

# Types of Strokes

Ischemic	Hemorrhagic
<ul style="list-style-type: none"> <li>• <u>88% of strokes</u></li> <li>• Embolic</li> <li>• Thrombotic</li> </ul>	<ul style="list-style-type: none"> <li>• <u>12% of strokes</u></li> <li>• 60% Intracerebral</li> <li>• 40% Subarachnoid</li> </ul>

# How bad is it?

Stroke in North America 4<sup>th</sup> Leading Cause of **Death**.  
Leading Cause of **Disability**.

Mario 01/13/2011

# How bad is it?

Stroke in-utero & newborns  
**>1 in 4,000** births  
Primarily in full-term infants

# How bad is it?

Stroke in the **Very Young**  
Boys have **1 1/2** the Risk of Girls  
6<sup>th</sup> Leading Cause of Death  
Black children have **DOUBLE** the risk of all other groups.

# How bad is it?

Stroke in *the young* rates vary.  
**Overall > 1 in 800.**  
Often unrecognized or misdiagnosed.

## Contributing Factors in Newborns

- Defects in the structure of the heart (congenital heart disease).
- Abnormally increased blood coagulation.
- An unusual increase in concentration of red blood cells (Polycythemia).
- Disseminated Intravascular Coagulopathy (DIC).
- AV malformations in the central nervous system.
- Infections.
- Traumatic birthing events.

## Contributing Factors in the Very Young

- Arteriopathy: Diseases of the arteries of the brain.
- Sickle Cell Disease (may cause blockage of blood vessels of the brain).
- Chronic Anemia.
- Clotting disorders.
- Infections Not relevant anymore due to vaccines.
- Blood vessel narrowing of any kind (often of unknown etiology).
- Trauma, especially head trauma.

## Contributing Factors in the Young

- Obesity.
- Diabetes.
- High cholesterol.
- Smoking.
- Sedentary lifestyle.
- Recent surgery.

## Contributing Factors in the Young

- Recent or ongoing infection.
- Uncontrolled high blood pressure.
- Excessive alcohol consumption.
- Women who are 1 to 6 months post partum.
- Women who take birth control pills.
- Cocaine and stimulant abuse.

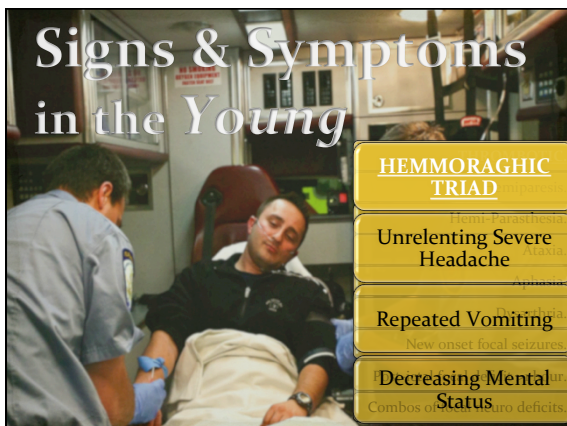
## Signs & Symptoms in Newborns

- A tendency to use only one side of the body.
- Extreme sleepiness and difficulty in rousing.
- Seizures.
- Focal weaknesses or neurological deficits.

## Signs & Symptoms in the Very Young

- Trouble walking due to weakness or loss of coordination.
- Problems speaking or understanding language.
- Severe headache especially with vomiting and sleepiness.
- Trouble seeing clearly in one or both eyes.
- New onset seizures focal seizures.
- Seizures followed by paralysis on the side of seizure.
- General sudden onset and focal neuro complaints.

## Signs & Symptoms in the Young



- HEMMORAGHIC TRIAD**
  - Hemiparesis
  - Unrelenting Severe Headache
  - Repeated Vomiting
  - Decreasing Mental Status

## Signs & Symptoms in the Young



- Garbled Speech
- Garbled Text

## Ruling It Out

- Diabetes Mellitus / Hypoglycemia**
  - BG <60 mg/dL & improves after dextrose.
- Tumor**
  - Slow and progressive onset.
- Brain Abscess**
  - Slow and progressive onset.
- Seizure**
  - + Aura. Post-ictal deficits brief or not focal

## Ruling It Out

- Overdose / Alcohol Intoxication**
  - Chronic abusers at high risk for stroke.
- Migraine**
  - Past history & sensitivity to light.
- Head Injury**
  - Trauma / significant mechanism of injury.
- Bell's Palsy**
  - Previous diagnosis or isolated deficit of facial muscles

## Dr. Timothy J. Bernard

Director of the Pediatric Stroke Program, Children's Hospital, Denver, CO.

"I believe that EMS is the key to improving treatment of childhood stroke in the acute setting. I have seen multiple cases where EMS takes a child into a pediatric ER and they are thinking stroke before the pediatrician. This is simply because EMS sees stroke every day and pediatricians do not."

<http://www.flickr.com/photos/drtimberj/314107207/>

## Dr. Timothy J. Bernard

Director of the Pediatric Stroke Program, Children's Hospital, Denver, CO.

"The average time to stroke diagnosis is 24 hours. In order to offer acute therapies, such as tPA (a clot buster) to children, we are going to have to reduce that time greatly. In my opinion, EMS is the most important part of this effort."

<http://www.flickr.com/photos/drtimberj/314107207/>

## Dr. Louise McCullough

Director of Stroke Research: Univ. of CT's John Dempsey Hospital

It is important to keep an open mind to the possibility of stroke in the young, and not presume that complaints are due to stroke mimics.

“All patients exhibiting potential stroke symptoms should be treated as if they were having a stroke, until proven otherwise.”

http://www.stroke.com/resources/compromised/youngstroke

## Stroke In The Young In The Hospital

- Designated Stroke Centers
- Pediatric Specialty Facilities

http://www.fda.gov/oc/ohrt/081110

## Stroke In The Young In The Hospital

- Comprehensive stroke evaluation
- Thrombolysis
- Clot removal
- Surgical intervention
- Neuroprotection
- Pediatric specialists
- Post acute-care stroke rehabilitation.

http://www.fda.gov/oc/ohrt/081110

## EMS Stroke Management In The Young

- Efficient Transport
- Care of Life Threats
- Care for Comfort
- Efficient Coordination

## The BIG Picture for Stroke

- Manage life threats (ABC's)
- Neuro Symptoms = Identify, Assess & Care for Stroke (any age).
- If stroke suspected, triage to a designated Stroke Center
- Pre-notify and coordinate with the Stroke Center
- Provide ongoing supportive care

4/28/14/14/14

## Identification

- Neurological Symptoms
- “Time Last Seen Normal”
- Use a Validated Stroke Scale

www.fda.gov/oc/ohrt/081110

# Identification

Evaluate the patient with a validated stroke scale

- FACE-ARM-SPEECH Test (FAST)
- Cincinnati Prehospital Stroke Scale (CPSS)
- LA Prehospital Stroke Scale (LAPSS)
- Miami Emergency Neurological Deficit (MEND)

# Assessment

Check medical history for events such as:

- Previous stroke or TIA.
- Heart Attack (MI).
- Trauma or bleeding, especially head injury.
- Recent surgery.

# Assessment

Check medical history for events such as:

- Congenital Heart Disease
- Hypertension
- Diabetes Mellitus
- Sickle Cell Disease
- Clotting Disorders

# Assessment

- Routine Vital Signs.
- Routine Physical Exam.
- Routine Medical History.

# Assessment

Provide cardiac monitoring

# Triage & Transport

**NEUROINTERVENTION DISCUSSION**

Her Angio revealed an acute carotid occlusion and Carotid T thrombus. A 6F Shuttle Sheath was used along with a 6F Navien. After passing the carotid occlusion, a 6 x 30 Solitaire device was delivered with a Markman catheter to retrieve the Carotid T Thrombus. After a single pass with the Solitaire FR device, complete TICI 3 reperfusion was achieved.

ell. EMS was deemed to not be eligible for medical transport.

**PATIENT OUTCOME**

NHSS: 1 Patient discharged home 10 days later

Pre - Carotid Occlusion    Pre - Carotid Terminus    Post - ANGIOGRAM

St. Mary's Medical Center is one of 23 hospitals in Florida designated as a Comprehensive Stroke Center by the Florida Agency of Healthcare Administration.

The Comprehensive Stroke Center at St. Mary's supports the mission of the American Heart Association in "leading healthier lives, free of cardiovascular disease and stroke." Following the standards set forth by the American Stroke Association, St. Mary's Medical Center will strive to provide quality care, the management of stroke patients throughout the continuum of care along with patient and family education for management of secondary risk factors and stroke prevention.

Hospital Name: St. Mary's Medical Center  
Interventionalist: Dr. Ali Hach  
Transfer: JH Medical Center

**St. Mary's**  
Medical Center  
West Palm Beach, Florida

Care of Dr. Peter Antevy

# Treatment



Supportive O<sub>2</sub> if SpO<sub>2</sub> <94%

Nothing PO

IV access if easily possible

# Treatment



If ABGT <60 mg/dL, admin dextrose according to protocol

Don't manage hypertension with EMS medications

Rest in a position of comfort

If possible avoid ambulating / sitting upright



# The Good News



Young victims of stroke tend to have **better outcomes** than older patients with similar injuries.

# We Can Do Better



The **TIPS** trial  
(*Thrombolysis in Pediatric Stroke*)

# Stroke Care



in the past



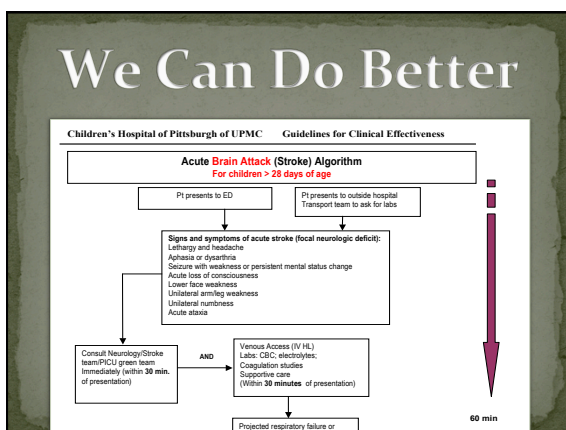
# We Can Do Better

*Stroke Systems of Care* have been shown to provide the best patient outcome for stroke *victims of all ages.*

*Ben Hutchings Photography*

# We Can Do Better

- Ensure rapid access to enhanced 911 systems for suspected stroke.
- Use education & protocols to assist dispatchers in recognition of stroke and rapid dispatch of appropriate resources.
- Improve identification of stroke in newborns, very young and young patients through education.
- Utilize stroke specific treatment, transport and communication guidelines for efficient delivery of young stroke patients to primary stroke centers.
- Use validated screening tools such as FAST, CPSS, LAPPS, MEND to rapidly identify stroke in the young and communicate & coordinate with hospitals to facilitate treatment.



# Our Goal

- Improved Identification**
  - Knowing stroke risk factors in a younger patient's history will help alert you to the possibility of stroke, even in complex and difficult cases.
- Improved Assessment**
  - Be especially suspicious of new onset, focal neurological deficits. Don't assume a stroke mimic just because of the patient's age.
- Improved Management**
  - Know and use both general management & specific stroke care recommendations for patients <45 years old, <18 years old, and newborns.
- Improved Coordination**
  - Know and use a validated stroke scale improving identification of stroke and assisting in coordination with hospital staff.

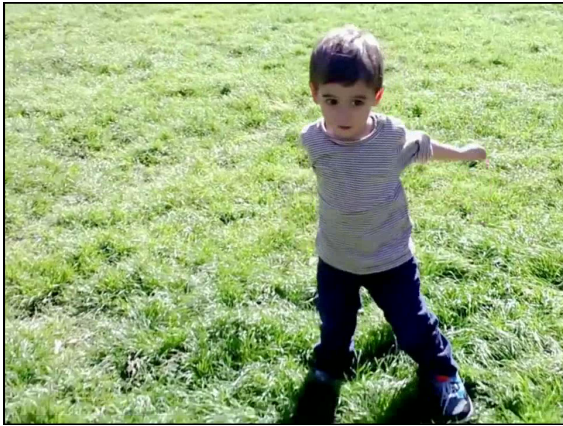
<http://www.flickr.com/photos/gu660ay6/No0/527338794/>

# Your Role

- Detect** stroke by
- Dispatching** the right resources so we can
- Deliver** the stroke patient to the
- Door** of the right hospital where
- Data** will allow a primary stroke center to make their
- Decision** to administer the right
- Drug** and give our stroke patient the best possible
- Disposition.**

# Your Role

## Make The Difference!



A graphic overlay with a yellow background and a blue border, featuring three sections of text and several logos. The top section is titled "Join Me On Twitter:" and lists "@romduck" and "@RescueDigest". The middle section is titled "Contact Me:" and lists "www.RomDuck.com". The bottom section is titled "Resources:" and lists "www.bit.ly/StrokeInTheYoung" and "www.RescueDigest.com". Logos include a red umbrella, a blue caduceus, a blue ambulance, and a circular logo with "RESCUE DIGEST" text.