

# Improving Outcomes for Patients with Acute Stroke Symptoms Through Structured Reporting of Brain CT and MRI

## Primary Authors

Lucy W. Glenn, MD  
Karl N. Krecke, MD  
Donald F. Schomer, MD

## Purpose and Rational

In 2008 an estimated 19% of CT and MRI studies from the emergency department submitted to Medicare were deemed erroneous due to insufficient documentation (OEI-07-09-00450: Medicare Payments for Diagnostic Radiology Services in Emergency Departments). Accordingly, the Center for Medicare and Medicaid Services (CMS) has a heightened level of attention for radiology documentation.

Over 700,000 patients suffer acute stroke symptoms annually in the USA. The number of patients who present with stroke-like symptoms is far higher with an estimated annual prevalence of 2.3% for transient ischemic attack (TIA). This implies that over 5,000,000 people annually will present to hospital emergency departments with at least one documented symptom suggesting the possibility for acute stroke, TIA or hemorrhage that will warrant imaging with CT or MRI.

The Physician Quality Reporting System known as PQRS (formerly PQRI) adopted a voluntary system that includes incentive payments to encourage better documentation. Measure 10 in this report requires documentation of the presence or absence of three items in patients with symptoms suggesting acute stroke or TIA. The CT or MRI report ordered for these purposes should always contain language that documents the presence or absence of 1) hemorrhage, 2) mass, and 3) acute infarction. This is especially important for initial exams; those that are acquired within 24 hours after admission.

The goal of this group project is to increase compliance with the PQRS recommendations for the reporting of brain CT and MRI in patients with acute stroke symptoms.

## Project Resources

- American College of Radiology CMS PQRI Guidance for Reporting, June 2007, pg 12-14
- CMS Overview PQRI. Available at <http://www.cms.hhs.gov/pqri/>
- Prevedello, et.al., "Large-Scale Automated Assessment of Radiologist Adherence to the PQRS for Stroke", J Am Coll Radiol 2012;9:414-420

## Project Measures

Numerator 1: # of sampled reports with full documentation (including presence or absence) of mass, hemorrhage and acute infarction

Denominator 1: # of CT or MRI reports sampled ordered through the emergency department for these purposes

## Baseline Data Collection

Develop a strategy to sample a minimum of 30 cases per quarter. Review the final reports for these cases to determine if appropriate documentation of the presence or absence of each of the three criteria (mass, hemorrhage, and acute infarct) are present. Score each report for completeness using binary grading ("yes" or "no"). This could be a group measure with feedback to individual radiologists.

### Potential search strategies:

-ICD9 codes: 430-438. These are the codes relevant to symptoms suggesting stroke, TIA or hemorrhage.

-CPT codes:

70450 - CT Brain without contrast

70460 - CT Brain with contrast

70470 - CT Brain without and with contrast

70551 - MRI Brain without contrast

70552 - MRI Brain with contrast

70553 - MRI Brain without and with contrast

-Radiology report text search, in RIS or EMR, for key words including stroke, TIA, infarction

### **Data Analysis**

The goal is to change the behavior of individual radiologists to improve group reporting metrics. The group should then plan quarterly meetings to analyze data and provide individual feedback. Individual data can be displayed by histogram with individuals anonymized by a numerical or alphabetic key, if appropriate. If group reporting is anonymized, consider providing a method so that individual radiologists can understand where they fall within the group metric.

First Quarter - Determine baseline and give feedback to individual radiologists. Have radiologists discuss in an open forum strategies to improve group compliance. Strategies might include visual aids or report template macros.

Second Quarter - Compare metric to baseline data as a group and individually. Discuss potential factors that influence compliance. Consider refining strategies.

Third Quarter - Compare metric to baseline and Quarter 2 data as a group and individually. Discuss ways to maintain sustainability and follow up assessment.

### **Factors Potentially Influencing Performance**

1. Radiologists lack of awareness of CMS reporting recommendation for explicitly reporting the presence or absence of hemorrhage, mass and acute infarct in each patient with acute stroke like symptoms.  
Intervention: communicate widely to all radiologists reading Head CT and MR scans in the setting of stroke about the three requirements that need documentation in each report.
2. Many radiologists likely include this data as pertinent negatives in a normal report. In the presence of positive findings however, it is not uncommon to focus on these positive findings possibly neglecting reporting the other two pertinent negatives. Intervention: Open group feedback to individual radiologists may serve as a reminder to improve compliance
3. Absence of standard reporting templates . Inntervention: Create standard reporting templates that specifically require comment about the presence or absence of hemorrhage, mass or infarct.

**Post Intervention Data Collection**

In order to consolidate the changes it is important to have an adequate control period where stability and reliability of the process is documented. Plan to continue quarterly data collection for at least one year and up to 3 years, with distribution of outcomes to all group members. Chart quarterly performance with time and review trend data for addressable patterns.