5164 ND records entered in GWTG-S

Stroke Systems of Care

Over 3 million records entered in GWTG-S nationally
Guidelines for the Early Management of Patients With Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association


on behalf of the American Heart Association Stroke Council, Council on Cardiovascular Nursing, Council on Peripheral Vascular Disease, and Council on Clinical Cardiology

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The goal of these guidelines is to:

1. Limit the morbidity and mortality associated with stroke.
2. Support the overarching concept of stroke systems of care and
3. Detail aspects of stroke care from:
   • Patient recognition;
   • Emergency medical services activation,
   • Transport, and triage; through the initial hours in the emergency department and stroke unit.

The guideline discusses early stroke evaluation and general medical care, as well as ischemic stroke, specific interventions such as reperfusion strategies, and general physiological optimization for cerebral resuscitation.
Despite the increase in the global burden of stroke, advances are being made.

In 2008, after years of being the third leading cause of death in the United States, stroke dropped to fourth.
Heart Disease and Stroke Statistics—2014 Update
A Report From the American Heart Association

“In 2010, stroke caused ≈1 of every 19 deaths in the United States. On average, every 40 seconds, someone in the United States has a stroke, and someone dies of one approximately every 4 minutes.”

http://circ.ahajournals.org/content/early/2013/12/18/01.cir.0000441139.02102.80.citation
Table 2. Definition of Classes and Levels of Evidence Used in AHA/ASA Recommendations

<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I</td>
<td>Conditions for which there is evidence for and/or general agreement that the procedure or treatment is useful and effective.</td>
</tr>
<tr>
<td>Class II</td>
<td>Conditions for which there is conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of a procedure or treatment.</td>
</tr>
<tr>
<td>Class IIa</td>
<td>The weight of evidence or opinion is in favor of the procedure or treatment.</td>
</tr>
<tr>
<td>Class IIb</td>
<td>Usefulness/efficacy is less well established by evidence or opinion.</td>
</tr>
<tr>
<td>Class III</td>
<td>Conditions for which there is evidence and/or general agreement that the procedure or treatment is not useful/effective and in some cases may be harmful.</td>
</tr>
</tbody>
</table>

Therapeutic recommendations

<table>
<thead>
<tr>
<th>Level of Evidence A</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Data derived from multiple randomized clinical trials or meta-analyses</td>
</tr>
<tr>
<td>Level of Evidence B</td>
<td>Data derived from a single randomized trial or nonrandomized studies</td>
</tr>
<tr>
<td>Level of Evidence C</td>
<td>Consensus opinion of experts, case studies, or standard of care</td>
</tr>
</tbody>
</table>

Diagnostic recommendations

<table>
<thead>
<tr>
<th>Level of Evidence A</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Data derived from multiple prospective cohort studies using a reference standard applied by a masked evaluator</td>
</tr>
<tr>
<td>Level of Evidence B</td>
<td>Data derived from a single grade A study or 1 or more case-control studies, or studies using a reference standard applied by an unmasked evaluator</td>
</tr>
<tr>
<td>Level of Evidence C</td>
<td>Consensus opinion of experts</td>
</tr>
</tbody>
</table>
1. Public Stroke Education

Fewer than half of 9-1-1 calls for stroke events were made within 1 hour of symptom onset, and fewer than half of those callers thought stroke was the cause of their symptoms.

Effective community education tools include:

1. Printed material
2. Audiovisual programs
3. Lectures
4. Television and billboard advertisements

Multiple studies have reported the benefits of 9-1-1 use and EMS involvement in acute stroke.
2. Prehospital Stroke Management

Advance notification of stroke patient arrival by EMS:

1. Shortens the time to be seen for initial evaluation by an emergency physician
2. Shortens the time to brain imaging
3. Increases the use of the intravenous recombinant tissue-type plasminogen activator (rtPA) alteplase.

![Graph showing percentage of patients receiving prenotification from 2010 to 2013 with 70.0% in 2013.](image-url)
## EMS and Time

<table>
<thead>
<tr>
<th>Name</th>
<th>Year</th>
<th>Door to Dr Evaluation</th>
<th>Door to CT</th>
<th>Door to needle</th>
<th>Chance of Reperfusion Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdullah</td>
<td>2008</td>
<td>--</td>
<td>17% shorter</td>
<td>--</td>
<td>41% vs 21% (among patients &lt;6 hrs)</td>
</tr>
<tr>
<td>Bae</td>
<td>2010</td>
<td>--</td>
<td>34% shorter</td>
<td>29% shorter</td>
<td>--</td>
</tr>
<tr>
<td>Bray</td>
<td>2005</td>
<td>52% shorter</td>
<td>35% shorter</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Goodacre</td>
<td>2004</td>
<td>--</td>
<td>--</td>
<td>21% shorter</td>
<td>21.4% vs. 4.7%</td>
</tr>
</tbody>
</table>

### EMS Prenotification vs No EMS Prenotification

<table>
<thead>
<tr>
<th>Door-to-Imaging time, n, median (25th to 75th percentile), min (in patients arriving ≤3 h)</th>
<th>EMS Prenotification</th>
<th>No EMS Prenotification</th>
<th>Absolute Difference (95% CI)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>26 (16–45)</td>
<td>31 (18–56)</td>
<td>235 min</td>
<td>+8.3% (7.6–8.9)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>230,430</td>
<td>112,580</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>42 (22–83)</td>
<td>55 (28–103)</td>
<td>13 min</td>
<td>+8.5% (8.2–8.8)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>78 (60–100)</td>
<td>80 (60–103)</td>
<td>2 min</td>
<td>+1.1% (0.0–2.1)</td>
<td>0.0583</td>
</tr>
<tr>
<td>141 (115–169)</td>
<td>145 (116–170)</td>
<td>4 min</td>
<td>+2.4% (1.2–3.5)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>22,305/30,541</td>
<td>7193/11,244</td>
<td>9% (8.0–10.1)</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
</tbody>
</table>

Lin C Circulation 2012
## EMS Assessment and Management

### Recommendations

1. To increase both the number of patients who are treated and the quality of care, educational stroke programs for physicians, hospital personnel, and EMS personnel are recommended.  
   Class I; Level of Evidence B

2. Activation of the 9-1-1 system by patients or other members of the public is strongly recommended.  
   9-1-1 Dispatchers should make stroke a priority dispatch, and transport times should be minimized.  
   Class I; Level of Evidence B

3. Prehospital care providers should use prehospital stroke assessment tools, such as the Los Angeles Prehospital Stroke Screen or Cincinnati Prehospital Stroke Scale.  
   (Class I; Level of Evidence B

4. EMS personnel should begin the initial management of stroke in the field.  
   - Development of a stroke protocol to be used by EMS personnel is strongly encouraged.  
   Class I; Level of Evidence B

5. Patients should be transported rapidly to the closest available certified PSC or CSC or, if no such centers exist, the most appropriate institution that provides emergency stroke care as described in the statement.  
   Class I; Level of Evidence A

6. 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.  
   Class I; Level of Evidence B
<table>
<thead>
<tr>
<th>Recommended</th>
<th>Not Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess and manage ABCs</td>
<td>Do not initiate interventions for hypertension unless directed by medical command</td>
</tr>
<tr>
<td>Initiate cardiac monitoring</td>
<td></td>
</tr>
<tr>
<td>Provide supplemental oxygen to maintain $O_2$ saturation $&gt;$94%</td>
<td>Do not administer excessive IV fluids</td>
</tr>
<tr>
<td>Establish IV access per local protocol</td>
<td>Do not administer dextrose-containing fluids in nonhypoglycemic patients</td>
</tr>
<tr>
<td>Determine blood glucose and treat accordingly</td>
<td>Do not administer medications by mouth (maintain NPO)</td>
</tr>
<tr>
<td>Determine time of symptom onset or last known normal, and obtain family contact information, preferably a cell phone</td>
<td>Do not delay transport for prehospital interventions</td>
</tr>
<tr>
<td>Triage and rapidly transport patient to nearest most appropriate stroke hospital</td>
<td></td>
</tr>
<tr>
<td>Notify hospital of pending stroke patient arrival</td>
<td></td>
</tr>
</tbody>
</table>

ABCs indicates airway, breathing, and circulation; IV, intravenous; and NPO, nothing by mouth.
ED-Based Care

<table>
<thead>
<tr>
<th>Action</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door to physician</td>
<td>≤10 minutes</td>
</tr>
<tr>
<td>Door to stroke team</td>
<td>≤15 minutes</td>
</tr>
<tr>
<td>Door to CT initiation</td>
<td>≤25 minutes</td>
</tr>
<tr>
<td>Door to CT interpretation</td>
<td>≤45 minutes</td>
</tr>
<tr>
<td>Door to drug (≥80% compliance)</td>
<td>≤60 minutes</td>
</tr>
<tr>
<td>Door to stroke unit admission</td>
<td>≤3 hours</td>
</tr>
</tbody>
</table>
%Door To CT <= 25min

<table>
<thead>
<tr>
<th>Time Period</th>
<th>All Hospitals</th>
<th>All ND Hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>16.0%</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>20.0%</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>19.5%</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>25.0%</td>
<td></td>
</tr>
</tbody>
</table>
Achievement Awards recognize hospitals that demonstrate at least 85 percent compliance in each of the Get With The Guidelines-Stroke Achievement Measures.

1. Percent of acute ischemic stroke patients who arrive at the hospital within 2 hours and for whom IV t-PA was initiated at this hospital within 3 hours
2. Percent of patients who receive antithrombotic therapy by the end of hospital day two.
3. Percent of patients who receive VTE prophylaxis the day of or the day after hospital admission.
4. Percent of patients prescribed antithrombotic therapy at discharge.
5. Percent of patients with atrial fibrillation/flutter discharged on anticoagulation therapy.
6. Percent of patients with a history of smoking cigarettes, who are, or whose caregivers are, given smoking cessation advice or counseling during hospital stay.
7. Percent patients with LDL ≥ 100, or LDL not measured, or on cholesterol-reducer prior to admission who are discharged on statin medication.
GWTG Performance Recognition Measures

Currently, there are >2400 hospitals in the United States using the GWTG-Stroke program.

From 2003 to 2007, a study of 322,847 hospitalized stroke patients in 790 US academic and community hospitals voluntarily participating in the GWTG-Stroke program showed significant improvement in stroke care by participating in the program.

![Rate Measures Chart]

- **Baseline**
  - National: 34.9%
  - Baseline: 13.8%
  - Rate Measures: 51.8%

- **2013**
  - National: 86.5%
  - 2013: 95.3%
  - National: 94.2%
North Dakota

Rate Measures

Baseline | 2013
--- | ---
IV rt-PA Arrive by 2 Hour, Treat by 3 Hour: All ND Hospitals | 22.2% | 22.6%
Early Antithrombotics: All ND Hospitals | 47.1%
VTE Prophylaxis: All ND Hospitals | 80.9%
Antithrombotics: All ND Hospitals | 95.4%
Anticoag for AFib/AFlutter: All ND Hospitals | 89.8%
Smoking Cessation: All ND Hospitals | LDL 100 or ND – Statin: All ND Hospitals
Your hospital’s Get With The Guidelines® recognition is tangible evidence of the care team’s hard work and commitment to saving lives.

Bronze recognizes performance for one calendar quarter

Altru Health System

Essentia Health

Sanford Health Bismarck
Silver recognizes performance of 12 consecutive months

The Plus Award is an advanced level of recognition that allows hospitals to be acknowledged for their compliance of the Quality Measures within the Get With The Guidelines-Stroke Program.

St. Alexius
Gold recognizes performance of 24 consecutive months

Sanford Health Fargo

Trinity Health

The Plus Award is an advanced level of recognition that allows hospitals to be acknowledged for their compliance of the Quality Measures within the Get With The Guidelines-Stroke Program.
Participating Hospital Award

The American Heart Association proudly recognizes

NELSON COUNTY HEALTH SYSTEM
Get With The Guidelines – Stroke
Participating Hospital

The American Heart Association proudly recognizes

UNITY MEDICAL CENTER
Get With The Guidelines – Stroke
Participating Hospital
The goal set for Target: Stroke is a door-to-needle (DT N) time within 60 minutes in at least 50% of ischemic stroke patients treated with IV rt - PA.
TARGET: STROKE

1 MINUTE OF BRAIN ISCHEMIA CAN KILL 2 MILLION NERVE CELLS AND 14 BILLION SYNAPSES.

TARGET: STROKE

TIME LOST IS BRAIN LOST.

GOAL: REDUCE DTN TIMES TO 60 MINUTES OR LESS IN ELIGIBLE ISCHEMIC STROKE PATIENTS
Best Practice Strategies

01 EMS Pre-Notification

02 Stroke Tools:

03 Rapid Triage Protocol and Stroke Team Notification:

04 Single Call Activation System: A

05 Transfer Directly to CT Scanner:

06 Rapid Acquisition and Interpretation of Brain Imaging

07 Rapid Laboratory Testing (Including point of Care Testing if indicated)

08 Mix tPA Ahead of Time

09 Rapid Access and Administration of Intravenous tPA

10 Team-Based Approach

11 Prompt Data Feedback
Helsinki Experience

Pre-notification and pre-mixing

Direct to CT

Merotjia Neurology 2012
Time to Intravenous Thrombolytic Therapy

Percent of acute ischemic stroke patients receiving intravenous tissue plasminogen activator (tPA) therapy during the hospital stay who have a time from hospital arrival to initiation of thrombolytic therapy administration (door-to-needle time) of 60 minutes or less.

- 2010: 12.5%
- 2011: 3.8%
- 2012: 25.8%
- 2013: 42.5%
www.heart.org/quality

https://learn.heart.org

http://www.strokeassociation.org/resources
Together to End Stroke

http://www.strokeassociation.org/targetstroke
Questions?

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Director, Quality & Systems Improvement
North Dakota and South Dakota

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or
1-800-691-6027 Ext, 7906
E-mail: pam.moe@heart.org

www.heart.org/quality