Early Career: Starting a Successful Career in Quality of Care and Outcomes Research

Successful Early Career Research Using Get With The Guidelines

Gregg C. Fonarow, MD
Eliot Corday Professor of Cardiovascular Medicine
Director, Ahmanson-UCLA Cardiomyopathy Center
Co-Chief, UCLA Division of Cardiology
Los Angeles, California
Presenter Disclosure Information

“GWTG Research”

I will **not** discuss off label use of medications or devices

DISCLOSURE INFORMATION:
The following relationships exist related to this presentation:

Gregg C. Fonarow, MD, FACC, FAHA – AHRQ, NHLBI, Novartis, and Medtronic: Research, Consultant
Domains of Outcomes Research

What Works
(for patients and populations)

System Performance
(getting what works implemented in patients and populations)

Patient Alignment
(how to apply in ways that are patient centered)

Discovery
Translation
Preference

Value
Implementing Guideline Recommended Therapies into Practice

• Cardiovascular disease remains a major public health problem resulting in substantial morbidity, mortality, and healthcare expenditures

• Several evidence-based, guideline-recommended therapies are available to treat patients with cardiovascular disease

• However, study after study shows gaps, variations, and disparities in the use of these evidence-based therapies in eligible patients
Institute of Medicine Definition of Quality:

The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge

IOM: Crossing the Quality Chasm: The IOM Health Care Quality Initiative
The IOM Definition of Quality Care

- **Timely**: rapid identification and treatment
- **Effective**: with right drugs / procedures and improves outcomes
- **Safe**: at right dose and / or done right
- **Equitable**: in all eligible patients
- **Patient centered**: considers the risks and benefits for the individual patient
- **Efficient / cost-effective**: avoiding over-treatment, use of futile therapies, and unnecessary procedures / hospitalizations
Translating Research Into Practice for Healthcare Providers:

The American Heart Association's Strategy for Building Healthier Lives, Free of Cardiovascular Diseases and Stroke

1. Research
2. Guidelines, Statements, Conference Proceedings
3. Performance Measures
4. Get With The Guidelines
5. Mission Lifeline
6. Heart 360
7. Hospital Accreditation / Certification
8. AHA/NCQA Recognition Program
Bridging the Gap Between Knowledge And Routine Clinical Practice

ACC/AHA Guidelines

• Clinical trial evidence

Systems

• Implement evidence-based care
• Improve communications
• Ensure compliance

Clinical Practice

• Improve quality of care and outcomes

Implementation of Guidelines

- Academic detailing or educational outreach visits are useful to facilitate the implementation of practice guidelines

- Chart audit and feedback of results can be effective to facilitate implementation of practice guidelines

- The use of reminder systems can be effective to facilitate implementation of practice guidelines

- The use of performance measures based on practice guidelines may be useful to improve quality of care

GWTG Program Aims

• Improve the delivery of key, evidenced-based care in patients hospitalized with CAD, Stroke/TIA, Heart Failure and those with cardiac arrest

• Improve clinical outcomes and help meet the 2010 and 2020 goals (By 2020, to improve the cardiovascular health of all Americans by 20% while reducing deaths from cardiovascular diseases and stroke by 20%).

• Engage hospitals, community, and national stakeholders in a unified approach to improving the quality of cardiovascular care

• Catalyze cardiovascular quality of care and outcomes research
Get With The Guidelines
Since 2001

- Over 1800 Hospitals Nationwide
- Over 4.4 Million Patient Records
- Over 800 Hospitals Receiving Recognition
- Over 200 Peer Reviewed Publications
GWTG Program Components

• AHA collaborations with hospital teams, organizational stakeholders, state QIOs
• Ongoing real time feedback of hospital data, clinical decision support for rapid cycle improvement
• Learning Sessions
  ▪ Didactic Session
  ▪ Best Practice Sharing
  ▪ Interactive Workshops
• Ongoing Education
  ▪ Teleconference and Web-Ex
  ▪ E-mail community
  ▪ Site visits

LaBresh, KA and Tyler, PA. Quality Management in Health Care, 2003, 12(1), 1
AHA GWTG Web Based Patient Management Tool
Benchmarked Performance Measures

AHA and CSM/TJC measures

Performance tracked over time

Compared against similar hospitals

Numerous benchmark, format options

**CADRecogGroup**
**HFRecogGroup**
**AHAGroup**
**AHA_HFInstructions**

**CAD Performance**

- AHA_AMIACEARB
- AHA_BB
- AHA_LDL100
- AHA_LipidRx
- AHA_Smoking

**HF Performance (and JCAHO)**

- HF-1
- HF-2
- HF-3
- HF-4

Beta Blocker Usage

**CAD Quality**

- AHA_AMIACE
- AHA_AMIACE
- AHA_AMIACE

**Hospital: AHA Training Site**

AHA ASA: Percent of patients discharged on Aspirin

All Hospitals

New England Hospitals

Northeast Region Hospitals

All MA Hospitals

Time Period: Q1 2005 - Q4 2005

% of Patients

<table>
<thead>
<tr>
<th></th>
<th>Q1 2005</th>
<th>Q2 2005</th>
<th>Q3 2005</th>
<th>Q4 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>All MA Hospitals</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Northeast Region Hospitals</td>
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<tr>
<td>New England Hospitals</td>
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<tr>
<td>All Hospitals</td>
<td></td>
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</tr>
</tbody>
</table>
# GWTG Patient Populations

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>STEMI, NSTEMI</td>
<td>Ischemic Stroke, TIA, Hemorrhagic Stroke, stroke of unknown origin</td>
<td>Acute HF admission – ischemic, non-ischemic cardiomyopathy</td>
<td>Acute Respiratory Failure, Cardiac Arrest, MET Team</td>
</tr>
</tbody>
</table>
## GWTG – Cumulative Progress

<table>
<thead>
<tr>
<th>Module</th>
<th>Contracts</th>
<th>Patient Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTION Registry-GWTG</td>
<td>737</td>
<td>358,379</td>
</tr>
<tr>
<td>Resuscitation</td>
<td>295</td>
<td>503,342</td>
</tr>
<tr>
<td>Heart Failure</td>
<td>549</td>
<td>720,384</td>
</tr>
<tr>
<td>Stroke</td>
<td>1,632</td>
<td>2,223,854</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3,213</td>
<td>3,805,959</td>
</tr>
</tbody>
</table>

** GWTG-CAD closed effective 12/31/09 with final data entry completed by 3/31/10 and a Final Patient Record count = 615,184.

Adjusted Total** 4,421,143

CPA = 243,462
ARC = 30,347
MET = 229,533
Get With the Guidelines® - Heart Failure, Stroke, Resuscitation & ARG

Unique hospitals implementing GWTG Stroke, Heart Failure, Resuscitation or ARG as of 3/17/11
(Count: 1895; 75.4% population coverage)

GWTG-Stroke: Data Submission

Number of records

- Apr-11: 1612406
- Jul-11: 1715154
- Oct-11: 1817321
- Jan-12: 1918297
- Apr-12: 2030279
- Jul-12: 2142462

July 2012
GWTG Quality Improvement Activity

• QI activities driven by database
  ▪ Local/regional QI workshops for multidisciplinary teams
  ▪ National monthly webinars
  ▪ National Quality Site reports
  ▪ National Performance Improvement reports
  ▪ Local/regional C-Suite events
  ▪ Monthly local/regional teleconferences
  ▪ QI site consultation: local hospital mentor programs, staff

• Local, State or National QI activity that utilizes the database
  ▪ AHA National Recognition
  ▪ JCAHO/ORYX
  ▪ AHA Clinical Cardiology Council
  ▪ Quality Improvement Organizations (QIOs)
  ▪ Departments of Health
  ▪ Health Plan relations
  ▪ National hospital systems, regional systems, individual systems
  ▪ AHA QI consultants
Results with GWTG-HF: Quality of Care Measures

Data from 458 GWTG-HF hospitals and 451,098 HF hospitalizations collected from 1/1/05-10/1/10
Registries Role in Evidence Development and Dissemination

Concept

Clinical Evidence

Outcomes

Guidelines

CV Registries

Performance Indicators

Measurement + Feedback

QI Initiatives

Adapted from Califf RM, Peterson ED et al. JACC 2002;40:1895-901
<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>Patient ID</td>
<td>• Medications Prior to Admission</td>
</tr>
<tr>
<td>Physician/Service</td>
<td>• VITAL Signs</td>
</tr>
<tr>
<td>Transferred in (ED)</td>
<td>• Height</td>
</tr>
<tr>
<td>Medicare</td>
<td>• Weight</td>
</tr>
<tr>
<td>Medicaid</td>
<td>• BMI</td>
</tr>
<tr>
<td>Admit Date</td>
<td>• Heart Rate</td>
</tr>
<tr>
<td>Discharge Date/Time</td>
<td>• BP</td>
</tr>
<tr>
<td>Date of Birth</td>
<td>• Respiratory Rate</td>
</tr>
<tr>
<td>Gender</td>
<td>• Lipids</td>
</tr>
<tr>
<td>Race</td>
<td>• Labs</td>
</tr>
<tr>
<td>Medical History</td>
<td>• Procedures</td>
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<tr>
<td>Hx Smoking</td>
<td>• Ejection Fraction</td>
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<tr>
<td>HF Hx</td>
<td>• Discharge Status</td>
</tr>
<tr>
<td>Cardiac Diagnosis</td>
<td>• Discharge Meds</td>
</tr>
<tr>
<td>Other Meds</td>
<td>• ICD Therapy</td>
</tr>
<tr>
<td>Risk Interventions</td>
<td>• Smoking Cessation Counseling</td>
</tr>
<tr>
<td>Activity Level</td>
<td>• Follow-up</td>
</tr>
<tr>
<td>Symptoms worsening</td>
<td>• Diet</td>
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<tr>
<td>Diet</td>
<td>• Medications</td>
</tr>
<tr>
<td>Weight Monitoring</td>
<td>• Referred to Rehab Program</td>
</tr>
</tbody>
</table>
GWTG Data Quality Control

- Site level data quality requirements
  - Edit Range Checks
  - Required fields to save records as complete
  - Staff training

- Not Society mandated
  - Front end vendor software data validation

- Frequency of validation
  - Submission per record

- National level data quality requirements
  - Ongoing data quality monitoring with annual data quality reports for each module
  - Pre-harvest internal quality control validations performed prior to analysis

- Type of quality report feedback
  - Site Data Quality Report feedback to each site introduced in Q1 ’07
  - Number of records excluded
  - Number of duplicate records
  - Number of complete records at time of harvest
  - Edit range checks
  - Required fields to save records as complete
GWTG Research

• Research activity supported by AHA/GWTG
  ▪ AHA (Clinical Cardiology and Stroke Councils)
  ▪ Extramural grants AHRQ, NIH, others

• Data access process
  ▪ Formal Publication Process and Oversight Committee
  ▪ GWTG Committees, AHA Council, Participating Hospitals
  ▪ Young Investigators
  ▪ Proactively promote the database to all interested investigators

• Research project recruitment process
  ▪ Periodic calls to our national volunteer base for recruitment as well as “idea generation” conference calls
  ▪ Research question and hypothesis presented to GWTG Science Subcommittee
  ▪ GWTG Steering Committee member assigned to writing group for guidance and co-authorship
GWTG Quality Research Programs

Years through 9/30/12

Total Pubs by Program:
* GWTG HF: 38
* GWTG Stroke: 39
* GWTG CAD: 42
* GWTG Resuscitation: 45
* Action-Registry GWTG: 36
* Mission: Lifeline: 1

Note: "Due to the transition over to ACTION Registry-GWTG, GWTG - CAD closed effective December 31, 2009 with final data entry completed on March 31, 2010”

* Pubs for more than module are counted in both module
* Pubs counted in year they went online or print

GWTG Quality Research Programs

<table>
<thead>
<tr>
<th>Years</th>
<th>GWTG HF</th>
<th>GWTG Stroke</th>
<th>GWTG CAD</th>
<th>GWTG Resuscitation</th>
<th>Action-Registry GWTG</th>
<th>Mission: Lifeline</th>
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<td>2012</td>
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</tbody>
</table>
GWTG Publications – HF, CAD, Stroke

2012 Calendar Year Results – through 10/15/12
33 Published Manuscripts (9 HF, 11 CAD, 13 Stroke)
22 Abstracts presented at Conferences
(ISC: 7, ACC: 0, QCOR: 6, HFSA: 2, SS: 7)

2011 Calendar Year Results
26 Published Manuscripts (13 HF, 4 CAD, 1 HF/CAD, 7 Stroke)
31 Abstracts presented at Conferences
(ISC: 10, ACC: 7, QCOR: 4, HFSA: 0, SS: 10)

2010 Calendar Year Results
19 Published Manuscripts (3 HF, 6 CAD, 10 Stroke)
20 Abstracts presented at Conferences
(ISC: 3, ACC: 2, QCOR: 11, HFSA: 1, SS: 3)

2009 Calendar Year Results
21 Published Manuscripts (8 HF, 8 CAD, 1 CAD/HF, 4 Stroke)
23 Abstracts presented at Conferences

2008 Calendar Year Results:
17 Published Manuscripts (4 HF, 9 CAD, 4 Stroke)
14 Abstracts presented at Conferences
GWTG Young Investigator Seed Grant

Young Investigator Database Research Seed Grant supported by the Council on Clinical Cardiology, the Stroke Council and the Council on Quality of Care and Outcomes Research

***Deadline is October 31, 2012***

General Information
The Council on Clinical Cardiology, the Stroke Council, and the Council on Quality of Care and Outcomes Research® proudly value the development of young clinical investigators. To further this effort, the councils have a limited number of seed grants for young investigators for meritorious research projects based on the data gathered from Get With The Guidelines®. A description of Get With The Guidelines® and the database content follows. The Executive Database Steering Committee, the Get With The Guidelines Steering Committee, and the Get With The Guidelines Science Subcommittees provide oversight for the large database. Members of these committees will be available as mentors to the applicants. Young investigators may be current fellows in training or within five years of completing their cardiology or neurology fellowship or other doctoral prepared professionals who are early in their career development and have interest in cardiovascular or stroke research.

The seed grants provide adequate funds to 1) allow initial project design, access to the Get With The Guidelines data and statistical analysis; and 2) cover travel expenses of the recipient to travel to a National scientific conference to present the results. Mentors provide recipients methods of clinical research using Get With The Guidelines® databases. Our goal is to have this initial effort succeed in opening future opportunities for research, collaboration and scientific advancement for the young investigator.

- What is Get With The Guidelines®?
- What information is collected in the Get With The Guidelines® database?
- Process for Developing and Submitting a Proposal
- Deadline and Award Information

What is Get With The Guidelines®?
Get With The Guidelines® is a research program sponsored by the American Heart Association and intended to improve the care of cardiovascular disease and stroke patients nationwide.
Young Investigator Research Seed Grant

- Grant Awards are for meritorious research projects based on the data gathered from Get With The Guidelines®.
- Data available for CAD, Heart Failure, Stroke, and Resuscitation
- Young investigators may be current fellows in training or within five years of completing their cardiology or neurology fellowship or other doctoral prepared professionals who are early in their career development and have interest in cardiovascular or stroke research
- Goal of the grant is to have this initial effort succeed in opening future opportunities for research, collaboration and scientific advancement for the young investigator
**Young Investigator Research Seed Grant**

- Grant Awards are funded through AHA Council Leadership
- Funds are provided to:
  1) allow initial project design, access to the Get With The Guidelines data and statistical analysis;
  2) cover travel expenses of the recipient to travel to a national scientific conference to present the results
- Award cycles are scheduled twice per year
- Mentorship provided to awardees by members of GWTG Science Subcommittee and clinical workgroups.
- Mentors provide recipients methods of clinical research using Get With The Guidelines databases during the length of the awarded project
Young Investigator Research Seed Grant

- Based on review of the data elements collected across each of the GWTG modules, develop a study hypotheses
- To avoid potential overlap, please review prior published publications and previously funded projects
- Obtain research proposal form online via the Young Investigator Research Seed Grant webpage
- Submit completed research proposal and updated Curriculum Vitae to Manager, Quality Research Development (email: laura.shuey@heart.org)
- Submitted proposals will be reviewed by the Get With The Guidelines committee leadership
- Notification is sent to all applicants based on the committee’s decision
Young Investigator Research Seed Grant

- If awarded funding, data access will be arranged through AHA staff and a designated Get With The Guidelines mentor.
- Statistical analysis will be arranged through DCRI.
- The monetary award will cover statistical analysis up to $6,000 in addition to $2,000 to support travel to the national conference for presentation.
- Awardees will work with their mentor to draft an abstract for presentation at a national conference and to development of a manuscript for submission to peer reviewed journal.
- Additional information may be found online through the AHA website: [www.heart.org](http://www.heart.org) key search Young Investigator Research Seed Grant.
Examples of GWTG Research with Early Career Investigators as First Author
Sex Differences in Medical Care and Early Death After Acute Myocardial Infarction

Hani Jneid, MD; Gregg C. Fonarow, MD; Christopher P. Cannon, MD; Adrian F. Hernandez, MD; Igor F. Palacios, MD; Andrew O. Mauee, MD; Quinn Wells, MD; Biykem Bozkurt, MD; Kenneth A. LaBresh, MD; Li Liang, PhD; Yuling Hong, MD, PhD; L. Kristin Newby, MD, MHS; Gerald Fletcher, MD; Eric Peterson, MD, MPH; Laura Wexler, MD; for the Get With the Guidelines Steering Committee and Investigators

Background—Women receive less evidence-based medical care than men and have higher rates of death after acute myocardial infarction (AMI). It is unclear whether efforts undertaken to improve AMI care have mitigated these sex disparities in the current era.

Methods and Results—Using the Get With the Guidelines–Coronary Artery Disease database, we examined sex differences in care processes and in-hospital death among 78 254 patients with AMI in 420 US hospitals from 2001 to 2006. Women were older, had more comorbidities, less often presented with ST-elevation myocardial infarction (STEMI), and had higher unadjusted in-hospital death (8.2% versus 5.7%; \( P < 0.0001 \)) than men. After multivariable adjustment, sex differences in in-hospital mortality rates were no longer observed in the overall AMI cohort (adjusted odds ratio [OR] = 1.04; 95% CI, 0.99 to 1.10) but persisted among STEMI patients (10.2% versus 5.5%; \( P < 0.0001 \); adjusted OR = 1.12; 95% CI, 1.02 to 1.23). Compared with men, women were less likely to receive early aspirin treatment (adjusted OR = 0.86; 95% CI, 0.81 to 0.90), early \( \beta \)-blocker treatment (adjusted OR = 0.90; 95% CI, 0.86 to 0.93), reperfusion therapy (adjusted OR = 0.75; 95% CI, 0.70 to 0.80), or timely reperfusion (door-to-needle time \( \leq 30 \) minutes: adjusted OR = 0.78; 95% CI, 0.65 to 0.92; door-to-balloon time \( \leq 90 \) minutes: adjusted OR = 0.87; 95% CI, 0.79 to 0.95). Women also experienced lower use of cardiac catheterization and revascularization procedures after AMI.

Conclusions—Overall, no sex differences in in-hospital mortality rates after AMI were observed after multivariable adjustment. However, women with STEMI had higher adjusted mortality rates than men. The underuse of evidence-based treatments and delayed reperfusion among women represent potential opportunities for reducing sex disparities in care and outcome after AMI. (Circulation. 2008;118:2803-2810.)

Key Words: myocardial infarction ■ percutaneous coronary intervention ■ reperfusion ■ revascularization ■ sex
Race and Sex Disparities in ICD Use at Discharge Among Eligible Patients With HF

Racial and Ethnic Differences in the Treatment of Acute Myocardial Infarction: Findings From Get With The Guidelines-CAD Program

Mauricio G. Cohen, MD; Gregg C. Fonarow, MD; Eric D. Peterson, MD, MPH; Mauro Moscucci, MD, MBA; David Dai, MHS; Adrian F. Hernandez, MD, MHS; Robert O. Bonow, MD; Sidney C. Smith, Jr., MD

Circulation. 2010 Jun 1;121(21):2294-301.
GWTG-CAD Eliminated Race/Ethnic-Based Disparities in AMI Care

Overall, defect-free care was:
- 80.9% for Caucasians
- 79.5% for Hispanics
- 77.7% for African Americans

Overall OR: 1.08 (1.06-1.10)
African American vs. Caucasian OR: 0.98 (0.79-1.21)
Hispanic vs. Caucasian OR: 1.19 (0.93-1.53)

* $ p<0.01$ for difference between African-American and Caucasian patients
$\S$ $ p<0.01$ for difference between Hispanic and Caucasian patients
The significance level of $p$ was changed to less than 0.01 to adjust for the multiple comparisons.
Association of Hospital Primary Angioplasty Volume in ST-Segment Elevation Myocardial Infarction With Quality and Outcomes

Dharam J. Kumbhani, MD, SM
Christopher P. Cannon, MD
Gregg C. Fonarow, MD
Li Liang, PhD
Arman T. Askari, MD
W. Frank Peacock, MD
Eric D. Peterson, MD, MPH
Deepak L. Bhatt, MD, MPH
for the Get With the Guidelines Steering Committee and Investigators

Several studies have demonstrated an inverse relationship between hospital primary angioplasty volume and mortality in patients presenting with ST-segment elevation myocardial infarction (STEMI). Analysis of data by the National Registry of Myocardial Infarction 2 investigators between 1994 and 1998 indicated that high primary angioplasty volume hospitals (>33 procedures per year) had a 28% lower inhospital mortality compared with low primary angioplasty volume hospitals (5-11 procedures per year).2 Another recent analysis using the same data set, but slightly different thresholds (<12

**Context** Earlier studies indicate an inverse relationship between hospital volume and mortality after primary angioplasty for patients presenting with ST-segment elevation myocardial infarction (STEMI). However, contemporary data are lacking.

**Objective** To assess the relationship between hospital primary angioplasty volume and outcomes and quality of care measures in patients presenting with STEMI.

**Design, Setting, and Patients** An observational analysis of data on 29,513 patients presenting with STEMI and undergoing primary angioplasty in the American Heart Association’s Get With the Guidelines registry. Patients were treated between July 5, 2001, and December 31, 2007, at 166 angioplasty-capable hospitals across the United States. Hospitals were divided into tertiles (<36 procedures per year, 36-70 procedures per year, and >70 procedures per year) based on their annual primary angioplasty volume.

**Main Outcome Measures** Door-to-balloon (DTB) times, length of hospital stay, adherence with evidence-based quality of care measures, and in-hospital mortality.

**Results** Compared with low- and medium-volume centers, high-volume centers had better median DTB times (98 vs 90 vs 88 minutes, respectively; P for trend <.001). High-volume centers were more likely than low-volume centers to follow evidence-based guidelines at discharge. Length of stay was similar between the 3 groups (P for trend=.13). There was no significant difference in the crude mortality between the tertiles of volume (incidence rate, 3.9% vs 3.2% vs 3.0% for low-, medium-, and high-volume centers, respectively; P=.26 and P=.99 for low- and medium- vs high-volume hospitals, respectively). Sequential multivariable modeling using generalized estimating equations revealed no significant association between hospital primary angioplasty volume and in-hospital mortality (adjusted odds ratio [OR], 1.22; 95% confidence interval [CI], 0.78-1.91; P=.38 and adjusted OR, 1.14; 95% CI, 0.78-1.66; P=.49 for low- and medium- vs high-volume hospitals, respectively).

**Conclusion** In a contemporary registry of patients with STEMI, higher-volume primary angioplasty centers vs lower-volume centers were associated with shorter DTB times and more use of evidence-based therapies, but not with adjusted in-hospital mortality or length of hospital stay.

*JAMA. 2009;302(20):2207-2213*
U.S. hospitals participating in the American Heart Association's Get With The Guidelines-Heart Failure Quality Improvement program provided **Improved and Equitable Care** for black, Hispanic and white patients.
GWTG-HF Associated with Equitable Care for Women and Men

<table>
<thead>
<tr>
<th>Characteristic (of non missing values in eligible patients)</th>
<th>Unadjusted OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete set of written instructions at time of discharge</td>
<td>0.95</td>
</tr>
<tr>
<td>Documentation of evaluation of left ventricular function</td>
<td>0.91</td>
</tr>
<tr>
<td>ACE-I or ARB prescription for LVSD</td>
<td>1.01</td>
</tr>
<tr>
<td>Adult smoking cessation counseling</td>
<td>1.01</td>
</tr>
<tr>
<td>β-blocker prescription for LVSD</td>
<td>0.89</td>
</tr>
<tr>
<td>Defect-free measure (100% compliance with all 5 primary measures)</td>
<td>1.13</td>
</tr>
<tr>
<td>Composite quality measure</td>
<td>0.97</td>
</tr>
<tr>
<td>Warfarin at discharge for patients with atrial fibrillation</td>
<td>0.85</td>
</tr>
<tr>
<td>Evidence based β-blockers prescription for LVSD</td>
<td>0.93</td>
</tr>
<tr>
<td>Aldosterone antagonists prescription for LVSD</td>
<td>0.95</td>
</tr>
<tr>
<td>African Americans with LVSD prescribed hydralazine/isosorbide dinitrate</td>
<td>0.82</td>
</tr>
<tr>
<td>ICD in patients with LVEF ≤ 35% (before admission or placed during admission)</td>
<td>0.61</td>
</tr>
</tbody>
</table>

Klein L, Grau-Sepulveda MV, Bonow RO, Hernandez AF, William MV Bhatt DL, Fonarow GC

*Quality of Care and Outcomes in Women Hospitalized for Heart Failure* CIRCHEARTFAILURE

Get With The Guidelines-Heart Failure

*Improved Overall Quality of Care*

in men and women.
Risks of Intracranial Hemorrhage Among Patients With Acute Ischemic Stroke Receiving Warfarin and Treated With Intravenous Tissue Plasminogen Activator

Ying Xian, MD, PhD
Li Liang, PhD
Eric E. Smith, MD, MPH
Lee H. Schwamm, MD
Matthew J. Reeves, PhD
DaiWai M. Olson, PhD, RN
Adrian F. Hernandez, MD, MHS
Gregg C. Fonarow, MD
Eric D. Peterson, MD, MPH

Intravenous tissue plasminogen activator (tPA) is currently the only effective treatment to improve outcomes for acute ischemic stroke; however, treatment with intravenous tPA carries the risk of symptomatic intracranial hemorrhage (sICH). Of patients who receive intravenous tPA for stroke, 2.4% to 8.8% experience this potentially life-threatening complication.3,6 Warfarin-treated patients may be at an increased risk of sICH, but the true absolute risk of sICH in this population remains a matter of significant debate, because warfarin-treated patients were excluded from major trials of tPA.3,8 Furthermore, observational studies of bleeding risk among warfarin-treated patients receiving intravenous tPA have been small and inconsistent.9-13

Context Intravenous tissue plasminogen activator (tPA) is known to improve outcomes in ischemic stroke; however, patients receiving long-term chronic warfarin therapy may face an increased risk for intracranial hemorrhage when treated with tPA. Although current guidelines endorse administering intravenous tPA to warfarin-treated patients if their international normalized ratio (INR) is 1.7 or lower, there are few data on safety of intravenous tPA in warfarin-treated patients in clinical practice.

Objectives To determine the risk of symptomatic intracranial hemorrhage (sICH) among patients with ischemic stroke treated with intravenous tPA who were receiving warfarin vs those who were not and to determine this risk as a function of INR.

Design, Setting, and Patients Observational study, using data from the American Heart Association Get With The Guidelines–Stroke Registry, of 23,437 patients with ischemic stroke and with INR of 1.7 or lower, treated with intravenous tPA in 1,203 registry hospitals from April 2009 through June 2011.

Main Outcome Measure Symptomatic intracranial hemorrhage. Secondary endpoints include life-threatening/serious systemic hemorrhage, any tPA complications, and in-hospital mortality.

Results Overall, 1,802 (7.7%) patients with stroke treated with tPA were receiving warfarin (median INR, 1.20; interquartile range [IQR], 1.07-1.40). Warfarin-treated patients were older, had more comorbid conditions, and had more severe strokes. The unadjusted sICH rate in warfarin-treated patients was higher than in non-warfarin-treated patients (5.7% vs 4.6%; P < .001), but these differences were not significantly different after adjustment for baseline clinical factors (adjusted odds ratio [OR], 1.01 [95% CI, 0.82-1.25]). Similarly, there were no significant differences between warfarin-treated and non-warfarin-treated patients for serious systemic hemorrhage (0.9% vs 0.9%; adjusted OR, 0.78 [95% CI, 0.49-1.24]), any tPA complications (10.6% vs 8.4%; adjusted OR, 1.09 [95% CI, 0.93-1.29]), or in-hospital mortality (11.4% vs 7.9%; adjusted OR, 0.94 [95% CI, 0.79-1.13]). Among warfarin-treated patients with INRs of 1.7 or lower, the degree of anticoagulation was not statistically significantly associated with sICH risk (adjusted OR, 1.10 per 0.1-unit increase in INR [95% CI, 1.00-1.20]; P = .06).

Conclusion Among patients with ischemic stroke, the use of intravenous tPA among warfarin-treated patients (INR ≤1.7) was not associated with increased sICH risk compared with non-warfarin-treated patients.

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Duration of resuscitation efforts and survival after in-hospital cardiac arrest: an observational study

Zachary D Goldberger, Paul S Chan, Robert A Berg, Steven L Kronick, Colin R Cooke, Mingrui Lu, Mousumi Banerjee, Rodney A Hayward, Harlan M Krumholz, Brahmajee K Nallamothu, for the American Heart Association Get With The Guidelines—Resuscitation (formerly the National Registry of Cardiopulmonary Resuscitation) investigators *

Summary

Background During in-hospital cardiac arrests, how long resuscitation attempts should be continued before termination of efforts is unknown. We investigated whether duration of resuscitation attempts varies between hospitals and whether patients at hospitals that attempt resuscitation for longer have higher survival rates than do those at hospitals with shorter durations of resuscitation efforts.

Methods Between 2000 and 2008, we identified 64339 patients with cardiac arrests at 435 US hospitals within the Get With The Guidelines—Resuscitation registry. For each hospital, we calculated the median duration of resuscitation before termination of efforts in non-survivors as a measure of the hospital's overall tendency for longer attempts. We used multilevel regression models to assess the association between the length of resuscitation attempts and risk-adjusted survival. Our primary endpoints were immediate survival with return of spontaneous circulation during cardiac arrest and survival to hospital discharge.

Findings 31198 of 64339 (48·5%) patients achieved return of spontaneous circulation and 9912 (15·4%) survived to discharge. For patients achieving return of spontaneous circulation, the median duration of resuscitation was 12 min (IQR 6–21) compared with 20 min (14–30) for non-survivors. Compared with patients at hospitals in the quartile with the shortest median resuscitation attempts in non-survivors (16 min [IQR 15–17]), those at hospitals in the quartile with the longest attempts (25 min [25–28]) had a higher likelihood of return of spontaneous circulation (adjusted risk ratio 1·12, 95% CI 1·06–1·18; p<0·0001) and survival to discharge (1·12, 1·02–1·23; 0·021).

Interpretation Duration of resuscitation attempts varies between hospitals. Although we cannot define an optimum duration for resuscitation attempts on the basis of these observational data, our findings suggest that efforts to systematically increase the duration of resuscitation could improve survival in this high-risk population.

Funding American Heart Association, Robert Wood Johnson Foundation Clinical Scholars Program, and the National Institutes of Health.
Expansion of QI Suite with GWTG-Atrial Fibrillation

Work is underway to develop and launch Get With The Guidelines-AF by June 2013

Clinical Work Group has been formed

inclusive of Clinical Cardiologist, Electrophysiologist, Neurologist, Pharmacist, Advanced Practice Nurse, Heart Failure specialist, and Hematologist

Patient Population has been defined as:

Patients with primary diagnosis with AF or secondary diagnosis with AF requiring hospitalization

All specifications related to case report forms and data definitions on track for December 15, 2012 submission
Expanding Capacity of Clinical Registries

Clinical Registry

Claims Data

Cross sectional Studies

Longitudinal Evaluations

Clinical Registry

Biomarker Genetics Samples

Translational Discovery

Clinical Registry

Detailed Pharm + Device Info

CER-Safety Surveillance

Clinical Registry

Device/Drug RCT

Practical Clinical Trials

Clinical Registry

Longitudinal Outcomes

Longitudinal Outcomes

Longitudinal Outcomes
Evidence-Based, Guideline-Driven, Patient-Centered Cardiovascular Care

Evidence
Guidelines
Clinical Decision Support

Integrated Multidisciplinary Care Teams
Patients and Families

Process Measures
Outcome Measures
Health Status Measures

Timely Safe Efficient Effective Patient Centered Equitable
## Potential Impact of Optimal Implementation of Evidence-Based HF Therapies on Mortality

<table>
<thead>
<tr>
<th>Guideline Recommended Therapy</th>
<th>HF Patient Population Eligible for Treatment, n*</th>
<th>Current HF Population Eligible and Untreated, n (%)</th>
<th>Potential Lives Saved per Year</th>
<th>Potential Lives Saved per Year (Sensitivity Range*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACEI/ARB</td>
<td>2,459,644</td>
<td>501,767 (20.4)</td>
<td>6516</td>
<td>(3336-11,260)</td>
</tr>
<tr>
<td>Beta-blocker</td>
<td>2,512,560</td>
<td>361,809 (14.4)</td>
<td>12,922</td>
<td>(6616-22,329)</td>
</tr>
<tr>
<td>Aldosterone Antagonist</td>
<td>603,014</td>
<td>385,326 (63.9)</td>
<td>21,407</td>
<td>(10,960-36,991)</td>
</tr>
<tr>
<td>Hydralazine/Nitrate</td>
<td>150,754</td>
<td>139,749 (92.7)</td>
<td>6655</td>
<td>(3407-11,500)</td>
</tr>
<tr>
<td>CRT</td>
<td>326,151</td>
<td>199,604 (61.2)</td>
<td>8317</td>
<td>(4258-14,372)</td>
</tr>
<tr>
<td>ICD</td>
<td>1,725,732</td>
<td>852,512 (49.4)</td>
<td>12,179</td>
<td>(6236-21,045)</td>
</tr>
<tr>
<td>Total</td>
<td>-</td>
<td>-</td>
<td>67,996</td>
<td>(34,813-117,497)</td>
</tr>
</tbody>
</table>

“Humanity’s greatest advances are not in its discoveries – but in how those discoveries are applied”

Bill Gates, June 7, 2007
Harvard Commencement Address
Conclusions

• There are excellent opportunities to launch your career focused on cardiovascular quality of care, performance improvement, and outcomes

• GWTG can provide you with terrific opportunities for early career mentoring, research, and publishing

• The GWTG Young Investigator Database Seed Grant Program is accepting applications

• There are opportunities to serve on various GWTG oversight committees