

Endovascular Stroke Treatment in the Developing World



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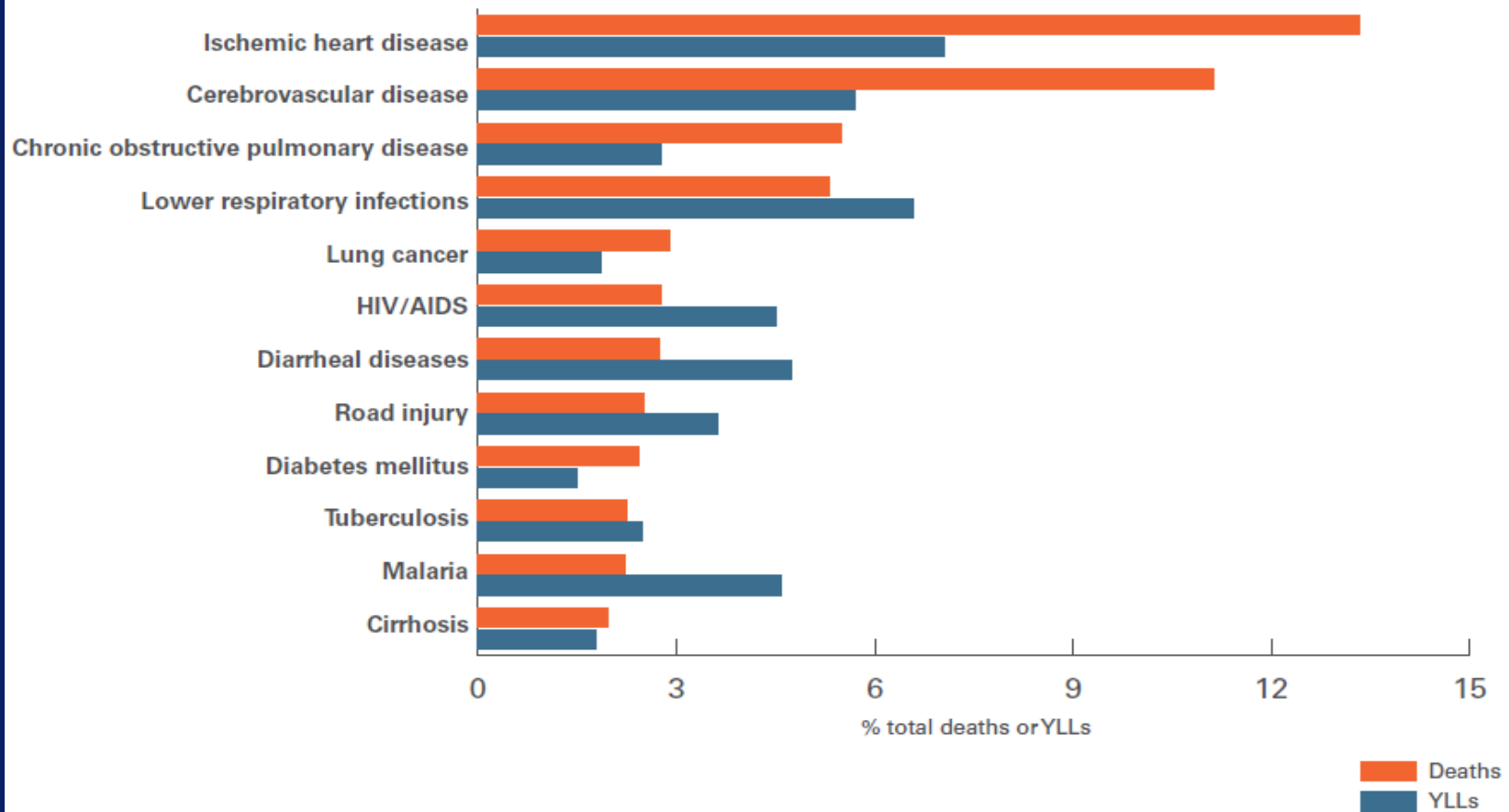
King Faisal Specialist Hospital, Riyadh

Disclosures

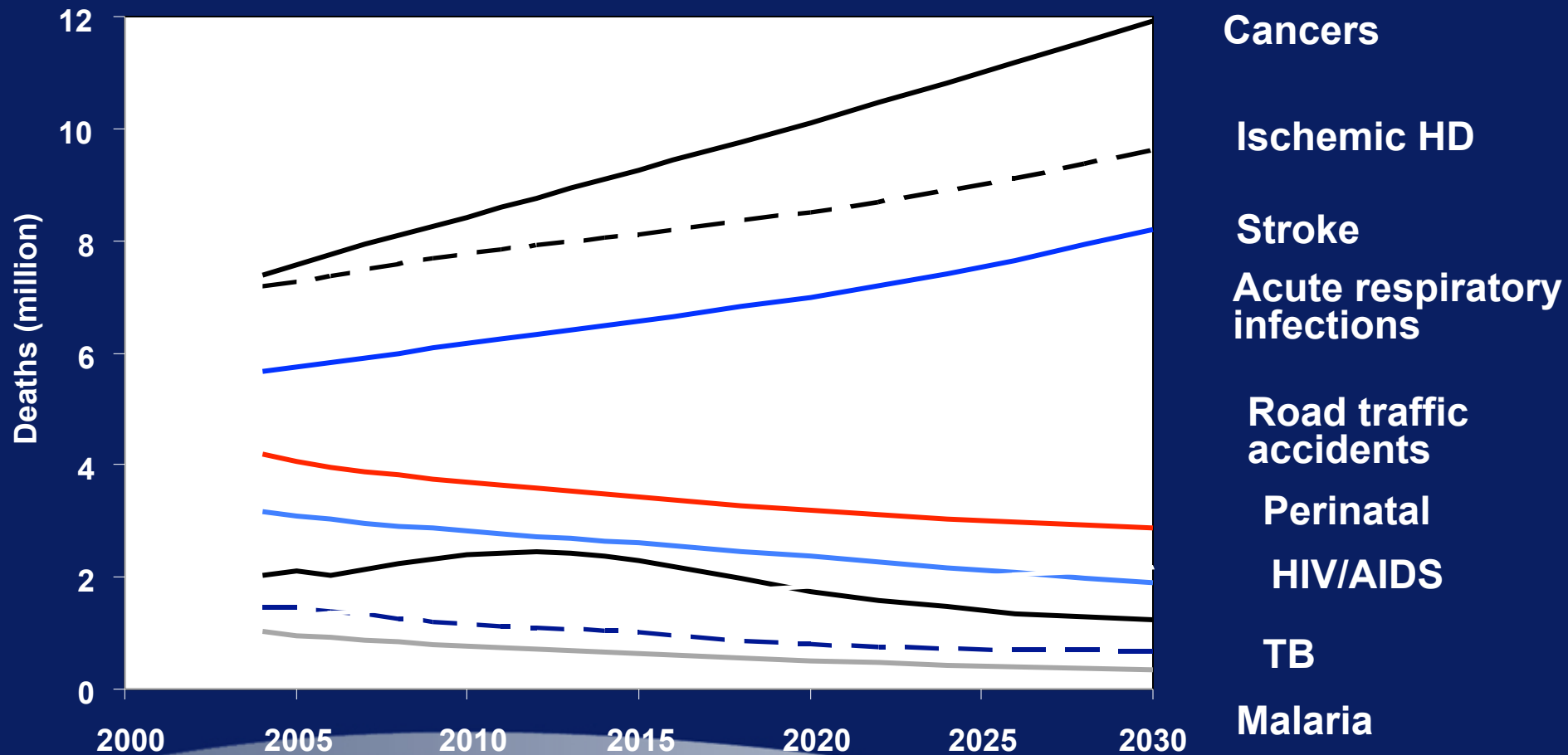
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The global burden of stroke

Leading causes of global death and premature death, 2010



Global projections for selected causes of death, 2004 to 2030





Area of Saudi Arabia 2.27 million m²

150 Cities

More than 2000 villages

Vast distances between cities

Population of more than 27 million

Population growth rate 3.19%

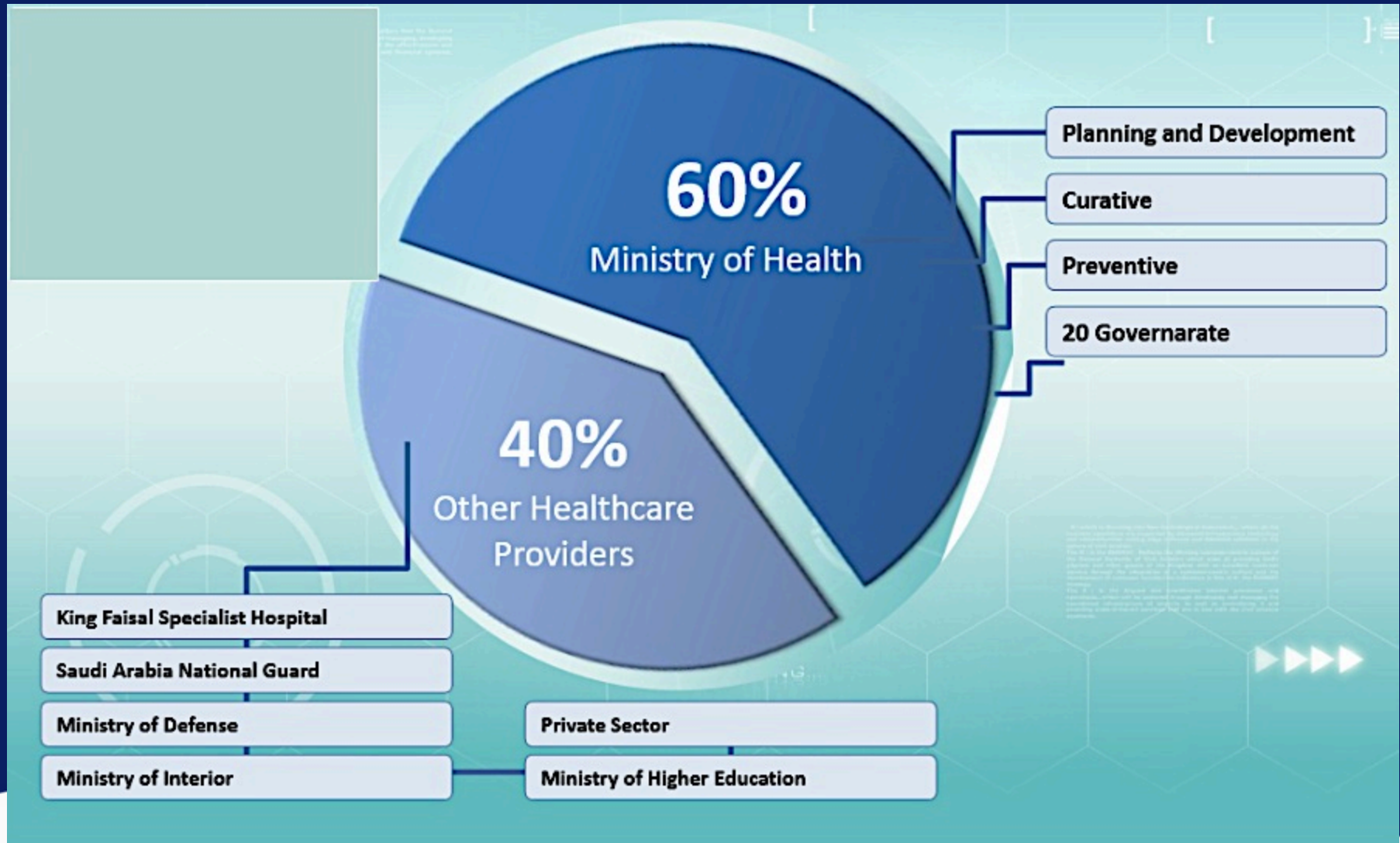
Birth rate 23.3 per 1000 people

Annual number of births 513.000

**Proportion of the population 15 years and less
%42.49**

**Proportion of the population above 15 years
%57.51**

Health system in Saudi Arabia



Stroke system in Saudi Arabia

- Population of 27 million
- Incidence : $126 / 10^5 / \text{yr.}^*$
- Indirect estimate suggests that there is at least 20,000 strokes / yr across the country ($150/10^5$)

Stroke system in Saudi Arabia

- This leads to:
 - ≈ 4,000 deaths/yr.
 - ≈ 6,000 disabilities/yr.
- Majority of stroke patients (>70 %) are cared for by ministry of health hospitals.
- The rest are admitted into other health sectors

Stroke system in Saudi Arabia

- Stroke patients are largely cared for by general internist particularly in the MOH hospitals.
- Only a few hospitals have a stroke service run primarily by neurologists.
- Number of neurologists across the country is about **150 - 200**.

Stroke system in Saudi Arabia

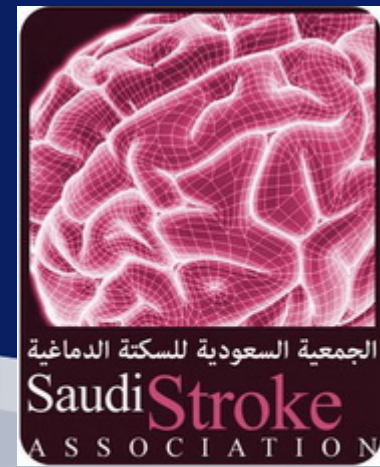
- There are around **10** trained stroke neurologists in the country primarily located in Riyadh.
- 9 Endovascular Interventionalists:
 - 4 Neurologists
 - 4 Radiologists
 - 1 Neurosurgen
- There are less than 20 qualified and trained practicing physiatrists.

Stroke Awareness Among the Public

- Face-to-face interview survey of 3,750 volunteers in 6 GCC countries.
- Only 29% were familiar with the term “stroke”
- Of these, 29.3% believed age group 30-50 yrs are at highest risk for stroke.
- HTN & DM were more common among those unfamiliar with the term “stroke”
- Predictors of stroke knowledge:
 - Level of education.
 - Monthly income.
 - Smoking.
- Conclusion:
 - *Majority of people had not heard of term “stroke”*
 - *Stroke knowledge is poorest among the high risk groups.*

Stroke system in Saudi Arabia

- There are no published practice guidelines for stroke in KSA.
- The stroke system and stroke care advocate in Saudi Arabia is the Saudi Stroke Association (SSA) established under the “*Saudi commission for health specialties*” governed by an elected board.



Stroke system in Saudi Arabia

- There are only 2 well established stroke units:
 - King Abdulaziz medical city-Riyadh
 - King Fahad medical city-Riyadh.
- Admitting around 1200 patients per year.

Established stroke centers



SANG- Comprehensive Stroke Program



King Fahad Medical City stroke program

Stroke system in Saudi Arabia

- New initiatives between SSA and Evidence based health care (MOH) to establish practice guidelines for stroke.
- Initiatives include:
 - Development, implementation, & evaluation of guidelines.
 - Training stroke care providers across the country on “state of the art” stroke care

Estimated Numbers

- KFSH - Riyadh:
 - IV tPA: 20/yr
 - IA thrombolysis: 1-2/yr
- KFSH - Jeddah:
 - IA thrombolysis: 1-2/yr
- NGH: IV tPA \approx 100/yr
- KFMC - Riyadh: IV tPA \approx 200/yr
- Military Hosp:
 - IV tPA: 150-200/yr
 - IA thrombolysis \approx 25/yr
- Rashid Hospital: IV tPA: 100-150/yr

Stroke system in Saudi Arabia

- There are few rehabilitation centers in the country:
 - King Fahad medical city-Riyadh.
 - Sultan bin Abdulaziz humanitarian city-Riyadh.
 - King Abdulaziz hospital-Jeddah.
 - Abdulatef Jameel Rehabilitation center-Jeddah.
- There are few smaller rehabilitation units:
 - King Abdulaziz medical city-Riyadh.
 - Military hospital in Riyadh & Taif.

The KFMC Stroke Program

- 1st Acute Stroke Unit in Saudi Arabia.
- April 2, 2005.
- Written protocols, database and quality indicators.
- Nucleus: Acute Stroke Unit
 - Multidisciplinary program
 - Neurology, Nursing, Emergency Dept, Laboratory, Radiology, Rehab (Physical, occupational, speech therapy), Neurosurgery, Vascular surgery, IM

8th Stroke Unit Anniversary



KFSH



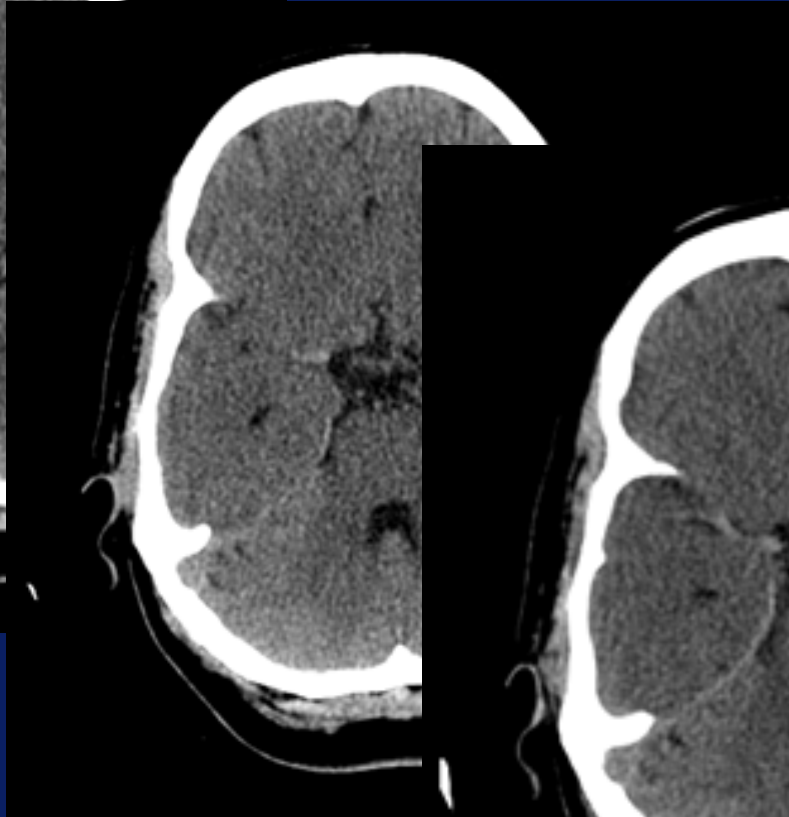
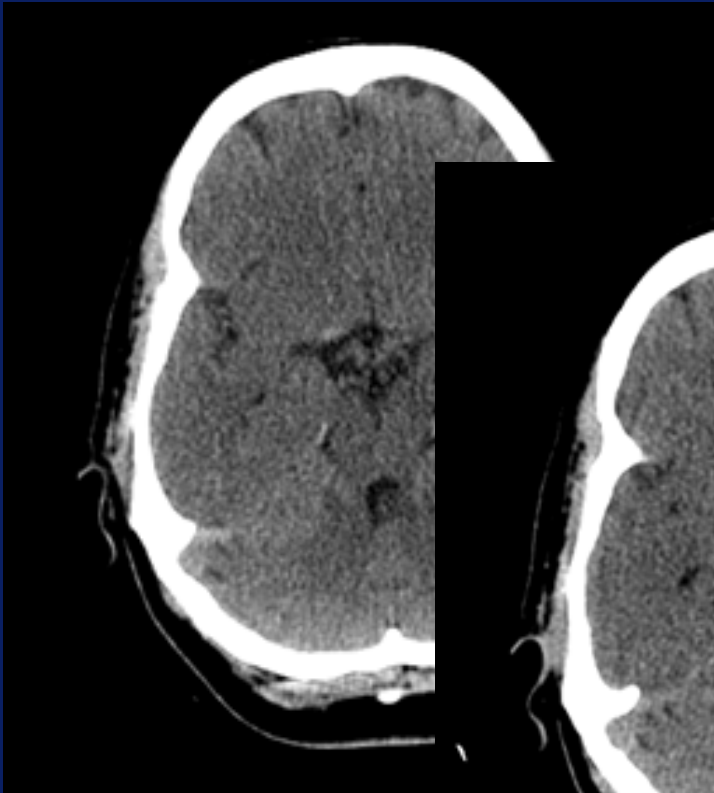
Dubai, Rashid Hospital



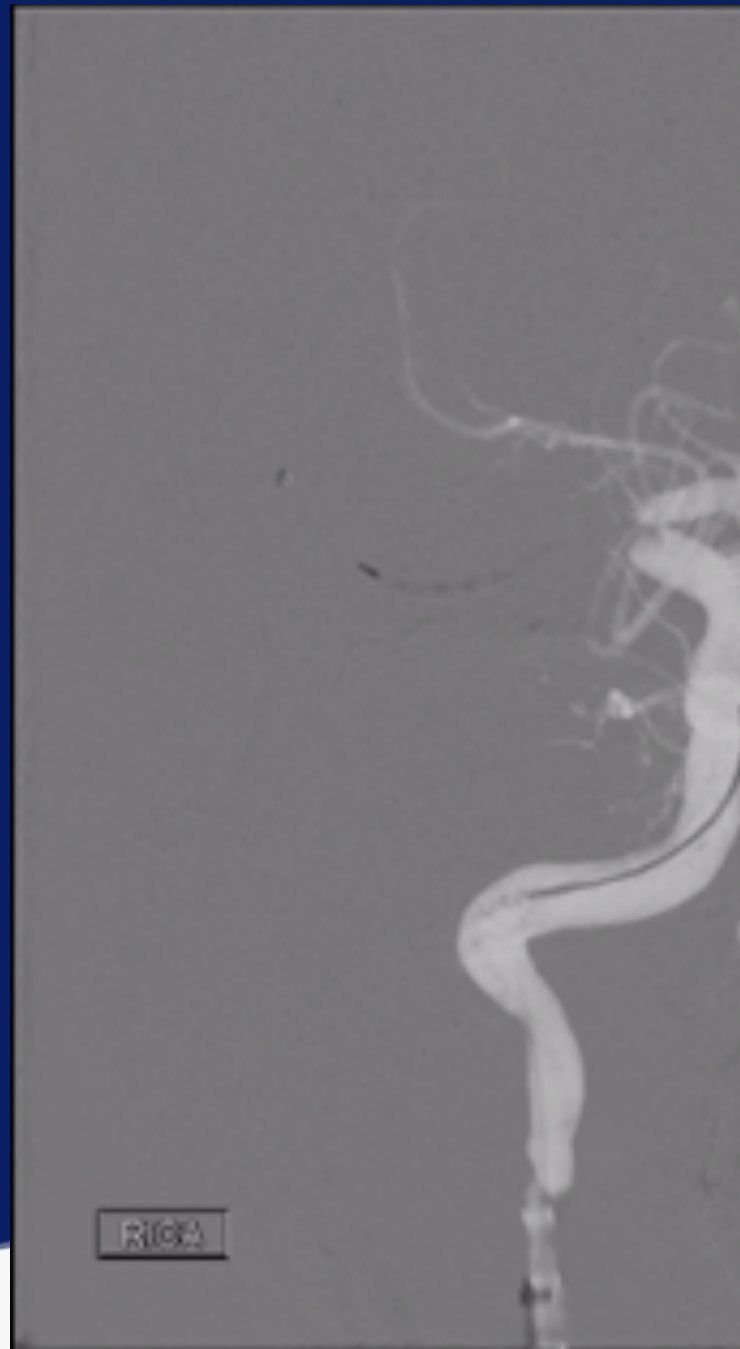
Dubai, Rashid Hospital



***30 F, acute dense Lt hemiplegia
NIHSS 16***

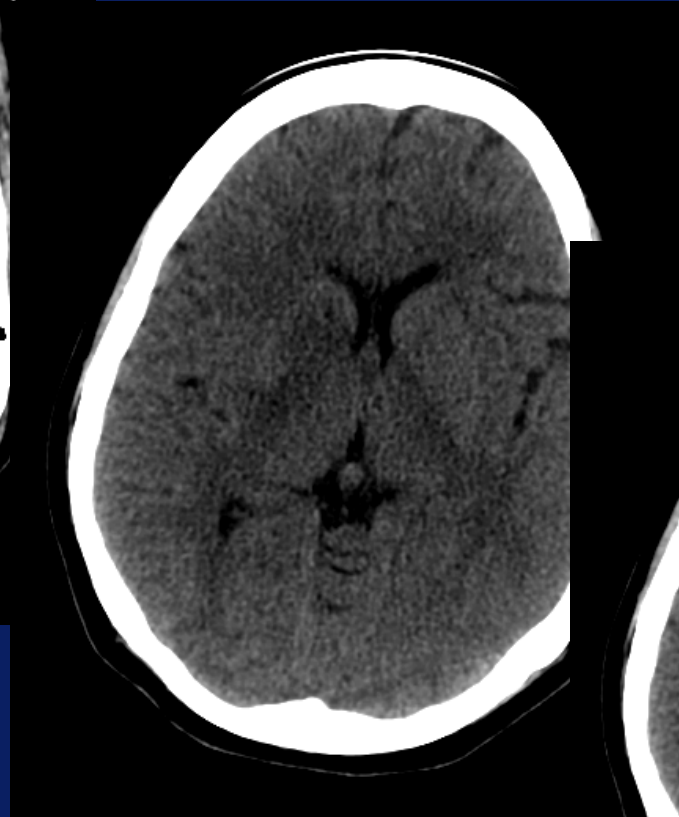




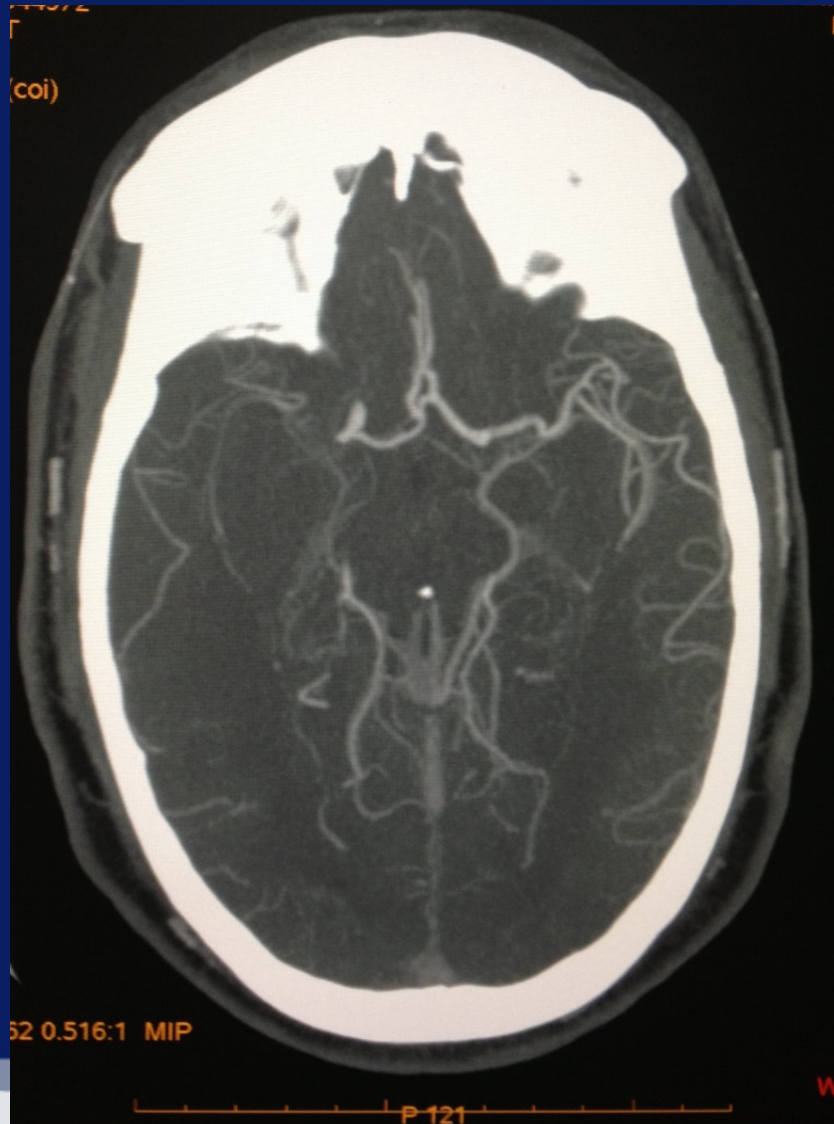


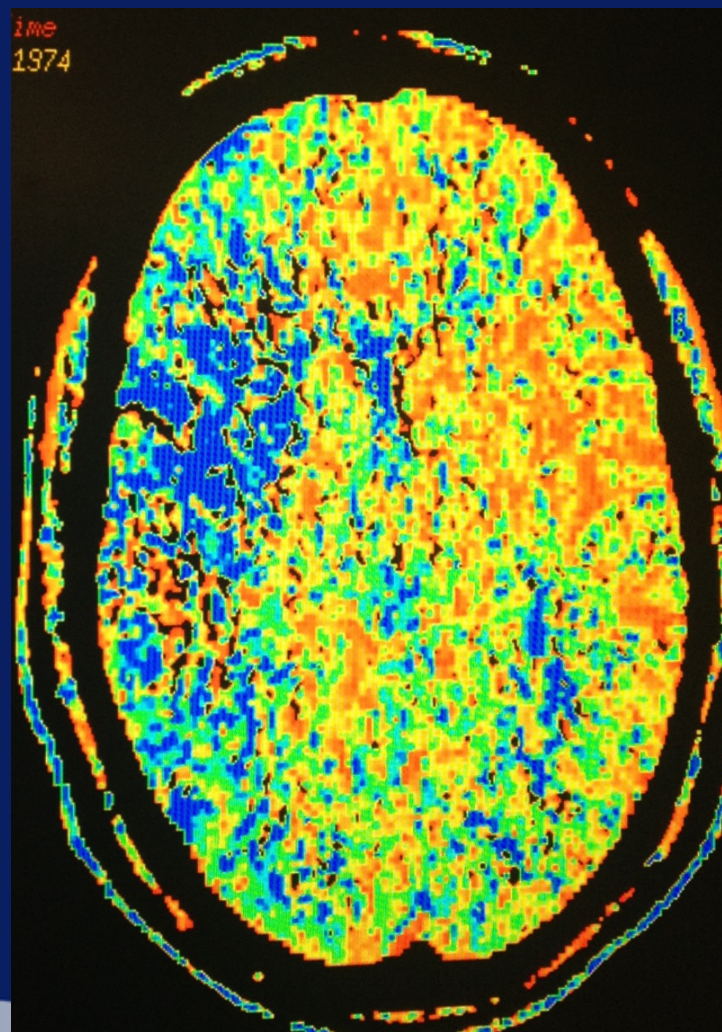
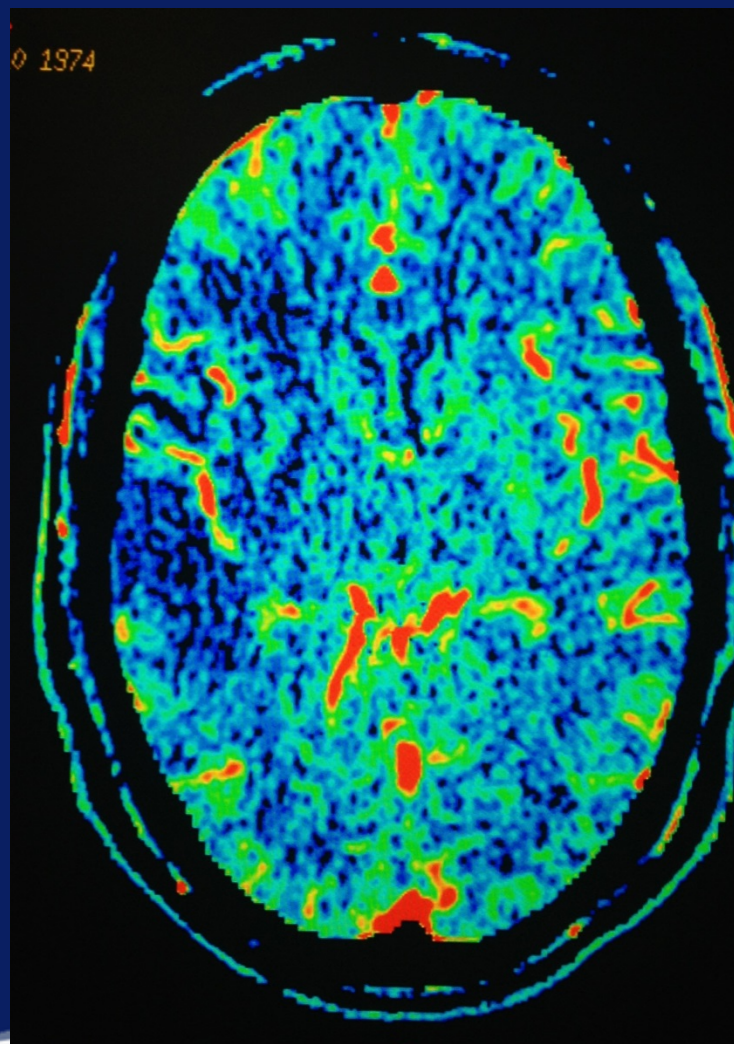


Post Thrombectomy

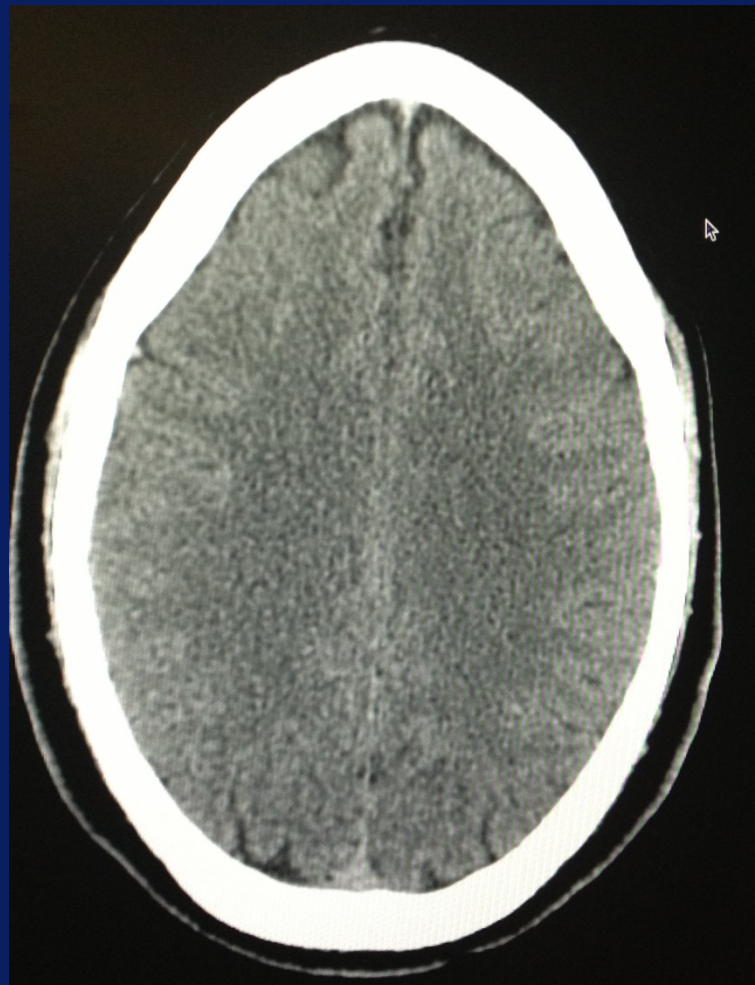
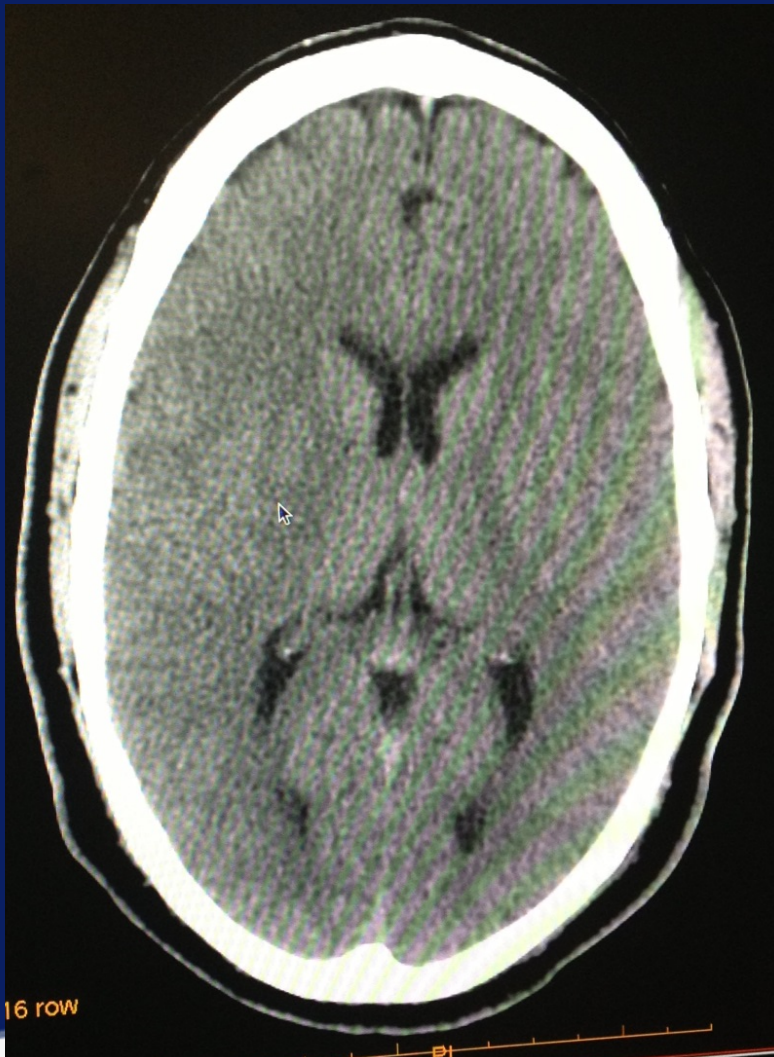


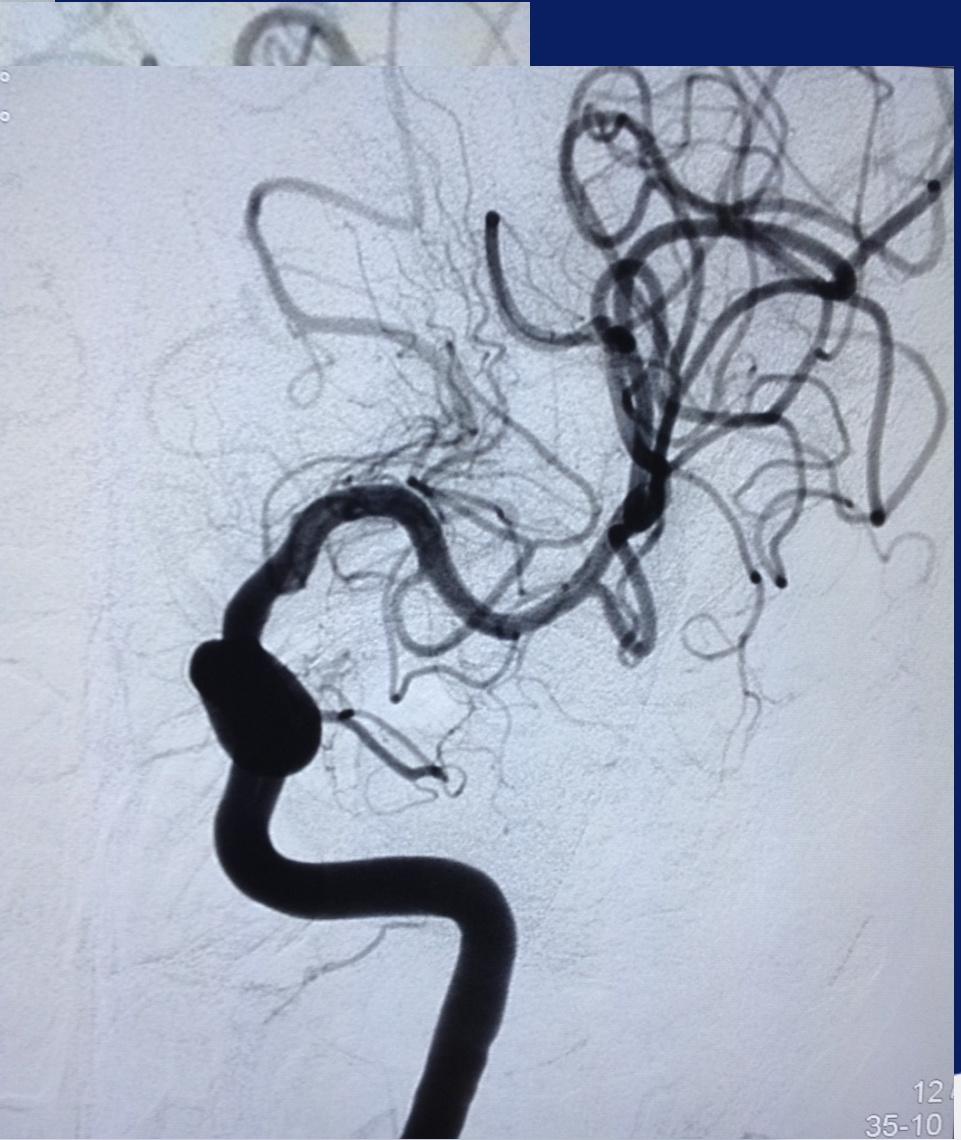
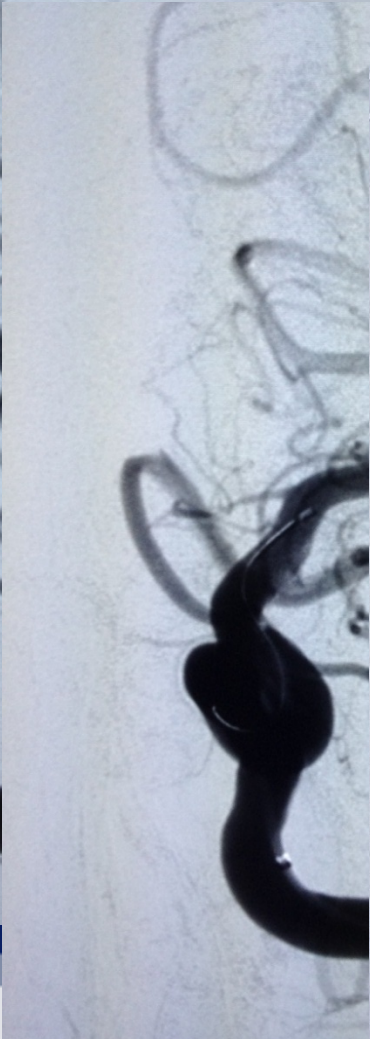
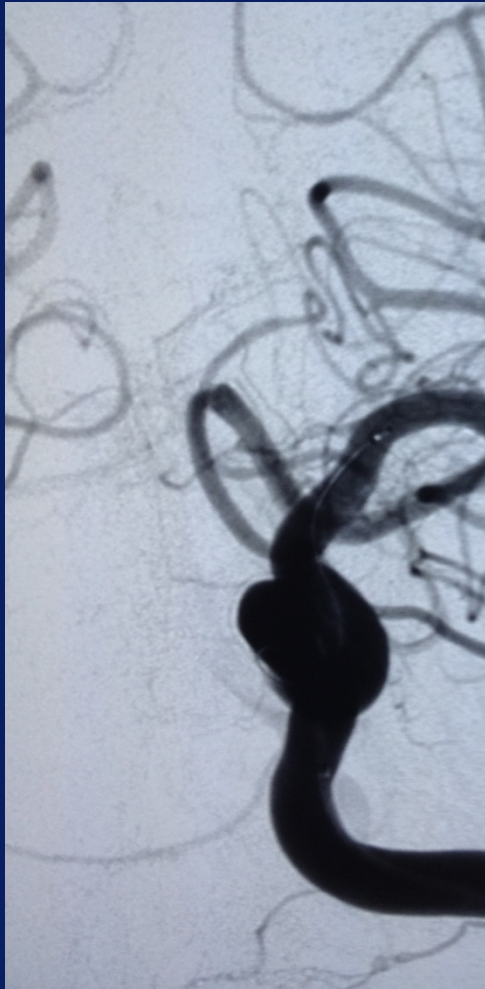
***39 yo male, Case of wakeup stroke , last
seen normal >6hrs***





Post IV tPA







Factors Impeding Stroke Management

- Public awareness of stroke is inadequate.
- Duplication of investigations: one patient presents to multiple hospitals.
- Access to **primary** health care is excellent, but different eligibility criteria for acceptance in **specialized** centers.
- No good address system, and suboptimal utilization of EMS “Red Crescent” for transport to medical centers.

Factors Impeding Stroke Management

- Few centers have multidisciplinary stroke teams.
- Stroke units are still very few, establishments of a unit is based on strategic plan of hospitals, priority of services and other factors.
- Radiologists in several centers maintain monopoly on interventions leading to fragmentation of care.
- Inadequate rehabilitation units and few long term health care facilities.

Future direction

The MOH-SSA agreement:

- National assessment of need.
- Saudi stroke audit.
- National stroke registry.
- Training of stroke care providers.

Building capacity:

- Annual stroke course for residents.
- CME for primary care and general internist.

Stroke system & Pre-hospital care redesign:

- In Riyadh:
 - New address system based on GPS
 - Advances in EMS “Red Crescent”

Future direction

- Increase awareness of stroke in public.
- Establishment of more stroke units & stroke centers.
- Expansion of manpower (Vascular Neurologists, ER physicians, rehabilitation, occupational, & speech therapist).
- Improve cooperative relations with Neurosurgery, Vascular surgery, & Radiology especially interventional.
- Improved registries and research.
- Support Gulf Stroke Group.

THANK YOU