

NEUROSURGERY TODAY

CHANGING TRENDS IN OUTCOME

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KOLKATA



 **NH** Rabindranath Tagore™
International Institute of Cardiac Sciences
Unit of Narayana Health



NEUROSCIENCES—BRAIN AND SPINE CARE

NEUROSCIENCES PROGRAM

NEUROEMERGENCY 24X7 FOR STROKE & TRAUMA

COMPLEX BRAIN AND SPINAL CORD TUMOURS

PEDIATRIC BRAIN AND SPINE SURGERY

MINIMAL ACCESS SPINE SURGERY

COMPREHENSIVE STROKE CARE- STROKE UNIT

COMPREHENSIVE EPILEPSY CARE- VIDEO EEG LAB

STEREOTACTIC & FUNCTIONAL NEUROSURGERY



MANAGEMENT OF STROKE

ACUTE CARE PATHWAY

BRAIN STROKE

**INCIDENCE IN INDIA:
119-145/ 1,00,000 POPULATION**

**CASE FATALITY IN KOLKATA
HIGHEST-42%**

WHY?

- † MAJOR GLOBAL PUBLIC HEALTH CONCERN
- † MAIN CAUSE OF DISABILITY IN ADULTS
- † SECOND COMMONEST CAUSE OF DEATH (WHO 2003)
- † FIFTY PERCENT ARE DEPENDENT DAILY ACTIVITIES
- † AMONG THE TOP 4 CAUSES OF DEATH IN ASEAN COUNTRIES

EVIDENCE BASED PATHWAY

- ISCHEMIC STROKE IN ADULTS
- TRANSIENT ISCHEMIC ATTACKS-TIA
- HEMORRHAGIC STROKE IN ADULTS
- STROKE IN CHILDREN
- ANEURYSMAL RUPTURE
- AVM BLEED

CHANGING TRENDS

.....As a newly qualified doctor, I remember feeling a sense of uselessness whenever I admitted a patient with a stroke. Here was one of the commonest of medical admissions, yet I had embarrassingly little to offer them.

- Today on acute takes, when a patient with a suspected stroke appears I am ushered aside by a specialist team eager to waste no time in assessing the patient, initiating appropriate treatment, considering their suitability for trials.
- This change in attitude is one of the most striking, and most welcome, I have seen in my medical lifetime. I am perhaps fortunate in working in a hospital which was an early developer of the acute stroke.....

Bernard Higgins MD FRCP

Director, National Collaborating Centre for Chronic Conditions
National clinical guideline for diagnosis
and initial management of acute stroke and
transient ischaemic attack (TIA)

STROKE IN THE YOUNG



SEVERE HEADACHE

YOUNG STROKE

SUBARACHNOID HEMORRHAGE

'Thunder Clap' **'Bolt of lightning'**





- **It's the worst headache I've ever had.** When people use this sort of language about a headache, they must be seen immediately. Called a "**thunderclap headache**," this sudden, excruciating pain, which reaches maximum intensity within seconds to a minute, may signal the rupture of a **brain aneurysm** when a blood vessel in the brain bursts, causing hemorrhage and cutting off the blood supply to a part of brain.
- **Brain aneurysms** can be treated, but only if you get to the emergency within hours of an attack.

STROKE

Warning sign

SUDDEN

Severe headache

Young Persons

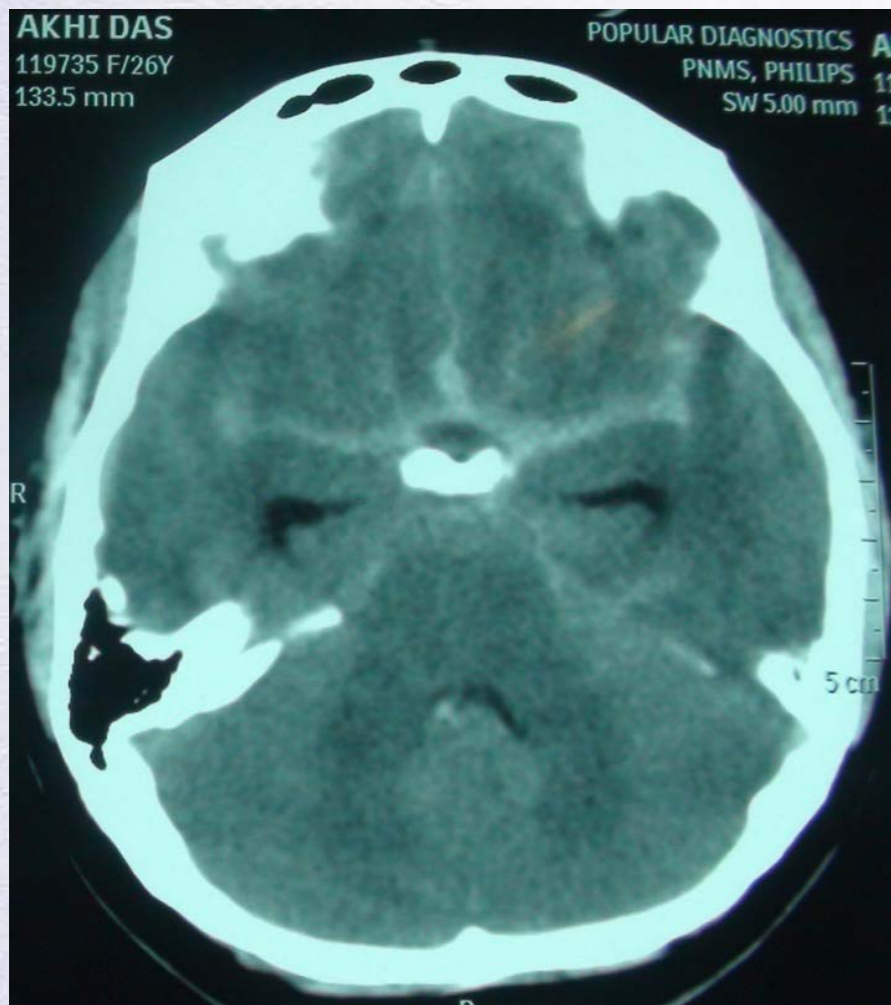


Sub Arachnoid Hemorrhage

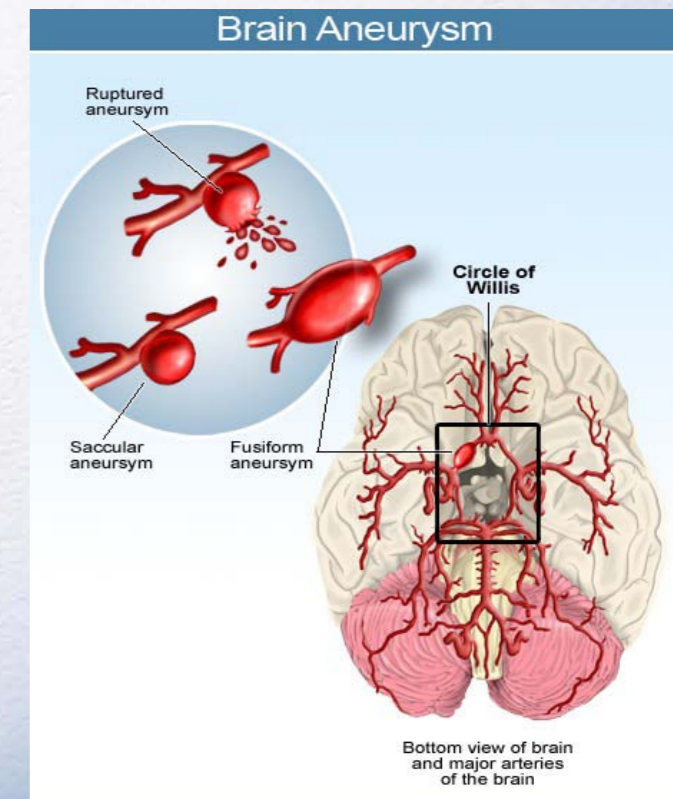
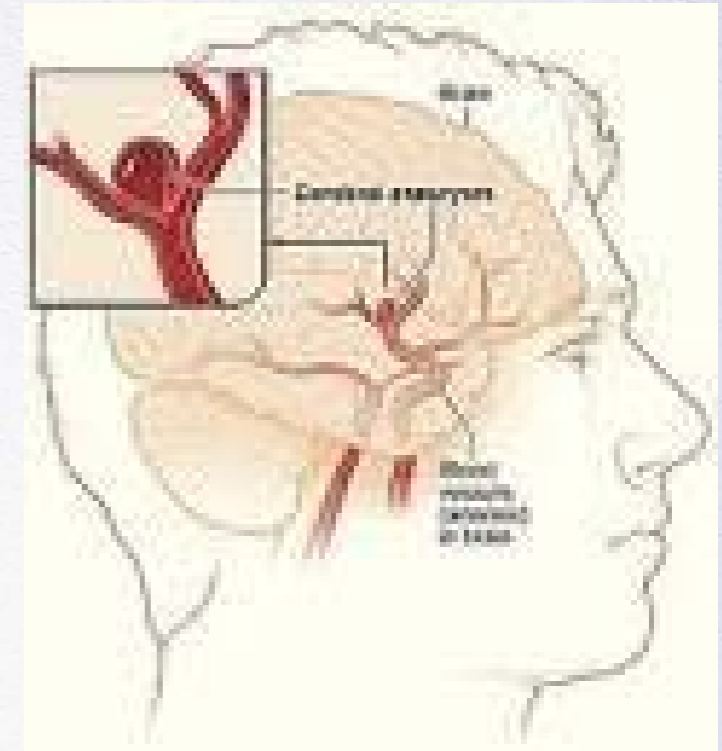


BRAIN ANEURYSM

26Y, Female
SUDDEN HEADACHE
CONSCIOUS



CT ANGIO

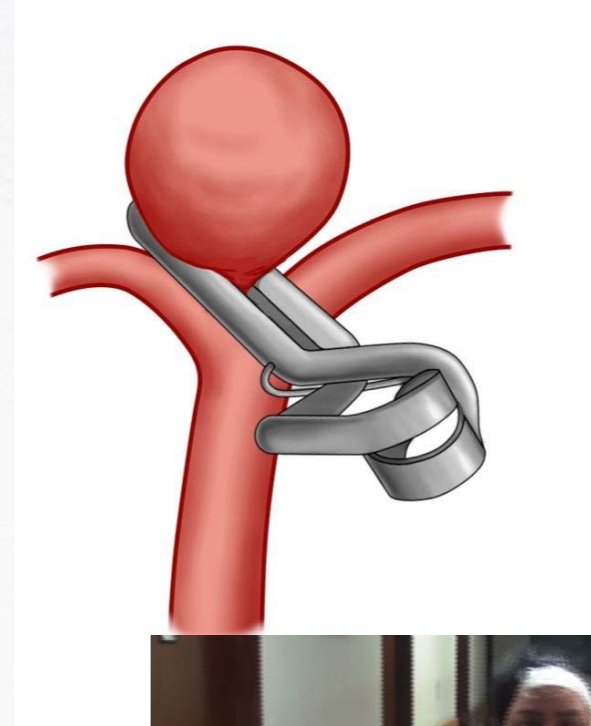
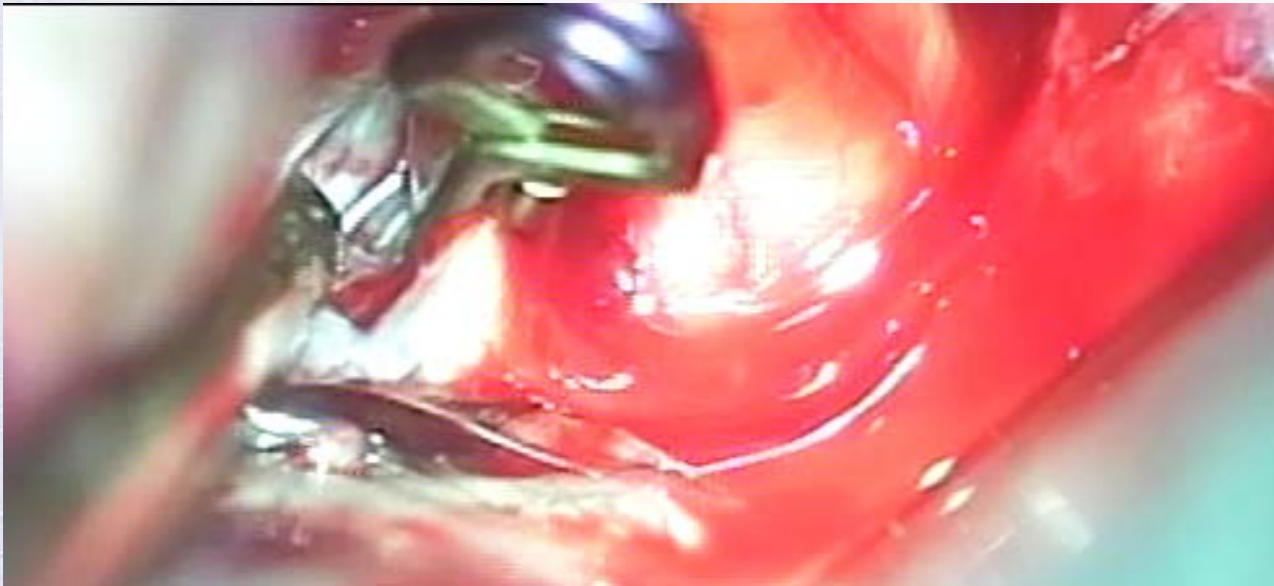


Diagnosis-- SAH WFNS GRADE I

BRAIN ANEURYSM

✦ MICROSURGICAL CLIPPING

✦ ENDOVASCULAR COILING



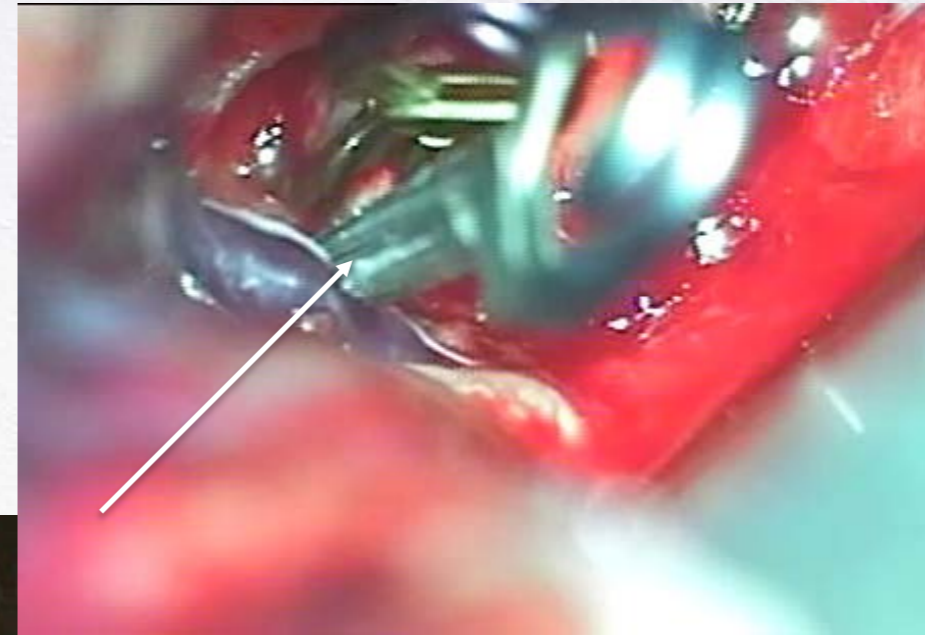
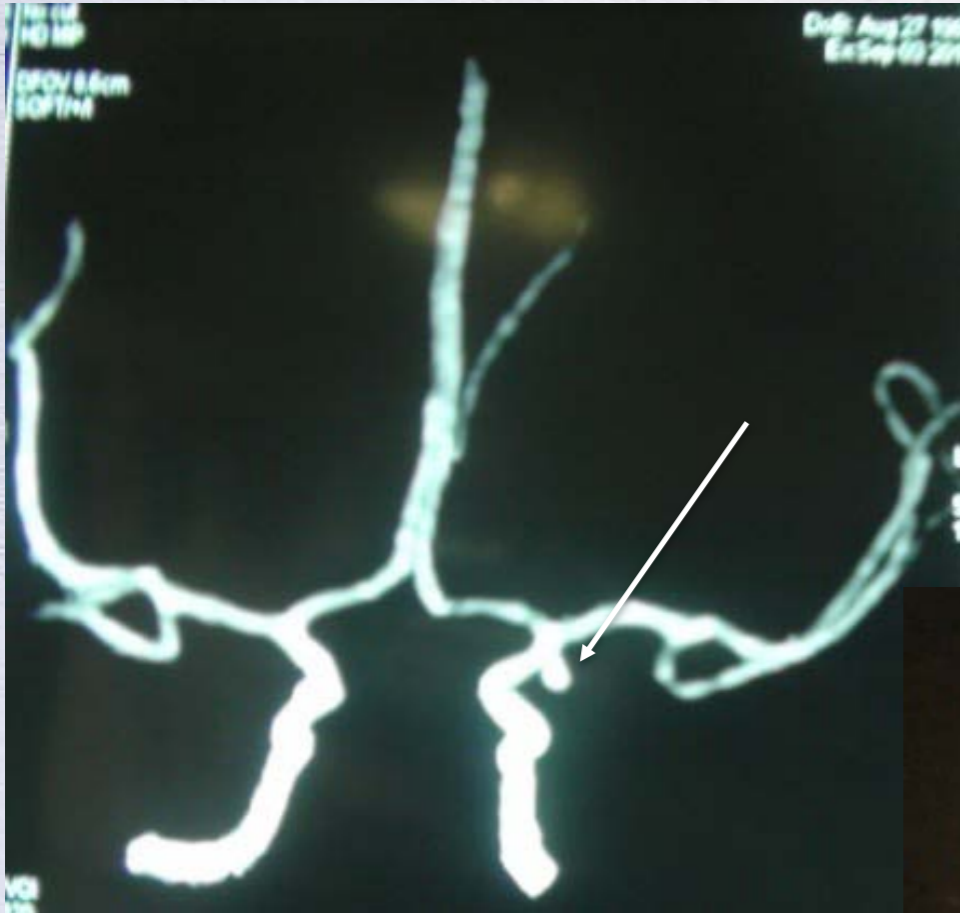
**HIGHLY EXPERIENCED NEUROANESTHESIA &
CRITICAL CARE TEAM**



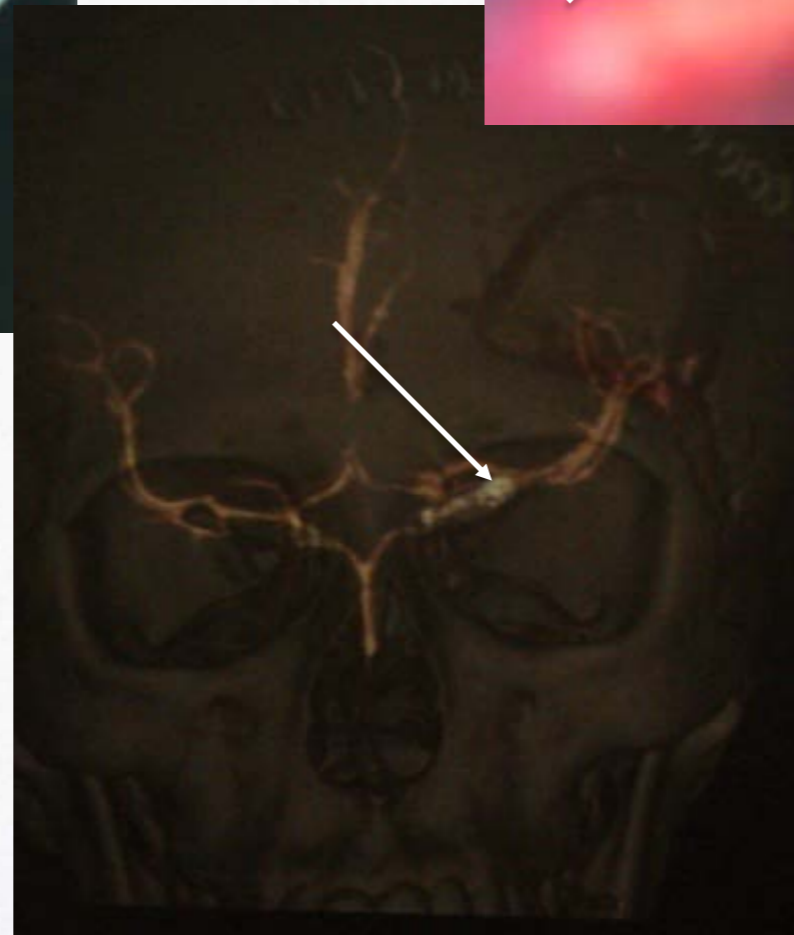
“Type a quote here.”

–Johnny Appleseed

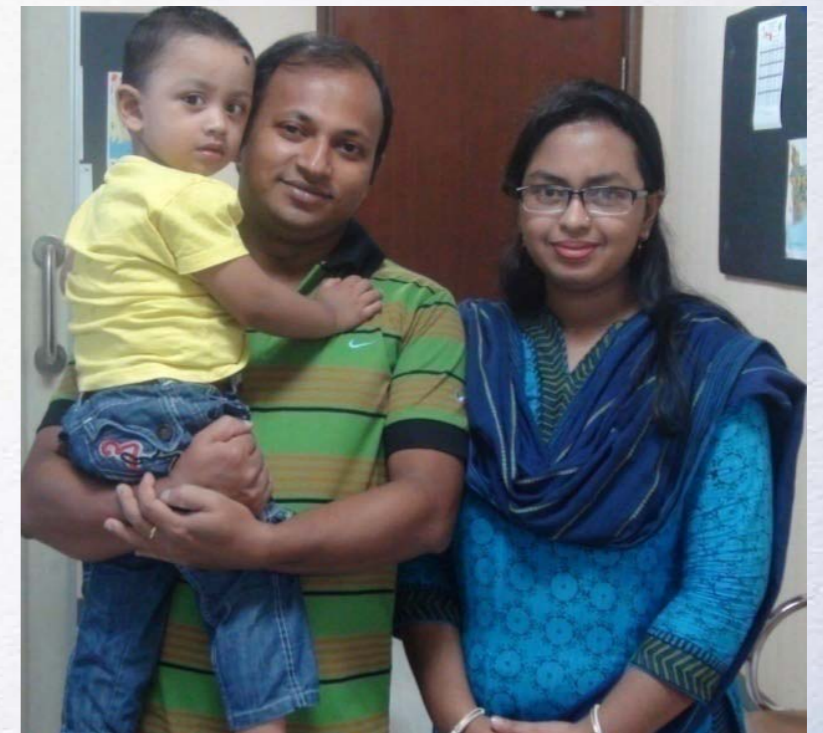
† MICROSURGICAL CLIPPING DONE



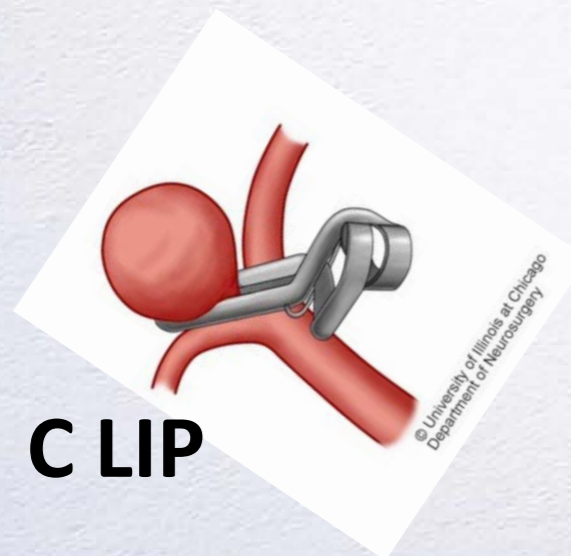
**PRE OPERATIVE
CT ANGIO BRAIN**



**POST OP. CT ANGIO
3D VIEW**



**COMPLETE RECOVERY
NO NEUROLOGICAL
DEFICIT**



C LIP

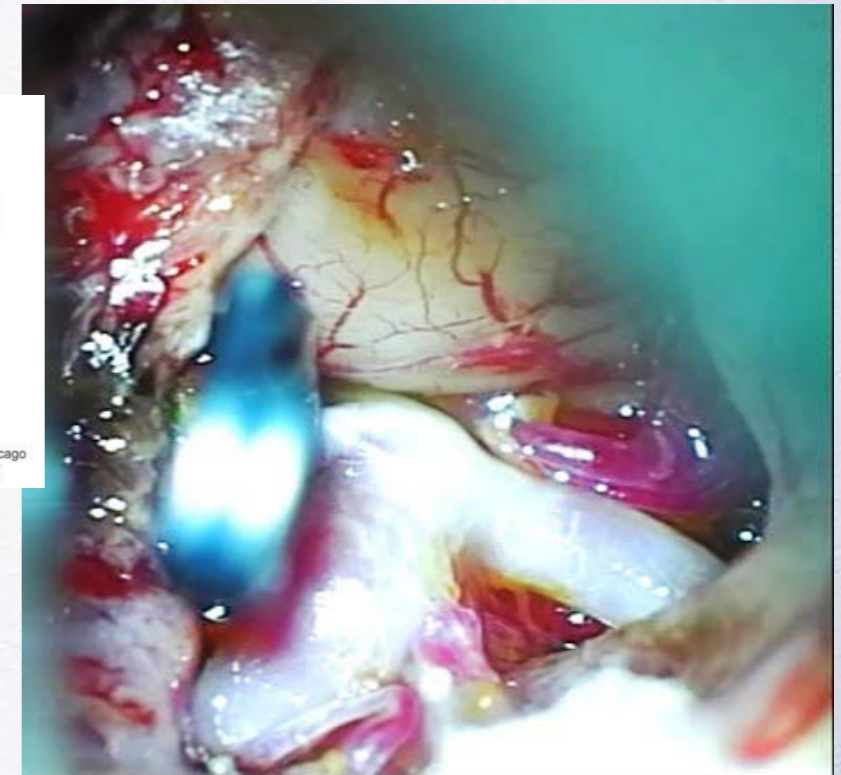
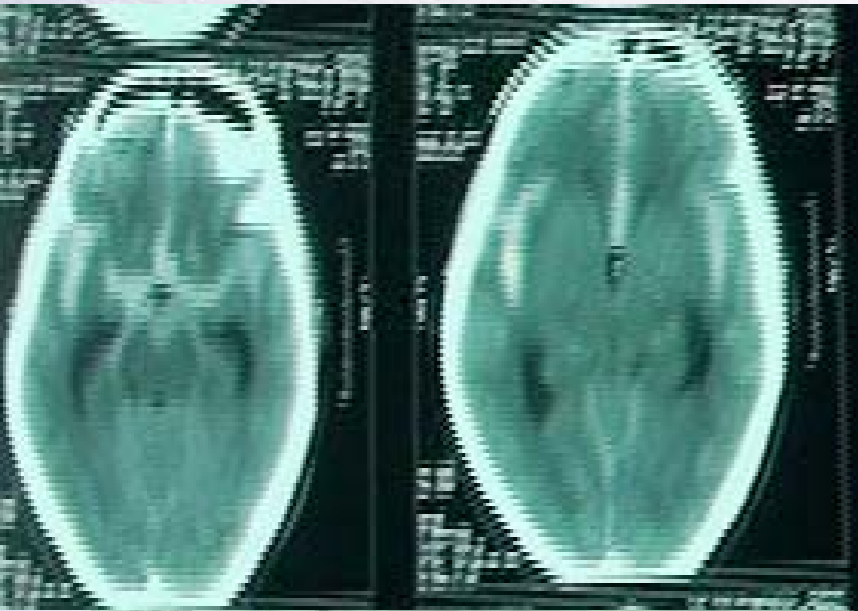
© University of Illinois at Chicago
Department of Neurosurgery

BRAIN ANEURYSM

Subarachnoid Hemorrhage (SAH)

✚ MICROSURGICAL CLIPPING

Intraoperative Microphotographs



**57 y/M, Headache,
Altered sensorium
SAH WFNS grade II**



YOUNG STROKE

SUB ARACHNOID HEMORRHAGE- ANEURYSM, AVM

PREGNANCY

RHEUMATIC HEART DISEASE

LIFESTYLE

STRESS

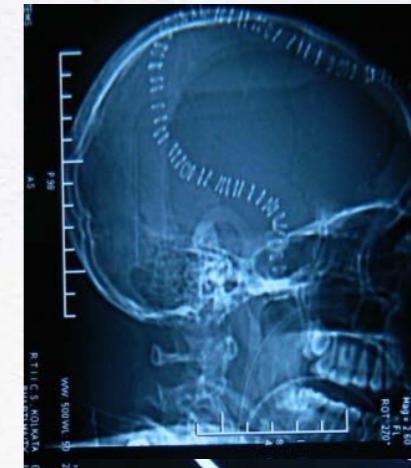
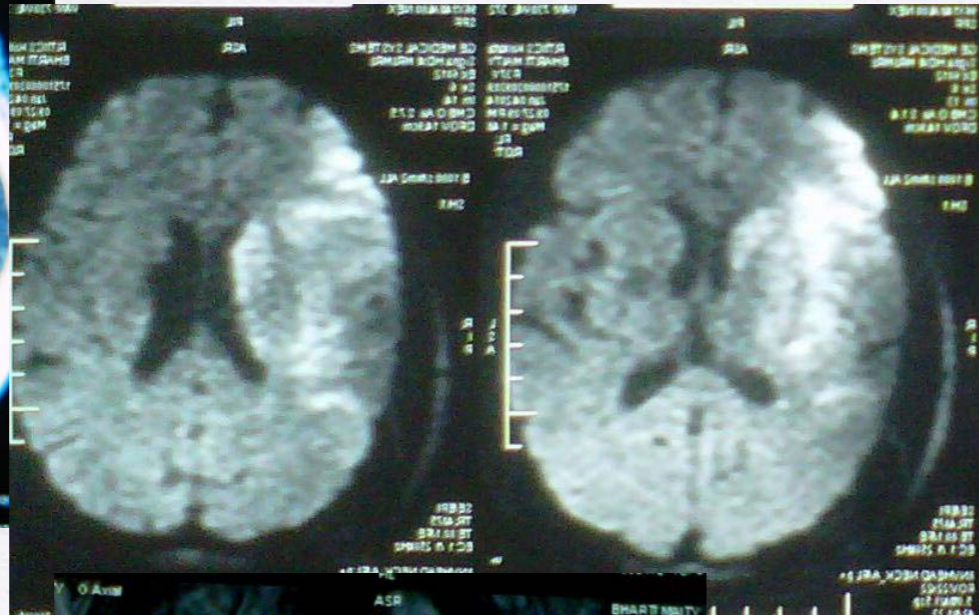
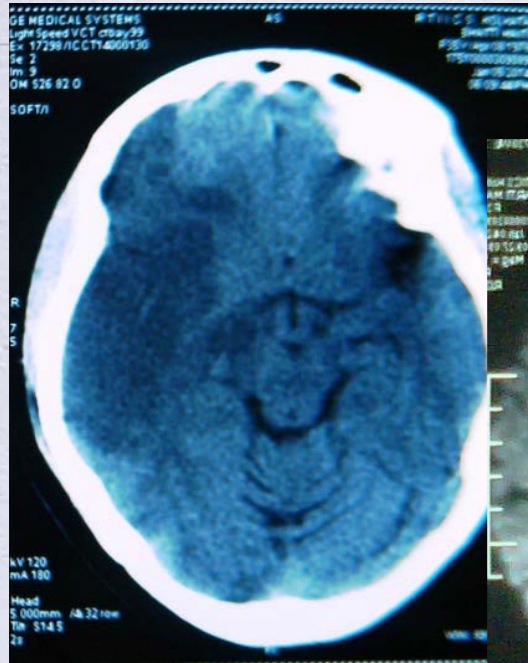
DIET



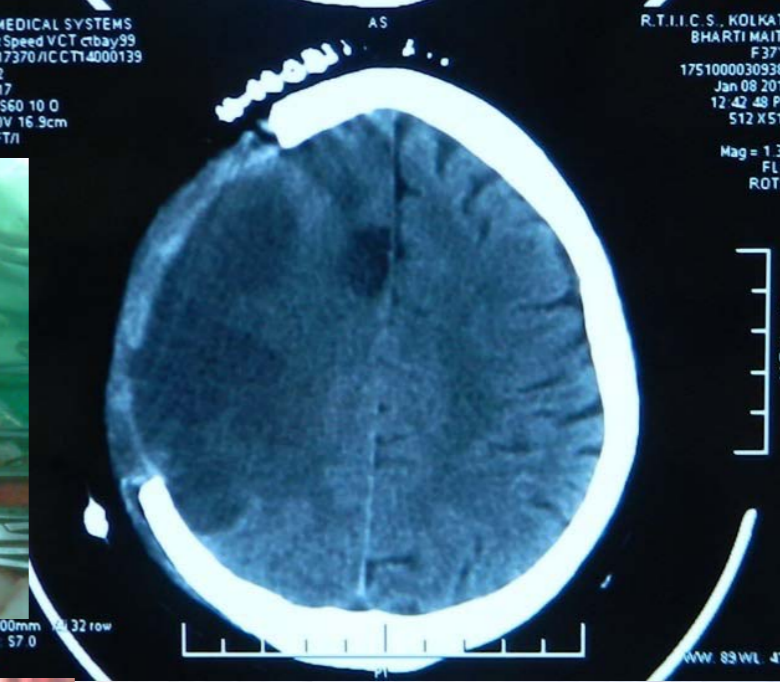
YOUNG STROKE



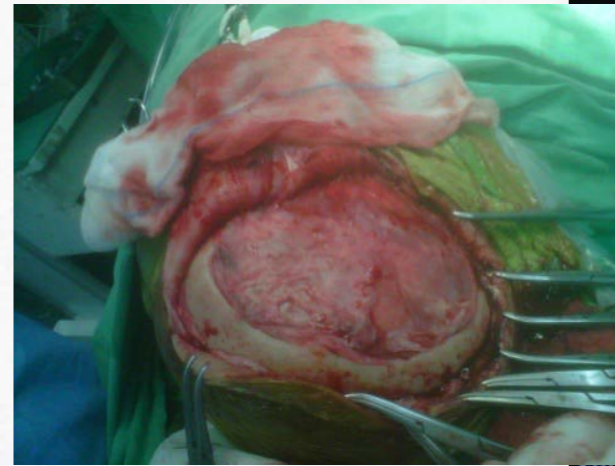
B M ,35 /F
PREGNANCY WITH
VALVULAR DISEASE WITH
ISCHEMIC BRAIN STROKE



GE MEDICAL SYSTEMS
Light Speed VCT ctbay99
Ex: 17370/ICCT14000139
Se: 2
Im: 17
OM S60 10 0
DFOV 16.9cm
SOFT/1



Mag = 1.3
FL
ROT



5.000mm 14.32 row
Tin 57.0
2s

PRE OP

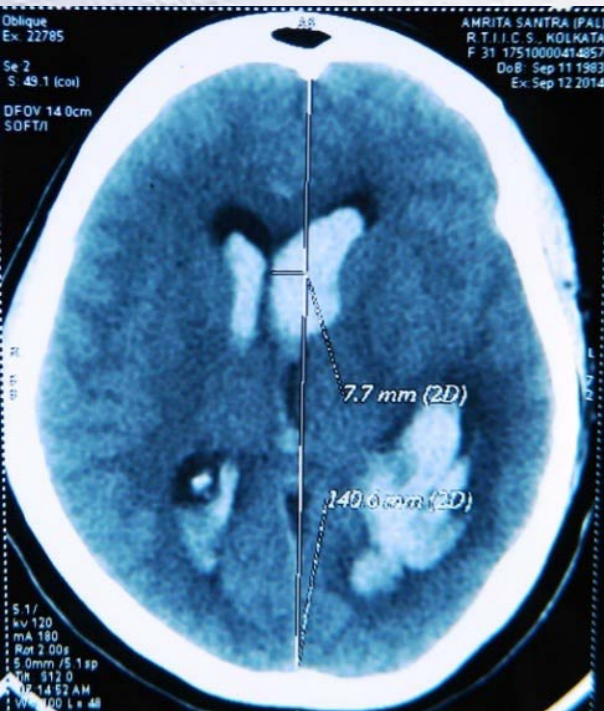
POST OP



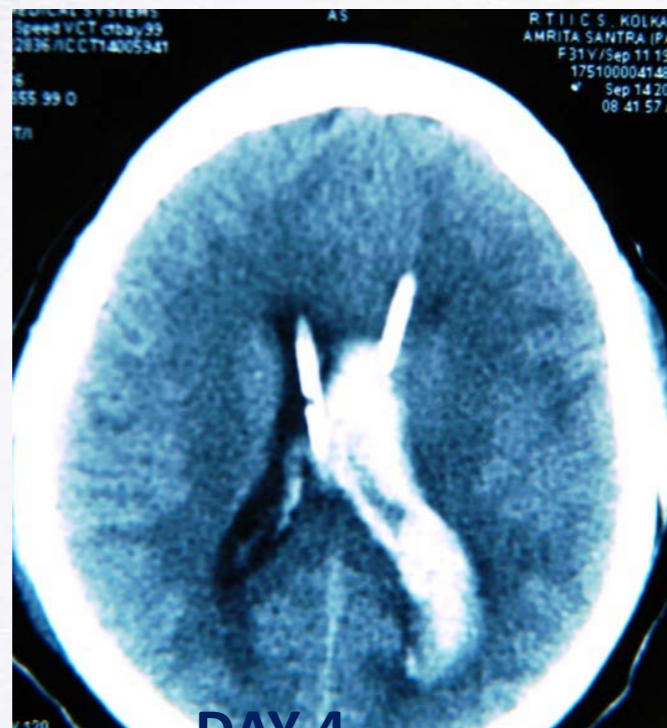
SPONTANEOUS INTRAVENTRICULAR HEMORRHAGE

External Ventricular Drainage + fibrinolysis

Using r-TPA(tissue plasminogen activator)



DAY 1



DAY 4

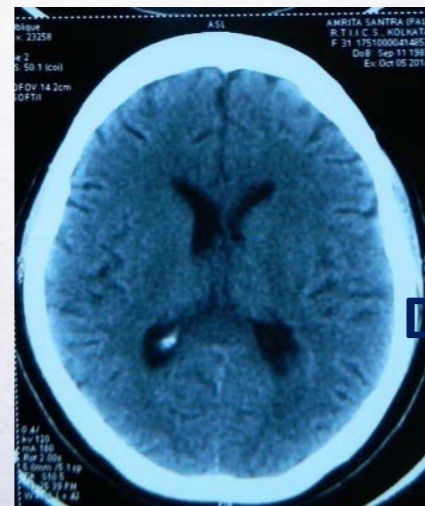


DAY 7



DAY 9

32 YRS, F LOSS OF CONSCIOUSNESS
ELECTIVE VENTILATION
COMPLETE RECOVERY IN 3 WEEKS
BACK TO WORK IN 4 WEEKS



DAY 24



STROKE SURGERY

INTRAVENTRICULAR HEMORRHAGE
EXTERNAL VENTRICULAR DRAINAGE

+

R-TPA- Recombinant Tissue Plasminogen
activator- *Actilyse*



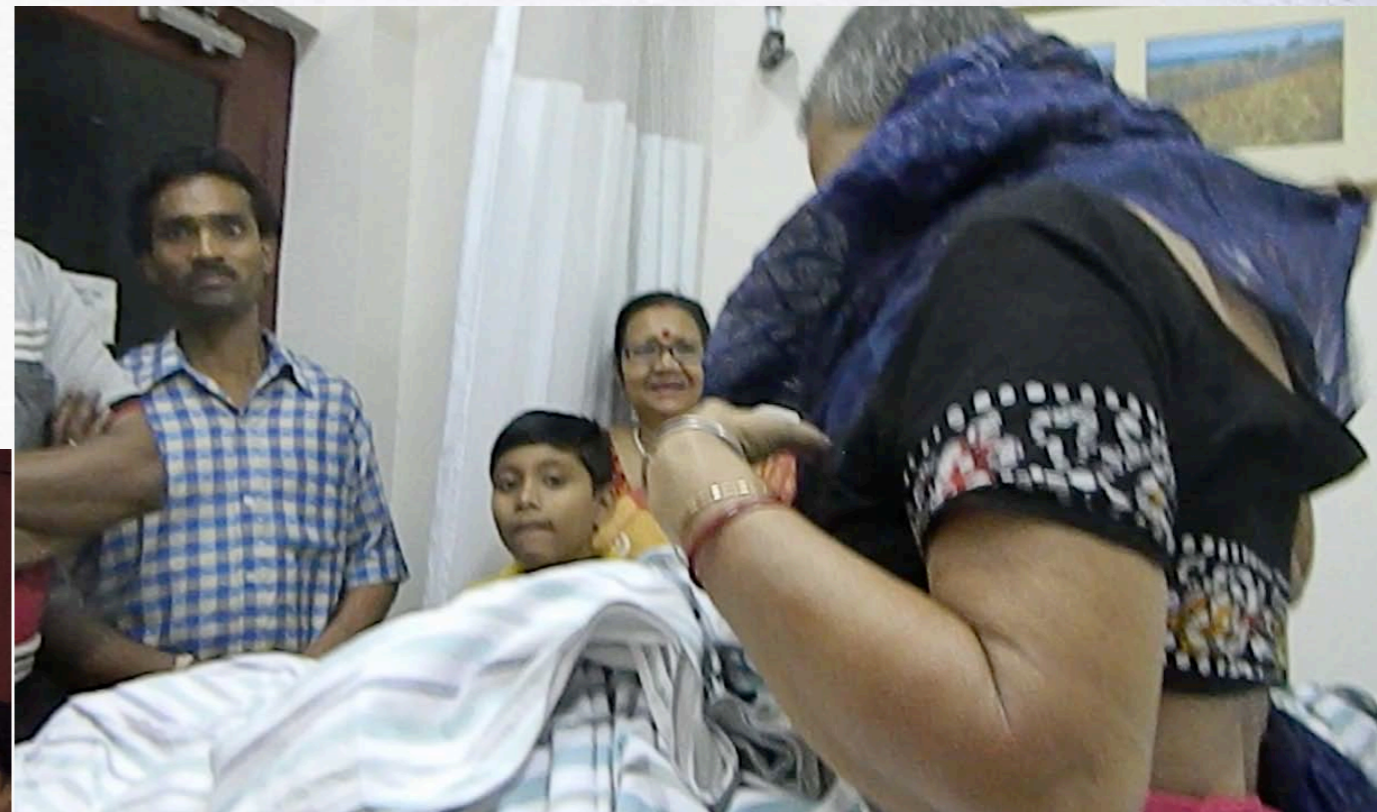
INTRAVENTRICULAR HEMORRHAGE EXTERNAL VENTRICULAR DRAINAGE

+

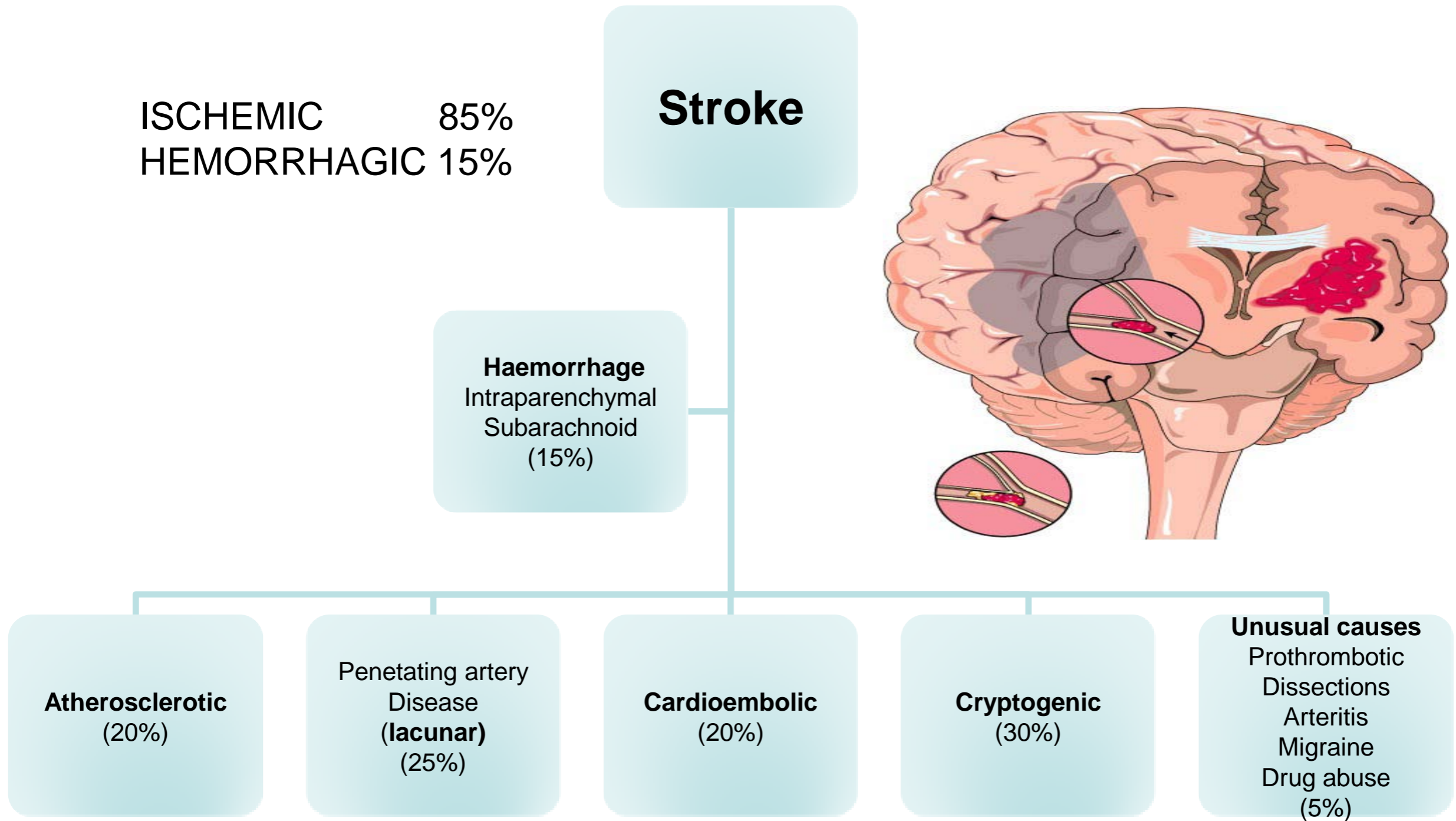
R-TPA- Recombinant Tissue Plasminogen
activator- *Actilyse*

MS, 65Y / F, SUDDEN LOSS OF
CONSCIOUSNESS

COMPLETE RECOVERY IN 3 WEEKS



TYPES OF STROKE



Warning Signs of Stroke

- Sudden weakness or numbness of arm or leg especially on one side
- Sudden confusion, trouble in speaking or understanding
- Sudden trouble in seeing in one eye
- Sudden trouble walking, dizziness, loss of balance or coordination
- Sudden severe headache



- **Use the Face–Arm–Speech Test (FAST)**

Three simple checks can help you recognise whether someone has had a stroke or mini-stroke (transient ischemic attack – TIA).

F -Facial weakness: Can the person smile? Has their mouth or an eye drooped?

A -Arm weakness: Can the person raise both arms?

S -Speech problems: Can the person speak clearly and understand what you say?

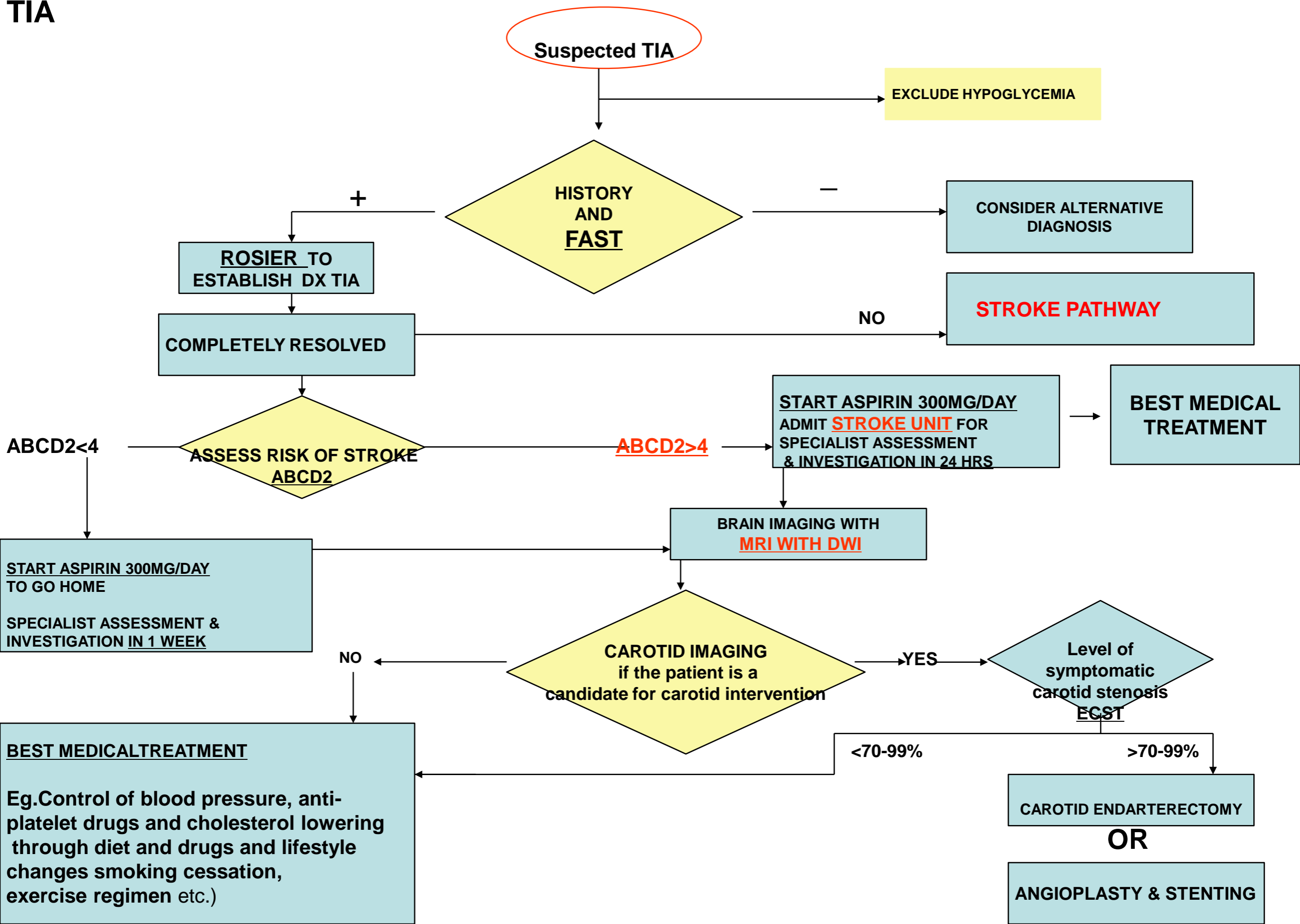
T -Test all three signs.

REFERENCE : *NICE CLINICAL GUIDELINES- STROKE*

EVIDENCE LEVEL 1 B

STROKE PATHWAY ALGORITHM

TIA



TIA

Symptom	Score
Age > 60 years	1 point
Blood pressure > 140/80	1 point
Clinical (neurological deficit)	2 points for hemiparesis 1 point for speech problem without weakness
Duration	2 points for >60 minutes 1 point for 10-60 min
Diabetes	1 point

Maximal score is 7.

REFERENCE: **Rothwell et al, Lancet. 2007;369:283-92**

EVIDENCE LEVEL 3

ABCD2 Score

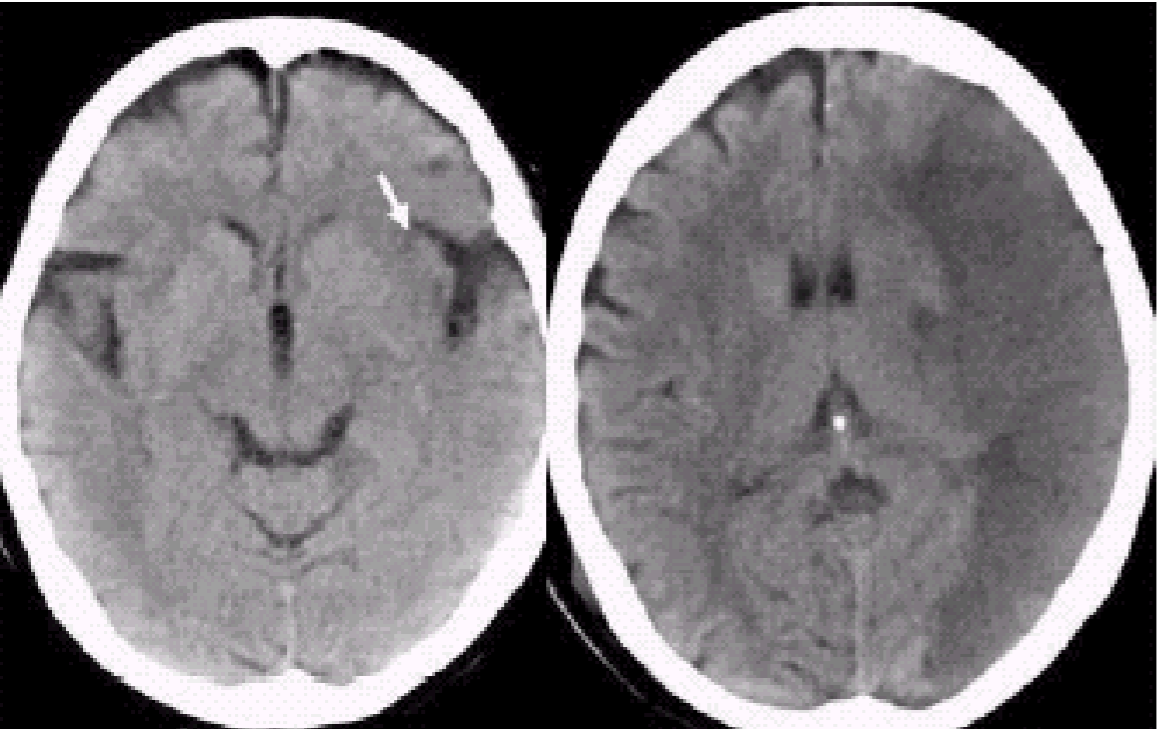
	<u>48 hours</u>	<u>1 week</u>	<u>3 months</u>
0-3			
Low r	1%	1%	3%
4-5			
Mod. risk	4%	6%	10%
5-7			
High Risk	8%	12%	18%

TIA's with a score of 5 or greater
To be admitted for immediate Ix and Tx
(within 24 h).

REFERENCE: 1. Rothwell et al, Lancet. 2007;369:283-92

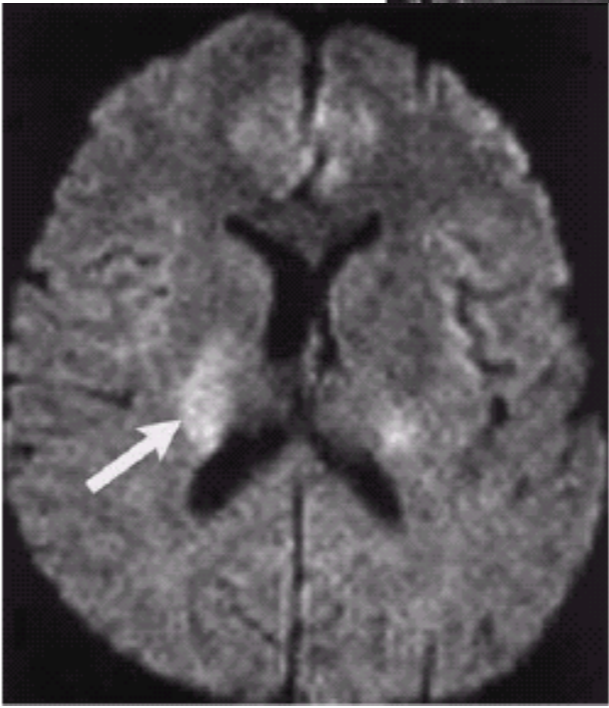
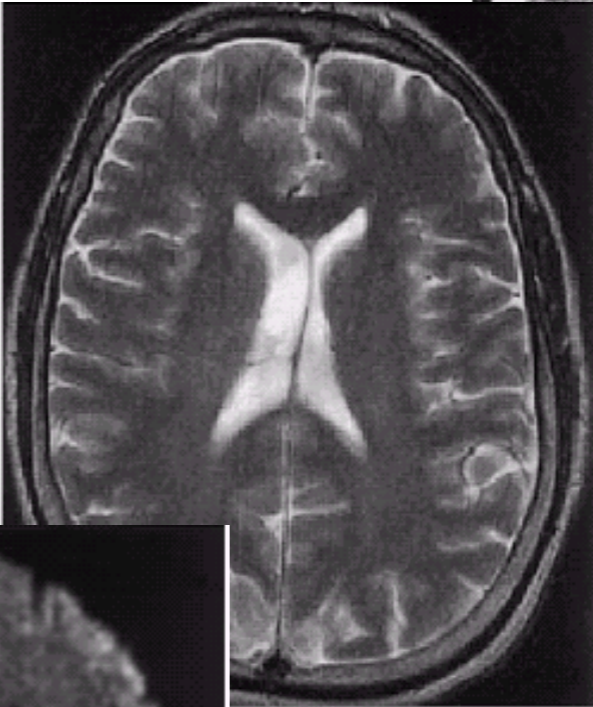
2. NICE CLINICAL GUIDELINES- STROKE

How to confirm Ischemic Stroke ?



CT SCAN 3 hours of Ischemic Stroke CT SCAN 24 hours later

MRI DWI



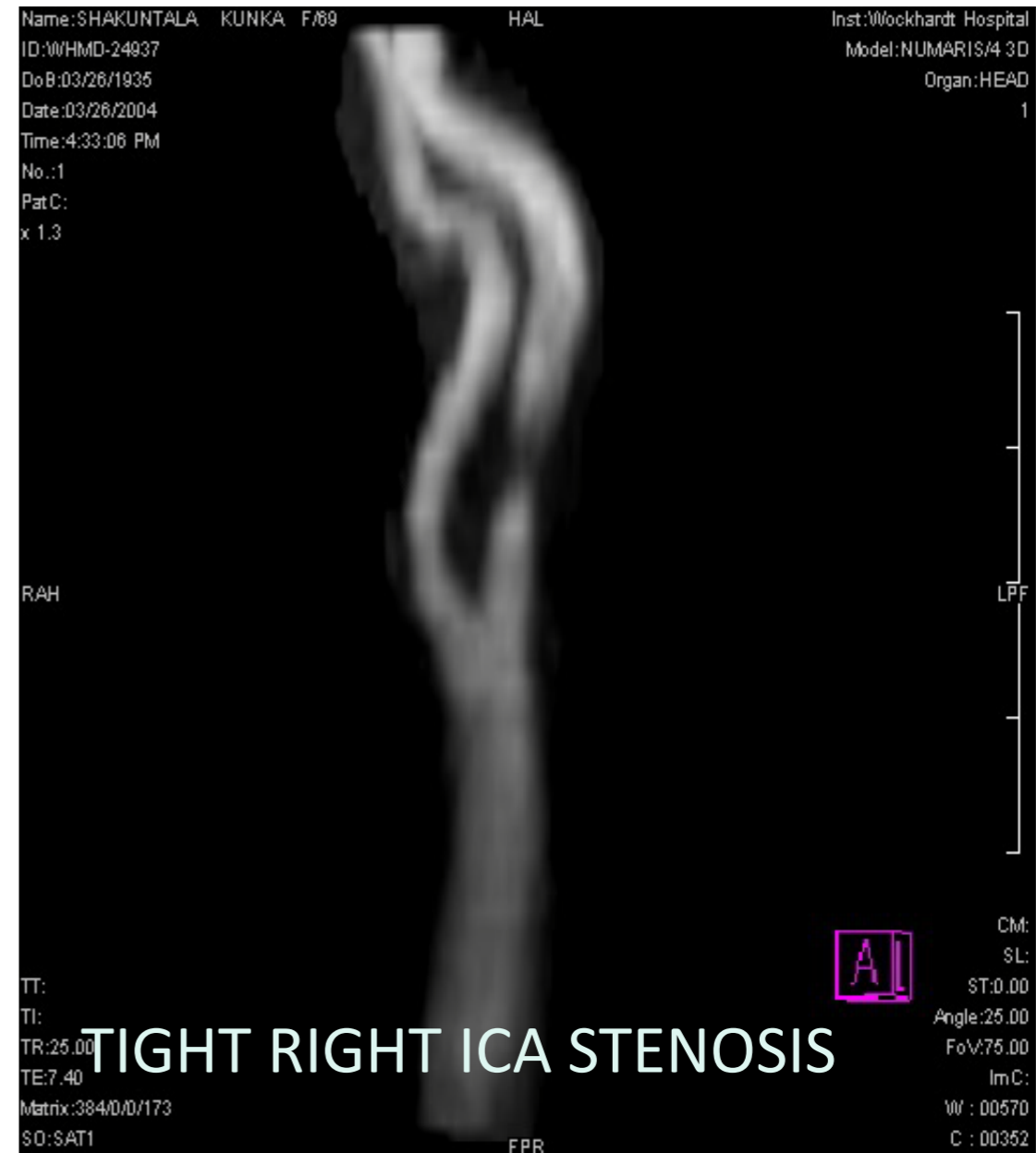
DETECTION WITHIN 30 MIN OF ISCHEMIC STROKE

How to confirm Stroke ?

TIA



RIGHT ICA WATERSHED INFARCT

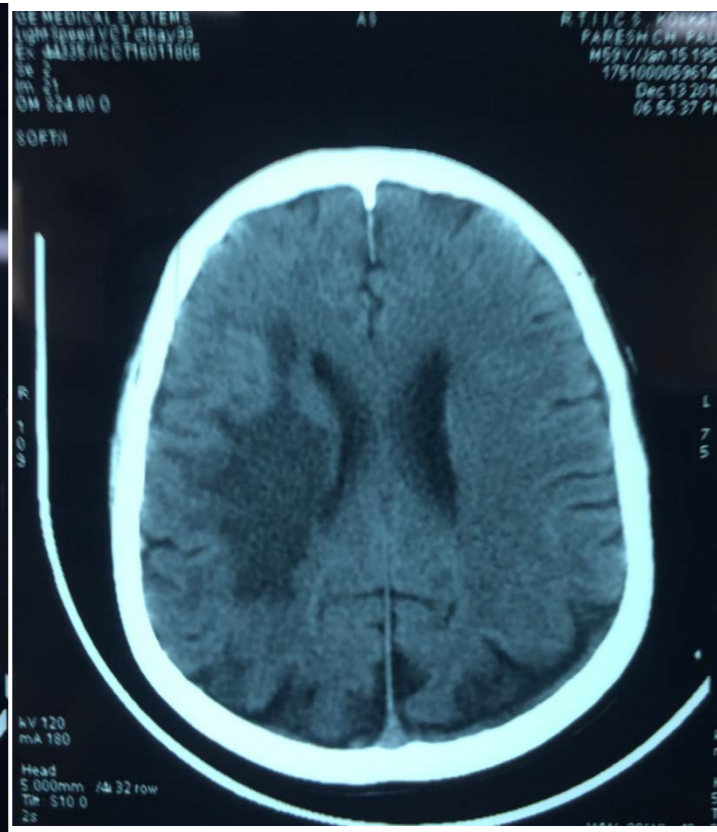


TIGHT RIGHT ICA STENOSIS

STROKE - ISCHEMIC

MRI

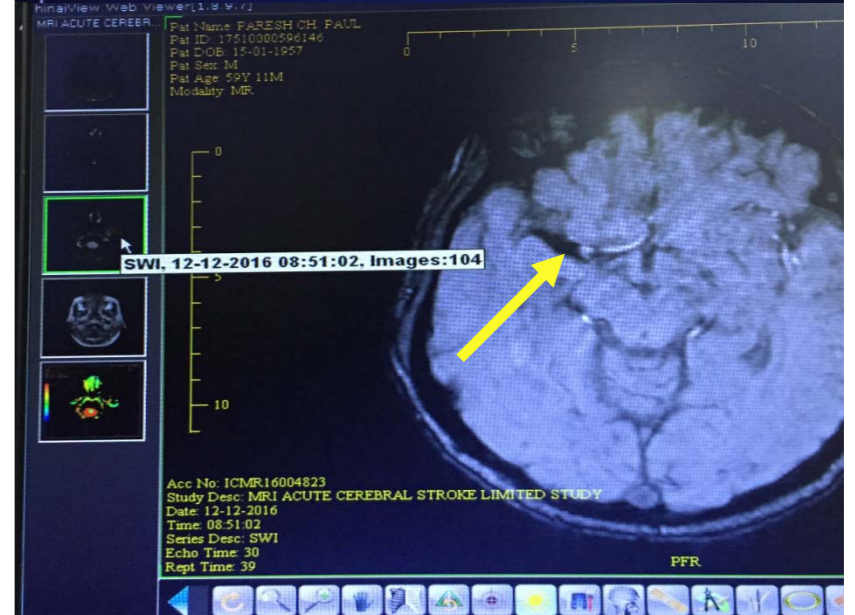
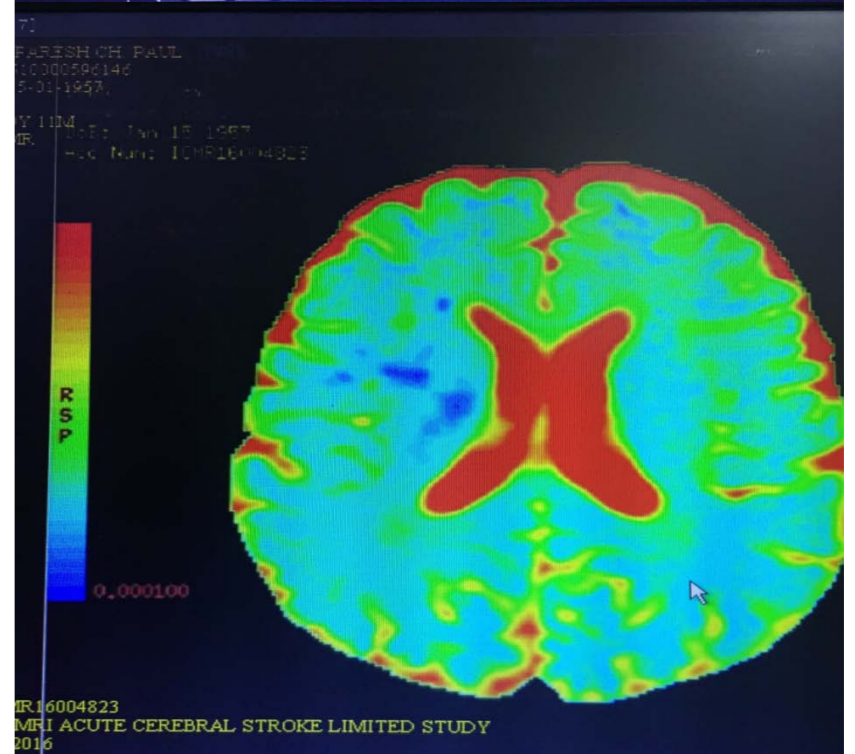
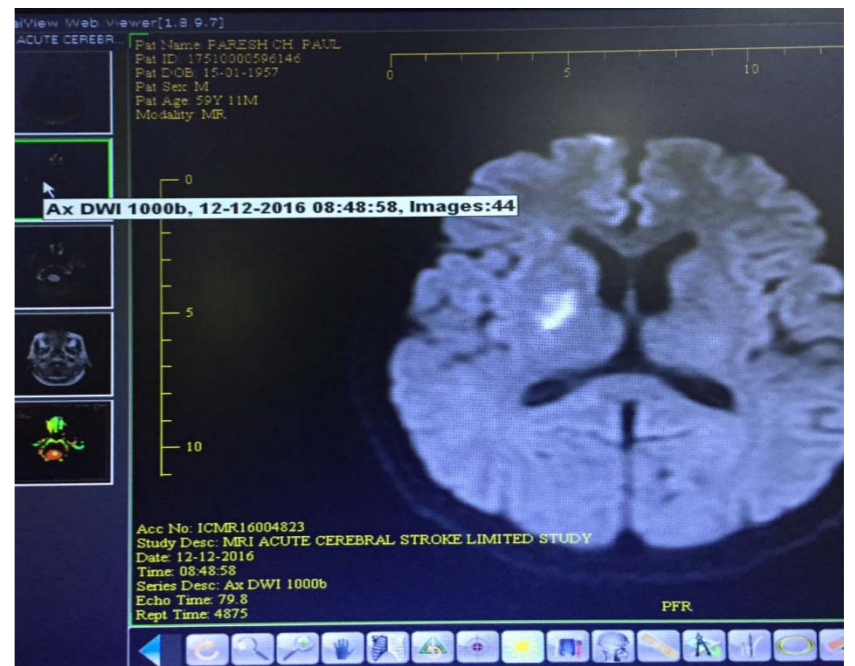
CT SCANS



24 hrs

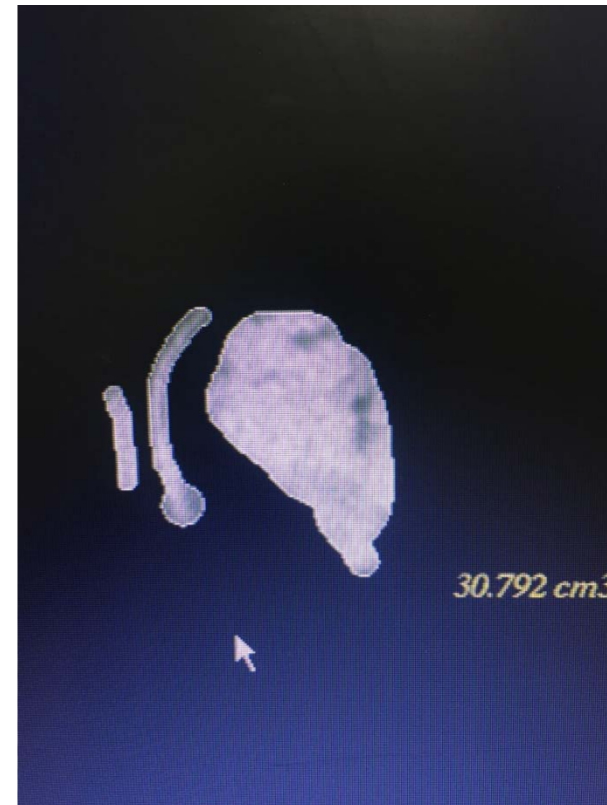
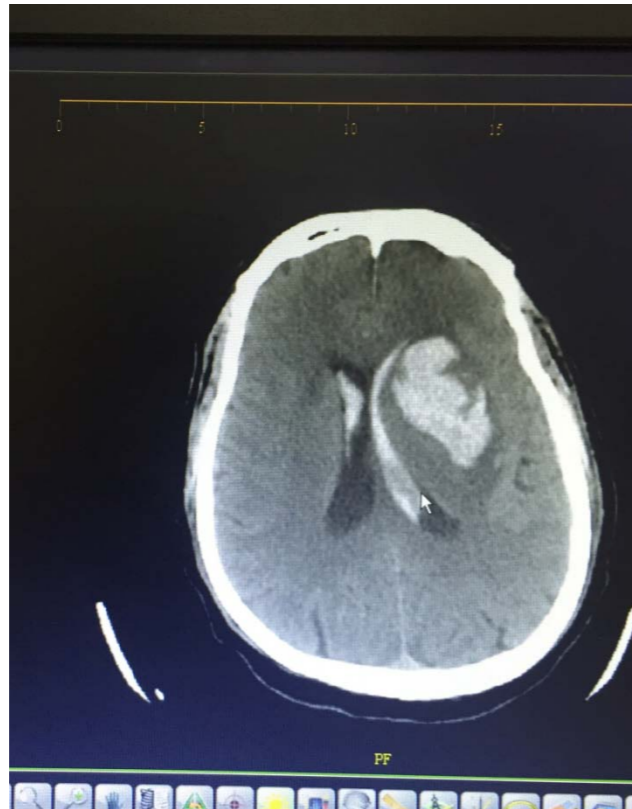
48 hrs

PRP, 56 YRS M
SUDDEN ONSET RIGHT HEMIPLEGIA
SPEECH DISTURBANCES



STROKE – HEMORRHAGIC

CT SCAN



VOLUME OF HEMATOMA – PROGNOSIS

<30 CC – GOOD

30–70 CC – SURGERY

> 70 CC – POOR

STROKE and EMERGENCY Rx

Blood Pressure management in Acute stroke:

- Manage the A B C s.
- Do not try to normalize BP
- For Ischemic stroke keep BP high- 80-110 MAP
- For Hemorrhagic Stroke keep BP lower- 80- 100 MAP
- Labetalol 10-20-mg i v over 1-2 min , if BP uncontrolled
- Treat other symptoms – headache, nausea, vomiting
- Treat hypoxia,, seizures, hypoglycemia
- Treat Raised ICP

STROKE

Acute Care Pathway

Administration of rTPA

- 2 intravenous cannulae are inserted before administration
- 0.9mg/kg (maximum 90mg) intravenously over 1 hr
- 10% as a bolus over 2 minutes
- Remainder via a syringe pump over 1hr.
- Flush line with 20mls of normal saline to empty it completely.

RESULTS

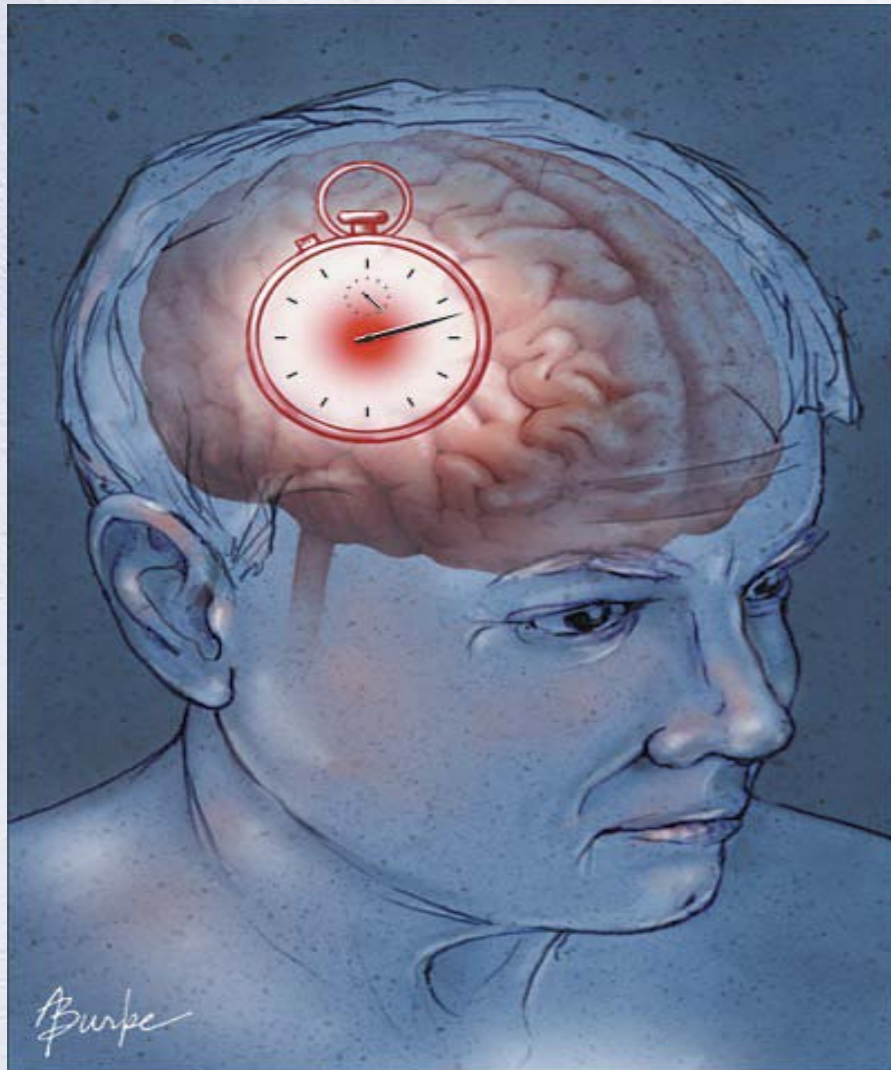
In the NINDS trial¹ 42% of the patients who received rTPA had made an independent recovery at 3 months' follow-up, as compared with only 26% of those who received placebo. This 16% absolute risk reduction was highly significant.

REFERENCE : ***NINDS trial of r T-PA for acute ischemic stroke***

- ***EVIDENCE LEVEL 1A***

ECASS3 Study showed a window upto 4.5 hrs

ISCHEMIC STROKE



Time Is Brain

For every minute that an AIS goes untreated, 1.9 million neurones, 14 billion synapses and 7.5 miles of myelinated fibres are destroyed.

For every hour that treatment is delayed, the ischemic brain ages 3.6 years

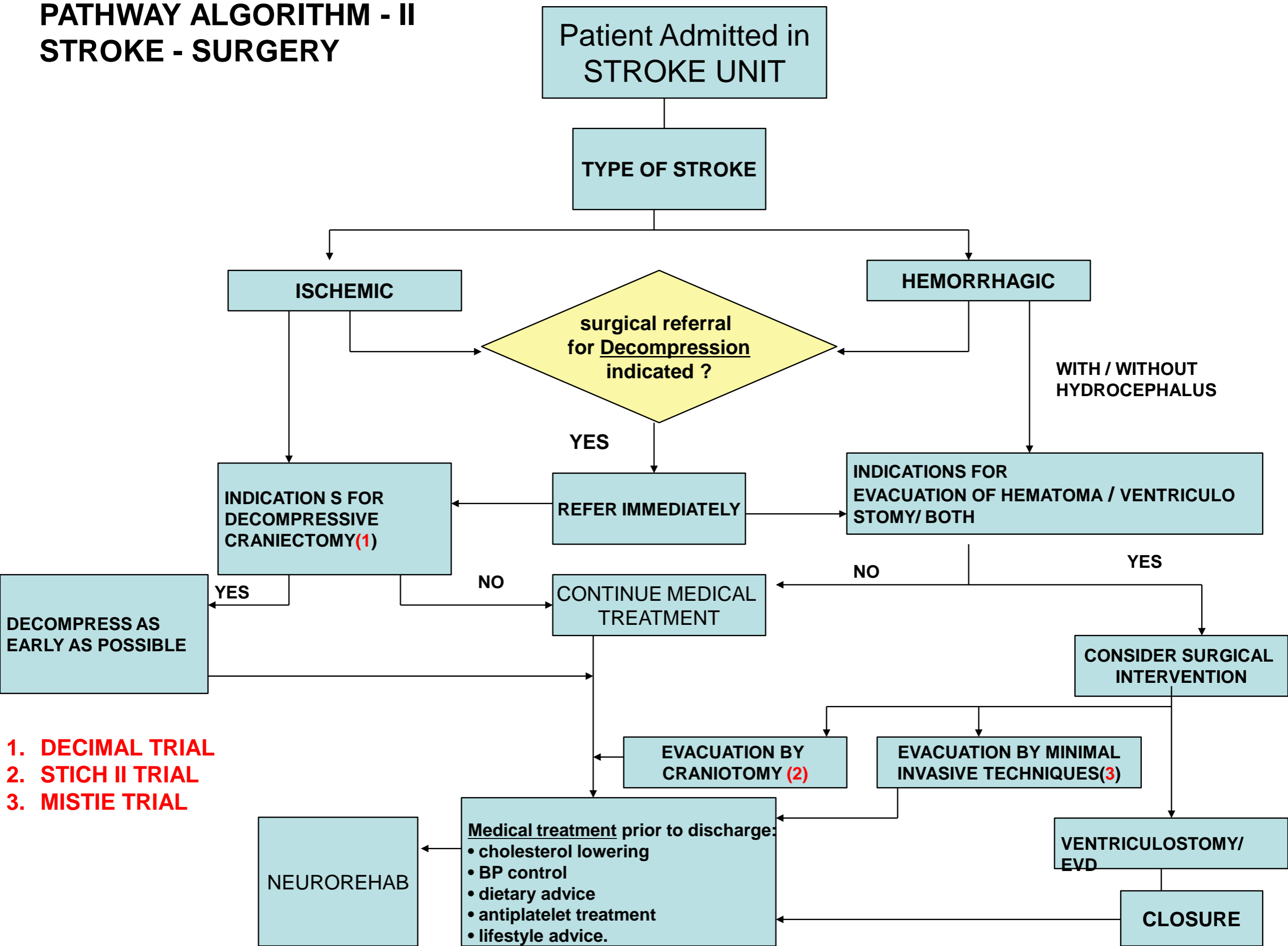


- Revascularisation Surgery for Ischemic Stroke-
MicroCarotid Endarterectomy(MCEA)
- Hemorrhagic Stroke -
Clot Evacuation
- Intraventricular hemorrhage -
External Ventricular drainage +/- rTPA
- Acute MCA infarct/ Hemorrhage-
Decompressive Craniotomy
- Subarachnoid Hemorrhage-
Aneurysm Clipping/ Coiling



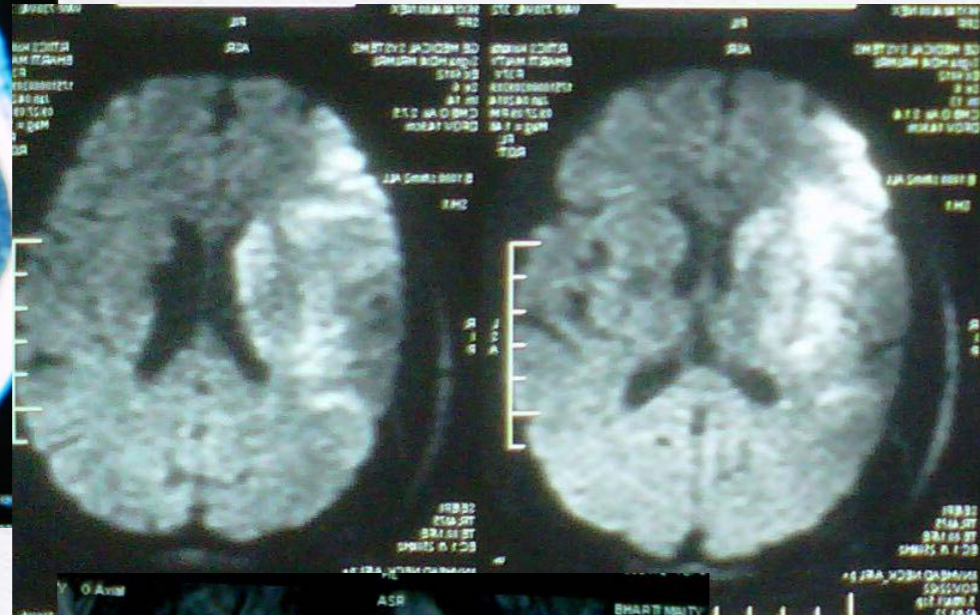
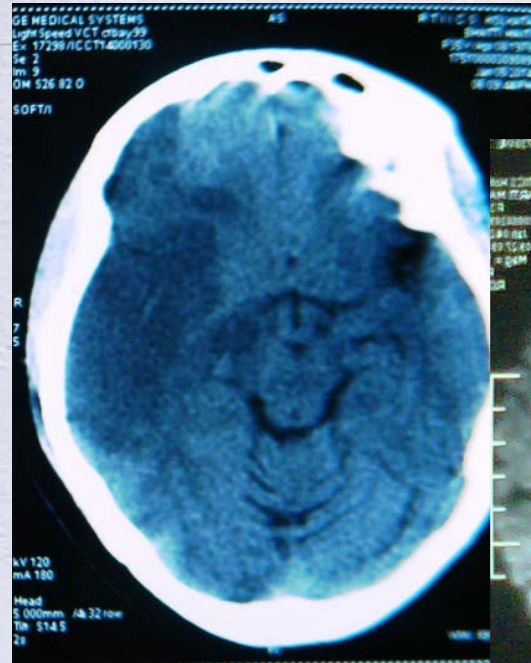
PATHWAY ALGORITHM - II

STROKE - SURGERY

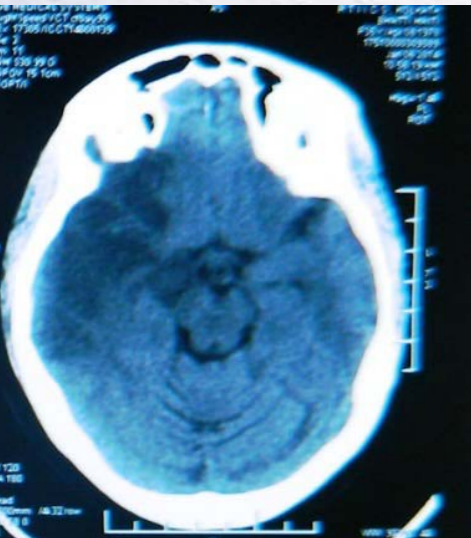
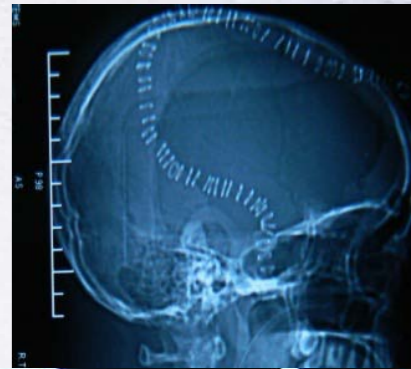


- 1. DECIMAL TRIAL
- 2. STICH II TRIAL
- 3. MISTIE TRIAL

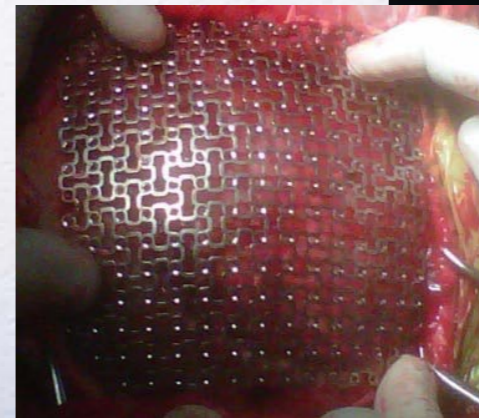
Surgery for Ischemic Stroke



**B M ,35 /F
PREGNANCY WITH
VALVULAR DISEASE WITH
ISCHEMIC BRAIN STROKE**



PRE OP



POST OP



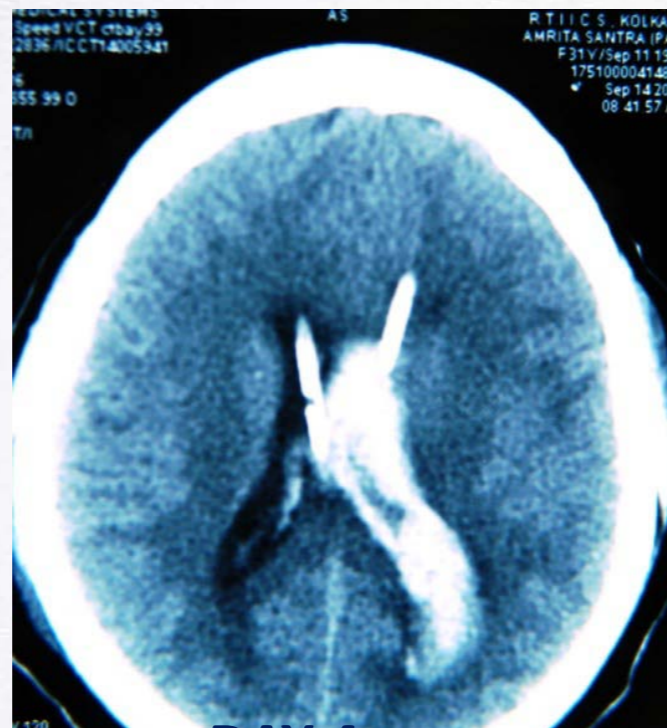
SPONTANEOUS INTRAVENTRICULAR HEMORRHAGE

External Ventricular Drainage + fibrinolysis

Using r- TPA(tissue plasminogen activator)



DAY 1



DAY 4

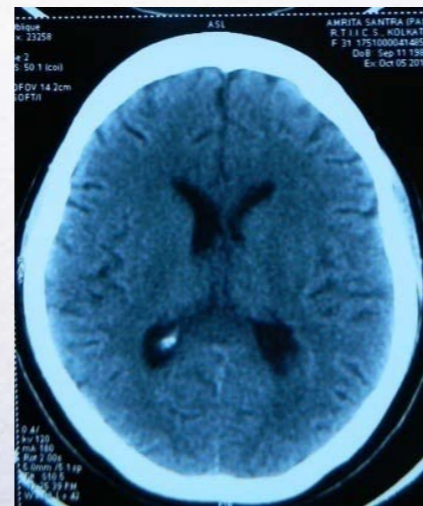


DAY 7



DAY 9

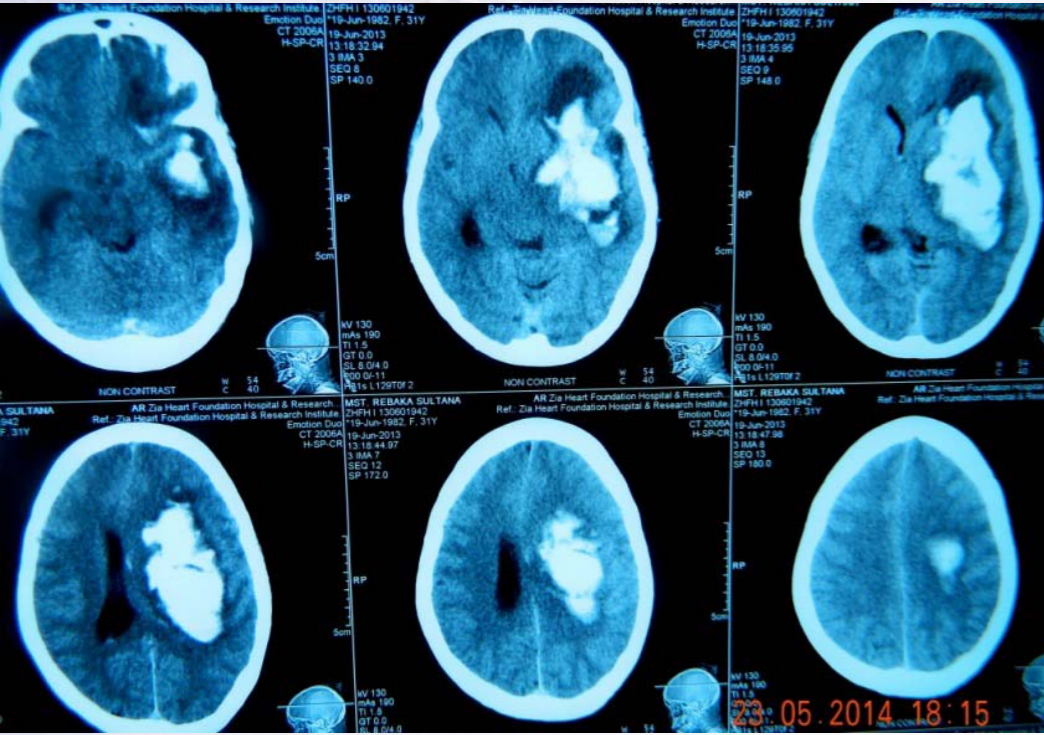
32 YRS, F LOSS OF CONSCIOUSNESS
ELECTIVE VENTILATION
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BACK TO WORK IN 4 WEEKS



DAY 24

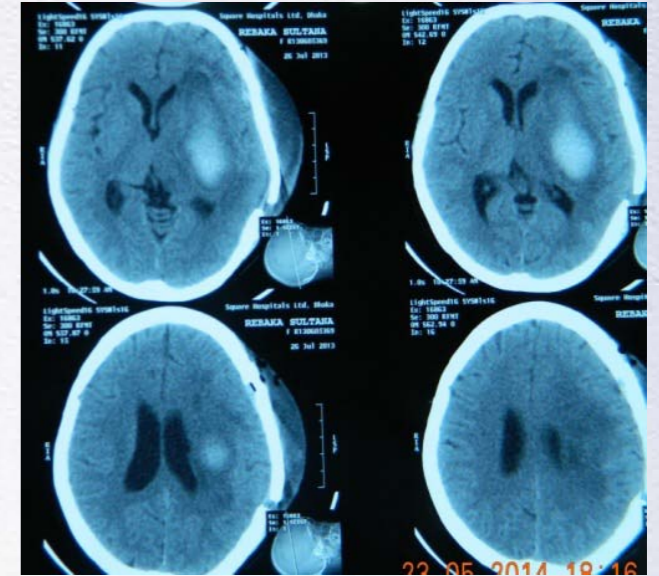


STROKE SURGERY

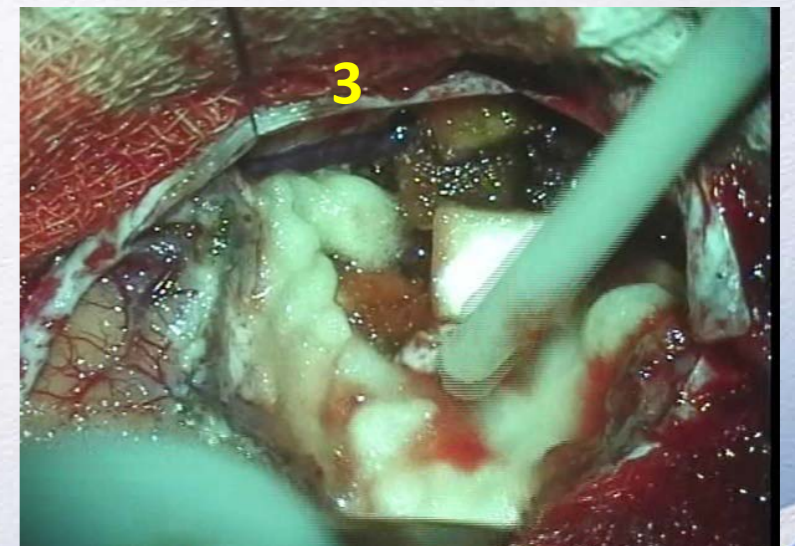
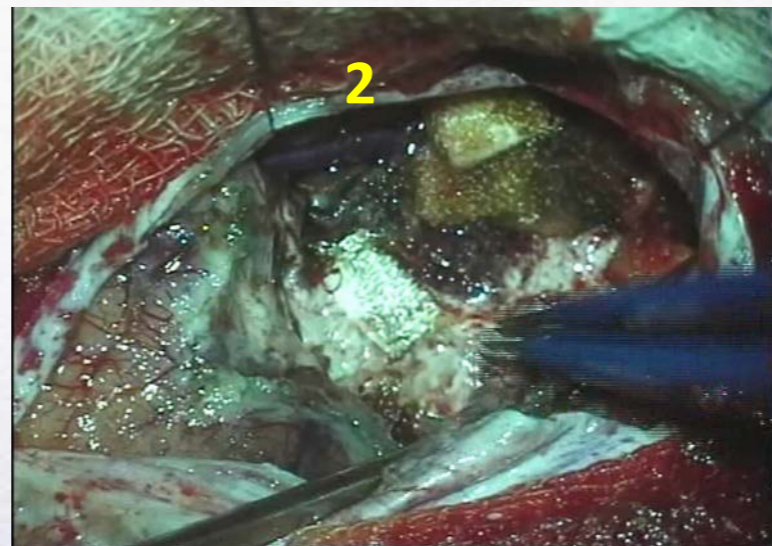
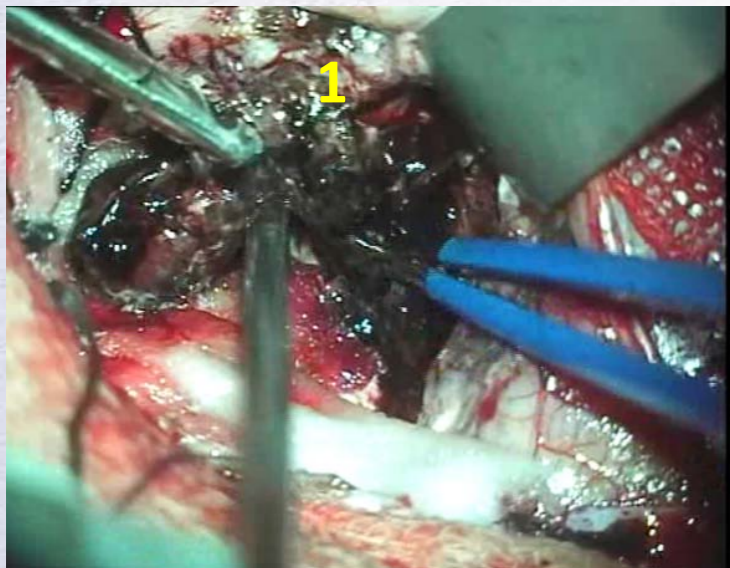


Volume of Bleed : 60 cc

AK, 35Y/F LARGE HYPERTENSIVE BLEED IN BASAL GANGLIA
SURVIVED WITH MODIFIED RANKIN SCALE 3 WALKING INDEPENDENTLY AFTER 4 MONTHS OF SURGERY



VIDEO



STROKE SURGERY



SURGICAL EVACUATION OF STROKE HEMATOMA COMPLETE RECOVERY

PRE OP



POST OP



STROKE PREVENTION



Stroke risk Factors that Cannot Be Treated

- Age
- Sex
- Race
- Prior stroke
- Family history

Stroke risk Factors that CAN Be Treated

Hypertension & Diabetes

Heart disease

Transient Ischemic Attacks

Elevated blood Cholesterol/ Lipids

Asymptomatic Carotid bruits

Heavy Alcohol consumption

Stress



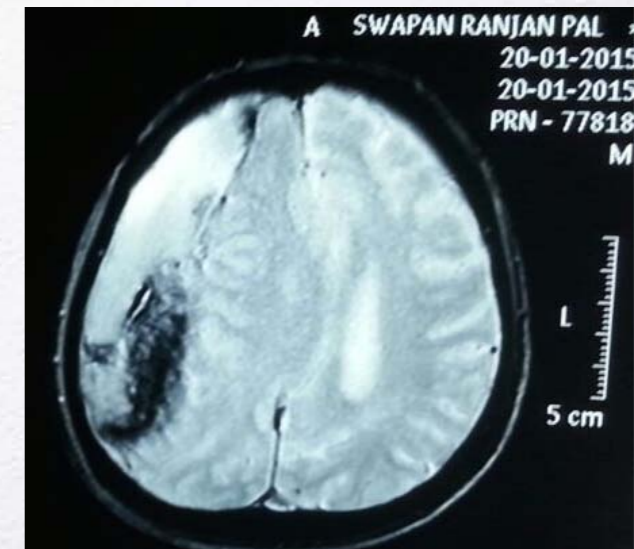
SEVERE HEADACHE

ELDERLY

CHRONIC SUBDURAL HEMATOMA

STROKE

BRAIN TUMOUR



PEDIATRIC STROKE



1



2



3

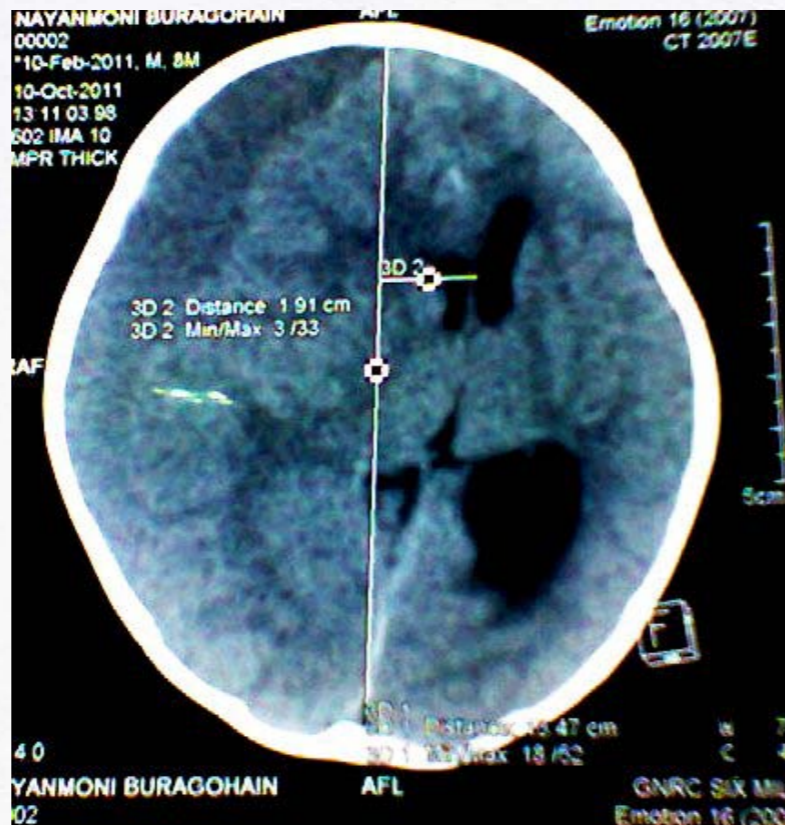
< 1 YEARS OLD



STROKE IN CHILDREN < 1YEAR

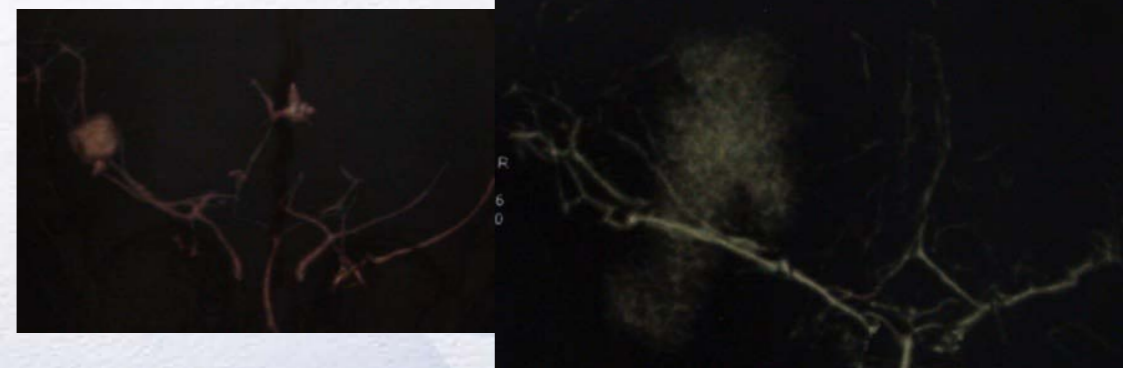
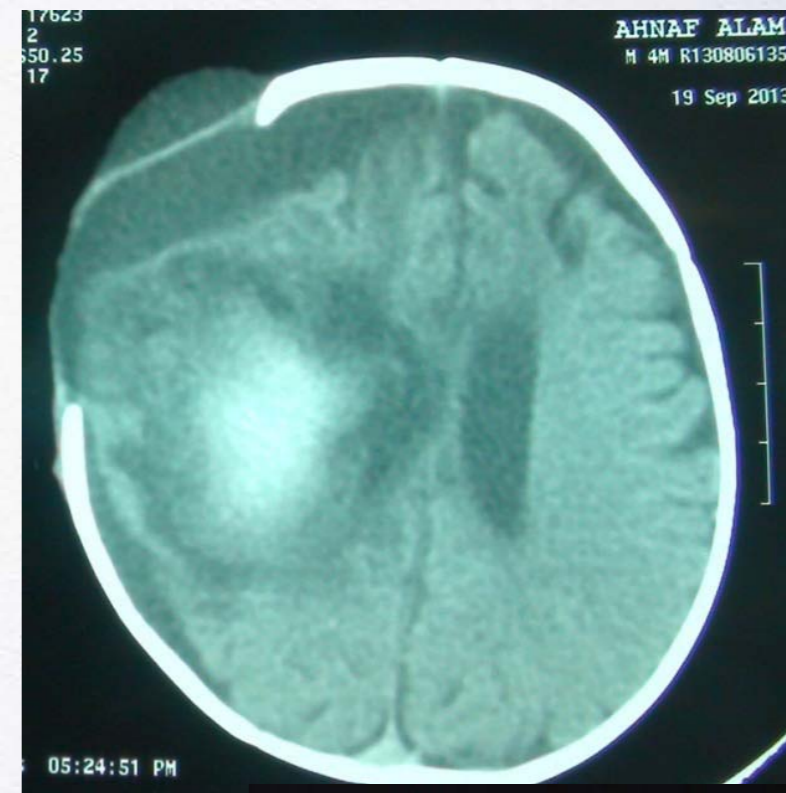


1. LARGE ICH



2. LARGE SUBDURAL HEMATOMA

3. LARGE ICH with MCA ANEURYSM



Recent trends...

Director- Professor Brahm Prakash

G B Pant Hospital
New Delhi, India

Prof. Anil K. Singh

G B PANT HOSPITAL
Director Neurosciences
Fortis group of Hospitals,
New Delhi, India



**G B PANT HOSPITAL
MAULANA AZAD MEDICAL COLLEGE
(UNIVERSITY OF DELHI)
NEW DELHI , INDIA**

Tertiary care Hospital for Neurological,
Cardiology & Gastroenterology
4000- 5000 ELECTIVE NEUROSURGICAL
PROCEDURES ANNUALY

Recent Trends...

 **TEAM BUILDING**

 **NEURO IMAGING**

 **NEURO ANAESTHESIA**

 **NEURO SURGICAL TECHNIQUES**

 **INTENSIVE CARE MONITORING**

 **REHABILITATION INTERVENTION**



Changing concepts Stroke management:

Stroke is a ***preventable*** and ***treatable*** disease

More effective ***evidence*** based primary and secondary ***prevention*** strategies

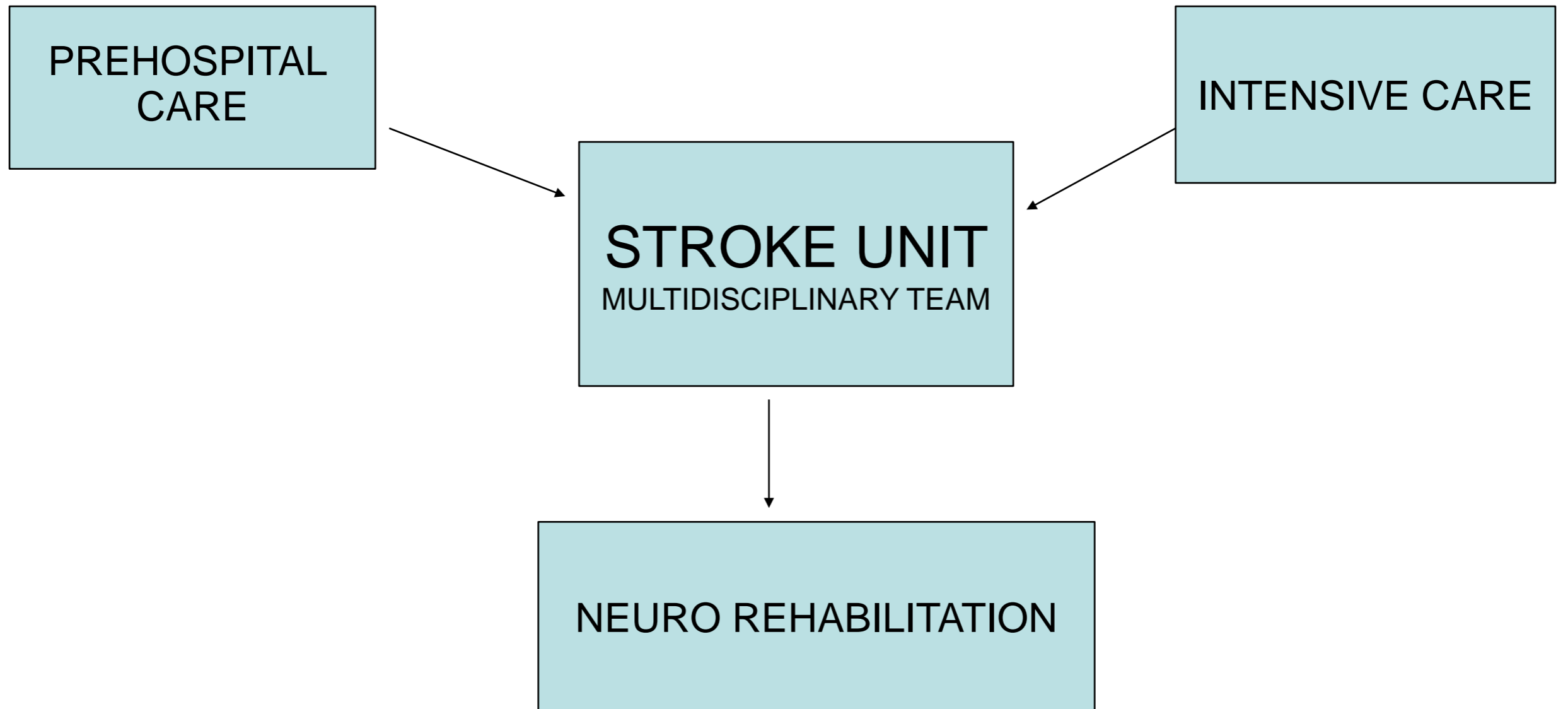
Evidence of ***interventions*** that are effective soon after the onset of symptoms

Understanding of the ***care processes*** that contribute to a better outcome has improved



STROKE

ACUTE CARE



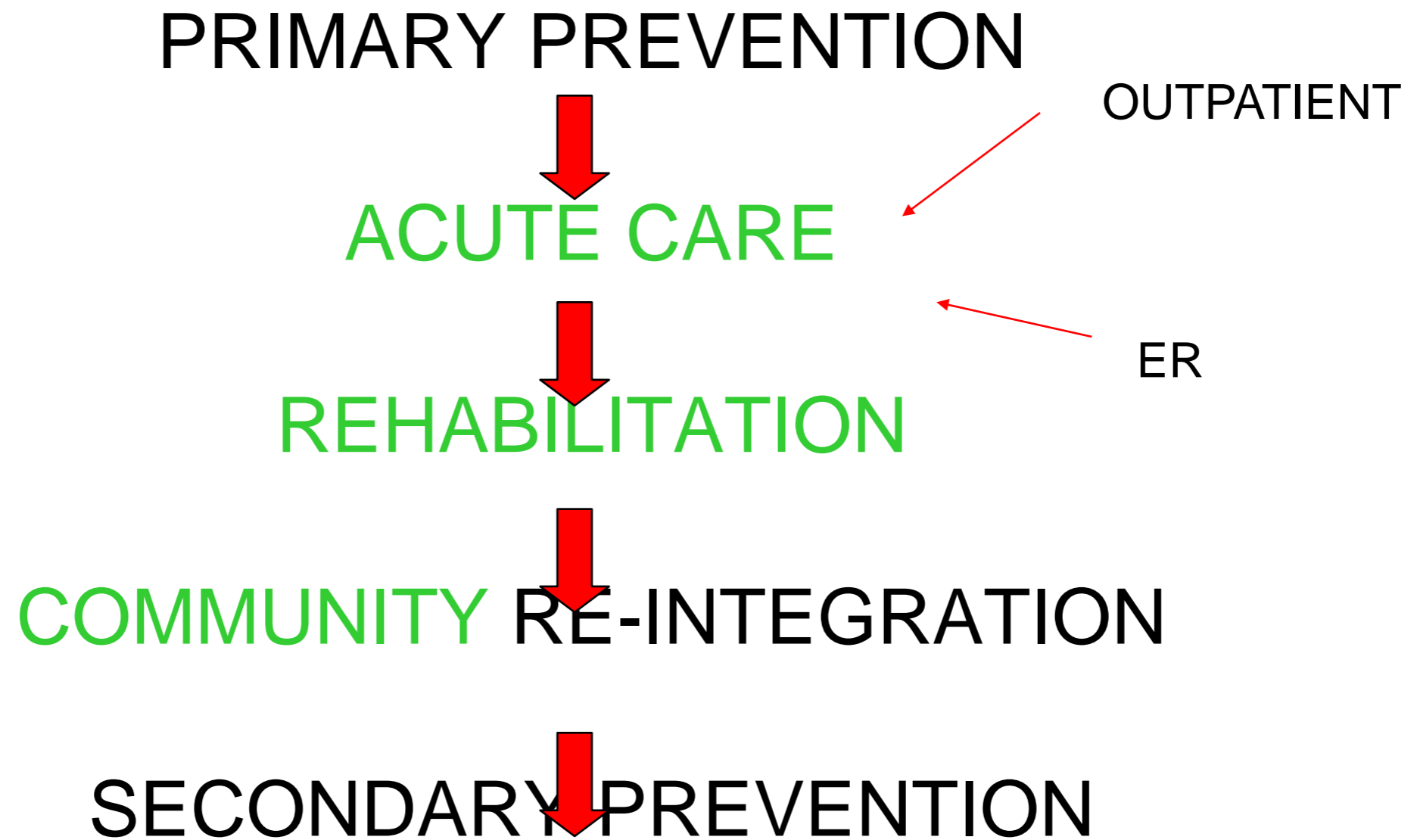
EVIDENCE BASED PATHWAY ALGORITHM



**Sree Chitra Tirunal Institute of Medical Sciences & Technology
Trivandrum, Kerala, India (south)**

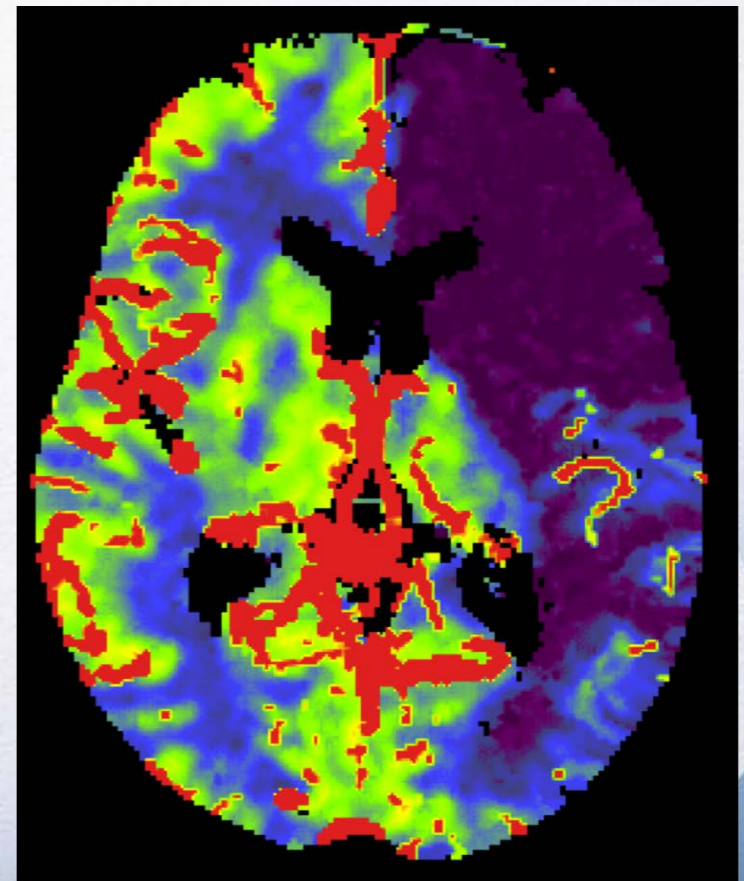


STROKE CONTINUUM



NEUROVASCULAR AND STROKE

STROKE UNIT



TAKE TIME OUT TO RELAX



*Thank you for your time and
your kind attention*

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STROKE

Acute Care Pathway

Administration of rTPA

- 2 intravenous cannulae are inserted before administration
- 0.9mg/kg (maximum 90mg) intravenously over 1 hr
- 10% as a bolus over 2 minutes
- Remainder via a syringe pump over 1hr.
- Flush line with 20mls of normal saline to empty it completely.

RESULTS

In the NINDS trial¹ 42% of the patients who received rTPA had made an independent recovery at 3 months' follow-up, as compared with only 26% of those who received placebo. This 16% absolute risk reduction was highly significant.

- REFERENCE : ***NINDS trial of r T-PA for acute ischemic stroke***
- ***EVIDENCE LEVEL 1A***
- ***ECASS3 Study showed a window upto 4.5 hrs***