


Anyone Can Have a Stroke

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"Stroke Expert"

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"Stroke Expert"

Nevada Neurology and Vascular Center LLC


Ted Bruschi Age 31

Who wants a stroke?

800,000 stroke per year in US

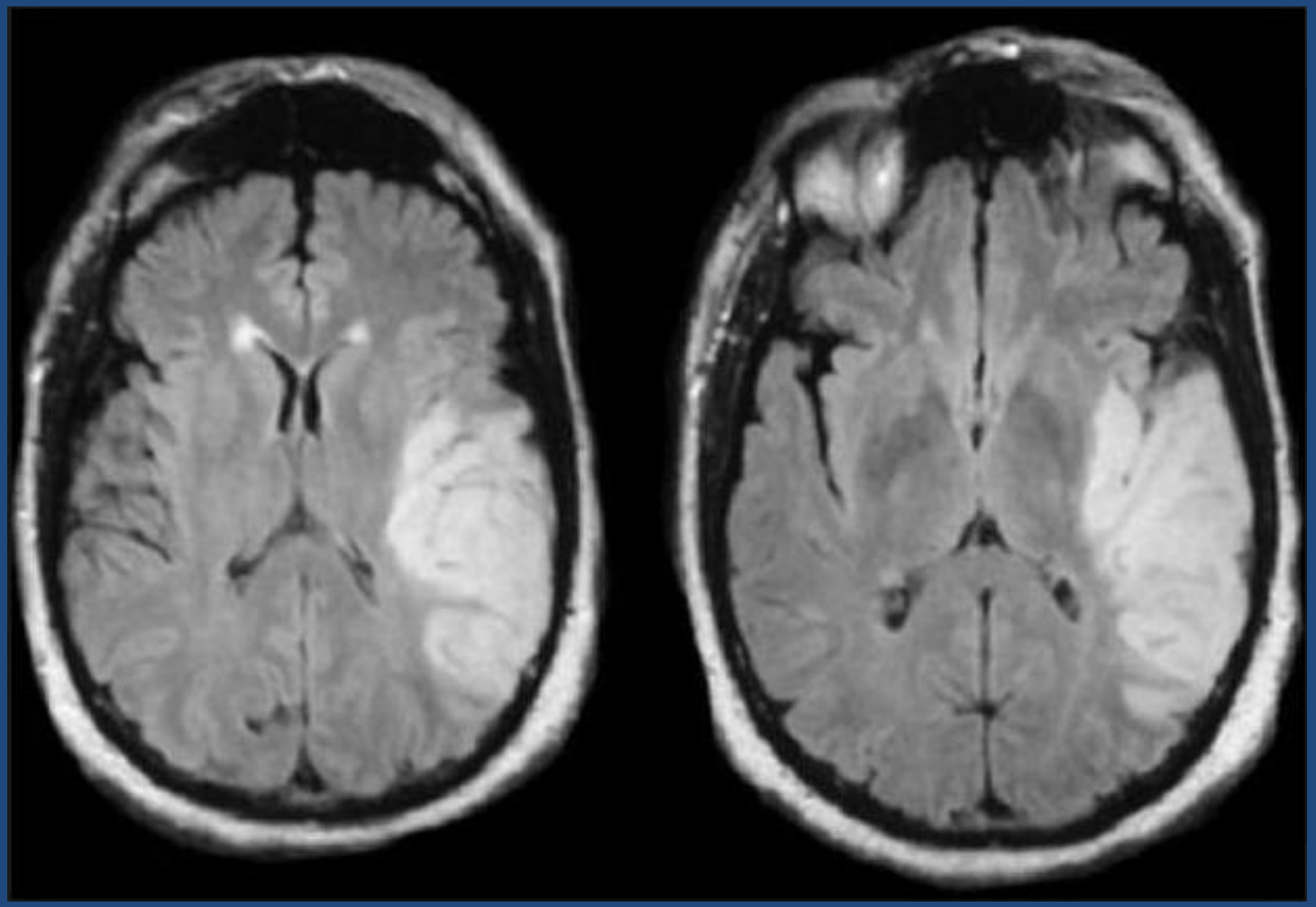
There are hundreds of causes of stroke

Strokes don’t kill they disable

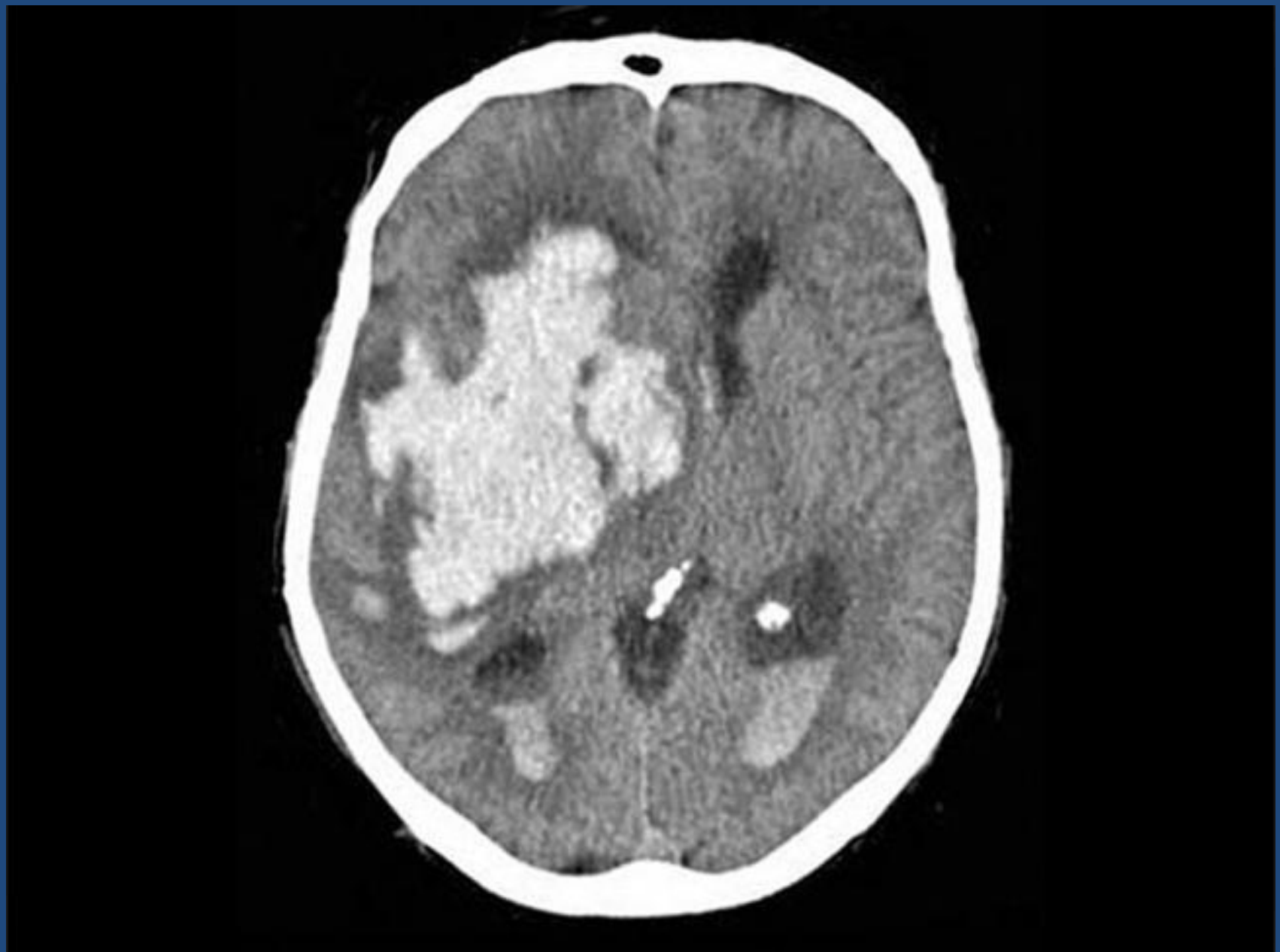
Leading cause of disability

What is a stroke?

Damaged brain



Do you take an aspirin if you are having symptoms of a stroke?



Are stroke and TIA the same thing?

T – Transient

I – Ischemic

A – Attack

12 to 25 % of people with TIAs will go on to have stroke within 90 days

Most strokes occur within first 7 days after TIA

TIAs are a neurological emergency and should be evaluated within 24 to 48 hours

50% TIAs are not TIAs

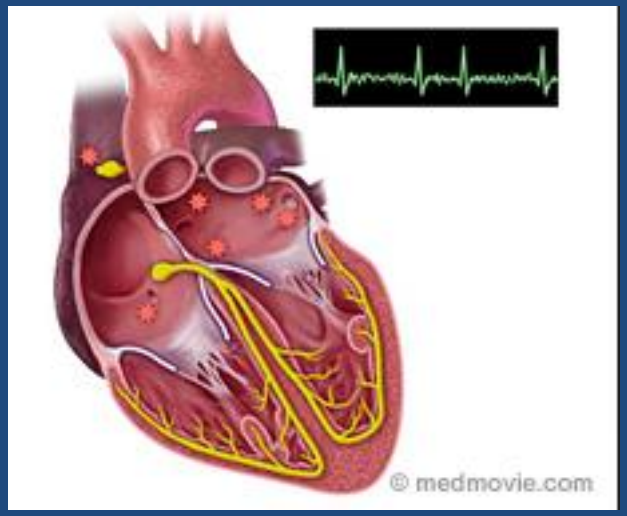
What causes a stroke?

Thrombosis

What causes a stroke?

Thrombosis

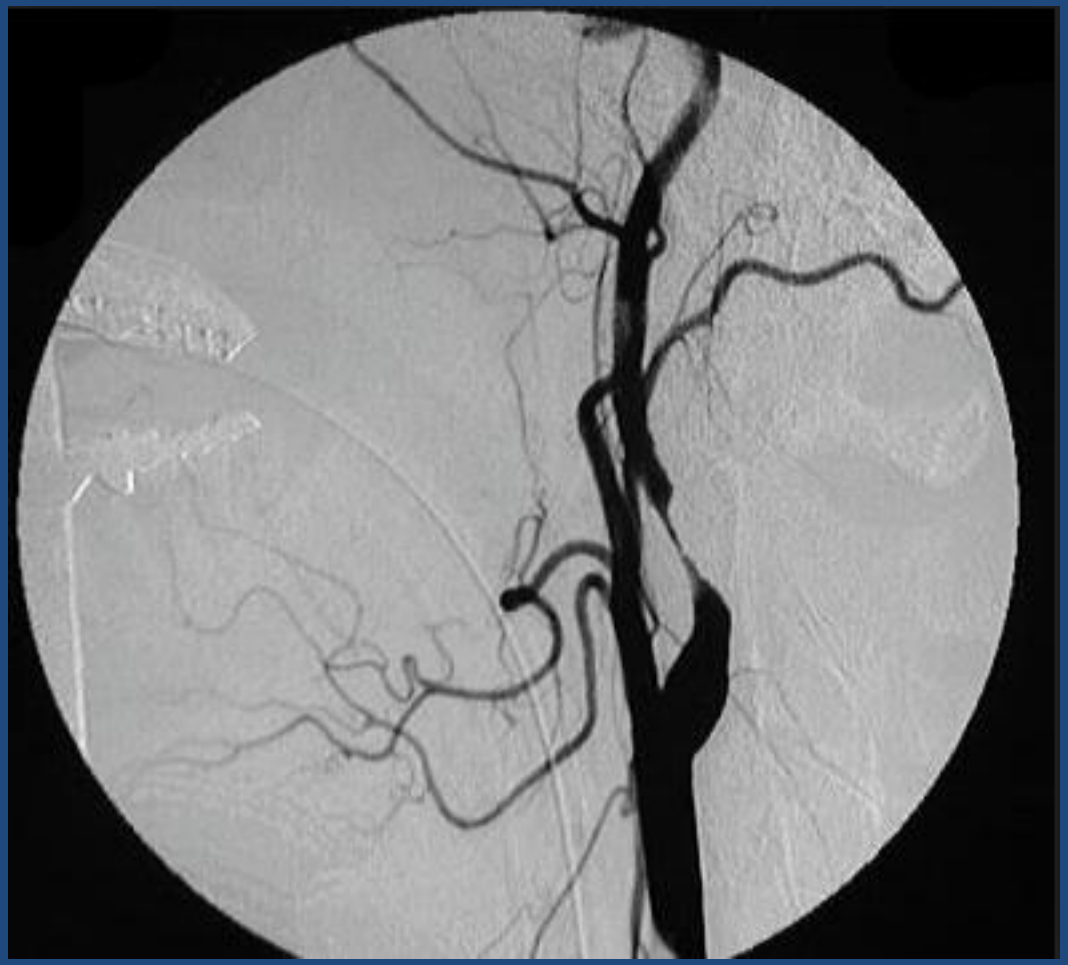
Embolus



MCA 3 mm

What causes a stroke?

Thrombosis
Embolus
Dissection



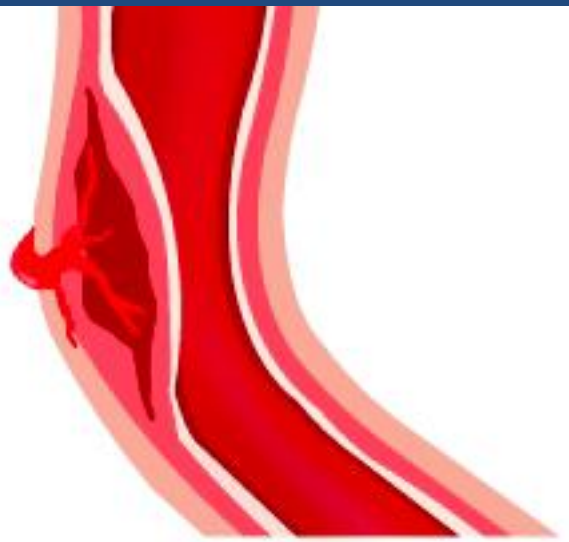


Fig 1 A haemorrhage into the vessel wall leading to occlusion of the vessel

Fig 2 An intimal tear

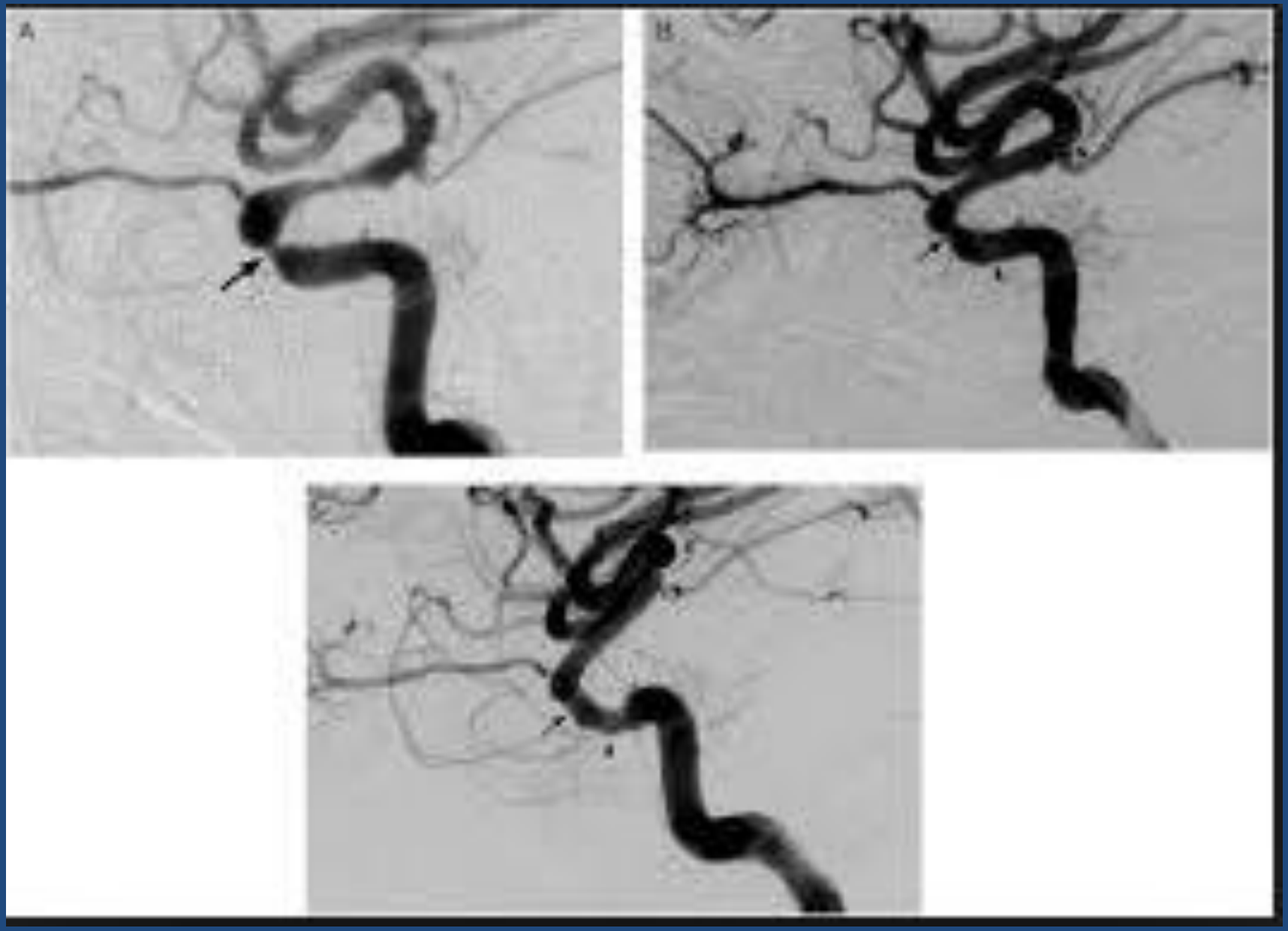
What causes a stroke?

Thrombosis
Embolus
Dissection
Vasospasm

What causes a stroke?

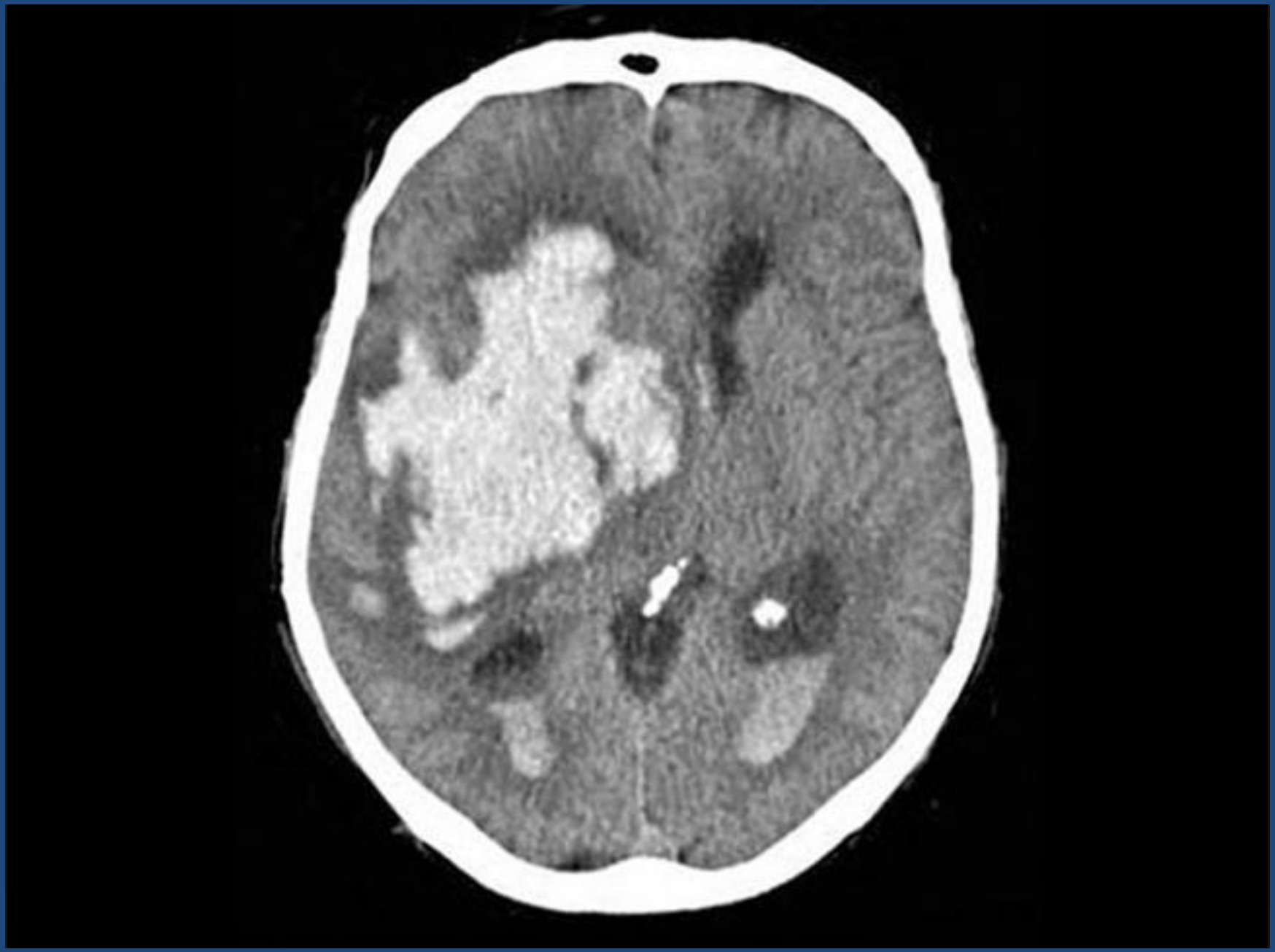
Thrombosis
Embolus
Dissection
Vasospasm
Luminal narrowing


CCA PROX


A
B

What causes a stroke?

Thrombosis
Embolus
Dissection
Vasospasm
Luminal narrowing
Vessel rupture



Phases of stroke

Prevention

Acute treatment

Subacute treatment

Chronic treatment

What costs the most?

Depends on who is paying….

Society – Chronic treatment (Billions per year)
Disability costs – lost productivity, therapies

Insurance – Prevention

Where are most resources and attention focused?

Acute treatment

Acute symptoms:

FAST

F – Face weakness

A – Arm weakness

S – speech changes

T – Time (get to expert ASAP)

Call 911

Triage – front of line

If you didn’t get to front of line tell me

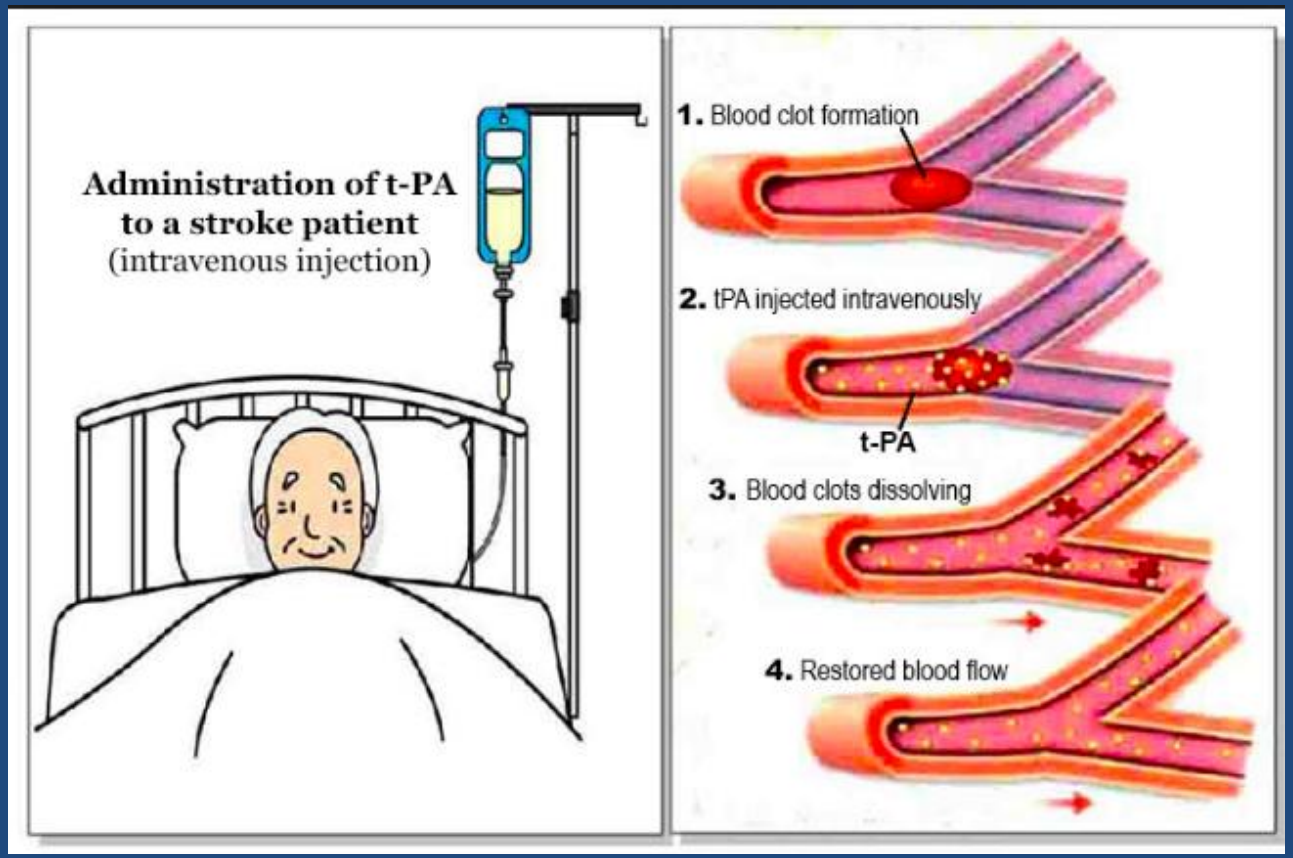
If you didn’t get considered for treatment tell me

CT head

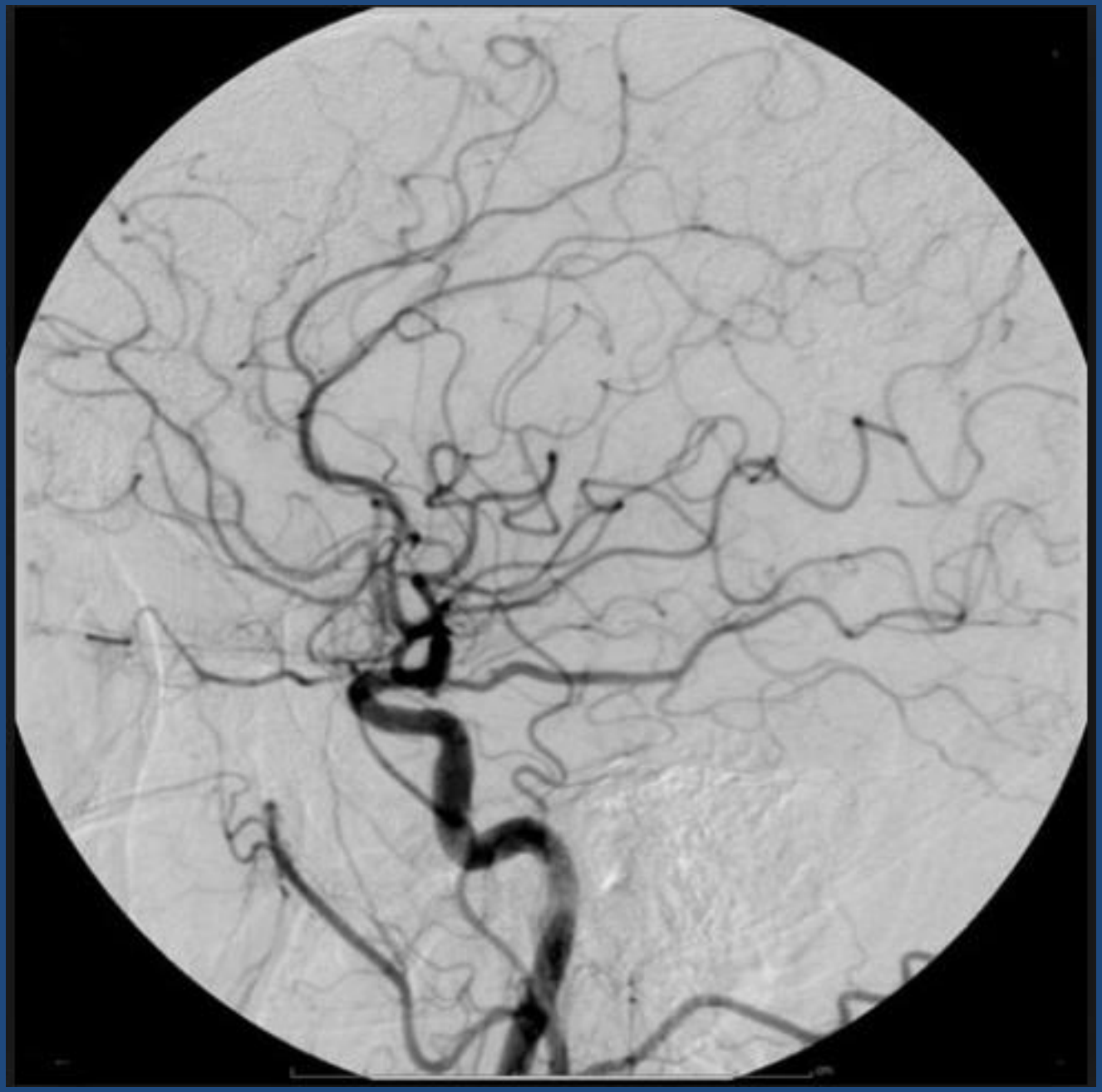
Neurological Exam

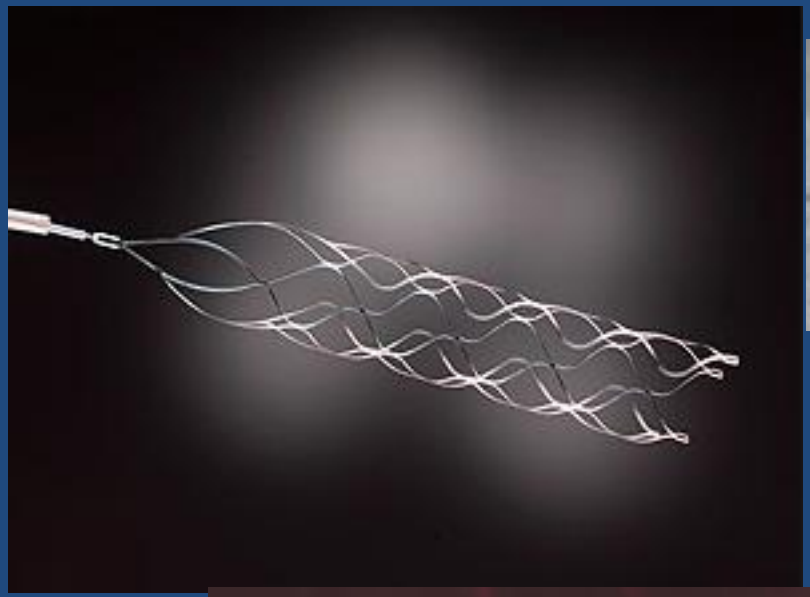
Symptoms less than 4.5 hours

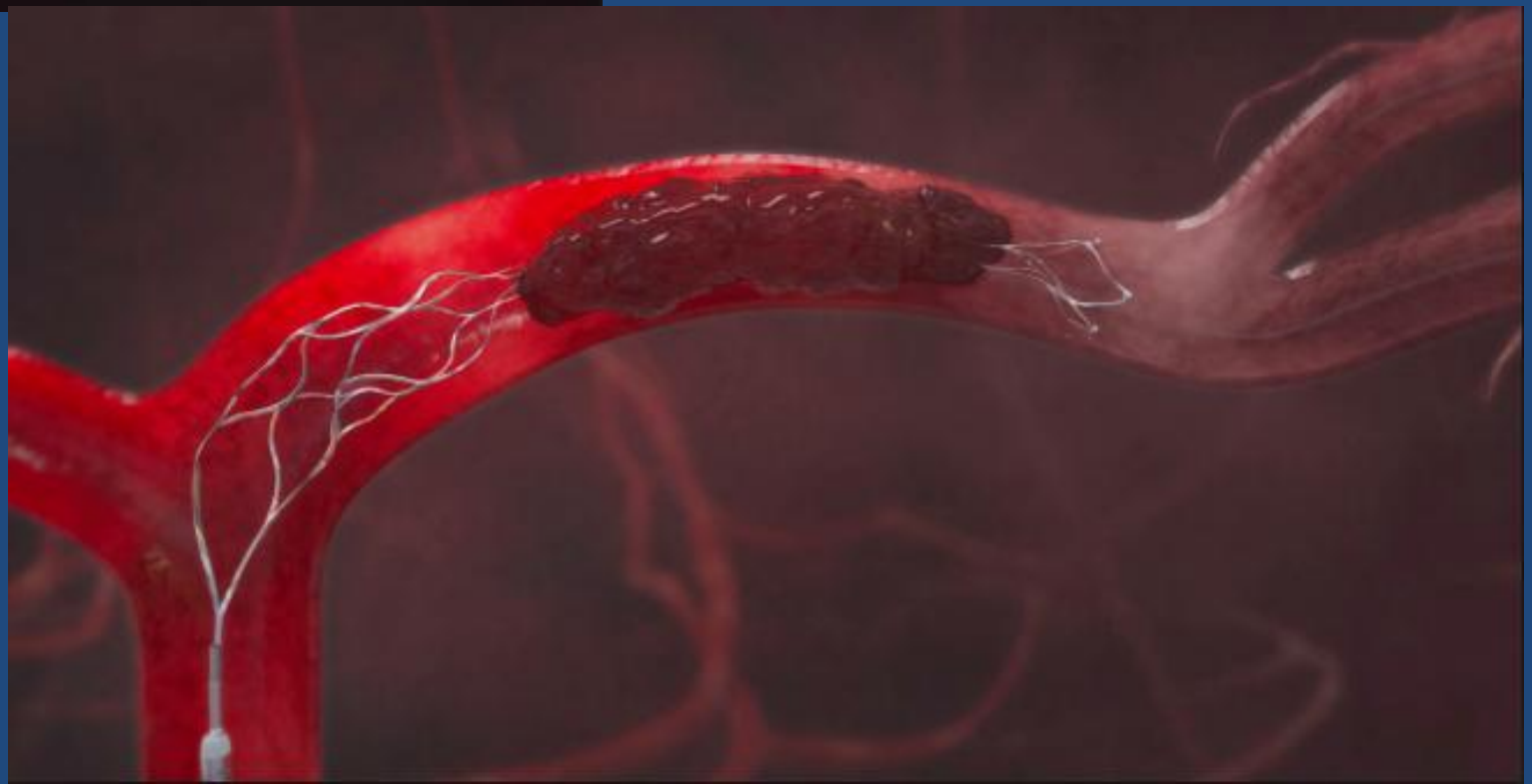
TPA




LINET







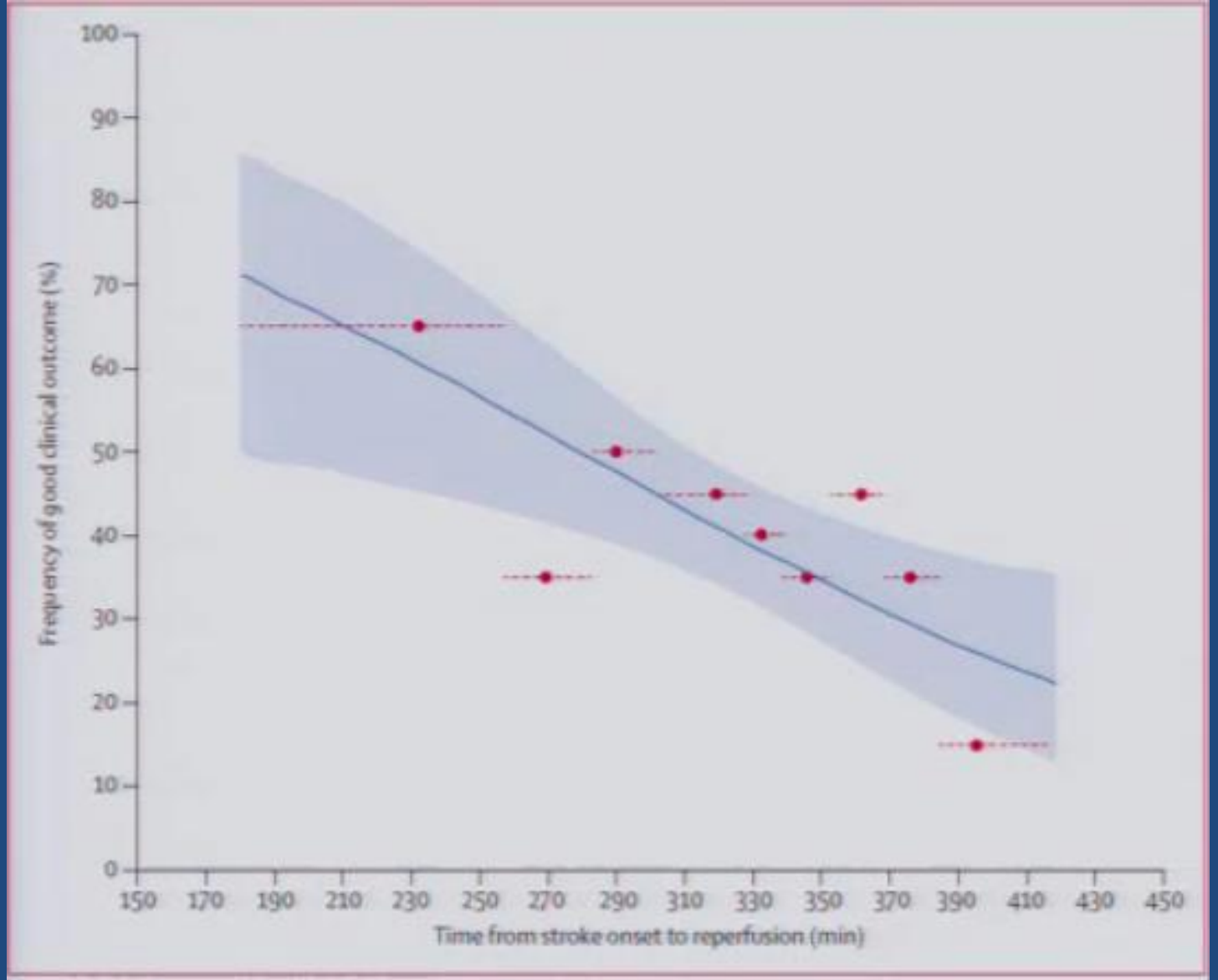


Figure 3: **Frequency of good clinical outcome by time, as predicted by unadjusted analysis**
The reperfusion cohort was divided into groups of about 20 on the basis of time to reperfusion. The red circles show the proportion with good outcome and mean time to reperfusion in each group, and the dashed lines depict the range of times included in that group. The solid line shows the model results from the logistic regression analysis, with 95% CIs shown in the shaded area. Good clinical outcome was defined as a modified Rankin Scale score of ≤2.

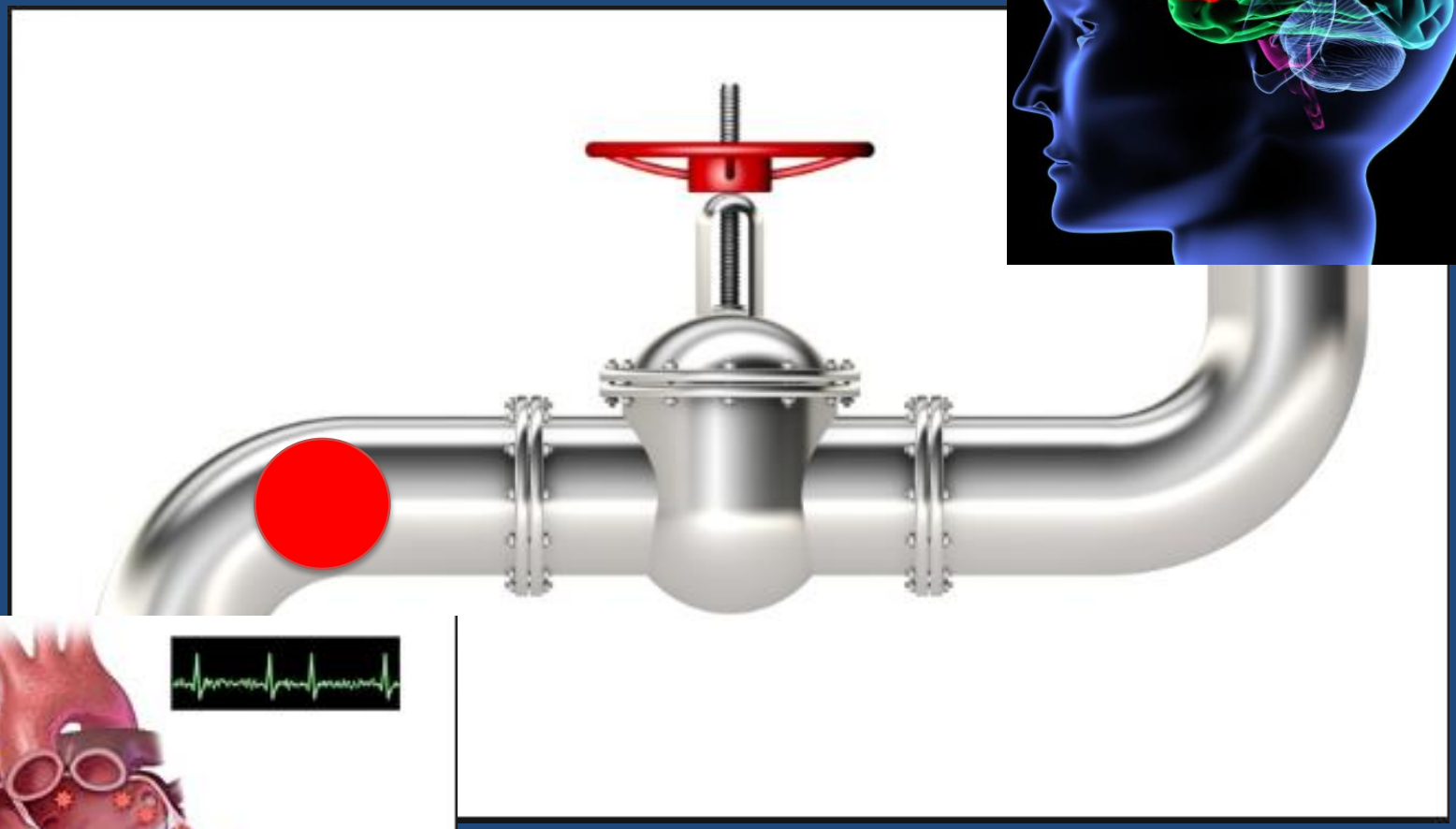
But…

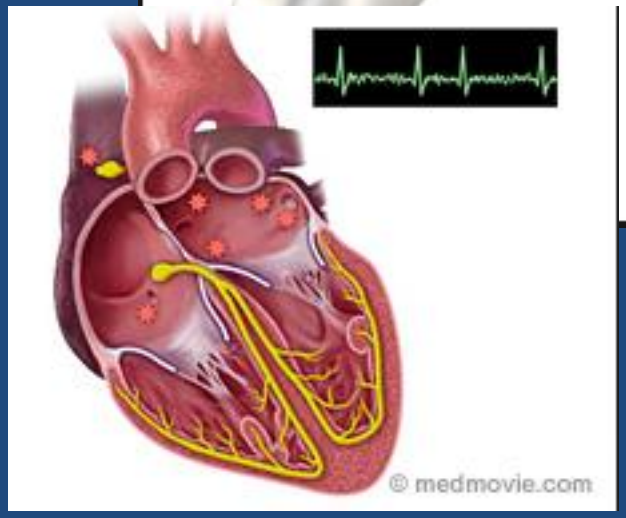
Lets discuss prevention

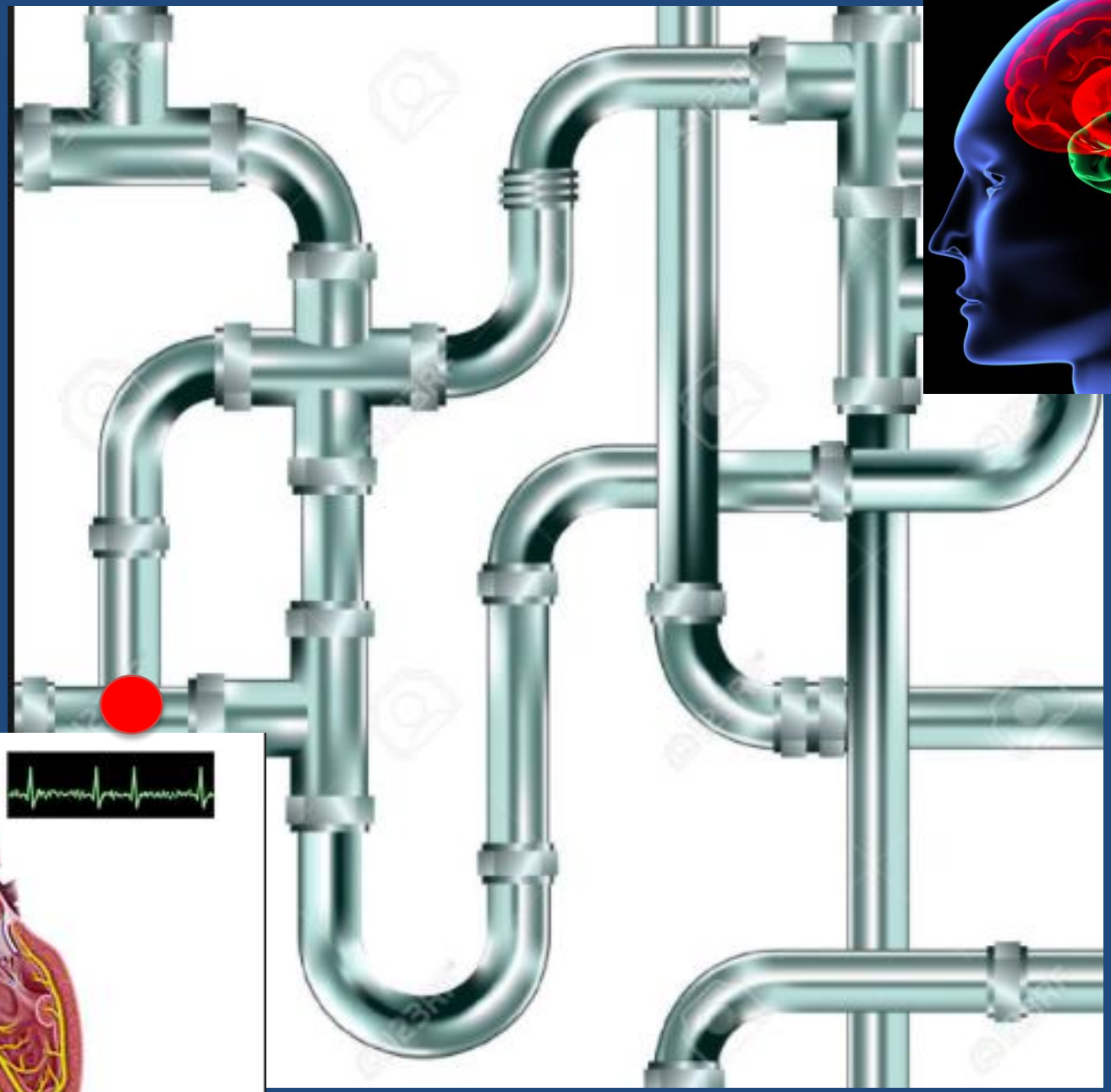
- Smoking
- Diabetes
- Hypertension
- Poor habits
- Genetics

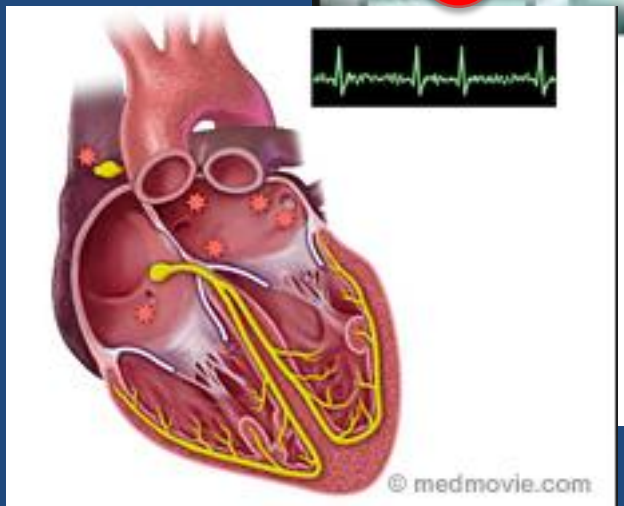
What is the most important factor in determining functional outcome from a stroke?

Collaterals !!!




© medmovie.com

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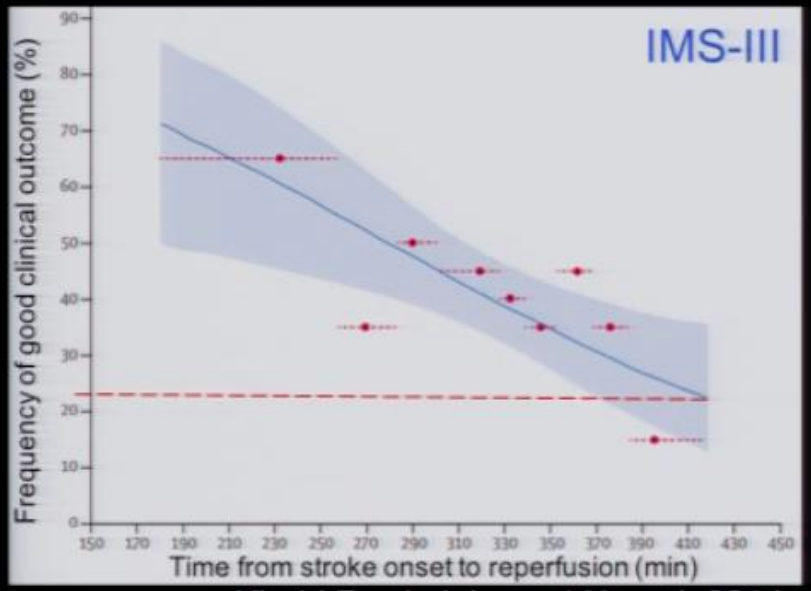
Previous studies



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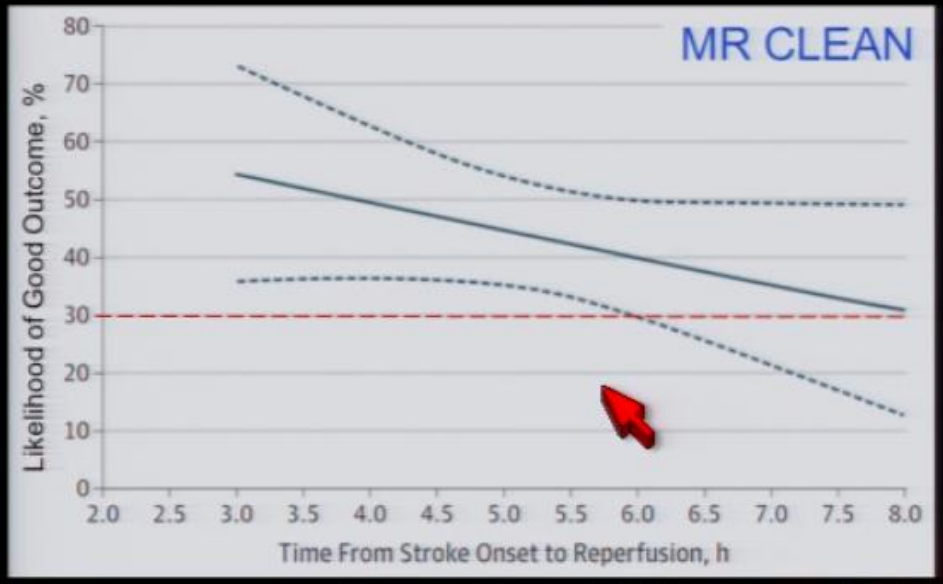

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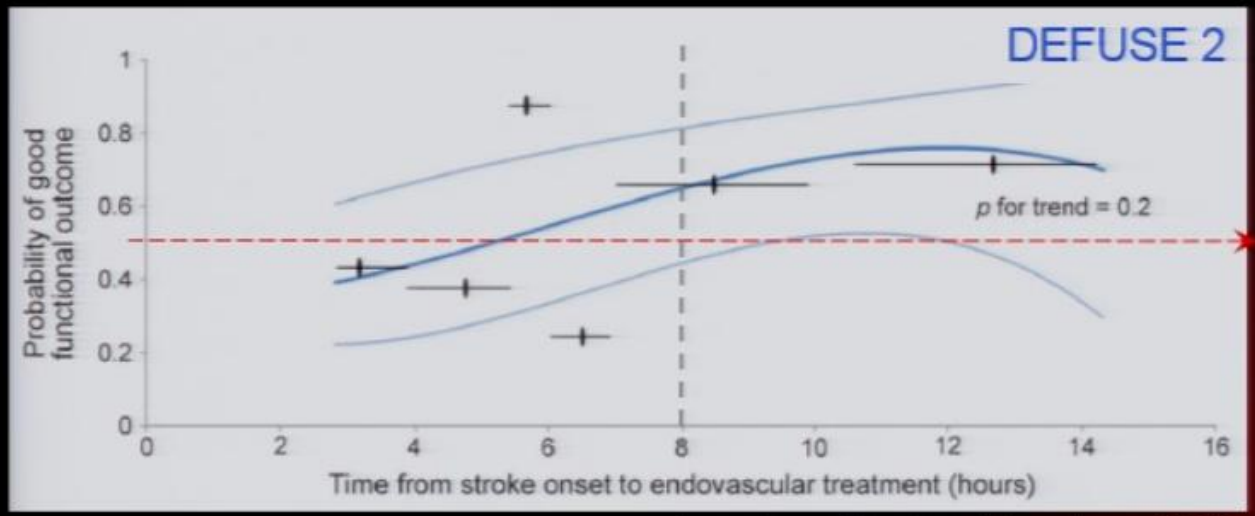
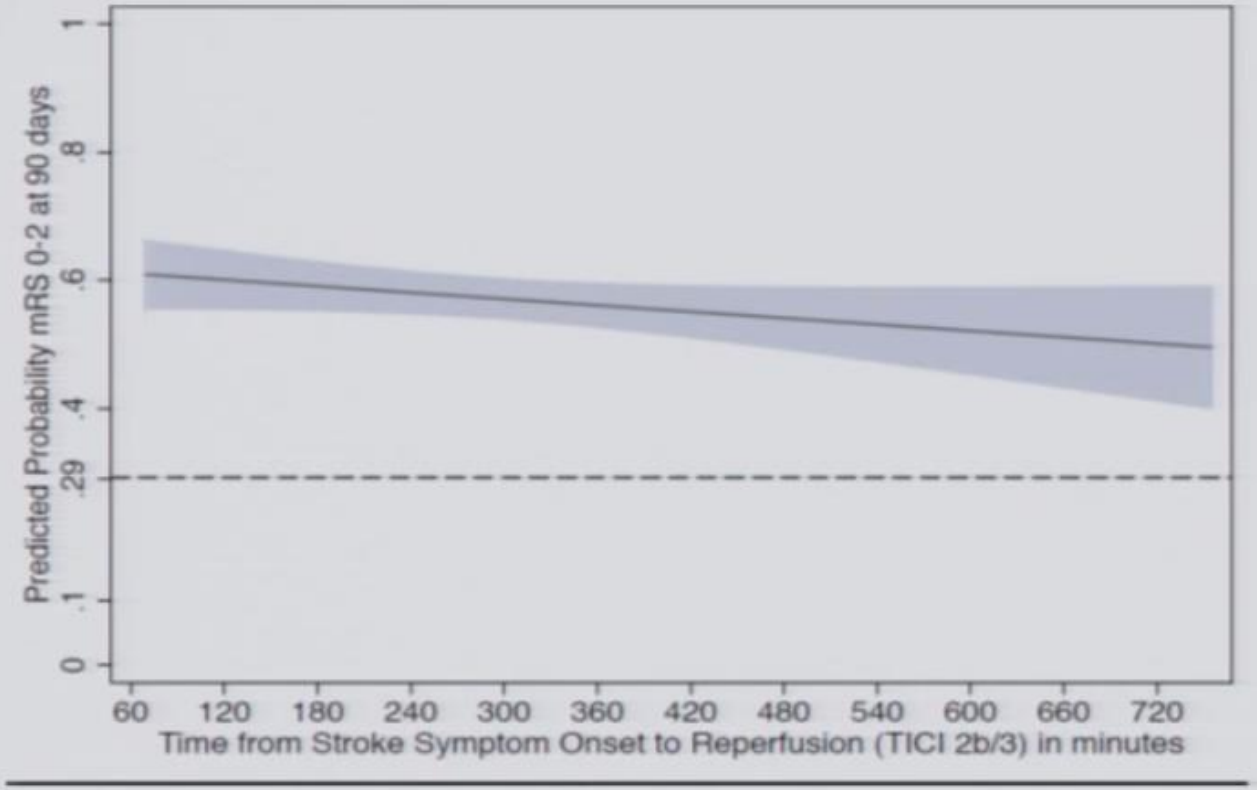


KHATRI CURVE REVISITED

RELATIONSHIP BETWEEN ONSET TO REPERFUSION AND LIKELIHOOD OF GOOD OUTCOME IN ESCAPE



N=113
Median ASPECTS = 9

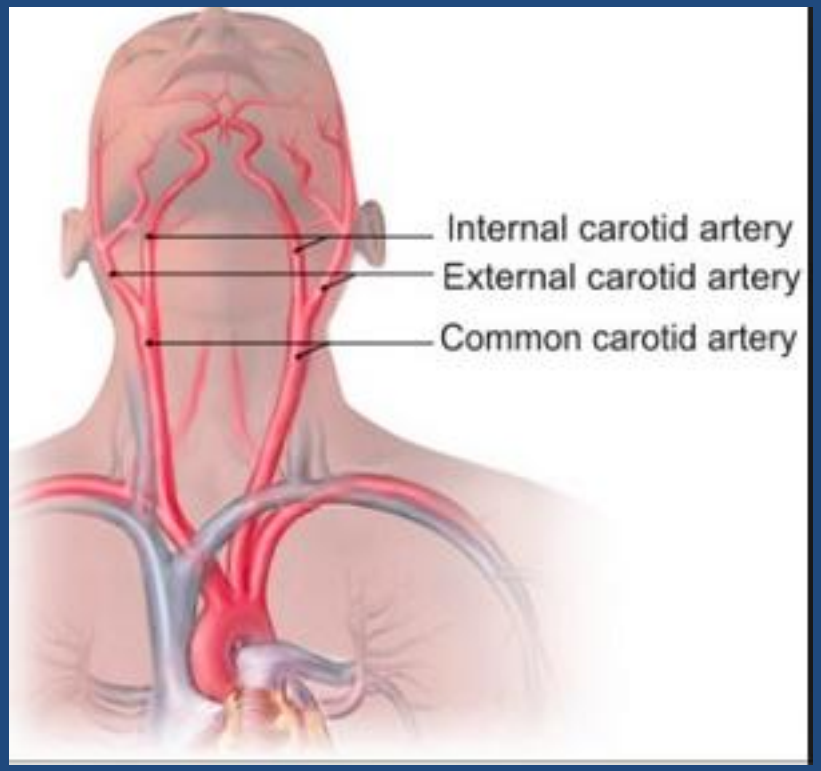
Every 30 minute delay in reperfusion is associated with a 0.5% relative reduction in probability of good clinical outcome (mRS 0-2).

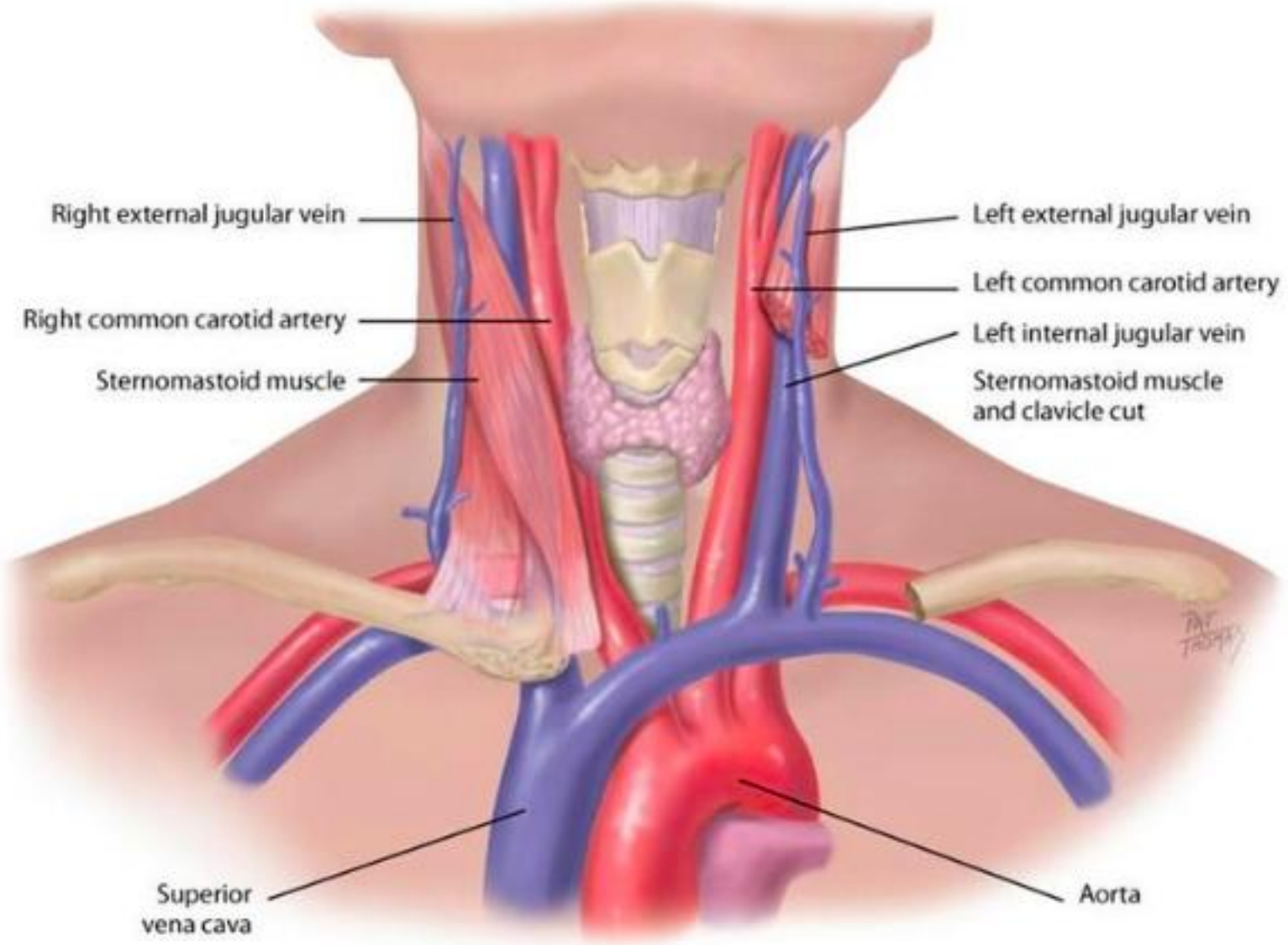
Courtesy of Dr. B Menon

Do you know your collaterals?

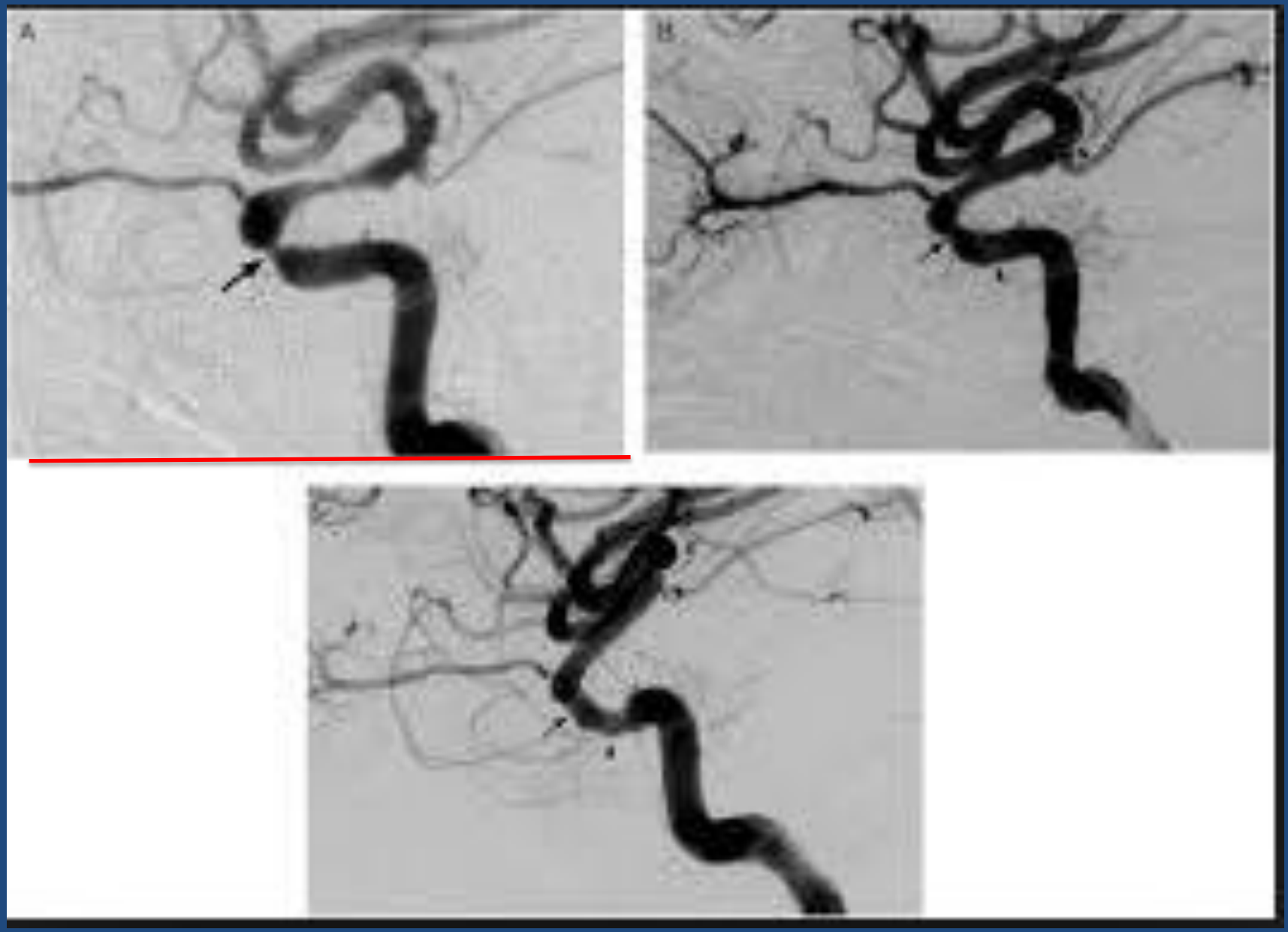
Who has had a carotid ultrasound exam?

If that is all you had then you don't know your collaterals?





NECK VESSELS



Father

$$$$

NASCET : Carotid artery stenosis > 70% (1994)

Surgery group: 3% stroke per year

Medical group ***: 12% stroke per year

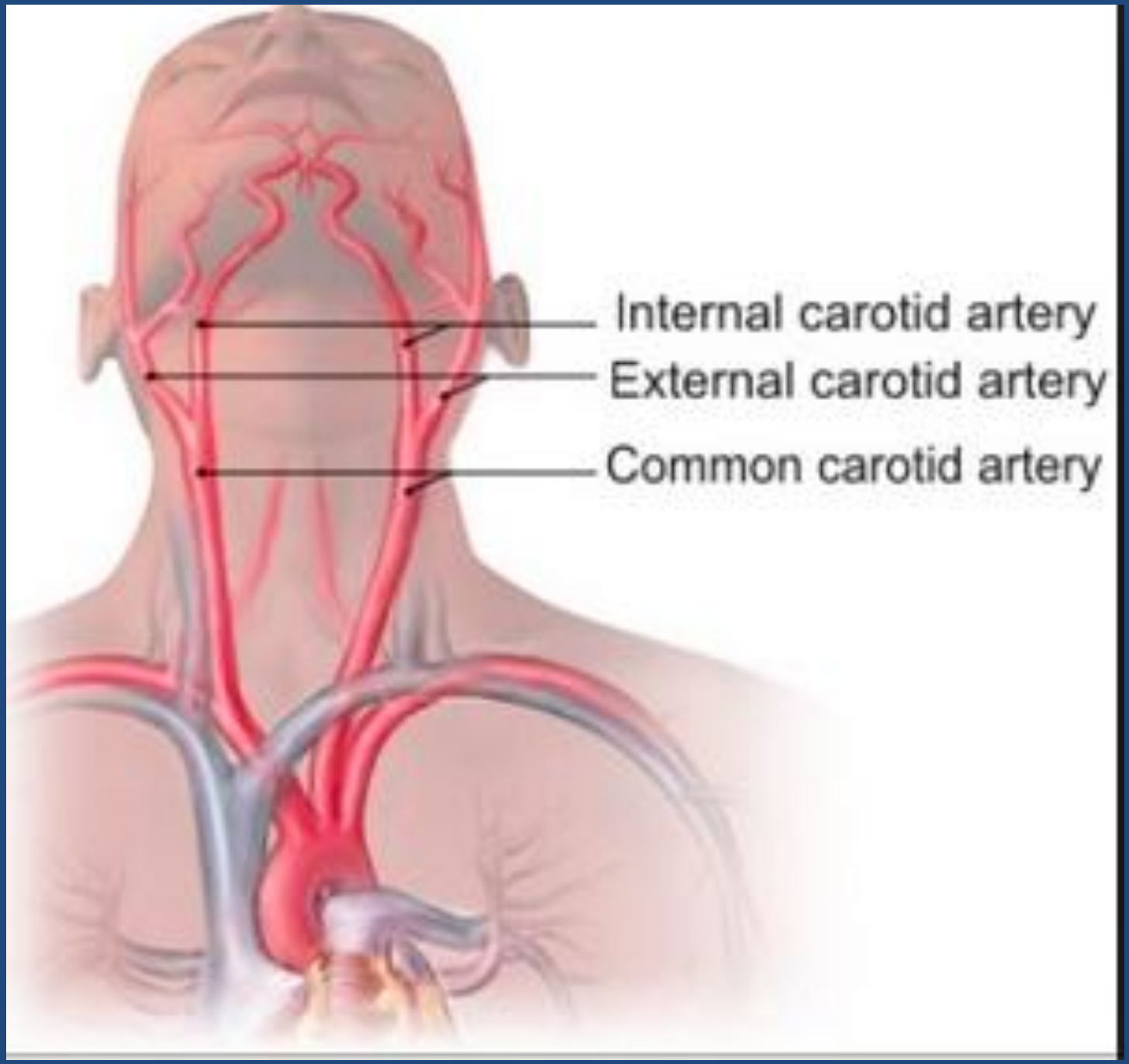
*** -- Before “maximal medical therapy”

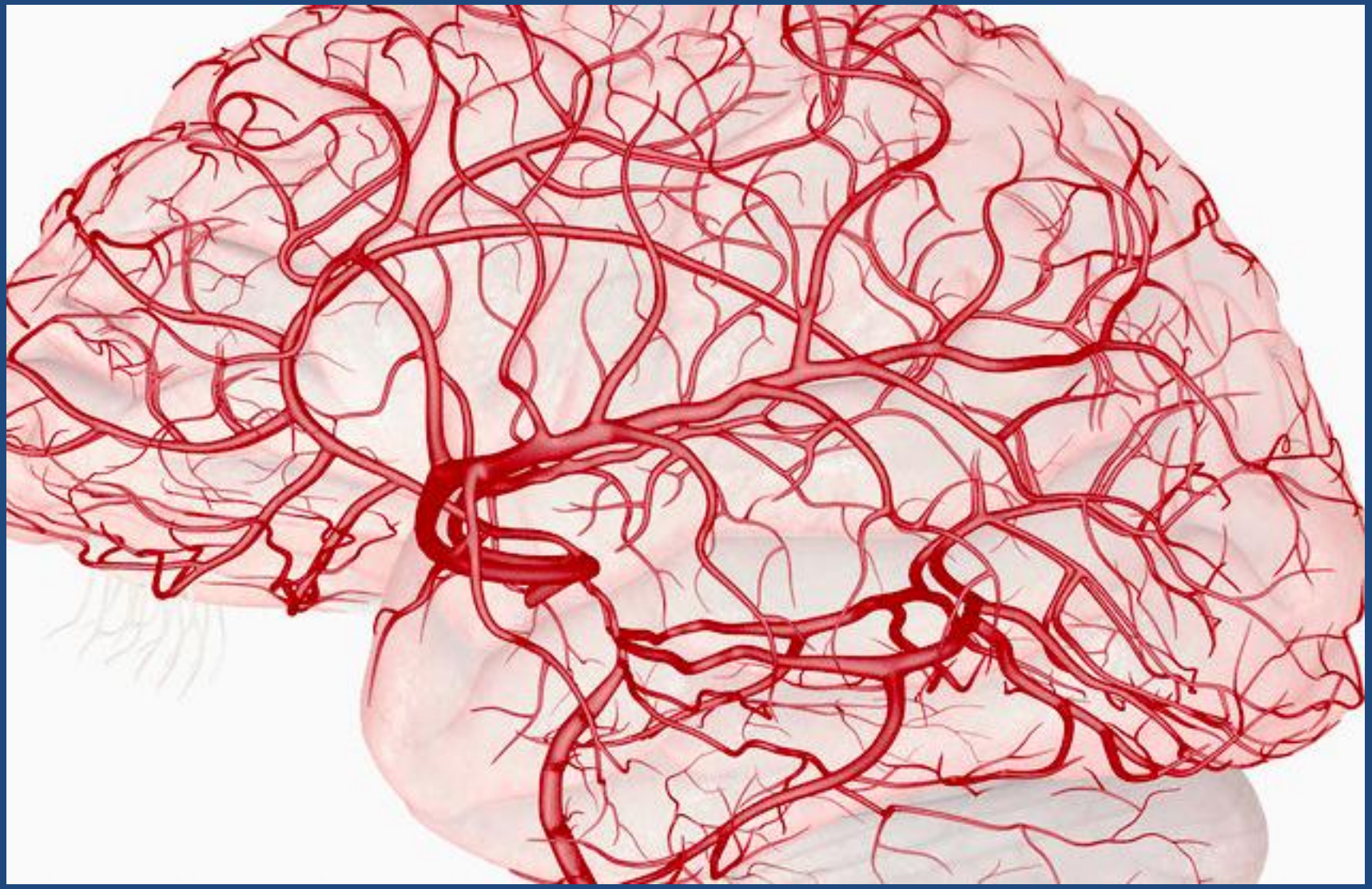
Lowering cholesterol
Controlling blood pressure
Controlling blood sugars
Anti inflammatory diet
Exercise

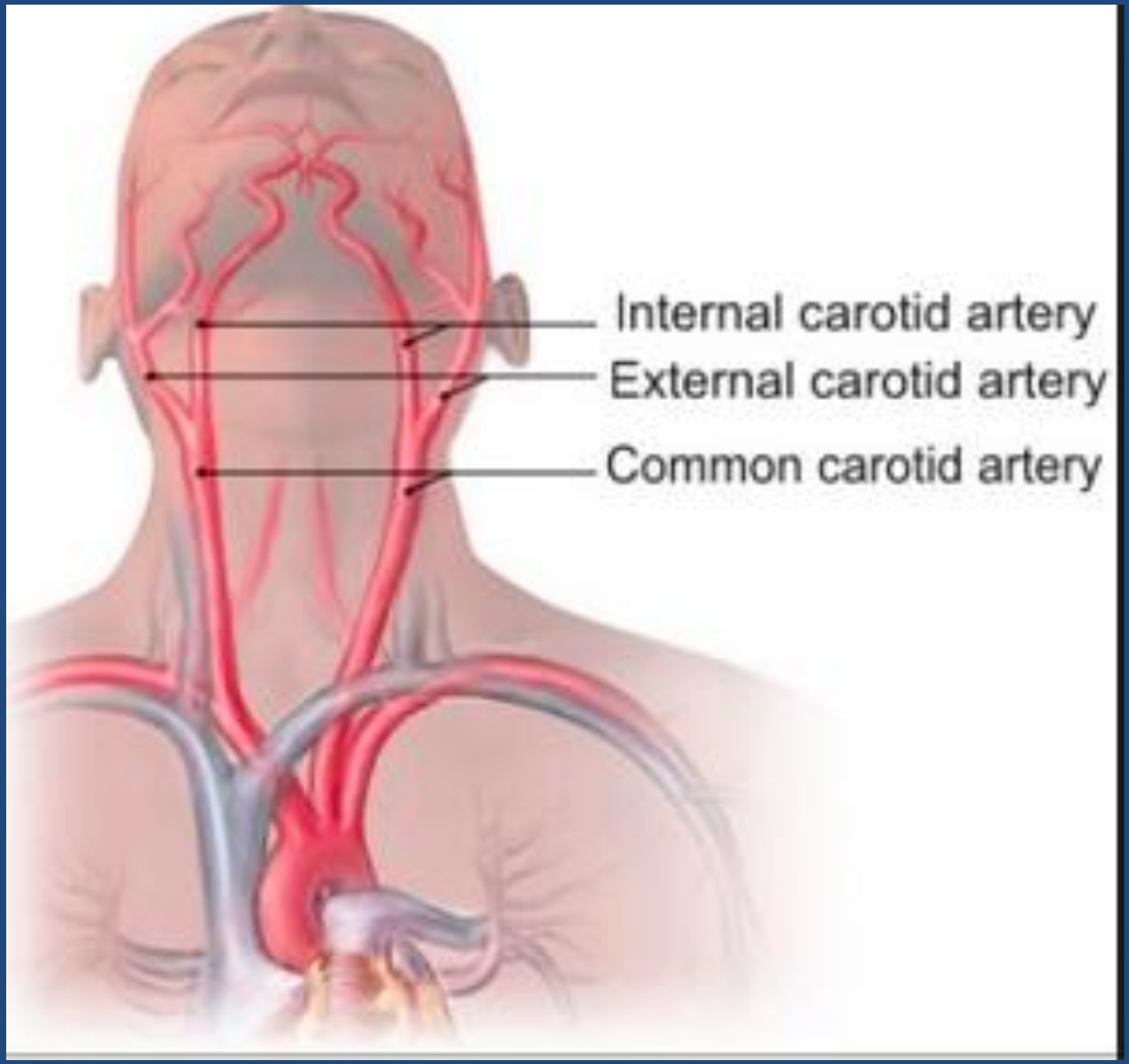
CREST 3

So now every one and their hamster does carotid ultrasound:

Vascular surgeons
Cardiologists
Primary Care doctors
Hospitals
Mobile businesses


Internal carotid artery
External carotid artery
Common carotid artery

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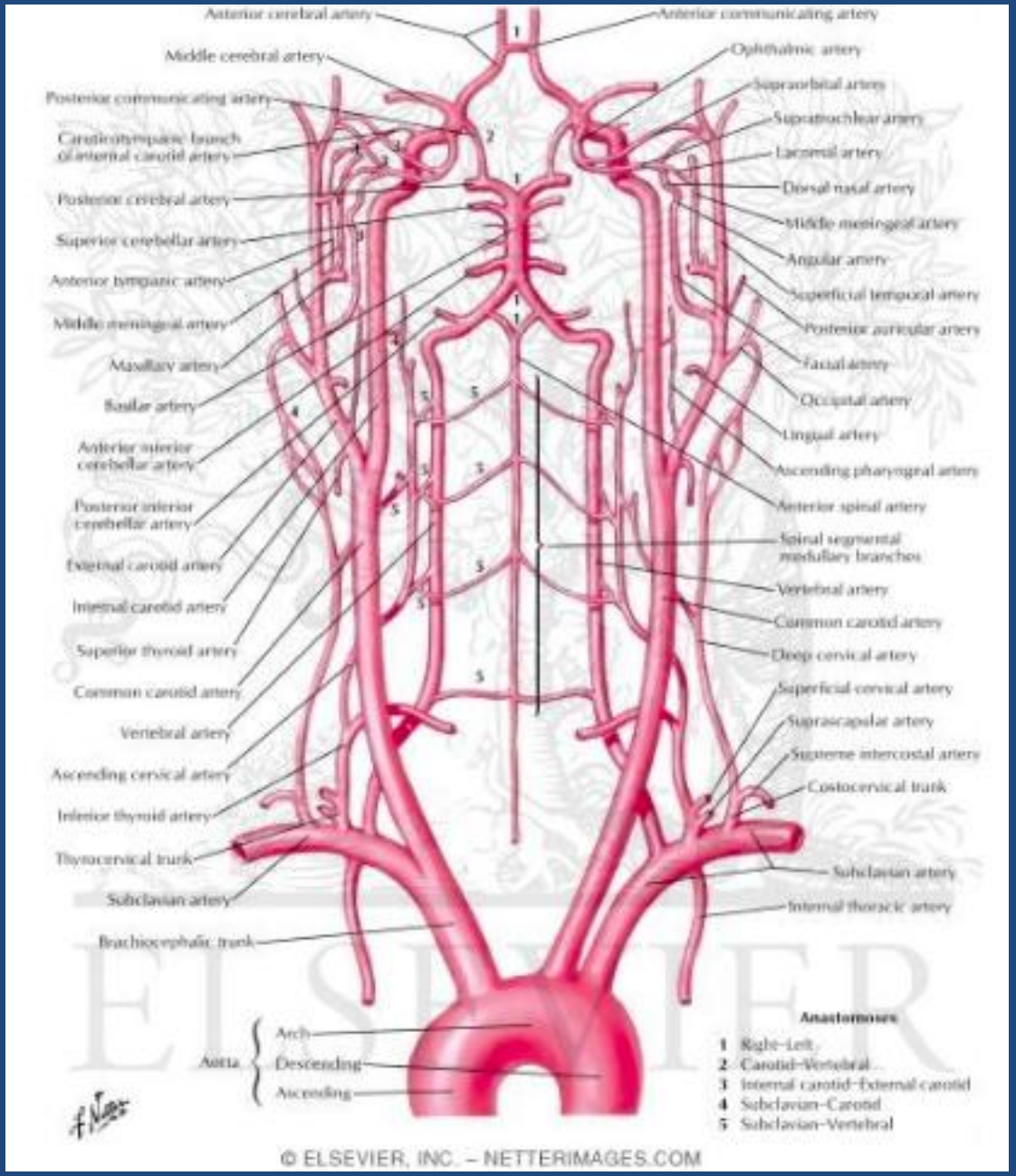
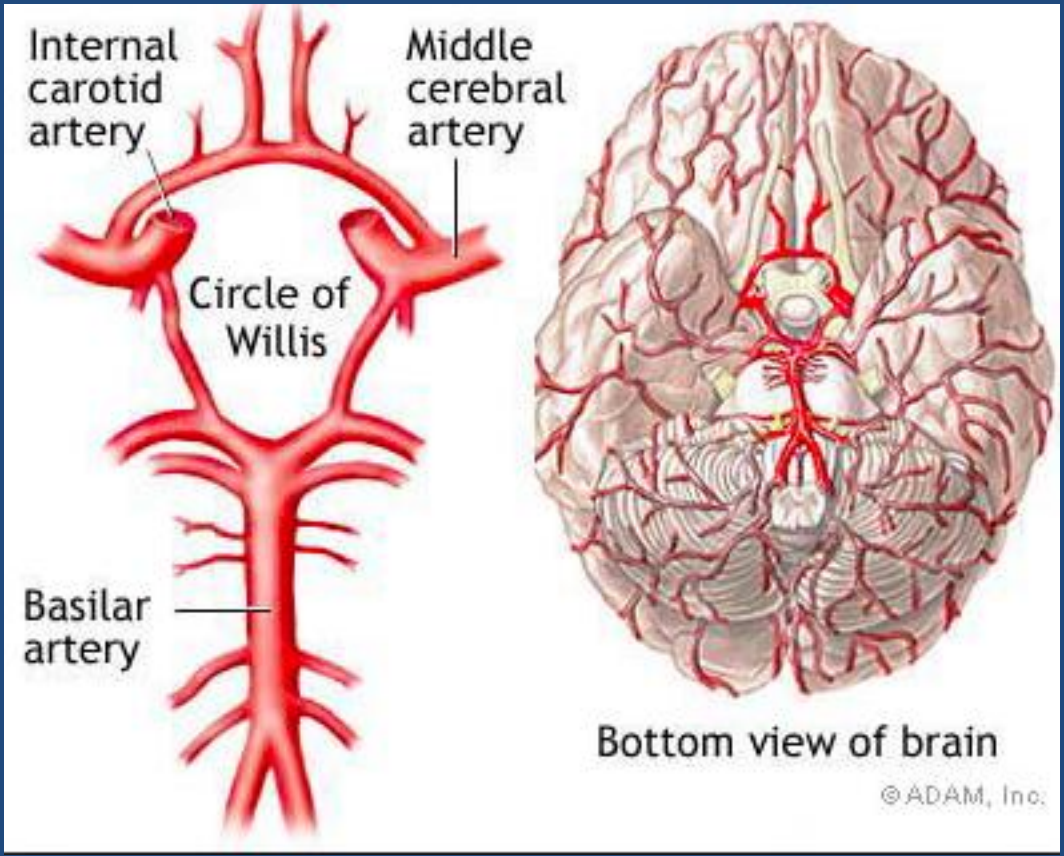
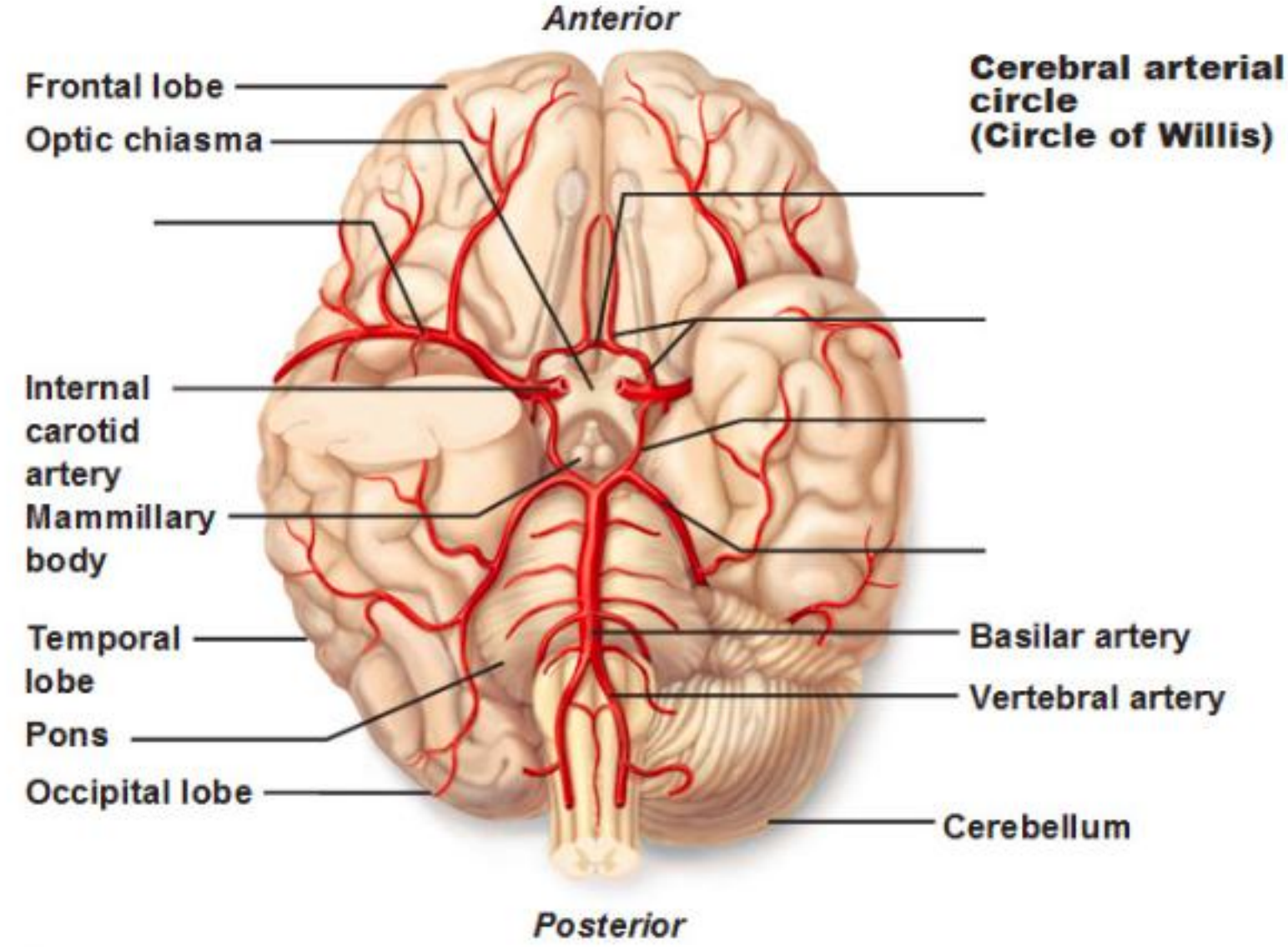
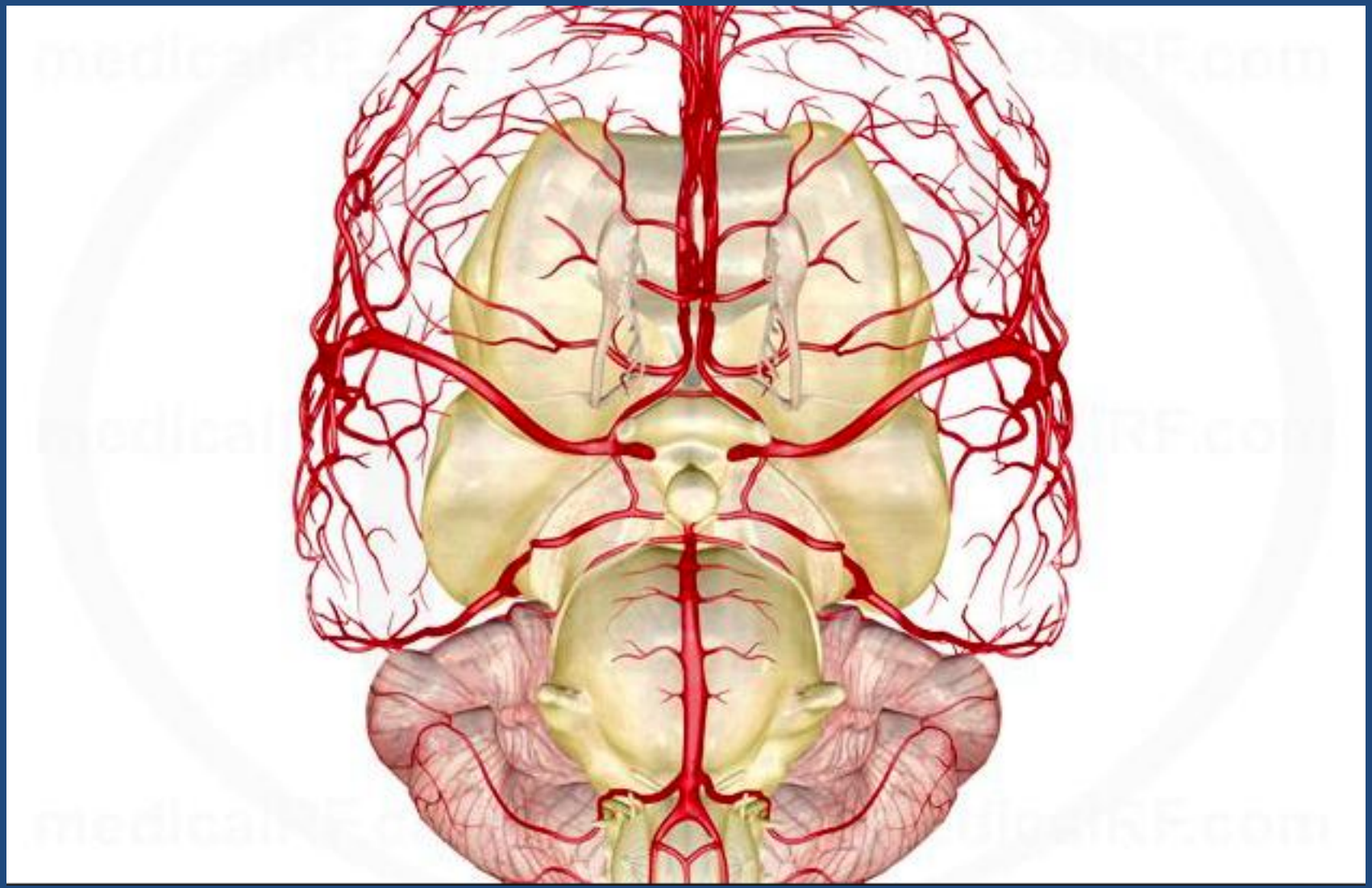
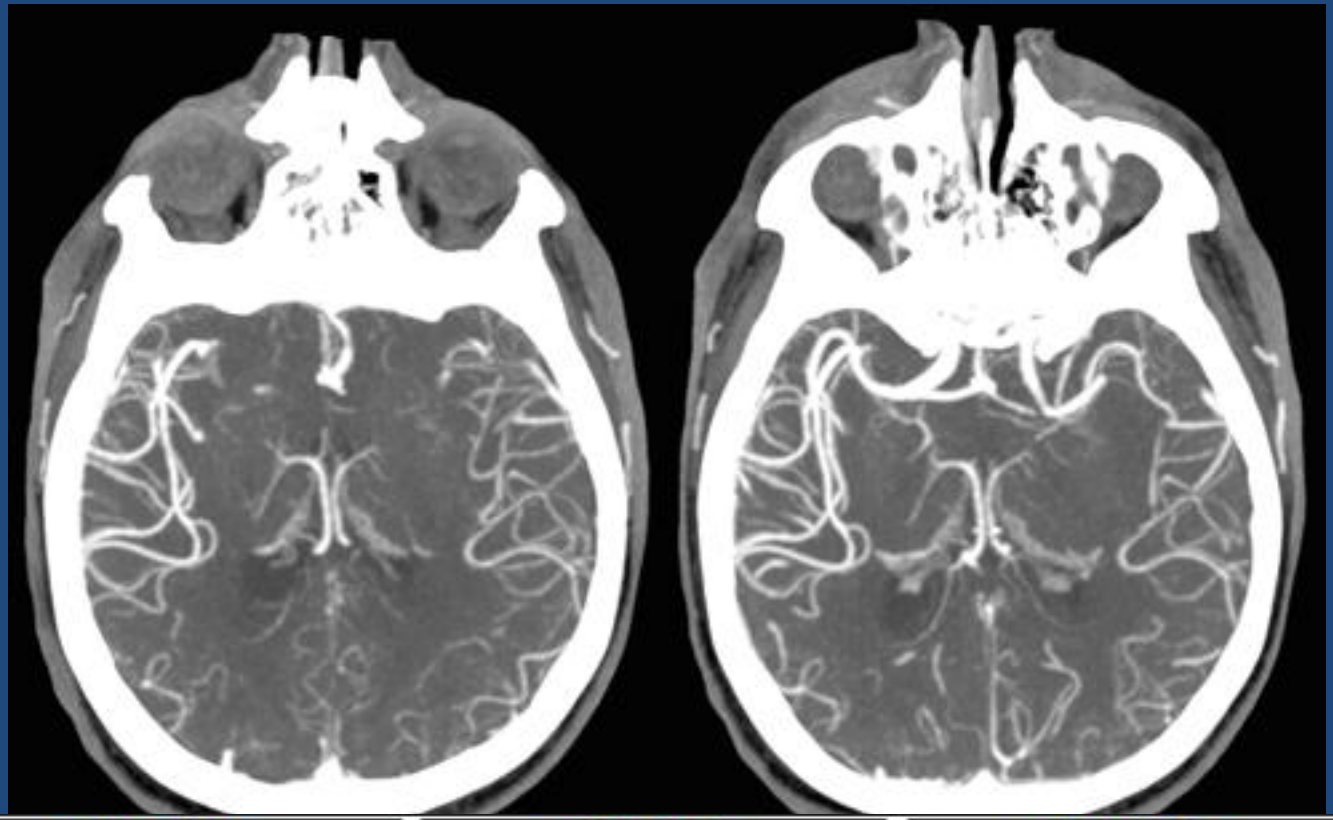


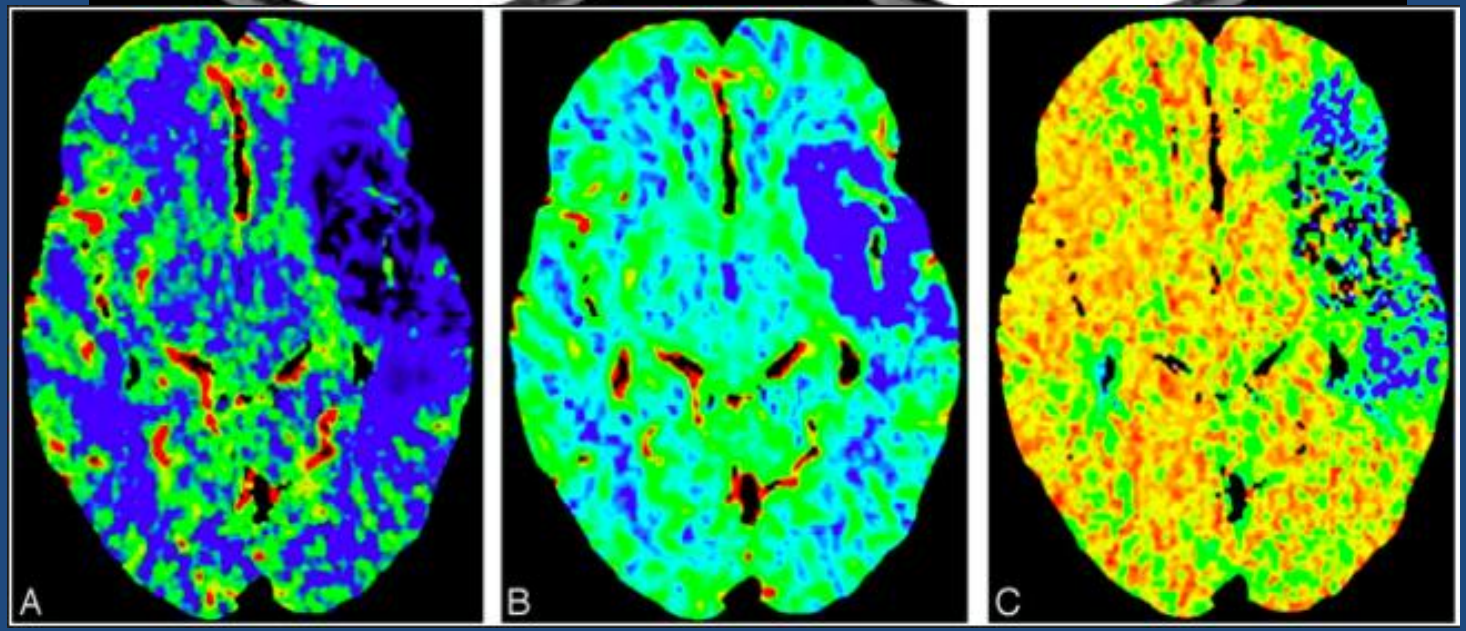

Internal carotid artery
Middle cerebral artery
Circle of Willis
Basilar artery
Bottom view of brain
©ADAM, Inc.

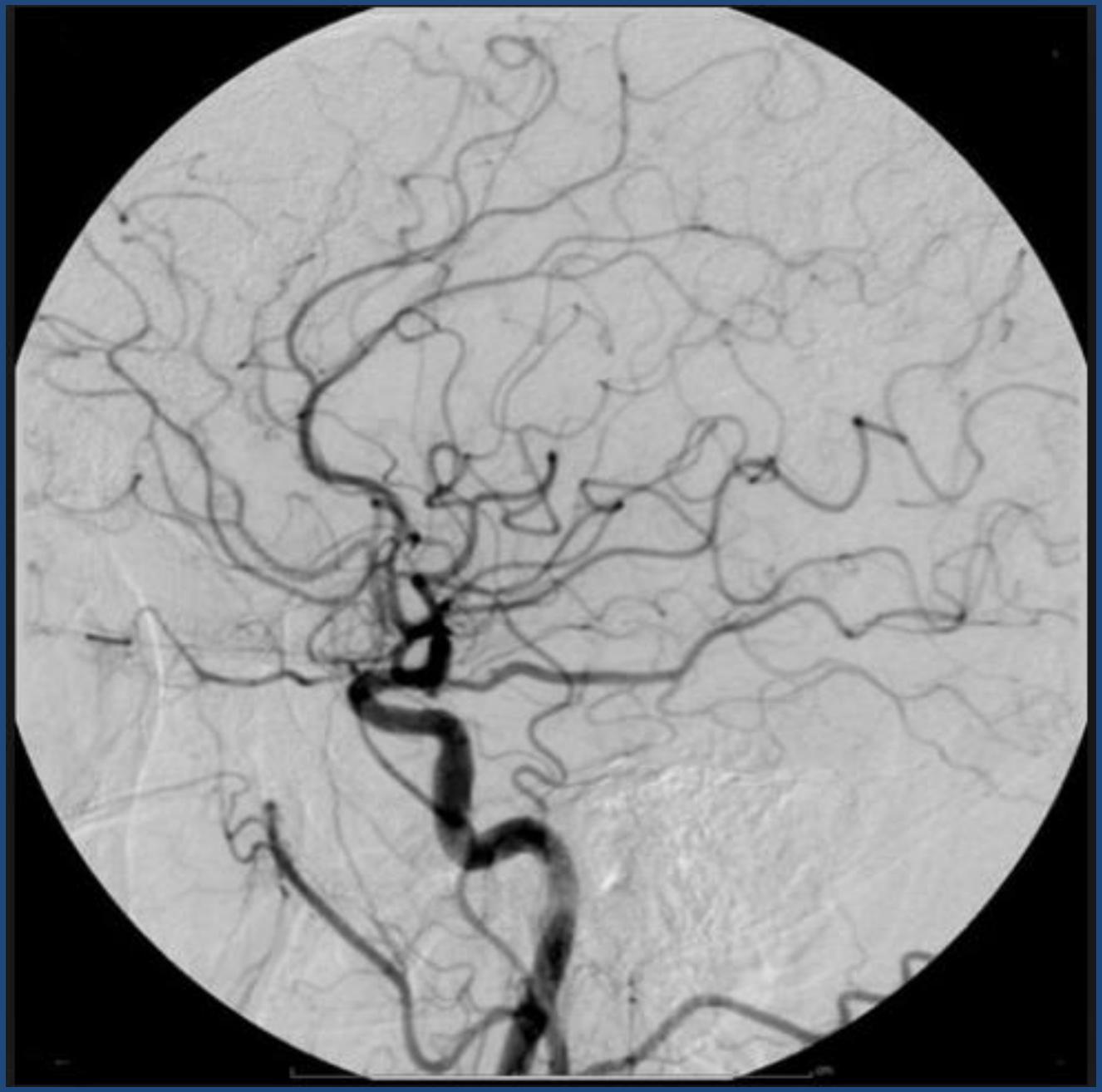
Major arteries serving the brain
(inferior view, right side of cerebellum and part of right temporal lobe removed)

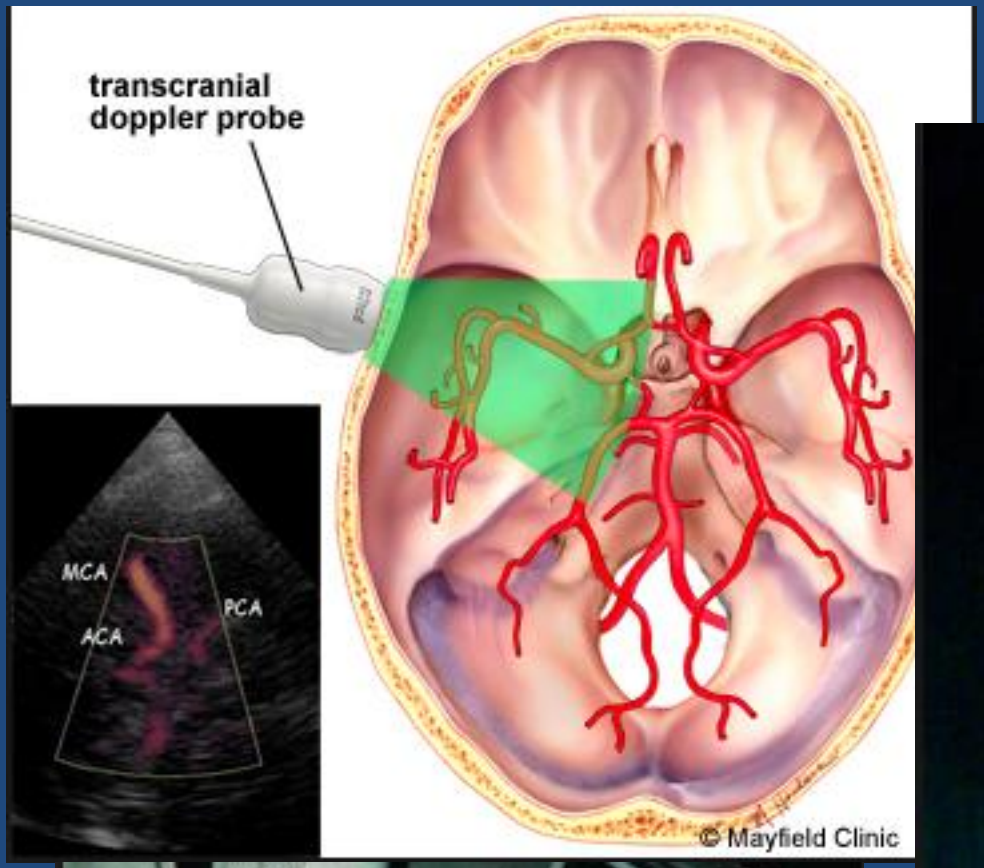


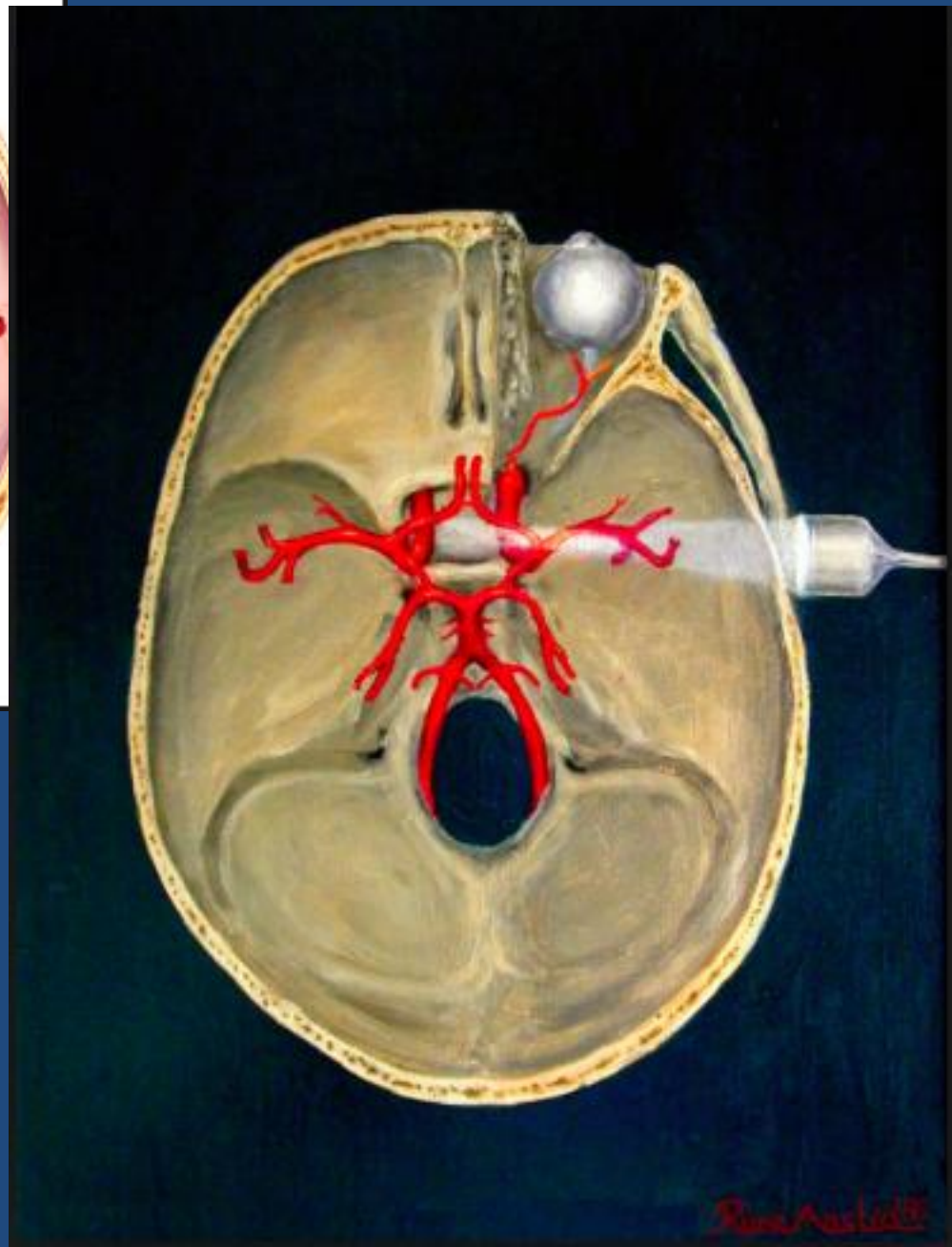





A
B
C

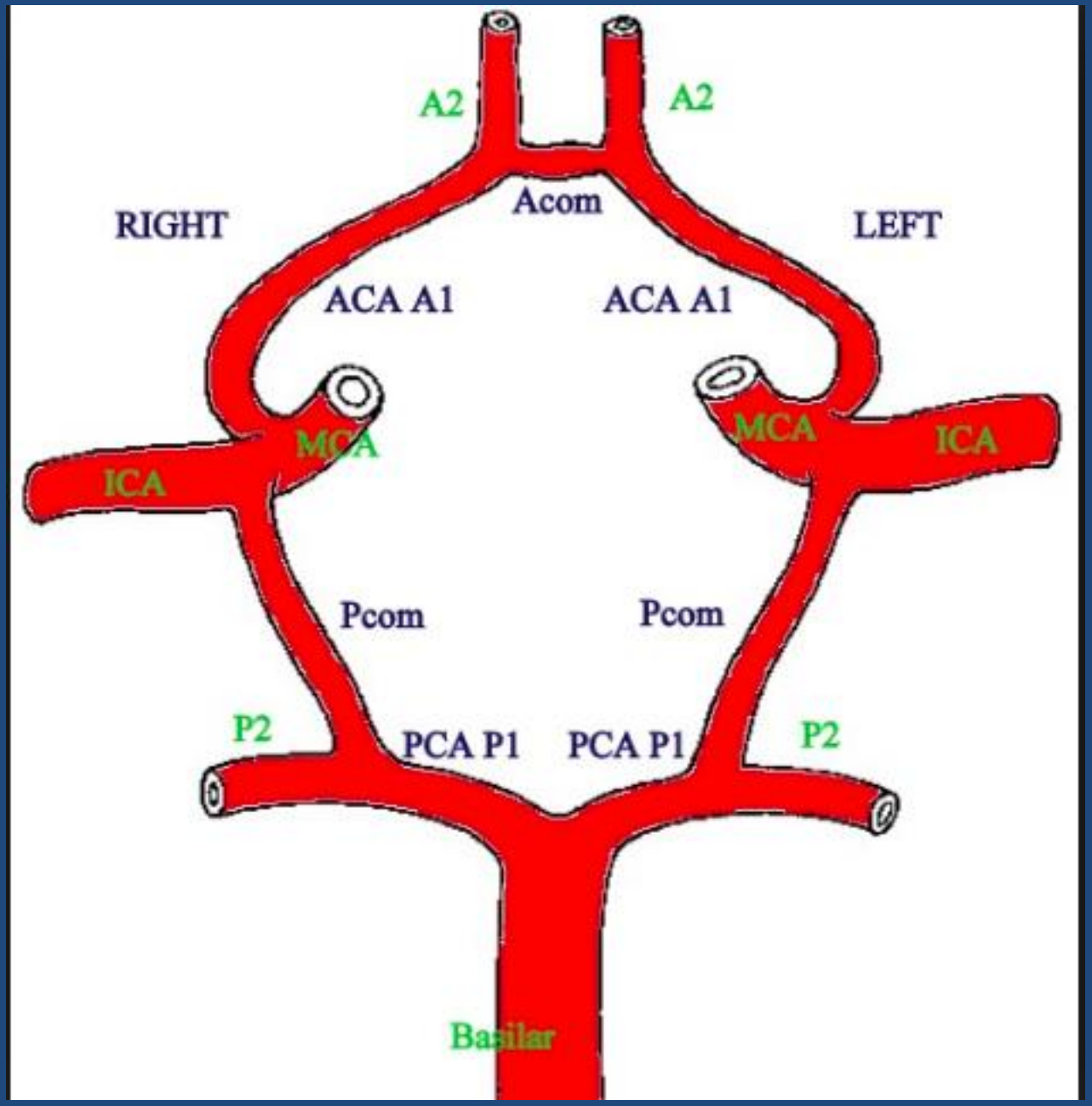


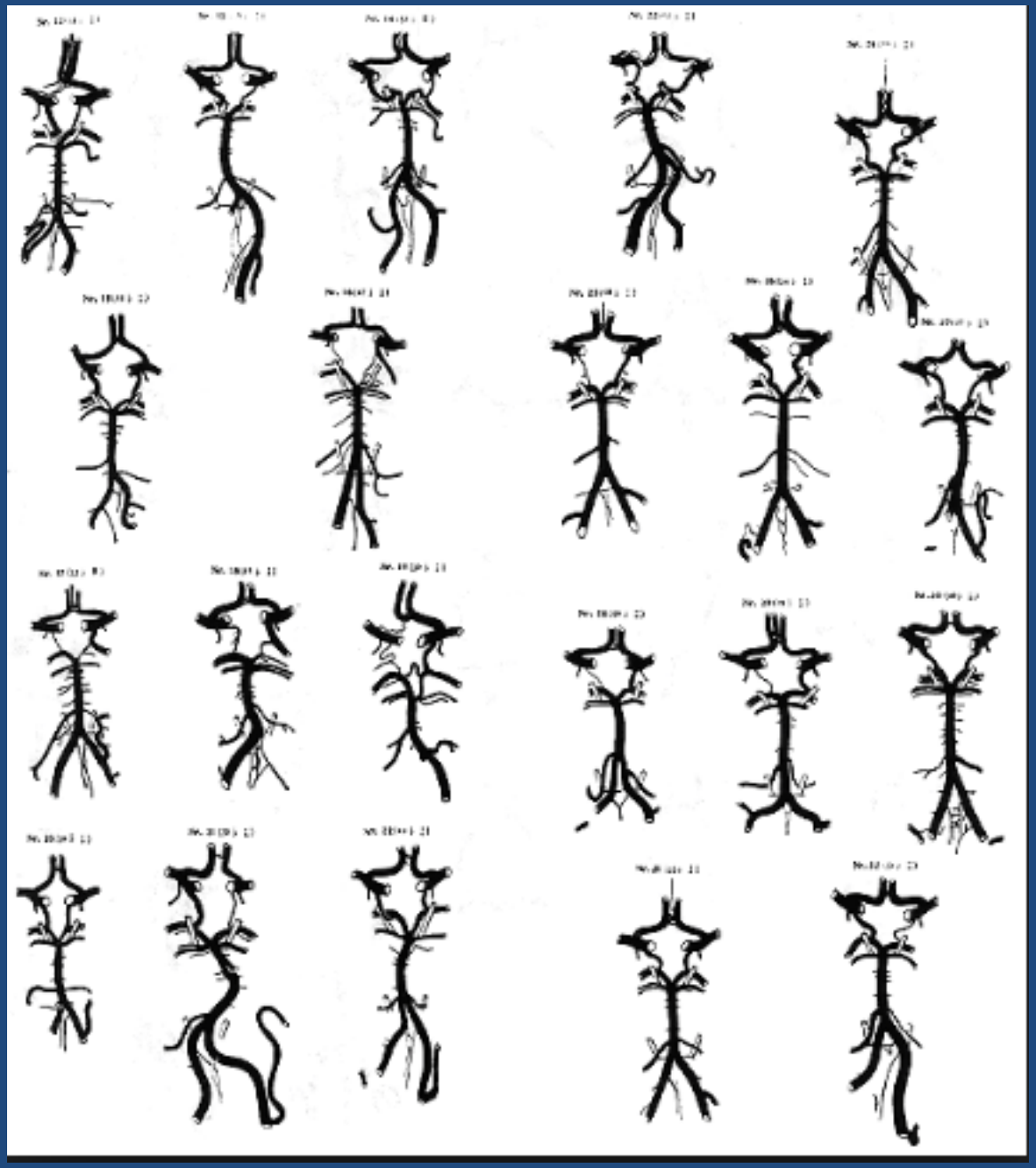

transcranial
doppler probe
MCA
ACA
PCA
© Mayfield Clinic



	Risks	Costs	Convenience	Info
MRA	++	+++	+++	static
CTA	+++	++	++	static
Angiogram	++++	++++	++++	flow/real time
Ultrasound	+	+	+	flow/real time

Veritas: Static measurements unrelated to distal flow when blockage > 50%
BP control can actually cause a stroke


A2
A2
Acom
RIGHT
LEFT
ACA A1
ACA A1
MCA
MCA
ICA
ICA
Pcom
Pcom
P2
PCA P1
PCA P1
P2
Basilar



25% poor or no collaterals

25% good collaterals

50% moderate collaterals and depends on artery affected

Worsened collaterals:

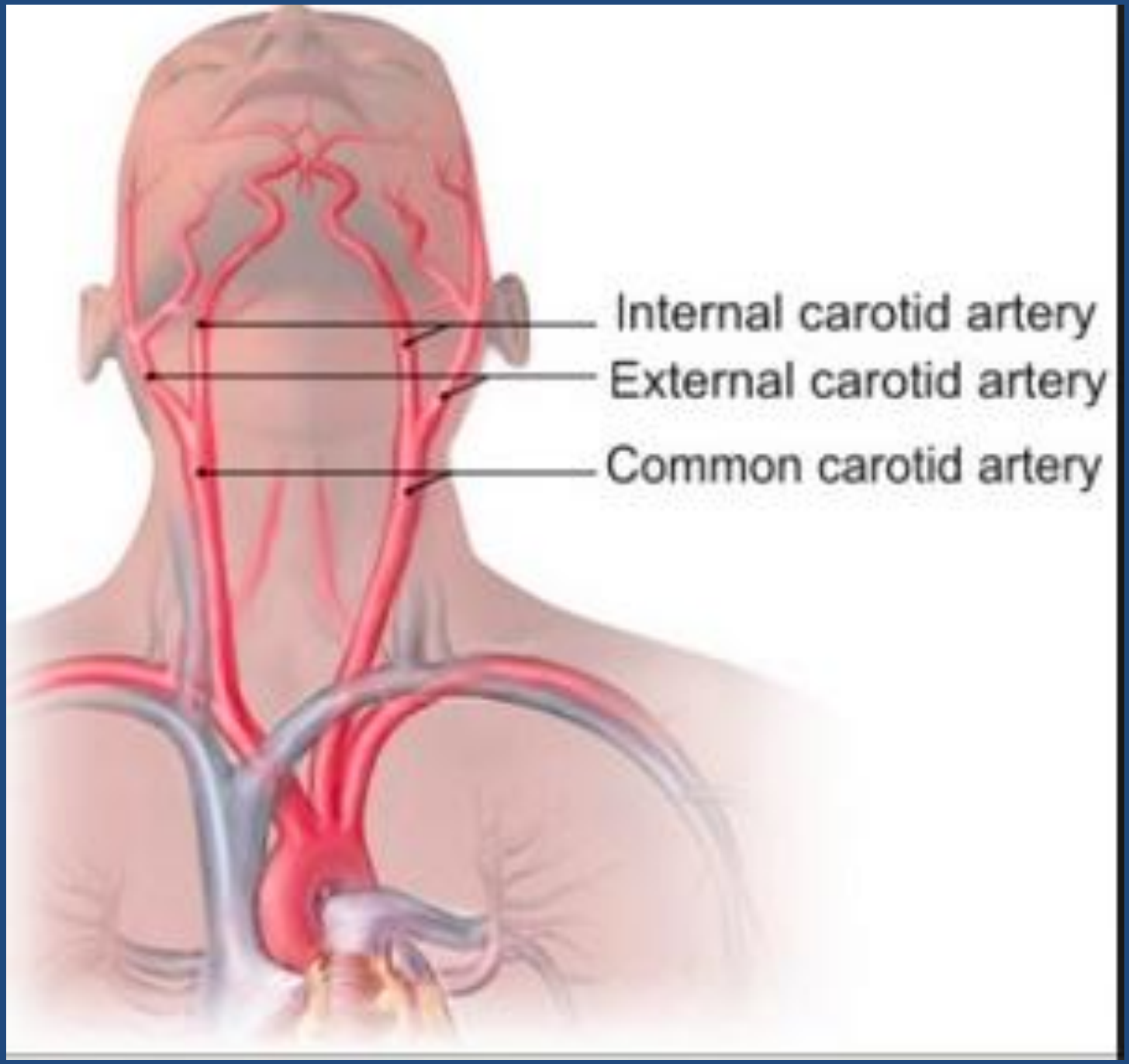
Hypertension
Diabetes
Inflammation
Age
Trauma
Genetics
Cholesterol?

Improves collaterals:

BP control
BS control
Anti-inflammation
Fountain of youth

Statin?
Exercise


Nestlé
Škoda
CSC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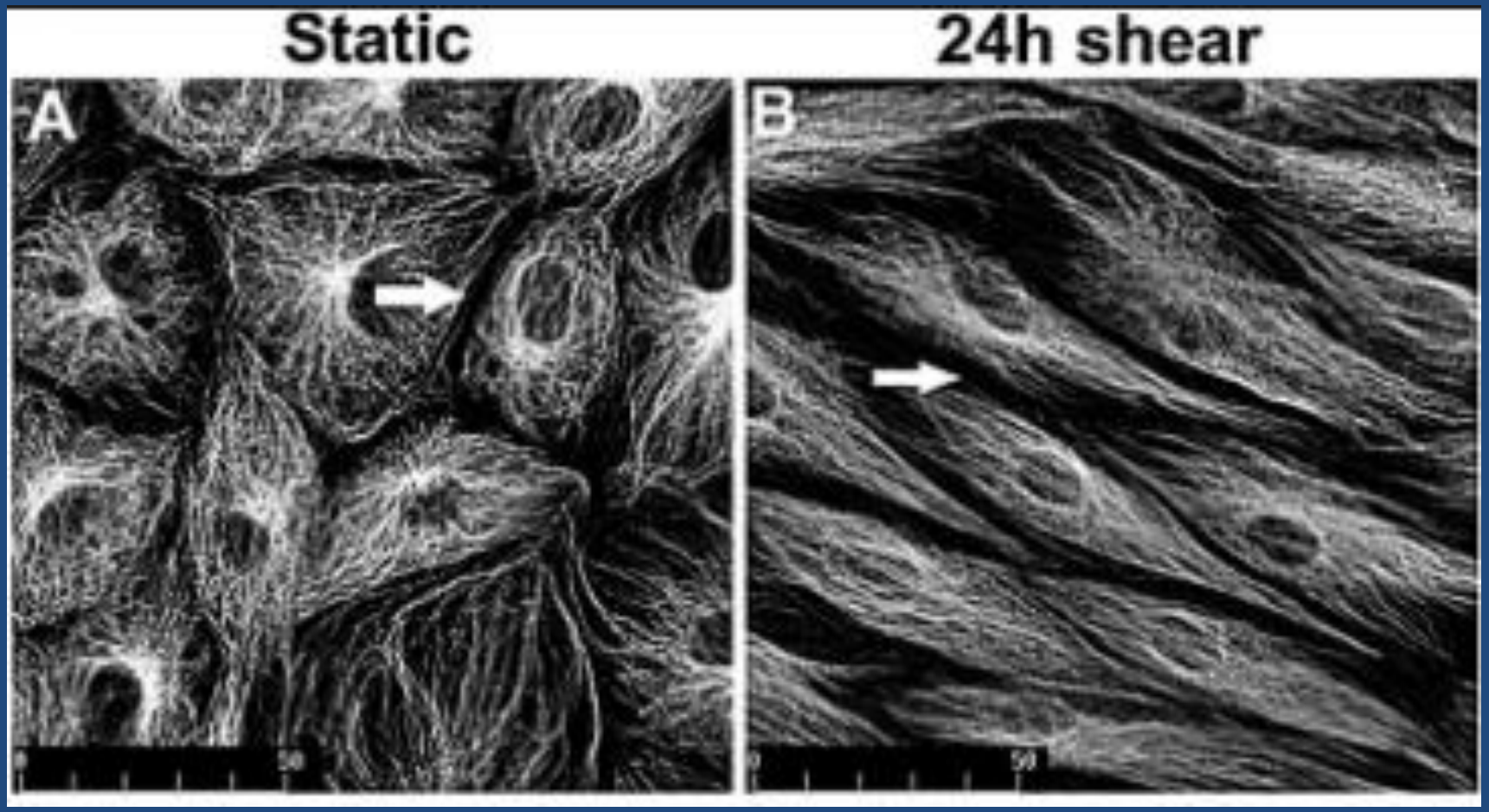
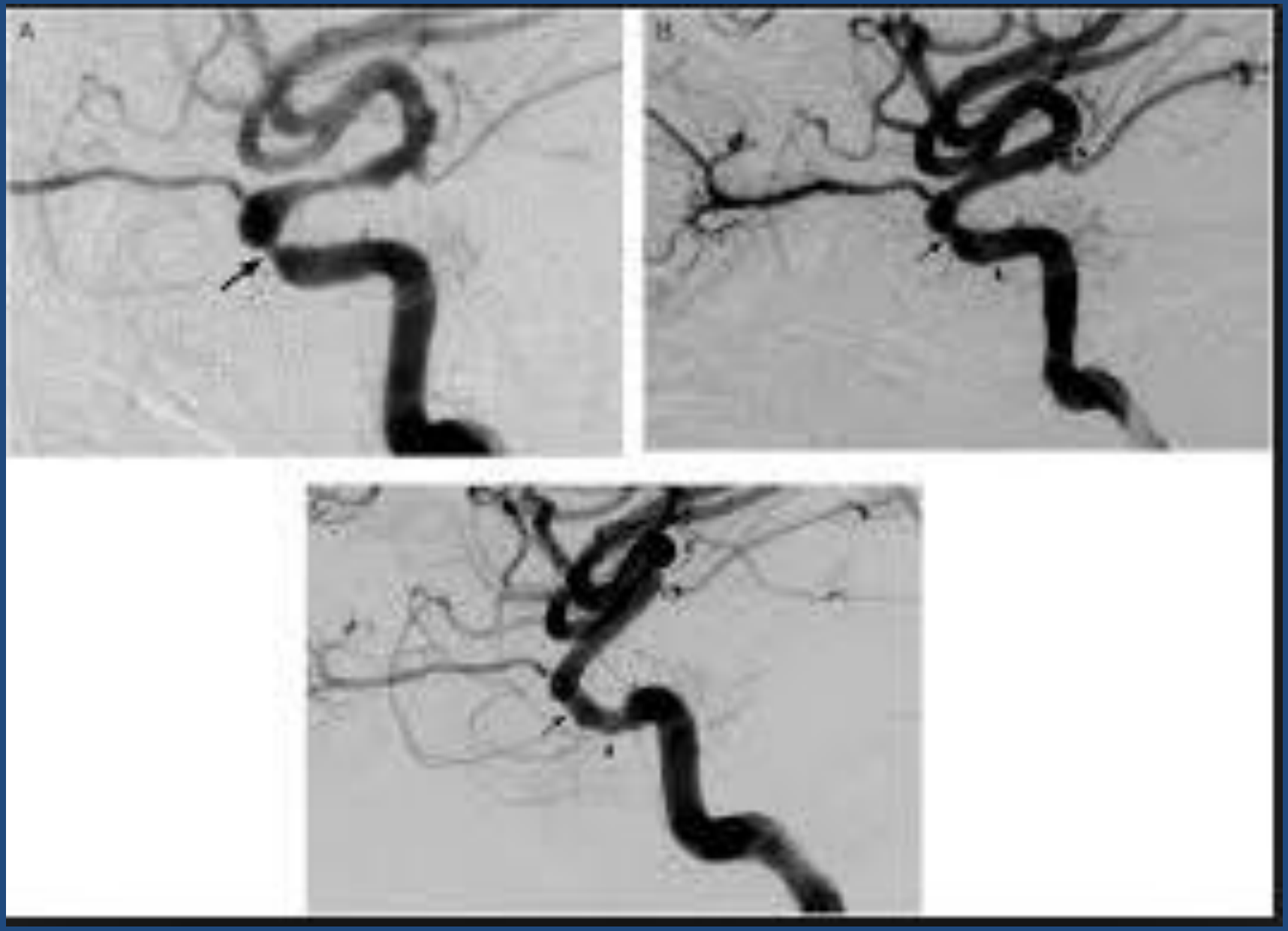
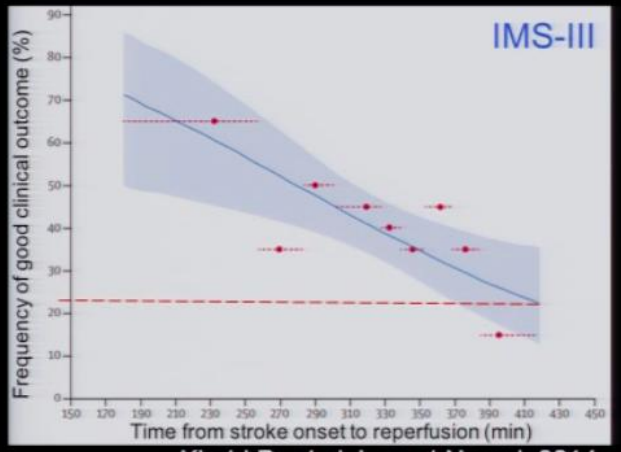

Static
24h shear
A
B


CCA PROX


A
B

Don’t you want to know your collaterals?

Previous studies



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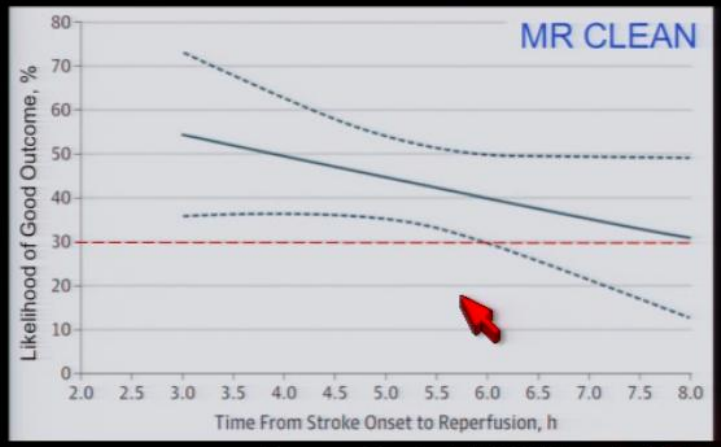

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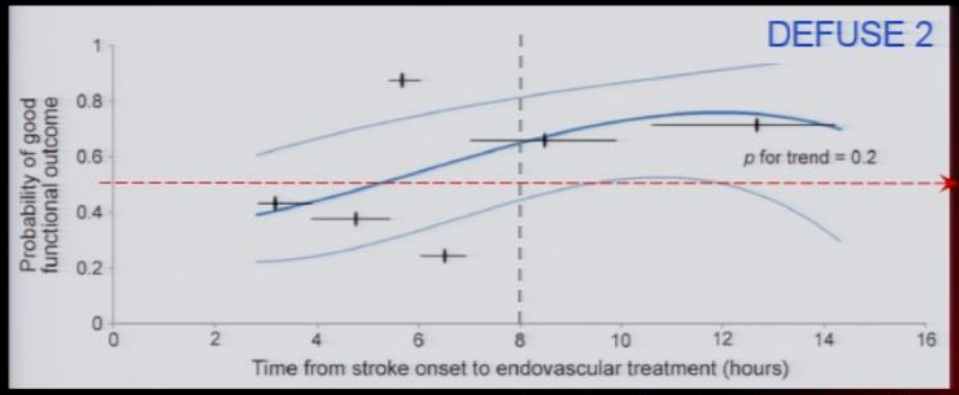
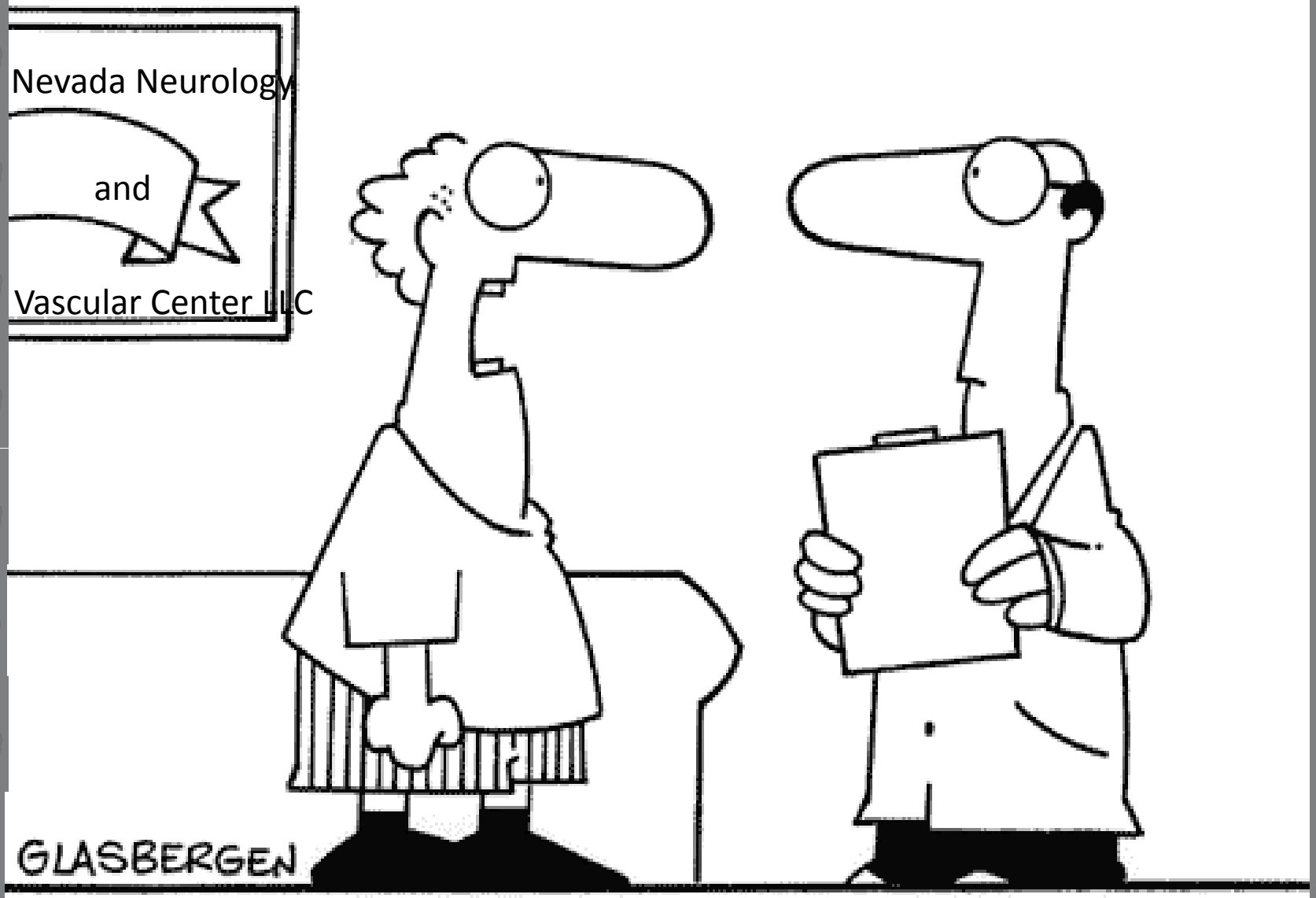


Nevada Neurology

and

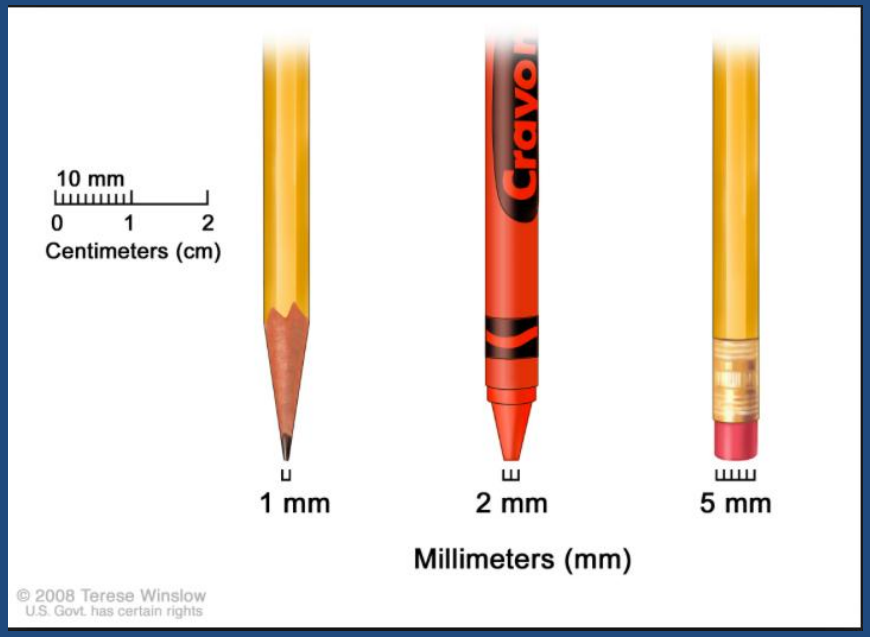
Vascular Center LLC

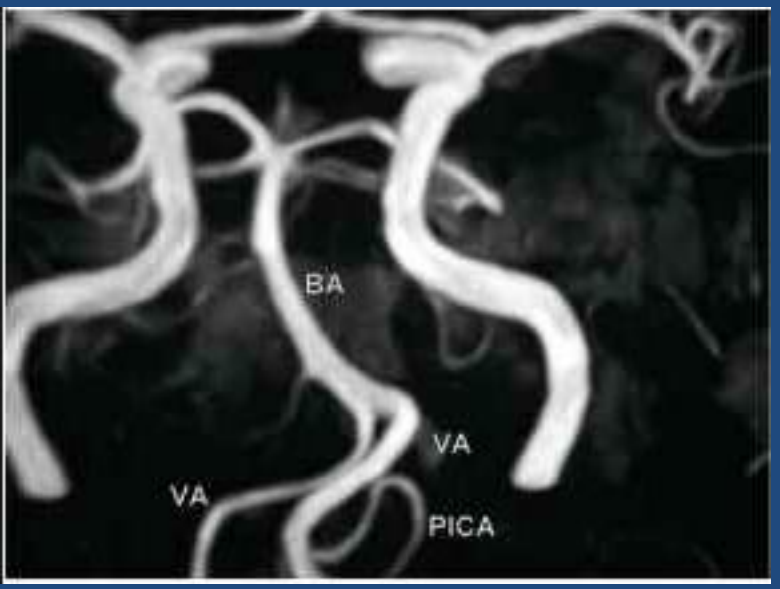


"I'm learning how to relax, doctor—but I want to relax better and faster! I WANT TO BE ON THE CUTTING EDGE OF RELAXATION!"

Artery size

Internal Carotid Artery (ICA):	4.5 to 5.2 mm
Middle Cerebral Artery (MCA)(M1):	2.4 to 4.6 mm
(M2):	1.4 to 2.3 mm
Anterior Cerebral Artery (ACA):	2.3 to 2.8 mm
Vertebral Artery (VA):	1.5 to 5.0 mm
Basilar Artery (BA):	2.5 to 3.5 mm
Posterior Cerebral Artery (PCA):	2.5 to 2.7 mm
Lenticulostriate:	0.7 mm





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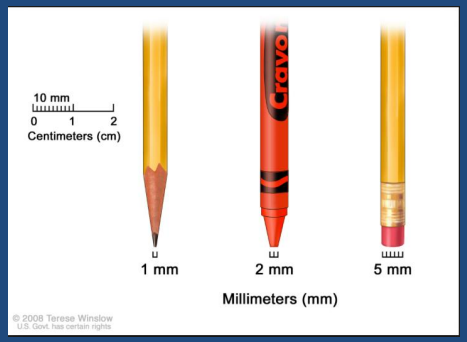
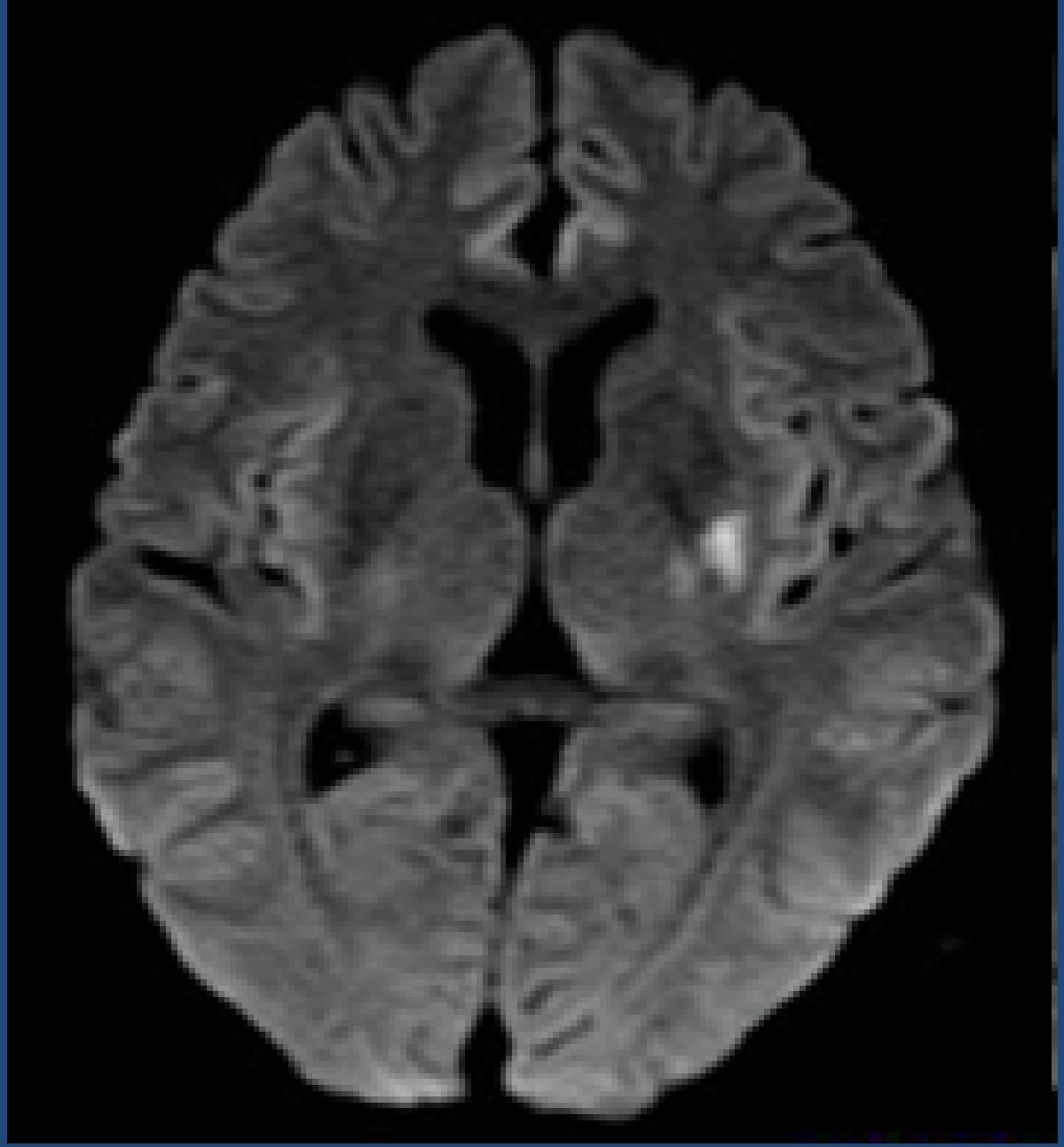
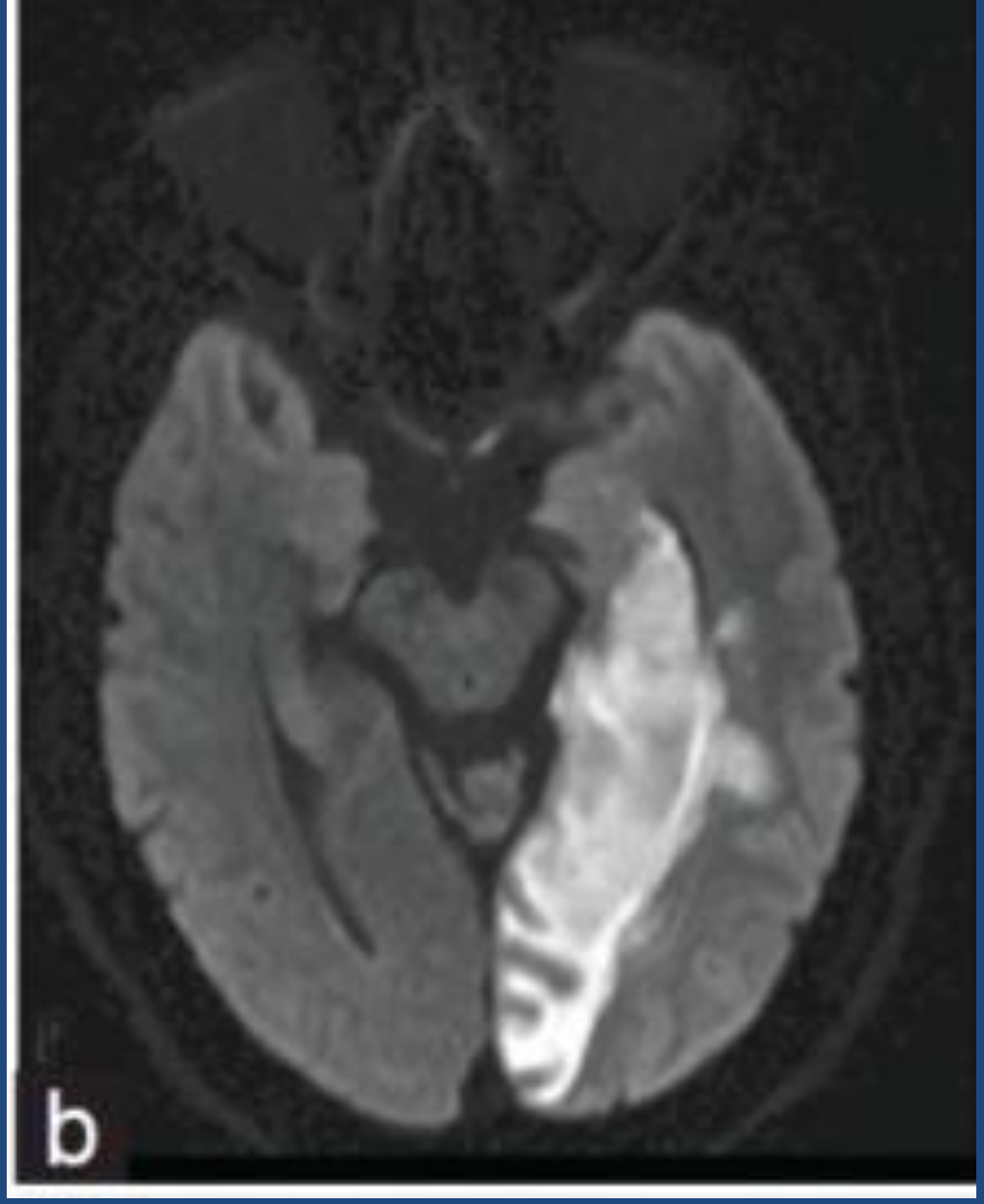
Lenticulostriate:	0.7 mm

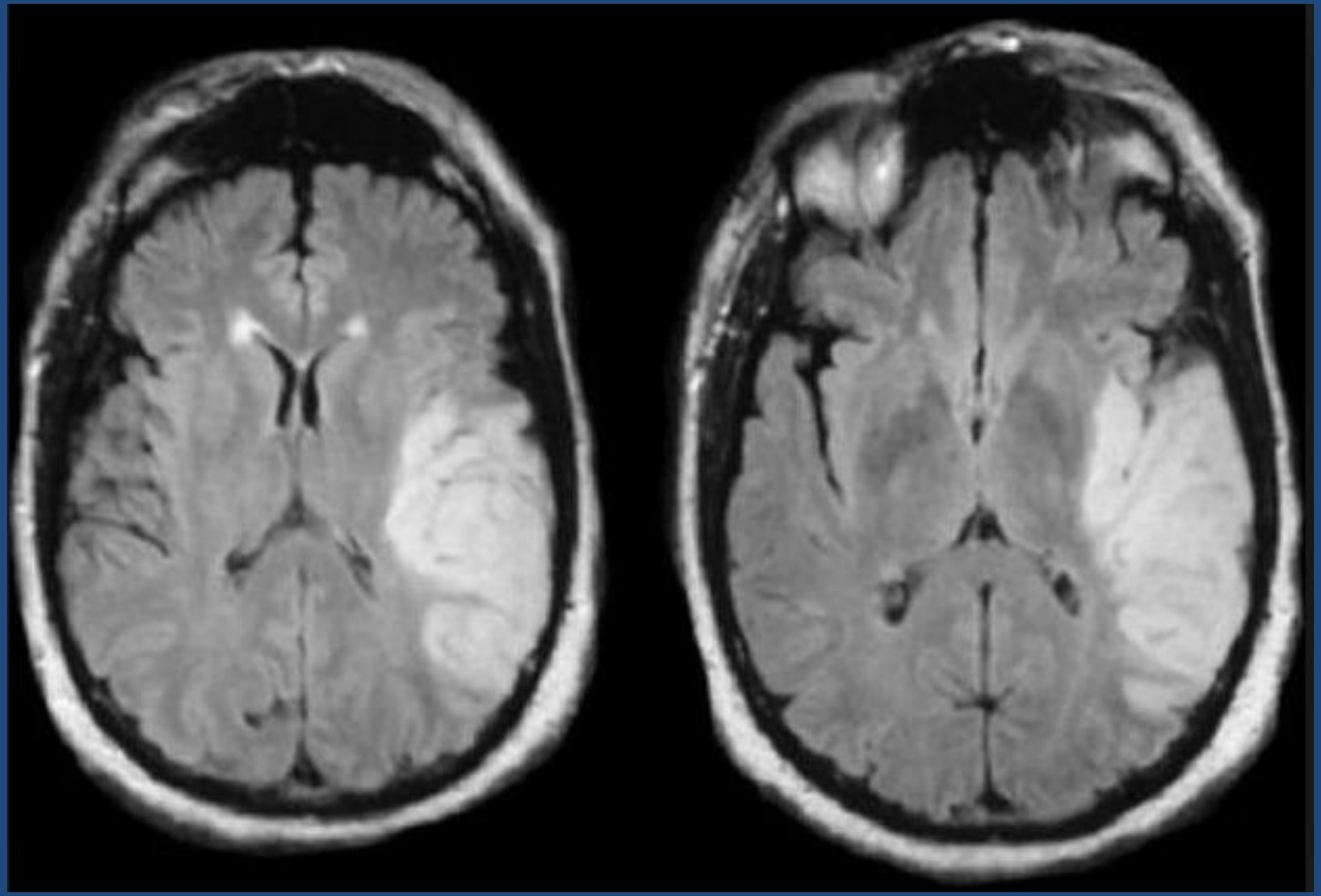




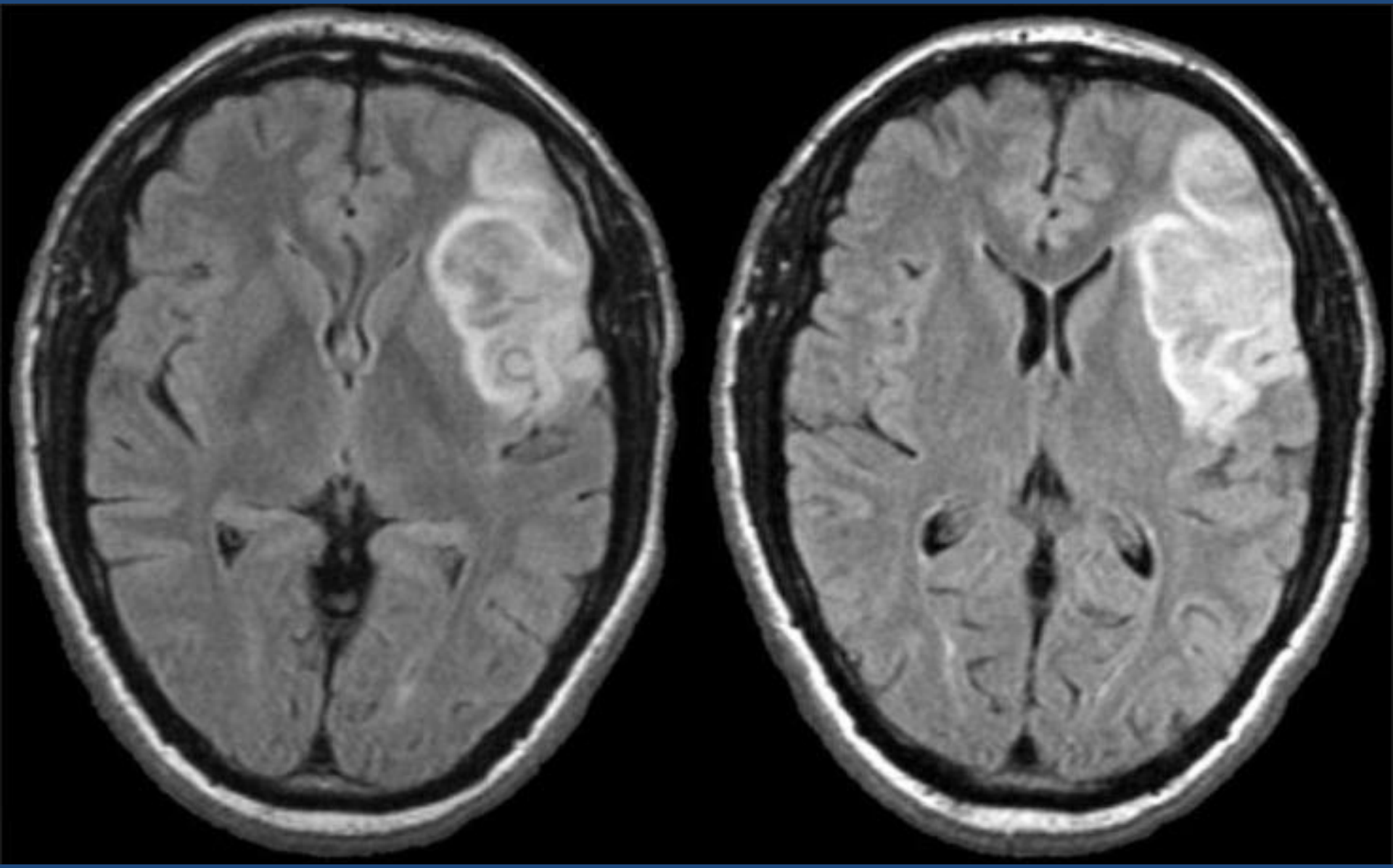
Lenticulostriate 0.7mm



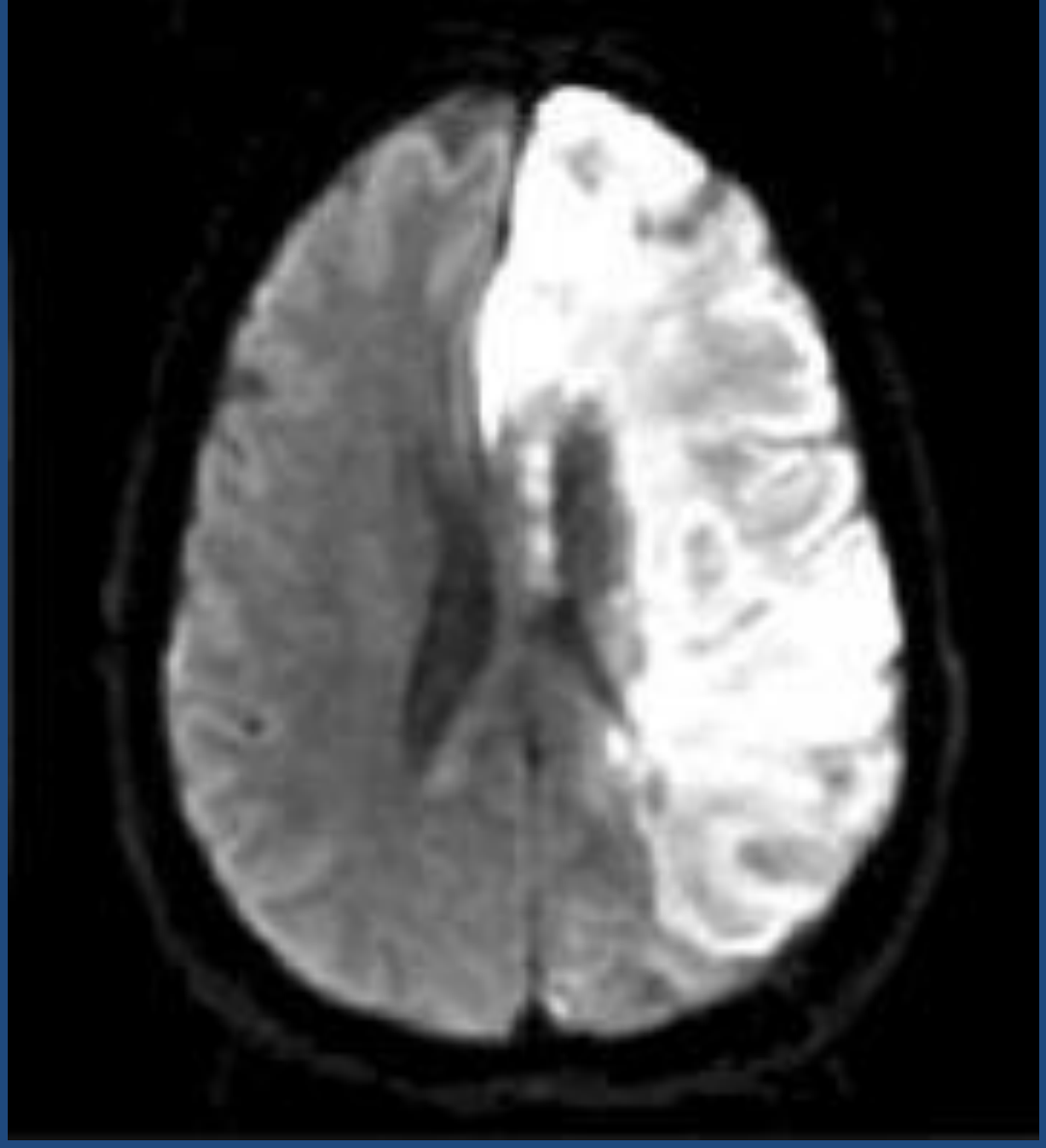
PCA 2.5 mm



MCA M2 posterior branch 1.4 to 2.3 mm



MCA M2 anterior branch 1.4 to 2.3 mm



MCA M1 2.4 to 4.6 mm

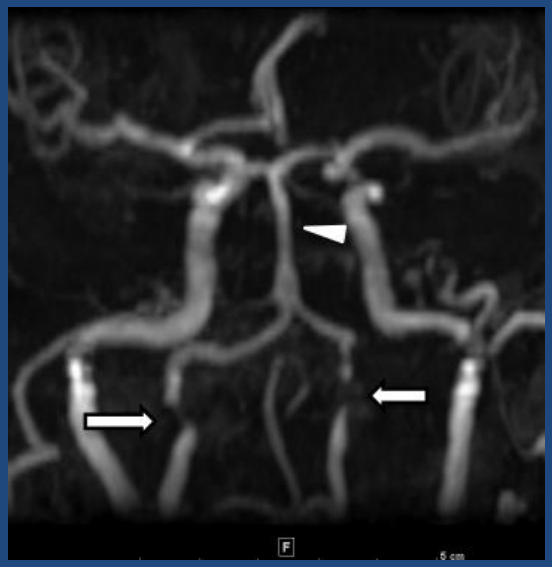
VERITAS

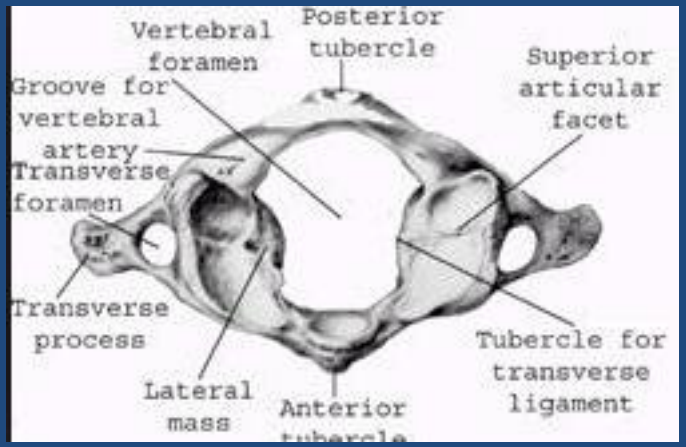
Vertebrobasilar Flow Evaluation and Risk of TIA and Stroke

Degree of measured blockage of 50% or greater does not correlate with distal flow or perfusion

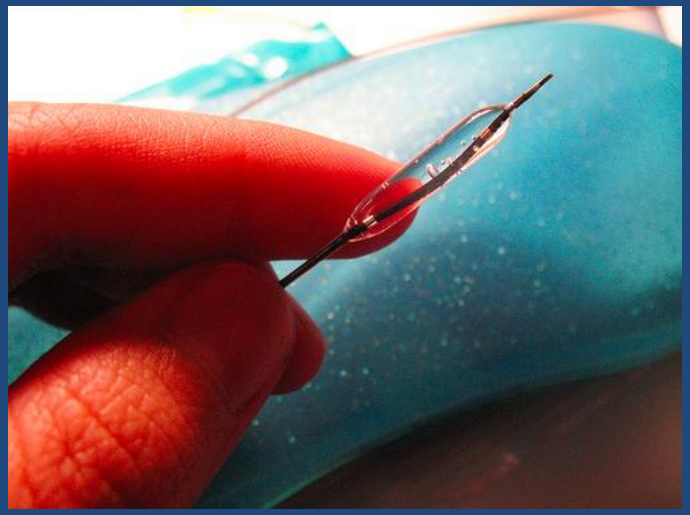
What does this mean?

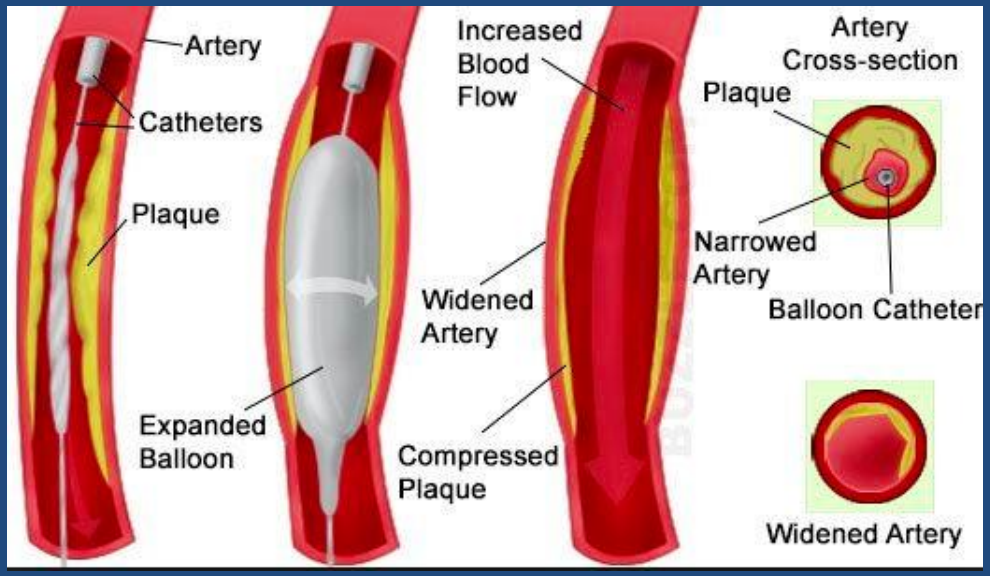
Lowering blood pressure to “normal” (120 to 140 systolic) in presence of blockage can result in stroke.

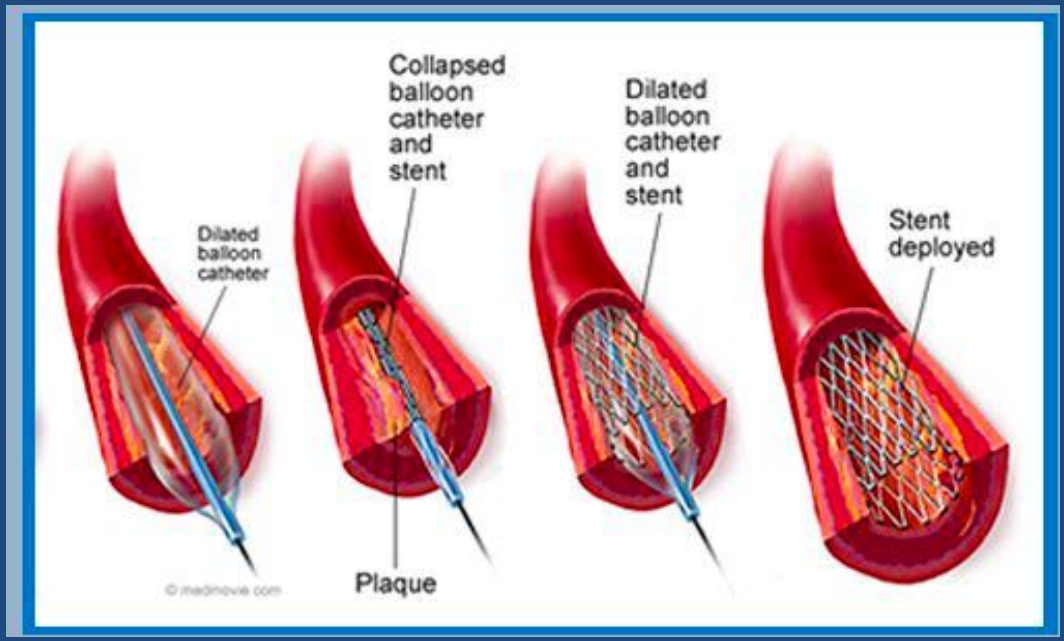



Vertebral foramen
Posterior tubercle
Groove for vertebral artery
Superior articular facet
Transverse foramen
Transverse process
Tubercle for transverse ligament
Lateral mass
Anterior

Balloon Cerebral Angioplasty and Stenting

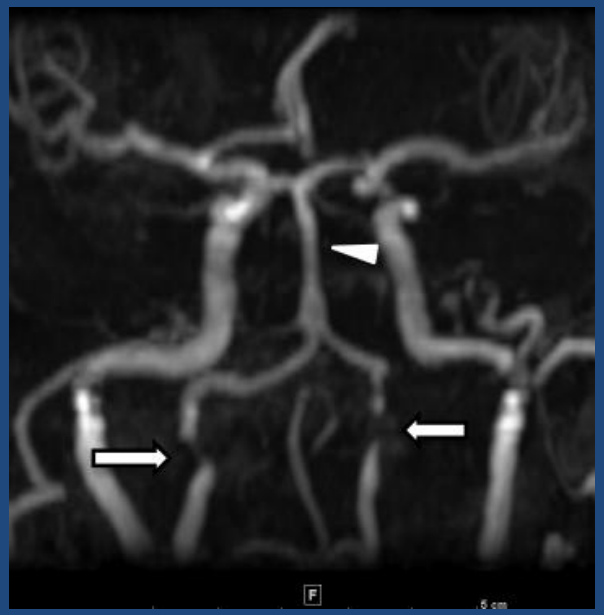







A


A



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