

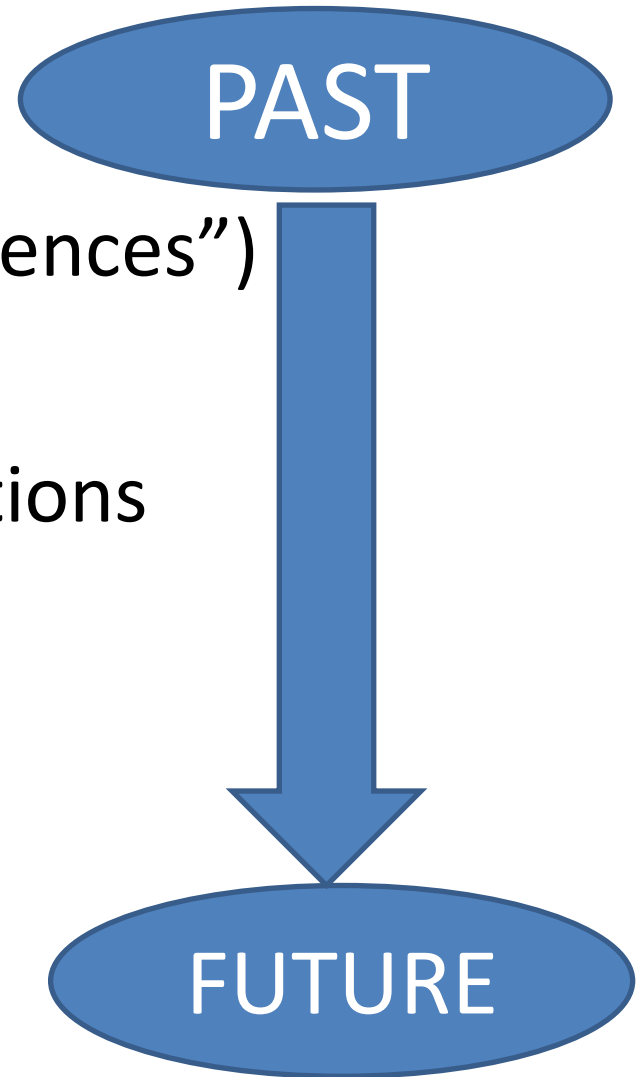
**Endovascular Intervention for
Acute Ischaemic Stroke in
Hong Kong West Cluster
– Past and Future**

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Department of Neurosurgery,
Queen Mary Hospital



Overview

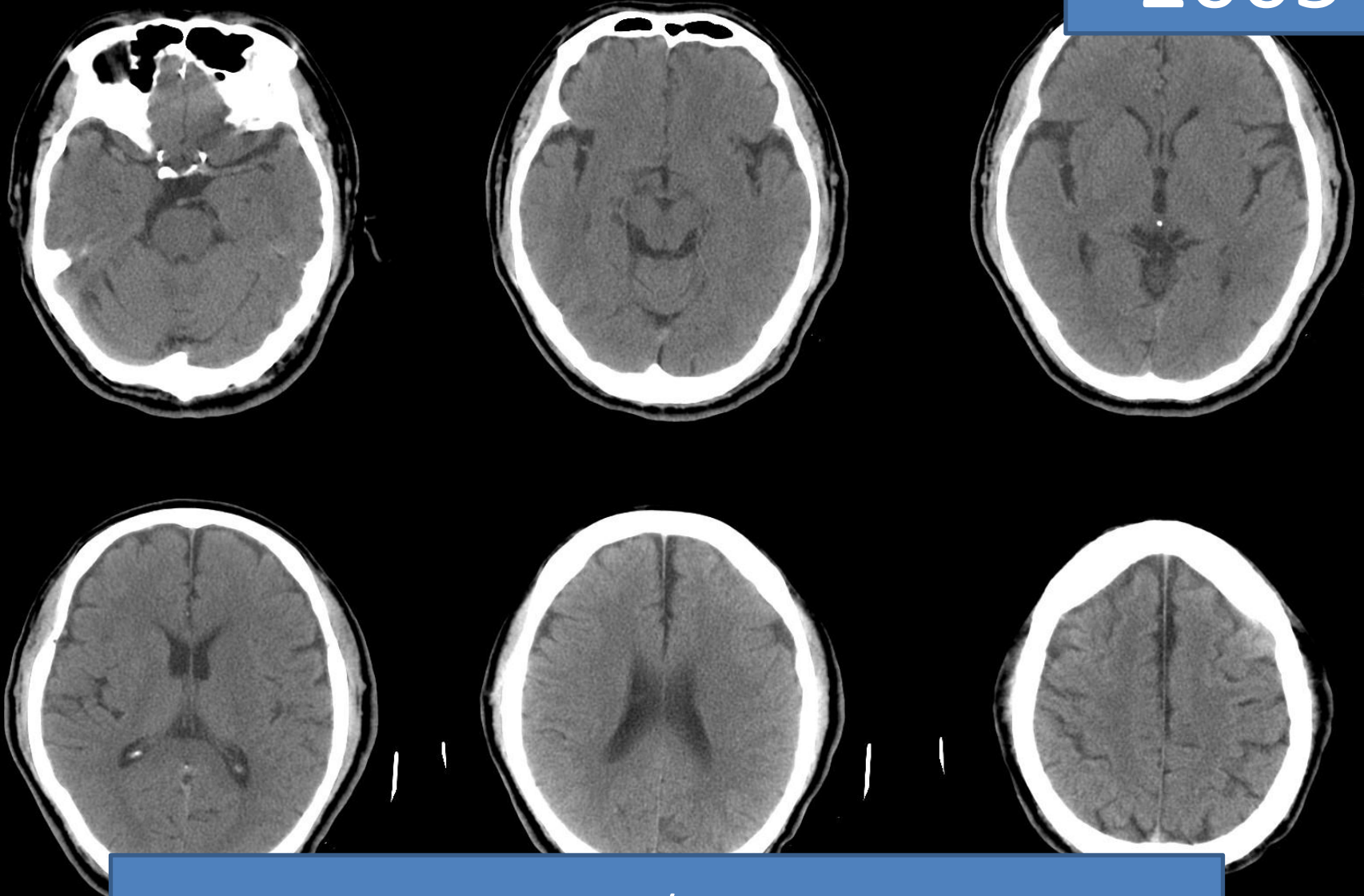
- What we have been doing?
(Roles of EVT before “best evidences”)
- Best evidences and its implications
- What are we going to?
(How to make it work?)



Background

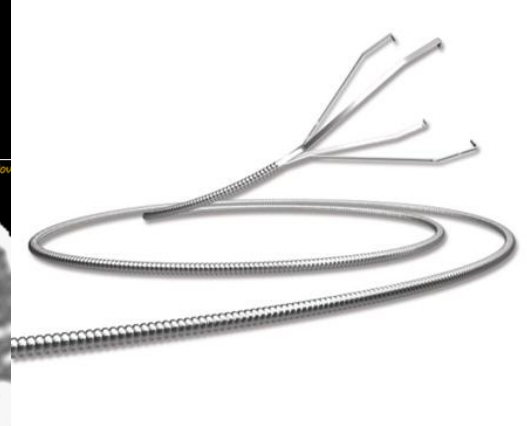
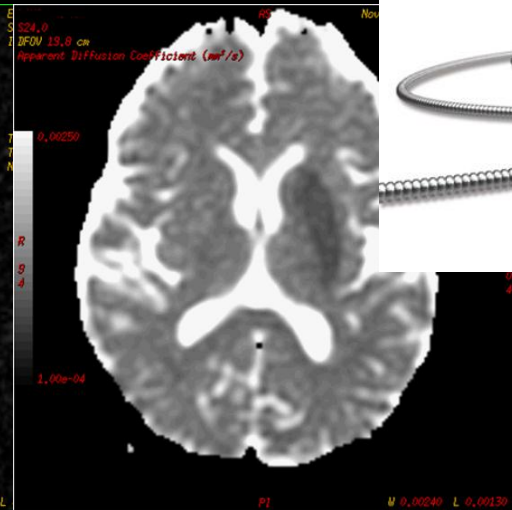
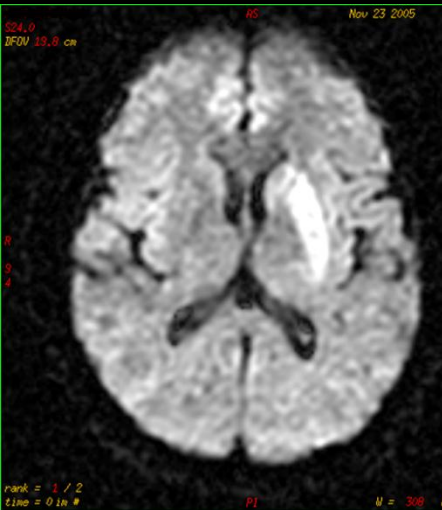
- Endovascular treatment (EVT) for acute ischaemic stroke (AIS) is NOT a regular service
- Mutli-disciplinary team
 - Neurologists, Neurosurgeons and Interventional Neuroradiologists
- 1st EVT for AIS in 2005 with a off-label use device

2005

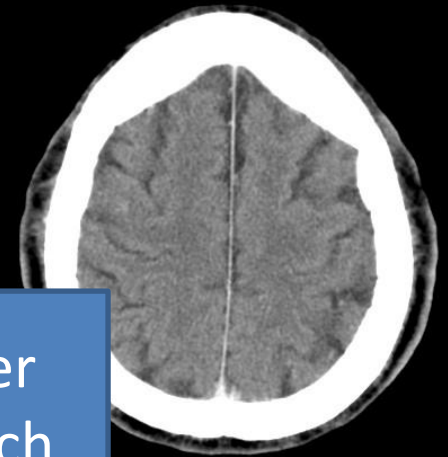
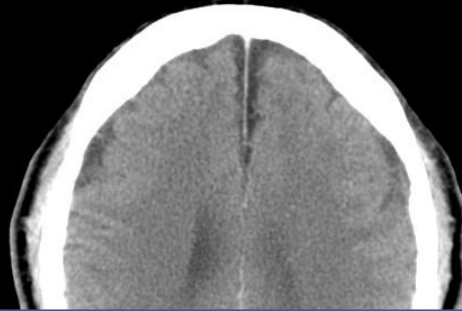
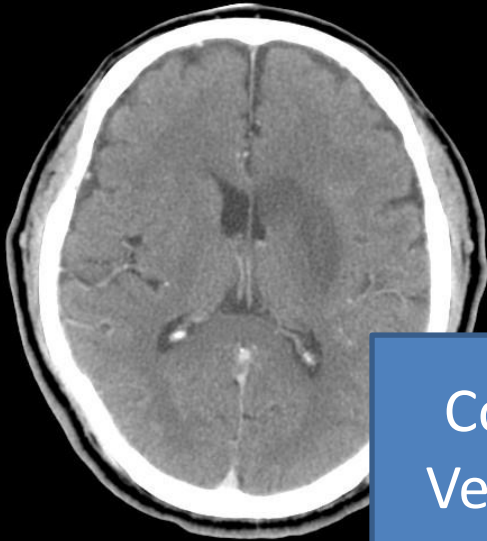
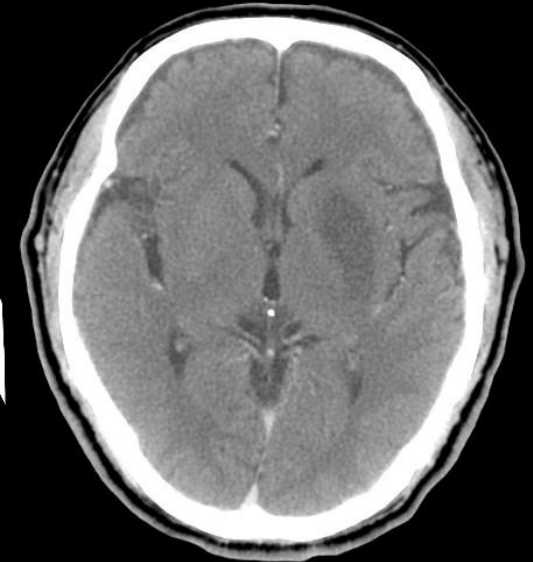


55/ M

Sudden onset right side weakness and dysphasia



Reperfusion 5.5 hours from the onset of symptoms



Completely regained limbs power
Very subtle residual slurred speech
No dysphasia

Indications for endovascular treatment

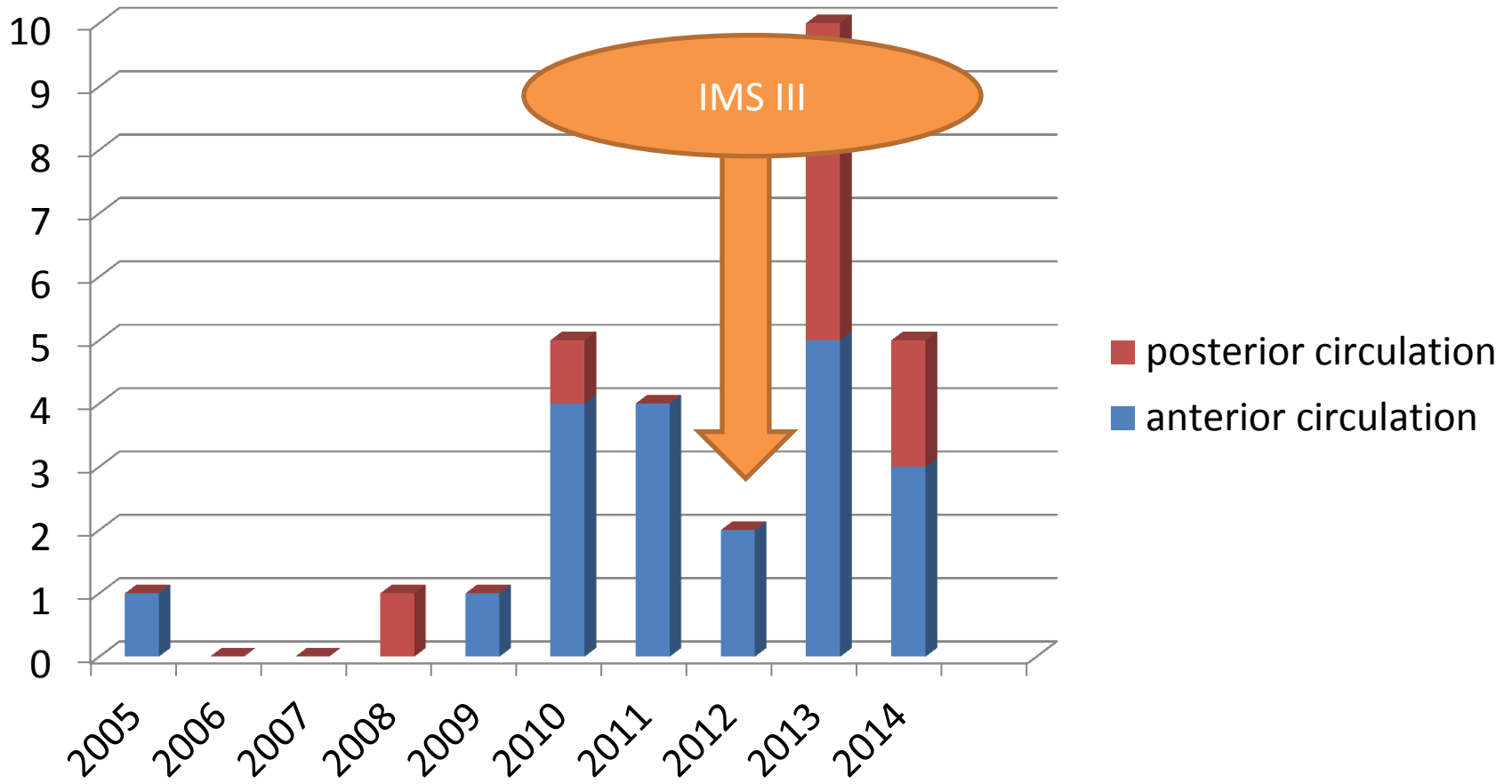
= **Contraindicated to IV rt-PA**



Contraindications to IV rt-PA

- Major surgery in recent 14 days
- Gastrointestinal or urinary tract haemorrhage in previous 21 days
- Use of anti-coagulant
- Head injury or prior stroke in previous 3 months
- Myocardial infarction in previous 3 months

Number of endovascular treatment for acute ischaemic stroke



INTERVENTIONAL MANAGEMENT OF STROKE TRIAL III



PI: Joseph P. Broderick, MD
Sponsor: NIH/NINDS

Clinical Coordinating Center:
University of Cincinnati
Study Number: U01 - NS52220

Communications

Documentation

Study Tools

eMOPP

Publications & COI

WELCOME

A phase III, randomized, multi-center, open label, 900 subject clinical trial that will examine whether a combined intravenous (IV) and intra-arterial (IA) approach to recanalization is superior to standard IV rt-PA (Activase®) alone when initiated within three hours of acute ischemic stroke onset.



IMPORTANT STUDY ANNOUNCEMENT:

The DSMB recommends that enrollment into the IMS-III study be put on hold, effective immediately. Subject follow-up should continue. The DSMB noted that there are no serious safety concerns. The study investigative team should remain blinded at this time. NINDS concurs with the IMS-III DSMB recommendations.

View the NINDS statement here:

http://www.ninds.nih.gov/disorders/clinical_trials/IMS-III.htm

WHAT'S NEW...

LEARN MORE...

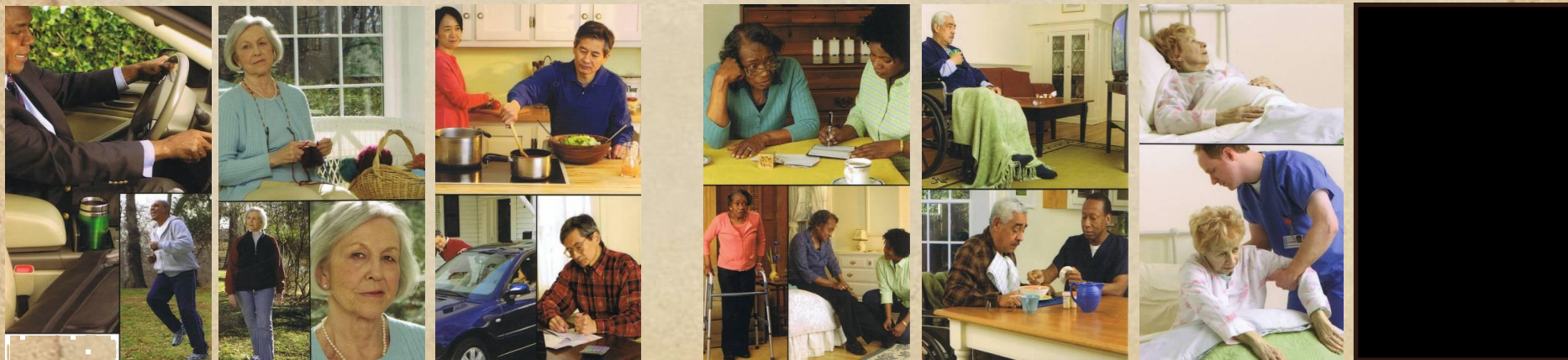
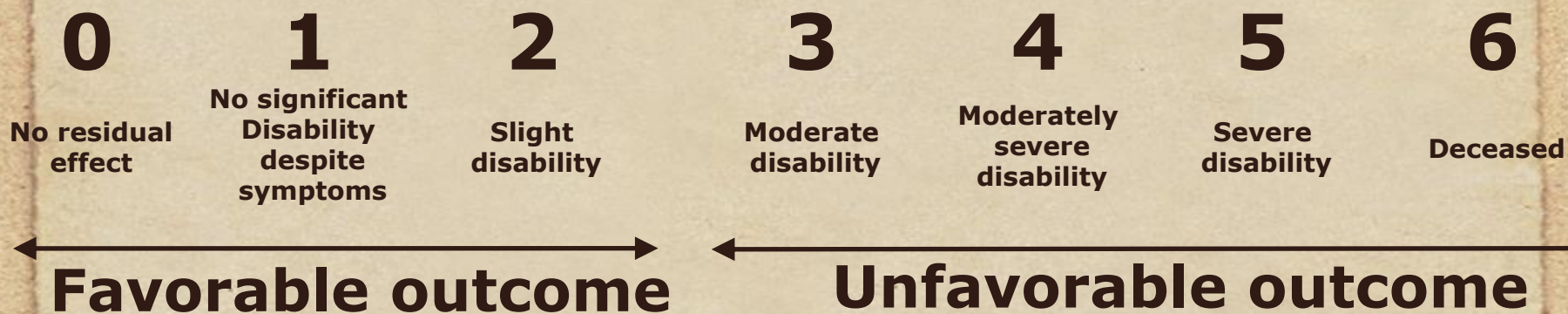
Full report to be presented in ISC Feb 2013

Results of QMH

- From 2005 to present
- N = 30
- Good angiographic outcome = 22/30 (73.3%)
 - ➔ Perfusion of half or greater of vascular distribution of the occluded artery to full perfusion

The modified Rankin Scale (mRS)

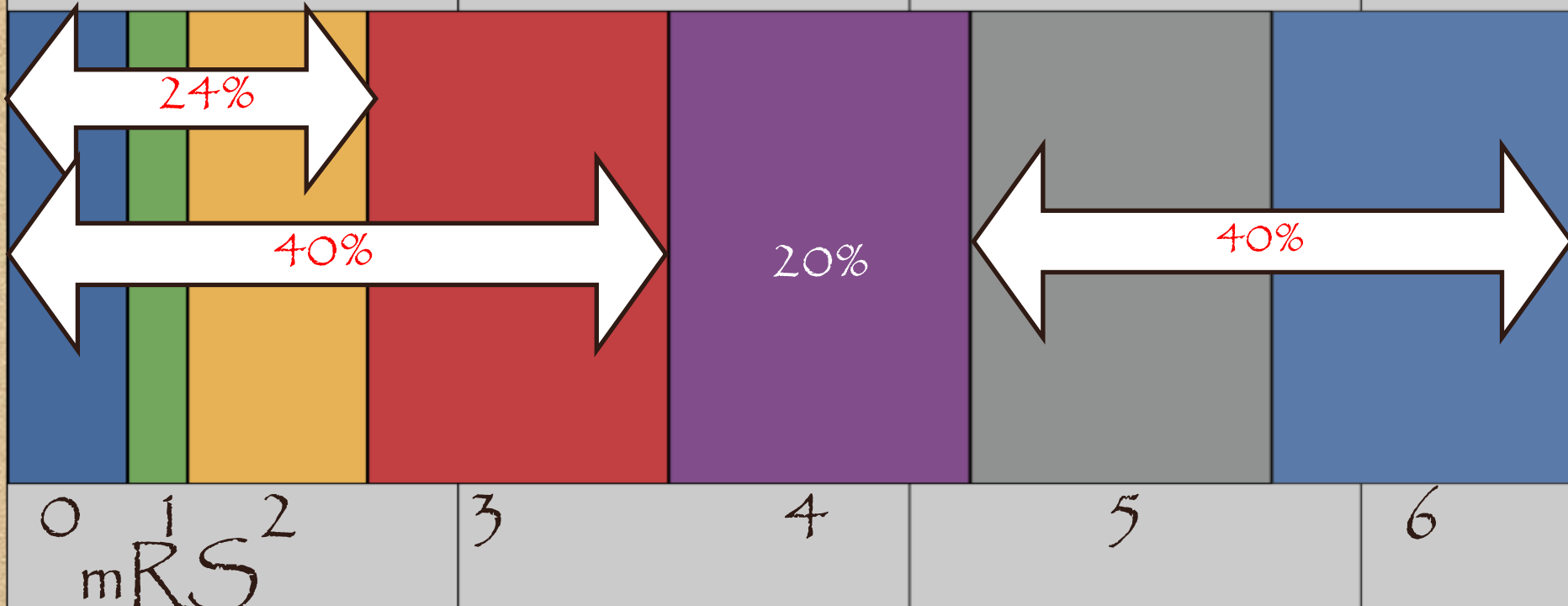
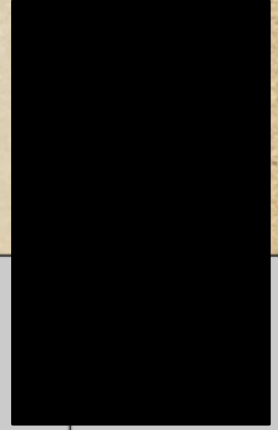
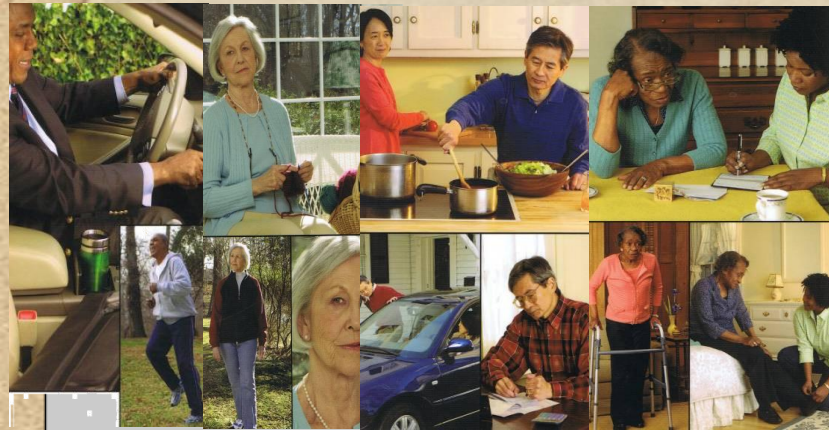
- ◆ A global measure of handicap
 - ◆ Combines: impairment, disability, dependency
 - ◆ Widely used in stroke trials, well accepted



Successful Recanalization Rate: 73.3%

Favorable outcome

Unfavorable outcome



Best evidences

- IMS III (NEJM 2013)
- MR RESCUE (NEJM 2013)
- SYNTHESIS EXP (NEJM 2013)
- No superior role of EVT identified over IV rt-PA on AIS

- PubMed search 'Endovascular treatment acute ischaemic stroke'
 - 371 hits
- WHY?
 - Weakness in IMS III, MR RESCUE and SYNTHESIS EXP
 - New device

Criticism of IMS III and SYNTHESIS EXP

- Occlusion of a major vessel is not an inclusion criteria
- Small proportion of usage of 2nd generation thrombectomy device, i.e. Stentriever
- No evaluation of the salvageable brain with perfusion
- Inclusion of low NIHSS in SYNTHESIS EXP

Criticism of MR RESCUE

- Small number of patients (≤ 30 in each group)
- Usage of 1st generation thrombectomy device

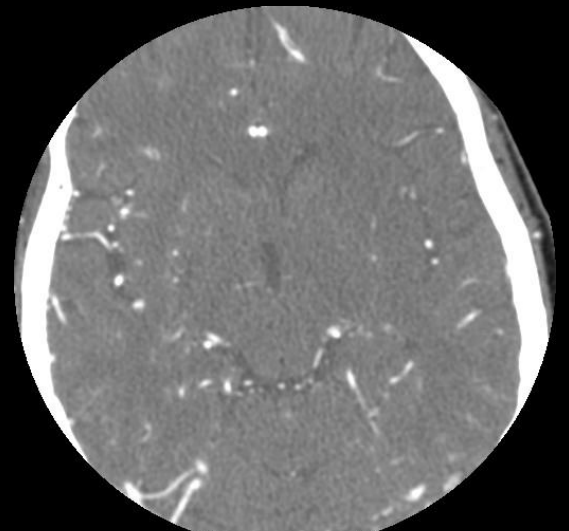
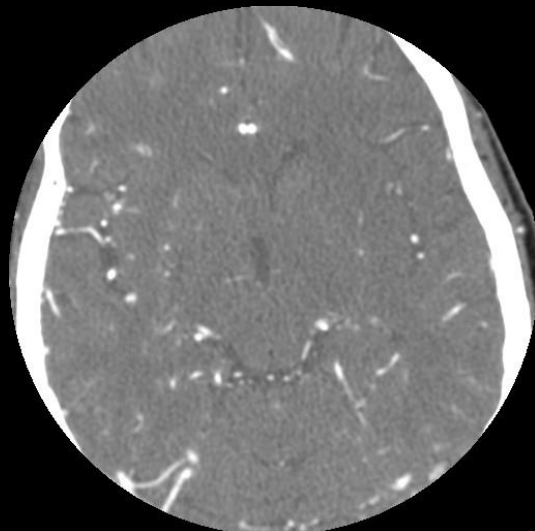
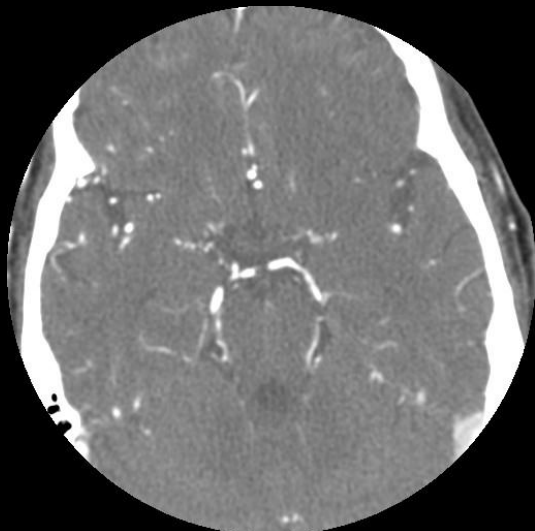
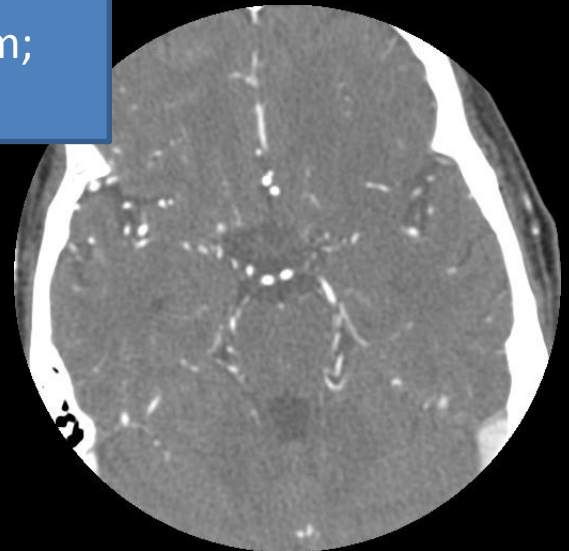
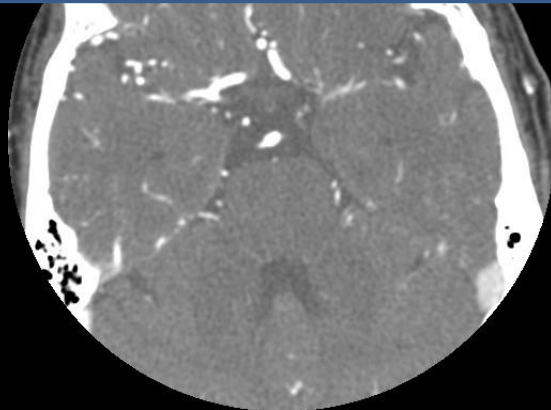
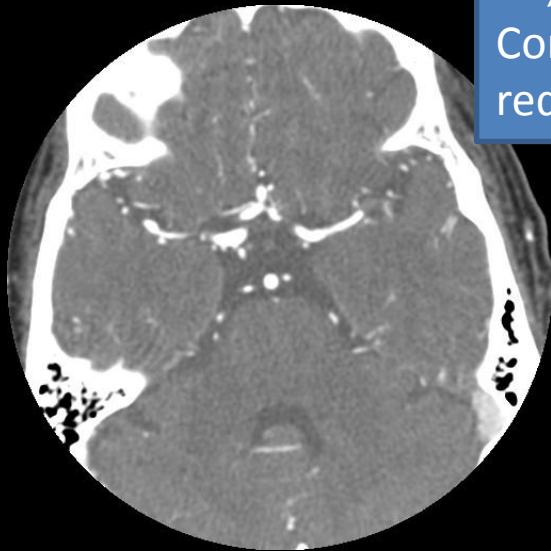
Criteria for Successful revascularization

1. Large vessel(s) occlusion

73/ F

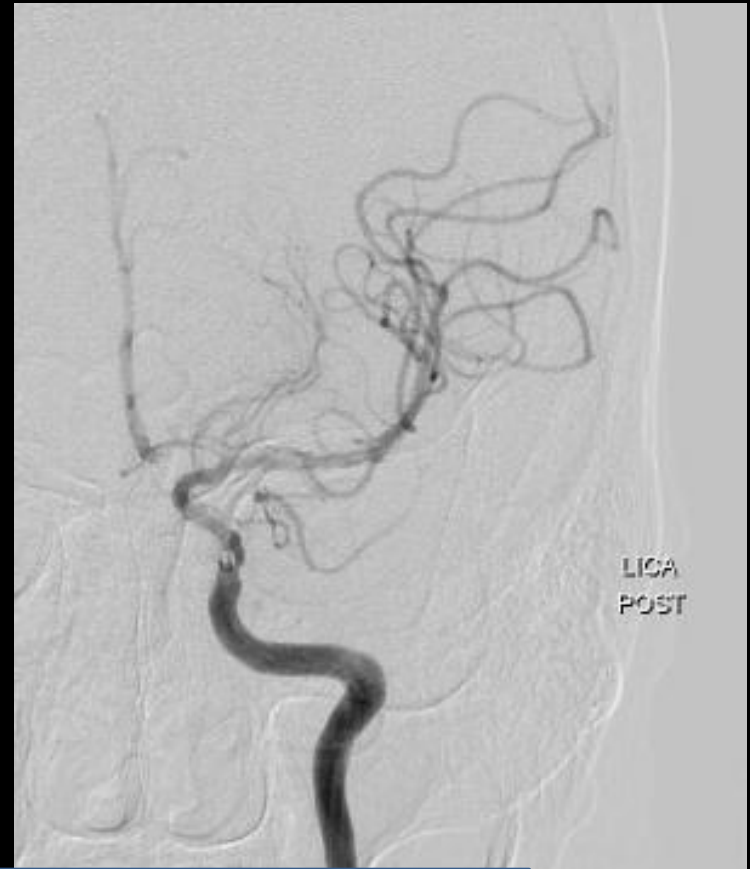
AF; pace-maker insertion

Complicated with haemo-pericardium;
required peri-cardiocentesis



11:30 Sudden onset of right side weakness and aphasia

Compress Pegasus JPEG Lossless

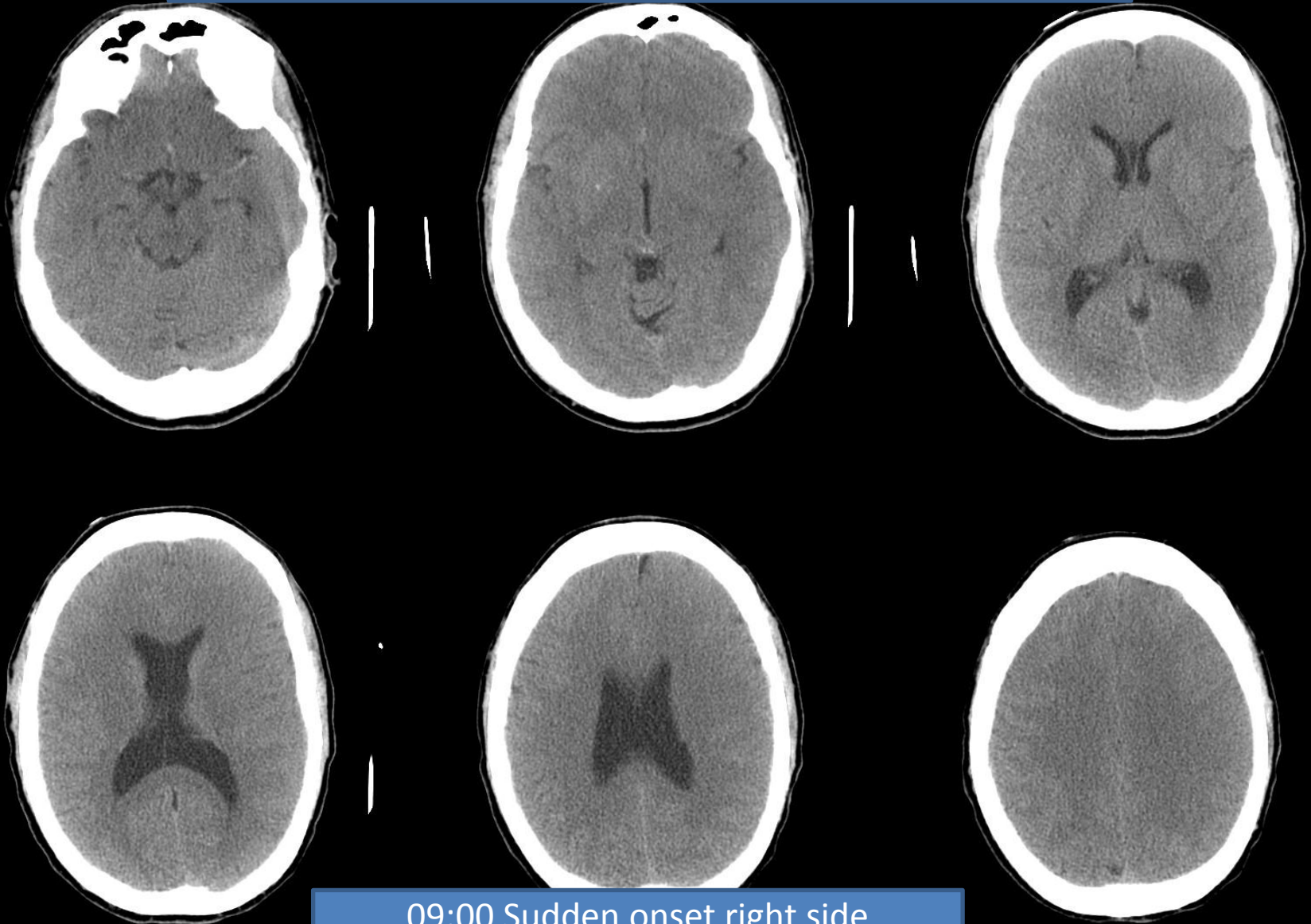


Successful reperfusion **9.5 hours**
after symptoms onset
Complete recovery of symptoms

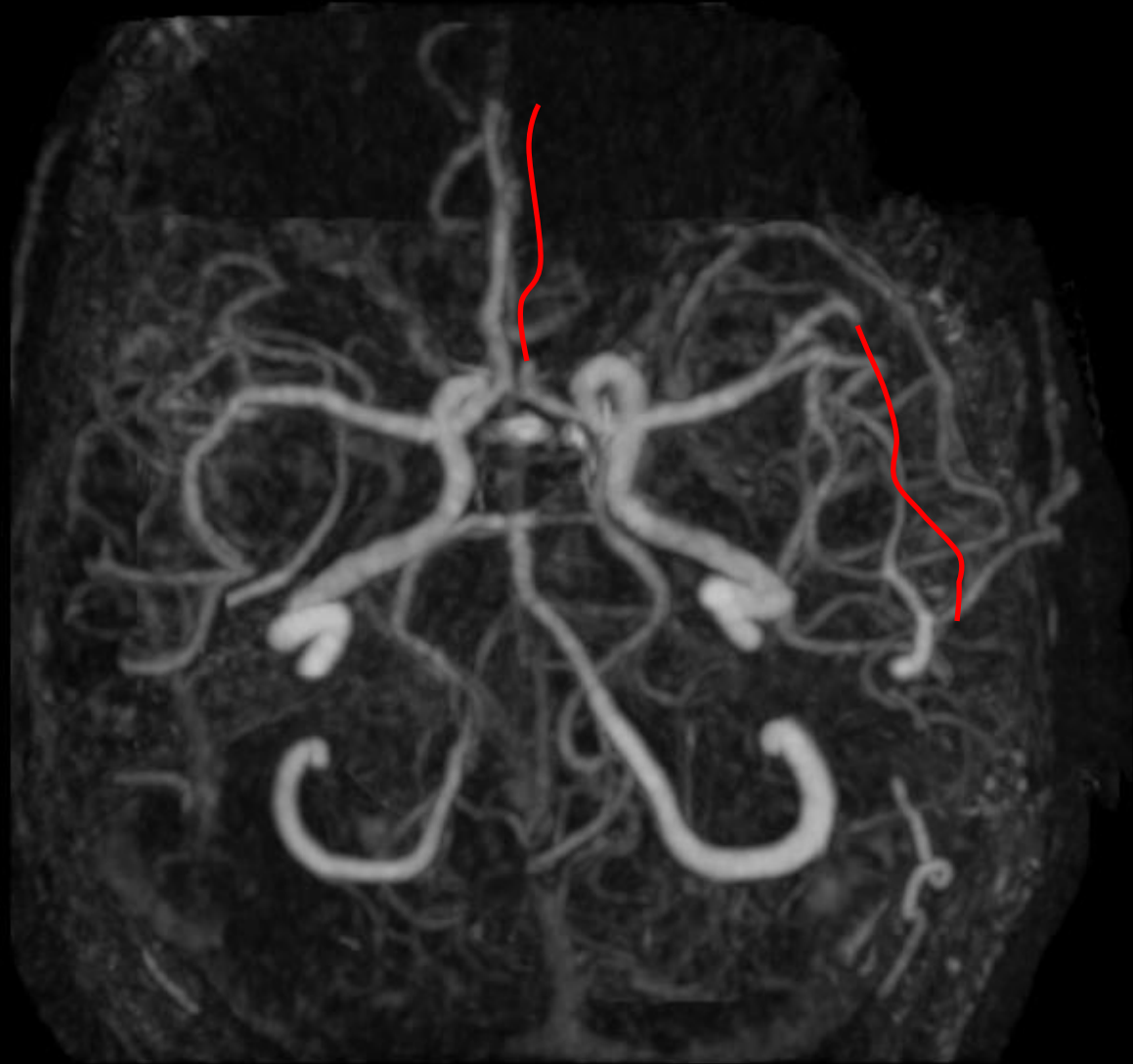
Criteria for Successful revascularization

1. Large vessel(s) occlusion
2. Small area of infarct (avoid large reperfusion hemorrhage)
3. Significant area of penumbra

47/M; Caucasian
History of DVT; previously on Warfarin

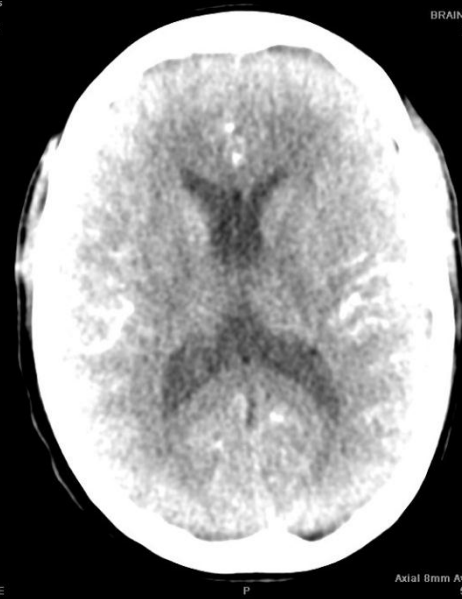


09:00 Sudden onset right side
weakness and aphasia



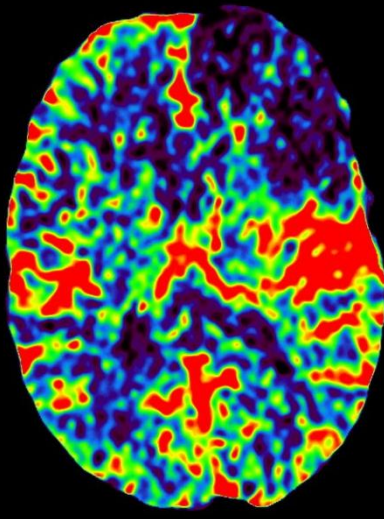
Age: 47 years
19 Feb 2014
11:41:44

BRAIN PERFUSION CTA
Head 0.5 CE Axial
Age: 47 years
19 Feb 2014
11:41:44



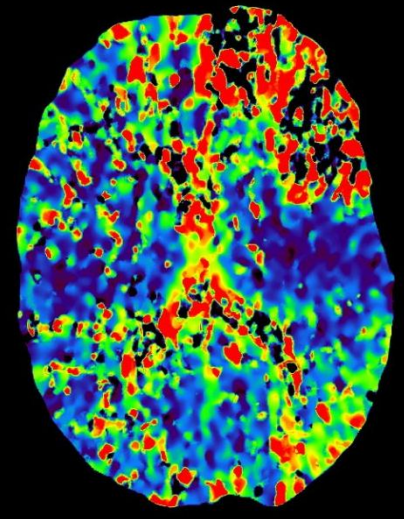
Vitreae®
Zoom: 157%
W/L: 90/40
#217-232
Axial 8mm Average Registered
5 of 16 at 10.9 sec
Aqilion ONE

BRAIN PERFUSION CTA
rCBV
Age: 47 years
19 Feb 2014
11:41:44



Vitreae®
Zoom: 157%
W/L: 5/3
#216-225
Axial 5mm Average Registered
rCBV (ml/100g) [SVD-1]
Aqilion ONE

Study Time: 11:41:44
BRAIN PERFUSION CTA
TTP
Age: 47 years
19 Feb 2014
11:41:44

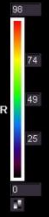
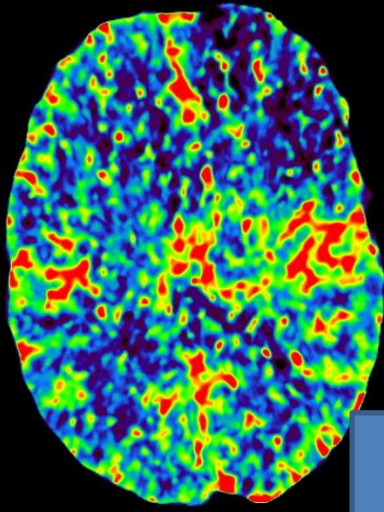


Vitreae®
Zoom: 157%
W/L: 11/18
#216-225
Axial 5mm Average Registered
TTP (sec) [SVD-1]
Aqilion ONE

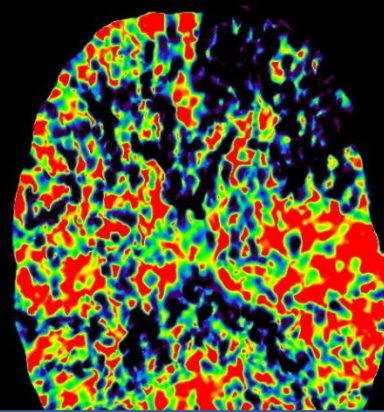
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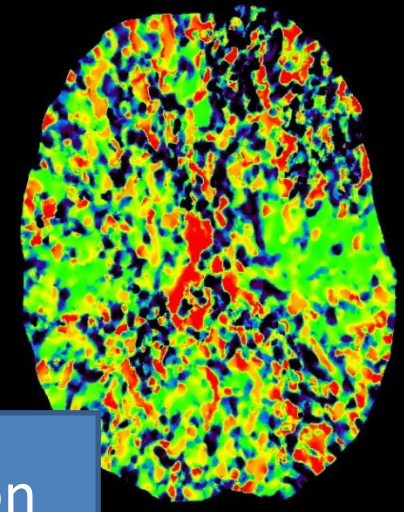
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mA: 310
msec: 750
mAs: 225
Krn: FC41
Thk: 0.5 mm
Aqilion ONE

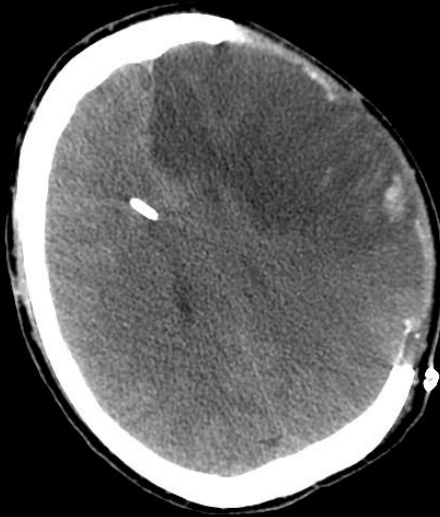
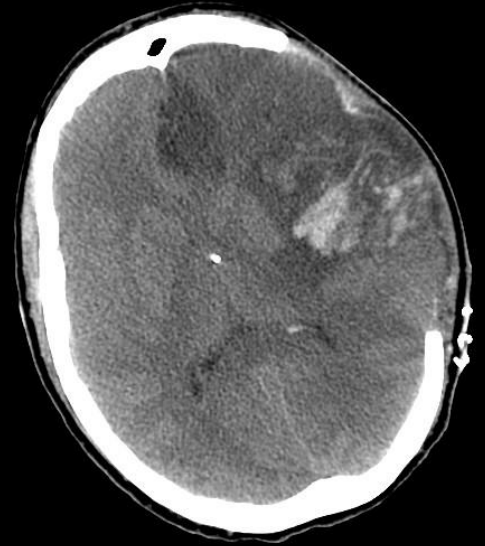
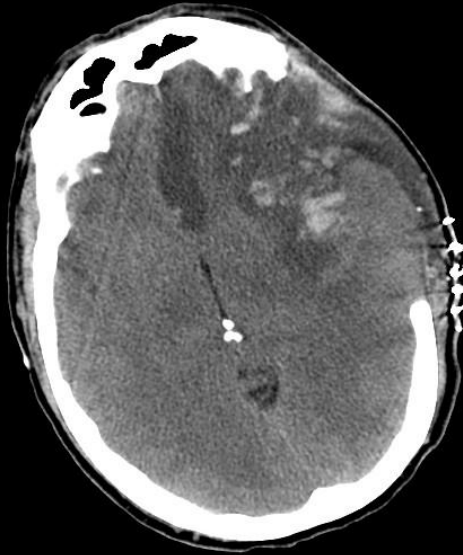


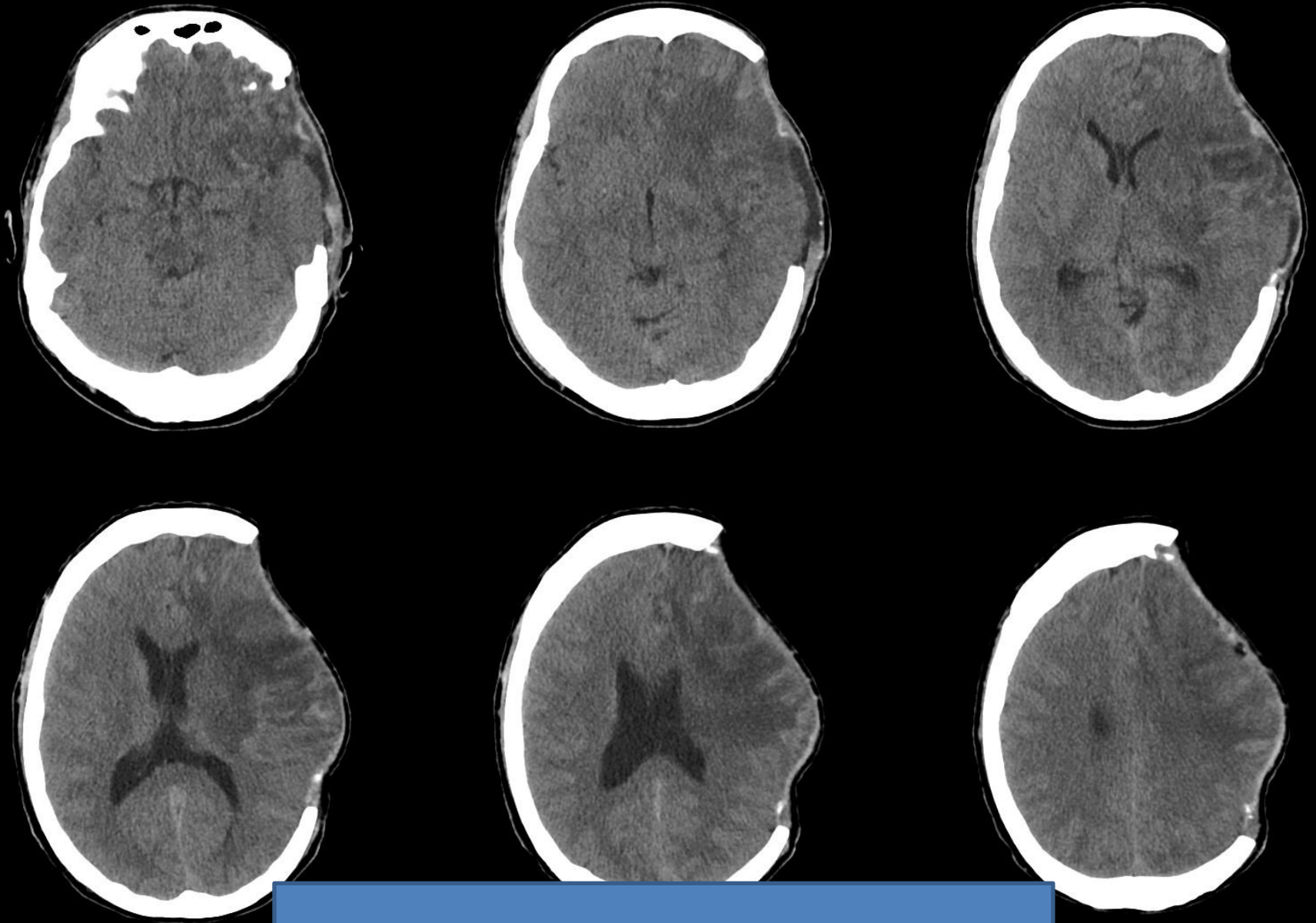
Vitreae®
Zoom: 157%
W/L: 18/1
#216-225
Axial 5mm Average Registered
rCBV (ml/100g) [SVD-1]
Aqilion ONE



Vitreae®
Zoom: 157%
W/L: 18/1
#216-225
Axial 5mm Average Registered
TTP (sec) [SVD-1]
Aqilion ONE

11:30 CT angiogram and perfusion
Not for EVT





GCS 11; right hemiplegia and aphasia

Results from QMH

- EVT for anterior circulation AIS
- N = 20
- Favourable outcome at 90 days = 6 (30%)
- Median time to puncture = 6.75 (2.5-8) hours
- Median time to recanalization = 8.63 (3.5-12) hours

Time is ‘Brain’ but is not absolute!

Criteria for Successful revascularization

1. Large vessel(s) occlusion
2. Small area of infarct
3. Significant area of penumbra
4. Timing: within 6 hours from the onset of symptom

Future of EVT for Ant. Circulation AIS

- Better patient selection
 - Large vessel occlusion
 - Present of significant penumbra with absent/ little infarct core
- Expand the indications
 - Outside therapeutic window of IV rt-PA
(Within 6 hours upon assessment)
 - Failed IV rt-PA
- Prospective study

Summary

- EVT for AIS has its role
 - Contra-indications for IV rt-PA
- Better patient selection (advance imaging) + latest-advance device (Stentriever) + previous experiences
 - ➔ Better angiographic outcome
 - ➔ Better clinical outcome

Acknowledgments

- **Neurologists**
- Dr Sonny Hon
- Dr Mona Tse
- **Interventional Neuroradiologists**
- Dr Raymand Lee
- Dr KK Wong
- **Neurosurgeons**
- Dr WM Lui
- Dr Wilson Ho
- Dr CP Tsang
- **Radiographers**
- **Nurses**



Thank you!

