Becoming a Comprehensive Stroke Center

Jawad F. Kirmani, MD
Director Stroke & Cerebrovascular Program
Professor, Seton Hall University

Spozhmy Panezai, MD; Mohammad Moussavi, MD;
Jan Voda, MD; Martin Gizzi, MD, PhD;
Florence Chukwuneke, RN; Veronica Larson, RN NP;
Charles Porbeni, MD; Nnamdi Uhegwu, MD; Madhu Gupta, MD
1983: NJ’s 1st Brain Trauma Unit
1995: NJ 1st Stroke Unit
1996: NJ’s 1st Biplanar Angiography Suite
1996: NJ’s 1st Stroke Unit
1996: NJ’s 1st IV tPA use in stroke
1996: Architect of NJ’s Stroke Designation Law
2011: NJ-Designated Comprehensive Stroke Center
2011: Initiated NCCU
2011: 2nd Biplanar Angiography Suite
2012: 1st CSC NorthEast - JC

JFK Medical Center
JFK Medical Center Stroke Program

- AHA/GWTG Gold Plus Award
- AHA/GWTG Stroke Target Honor Roll Award
- Health Grades
  - top stroke hospital in NJ
  - top 5% nationally
Stroke Program Goals

Rapid assessment and treatment of all patients with acute and complex stroke to ensure optimal outcomes

Provision of comprehensive clinical services within a seamless continuum of care

Provision of patient, family and community education

Recruitment and retention of highly skilled medical and allied health professionals

Recognition as a national center of excellence for stroke care through research and education efforts related to cerebrovascular disease
Core Stroke Committee

Develops, Reviews, & Revises Clinical Practice Guidelines (CPGs)

Oversees Stroke Program PI Activities

Assesses Educational Outreach Needs

Coordinates care with affiliated Primary Stroke Centers

Stroke Neurologists

Vascular Neurosurgeons

Stroke Nurse Coordinator

Stroke Registrar

Stroke APN

NCC Unit & Stroke Unit Nurse Managers

ED

Neurocritical Care

Neuro-interventional
Multidisciplinary Stroke Committee

- Approves CPGs
- Designs tools for implementation and measurement
- EMS
  - QI Coordinator
  - ED
- Pharmacy
- Core Stroke Committee
- Private Neurology Staff
- Nursing
- Radiology
- Laboratory
- Case Management
- Social Work
- Rehabilitation

PATIENT

Assesses compliance with CPGs
Assesses compliance with Stroke Performance Measures
Board-Certified Vascular Neurologists

Board-Certified ED Physicians

Neurology Residents and Fellows

Nursing (ED or Stroke Unit)

PATIENT

8hrs of Cerebrovascular CME + NIHSS

8hrs of Cerebrovascular CEU + NIHSS

NIHSS certified; adjunct to attendings
“Code Stroke!!!”

EMS initiates pre-hospital protocol and notifies ED of stroke patient arrival

PAGER system to acute stroke team, CT, laboratory and EKG

PATIENT with neurological change <24hrs duration

Called in ED or in Inpatient Units

Next
Acute Stroke Team responds immediately & performs NIHSS

Phlebotomy responds immediately and labs are sent with stroke label as STAT

PATIENT with neurological change <24hrs duration

EKG Technologist responds immediately with study given to attending team member

CT Scan staff clears a scanner in preparation
Acute Stroke Team determines eligibility for IV tPA, endovascular treatment or clinical trial

PATIENT with neurological change <24hrs duration

Neurology consultation is called

Acute Stroke Team will administer acute therapy as appropriate

Treatment decision based on history, NIHSS, CT results, laboratory data and BP
Transfer Protocol

1-877-NJ-BLEED
Answered by resident/ fellow 24/7

NCC arranges for bed

Emergency

Non-Emergency

Bed board: fax Stroke Transfer Form

Resident/Fellow calls appropriate staff

Transport: CCT or transferring facility arranges

Stroke Team meets patient in ED and begins assessment

Resident transports patient to appropriate location and performs handoff of care

Bed board will call transferring facility when bed available

JC/NJ State Designated CSC

Have transfer agreements with 13 PSCs
Educational Outreach to PSCs

- Tele Stroke
- Tele NCC
EMS Outreach & Education

- 5 Educational Activities 2011-2012
  - Stroke Pre-notification
  - Triage Guidelines
  - Case Studies
    - 5/5/11: Code Stroke Update
    - 11/19/11: Altered Mental Status lecture as part of weekend EMS course
    - 1/16/12: ALS & BLS Outreach Stroke Prenotification
    - 5/3/12: Stroke Case Studies and Triage Guidelines
    - 5/25/12: Stroke Triage Guidelines
Advanced Imaging Capabilities

- On site 24/7
  - Computed Tomography (CT)
  - CT Angiography (CTA)
  - CT Perfusion (CTP)
  - Magnetic Resonance Imaging (MRI)
  - MR Angiography (MRA)
  - Conventional Angiography

- Carotid Ultrasound
- Transcranial Doppler and Extracranial Ultrasonography
- Transthoracic and Transesophageal Echocardiography
Staff Availability

- Physicians Available 24/7
  - 2 Endovascular Neurologists
  - Interventional Radiologists (neurointervention)
  - Neuroradiologists
  - Neuro-Intensivists & Medical Intensivists
  - Vascular Neurologists
  - Vascular Neurosurgeons
  - Surgeons with expertise in carotid endarterectomy

- Imaging Staff Available 24/7
  - Certified Radiology Technicians, MRI Technologists, Endovascular Nurses & Technicians
Staff Availability

- **Rehabilitation Staff**
  - Director of Inpatient Rehabilitation
  - Director of JFK Rehabilitation Consult Service
    - Board Certified Physiatrists
    - Physiatry Residents

- PT/OT- available 6 days, on call the 7th
- ST- available 7 days a week
Inpatient Stroke Care

NCCU
- 5 dedicated NCCU beds
- Neurointensivists and Medical Intensivists
- RN staff: 8 hrs stroke CEUs annually + NIHSS certified

Stroke Unit
- 8 bed unit with telemetry monitoring
- RN staff – Inpatient Code Stroke responders
- 8 hrs of stroke education annually + NIHSS certified

Access Center
- RN staff: 8 hrs stroke CEUs annually + NIHSS certified
Cerebrovascular Program Fellowships

Jawad F. Kirmani, MD

YEAR 1

Ongoing Clinical & Basic Science Research

YEARS 2 and 3

NEUROCRITICAL CARE FELLOWSHIP

ENDOVASCULAR SURGICAL NEURORADIOLOGY FELLOWSHIP

STROKE RESEARCH/CLINICAL TRIALS FELLOWSHIP

CAROTID DOPPLERS/TCD’S TRAINING

ANGIOGRAPHY VASCULAR FELLOWS
Care Coordination

- Multidisciplinary Approach:
  - PT/OT/ST, Social Work, Case Management, Pharmacy, Rehabilitation, Nursing, Physician(s)
  - Expertise regarding neurology & stroke care
  - Knowledge of different levels of rehab & appropriate referral
  - Community resources

- Multidisciplinary Rounds
- Stroke Education
Care Coordination

- Post Hospital Planning:
  - Social Work and Case Management coordinate with other team members to prepare patient and family for discharge and/or next level of care

- Continuum of Services including Acute Rehab (on site), SAR, SNF/Long Term Care, Outpatient Rehab, Home Care Services, Palliative Care, and referrals to Respite Care Services and Adult Day Care
Meeting Community Needs

- Needs assessment 2011, increased stroke market share 7.5% in past 3 years
- Focus groups interviewed to assess consumer opinion, needs, and feelings
- Focused strategic planning with Medical/Dental Staff
- Clinical Visioning Steering Committee
- Recommended priority tactics and actions
Needs Assessment: Focus Groups

4 Focus groups
Residents of primary and secondary areas
Age 45-65

4 Focus groups
Ethnic/minority health issues: Asian, Hispanic, Asian Indian, and African-American
Needs Assessment: Identified Strategies

- Specialized ED treatment space to accommodate stroke and heart attack patients
- Upgrade interventional radiology suite to support service growth with emphasis on neuro-radiology, vascular and other specialty procedure
- Enhance EMS relationships to promote program awareness
- Improve process to expedite transfers and admissions
- Broaden stroke network and enhance referrals
- Promote quality outcomes and performance data to community
Selection and Implementation of CPGs
Selection and Implementation of CPGs

- **Emergency Management of Acute Ischemic Stroke**: Focus on Thrombolysis and Reduction of Peristroke Complications
- **Inpatient Treatment of Stroke**: Focus on Antithrombotics Identification of Sources Secondary Stroke Prevention
- **Management of Hemorrhagic Stroke**: Focus on Management of ICH and Reduction of Peristroke Complications
- **Transient Ischemic Attack with Observational Services**: Focus on Monitoring, Rapid Work Up, and Stroke Prevention
- **Management of Aneurysmal Subarachnoid Hemorrhage**: Focus on Management of Peristroke Complications
- **Endovascular Procedures Guidelines**: Focus on Appropriate Use of Procedures
Performance Improvement Initiatives & Peer Review
Implementation and Evaluation

Performance improvement

QI Coordinator

Stroke Nurse Coordinator

Core Stroke Committee

Concurrent tracking of code stroke process

Concurrent tracking of stroke order sheet use

Concurrent tracking of compliance with orders, smoking cessation, patient stroke education, stroke measures
Stroke Measures

- JC 8 Core Stroke Measures
- Dysphagia Screening
- Smoking Cessation
- Code Stroke Response Times
  - Code Stroke called
  - Door to MD contact
  - Door to CT done
  - CT done to read
  - Labs & EKG ordered to read
  - Door to Drug
- In Hospital complications
  - UTI, DVT, and pneumonia
Implementation and Evaluation

*Performance Improvement Process*

- Weekly clinical quality meeting reviews ED cases, admissions and discharges
- Monthly retrospective data analysis by the Multidisciplinary Stroke Committee
- Retrospective data presentation to JFKMC PI committee (Med Exec & Board)
Medical Staff Comprehensive Stroke Committee

Purpose:
- Understand the entirety of stroke care beyond individual Department/Service levels
- Evaluate comprehensive stroke related clinical care issues
- Identify opportunities for improvement
- Monitor improvement progress

Goals:
- Promote discussion and exchange of ideas
- Review effectiveness of stroke care
- Deliver highest standard of safe, comprehensive stroke care
Medical Peer Review Process:
Comprehensive Stroke Care

- **Generic Screens**
  - Identified Issues

- **Department/Division**
  - Quality Review

- **Medical Staff**
  - Comprehensive Stroke Review Committee (Quarterly)

- **Performance Improvement Committee**
  - (Semi Annually)

- **Medical Executive Committee**

- **Board of Directors**
Community Education

- Large volume of ischemic stroke & hemorrhagic stroke

- Community education focus:
  - recognizing stroke as an emergency
  - Symptoms recognition
  - Activation of EMS
  - Primary & Secondary Prevention

- Advanced Disease-Specific Care Certification
  Core Standards:
  - Program Management (PR)
  - Delivering/Facilitating Clinical Care (DF)
  - Supporting Self-Management (SE)
  - Clinical Information Management (CT)
  - Performance Measurement (PM)
Eligibility

- Volume
  - 20 or more patients per year with a diagnosis of aneurysmal subarachnoid hemorrhage.
  - 15 or more endovascular coiling or surgical clipping procedures for aneurysm are performed per year.
  - Administration of IV tPA to 25 eligible patients per year
Eligibility

- Advanced Imaging Capabilities
  - Available on-site 24 hours a day, 7 days a week
    - Catheter angiography
    - CT angiography
    - MR angiography-MRA
    - MRI, including diffusion weighted MRI
  - Transcranial Doppler
  - Carotid duplex ultrasound
  - Extracranial ultrasonography
  - Transesophageal Echocardiography
  - Transthoracic Echocardiography
Eligibility

- Post Hospital Care Coordination for Patients
- Dedicated Neuro-Intensive Care Unit for Complex Stroke Patients
- Peer Review Process
- Participation in Stroke Research
- Performance Measures
JC Core Measure for Primary Stroke Centers

- DVT Prophylaxis by hospital day 2
- Antithrombotics by hospital day 2
- Discharged on Antithrombotics
- Anticoagulation for Patients with Atrial Fibrillation
- tPA given
- Discharged on Statin
- Stroke Education
- Plan for Rehabilitation
CSTK Draft Measures

- CSTK-01  NIHSS on Arrival
- CSTK-02  Modified Rankin Score (mRS) at 90 days
- CSTK-03  Severity Measurement on Arrival SAH/ICH
- CSTK-04  INR Reversal Achieved
- CSTK-04a Median Time to Treatment with a Procoagulant Reversal Agent
- CSTK-04b Median Time to INR Reversal
- CSTK-05  Hemorrhagic Complication (Overall)
- CSTK-05a Hemorrhagic Complication for Patients treated with IV tPA without catheter based reperfusion
- CSTK-05b Hemorrhagic Complication for Patients treated with IA Thrombolytic Therapy or Mechanical Endovascular Procedure with or without IV tPA
- CSTK-06  Nimodipine Treatment Initiated
- CSTK-07  Median Time to Recanalization Therapy
- CSTK-7a Thrombolysis in Cerebral Infarction (TICI) Post Treatment Reperfusion Grade
Standards
Standard PR: Program Management

- PR1: The program defines its leadership roles.
Standard PR.2: The program is designed, implemented, and evaluated collaboratively.

Multidisciplinary Stroke Committee

- EMS
  - Core Stroke Committee
    - designs tools for implementation and measurement
  - ED
- Pharmacy
- QI Coordinator
- Rehabilitation
- Social work
- Case management
- Laboratory
- Radiology
- Nursing
- Private Neurology Staff
- assesses compliance with quality measures

assesses compliance with CPGs

approves CPGs
Standard PR.2: The program is designed, implemented, and evaluated collaboratively.
Standards: The Program....

- PR3- meets the needs of the target population and/or health care service area
  - Needs survey, program mission

- PR4- follows a code of ethics
- PR5- complies with applicable laws and regulations
- PR6- has current reference and resource materials readily available
  - Clinical Practice Guidelines- hospital intranet
  - Standard written order sets- patient care areas

- PR7- facilities are safe and readily accessible
Clinical Practice Guidelines

- Emergency Management of Acute Ischemic Stroke
- Inpatient Treatment of Stroke
- Management of Hemorrhagic Stroke
- Transient Ischemic Attack with Observational Services
- Management of Aneurysmal Subarachnoid Hemorrhage
- Endovascular Procedures Guidelines
• **PR8-** The Program communicates to participants the scope and level of care, treatment, and services it provides.
  
  - Advanced Imaging Capabilities
  - Procedures:
    - Aneurysms: Microsurgical Neurovascular Clipping/ Neuroendovascular Coiling
    - Extracranial Carotid Artery Stenting/ Endarterectomy
  
  - Staff Availability (24/7)
  - Physicians
    - 2 Endovascular Neurologists
    - Interventional Radiologists
    - Vascular Neurologists
    - Neuroradiologists
    - Vascular Neurosurgeons
    - Neuro-Intensivists & Medical Intensivists
    - Surgeons with expertise in carotid endarterectomy
  
  - Imaging Staff Available 24/7
    - Certified Radiology Technicians, MRI Technologists, Endovascular Nurses & Technicians
Staff Availability

• Rehabilitation Staff
  • Director: Expertise & experience in neuro-rehabilitation
    • Director of Inpatient Rehabilitation
    • Director of JFK Rehabilitation Consult Service
    • PT/OT- available 6 days, on call the 7th
    • ST- available 7 days a week

• Advanced Practice Nurse
  • Support delivery of evidence based acute stroke assessment and management
  • Expert nursing consultation and oversight
  • Develop and deliver acute stroke continuing education programs
  • Participate in PI processes and CSC research
• PR9- The scope and level of care, treatment, and services provided are comparable for individuals with the same acuity and type of disease being managed
  
  • Code Stroke Process
    
    • 24/7 availability of neurological assessment for IV tPA

• PR10- Eligible patients have access to the program
Standard DF: Delivering/Facilitating Clinical Care

- **DF1**: Practitioners are qualified and competent
- **DF2**: The program develops a standardized process originating in clinical practice guidelines (CPG) or evidence-based practice to deliver or facilitate the delivery of clinical care.
  - Patient assessed to identify post hospital care requirements
- **DF3**: The program is designed to meet the participant’s needs.
- **DF.4**: The program manages co-morbidities and concurrently occurring conditions and/or communicates the necessary information to manage these conditions to appropriate practitioners.
  - Transfer Protocols
Standard SE: Supporting Self Management

- **SE1**: The program involves participants in making decisions about managing their disease or condition.
- **SE2**: The program addresses lifestyle changes that support self-management regimens.
  - Stroke Patient/Family Education booklet
  - Stroke Care Discharge Instruction Sheet
- **SE.3**: The program addresses participants’ education needs.
  - Post hospital care, durable medical equipment, respite care
  - CSC sponsors at least 2 public educational activities that focus on stroke prevention annually
Standard CT: Clinical Information Management

- **CT.1:** Participant information is confidential and secured.
- **CT.2:** Information management processes meet the program’s internal and external information needs.
  - *Stroke Team response times*
- **CT.3:** Participant information is gathered from a variety of sources.
- **CT.4:** The program shares information with any relevant practitioner or setting about the participant’s disease or condition across the continuum of care.
- **CT.5:** The program initiates, maintains, and makes accessible a health or medical record for every participant.
Standard PM: Performance Measurement

- PM1: The program has an organized, comprehensive approach to performance improvement.
  - Peer Review Process
  - Collection of data:
    - Periprocedure complication rates for:
      - Placement of transducer & ventriculostomy
      - Performance of decompressive craniectomy & endovascular recanalization
    - Volume requirements
    - Follow up phone calls
    - CSC publicly reports outcomes related to interventional procedures
Performance improvement

- QI Coordinator
  - Concurrent tracking of code stroke process
- Stroke Nurse Coordinator
  - Concurrent tracking of stroke order sheet use
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Standard PM: Performance Measurement

- **PM2**: The program uses measurement data to evaluate processes and outcomes.
  - Stroke registry
  - Analysis of measurement data
    - Complication rates for CEA & CAS (<6%)
    - Diagnostic catheter angiography
      - Periprocedure stroke and death rate ≤ 1%
      - Aggregate serious complication rate ≤ 2%

- **PM3**: The program maintains data quality and integrity.
Standard PM: Performance Measurement

- PM4: The process for identifying, reporting, managing, and tracking sentinel events is defined and implemented.
- PM5: The program collects and analyzes data regarding variance from the clinical practice guidelines to improve the standardized process.
- PM6: The program evaluates participant perception of the quality of care.
Thank You!

The FIRST Stroke Center in the Tri-State Area to be awarded Advanced Certification