Stroke and Patient Care
The Stroke Center at JCMC:

- Joint Commission Certified Primary Stroke Centers.
- JCMC Stroke Center received primary certification in 2007.
- The Stroke Center is a part of the Neuroscience Division of JCMC.
- We are supported by the Administration and Board of Directors of Mountain States Health Alliance.
- Certification was received from the Joint Commission:
  - Private sector based non-profit organization
  - Mission - "To continuously improve the safety and quality of care provided to the public through the provision of health care accreditation and related services that support performance improvement in health care organizations."
The Stroke Center

The Stroke Center at JCMC:
- Emergency Department
- 4200 – 19 bed Medical/Surgical Neuroscience Telemetry Wing
- 4300 – 16 bed PCU Wing
- 2900 – 8 bed ICU
- All other ICU’s
- CT/MRI
- Special Procedures
- Lab
- Pharmacy
- SLP
- OT/PT
What are the facts related to stroke?

- About 795,000 Americans each year suffer a new or recurrent stroke. That means, on average, a stroke occurs every 40 seconds.
- Stroke kills more than 150,000 people a year. That's about 1 of every 16 deaths. It's the No. 4 cause of death behind diseases of the heart and cancer.
- On average, every 3 to 4 minutes someone dies of stroke.
- Of every 5 deaths from stroke, 2 occur in men and 3 in women.
- The 2004 stroke death rates per 100,000 population for specific groups were 48.1 for white males, 47.2 for white females, 74.9 for black males and 65.5 for black females.
- Americans will pay about $65.5 billion in 2008 for stroke-related medical costs and disability.
Disease Specific Care Performance Measures

- **STK-1** Deep Vein Thrombosis (DVT) Prophylaxis
- **STK-2** Discharged on Antithrombotic Therapy
- **STK-3** Patients with Atrial Fibrillation Receiving Anticoagulation Therapy
- **STK-4** Thrombolytic Therapy Administered
- **STK-5** Antithrombotic Therapy By End of Hospital Day Two
- **STK-6** Discharged on Cholesterol Reducing Medication
- **STK-8** Stroke Education
- **STK-10** Assessed for Rehabilitation
  - Dysphagia Screening
  - Smoking Cessation/Advice/Counseling
NIH-recommended Emergency Department response times
The “golden hour” for evaluating and treating acute stroke

door-to-needle ≤60 min

Suspected stroke patient arrives at ED ≤10 min
Initial MD evaluation (including patient history, lab work initiation, and NIH Stroke Scale assessment)

≤15 min
Stroke team notified (including neurologic expertise)

≤25 min
CT scan initiated

≤45 min
CT & labs interpreted

≤60 min
Activase® (Alteplase, t-PA) given if patient is eligible

Stroke symptoms depend on infarct location

- **Motor Cortex**: (Movement)
- **Central Sulcus**: (Motor and sensory integration)
- **Sensory Cortex**: (Pain, heat, and other sensations)
- **Frontal Lobe**: (Movement, judgment, foresight, and voluntary movement)
- **Broca’s Area**: (Speech)
- **Parietal Lobe**: (Comprehension of language)
- **Frontal Lobe**: (Smell)
- **Temporal Lobe**: (Hearing)
- **Temporal Lobe**: (Primary visual area)
- **Wernicke’s Area**: (Speech comprehension)
- **Occipital Lobe**: (Primary visual area)
- **Brainstem**: (Swallowing, breathing, heartbeat, wakefulness, and other involuntary functions)
- **Cerebellum**: (Coordination)
Carotid arteries: primary conduits for cerebral blood supply

Vertebral Artery

Internal Carotid

External Carotid

Common Carotid Arteries
Circle of Willis provides collateral circulation

- Anterior Communicating Artery
- Anterior Cerebral Artery
- Middle Cerebral Artery
- Posterior Communicating Artery
- Internal Carotid Artery
- Posterior Cerebral Artery
- Basilar Artery
- Superior Cerebral Artery
- Posterior Inferior Cerebellar Artery
- Vertebral Artery
Lacunar strokes cause pockets of necrotic tissue
Potential to reverse neurologic impairment with thrombolytic reperfusion

The average stroke patient loses 32,000 brain cells every second. Reperfusion offers the potential to reduce the extent of ischemic injury.
Stroke Warning Signs

• Sudden Onset:
  • Numbness, weakness or paralysis of the face, arm or leg – especially on one side of the body.
  • Confusion, difficulty speaking or understanding
  • Double vision, dimness or loss of vision.
  • Unexplained dizziness, unsteadiness or loss of balance – especially in combination with other signs.
  • Severe headache without apparent cause.
    • “The worst headache I’ve had in my life.”
Remember FAST:

- **Face**: ask the person to smile. Does one side of the face droop?
- **Arms**: ask the person to hold both arms up evenly. Does one arm drift downward?
- **Speech**: ask the person to repeat a simple sentence. Are the words slurred or mixed up?
- **Time**: If the person shows any of these symptoms, call 911 immediately!
Stroke Orders

- Emergency Department Stroke Orders EB-1503
- Admission Order for Acute Ischemic Stroke/TIA not treated with t-PA EB-1502
- t-PA Administration for Acute Ischemic Stroke EB-1505
- Admission Order for Ischemic Stroke treated with t-PA EB-1506
- In-House Ischemic Stroke Orders EB-1507
- Intracerebral Hemorrhage Orders Non Traumatic EB-1501
- Subarachnoid Hemorrhage Orders Non Traumatic EB-1504
- POE Go live March 2012, all order sets are on line and remain on paper for downtime procedures
Stroke Orders

- Emergency Department Stroke Orders EB-1503
  - CT - STAT
    - Ischemic Stroke
    - Hemorrhagic Stroke
  - Labs- STAT
  - Monitor
  - NPO
  - Dysphagia Screen
  - NIHSS
  - BP Control Guide (Back of Orders)
  - **Beware of other conditions that may look like stroke**
Stroke Orders

- t-PA Administration for Acute Ischemic Stroke EB-1505
  - Inclusions
  - Exclusions
  - Labs
  - Thrombolytic Flow Sheet
  - IV Sites – 2 is good – 3 is GREAT
  - Patient Weight
  - Vital Signs
  - Neuro Checks
Stroke Orders

- Ischemic Stroke/TIA Admission Orders
  - Neuroscience Unit
  - Progressive Care
  - ICU – Neurology
  - NIHSS
  - Dysphagia Screen
  - NPO or NPO except meds until seen by SLP
  - Patient/Family Education
  - Smoking
  - Fasting Lipid Profile and Hgb A\textsubscript{1c}
  - LDL > 100 – Zocor, etc.
  - Antihypertensives
  - SCD’s
  - Vital Signs
Hemorrhagic Stroke

- Less common than ischemic strokes
  - Intracerebral Hemorrhage
  - Subarachnoid Hemorrhage

- Higher fatality and poorer prognosis than with Ischemic Strokes
Hemorrhagic Stroke

- Hemorrhagic stroke occurs when a weakened blood vessel ruptures.
- Two types of weakened blood vessels usually cause hemorrhagic stroke: aneurysms and arteriovenous malformations (AVMs).
  - An **aneurysm** is a ballooning of a weakened region of a blood vessel. If left untreated, the aneurysm continues to weaken until it ruptures and bleeds into the brain.
  - An **arteriovenous malformation (AVM)** is a cluster of abnormally formed blood vessels. Any one of these vessels can rupture, also causing bleeding into the brain.
- The blood accumulates and compresses the surrounding brain tissue.
- Symptoms usually appear suddenly.
**How are hemorrhagic strokes treated?**

- *Surgical Intervention*
  For hemorrhagic stroke, surgical treatment is often recommended to either place a metal clip at the base, called the neck of the aneurysm or to remove the abnormal vessels comprising an Arteriovenous Malformation (AVM).

- *Endovascular Procedures, e.g., "coils"*
  Endovascular procedures are less invasive and involve the use of a catheter introduced through a major artery in the leg or arm, guided to the aneurysm or AVM where it deposits a mechanical agent, such as a coil, to prevent rupture.
Stroke Orders

- Intracerebral Hemorrhage Orders Non Traumatic
- Subarachnoid Hemorrhage Orders Non Traumatic
  - Patient/Family Education
  - Smoking
  - NIHSS
  - NPO
  - Dysphagia Screen – SLP evaluation
  - SCD’s
  - Blood Pressure management
Other Forms

- Interdisciplinary Education Record
  - Patient Education Book
- Stroke/Thrombolytic Flow Sheet
- Rapid Bedside Dysphagia Screen for Medication Administration
- Stroke Scale Assessment
  - Admission/Prior to t-PA
  - After t-PA
  - Every Shift
  - With Neuro Changes
  - Before Discharge
- Neuro Flow Sheet
- Picture Chart
- Activase Dosing Flow Chart
- t-PA Reminder Sheet
Educational Opportunities

- NIHSS – 3 hours in length [americanheart.org](http://americanheart.org) 10.00 fee
- NIHSS- [nihss-english.trainingcampus.net](http://nihss-english.trainingcampus.net)
- National Stroke Association-[www.stroke.org](http://www.stroke.org)
Who To Call?

- Attending Physician
- Shift Leader 4200/4300
- Rapid Response Team
- Stroke Program Coordinator
  - 610-2055 Pager
  - 431-1643 Office