

Ideal Foundational  
Requirements for Stroke  
Program Development and  
Growth: A Scientific  
Statement From the  
American Heart Association

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Wendy Dusenbury

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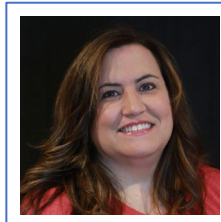
## AHA SCIENTIFIC STATEMENT

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# Ideal Foundational Requirements for Stroke Program Development and Growth: A Scientific Statement From the American Heart Association

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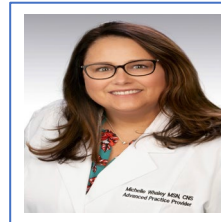
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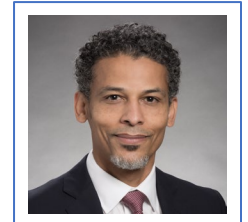
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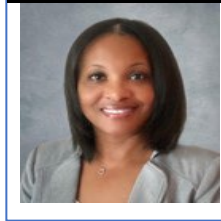
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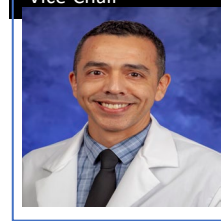
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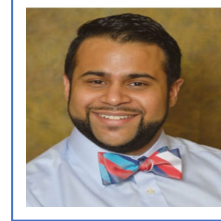
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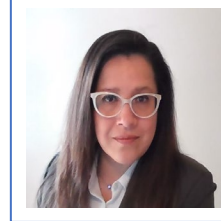
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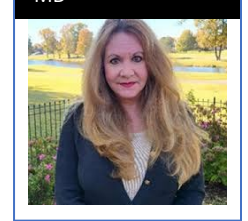
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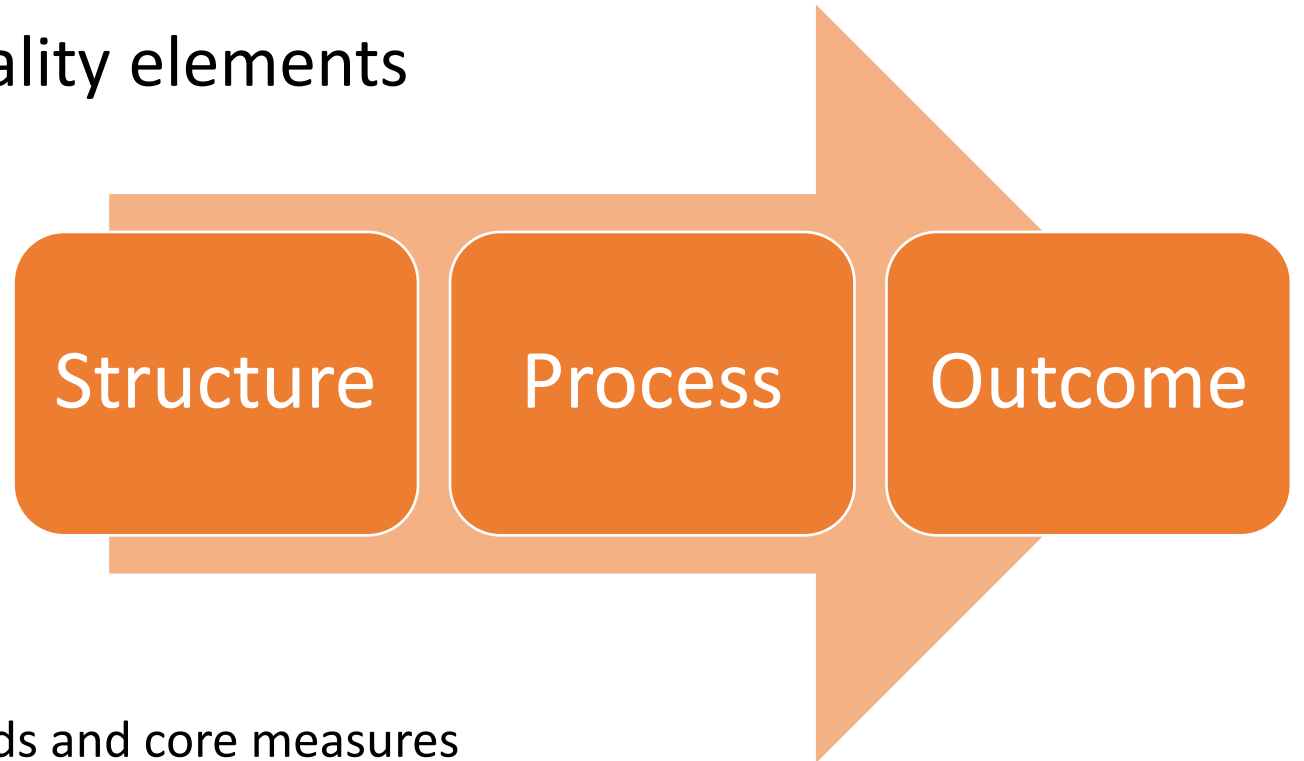
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# Quality Improvement Model: Donabedian Model

- Donabedian Model has three quality elements
  - **Structure**
    - How work is organized
    - Tools and resources available
    - Staffing and patient load
    - Not covered at all!
  - **Process**
    - How work is done
    - Staff training
    - Methods used to provide care
    - Well covered by certification standards and core measures
  - **Outcome**
    - Results of work
    - Somewhat covered by certification standards and core measures





# Foundational Structure

- Stroke Program Leadership
  - Personnel Resources
  - Neuroimaging Capabilities
  - Procedural Capabilities
  - Hospital Bed Resources
  - Quality Improvement and Clinical Research
  - Stroke System Accountability
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# Stroke Program Leadership

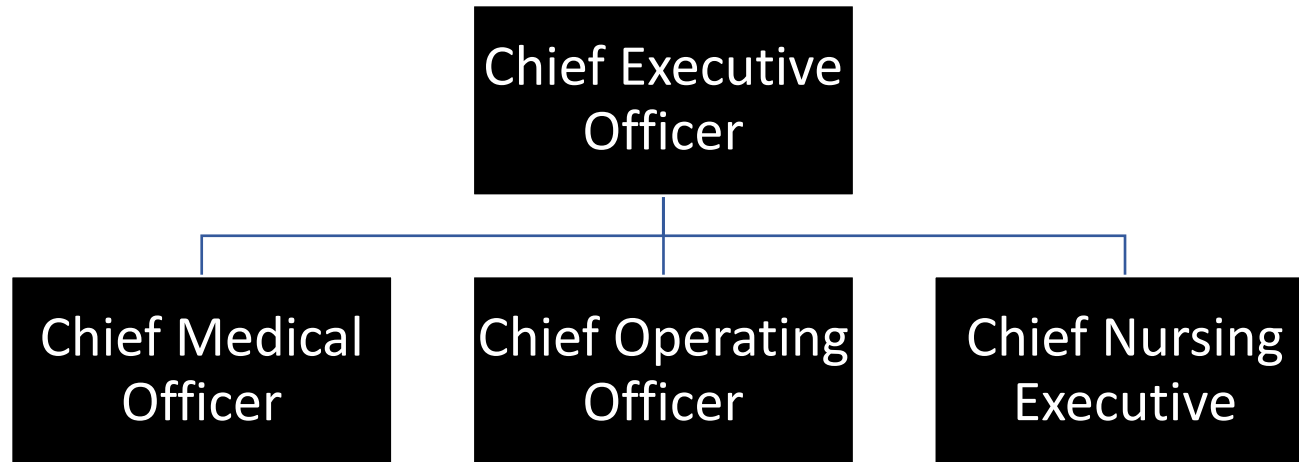
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- Corporate Leadership
- Stroke Program Medical Director
- Stroke Coordinator
- Advance Practice Providers





# Corporate Leadership



Neuroscience Service  
Line Manager

- Strategic goals and initiatives for the organization
- Hold line responsibility for stroke patient care.
- Service line director
  - Groups together key neurological and neurosurgical diagnoses, hospital units, and clinicians for administrative accountability and frontline rollout of strategic initiatives
- Transparency is key
  - Mission & Vision
  - Reporting Structure
  - Stroke Program Performance dissemination



# Stroke Medical Director

- PSC, TSC, and CSC hospitals should be supported by an official stroke medical leader
  - ensures that robust, evidence-based services are developed and implemented
- Additional skills:
  - Organizational behavior, strategic negotiation, change dynamics
  - Paints a clear picture of the program's vision, mission and values
  - Publication record:
    - Traditional manuscripts/abstracts, clinical treatment guidelines and protocols, multidisciplinary healthcare delivery systems, transfer protocols, educational curricula, etc.
    - Creative participation in evaluation of effectiveness of care

# Stroke Medical Director



Standards for Clinical Process & Policies

M&M, census, diversion status, education, metrics, multidisciplinary assessment



Protected Time

Best Medical Practices  
Scholarly Contribution




Medical Director + Service Line Director = Collaboration on **Shared Quality Goals** and **Strategic Development**



Stroke  
Coordinator



# Stroke Coordinator



PSC, TSC and CSC certified hospitals require leadership by Stroke Coordinators to ensure provision of evidence-based, efficient, high quality acute stroke services



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Empowered to assess and optimize acute stroke services within their assigned hospitals, and to situate the hospital to work effectively within community stroke systems

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Expert acute stroke clinical knowledge and skills are foundational to the role to support the synthesis of new evidence and evolving practice paradigms and to promote an understanding of critical gaps in care, resources, and services

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The work of stroke coordinators is supported by clinical relevancy, but furthered by understanding the dynamics of organizational behavior, change theory, and healthy work environments

# Essential Functions for the Stroke Coordinator

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- Responding to and supporting the provision of excellent emergent acute stroke care
- Serving as a role model that provides both formal and informal bedside education that ensures clinical competency in assessment and delivery of acute stroke care
- Development of and ensuring appropriate use of patient education materials
- Providing stroke community education
- Analyzing quality performance data
- Constructing/presenting stroke system quality reports and proposing unique organization-specific quality goals and outcome measures
- Development of evidence-based policies and procedures
- Performing gap analyses that explore and make clear areas for program improvement
- Leading preparation and attainment of certification, often in collaboration with regulatory and nursing leadership.
- Working with community stroke leaders to develop and implement strategies that aim to improve the overall stroke system of care
- Ongoing professional development to remain an agile leader and partner to the stroke program medical director

# Advanced Practice Providers

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# Advanced Practice Providers

- Both TSC and CSC certified hospitals require leadership by APPs to support delivery of evidence-based acute stroke care
- Essential partners to physician program leaders and the stroke coordinator
- Allowed to practice to their full practice authority
- Role of the APP must be meaningful



# Common Roles of Advanced Practice Providers

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Emergency responders for acute stroke alerts

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Stroke medical management during hospitalization

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First-assist neurointerventional and neurosurgical clinicians

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Provision of outpatient stroke clinic services

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Researcher

# Evolving Roles of the Neurovascular Advanced Practice Provider

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- Telemedicine emergency responders
  - Ongoing daily telemedicine patient management in underserved hospitals
  - Mobile stroke unit on-board expert



# Personnel

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Vascular Neurologists

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Neuro Interventionalists

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Telestroke Responders

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Clinical pharmacists

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Nursing

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Data Collection staff

## Vascular Neurologist



## Telestroke Responders



## Neuro-Interventionalist



Nursing

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# Nursing

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- Most essential and prevalent hospital clinician, but often receive minimal stroke education
- Neurovascular Nursing nurses have mastered a specific body of clinical knowledge and skill to ensure delivery of evidence-based practice.
- Experienced Neurovascular Nurses have been shown to significantly improve patient outcomes at 3 months and likely due to increased attention and greater attention to this unique patient population



# Nurse Staffing



When nurse-patient staffing ratios are optimal to provide increased patient contact, patient outcomes are significantly better, but acute stroke units may be staffed in insufficient numbers to meet patient needs



An analysis of stroke unit nurse staffing in 5 CSC hospitals showed that when nurse-patient ratios exceeded 4 patients with stroke to 1 registered nurse, “staffing-imposed immobility” resulted, with stable patients spending significantly more time in bed



All certifying agencies must examine the adequacy of nurse staffing, requiring stroke unit staffing at 3 or 4 patients to 1 registered nurse



Although the nursing shortage is a key staffing factor, administrators should not ignore the significant contribution of hospital culture to nurse recruitment and retention



Hospital  
Bed  
Resources

Hospital Stroke  
Units

Transfer  
Resources

# Stroke Units

Regulatory standards and guidelines require Stroke Units in USA certified stroke centers

## The Joint Commission Stroke Certification Programs – Program Concept Comparison

Program Concept	ASRH	PSC	TSC	CSC
<b>Stroke Unit</b>	No designated beds for acute care of stroke patients	Stroke unit or designated beds for the acute care of stroke patients	Has a neurointensive care unit or designated intensive care beds for complex stroke patients available 24/7; on-site critical care coverage 24/7	Has a neurointensive care unit or designated intensive care beds for complex stroke patients available 24/7; on-site neurointensivist coverage 24/7



# How the World Views Stroke Units

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On every inhabited continent, systems for development and credentialing of Stroke Centers are now in existence

- Some are credentialed by government bodies (i.e. Singapore)
- Some are credentialed by professional organizations (i.e. European Stroke Organization)
- All utilize evidence to support recommendations for standards of care
- Most are supported by quality metrics that collect data on use of evidence-based methods and benchmark performance (i.e. AuSCR; Get With The Guidelines)
- Some are bound by government payer mandates for performance that penalizes poor quality (i.e. CMS)
- Some require public reporting of quality (i.e. CMS; AuSCR)
- All include Stroke Units as key to stroke care excellence

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Stroke Units are recognized as the very first successful treatment for patients with acute neurovascular disease





# Research

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*Stroke patients who receive organized inpatient care in a stroke unit are more likely to be alive, independent, and living at home one year after the stroke*

*Patients with intracerebral hemorrhage seem to benefit at least as much as patients with ischemic stroke from organized inpatient (stroke unit) care*

\*Langhorne P, Ramachandra S, and Stroke Unit Trialists' Collaboration. Organized inpatient (stroke unit) care for stroke: Network meta-analysis. *Cochrane Database Syst Rev.* 2020; CD000197. Doi: 10.1002/14651858.CD000197.pub4. PMID: 32324916

\*Cochrane Database Syst Rev. 2013 Sep 11;9:CD000197

# Why do Stroke Units make a difference?

- Highly specialized interprofessional clinicians overseeing all aspects of patient care
  - Initial and ongoing specialist education and clinical training for bedside nurses, nurses in managerial and clinical leadership positions, physicians, therapists, nutritionists, pharmacists
- Segregation of stroke patients under the management of specialists
- Interprofessional collaboration
- Early involvement of the patient and family in plan development and provision of care

What do stroke units in the United States look like?

# USA National Stroke Unit (SU) Study

- Surveys were returned from 47 of 50 states, DC, and Puerto Rico: 57% PSC; 27% CSC; 15% TSC; 1% other
- Only 34% of certified stroke centers had SUs, with CSCs more commonly (59%) possessing a SU than other centers ( $p < 0.001$ )
- 61% of centers without SUs did not maintain designated beds for stroke; 36% admit stroke to general medical units, with 12% admitted to a variety of hospital units
- Only 14% of stroke directors control access to SU beds; SUs had significantly greater (40%) 24/7 MD coverage compared to non-SU hospitals (20%;  $p = .001$ )

Dusenbury W, Patterson, J, Kiernan T, Friedrich S, Alexandrov AW.  
European Stroke Organization Conference. 2021



# USA National Stroke Unit (SU) Study

- Overall, only 17% of Stroke Centers admitted tPA cases to non-ICU beds; in hospitals with SUs, CSCs more frequently admitted tPA patients to the SU (30%) compared to other centers (7%;  $p=0.029$ )
- RN staffing on SUs and general units was similar ( $p=ns$ ) at median 4 (IQR 3-4.25) patients to 1 RN on all shifts; staffing was 2 (IQR 2-2) patients to 1 RN for alteplase treated patients outside the ICU
- Overall, 1% (median; IQR 0-5.75%) of RNs were stroke-certified with CSCs having the highest rates of certified RNs (59%) compared to other centers ( $p=0.005$ ) and significantly more (43%) advanced practice provider coverage ( $p<0.001$ )
- Overall, only 33% of RNs caring for stroke patients were considered Stroke Team members

*Are these findings sufficient to produce patient outcomes that mirror European Stroke Unit clinical trials?*



# DATA Collection Staff

- Essential to stroke center operations
- Should be staffed similar to Trauma
- **500 stroke patients/** data collector annually





# Stroke Program Quality Improvement

- Core Measure Performance
- Clinical Practice Guidelines
- Policies, procedures, volumes
- Time metrics
- Quality / Outcome metrics
- PI Projects
- Peer Review
- Benchmark data bases
- Data integrity



# Questions

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