Thank you for joining The Guideline Advantage this afternoon!

To access the audio portion:
Dial: (866) 832-6378
Conference ID: 337 535 42

We will be starting the presentation shortly.
Improving Care Coordination for Stroke Survivors: Preventing Recurrent Stroke and Hospital Readmissions

Webinar Presented October 10, 2013
1. Providers can use several different technology platforms.


3. Data are processed, analyzed and provided back to the practice via a practice portal.

4. Performance is measured; Professionals can set measurable goals and chart improvements in performance.
As a part of quality improvement, clinical data must be aggregated into a data warehouse to facilitate analysis and reporting.

Technically speaking... how does it work?

Key activities include:
- Data Alignment
- Denominator Calculation
- Numerator Calculations
- Attribution
- Benchmarking
Program Functionality

- The Guideline Advantage Measure Sets + an Additional Measure Set available as defined by the customer
- Patient Lists and action list functionality
- Views & filtering options for Teams
- Comparison, Benchmarking & Historical Trending
- Customer Driven Functionality, including demographic information displays, incentive program tracking, & non-clinical custom groupings
- Complete data advisory service, including comprehensive consultations and guidance in identifying data sources, mapping, data cleansing and alignment
- Fixed implementation fee and annual licenses
Advantages to Practices & Physicians

On-demand access to quality improvement data using a web-based tool

Available physician-level reporting

Clinic and system aggregation

Tools for creating action lists

Alignment with key national initiatives

National and State Benchmarking

Practice Network opportunities including virtual workshops and national recognition
The Guideline Advantage’s Measures

**Diabetes Mellitus**
- HbA1c Control
- LDL Control
- High Blood Pressure Control
- Annual nephropathy screening (urine albumin)

**Preventive Care Screening**
- BMI Screening & Follow-up
- Influenza Vaccination
- Tobacco Use and Counseling
- Blood Pressure Screening
- LDL Measurement

**Cancer**
- Colorectal Cancer Screening
- Mammography Screening
- Cervical Cancer Screening

**Cardiovascular**
- Ischemic Vascular Disease: Aspirin Use & Lipid panel
- Hypertension: Blood Pressure Control
- CAD: Lipid-lowering Therapy
- CAD: Antiplatelet Therapy
- CAD: Blood Pressure Control
- CAD: Tobacco Use

*Measures are subject to change*
Alignment with National Programs

Million Hearts Initiative
The Guideline Advantage reports on the "ABCS" measures of interest to Million Hearts
http://millionhearts.hhs.gov/index.html

Uniform Data System (UDS)
The program reports all adult UDS measures of interest to Community Health Centers and Federally Qualified Health Centers
http://www.udsmr.org/
Leading practices for effective participation

- Use existing EHR platform; don’t interrupt work flow to collect data; offer vendor or neutral program model
- Provide tools and resources (Webinars, CME programs, etc.) to help develop a culture of quality improvement
- Provide feedback and consult with practices on how to disseminate information
- Encourage focus on 1-2 areas only
- Direct practices to resources to support improvement
- Recognize and link to incentives

These are just a few of the best practices shared by the program.
Improving Care Coordination for Stroke Survivors: Preventing Recurrent Stroke and Hospital Readmissions

Cheryl Bushnell, MD, MHS and Pam Duncan, PT, PhD
Disclosures

• Dr. Bushnell has nothing to disclose
• Dr. Duncan has nothing to disclose
Objectives

- Risk factor stratification and secondary prevention strategies prior to discharge
- Evidence behind secondary prevention and where the boundaries are
- Transitions of care, early supported discharge, and preventing readmissions
Questions patients and families ask

• Will I recover back to my normal self?

• How do I prevent another stroke?
What happens after stroke?

• 987 participants of the Atherosclerosis Risk in Communities (ARIC) study with first-ever stroke followed for 5 years

• 183 recurrent strokes (18.5%); 70% were of same subtype

• 3234 hospitalizations among 746

• 529 deaths

• Only 14% were event-free during follow-up

Time to recurrent stroke varies by stroke type

Time to readmission by stroke type

![Graph showing time to readmission by stroke type.](image)
Incidence of events varies by stroke type

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Thrombotic (n=481)</th>
<th>Cardioembolic (n=197)</th>
<th>Lacunar (n=183)</th>
<th>Intracerebral Hemorrhage (n=85)</th>
<th>Subarachnoid Hemorrhage (n=41)</th>
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</thead>
<tbody>
<tr>
<td>Mortality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-day</td>
<td>7.5 (5.5–10.3)</td>
<td>12.8 (8.8–18.3)</td>
<td>1.1 (0.3–4.4)</td>
<td>36.5 (27.3–47.7)</td>
<td>24.4 (13.9–40.6)</td>
</tr>
<tr>
<td>1-year</td>
<td>19.6 (16.3–23.4)</td>
<td>27.6 (21.9–34.6)</td>
<td>9.6 (6.1–15.0)</td>
<td>45.4 (35.4–56.6)</td>
<td>26.9 (15.9–43.3)</td>
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<tr>
<td>Recurrent stroke</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>30-day</td>
<td>1.6 (0.7–3.2)</td>
<td>2.3 (0.9–6.0)</td>
<td>1.1 (0.3–4.4)</td>
<td>…</td>
<td>…</td>
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<tr>
<td>1-year</td>
<td>7.9 (5.7–11.0)</td>
<td>6.5 (3.6–11.9)</td>
<td>6.5 (3.6–11.4)</td>
<td>…</td>
<td>…</td>
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<tr>
<td>Hospital readmission</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All-cause readmission</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-day</td>
<td>14.4 (11.5–18.0)</td>
<td>22.0 (16.5–29.1)</td>
<td>2.9 (8.8–18.8)</td>
<td>9.3 (4.0–21.0)</td>
<td>18.8 (8.9–37.1)</td>
</tr>
<tr>
<td>1-year</td>
<td>53.2 (48.6–57.9)</td>
<td>65.6 (58.2–72.8)</td>
<td>41.2 (34.3–48.8)</td>
<td>42.8 (30.6–57.4)</td>
<td>50.0 (34.3–68.1)</td>
</tr>
<tr>
<td>CVD-related readmission*</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>30-day</td>
<td>1.8 (0.9–3.6)</td>
<td>6.6 (3.7–11.6)</td>
<td>0.6 (0.1–3.9)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1-year</td>
<td>13.3 (10.4–17.0)</td>
<td>23.4 (17.5–31.0)</td>
<td>5.9 (3.2–23.2)</td>
<td>9.4 (3.6–23.2)</td>
<td>6.8 (1.7–24.6)</td>
</tr>
</tbody>
</table>


Case

- 78 yo male with htn, afib, and CAD has acute onset of confusion and running into doorways on the left
- Neuro exam reveals left neglect and likely visual field cut, mild left face and arm weakness; NIHSS 5
- He received IV tPA since he was in the 4.5 hr window
- He did not like being on warfarin
Case (cont)

• Medications on admission:
  • Amlodipine 5 mg qd
  • Enalapril/HCTZ
  • Isosorbide dinitrate
  • Metoprolol XL 25 mg
  • NTG prn, synthroid, Celexa
Case (cont.) CTA and MRI
Case (cont) Right ICA

- Right ICA stenosis 80%
- Left vertebral artery origin stenosis and delayed filling
Case (cont.)

- **TTE**: LV function is low normal, left ventricular septal hypertrophy, left atrium mildly dilated, EF 53%, no right to left shunt
- **EKG**: Right bundle branch block, sinus bradycardia 51
- **Labs**
  - Lipid panel TC 147, Trig 165, HDL 30, LDL 98
  - TSH 2.887
  - Plts 189,000
  - HgbA1c 5.2
Summary of risk factors/potential etiologies

- Vertebrobasilar disease
- Carotid stenosis
- Intracranial disease
- Atrial fibrillation
- Hyperlipidemia
Risk factors for stroke

**Modifiable**
- Hypertension
- Diabetes
- Tobacco use
- High cholesterol
- Physical Inactivity and Obesity
- Metabolic syndrome
- Oral contraceptives/HRT
- Hyperhomocysteinemia
- Carotid stenosis
- Alcohol abuse
- Atrial fibrillation
- Vitamin D deficiency

**Non-modifiable**
- Age
- Family history
- Pregnancy/Preeclampsia
- Prior stroke/TIAs
- Heart disease
- Chronic kidney disease
- Obstructive sleep apnea
- Hypercoagulable states
- Hematologic disorders
Additional History for Risk Stratification

- Miscarriages
- Migraines with or without aura and treatment
- Preeclampsia, gestational hypertension, or gestational diabetes
- Family history of venous thrombosis, CAD, or stroke and age of onset
- Skin rashes
- Recent infections, low grade fevers
- Contraception (pills, IUDs, patches, Depot Provera shots)
- Hormone therapy
- Drug use, especially cocaine and amphetamines
History and Physical Examination

• Careful examination for:
  • Heart murmurs, arrhythmias
  • Evidence of peripheral arterial emboli
  • Livedo reticularis
  • Fundus examination to rule out papilledema
  • Neurologic deficits, old vs. new
Idiopathic or primary livedo reticularis is a bluish mottling of the skin, usually on the legs. It is linked with enlargement of the blood vessels and may be made worse by cold exposure.
How Many Strokes in the US Can Be Prevented by Risk-Factor Control?

- Hypertension: 360,500
- Cholesterol: 146,000
- Cigarettes: 89,500
- Atrial Fibrillation: 68,500
- Heavy Alcohol Use: 34,500

*Based on estimated 700,000 annual strokes.
Extent of awareness, treatment, and control of high blood pressure by race/ethnicity and sex (NHANES 2007-2010)

Source: National Health and Nutrition Examination Survey: 2007-2010; National Center for Health Statistics and National Heart, Lung and Blood Institute, Wake Forest Baptist Health
Diabetes mellitus awareness, treatment, and control (NHANES 2007-2010)

Atrial fibrillation and stroke risk

- Atrial fibrillation is associated with at least a 4% risk of stroke per year
- 5-fold risk of stroke vs. someone without AF
- Anticoagulation for those eligible is a stroke quality measure

# Atrial Fibrillation—CHA2DS2-VASc

<table>
<thead>
<tr>
<th>Factor</th>
<th>Score</th>
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</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>&lt; 65 years</td>
<td>0</td>
</tr>
<tr>
<td>65-74 years</td>
<td>1</td>
</tr>
<tr>
<td>&gt; 75 years</td>
<td>2</td>
</tr>
<tr>
<td>Congestive heart failure</td>
<td>1</td>
</tr>
<tr>
<td>Hypertension</td>
<td>1</td>
</tr>
<tr>
<td>Stroke/TIA/Thromboembolism</td>
<td>2</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>1</td>
</tr>
<tr>
<td>Female</td>
<td>1</td>
</tr>
</tbody>
</table>

Score = 0: aspirin
Score = 1: aspirin or oral anticoagulation
Score = 2: Oral anticoagulation

More clearly defines those who should be on anticoagulation

Other anticoagulants

- Dabigatran etexilate (Pradaxa) 150mg BID
- Apixaban (Eliquis) 5 mg BID
- Rivaroxaban (Xarelto) 20 mg qd
Atrial fibrillation: guidelines

• Patients with ischemic stroke or TIA with paroxysmal or permanent AF, anticoagulation with vitamin K antagonist is recommended (Class I; LOE A).

• For patients at high risk for stroke who require temporary interruption of oral anticoagulation, bridging therapy with an LMWH administered subcutaneously is reasonable (Class IIa; LOE C—New in 2011).

Furie, et al Stroke 2011;42;227
Carotid disease: guidelines

- Symptomatic carotid stenosis 70-99%, CEA is recommended if perioperative morbidity and mortality is <6% (Class I; LOE A)
- When CEA is indicated, surgery is reasonable within 2 weeks rather than delay if no contraindications (Class IIa; LOE B)
- CAS is alternative for symptomatic patients at average or low risk of complications associated with endovascular intervention (Class I; LOE B)

Furie, et al Stroke 2011;42;227
Vertebrobasilar disease: guidelines

- Optimal medical therapy, which should include antiplatelet therapy, statin therapy, and risk factor modification, is recommended for all patients with vertebral artery stenosis and TIA or stroke. (Class I; LOE B)

- Endovascular and surgical treatment of patients with extracranial vertebral stenosis may be considered when patients are having symptoms despite optimal medical treatment (Class IIb; LOE C)

Furie, et al Stroke 2011;42;227
Intracranial disease: guidelines

• For patients with stroke or TIA due to 50-99% stenosis of a major intracranial artery, aspirin is recommended in preference to warfarin (Class I; LOE B).

• Usefulness of angioplasty and/or stent placement is unknown and is considered investigational (Class IIb; LOE C)

Furie, et al Stroke 2011;42;227
Hyperlipidemia: guidelines

- Statin therapy with intensive lipid-lowering effects is recommended to reduce risk of stroke and cardiovascular events among patients with ischemic stroke or TIA who have evidence of atherosclerosis, an LDL-C level > 100 mg/dL, and without CHD (Class I; LOE B).

Furie, et al Stroke 2011;42;227
Antiplauletal therapy: guidelines

• Noncardioembolic ischemic stroke or TIA: antiplatelet agents rather than oral anticoagulation (Class I; LOE A)

• Aspirin (50 mg/d to 325 mg/d) monotherapy (Class I; LOE A), aspirin/dipyramidimole ER (Aggrenox; Class I; LOE B), and clopidogrel 75 mg (Class IIa; LOE B) are options.

• Addition of aspirin to clopidogrel increases risk of hemorrhage and is not recommended for routine secondary prevention (Class III; LOE A).

• For IS/TIA while on aspirin, no evidence for increasing aspirin dose, and no single agent or combination has been studied (Class IIb; LOE C)
Case Prevention regimen

• Hyperlipidemia—treat with statins
• Hypertension—goal systolic 120-140 mm Hg
• Carotid disease—evaluate for carotid procedure
• Vertebrobasilar disease—medical management
• Atrial fibrillation—anticoagulation
• Intracranial disease—antiplatelet therapy
SAMMPRIS Methods/Design

• Recent IS/TIA attributed to 70 to 99% stenosis of major intracranial artery

• Aggressive medical management: aspirin 325 mg qd, clopidogrel 75 mg qd for 90 days, then aspirin alone, primary risk factor management, smoking cessation, weight loss, and exercise with health coaches

• Intracranial stenting with the Wingspan stent

• Primary outcome: stroke or death at 30 days

Chimowitz, et al. NEJM 2011;365:993
The “SAMMPRIS” Approach

• PTAS group: 20% 1-year event rate

• Medical mgmt: 12% 1 year event rate

• It may be reasonable to treat patients with dual antiplatelet therapy for 90 days, then transition to aspirin, plus aggressive medical management (not published in a guideline)

Chimowitz, et al. NEJM 2011;365:993
Medication adherence

•Patients with known CAD in the Heart and Soul Study  
Single question for adherence: In the past month, how often did you take your medications as the doctor prescribed?

•Responses: All of the time (100%); Nearly all of the time (90%); most of the time (75%); About half the time (50%), or less than half the time (<50%).

Non-adherence is risk factor for stroke

• Those patients with stable CAD and self-reportedly took 75% or less of their medications:
  • Stroke OR 4.4 (95% CI 1.4-13.9)
Medication coaching and reducing risk of non-adherence

- Provide individualized information about risk factors and treatment goals prior to discharge
- Telephone follow-up within 2 days of discharge for high risk patients
- Clinic follow-up within 2 weeks
- Ask why patients do not take their medications as this is a key factor for medication non-adherence

Primary Prevention of Stroke by Assessment of Healthy Lifestyle

- Healthy Lifestyle
  - No smoking
  - Exercise
  - Diet
  - BMI
  - Alcohol

Transitional Care and Early Supported Discharge for Stroke Patients

Cheryl Bushnell  MD, MHS, Associate Professor Neurology, Director of WFBH Comprehensive Stroke Center

Pamela W Duncan PhD, FAPTA, FAHA
Professor, Neurology and Director of Innovations and Transitional Outcomes
Stroke Post Acute Care

• Stroke is a condition which requires intensive post-acute services and is one of the most costly conditions for Medicare.

• 2012 CMS Chart Book for Chronic Conditions
## Cost of Stroke Post Acute Services Compared to Acute Care - Medicaid in Forsyth County

<table>
<thead>
<tr>
<th>Service Category</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Inpatient</td>
<td>$8,014</td>
</tr>
<tr>
<td>Skilled Nursing</td>
<td>$41,029</td>
</tr>
<tr>
<td>Inpatient Rehab</td>
<td>$15,695</td>
</tr>
<tr>
<td>Home Health</td>
<td>$6,207</td>
</tr>
<tr>
<td>Long-Term NH</td>
<td>$62,000</td>
</tr>
</tbody>
</table>
DATA HIGHLIGHTS:
In 2010, 3.1 million beneficiaries (approximately 10%) received at least one home health visit during the year and 7% received 13 or more home health visits during the year (more than 1 per month on average). In contrast, over one-quarter of beneficiaries with 6 or more chronic conditions received 13 or more visits during the year.

WFB TJC Certified
Comprehensive Stroke Center
Early Supported Discharge

**Hospital Discharge**
- Stroke education
- Medication reconciliation
- Therapy needs
  - Refers to home health services

**Early Supported Discharge**
- Medication self-management and coaching
- Rehabilitation
- Safety
- Blood pressure mgmt
- Fall prevention
- Primary Care

**Reintegration**
- Maintaining stroke prevention medications
- Preventing medical and neurological complications (i.e. readmission)
- Maintaining and improving functional status post-rehab
- Treating depression
- Reinitiation of community and/or work activity
- Return to Primary Care Provider

WFBH Stroke Team Co-Manages with Home Health
Stroke Patient Case

- A 63 year old “healthy and functionally independent” female with PMH of HTN presented to the ED with profound left arm and leg weakness.
- Discharged from hospital to rehab and then home with a referral for physical and occupational therapy.
- Care at Home was initiated and she was transitioned to home health Nursing with PT/OT/Speech therapy.
Care at Home Services with Weekly Follow Up and Co-Management with Stroke Service NP

- Initiated Lifewatch telemetry monitor with RN’s assistance- *Falls Prevention Screening and Intervention*

- INR managed by HH in collaboration with patient’s PCP for adjustments

- Managed Medication side effects (Baclofen- Patient was referred to spasticity clinic for botox therapy)

- Blood Pressure Self-Management

- Began PT/OT and Speech therapy for stroke deficits
• Home Health Aid
  • To help with bathing and assist in ADL’s
• Case Manager (Social Worker)
  • Identified caregiver strain, assisted in financial and insurance issues
• Referred patient to PACE program once Care at home was completed
Outcomes

- Avoided hospital readmission
- Bridged care between neurology and primary care provider
- Improved communication between providers and family
- Improved patient functioning. *She can now climb stairs!*
- Reduced shoulder pain
- Reduced medication side effects
- Implemented secondary stroke prevention
- Reduced caregiver burden
- As family wished, avoided SNF placement, allowed patient to regain her independence (she is living in an apartment next to her daughter and now going to the PACE program during the day)
Patient and Family Satisfaction

• Daughter states Care at Home program “has Been a Godsend”
Early Supported Discharge (ESD) for Moderately Disabled Patients

• Stroke patients discharged from the acute hospital receive post-acute services at home rather than SNF or IRF

• Delivered by our Comprehensive Post-Acute Stroke Team (hospital and home health experts), (within 48 hours hospital discharge)
Early Supported Discharge

• Rehabilitation therapy

• Chronic disease and risk factor management

• Supports a seamless transition to primary care and community services
Evidence for ESD

- Multiple randomized controlled trials
- Best Practices in UK and Canada
  [www.strokebestpractices.ca](http://www.strokebestpractices.ca)
- International Consensus Guidelines
- ESD reduces cost and improves function.
  
  **Canada ESD generates $132.9 million of the direct cost savings.**

- In addition to the cost savings there are improved functional outcomes, patient satisfaction, reduced death and dependency at 6 months
ESD- Driver Diagram

Reduce utilization of post-acute services (in skilled nursing facilities, inpatient rehabilitation, and multiple episodes of home health care)

Reduce rehospitalizations

Reduce long term care placement in nursing homes

Improve patient functional status and reduce secondary complications of stroke

Improve patient and caregiver self-management of stroke, co-morbid chronic conditions and cardiovascular risk factors

Improve patient and caregiver satisfaction with post-acute stroke care

Implement and optimize uptake of Early Supported Discharge as the new health care delivery model for post-acute comprehensive stroke management

Integrate primary care with Early Supported Discharge to improve access and transition care to community-based health care providers

Transition to community-based wellness and exercise programs, case management, and long term services as needed

Reduce PMPM by 34% for Medicare and Medicaid- saving $2.4 million over a three year period for 300 stroke pts
Health Care Innovation Awards ROUND 2-
PURPOSE- Decrease post acute care costs-

2008-2012 outpatient costs increased 42%.

Variance in cost and utilization is wide and larger than for other services
Categories and Priorities

• Category 1- Reduce Medicare, Medicaid and/or CHIP expenditures in *outpatient and/or post-acute settings*

• Priorities
  • Home-based services
  • Therapeutic services
  • Post-acute services
Thank you for your time!!!

We would be happy to answer any questions at this time.
Questions?

Type question into the Q&A tab at the top of your screen.

Additional questions email laura.jansky@heart.org

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