



Sanford Brain and Spine
Alex Drofa MD FRCSC
Cerebrovascular, Endovascular and
Skull Base Neurosurgery

Sanford Medical Center – Fargo



Advanced comprehensive stroke center (JC)

SANFORD
HEALTH

Disclosure:

Consultant for Medtronic/Covidien Neurovascular

Consultant for Microvention/Terumo

Sanford Health System

- Integrated rural health system headquartered in the Dakotas.
- One of the largest health systems in the nation
 - 46 hospitals; 300 communities, 48 Senior Living Facilities
 - 290 clinics in nine states and six countries
 - 35,000 employees:
 - 1,360 physicians
 - 80 specialty areas of medicine



Sanford Medical Center Fargo

- 2017 was quite a year for us!
 - New Hospital opened July 25
 - 58,726 Emergency Room Visits per year
 - 26,354 Hospital Admissions

Sanford Health System Locations

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Sanford Medical Center Fargo

- Cerebrovascular Center
 - 500 stroke codes/year (this year likely close to 800)
 - Advanced comprehensive stroke center
- Emergency Center- Trauma level II Adult & Pediatrics
- Sanford owned emergency transport Services
 - AirMed
 - Fargo/Moorhead Ambulance

EMS

- Sanford Fargo-Moorhead Ambulance
 - ALS
 - Serves Minnesota and North Dakota
 - CAAS accredited
- Sanford Air Med
 - Fixed wing & Helicopter
 - Fargo, Bemidji, and Bismarck
 - 300+ mile radius of Fargo
 - >1200 flights/year

Cerebrovascular Center

Our Mission:

Dedicated to the work of health and healing *and quality of life of the people we serve by providing high quality patient-centered and comprehensive evidenced-based stroke care.*

Our Vision:

Improving the human condition through exceptional care, innovation and discovery.

Cerebrovascular Center Stroke Task Force

- Medical Director
- Physicians & APP's
- Stroke Program Specialists
- Emergency Room
- Surgical Services
- Interventional Radiology
- Radiology
- Pharmacy
- Education
- EMS
- Pharmacy
- Lab
- Inpatient nursing
- One Call
- Clinic
- Therapy
- Case management
- Quality/Performance Improvement

Clinical Practice Guidelines

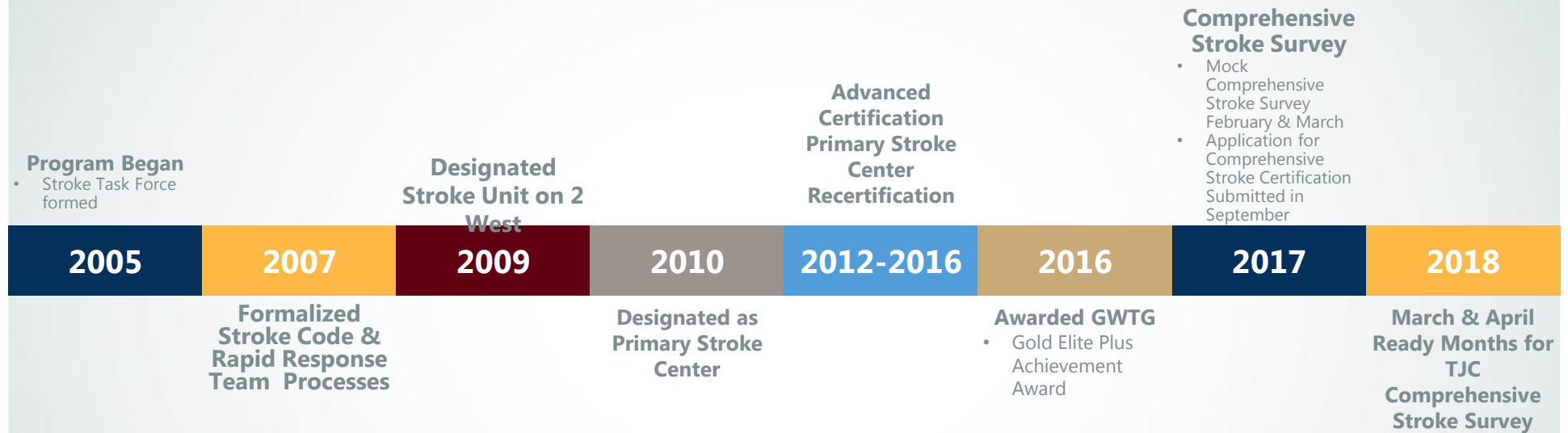
The Stroke Task Force has approved the following Clinical Practice Guidelines:

- ❖ **Guidelines for the Early Management of Patients with (Adults) Acute Ischemic**
- ❖ **Guidelines for the Early Management of Patients With Acute Ischemic Stroke Regarding Endovascular Treatment**
- ❖ **Guidelines for the Management of Spontaneous Intracerebral Hemorrhage (of Adult)**
- ❖ **Guidelines for the Prevention of Stroke in Patients with Stroke and Transient Ischemic Attack**
- ❖ **Scientific Rationale for the Inclusion and Exclusion Criteria for Intravenous Alteplase in Acute Ischemic Stroke**
- ❖ **Guidelines for Adult Stroke Rehabilitation and Recovery Early Depression Screening Is Feasible in Hospitalized Stroke Patients**

System Challenges

- Capacity Management
- Recruitment/retention

Stroke Survey Timeline



Cerebrovascular Center

- **Target Population**

- Large Vessel Occlusions
- Ischemic Strokes/TIA's
- Hemorrhagic Strokes
- Strokes with unusual etiologies or requiring specialized testing or therapies
- Those requiring multi-specialty management
- Serves Fargo-Moorhead Communities and is a resource and stroke referral center for:
 - Primary Stroke Centers without Neurovascular specialty
 - Other comprehensive stroke centers
 - Critical Access Hospitals
 - Other affiliates in the surrounding region

Cerebrovascular Center

•Population Health Needs

- Aging population
- North Dakotans over age 65 is expected to double between 2012 and 2025
- High incidence of Diabetes
- Lack of access/rural population: 51% of ND is rural
- Stroke is the 5th leading cause of death in ND (2014)
- High incidence of heart disease (#1 cause of death)
- Risk factors such as: hypertension, obesity and kidney disease

Reference: ND Compass (www.ndcompass.org); Sanford Medical Center Fargo- 2016 Community Health Needs Assessment)

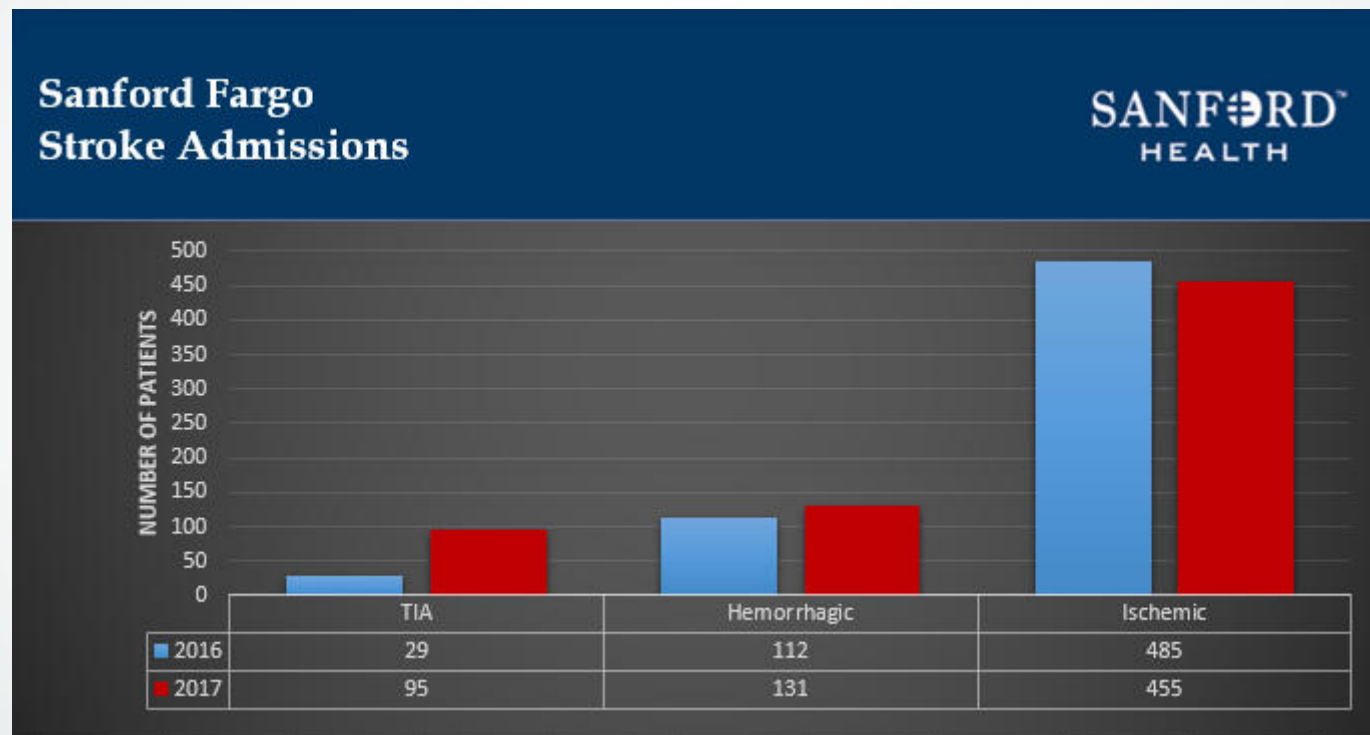
We invite you to attend a Stroke Code

One “Stroke Code” page notifies:

- Stroke Neurologist
- Neurovascular Provider
- CT
- Cath Lab
- Anesthesia
- Stroke Program Specialist
- Lab
- MRI
- Pharmacy
- ICU Charge Nurse
- Rapid Response Nurse

Cerebrovascular Center Admissions 2017

- Total Stroke/TIA Admissions
 - **2017 681**
 - 2016 626



- Growth attributed to outreach, reputation, and aging population.

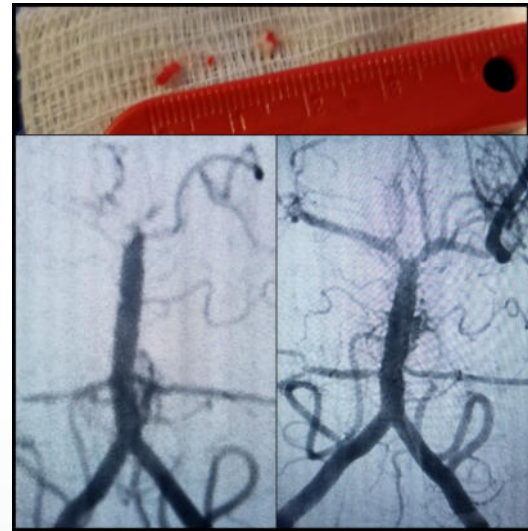
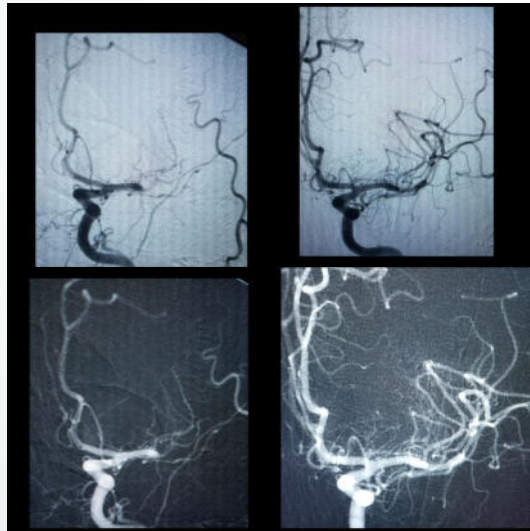
G14

I like this, I think we should speak to why our SD volume is low considering where we are located geographically or it may look like we are missing a market- dont we like SD?

Gesinger, Mitchell; 12.02.2018

Cerebrovascular Center Stroke Code Volumes 2017

Approximately 100 mechanical
thrombectomies per year



Youngest patient is 9 days old....oldest 105 years old

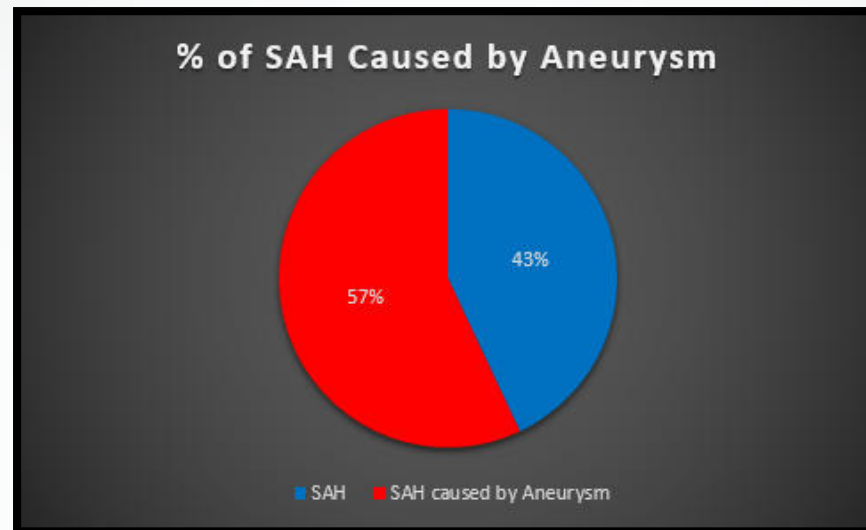
Thrombectomy Times

Comparison to 5 public trials

	Sanford	SWIFT PRIME	EXTEND IA	ESCAPE	REVASCA T	MR CLEAN
ED arrival to groin puncture (min.)	45	90	113			
ED arrival to revasc. (min.)	78					
Imaging to groin puncture (min.)	25	57	93	51		
Imaging to revasc. (min.)	49			84		
LKN/Onset to arrival (min.)	233		78			
LKN/Onset to imaging (min.)	275			134	192	
LKN/Onset to groin puncture (min.)	297	224	210		269	260
LKN/Onset to revasc. (min.)	316		248	241	355	
Groin puncture to revasc. (min.)	24.5		43			
TICI 3 (%)	65	68.7	48		18.6	24
TICI 2b (%)	20	19.3	38		47.1	34.7
TICI 2a (%)	15	6	7		24.5	21.9
TICI 1 (%)	0	1.2	3		2	5.6
TICI 0 (%)	0	4.8	3		7.8	13.8

Subarachnoid Hemorrhage

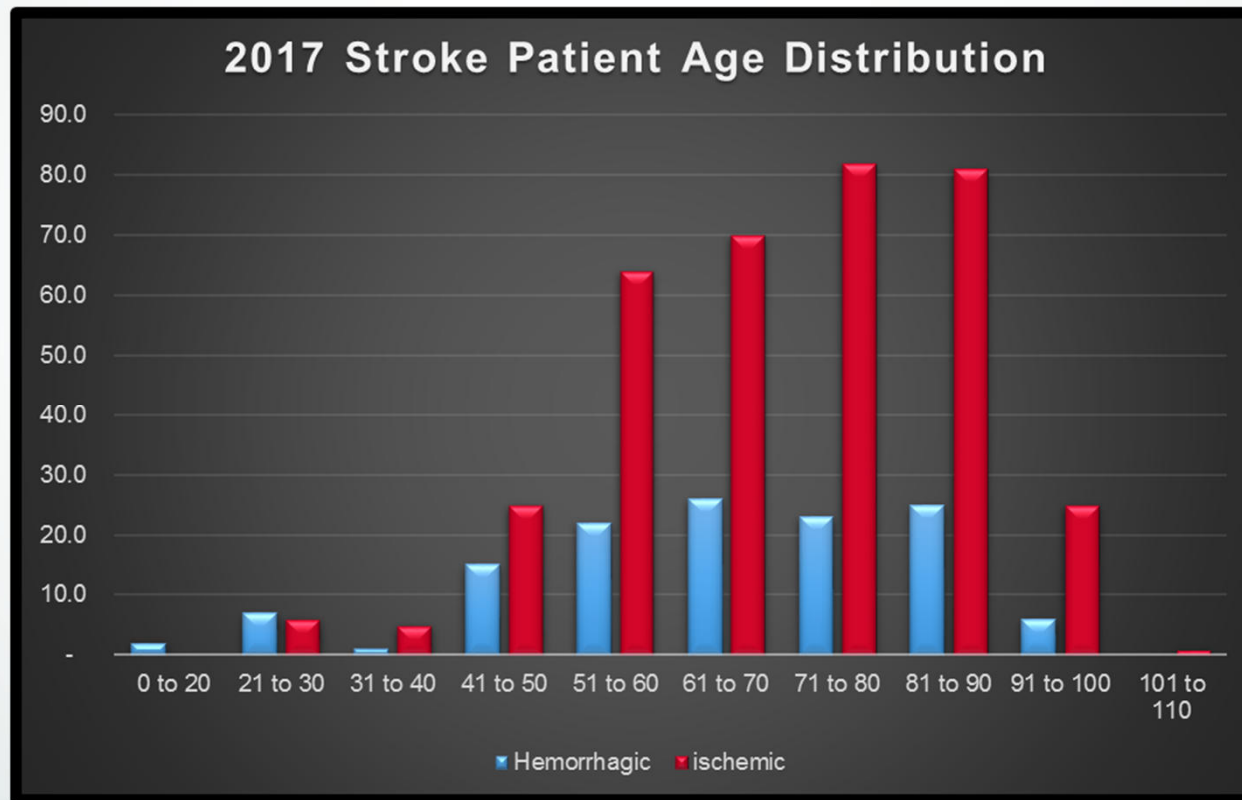
Volumes by Primary Report



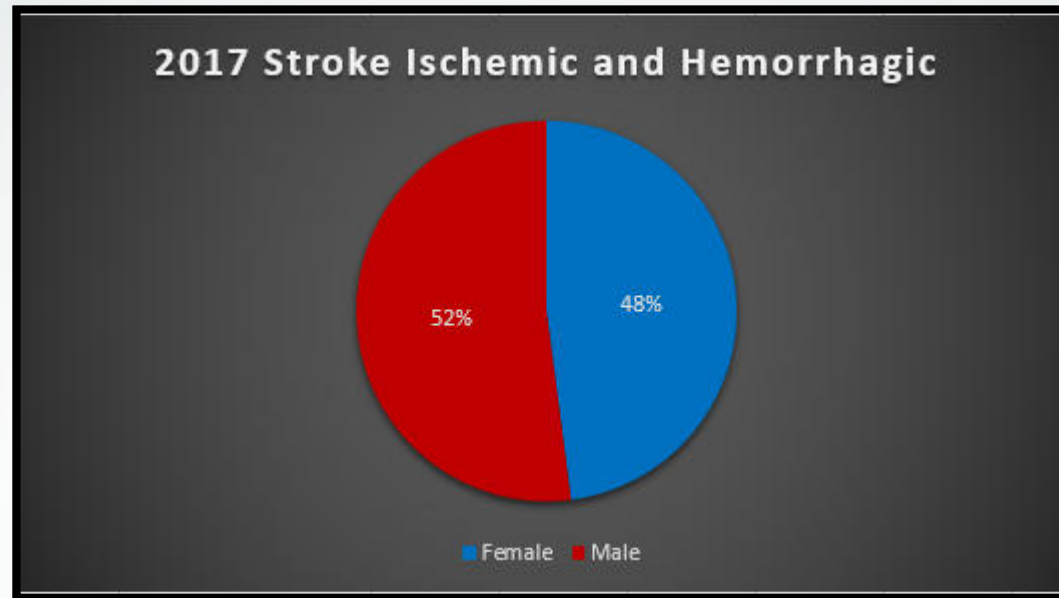
Approximately 150 aneurysms are treated per year
(both coiling and clippings)

Age Distribution

- Average Age of Stroke Patient: 69 years old

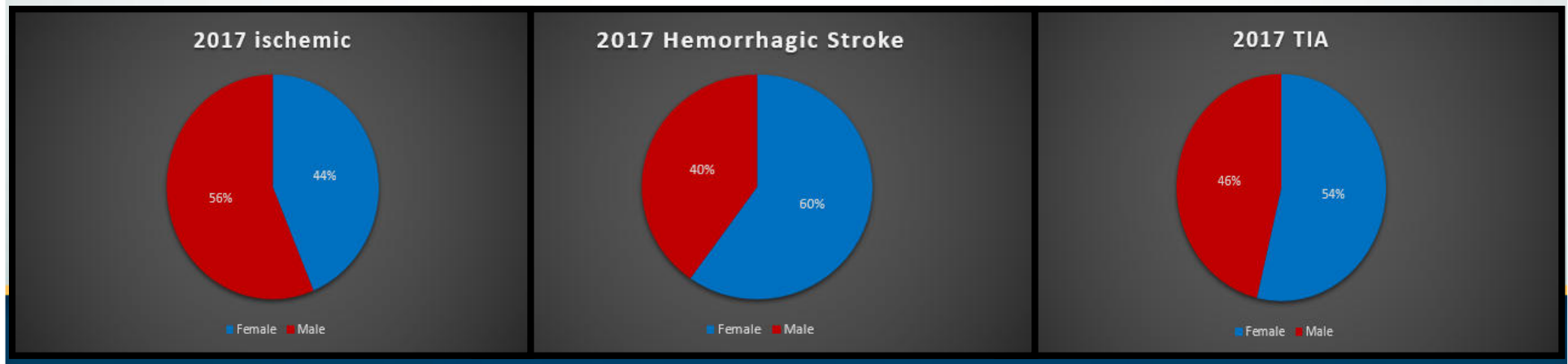


Gender Distribution



* Strokes overall, **Male** > **Female**

* Hemorrhagic and TIA patients, **Female** > **Male**

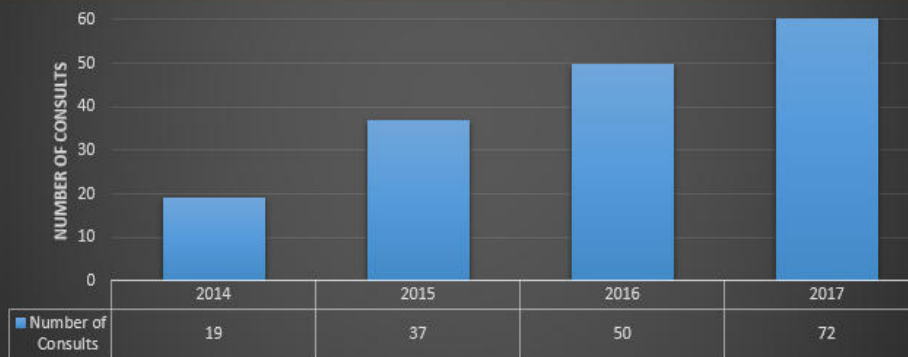


Telestroke

- Implemented in 2014
- Centralized communication hub located in Sioux Falls, SD
- Encompasses North Dakota, Minnesota, South Dakota, Northern Iowa, spans over 2,500 square miles
- **25%** of patients who utilize Telestroke receive TPA

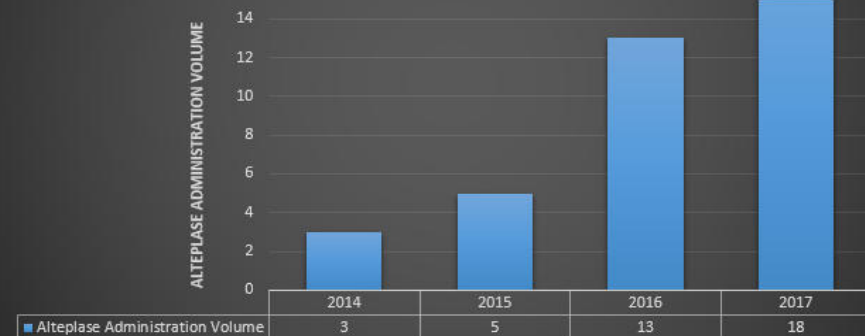
2017
Sanford Enterprise
Neurology Consults Utilizing Telestroke

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2017
Sanford Enterprise
Alteplase Administration Utilizing Telestroke

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Neuro/Endovascular Expertise

24-7-365 coverage

Providers:

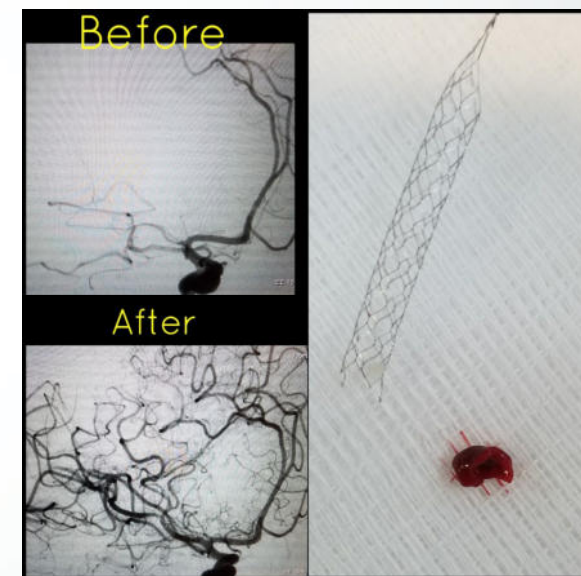
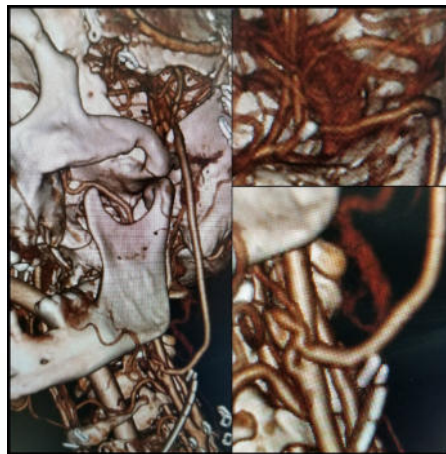
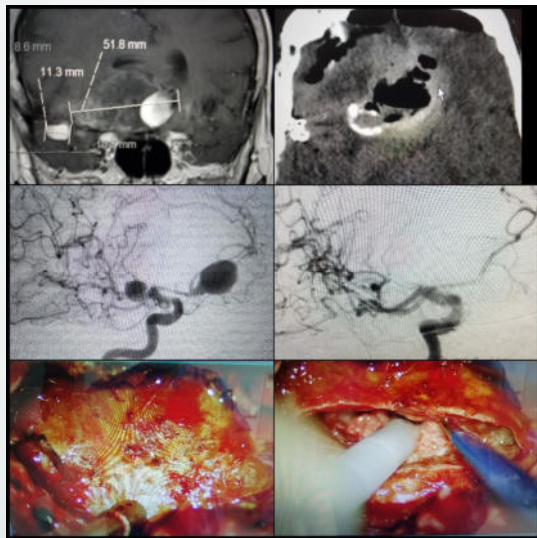
- Vascular Neurologists
- Endovascular Neurologist
- Cerebrovascular Neurosurgeons
- Neurologists
- Neuroradiologists
- Neurosurgeons
- Interventional Radiologists
- Interventional Cardiologists
- Neuro-Intensivists

Interventions:

- Carotid angioplasty and stenting
- Carotid Endarterectomy
- Intracranial angioplasty
- Intra-arterial thrombolysis
- Mechanical thrombectomy
- Microsurgical Neurovascular Clipping of Aneurysms
- Coiling of Aneurysms (included in carotid angioplasty)
- Extracranial-Intracranial Bypass
- Stereotactic radiosurgery
- Surgical excision of AVMs

Neuro/Endovascular Expertise

24-7-365 coverage



24/7 Diagnostic/Cardiovascular Imaging

- Magnetic Resonance Imaging (MRI) and Angiography (MRA)
- Computerized Tomography (CT) and Angiography (CTA)
- Ultrasound
- Transcranial Doppler (TCD)
- Direct (or Digital) Radiography (DR)
- Catheter Angiography
- Transesophageal Echocardiography (TEE) and Transthoracic Echocardiography (TTE)
- Radio nucleotide Perfusion (SPECT)
- Staffing/Technologists

Model of Neuro ICU Care

- Neuro-critical care beds – flex to demand
- Vascular Neurology/Vascular Neurosurgery
- Advanced Practice Nurse
- Neuro-intensivists and Hospitalist Team

Data Elements & Quality

- Stroke Code Data
- GWTG Stroke Registry
- Patient Satisfaction and Quality of Care
 - Inpatient Stroke Survey prior to discharge
- TJC data fall outs done at system level
- Stroke Task Force
- Peer Review & Interdisciplinary Outcome Review

Community Engagement and Education



Stroke
Survivor
Support
Group

Community
Education
Booths

Welcome to **SANFORD** HEALTH

The Next Chapter

Helping stroke survivors move *forward*

Helping stroke survivors move *forward*
Oct. 12, 2017

Research

- The Comprehensive Stroke Center participates in IRB-approved patient-centered stroke research, presents research at international meetings, and participates in development of new device technology
- They include:
 - Generation of a Novel Stroke Scale with Improved Sensitivity for Large Vessel Occlusion (Determining Eligibility for Mechanical Thrombectomy)
 - Extra cranial-Intracranial Bypass for Extra/Intracranial Stenosis Revisited: A Case Series
 - Mechanical Thrombectomy for Small/Medium Vessel Occlusion: A Sanford Experience – Leslie Koltes NP, RN Co Investigator
 - Multiple national and international talks
 - Canadian Neurovascular Meeting 2016, 2017

Sanford Health System Locations

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Hello Future

- Currently our healthcare system allows cardiologists to obtain credentials for endovascular stroke treatment
- Neurocardiology fellowship
 - allows cardiologists to be trained in “acute” stroke care (tPa, neuroimaging, mechanical thrombectomy)

Thank you.

Welcome to Sanford Medical
Center – Fargo!