Diagnosis and Management of stroke

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BRAIN HEALTH INITIATIVE

Outline

Introduction

Clinical assessment

Case scenario

Conclusion

Stroke- Brain attack!!!

CNS infarction is brain, spinal cord, or retinal cell death attributable to ischemia

Pathological, imaging, or other objective evidence of cerebral, spinal cord, or retinal focal ischemic injury in a defined vascular distribution

Clinical evidence of cerebral, spinal cord, or retinal focal ischemic injury based on symptoms persisting ≥24 hours or until death, and other etiologies excluded

TIA- the warning!!!

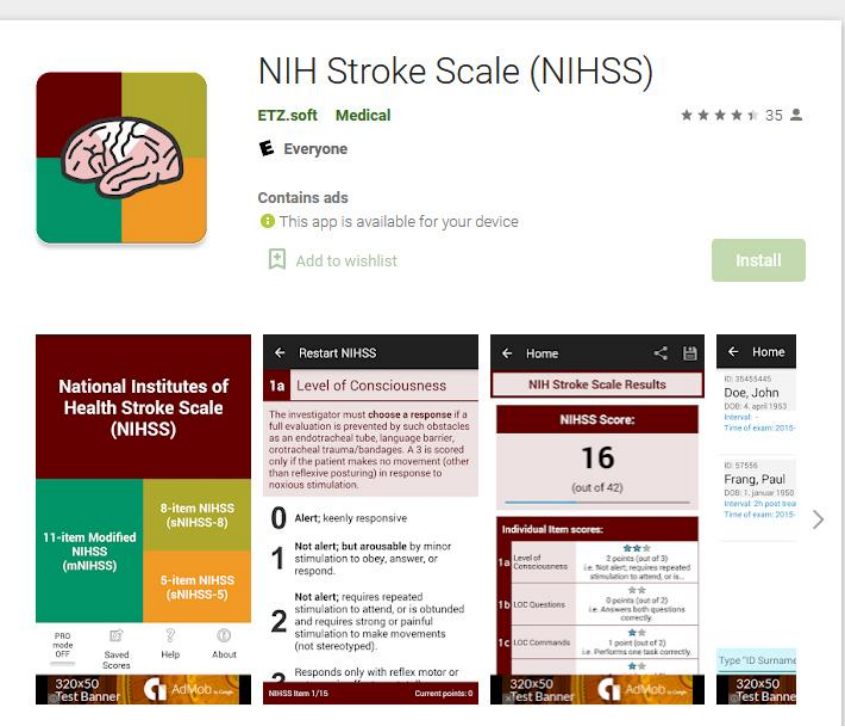
Transient episode of neurological dysfunction caused by focal brain, spinal cord, or retinal ischemia without acute infarction

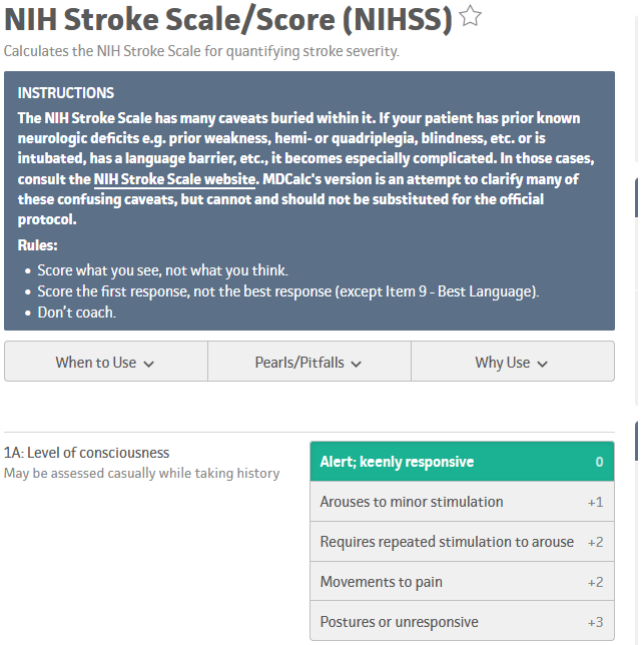
Duration

Chameleons

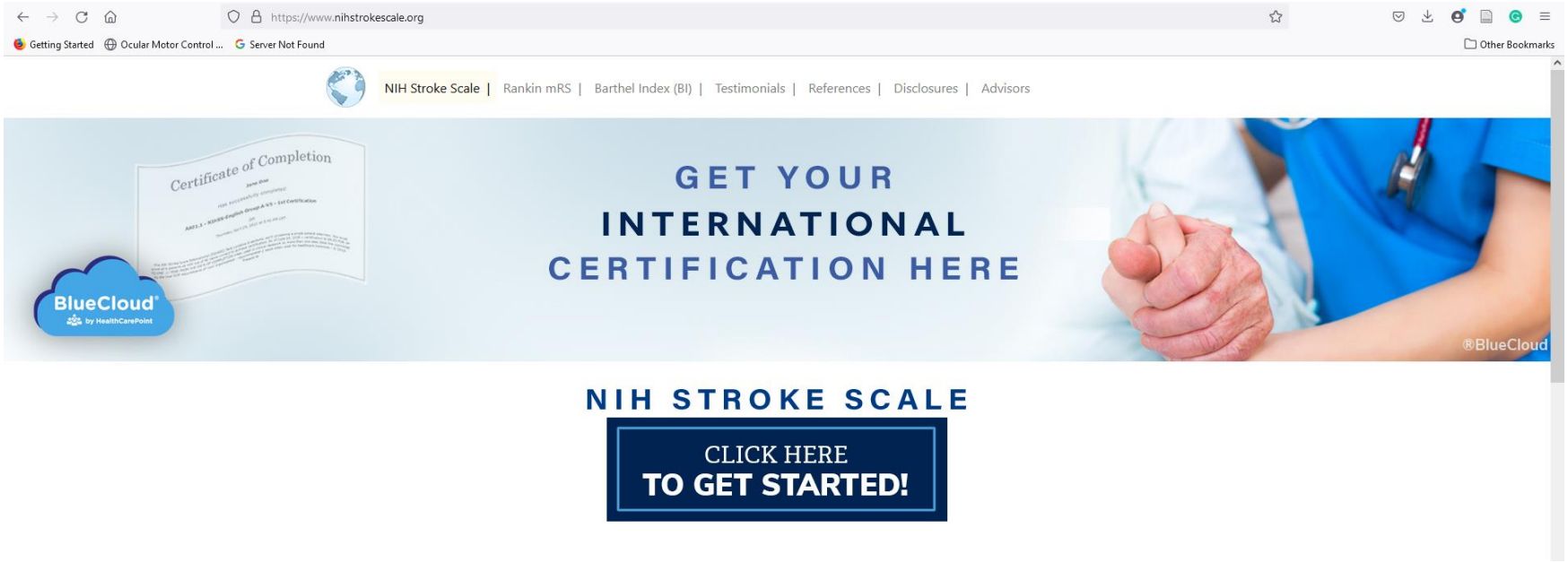
Stroke Mimics	Clinical features
Seizures	Recurrent stereotyped movements. May be associated with tongue bite, incontinence, and altered sensorium.
Syncope	Sudden blackout with or without loss of consciousness. Symptoms improve within a few seconds.
Migraine with aura	Recurrent episodes with gradual onset of symptoms (commonly visual) and usually improving within one to a few hours. Associated with typical features of migraine.
Neuro Infection	Associated with fever, headache, sensorium changes, and seizures.
Hypoglycemia	Known diabetic on therapy associated with drowsiness, autonomic features, focal deficits.
Hyperglycemia	Confusion, abnormal movements like Hemiballismus, Hemi chorea
Metabolic disorders	Asterixis, encephalopathy and associated end organ involvement (Liver, kidney, respiratory disease).
Psychogenic	Bizarre symptoms difficult to explain anatomically, Hoover's sign (The patient is unable to extend the hip and to press the heel into the bed on request) normal imaging

NIHSS

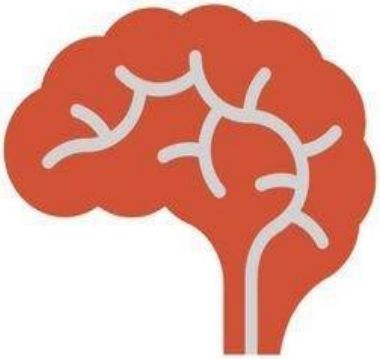

NIH Stroke Scale (NIHSS)
ETZ.soft Medical
35
Everyone
Contains ads
This app is available for your device
Add to wishlist
Install
National Institutes of Health Stroke Scale (NIHSS)
11-item Modified NIHSS (mNIHSS)
8-item NIHSS (sNIHSS-8)
5-item NIHSS (sNIHSS-5)
PRO mode OFF
Saved Scores
Help
About
320x50 Test Banner
Restart NIHSS
1a Level of Consciousness
The investigator must choose a response if a full evaluation is prevented by such obstacles as an endotracheal tube, language barrier, orotracheal trauma/bandages. A 3 is scored only if the patient makes no movement (other than reflexive posturing) in response to noxious stimulation.
0 Alert; keenly responsive
1 Not alert; but arousable by minor stimulation to obey, answer, or respond.
2 Not alert; requires repeated stimulation to attend, or is obtunded and requires strong or painful stimulation to make movements (not stereotyped).
NIHSS Item 1/15
Current points: 0
Home
NIH Stroke Scale Results
NIHSS Score:
16
(out of 42)
Individual Item scores:
1a Level of Consciousness
1b LOC Questions
1c LOC Commands
320x50 Test Banner
Home
Doe, John
Frang, Paul
320x50 Test Banner


NIH Stroke Scale/Score (NIHSS)
Calculates the NIH Stroke Scale for quantifying stroke severity.
INSTRUCTIONS
The NIH Stroke Scale has many caveats buried within it. If your patient has prior known neurologic deficits e.g. prior weakness, hemi- or quadriplegia, blindness, etc. or is intubated, has a language barrier, etc., it becomes especially complicated. In those cases, consult the NIH Stroke Scale website. MDCalc's version is an attempt to clarify many of these confusing caveats, but cannot and should not be substituted for the official protocol.
Rules:
• Score what you see, not what you think.
• Score the first response, not the best response (except Item 9 - Best Language).
• Don't coach.
When to Use
Pearls/Pitfalls
Why Use
1A: Level of consciousness
May be assessed casually while taking history
Alert; keenly responsive 0
Arouses to minor stimulation +1
Requires repeated stimulation to arouse +2
Movements to pain +2
Postures or unresponsive +3

WEBSITE- NIHSS certification



KNOW STROKE | ACT IN TIME

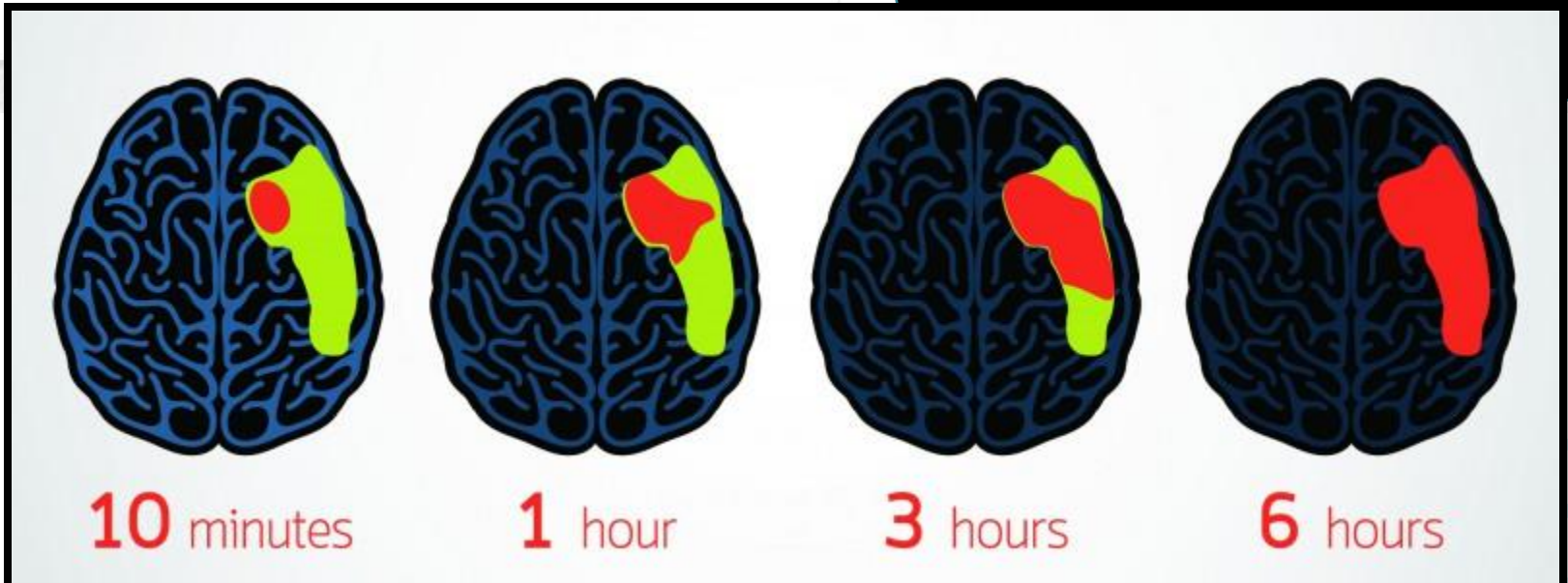


2 Million

brain cells die every minute

increasing the risk of permanent brain damage, disability or death.

Exact time of onset?



Spend time in assessing exact time of onset, progression, onset to peak, what was patient doing during the onset?

Unilateral weakness

Facial

Visual field

Facio-brachial weakness

Giddiness

Loss of consciousness

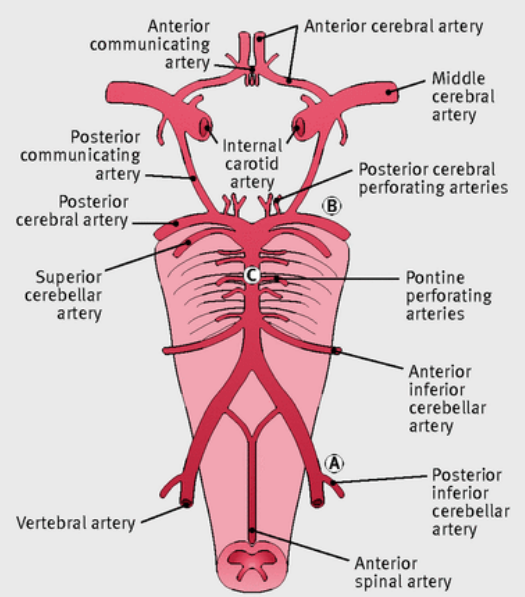
Vomiting, imbalance, double vision

- Family history
- DM, HTN
- Cognition /Psychiatric symptoms

Posterior circulation

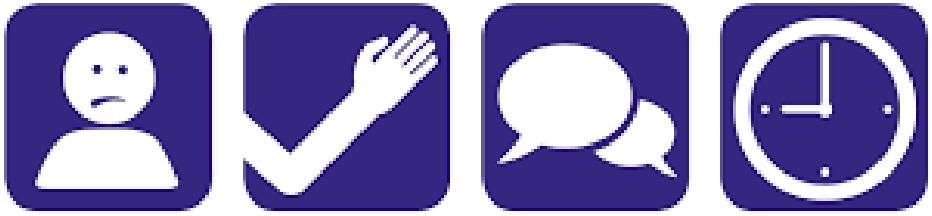
Box 1: Common symptoms seen in posterior circulation ischaemia

- Motor deficits (weakness, clumsiness, or paralysis of any combination of arms and legs, up to quadriplegia, sometimes changing from one side to another in different attacks)[17]
- "Crossed" syndromes, consisting of ipsilateral cranial nerve dysfunction and contralateral long motor or sensory tract dysfunction are highly characteristic of posterior circulation stroke[18]
- Sensory deficits (numbness, including loss of sensation or paraesthesia in any combination of extremities, sometimes including all four limbs or both sides of the face or mouth)
- Homonymous hemianopia—a visual field defect affecting either the two right or the two left halves of the visual fields of both eyes
- Ataxia, imbalance, unsteadiness, or disequilibrium
- Vertigo, with or without nausea and vomiting
- Diplopia as a result of ophthalmoplegia
- Dysphagia or dysarthria
- Isolated reduced level of consciousness is not a typical stroke symptom but can result from bilateral thalamic or brainstem ischaemia (especially from rostral basilar artery occlusion)



HINTS

Act FAST and call 999.

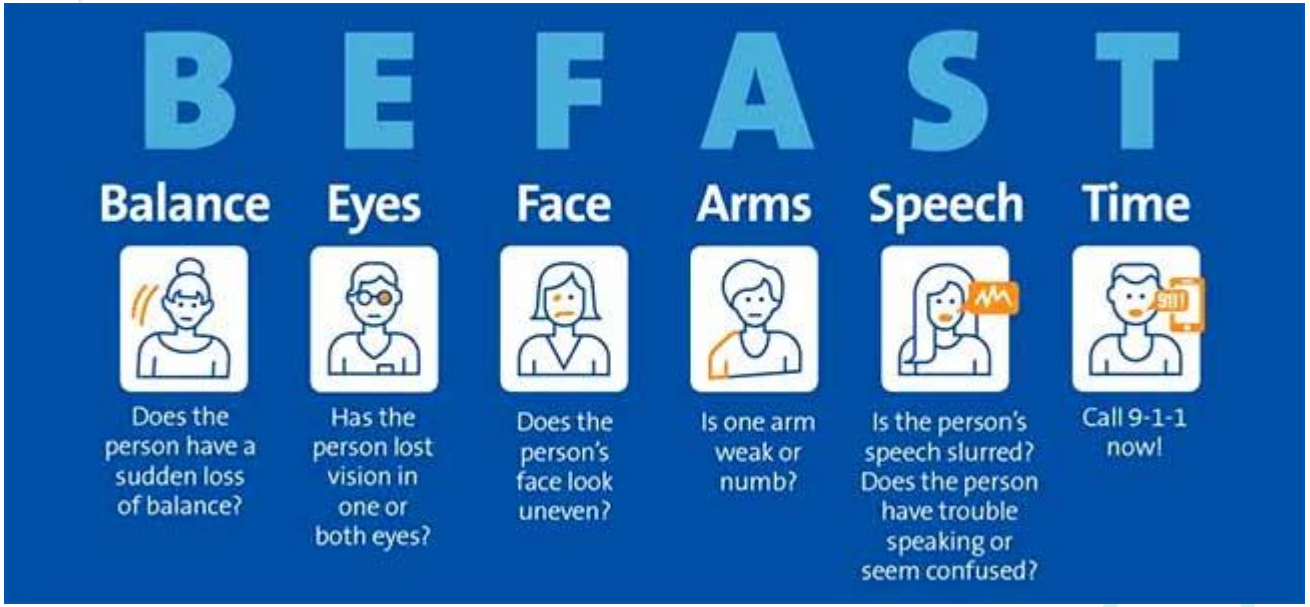


Facial weakness

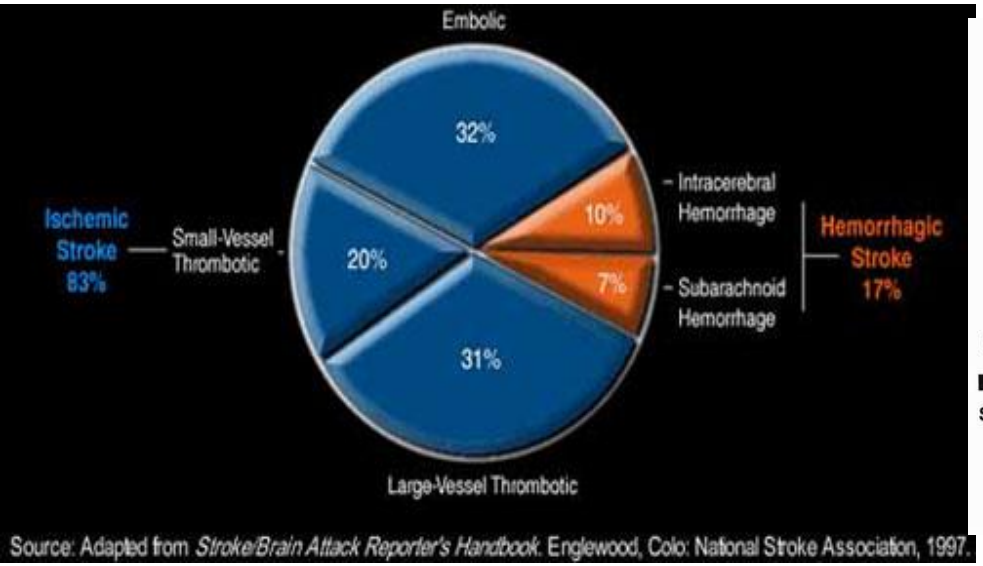
Arm weakness

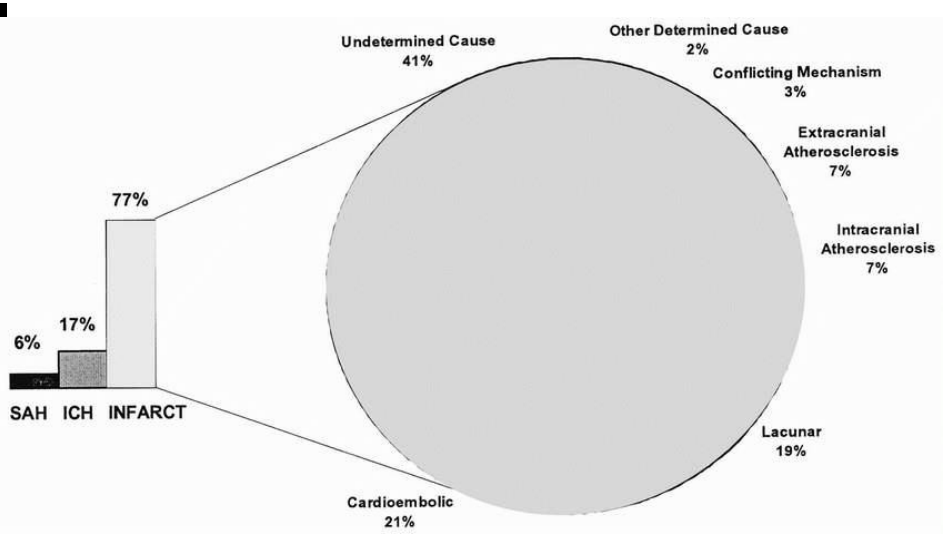
Speech problems

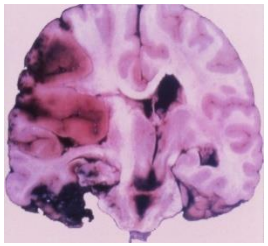
Time to call 999



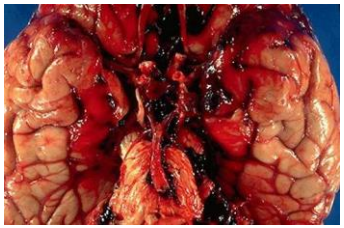
Stroke types and incidence



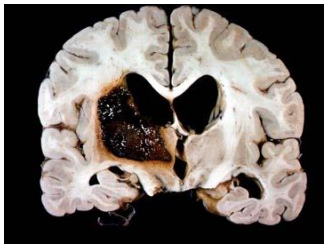




Arterial stroke

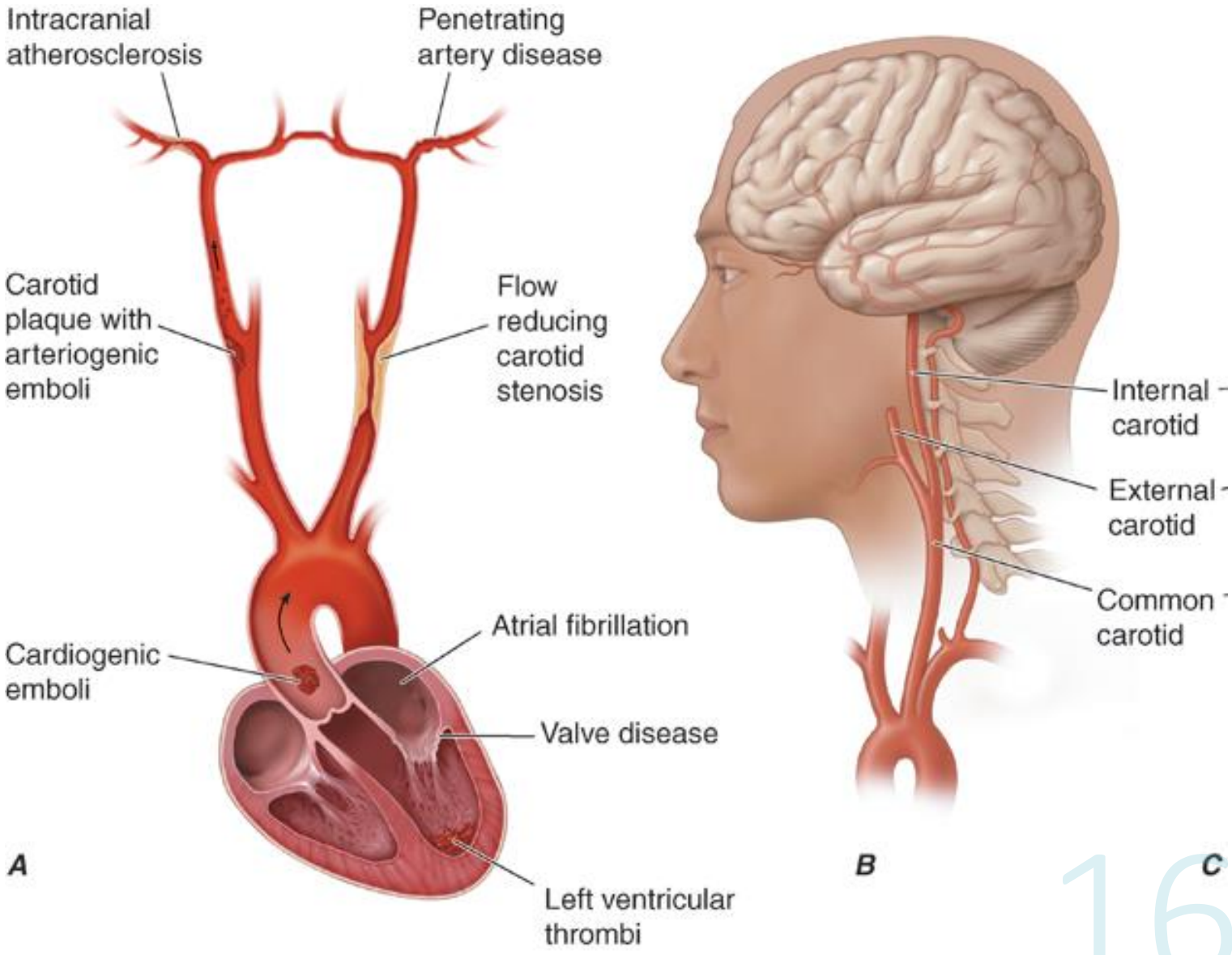


SAH

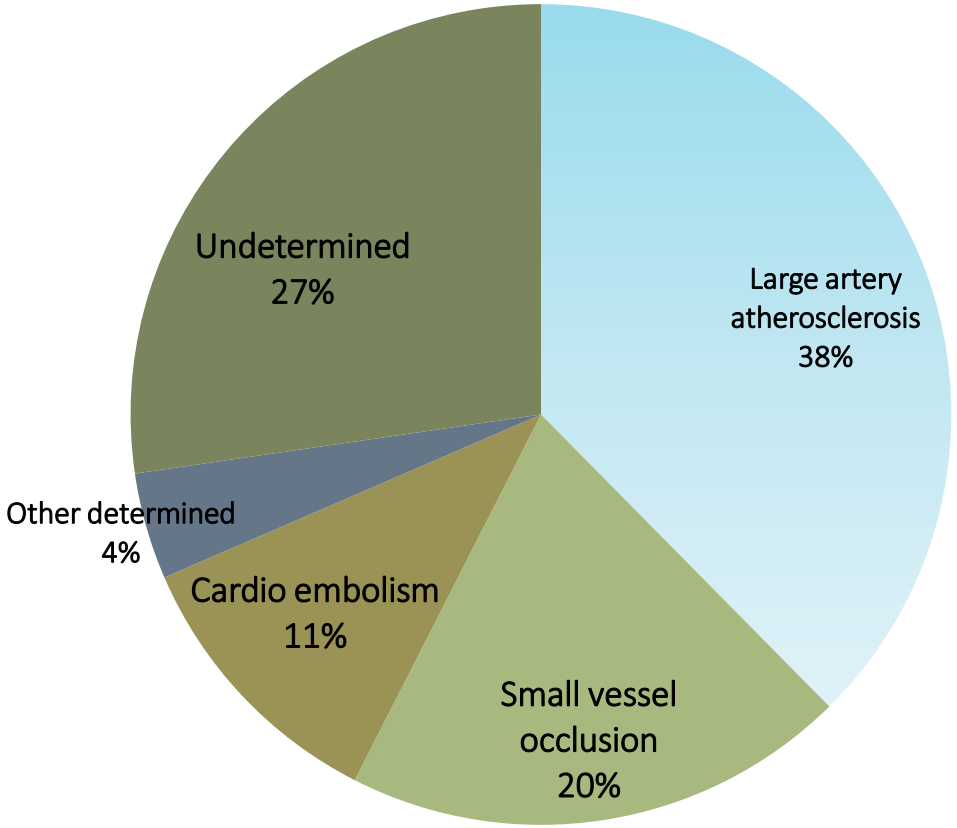


Hemorrhage

Pathophysiology of Stroke (TOAST Criteria)



Stroke types and incidence



Intracranial atherosclerosis is the most common stroke subtype: Ten-year data from Hyderabad stroke registry (India),Annals of IAN,2018

Subash kaul et al

TOAST-1993

Large artery atherosclerosis

Cardio-embolic

Small artery occlusion

Other determined etiology

Undetermined etiology

1. Mrs. R

35 yr

Right sided weakness

Facial deviation

Difficulty to speak

Onset: 11:30 pm

Reached casualty by 1:15 am

Known RHD, PTMC -2011

PR- 60/min, Irregularly irregular, BP-110/70 mm Hg

Pan-systolic murmur, Soft S1 , MDM

Aphasia, Gaze preference to left, Right complete hemiplegia

NIHSS-16

What to do

A)Give ecospirin and refer to district hospital

B)Give ecospirin and clopilet and refer to district hospital

C)Immediate referral to stroke ready center

D)refer to cardiologist

Imaging

A)CT

B)MRI

Treatment options available?

A)Antiplatelets

B)anticoagulants

C)Thrombolysis

D)Thrombectomy

Role of anticoagulants??

What has to be done

Recognise LVO signs

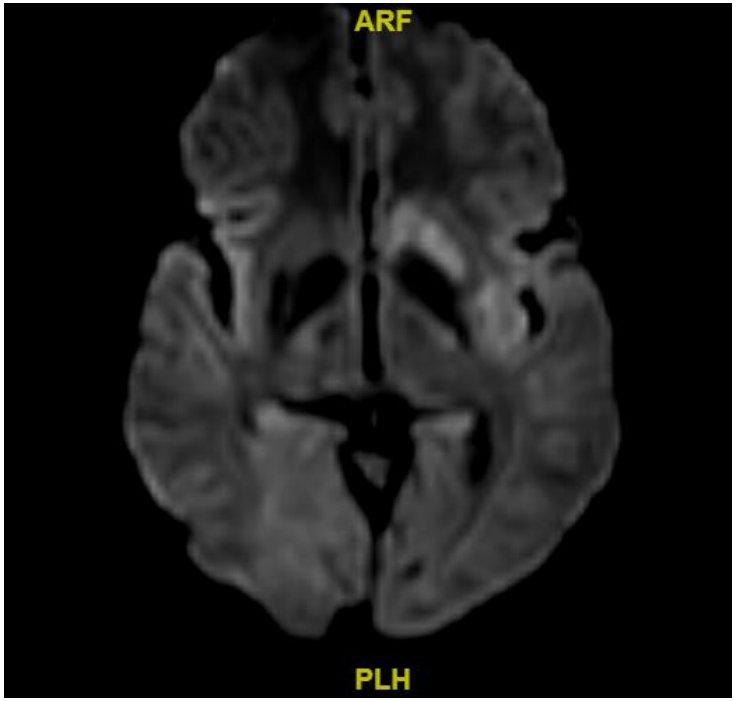
Stabilise the patient

Look for stroke mimics and correct

Do not give diuretics/fluids

Refer to stroke ready hospital

Endo Vascular Therapy



Anticoagulant management

Outpatients: Dose adjustment of established (maintenance) warfarin i.e. in patients who have been taking warfarin for 7 days or longer		
Target INR 2.5		
INR	**Dose change**	**Next INR**
<1.5	30% Increase	3 days
1.5-2	20% Increase	
2.1-3	No Change	
3.1-4	20% Reduction	
4.1-6	Miss 2 days & 30% reduction	4 days
>6.1	Miss 3 days	Measure INR daily if there is a high concern for bleeding

NOTE: This guide cannot be used in acutely unwell patients, where daily INR must be monitored.

Management of over dose

Major bleeding- Irrespective of INR, PCC/FFP with Vit k 2mg iv

6-8- no/minor bleeding- stop till INR<5, restart at 05mg/1mg

>8- no/minor bleeding- stop, Inj vit K2mg iv

2. Mr. S

22 yr

Sudden onset weakness of right upper and lower limb, difficulty to speak, unable to understand from 8:30 pm

Reached casualty in 2h

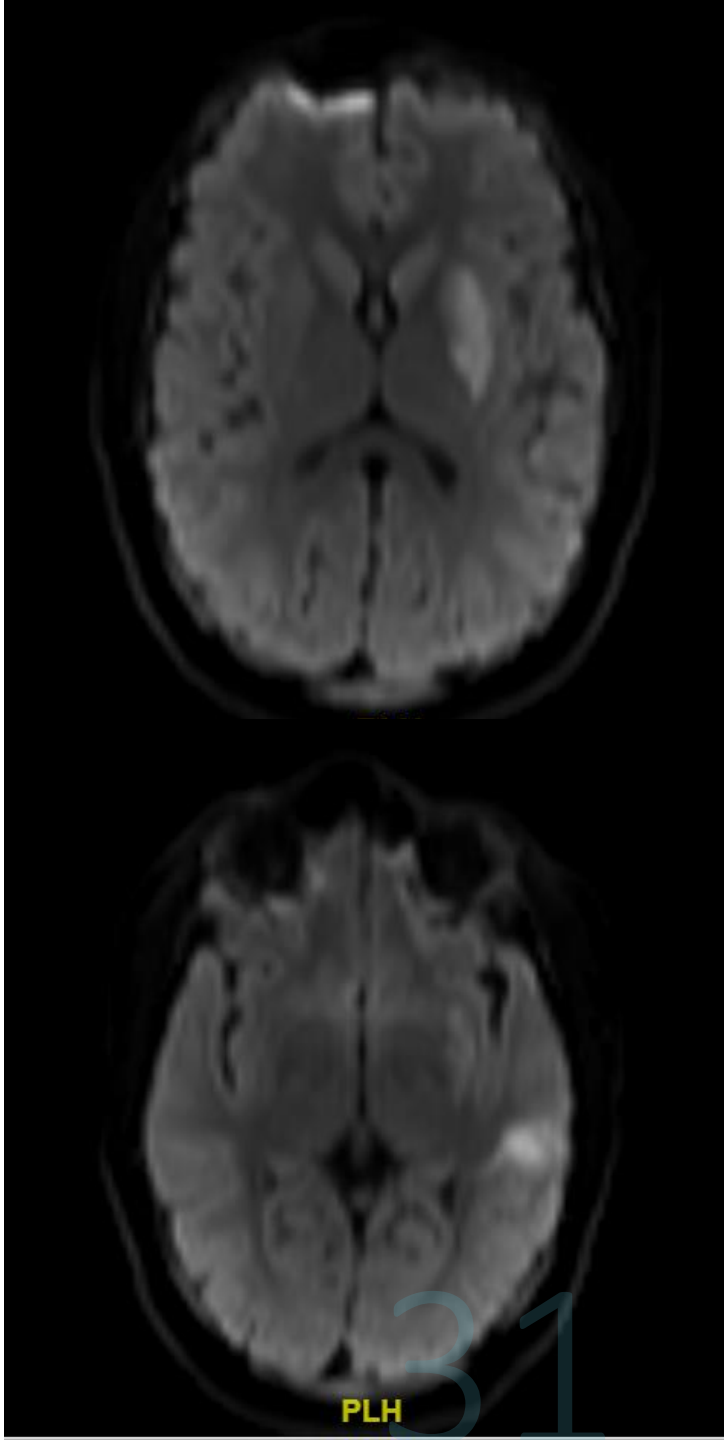
Started improving- Limb weakness improved followed by started speaking. However, comprehension difficulties persisted.

What you do?

A)Reassure

B)Urgent referral

IVT



Window for thrombolysis

A)3hrs

B)4.5hours

C)9hours

D)All of the above

Mr.Z

55/M

Found in the road unresponsive

No details known

O/e, BP-170/90mmhg

No smell of alcohol

Aphasia with right sided weakness and gaze paresis to left side

Diagnosis

A)hypoglycemia

B)Stroke

C)Seizure with todd’s palsy

Plan of action

A)call the relatives over phone for further clarification

B)Call 108 for referral

C)wait till he regains consciousness

D)load with phenytoin

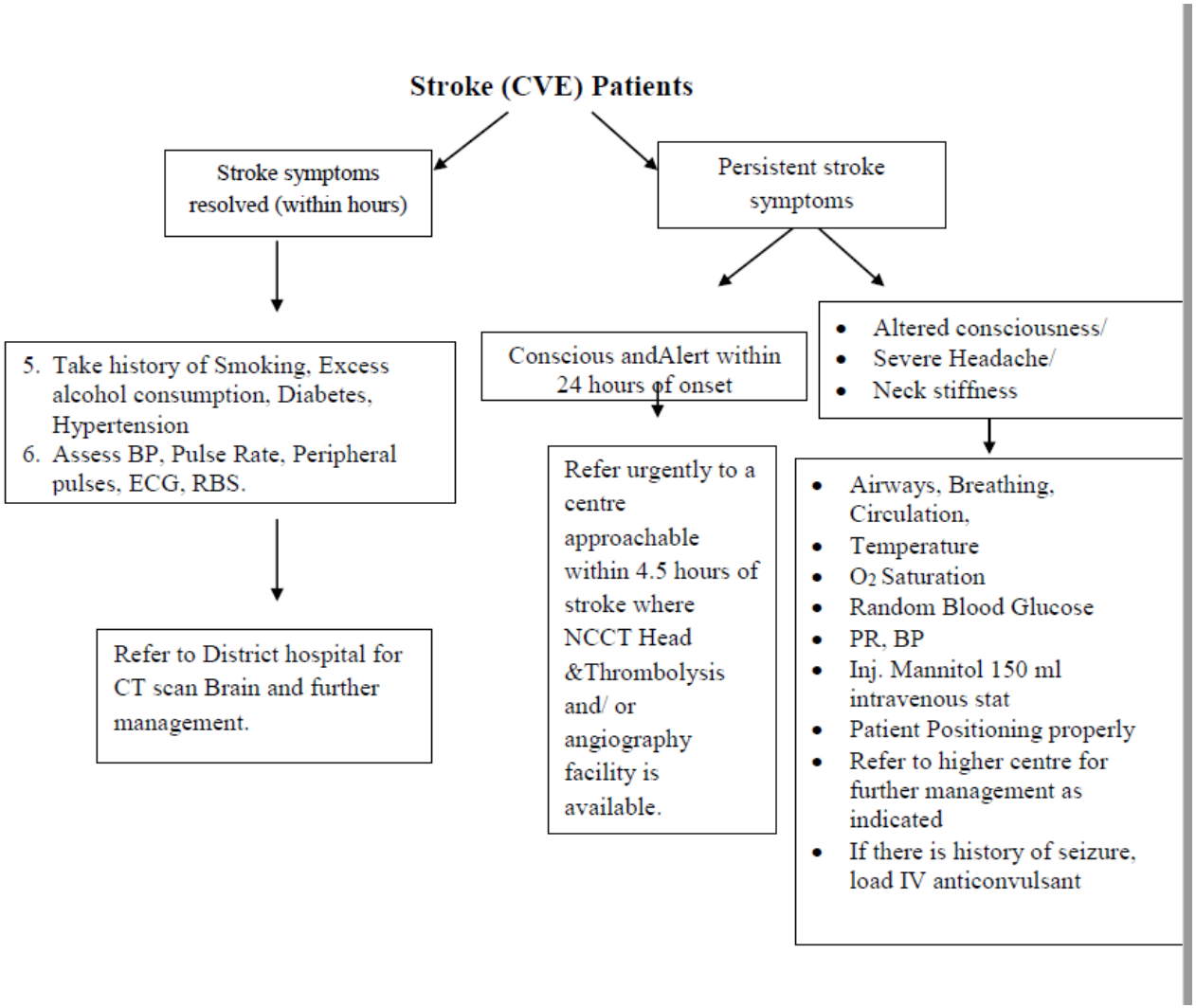
Window for thrombectomy

A)6hours

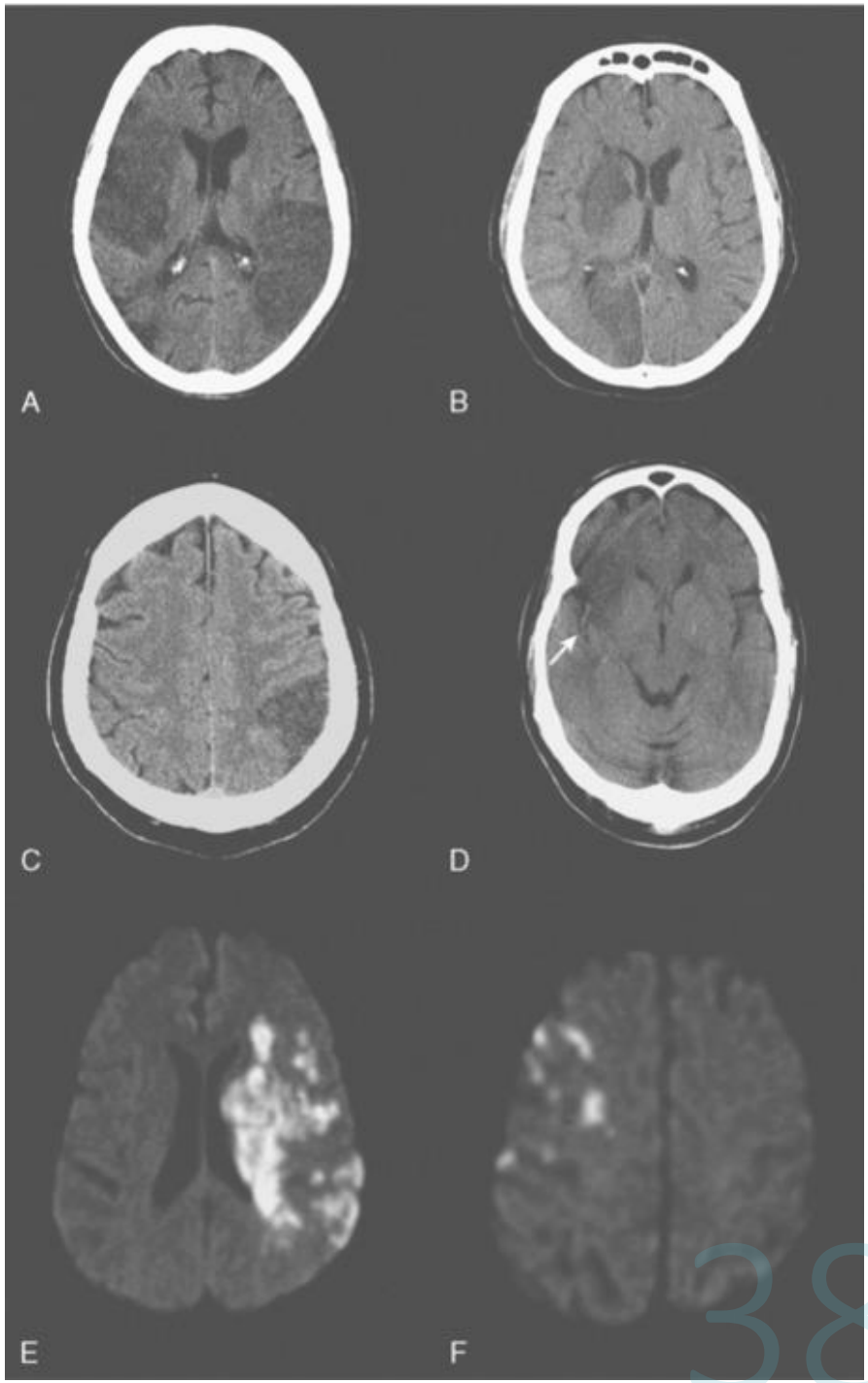
B)12hours

C)24hours

D)all the above


Stroke (CVE) Patients
Stroke symptoms resolved (within hours)
Persistent stroke symptoms
5. Take history of Smoking, Excess alcohol consumption, Diabetes, Hypertension
6. Assess BP, Pulse Rate, Peripheral pulses, ECG, RBS.
Refer to District hospital for CT scan Brain and further management.
Conscious andAlert within 24 hours of onset
Refer urgently to a centre approachable within 4.5 hours of stroke where NCCT Head &Thrombolysis and/ or angiography facility is available.
Altered consciousness/
Severe Headache/
Neck stiffness
Airways, Breathing, Circulation,
Temperature
O2 Saturation
Random Blood Glucose
PR, BP
Inj. Mannitol 150 ml intravenous stat
Patient Positioning properly
Refer to higher centre for further management as indicated
If there is history of seizure, load IV anticonvulsant

Imaging



Mr.R

45/m

Right upper and lower limb weakness 12days back

Was thrombolysed with alteplase

Now C/o headache

o/e, BP-140/90mmhg

Mild right upper ang lower limb weakness

Diagnosis?

A)Post thrombolysis bleed

B)Migraine

C)others

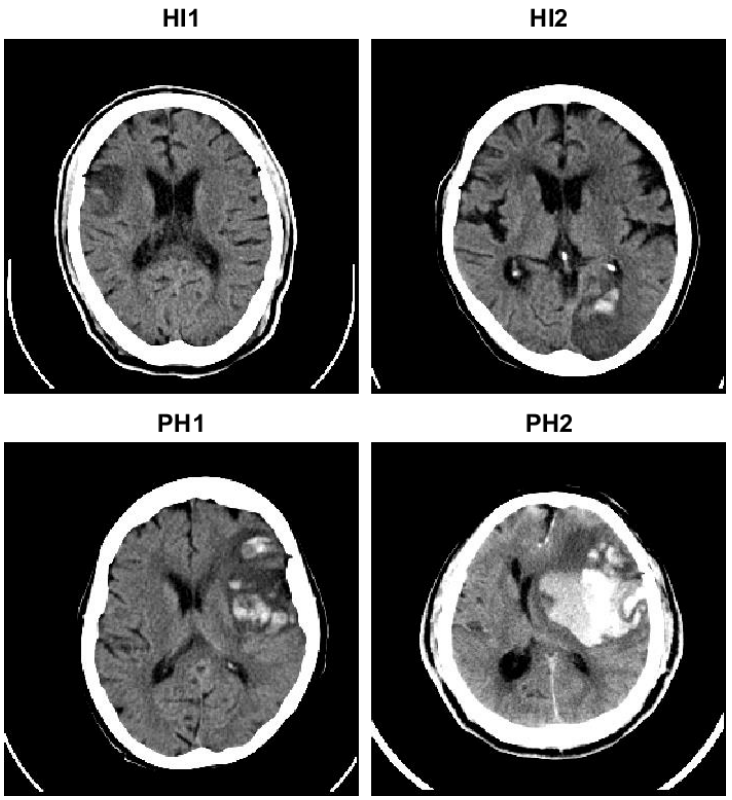
Post thrombolysis bleed can be suspected in

A)<12hrs

B)<24hrs

C)<36hours

Continuation of antiplatelets?



3.Mr A

38 yr

Sudden onset weakness of left side before 25 days

Dysarthria, facial deviation- improved in 30min

Blurring of vision in right eye, more so in standing position and seeing bright light- 1 day back- totally improved in 30min

Diabetic, hypertensive, CKD

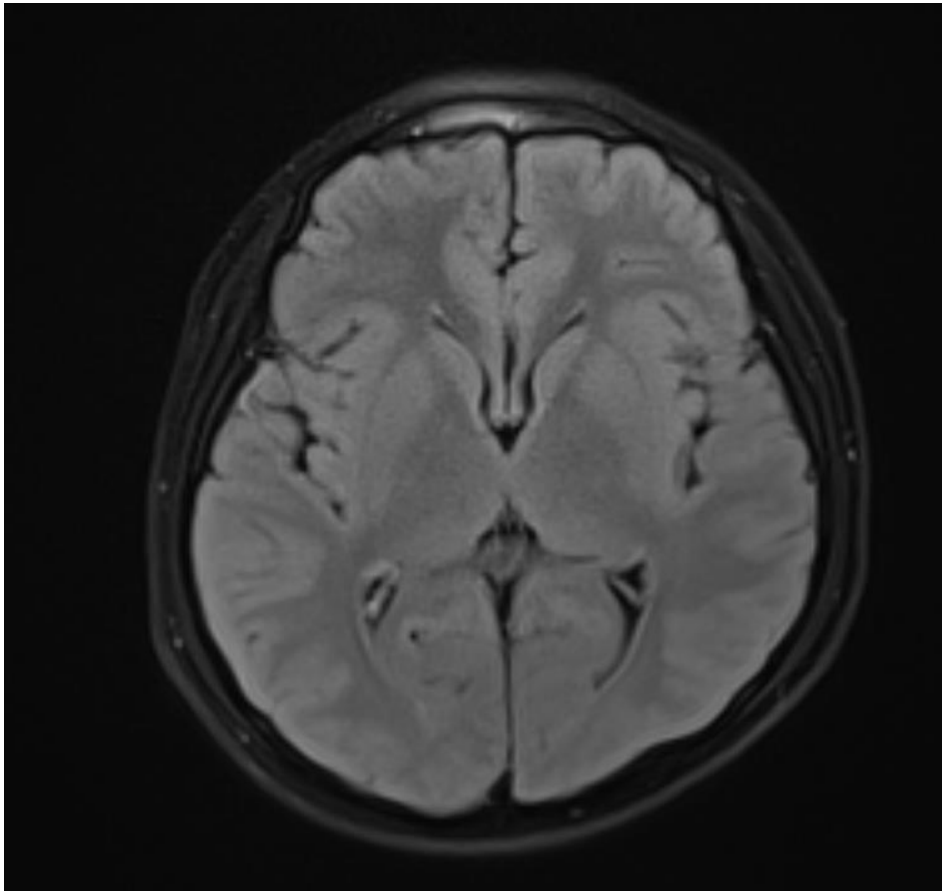
No similar family history

Diagnosis

A) Hypoglycaemic episodes

B) Episodes of stroke/TIA

C) Seizures



ABCD score

Risk stratification for TIA with ABCD2 score

ABCD²	Criteria	Points
Age	≧ 60 years	1
Blood pressure	≧140/80	1
Clinical features	Unilateral weakness	2
	Speech impairment without weakness	1
Duration of Sx	>60minutes	2
	10-59 minutes	1
Diabetes	Yes	1

Score	2day-risk for stroke	Recurrence within 90days
0-3	Low	1.0%
4-5	Moderate	4.1%
6-7	High	8.1%

JAMA 2000;284:2901-2906

ABCD2-I	Points
ABCD2 +	7
I = (image) MRI : acute infarction on DWI CT : acute or old infarction	3

Stroke 2010;41:1907-13

5. Mrs. M

52 yr

Left sided weakness without facial weakness-Started at 9:30 am, improved by 11 am

Diabetic/hypertensive

Had 2 similar episodes yesterday

o/e

Bp-130/80mmhg

No deficits

Diagnosis

A)TIA

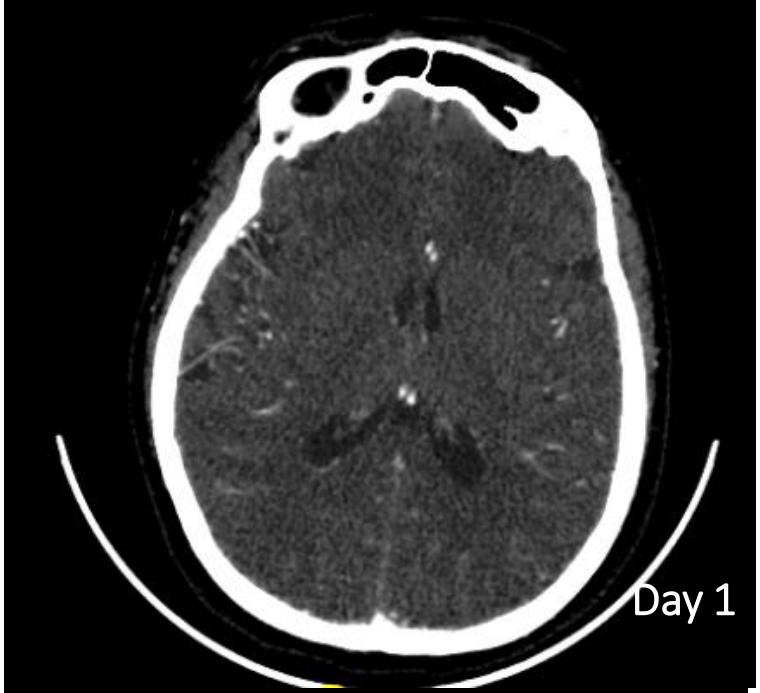
B) Hypoglycemia

C)Seizures

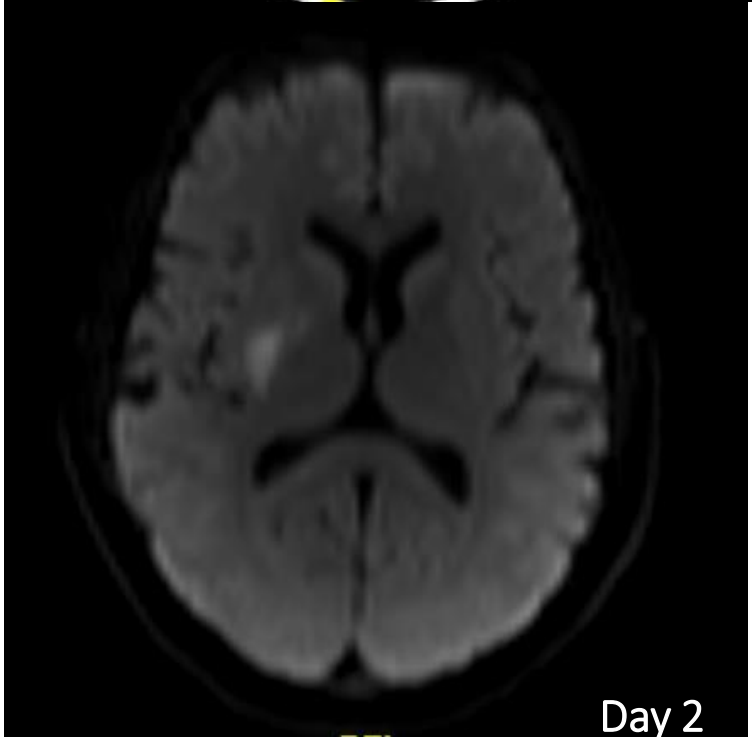
What you do

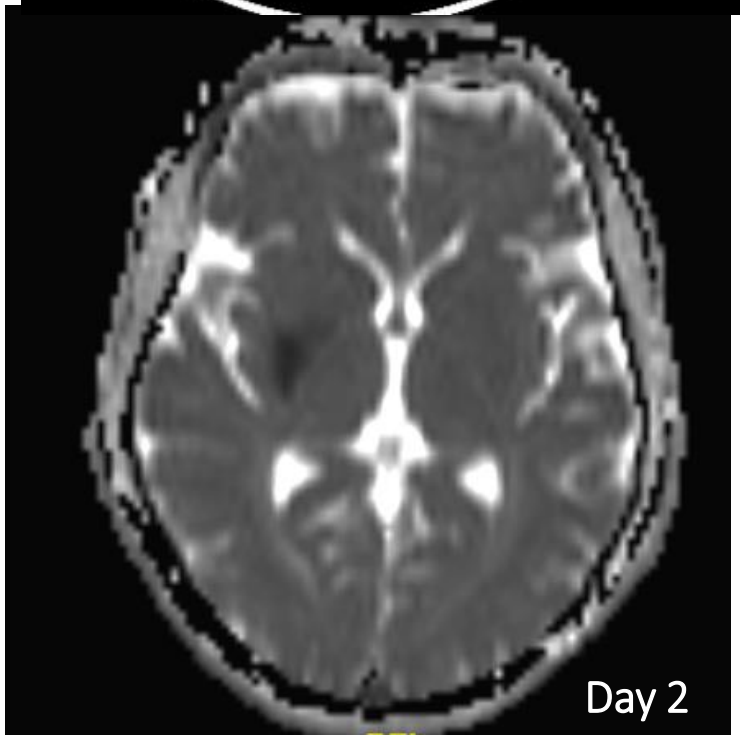
A)refer to higher center

B) reassure and load with antiplatelets


Day 1


Day 2


Day 2


Day 2

Small artery occlusion

Failure to involve higher cerebral functions-Language, praxis, behavior, memory and vision

Pure motor weakness

Pure sensory loss

Ataxic hemi-paresis

Clumsy hand dysarthria

Capsular warning syndrome

4. Mr. K

50 yr

Sudden onset difficulty to speak, understand and right sided weakness 3 yrs back

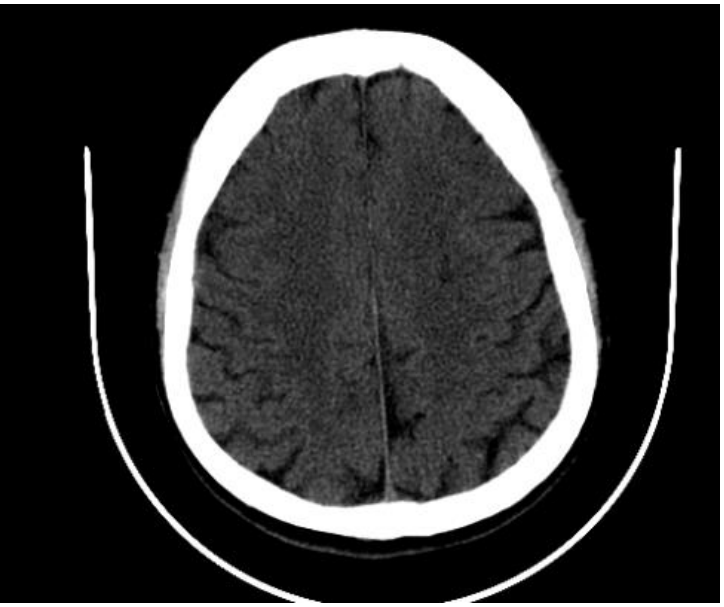
Weakness improved partially

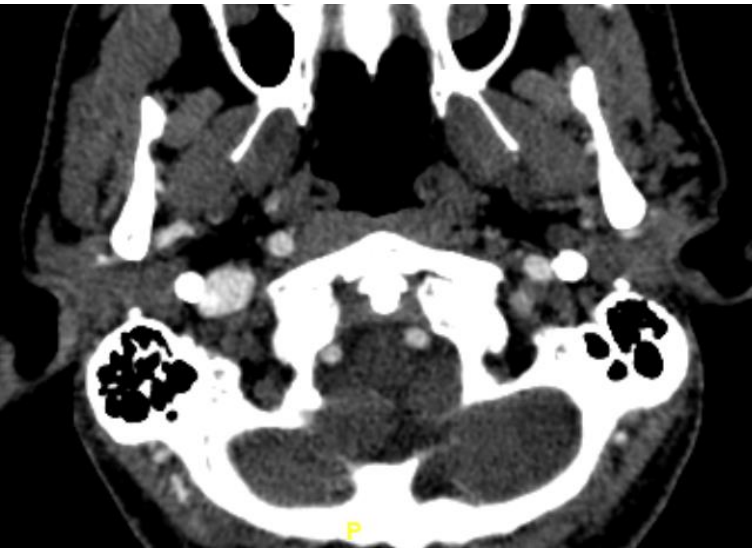
Speech improved slightly

He was found to have vision loss in left eye

Chronic alcoholic and smoker

HTN detected during illness

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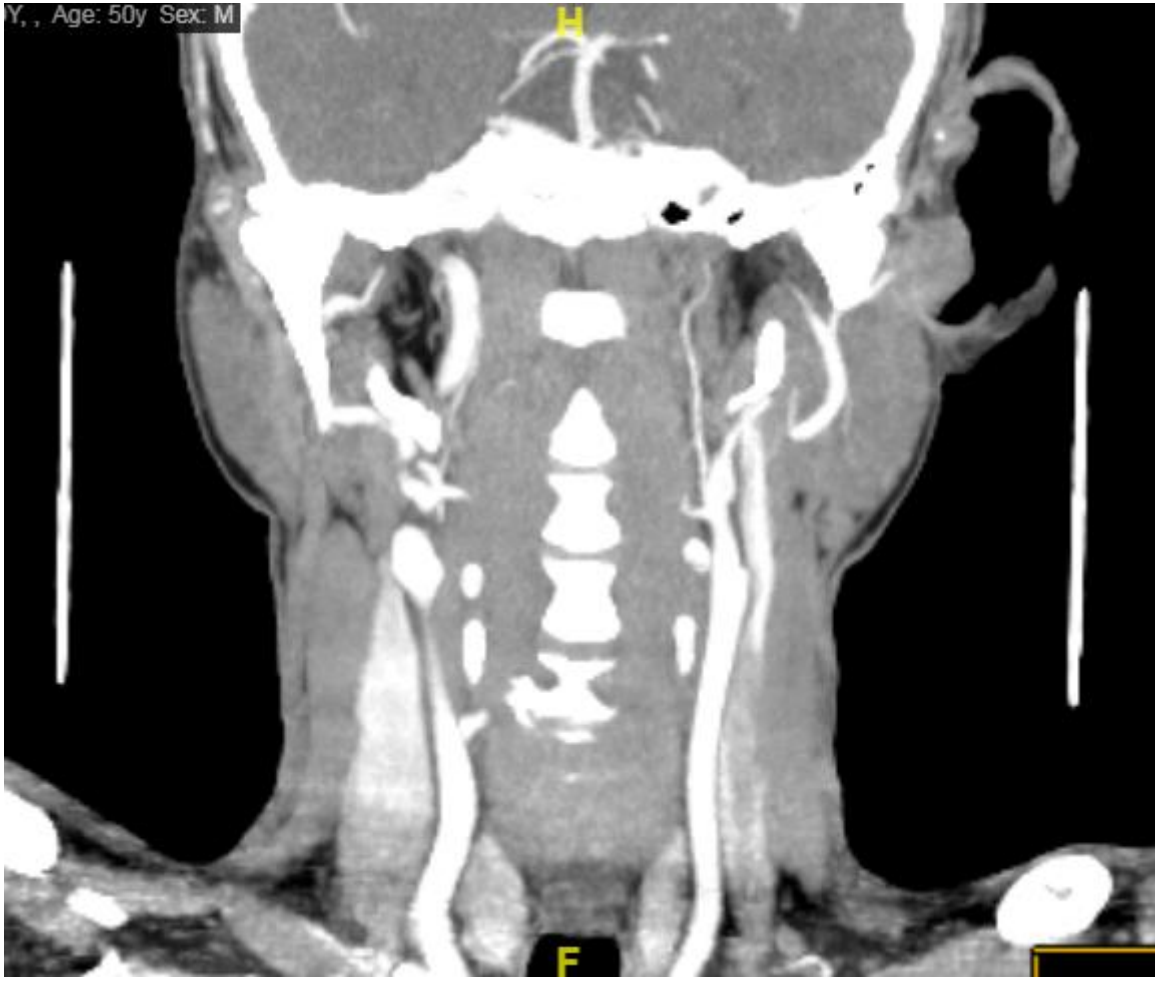

Y, , Age: 50y Sex: M
H
F

Large artery Atherosclerosis

Fractional arm weakness

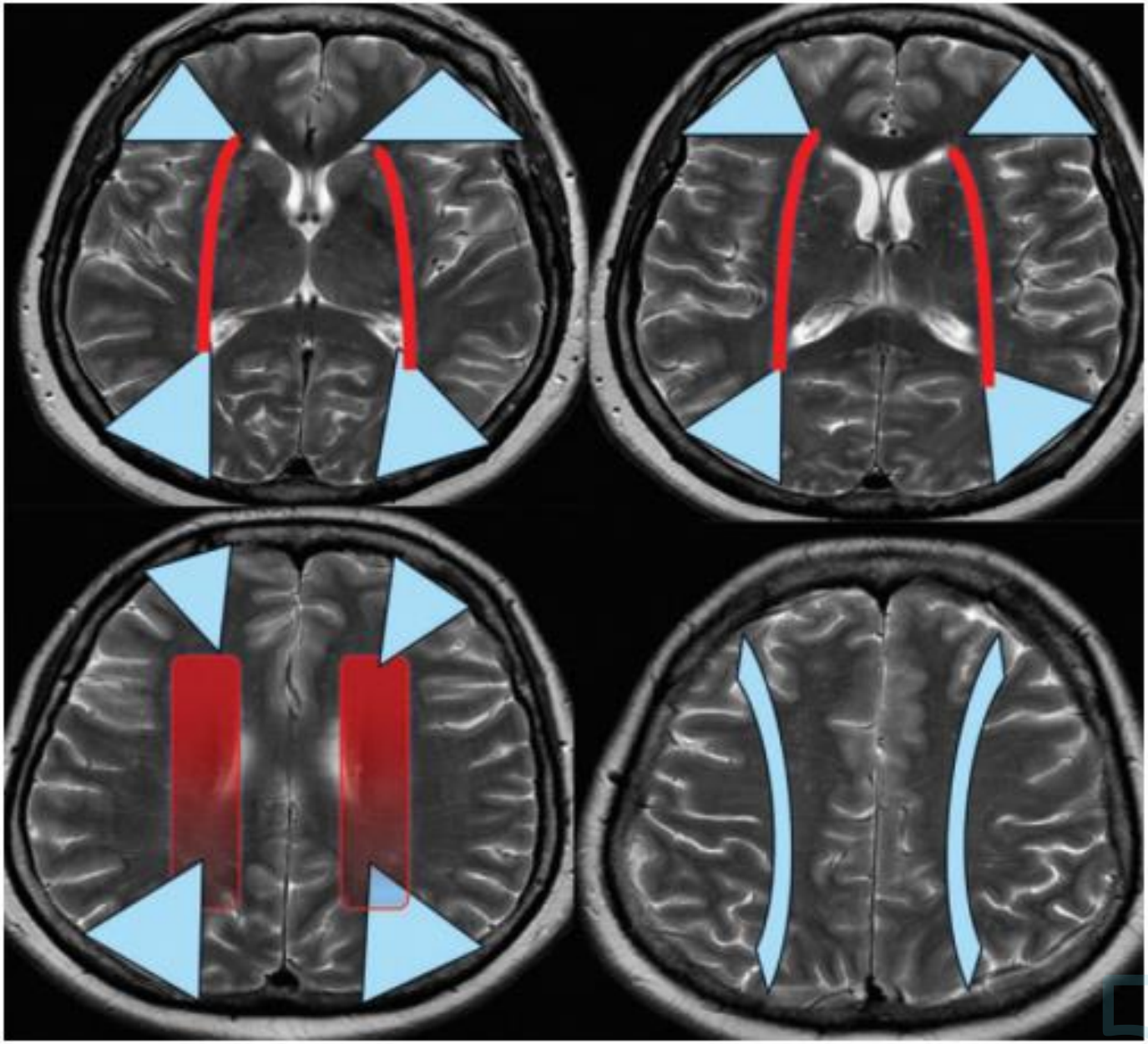
Transient monocular blindness

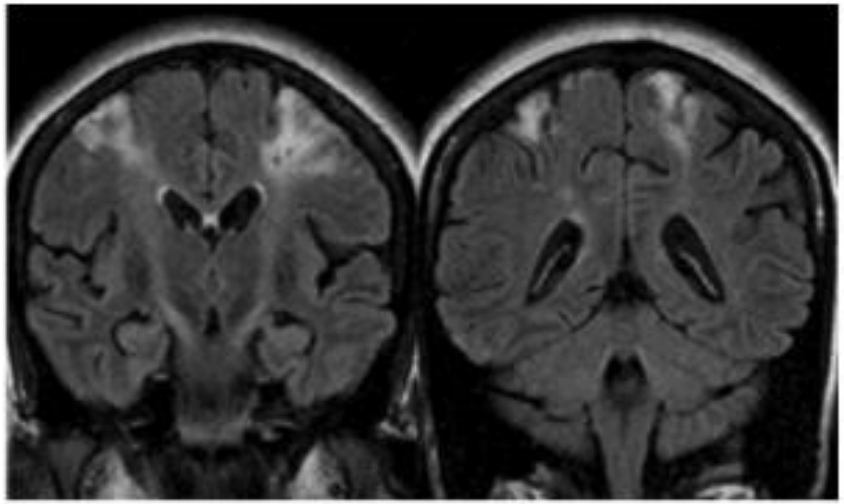
TIA

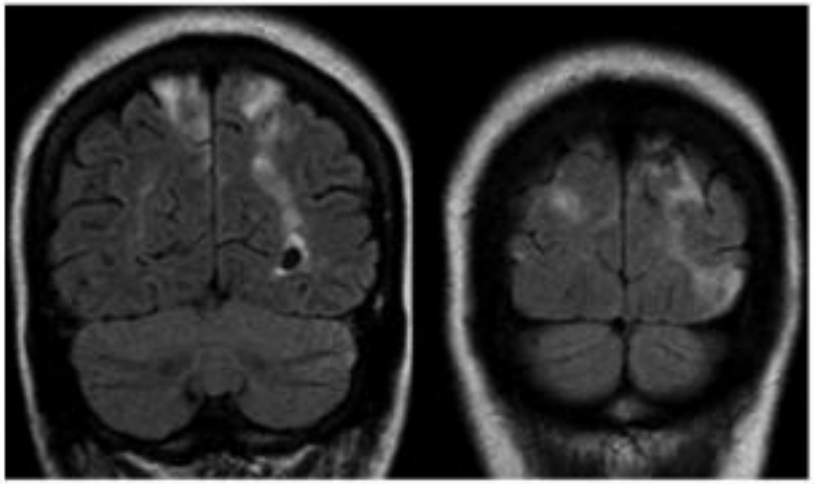
Limb shaking TIA

Prior stroke in same territory

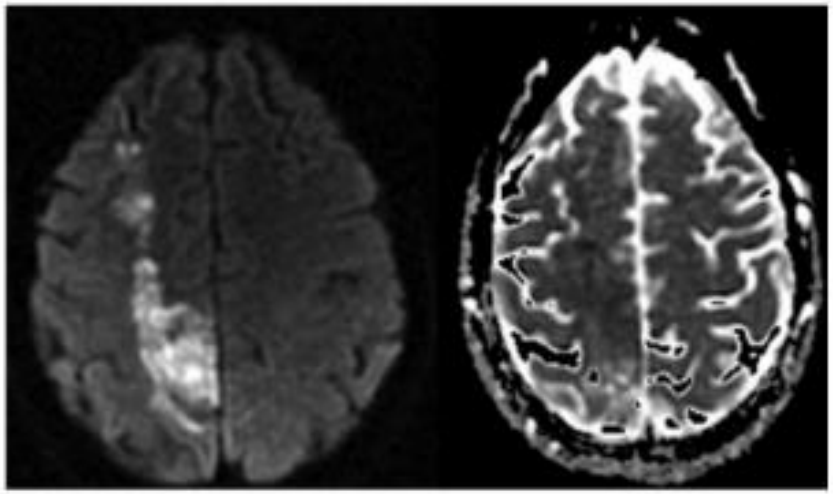
Im







a.



Mr.F

60/m

Diabetic/hypertensive

Sudden onset giddiness/vomiting and imbalance while walking

For last 3hours

o/e-bp-150/70mmhg

Bilateral gaze paretic nystagmus

Headimpulse test- negative, no skew

Diagnosis

A)Vestibulopathy

B)Posterior circulation stroke

6. Mr B

70 yr

Headache/vomiting f/b

Sudden onset weakness of right side

Known hypertensive on irregular medications

O/E:

BP-210/90 mm Hg

Right UMN facial palsy and right upper and lower limb -0/5

Secondary prevention

Etiology	Management
Non-cardio embolic	Anti platelets
Stroke while on Aspirin	Escalate dose
Ischemic Stroke with AF	Start Oral Anti-coagulants in 4-14 days, Target INR 2-3
Ischemic stroke with hemorrhagic transformation	Continue Anti-platelets
Ischemic stroke with Extracranial dissection	Anti-platelet or anti coagulant 3-6 months
TIA	Dual anti-platelets for 3 weeks followed by single
Embolic stroke of undetermined source	24-48 Hrs Holter
Atherosclerotic Cardio vascular disease ≤75 yrs	High Intensity statins

AHA/ASA Guidelines, 2018

Carotid Stenosis

Severity of stenosis	Management
Mild (<50%)	Single anti-platelet
Moderate (50-70%)	High Intensity Statin, SBP around 140 mm Hg
Severe (70-99%)	Dual anti-platelets 70-99% -90 days

Primordial and primary prevention

DIET: Decrease Sodium intake,
Decrease calories,
Decrease simple sugars

EXERCISE: Moderate to intense exercise 3-4 times a week

WEIGHT CONTROL: If Obese –Goal is <30kg/m2
If overweight-<25kg/m2
Healthy- 18.5-25 kg/m2

SMOKING CESSATION:
Nicotine patch, Bupropion

OTHER MODIFIABLE RISK FACTORS: HTN, Hyperlipidemia, DM, Alcohol consumption

CONCLUSION

Stroke is a medical emergency.

Knowledge of etiology, pathology and imaging helps in correct diagnosis and management.

Secondary prevention helps in reducing the recurrence.

Primary prevention is the need of time for reducing stroke burden.

Thank You

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