

Metrics for Measuring Quality of Care in Comprehensive Stroke Centers-- AHA Scientific Statement

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Presenter Disclosure Information

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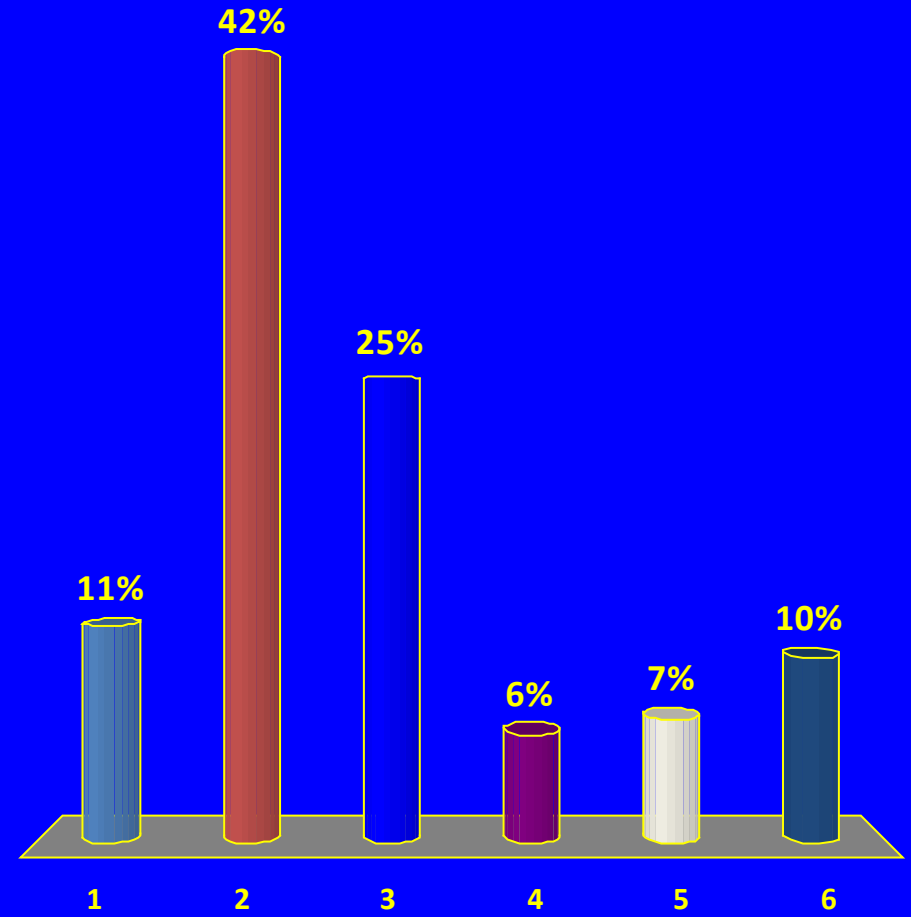
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Unlabeled/Unapproved Uses Disclosure:

Intra-arterial thrombolysis, embolectomy

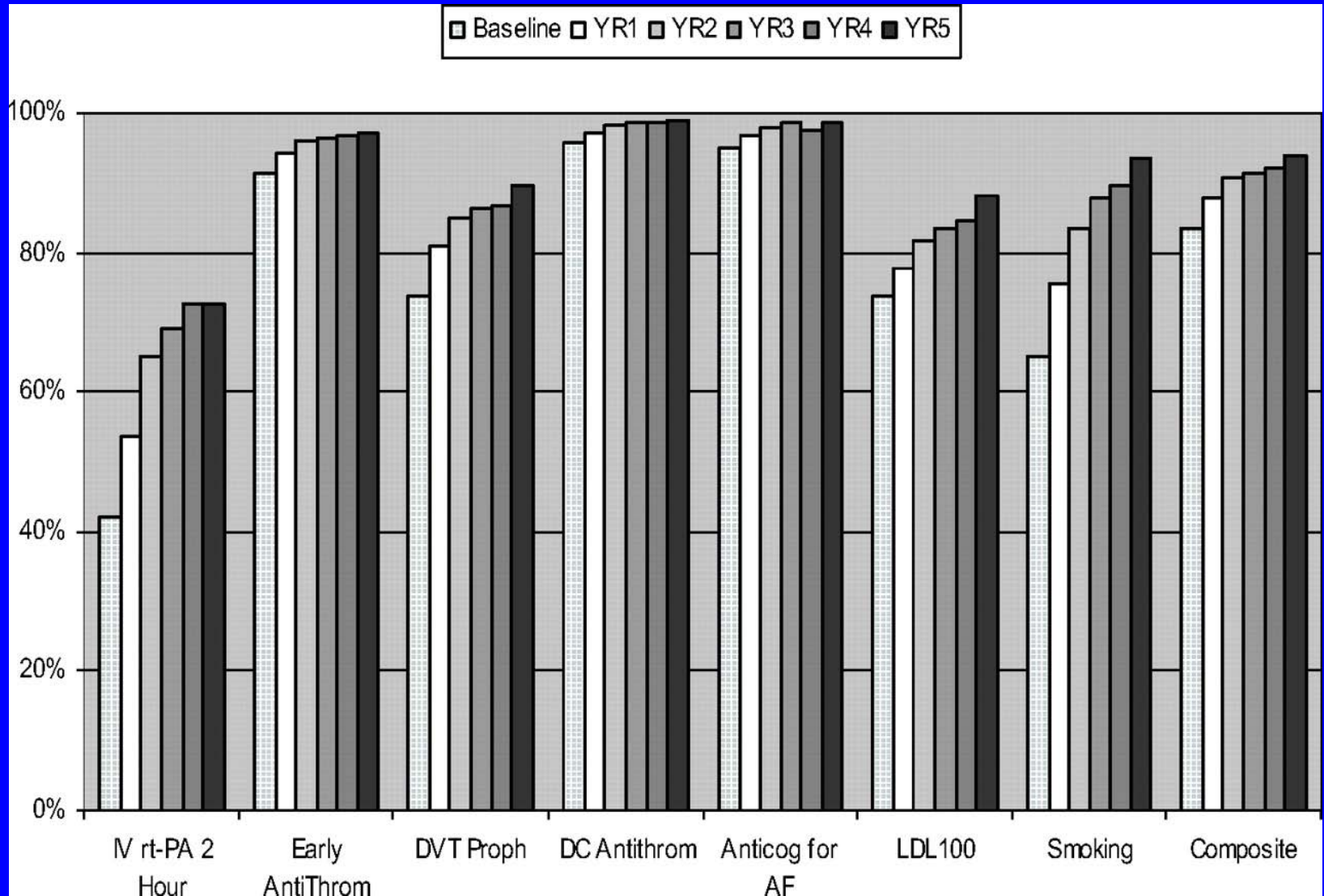
What is your affiliation?

1. Hospital, not a stroke center
2. Primary Stroke Center (PSC), not expecting to be CSC
3. PSC planning to be CSC
4. EMS
5. Department of Health
6. Other



- **Development of Comprehensive Stroke Centers (CSC) driven by success of Primary Stroke Centers (PSC)**
- **Use of Metrics Associated with Improvement in PSC Performance**

Improvement over time in GWTG-Stroke, displayed as the percentage of eligible patients who received each evidence-based measure per program year



Basic elements of CSCs

Brain Attack Coalition (Stroke 2005; 36:1597)

Proposed Requirements for accreditation CSCs

Posted on The Joint Commission (TJC) website

http://www.jointcommission.org/comprehensive_stroke_center_certification/

Vascular Neurology

Neurosurgery

Endovascular intervention

Advanced neuro-imaging

Specialized ICU

Rehabilitation

Stroke Registry

Clinical Research

**Metrics intended for use in quality improvement,
not as formal performance metrics**

**Expect that they will be refined to develop
performance metrics**

Metrics development based on

Literature review

AHA guidelines

Other guidelines

Cover major elements that distinguish CSCs

Feasibility of measurement in clinical practice

**Iterative process involving writing group
& input from other stroke specialists**

Two types of metrics--

Process measures

Use of specific diagnostic tests or treatments

Time from admission to testing or to treatment

Outcome measures

Rankin

Complication rates for procedures

Core metrics

Stronger evidence in the literature

More important clinically

Additional Data Elements

Supplementary information to help interpret metrics

Assist in quality improvement

Three major disease categories

Ischemic stroke

SAH and aneurysms

Non-traumatic intracerebral hemorrhage

Rehabilitation

Transfers from outlying hospitals

Enrollment in clinical trials

Percent of ischemic stroke patients (and TIA patients with persisting deficit) who have NIHSS performed at time of admission

- NIHSS has established role in clinical decision-making and in patient selection for clinical trials.
- AHA/ASA Guidelines advise standardized exam “preferably the NIHSS” for assessing stroke patients acutely (Class I, Level of Evidence (LOE) B).
- Strong predictor of outcome and therefore has a role in risk adjustment (Circulation 2010; 122:1496).
- Not widely used for hemorrhage patients, so proposed monitoring other measures for them, e.g, Hunt-Hess grade and ICH score.
- Core metric
- NIHSS within 60 minutes for stroke patients proposed as performance measure by TJC

Percentage of eligible ischemic stroke patients treated with intravenous thrombolysis \leq 60 minutes from arrival

- Not currently a performance metric for primary stroke centers by AHA, CDC and Joint Commission, but has become an accepted target for stroke centers (TARGET STROKE initiative).
- CSCs should aim for this higher standard.
- Earlier TPA administration is associated with improved outcome.
- Core metric

Median time from arrival to start of multimodal imaging with CT/CTA or MRI/MRA in patients under 6 hours from symptom onset

- Purpose is to measure length of time it takes to obtain multimodal imaging when it is performed emergently.
- Track separately for patients treated with IV TPA prior to multimodal imaging.
- Not intended to imply that multimodal imaging should be done on all stroke patients.
- Core metric

Multimodal CT and MRI may provide additional information that will improve diagnosis of stroke.	Class I; Level of Evidence A
Vascular imaging may help in selection of intravenous or intra-arterial therapies.	Class IIb; Level of Evidence B
Vascular imaging should be performed if intra-arterial therapy is being considered beyond 3 hours from symptom onset.	Class I; Level of Evidence A

Percentage of patients seen within 6 hours from symptom onset with documentation of performance or consideration of an endovascular procedure

- Intent is that CSC should consider endovascular procedures, not that procedure should be performed on any specific patient.
- Analogous to early TPA metric for PSCs requiring consideration of TPA use.
- Endovascular thrombolysis under 6 hours from symptom onset is an option for patients with ischemic stroke (Class I, LOE B).
- Mechanical thrombolysis under 8 hours from symptom onset (e.g., with the Merci retriever or Penumbra aspiration catheter) is an option in patients with ischemic stroke (Class IIb, LOE B).

Median time from arrival to start of treatment for acute ischemic stroke patients undergoing an endovascular intervention

- **Speed of reperfusion appears to be beneficial**
- **Suggested goal for CSCs is to achieve a door to treatment time of 2 hours (cardiac goal is 90 minutes for door-to-angioplasty).**
- **Door to puncture time proposed by TJC as performance measure**

Percentage of patients treated with IV thrombolysis or treated with endovascular interventions who have a symptomatic intracranial hemorrhage within 36 hours of treatment.

- Defined as any hemorrhage on CT scan within 36 hours post IV tPA with neurological worsening not explained by other causes (i.e. cerebral edema, seizure, etc)
- Symptomatic intracranial hemorrhage is associated with worse neurological outcome (Class I , LOE A).
- Core metrics
- TJC proposed combined rate as performance measure (if associated with increase of 4 or more on NIHSS)

Percentage of ischemic stroke patients treated with IV thrombolysis or endovascular therapy for whom 90-day modified Rankin score is documented

- **Reliable and reproducible and considers functional ability and impairment.**
- **Accepted as metric for assessment of recovery from stroke at 3 months in numerous clinical trials.**
- **Standardized interview can be performed via telephone or at an office visit by certified examiner (Class I, LOE B).**
- **Expectation that this will be used to assist in QI, but because diverse factors affect outcome, no requirement to report scores.**
- **Core metric**
- **TJC proposed 30-day Rankin as performance measure**

Median time from admission to procedure intended to obliterate a ruptured aneurysm by surgical clipping or endovascular coiling for patients arriving within 48 hours of the hemorrhage (Core metric)

Percentage of patients with aneurysmal SAH arriving within 48 hours of hemorrhage for whom surgical intervention not started within 36 hours of arrival who have documentation of reason for not treating.

- **3-4% risk of re-bleeding in the first 24 hours.**
- **Risk of re-bleeding decreases each day after rupture.**
- **Urgent evaluation and treatment of SAH advised (Class I, LOE B).**

Percentage of patients with aneurysmal SAH started on nimodipine within 24 hours of diagnosis

- **Nimodipine reduces incidence and severity of delayed ischemic deficits in patients with SAH from a ruptured aneurysm. (Class I, LOE A).**
- **Core metric**
- **Proposed by TJC as performance measure**

Percentage of SAH patients with diminished level of consciousness and ventriculomegaly who are treated with external ventricular drainage (EVD).

- **EVD can be beneficial in SAH patients with ventriculomegaly and diminished LOC (Class IIa, LOE B).**

For patients with warfarin-associated intracerebral hemorrhage and $INR > 1.4$, median time from arrival to start of treatment with a procoagulant preparation

- Hemorrhage expansion occurs primarily in the first hours, so treatment should be initiated quickly with a goal of rapid correction of INR.
- AHA/ASA guidelines recommend treatment with intravenous vitamin K and replacement of clotting factors (Class I, LOE B).
- Core metric
- TJC proposes % for whom procoagulant started within 2 hours of admission as performance measure

Percentage of patients with stroke or TIA transferred from another hospital to the CSC with documentation of the time from the first call to arrival time at CSC

- Data clearly demonstrate the importance of time to initiation of IV or endovascular treatment for ischemic stroke and the time to coiling or clipping for ruptured aneurysms.
- Goal is to collect data about transfer process for quality improvement.
- Avoided reporting of the times themselves because of variability of local conditions, lack of data about what transfer times are reasonable expectation, and varying urgency of transfers.

Percentage of stroke patients admitted to each type of unit (stroke unit, neuro ICU, other ICU, neurology/neurosurgery floor, other floor)

- Intent is to correlate data collected under this metric with outcomes for QI purposes
- Brain Attack Coalition:
 - PSCs and CSCs must have stroke unit (Class I. LOE A).
 - CSC must have ICU with personnel trained to care for stroke patients and dedicated neuroscience ICU is desirable.
 - Neuroscience ICU associated with better clinical outcomes.

Median number of days from admission to completion of evaluations for physical therapy (PT), occupational therapy (OT), speech-language pathology (SLP), and rehabilitation medicine.

- **Early initiation of stroke rehabilitation is associated with improved functional outcomes (Class I, LOE B).**
- **Early mobilization is associated with improved outcome (Class I, LOE B).**
- **Organized multidisciplinary stroke rehabilitation reduces death, death or disability, and death or institutionalization (Class I, LOE B).**

Percentage of patients admitted with diagnoses of ischemic stroke, SAH, ICH, extracranial cervical stenosis, intracranial stenosis, or TIA, who are enrolled in a clinical research study

- Any protocol approved by the institutional review board of the CSC is considered a clinical research study for the purposes of this metric.
- If a patient meets all criteria for enrollment in a clinical study that is active at the center and is not enrolled in that study, the reasons should be documented and tracked.
- Research is an important but optional CSC component (Brain Attack Coalition, Stroke 2005; 36:1597).

Complications

Symptomatic hemorrhage after IV TPA or
endovascular procedure for acute ischemic stroke

Endarterectomy

Angioplasty/stenting

Aneurysm coiling/clipping

AVM embolization or surgery

Diagnostic angiography

Ventriculostomy

TJC proposed stroke/death within 7 days of
CEA/CAS/coiling/clipping/embolectomy as performance
measure

Issues not covered by metrics

- TIA
- Decompressive surgery
- Other complications
- Risk Adjustment (NIHSS useful)

Conclusions

- Proposed set of metrics and related data elements to facilitate monitoring and improving the quality of care delivered at CSCs.
- Quality improvement efforts essential for CSCs if they are to provide the best possible care for the most critically ill stroke patients.
- Data collected by CSCs initially should be pooled and used to refine metrics and drive further advances in stroke care.