

Time Sensitive Emergency: **STROKE**

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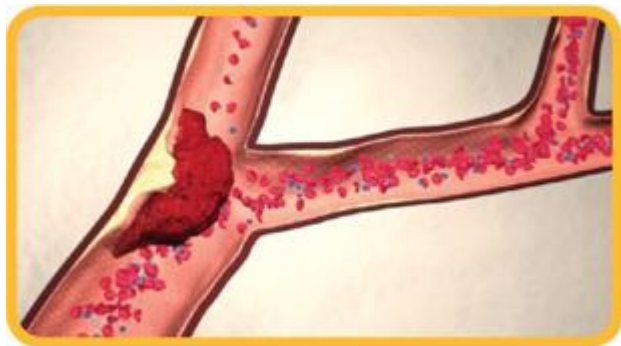


795,000 strokes
each year in the U.S.

What is a STROKE?

ISCHEMIC

- Fatty plaque or clot
Obstructs blood flow
 - Starves cells of oxygen
 - Tissue dies



87%

HEMORRHAGIC

- Blood vessel leaks or breaks



13%



200,000-500,000
reported each year

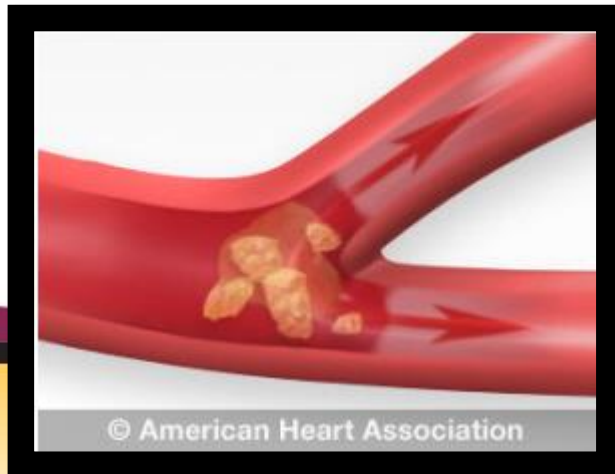
TIA

(Transient Ischemic Attack)

- Temporary Symptoms
- Most last less than 5 minutes,
- Average is about 1 minute
- Complete resolution of symptoms w/in 24⁰
- Is a medical emergency & needs medical attention

3-10% risk of stroke
@ 2 days

9-17% risk of stroke
@ 90 days



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AIR IDAHO RESCUE



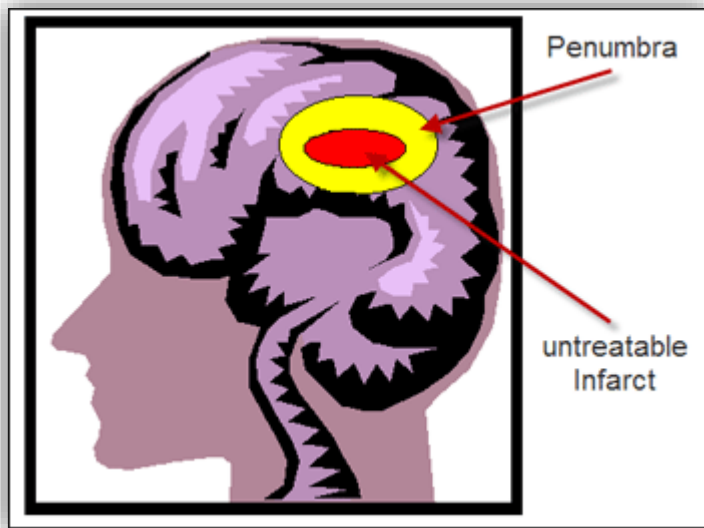
Orientalreview.org



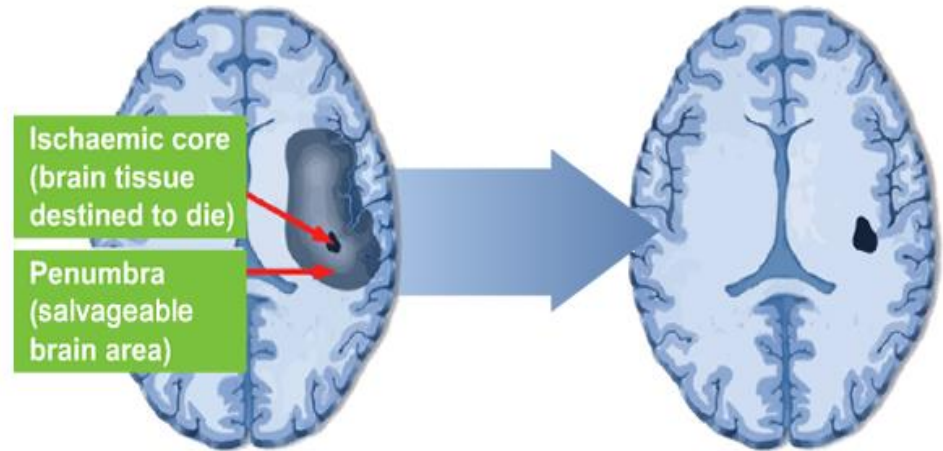
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Penumbra = Injured Tissue

Infarct = Dead Tissue



Strokecarenow.com



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AIR IDAHO RESCUE

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Stroke Risk Factors

Non-Modifiable

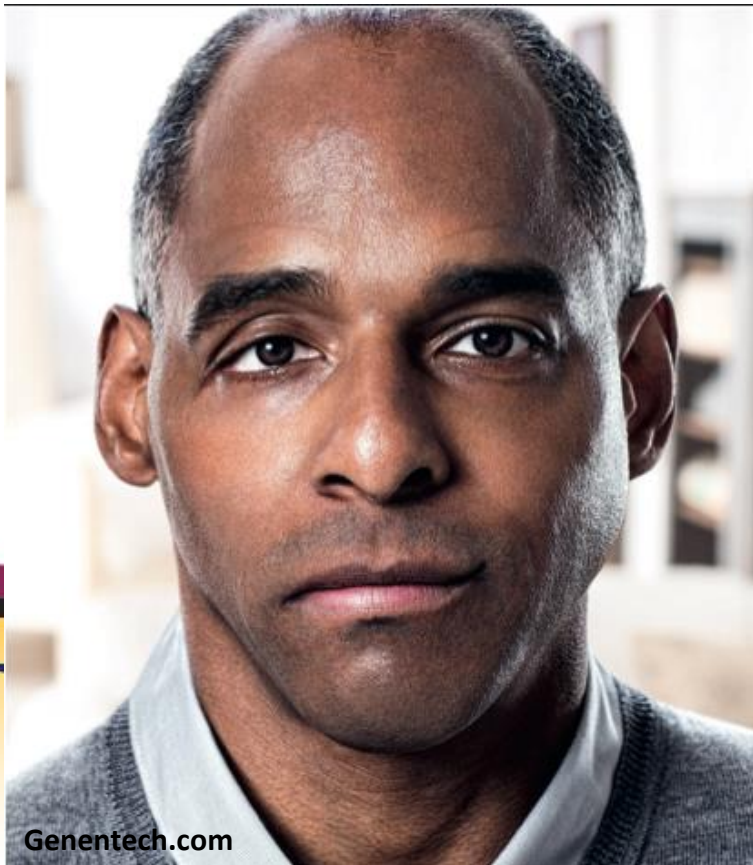
- Age
- Sex
- Race
- Heredity
- Family History
- Pregnancy
- Postpartum (6wks)

Modifiable

- High Blood Pressure
- Coronary Heart Disease
- High Cholesterol
- Atrial Fibrillation
- Physical Inactivity
- Excessive Alcohol
- Obesity
- Sleep Apnea
- Smoking
- Diabetes
- Stimulant Use
- Anti-depressants
- Hormone Use



Stroke Signs & Symptoms

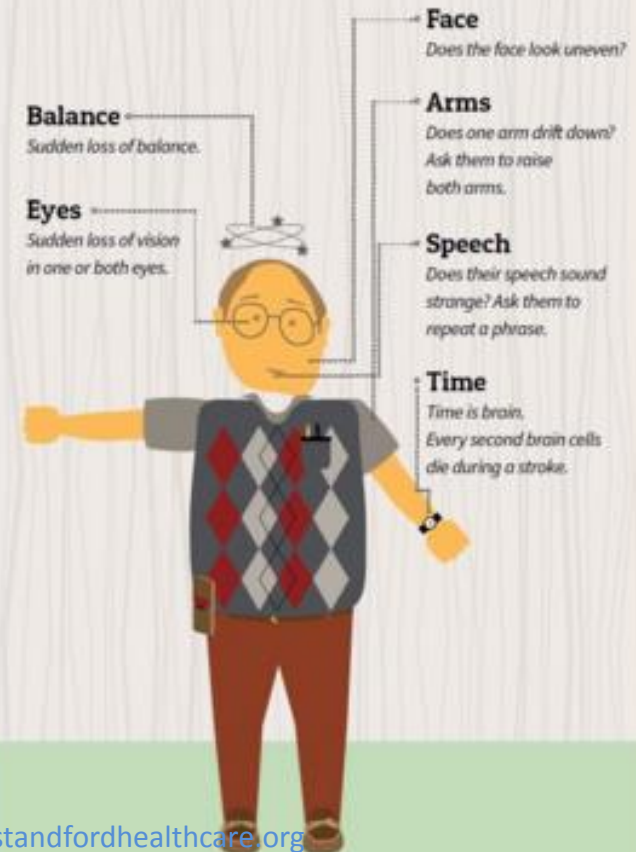


BEFAST

Know the signs of stroke

Stroke is a medical emergency.

For any sign of stroke CALL 911! Every minute counts. Learn the physical symptoms to swiftly identify stroke and save your life or the lives of loved ones.



BRAIN AREAS AND RELATED FUNCTIONS^{1,2}

Frontal lobe

- Control of mood, emotions, and thought
- Conveys emotion in speech, facial expressions, and gestures

Parietal lobe

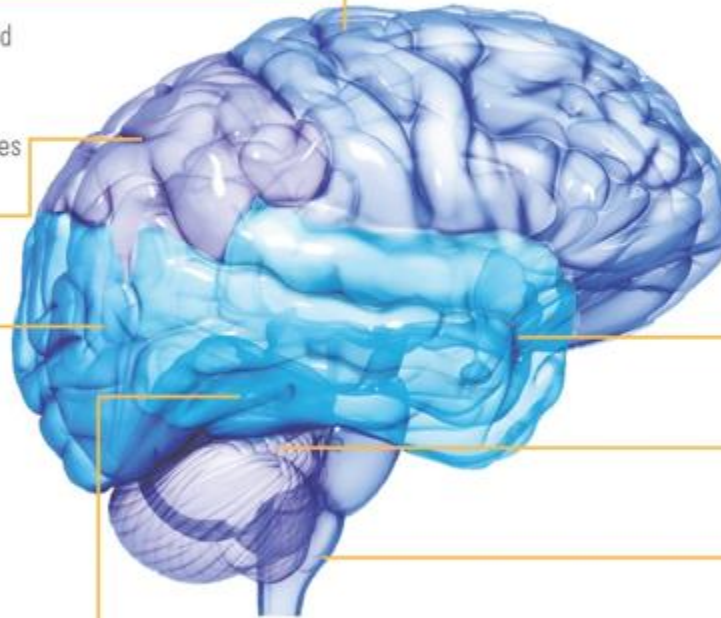
- Sensory perception

Occipital lobe

- Occipitoparietal cortices mediate verbal and nonverbal material for immediate visual memory
- Occipitotemporal regions are used in object and facial recognition

Insula

- Language processing and function



Temporal lobe

- Emotional modulation of memories
- Fear conditioning
- May store long-term autobiographical memory

Cerebellum

- Refines force and timing of movement
- Contributes to coordinated stepping

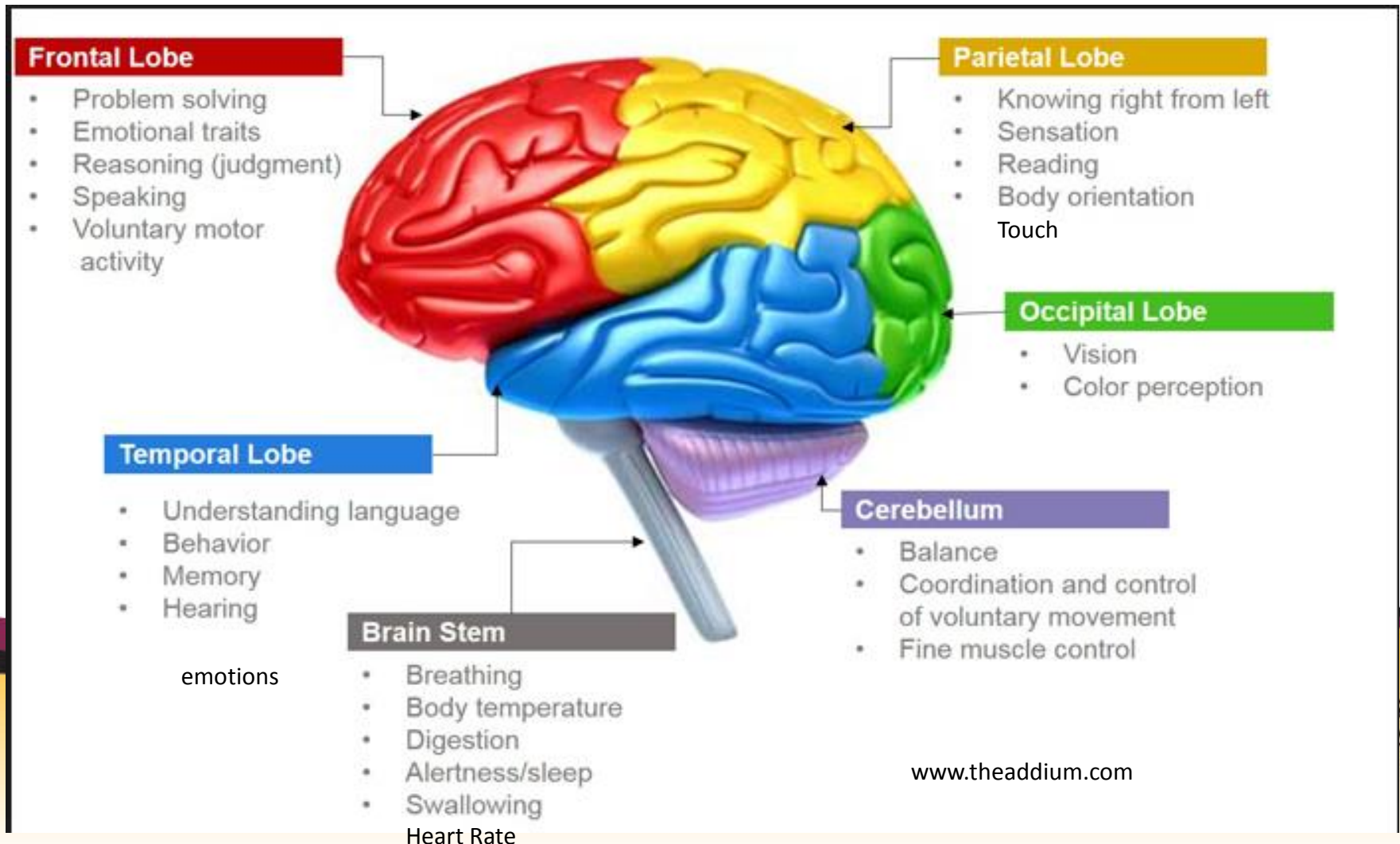
Brain stem

- Balance and locomotion
 - Initiation and speed of locomotion
 - Postural tone
 - Modulation of muscle-generated force

References: 1. Goetz CG. *Textbook of Clinical Neurology*. 2007. 2. Wityk R, Llinas R. *Stroke*. 2007.

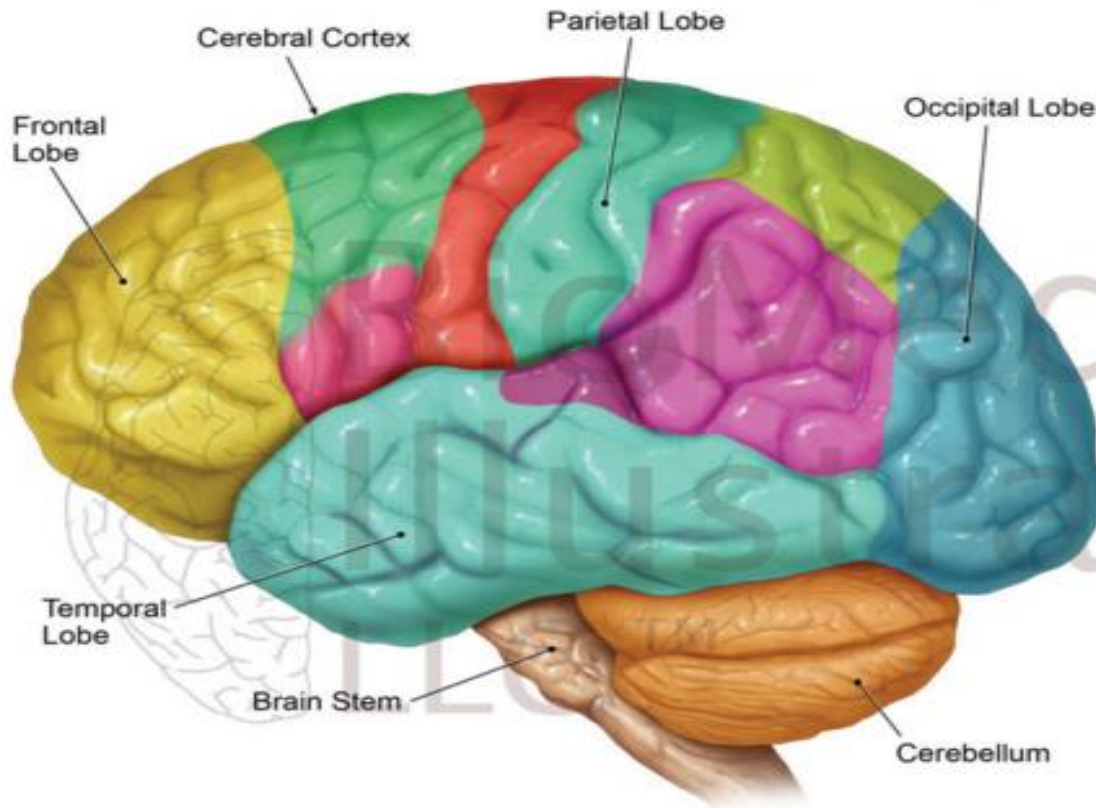
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Functions of Each Brain Lobe



Brain Lobes Continued...

Brain Surface Anatomy & Functions



Cerebral Functions

- Higher Mental Function:**
Problem Solving, Thinking, Planning, Judgement, Emotional Expression, Creativity, Behavioral Control
- Motor Functions:**
Orientation, Head and Eye Movements, Posture
- Broca's Area:**
Control of Muscles for Speech Production & Ability to Comprehend Grammatical Structure
- Motor Functions:**
Initiation of Voluntary Muscles, Movement
- Sensory Functions:**
Sensation from Skin and Muscles
- Wernicke's Area:**
Comprehension of Speech Sounds & Language
- Auditory Functions:**
Perception of Sounds
- Tactile Perceptions:**
Processing of Multi-Sensory Information
- Visual Functions:**
Coordination of Eye Movements, Perception, Image Recognition, Association, Visual Memory
- Association Area:**
Short Term Memory, Equilibrium, Emotion

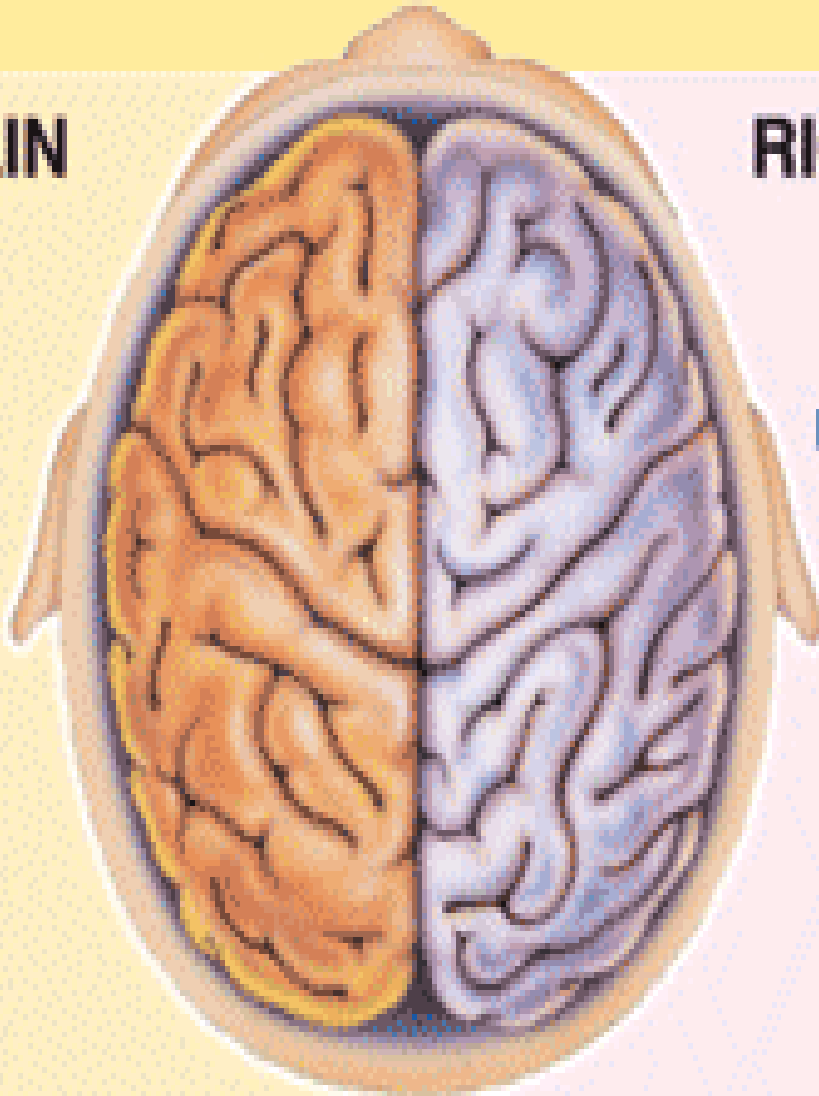
Cerebellar Functions

- Motor Functions:**
Coordinates Voluntary Movements:
Posture, Balance, Coordination, & Speech

Right Brain vs Left Brain

LEFT BRAIN

LOGIC
ANALYSIS
SEQUENCING
LINEAR
MATHEMATICS
LANGUAGE
FACTS
THINK IN WORDS
WORDS OF SONGS
COMPUTATION



RIGHT BRAIN

CREATIVITY
IMAGINATION
HOLISTIC THINKING
INTUITION
ARTS (Motor skill)
RHYTHM (Beats)
NON-VERBAL
FEELINGS
VISUALISATION
TUNE OF SONGS
DAYDREAMING

EMS' / FIRST RESPONDERS' ROLES

- ASSESS THE PATIENT
- MANAGE ABC's
- PRE-HOSPITAL STROKE SCREENING
- IDENTIFY SIGNS & SYMPTOMS OF STROKE
- PROVIDE RAPID TRANSPORT
- PRE-NOTIFY HOSPITAL



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ASSESS



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Evaluate Signs & Symptoms

Manage ABC's



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Cincinnati Stroke Scale: Facial Droop

- Have patient smile & show their teeth



www.bhmpics.com



www.health24.com



Cincinnati Stroke Scale: Arm Drift

- Patient raises both arms up and holds them out with their eyes closed for 10 seconds



Cincinnati Stroke Scale: Slurred Speech

- Have patient say, “You can’t teach an old dog new tricks.”



Review

CINCINNATI PREHOSPITAL STROKE SCALE¹



- **Facial droop (have patient smile)**

Normal: Both sides of face move equally

Abnormal: One side of face does not move as well



- **Arm drift (have patient hold arms out for 10 seconds)**

Normal: Both arms move equally or not at all

Abnormal: One arm drifts compared with the other, or does not move at all



- **Speech (have patient speak a simple sentence)**

Normal: Patient uses correct words with no slurring

Abnormal: Slurred or inappropriate words or mute

Reference: 1. Kothari RU, et al. *Ann Emerg Med.* 1999;33:373-378.



Identify Signs & Symptoms of Stroke



Rapid Transport & Pre-notify Hospital

- Transport to Nearest appropriate facility
- Blood Glucose, if available
- Establish Cardiac Monitoring & IV access
- While En Route, Notify Hospital
 - Include in report:
 - Vitals
 - Signs & Symptoms
 - Time patient was last seen normal
 - Time signs & symptoms began



Why Is Pre-notification So Important?

- CT scanner is cleared
- 1:1 nurse
- Physician heads up
- Lab responds to patient
- Pharmacy is prepared to mix tPA



Time Sensitive Emergency: STROKE

EMS Time Goals

Dispatch time	Turnout time	Travel time	On-scene time
<ul style="list-style-type: none">From time call is received to time EMS unit is notified to respond	<ul style="list-style-type: none">From time EMS unit is notified until unit wheels move	<ul style="list-style-type: none">Time until EMS arrives on scene	<ul style="list-style-type: none">Time spent with patient before start of transport
<1 minute	<1 minute	Same priority as trauma and heart attack	<15 minutes

References: 1. Acker JE III, et al. *Stroke*. 2007;38:3097-3115. 2. Jauch EC, et al. *Stroke*. 2013;44:870-947.



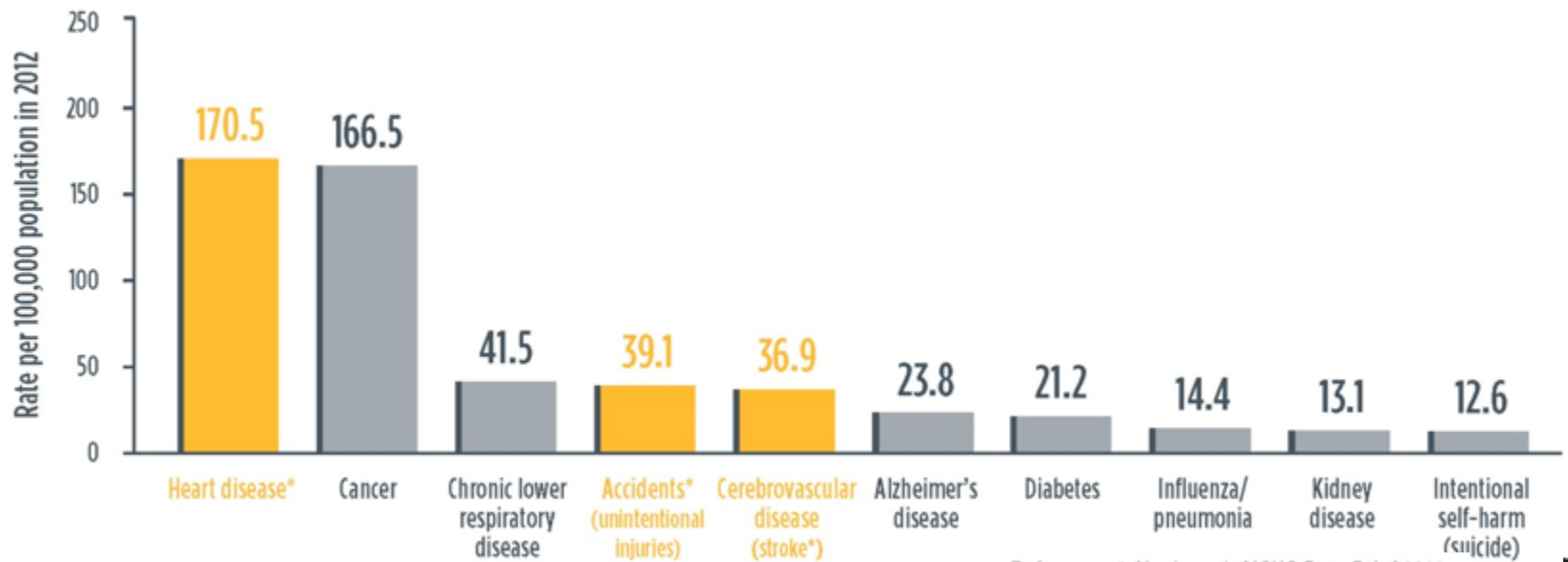
Most Common Stroke Mimics

- Seizures
- Migraines
- Systemic Infections
- Hyperglycemia
- Hypoglycemia
- Transient Global Amnesia
- Tumors
- Traumatic Injury
- Psychiatric Disorder
- Syncope
- Bell's Palsy
- Todd's Palsy
- Other
 - Sickle Cell Crisis-Cerebral crisis
 - Substance Abuse



Facts about Stroke

- Stroke is the 5th leading cause of Death in the US

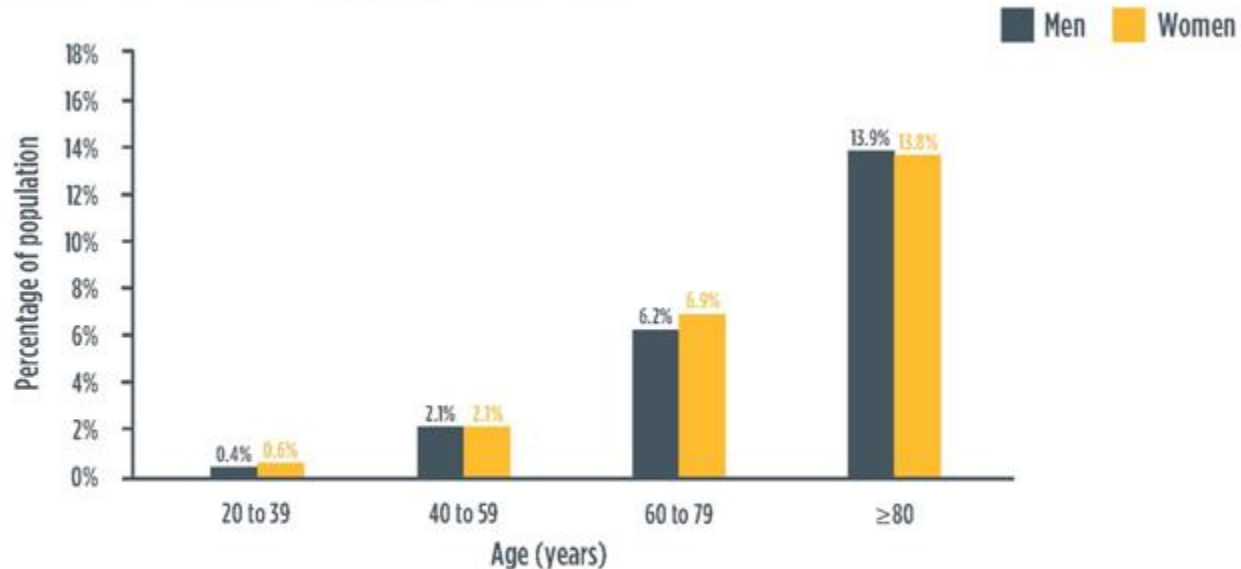


Reference: 1. Xu J, et al. NCHS Data Brief. 2014.



Prevalence of Stroke Age & Sex

US prevalence of stroke by age and sex



- Each year, approximately 55,000 more women than men have a stroke
- In 2009, 34% of people hospitalized for stroke were under the age of 65

References: 1. Centers for Disease Control and Prevention Web site. <http://www.cdc.gov/stroke/facts.htm>. 2. Go AS, et al. *Circulation*. 2013;127:e6-e245.

Ems4stroke.org



Stroke is the leading Cause of Disability In the **WORLD**

- There is a stroke every 40 seconds
 - Someone dies from a stroke every 4 minutes
- According to World Health Organization
 - 5 million people die from stroke every year
 - 5 million people are permanently disabled from stroke



What kinds of Disability?

Disabilities in patients with ischemic stroke ≥ 65 years of age*

Psychological impact

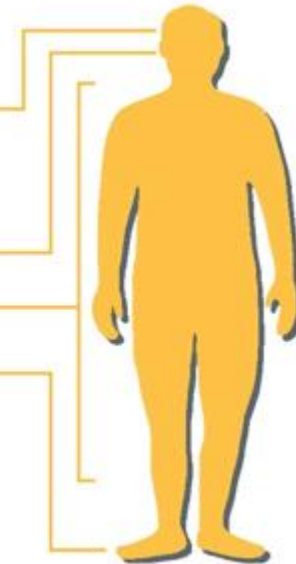
Depressive symptoms 35%

Physical impact

Aphasia (impaired communication) 19%

Hemiparesis (paralysis of one side of the body) 50%

Inability to walk without some assistance 30%



*In a survey of patients older than 65 taken 6 months after ischemic stroke.

Reference: 1. Go AS, et al. *Circulation*. 2013;127:e6-e245.

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What About the Caregivers?

- Stroke has far reaching effects
 - Among elderly patients, 35% to 40% are dependent on other people 1 year after a stroke
 - 45% of ischemic stroke patients are characterized as functionally dependent at 6 months, and higher levels of disability are linked with earlier mortality

References: 1. Dewey HM, et al. *Cerebrovasc Dis.* 2003;15:133-139. 2. Bath PMW, Lees KR. *BMJ.* 2009;320:920-923. 3. Varona JF. *Stroke Res Treat.* 2010;2011:879817. 4. Slot KB, et al. *BMJ.* 2008;336:376-379.

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How Can We Reduce This?

TOGETHER



WWW1.UWE.AC.UK



Education

Public awareness

- Overall, almost 40% of people still do not recognize stroke symptoms
- Less than half of 911 calls for stroke are made within the first hour of symptom onset
- Benefits associated with 911 use vs private transport
 - EMS use is strongly associated with decreased time to initial physical examination
 - EMS is able to manage symptoms en route should they deteriorate
 - EMS is more aware as to which hospital is most appropriate

Thank You!

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