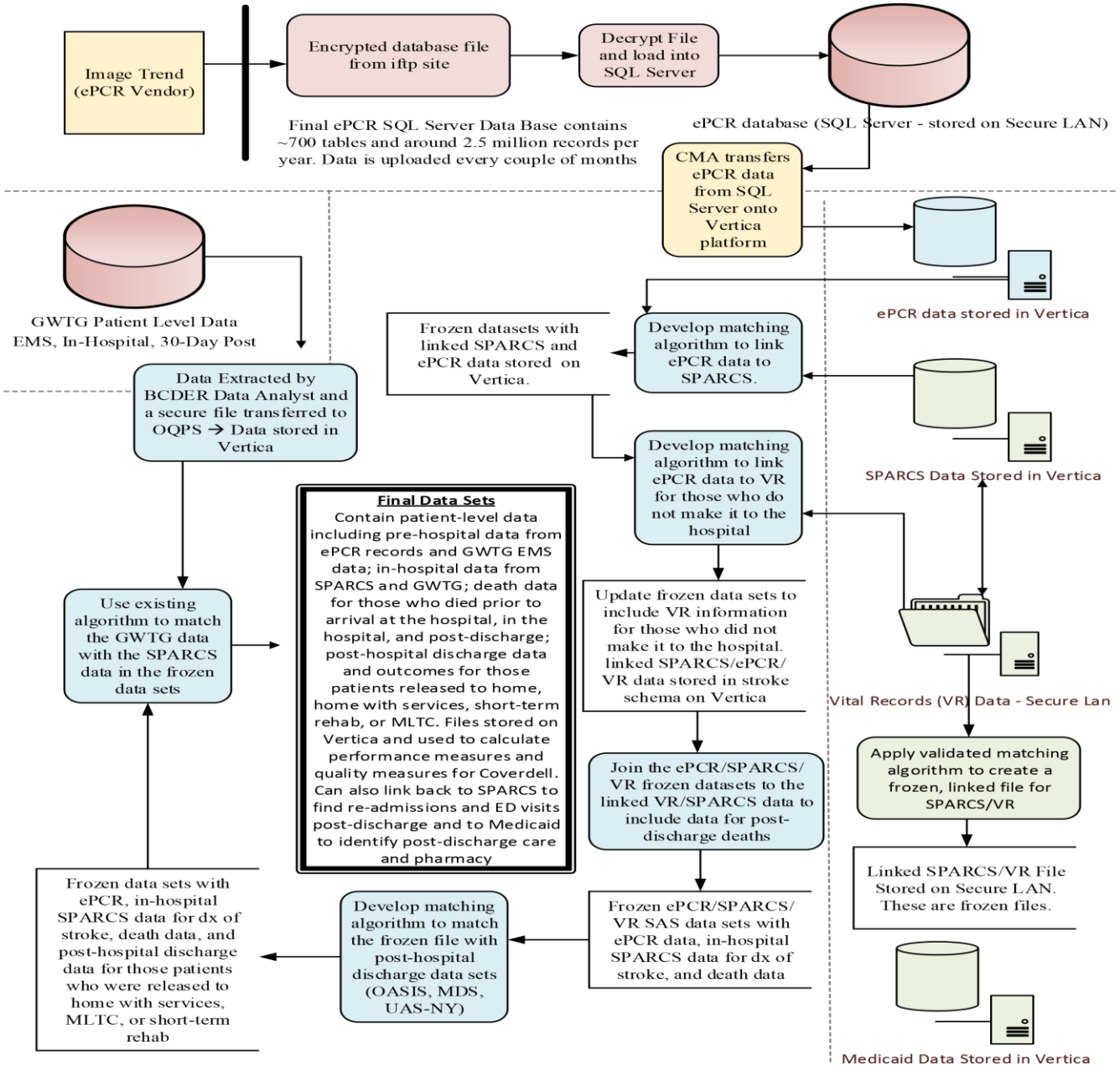
Figure 1 shows all of the data sets that the NYS Coverdell team plans to use along with the type of data included in the data sets. In addition, two data flow diagrams (one high level and one detailed) are included as separate documents. The detailed diagram shows how the final state data sets will be created.



Simplified Data Flow Diagram



Detailed Process Flow



1. Examining the various tool options and updating the categories section based on your experiences. New categories can also be added if any are missing.

Table 1 contains a summary of each data collection tool mentioned during the last all-state Coverdell call and the type of data the NYS team will collect using the tool. Detailed information for each data tool follows the table.

Table 1. Data Tools and Their Use – NYS Coverdell Team

Data Tool	Used For…
EMR Indigenous	Post
State's Tools	Pre, In, Post
Get With the Guidelines – In Hospital	In
Get With the Guidelines – EMS	Pre
Image Trend	Pre
EpiInfo	Not Using
Get With the Guidelines – 30-day Tool	Post
RedCap	Not Using
SMART on FHIR	Undecided

EMR Indigenous

The NYS team has alternative ways to collect data for the in-hospital quality measures; therefore, there is no plan to use EMRs for these measures at this time. The team is exploring the possibility of using EMR data for **post-hospital** quality of care measures since follow-up visits will take place at primary care practices and not at the hospital the patient was treated at when experiencing the stroke. It is anticipated that the hospitals may be able to make use of data submitted to their regional health information organization (RHIO) from the primary care providers in their region to identify follow-up care that has taken place for their patients. NYS has nine RHIOs "that enable the secure and interoperable exchange of health information." At present, 30 of the 56 Coverdell hospitals (54%) participate with the RHIO that serves their area. The NYS team is exploring the possibility of a regional pilot project in the latter years of the Coverdell grant to make use of the RHIO data to report on the post-hospital measures.

State Tools

Health Emergency Response Data System (HERDS) Data [pre, in]

All of the hospitals participating in the Coverdell program are also NYS stroke centers. All stroke centers in NYS are required to submit their annual review tool in February/March in order to maintain designation. This annual review tool confirms that the stroke centers continue to meet the key criteria for being a stroke center but also collects data on twelve key performance measures, five time targets, five EMS measures, and patient disposition from each stroke center for the previous calendar year. This data can be used for some of the **pre-hospital** and **in-hospital** quality measures. This data is currently collected annually so there is a one year lag. The OQPS portion of the Coverdell team is responsible for this data collection from all NYS stroke centers and has access to the data. The Bureau of Chronic Disease Evaluation and Research portion of the Coverdell team is responsible for submitting the data for those hospitals that participate in the Coverdell program using Get with the Guidelines.

Statewide Planning and Research Cooperative System (SPARCS) Data [post, pre]

SPARCS is a comprehensive all-payer hospital discharge database with patient-level detail on demographics, diagnoses, treatments, services, and charges for every acute care hospital discharge, emergency department visit, hospital-based outpatient and ambulatory surgery visit in New York State. This data can be used to calculate some of the **post-hospital** measures such as ED visits and inpatient re-admissions following a discharge with a primary diagnosis of stroke. This data can also be linked to the ePCR data (see below) to identify the percentage of cases that were suspected stroke transports where the EMS primary impression agreed with the hospital diagnosis. It can also be linked to the Vital Records data to determine the percentage of patients discharged to home who died within 30 days. There is a six-month lag with this data. It is deemed complete and processed for the previous calendar year at the end of July in the next year. This data set is owned by the Office of Quality and Patient Safety and members of the Coverdell team in OQPS have access to the data.

ePCR Data [pre]

The electronic patient care record data includes patient-level data for all ambulance calls in New York State. This data set contains the National EMS Information System Data Elements that are required by the NYSDOH. The data is owned by the Bureau of EMS. It is collected through Image Trend and transferred to a secure SQL server in the Office of Primary Care and Health Systems Management on a quarterly basis. This data can be used alone and in conjunction with the SPARCS data to calculate the **pre-hospital** quality measures. The typical lag time for data to be uploaded into the Image Trend database from the EMS providers is 24 to 48 hours; however, it can be as long as one month. There is a three month lag for the data to be transferred to the secure SQL server. The Coverdell team is working on data use agreements that will allow the OQPS team members to have access to the patient-level ePCR data and link it to SPARCS, Vital Records, and the post-hospital care data sets described below.

New York Uniform Assessment System (UAS-NY) [post]

The UAS-NY data is used to support care planning and service delivery for members of Medicaid Managed Long-Term Care (MLTC) health plans. It includes the results of the community assessment along with the results of the functional and mental health supplements. The assessments are performed every six months. The data can be used to calculate some of the **post-hospital** quality measures for the subset of patients who are enrolled in MLTC plans. There is essentially no lag time between when the assessment is administered and the data is available. The UAS-NY data set is owned by the Office of Quality and Patient Safety and is available for use by the OQPS members of the Coverdell team.

CMS Minimum Data Set (MDS) [post]

The MDS is used to support care planning for patients in short-term rehabilitation centers. It is an all-payer, patient-level data set that contains the results of the resident assessment instrument which is administered every 90 days. The data can be used to calculate some of the **post-hospital** quality measures for the subset of patients who are discharged to short-term rehabilitation centers. The MDS data set is owned by the Division of Home and Community Based Services (DHCBS). Some of the OQPS members of the Coverdell team have data use agreements in place with the DHCBS and have access to the MDS data set.

Vital Records [post]

The vital records (VR) data includes all birth and death certificates. This data can be linked with the SPARCS data to identify those stroke patients who died within 30 days. The vital records data is owned by the Office of Quality and Patient Safety. The OQPS members of the Coverdell team are working on completing the data use application to get access to this data and use the linked SPARCS/VR files. There is a one-to-two year lag in this data.

Other Data Sets

In addition to the data sets listed above, the OQPS members of the Coverdell team have access to the Medicaid data which can be used for **post-hospital** measures for Medicaid members (9month lag). The OASIS data which is an all-payer database for patients released to home care with services (2-year lag) is also available to help calculate some of the **post-hospital** quality measures.

Get with the Guidelines – In Hospital

All of the NYS stroke centers that are participating in the Coverdell program use Get with the Guidelines to capture in-hospital patient-level data. In addition, the NYSDOH Coverdell team has super-user access and a Get with the Guidelines analyst housed in the Bureau of Chronic Disease Evaluation and Research. This data has a short lag time (up to 3 months for some hospitals) and can be used to report on **in-hospital** quality measures.

Get with the Guidelines – EMS

All NYS stroke centers began collecting data on five EMS measures in January 2015. These measures include administration of the Cincinnati stroke scale; whether pre-notification occurred; if pre-notification occurred, whether it included last known well and/or stroke scale results; and whether or not the stroke team was activated when EMS pre-notified the stroke center. This data is entered into the special initiatives tab in Get with the Guidelines. In addition, Quintiles created reports so that the stroke centers can easily extract the data for reporting purposes. The NYSDOH Coverdell team has access to this data for all of the stroke centers that are participating in Coverdell. The data can be used to report on some of the **prehospital** quality measures.

Image Trend

Image Trend is the vendor that the Bureau of EMS uses for collection of electronic patient care record data from the EMS providers across NYS. The NYS Coverdell team is exploring whether some of the Image Trend standard tools can be used to help support reporting on the **pre-hospital** quality measures. These tools include Report Writer and Hospital Hub. Report Writer allows the user to access the ePCR data in real-time and provide data summaries. Hospital Hub allows patient data to be sent to the hospital while in route and facilitates transfer of the EMS data into the EHR. In addition, the NYS Coverdell team is considering using carryforward funds to help some remote EMS agencies convert from paper to electronic records by working with Image Trend. This will increase the percentage of patient care records in NYS that are submitted electronically and will enhance data collection to support reporting of the pre-hospital measures.

Get with the Guidelines – 30 Day Tool

The NYS Coverdell team is participating in the pilot project for the 30-day patient follow-up survey that Massachusetts developed. This will give the NYS Coverdell team access to posthospital data for those patients discharged to home without additional services. This is a subset of those patients diagnosed with stroke for whom we do not currently have access to **posthospital** discharge data. It is the team's understanding that the CDC is working with Quintiles to develop a 30-day follow-up tab on which the patient follow-up data can be entered along with reports to extract the data. Those stroke centers that choose to participate in the pilot project will use this tab to enter the post-hospital discharge data from this survey.

SMART on FHIR

The NYS Coverdell team is waiting until the results of the proof of concept study are presented to make a decision about use of this data collection tool.

3. Listing EMS, in-hospital and post hospital vendors (for data collection) that states are planning to work with.

The NYS Coverdell team is not planning to work with new vendors for data collection. The NYSDOH Bureau of EMS will continue to work with Image Trend to collect the ePCR data from the EMS providers; however, this work is independent of the Coverdell grant. The NYS Coverdell team is pursuing an option to work independently with Image Trend to expand electronic patient care record utilization in NYS. In addition, the NYSDOH team will continue to work with Quintiles to ensure that Get with the Guidelines continues to support the Coverdell work in NYS.

4. Determining the percentage of Coverdell hospitals use Epic and/or Cerner systems in your state.

Table 2 shows the EMR systems that are currently being used by the NYS stroke centers participating in the Coverdell program based on the self-reported data from the hospital inventory survey. There are a total of 22 stroke centers that report using Epic, Cerner, or both EMR systems. This is 39% of the NYS stroke centers participating in the Coverdell program for the current funding period.

Table 2. EMR Systems Being Used by NYS Coverdell Hospitals

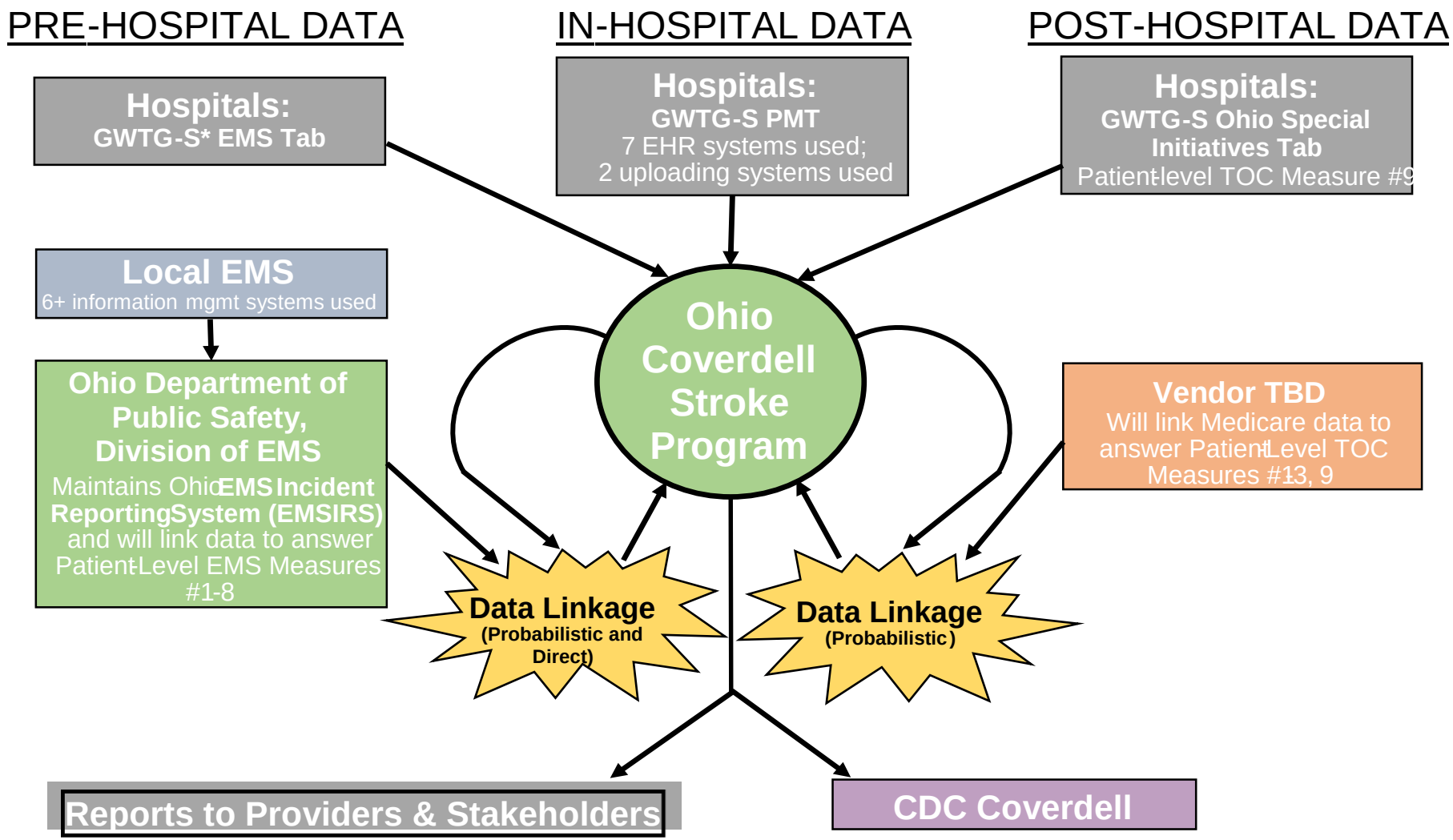
EMR System	I
One EMR System	
Epic Systems	
Allscripts	
Cerner	
Meditech	
Quadramed	
PRISM	
Soarian	
Sunrise	
Computer Programs and Systems Inc	
McKesson	
Vista	

EMR Systems	Number of Coverdell Participating Hospitals
Two EMR Systems	4
Cerner and Epic	1
Allscripts and Centricity	1
Allscripts and McKesson	1
Allscripts and Meditech	1
Three EMR Systems	3
Cerner, eClinical Works, and Medhost	1
Cerner, Epic, and McKesson	1
Allscripts, McKesson, and Net Access	1
Four EMR Systems	1
Allscripts, Centricity, Cerner, and SEC Sunrise	1

5. Mention interest, if any, in setting up a webinar to discuss any tool/partner in particular – like Image Trend, RedCap, NEMSIS, GWTG etc.

The NYS Coverdell team is interested in continuing to hear updates on the SMART on FHIR proof of concept study.

Ohio:



Get With the Guidelines ® -Stroke, maintained by Quintiles/Outcomes Sciences

1) Examine the various tool options and update the categories section based on your experiences. New categories can also be added if any are missing.

   We might need more clarification here. We are not sure which categories section we are supposed to update (on the slides it was listed as Considerations). As far as considerations are concerned, would the CDC be willing to outline these considerations:

   - How does the data gets into each tool (i.e. manual data input, pulled from EMR or Core Measure Vendor)?
   - Can the tool/data can be integrated with other systems?
   - Who can access the data in each tool (i.e. EMS only, hospital only, both)?

   All of these aspects need to be considered in order to create an integrated, sustainable data collection system across the care continuum.

2) List EMS, in-hospital and post-hospital vendors (for data collection) that states are planning to work with.

   <u>EMS Vendors</u>

   - **Local EMS Software Systems:** FireHouse Software, Open Incorporated (Safety Pad), emsCharts, Zoll Data Systems, Emergency Reporting, ESO Solutions.
     - If we understand correctly, there may be up to 50 different systems used. These are the ones of which we are currently aware.
   - **State EMS Registry (Ohio EMSIRS):** Digital Innovation, Inc.
     - Ohio Coverdell in-hospital data to be linked with EMSIRS data by Ohio Department of Public Safety, Division of EMS.
   - **Ohio Coverdell Reporting Platform:** *Get With the Guidelines®-Stroke* (Quintiles/Outcome Sciences) EMS Tab to collect data TBD from in-hospital staff.

   <u>In-Hospital Vendors</u>

   - **Ohio Coverdell Reporting Platform:** *Get With the Guidelines®-Stroke* (Quintiles/Outcome Sciences)
   - **Electronic Health Records Systems:** Epic, Cerner, AllScripts, Eclipsys, MediTech, McKesson, and Siemans Soarian.
   - **Electronic Uploading Systems:** MIDAS, Quintiles

   <u>Post-Hospital Vendors</u>

   - **Ohio Coverdell Reporting Platform:** *Get With the Guidelines®-Stroke* (Quintiles/Outcome Sciences) Ohio Special Initiatives Tab to collect follow-up appointments data from in-hospital staff.

- Ohio Coverdell in-hospital data to be linked with Centers for Medicare & Medicaid Services data by a vendor TBD to obtain data on 30-Day Measures and further data on follow-up appointments.

3) Determine the percentage of Coverdell hospitals use Epic and/or Cerner systems in your state.

   Epic = 50.0%, Cerner =11.4%

4) Mention interest, if any, in setting up a webinar to discuss any tool/partner in particular – like Image Trend, RedCap, NEMSIS, GWTG etc.

   N/A

Washington:

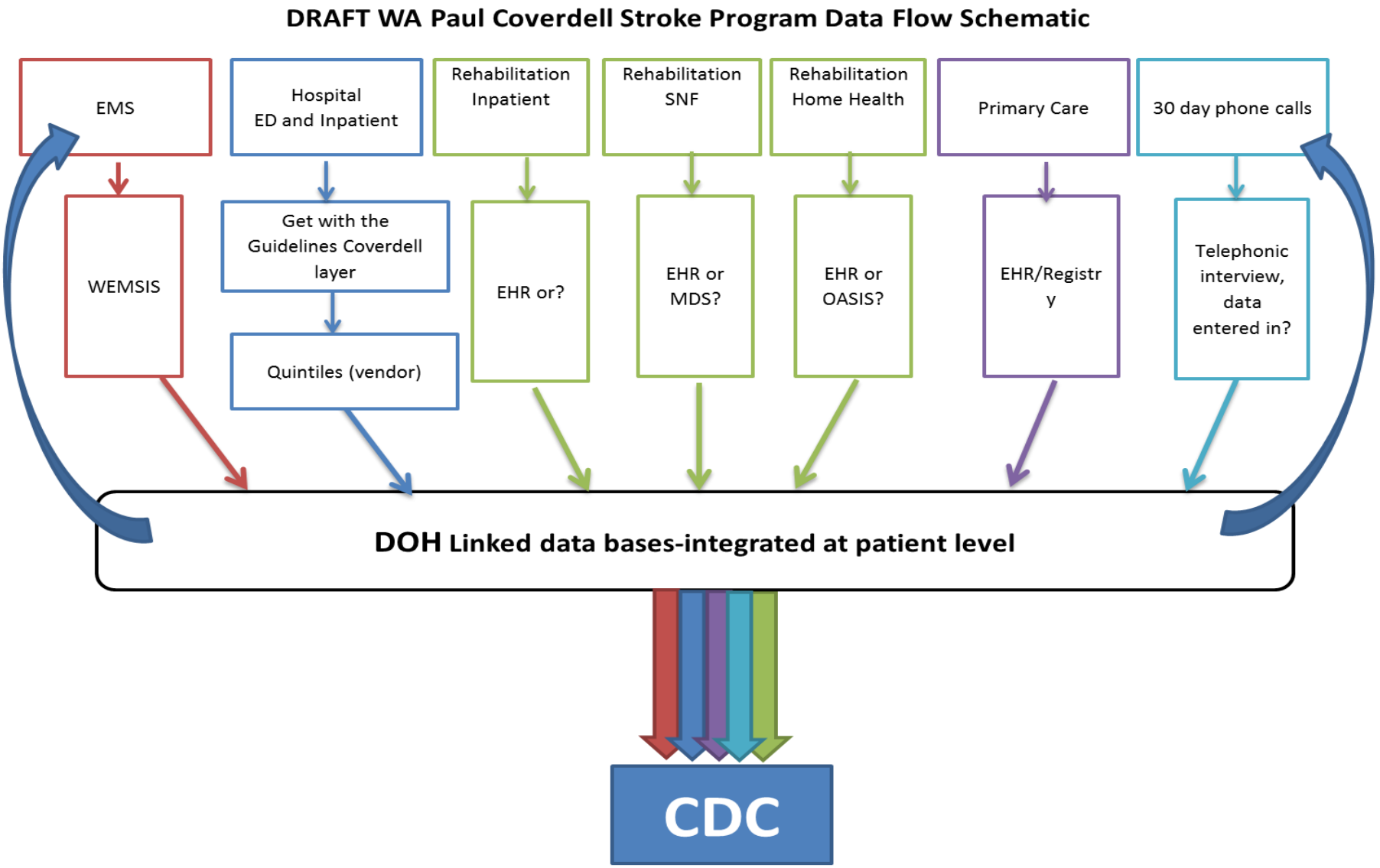

DRAFT WA Paul Coverdell Stroke Program Data Flow Schematic
EMS
Hospital ED and Inpatient
Rehabilitation Inpatient
Rehabilitation SNF
Rehabilitation Home Health
Primary Care
30 day phone calls
WEMSIS
Get with the Guidelines Coverdell layer
Quintiles (vendor)
EHR or?
EHR or MDS?
EHR or OASIS?
EHR/Registry
Telephonic interview, data entered in?
DOH Linked data bases-integrated at patient level
CDC

Diagram 1 Linkage Option

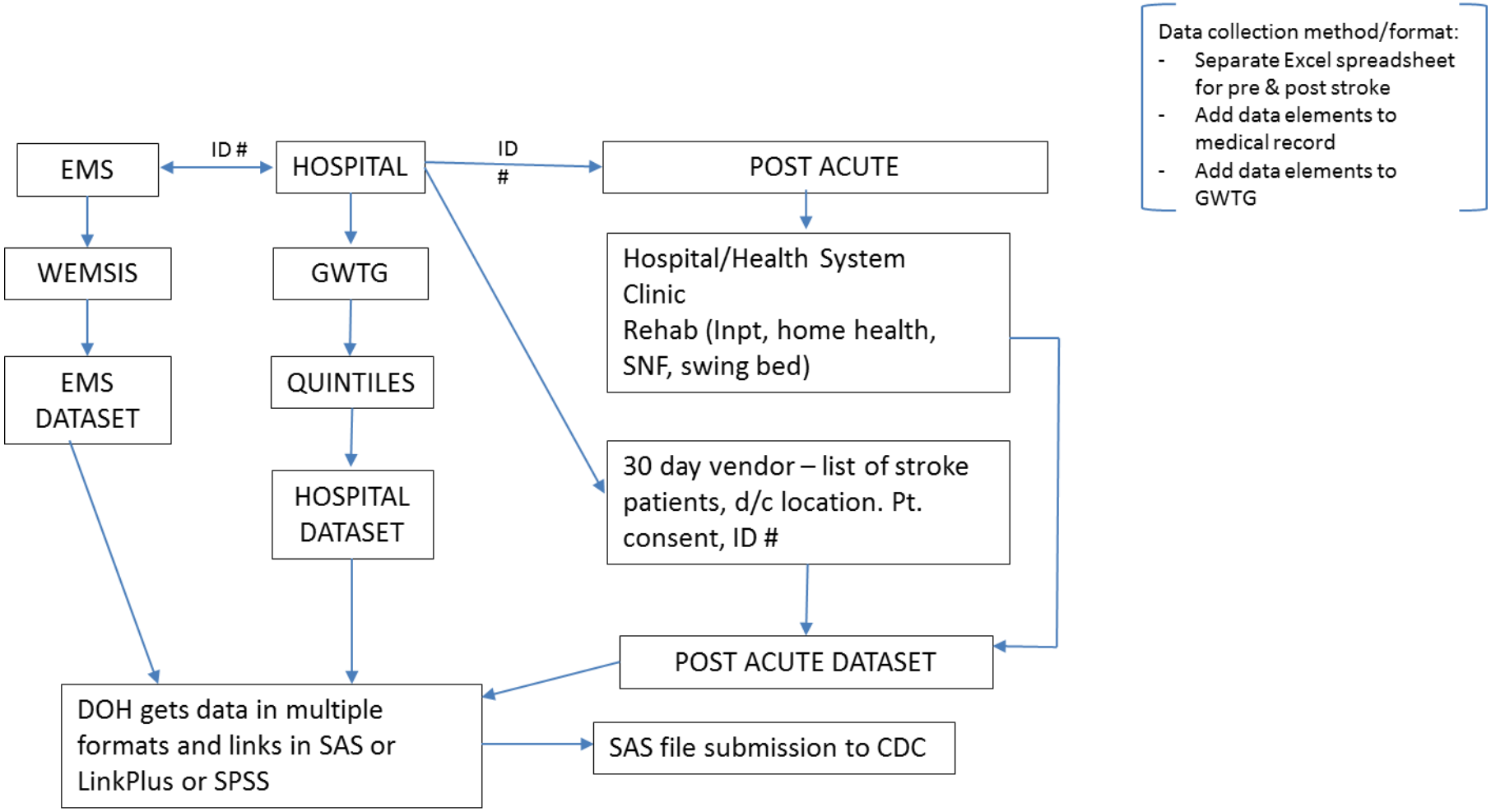


Diagram 2 – All Direct Entry to GWTG
Participating system v/s Participating hospital

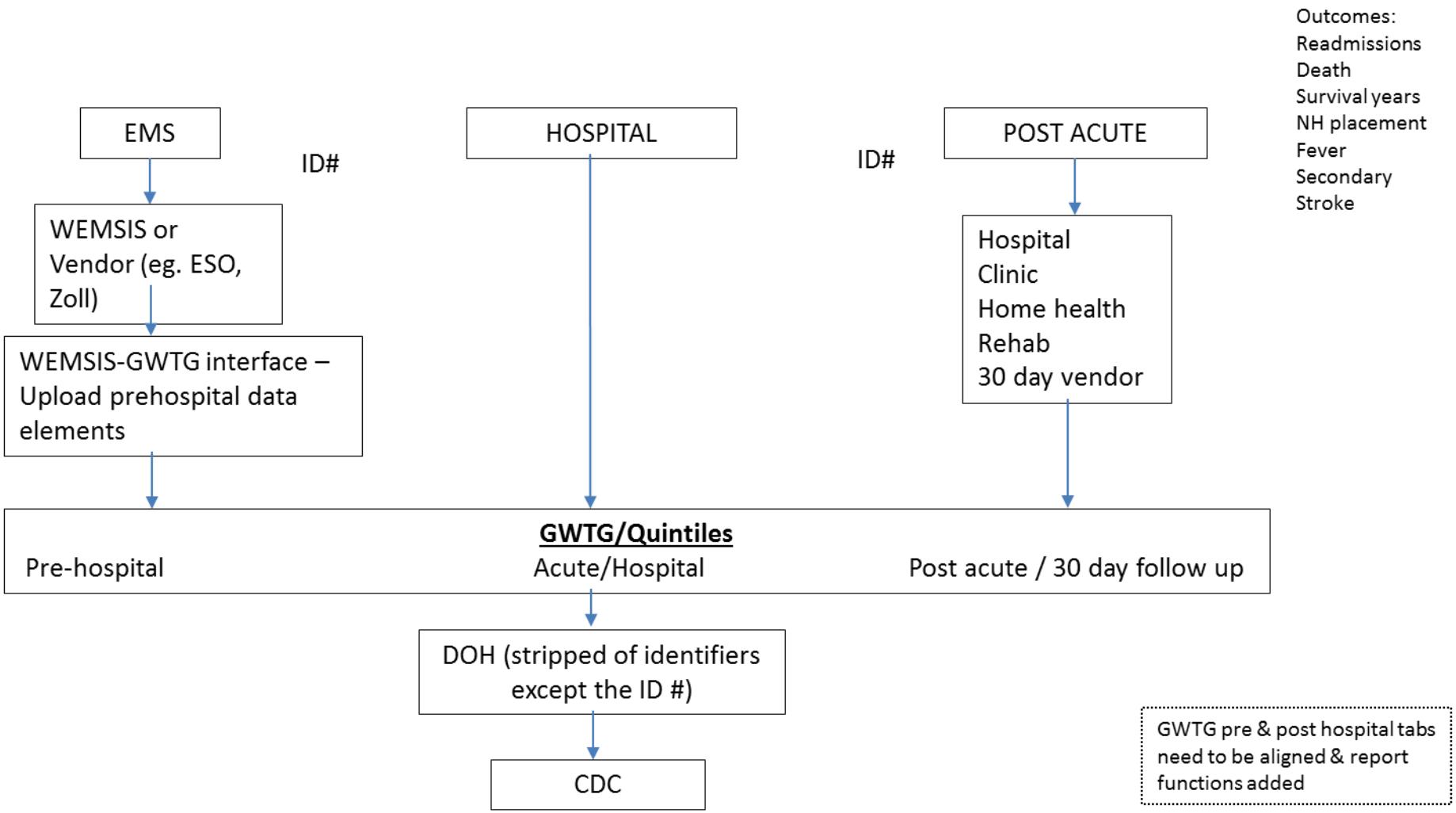
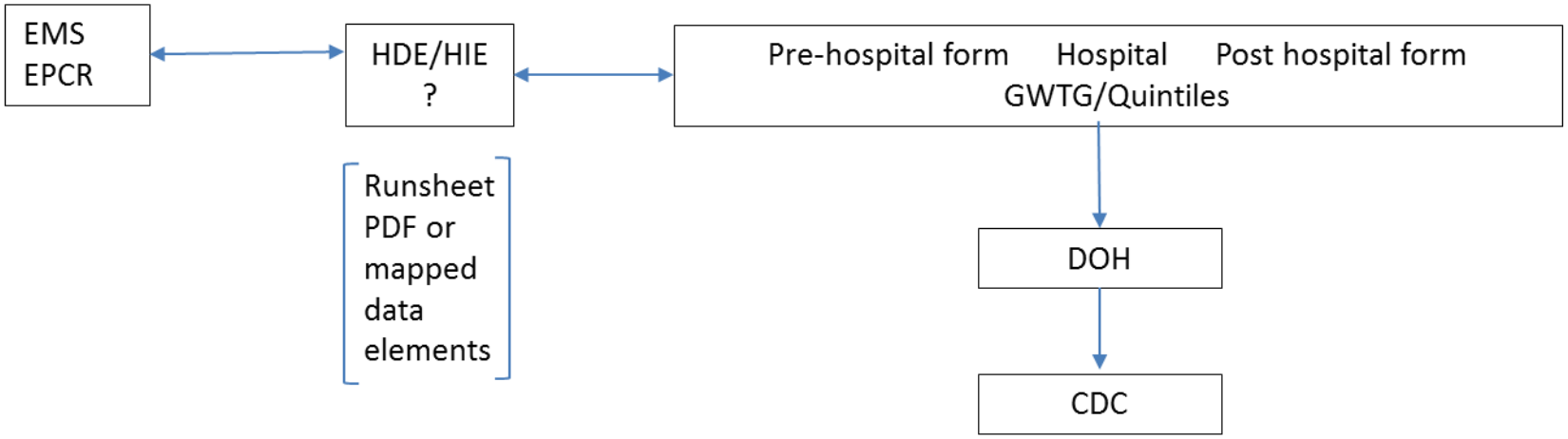


Diagram 3 Data Exchange



1) Examining the various tool options and updating the categories section based on your experiences. New categories can also be added if any are missing.

   GWTG - InHospital

   - All 9 states adopted providing familiar data capture and utility
   - Easier to link based on GWTG ID

   GWTG – EMS

   - Experience with GWTG in-hospital tool
   - EMS and Hospital Data at the same place (linkage through GWTG)

   Image Trend

   - Option for real time data transfer
   - Provides authentication

   New Tool being tested in Year 2– ESO Health Data Exchange. Once the EMS ePCR for a patient is completed, it will automatically be sent to the hospital and put directly in the patient record. Once the hospital EHR is locked, information on the final diagnosis, demographics/billing, and other selected data will automatically be pushed to the EMS agency' ePCR.

2) Listing EMS, inhospital and post hospital vendors (for data collection) that states are planning to work with.

   EMS –WEMSIS (Image Trend)
   InHospital – GWTG
   Post Hospital - TBD

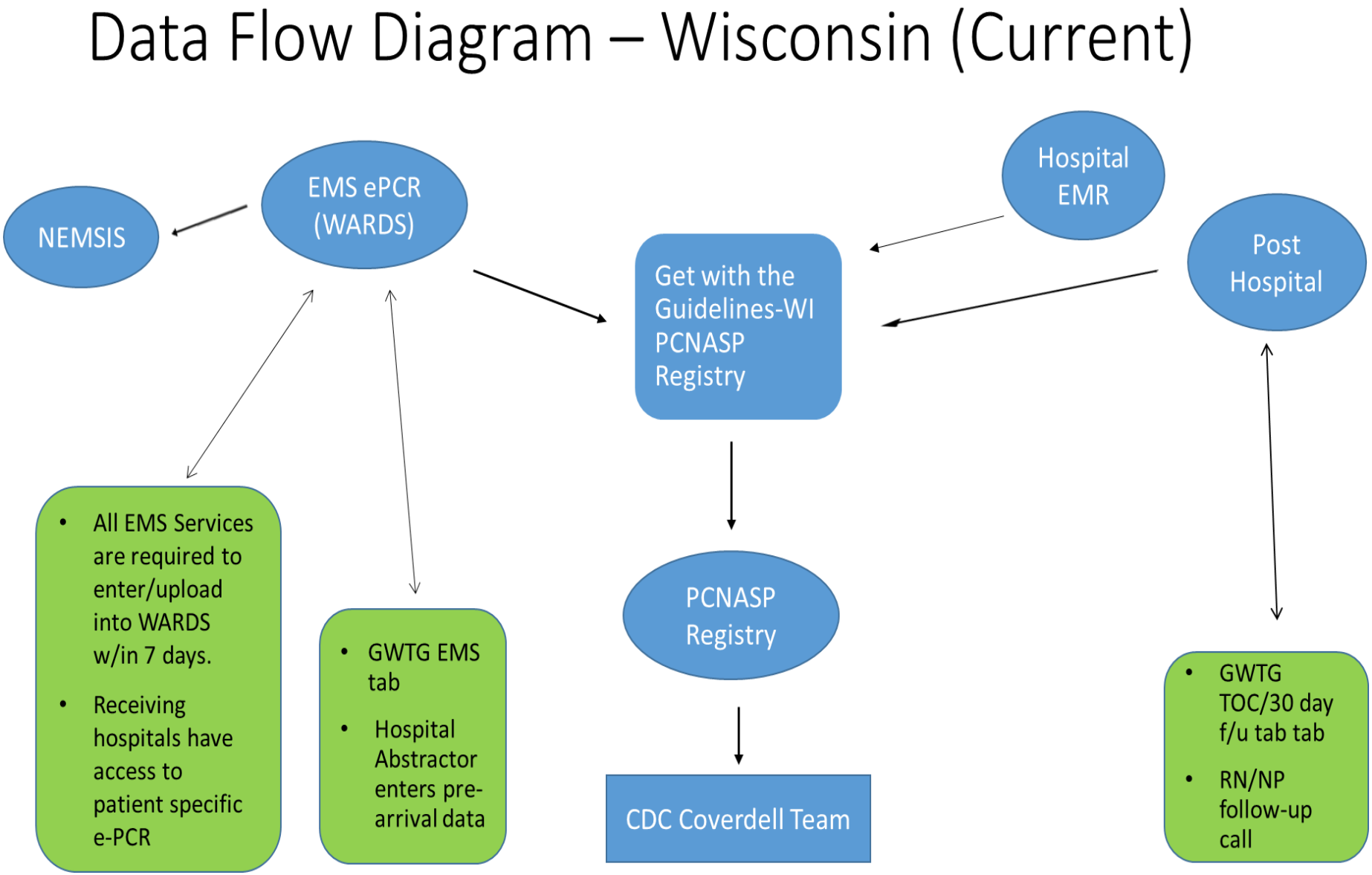
3) Determining the percentage of Coverdell hospitals use Epic and/or Cerner systems in your state

Agency Name	System
Ocean Beach Hospital	Healthland
Willapa Harbor Hospital	CPSI
Multicare Hospital	EPIC

4) Mention interest, if any, in setting up a webinar to discuss any tool/partner in particular – like Image Trend, RedCap, NEMSIS, GWTG etc.

   Interested in the Webinar to discuss the Tool options – RedCap, Image Trend, GWTG for pre and post-hospital.

Wisconsin:


Data Flow Diagram – Wisconsin (Current)
NEMSIS
EMS ePCR (WARDS)
Hospital EMR
Post Hospital
Get with the Guidelines-WI PCNASP Registry
All EMS Services are required to enter/upload into WARDS w/in 7 days.
Receiving hospitals have access to patient specific e-PCR
GWTG EMS tab
Hospital Abstractor enters pre-arrival data
PCNASP Registry
CDC Coverdell Team
GWTG TOC/30 day f/u tab tab
RN/NP follow-up call

1) Examine the various tool options and update the categories section based on your experiences. New categories can also be added if any are missing.

   No additions at this time.

2) List EMS, in-hospital and post-hospital vendors (for data collection) that states are planning to work with.

   - Pre- WARDs Wisconsin Ambulance Run Data System (Image Trend/NEMSIS) (https://www.dhs.wisconsin.gov/ems/wards.htm) and Get with the Guidelines- EMS tab (Pilot project)
   - In- Get with the Guidelines
   - Post- Get with the Guidelines – 30 day tab (Pilot project)

3) Determine the percentage of Coverdell hospitals use Epic and/or Cerner systems in your state.

Value	Percent		Count
Cerner	14.3%		4
Epic Systems	75.0%		21
McKesson	7.1%		2
Meditech	3.6%		1
		Total	28

4) Mention interest, if any, in setting up a webinar to discuss any tool/partner in particular – like Image Trend, RedCap, NEMSIS, GWTG etc.

   All of the above! This is definitely the area that we need guidance in.