



X-Ray

يُظهر عظام الجمجمة فقط. حيث لا يظهر الدماغ بالتصوير. يُستخدم غالباً للكشف عن وجود كسور في العظام.

MRI

يظهر الدماغ بجميع التفاصيل الدقيقة. ويظهر أي نزيف سواء كبير أو صغير، ويُبين السكتات الدماغية والكُتل أو أي آفات أخرى.



PET Scan

يوضح مدى نشاط أجزاء مختلفة من الدماغ. حيث يستخدم الدماغ السكر كمصدر طاقة، ويكشف الـ PET كمية السكر المستخدمة من خلال الإضاءة وتمويل الوانها، حيث كلما زاد استخدام السكر كلما زادت إضاءة المنطقة؛ لذا تُضيء الخلايا السرطانية أكثر؛ لأن الخلايا السرطانية تستهلك سكر أكثر من غيرها من الخلايا. يستخدم الـ PET للكشف عن السرطانات.

CT Scan

يظهر الدماغ لكن التفاصيل غير دقيقة. يظهر ما إذا كان هناك أي نزيف أو سكتات دماغية أو كتل كبيرة.



ليزت
@Medics_Abusaif

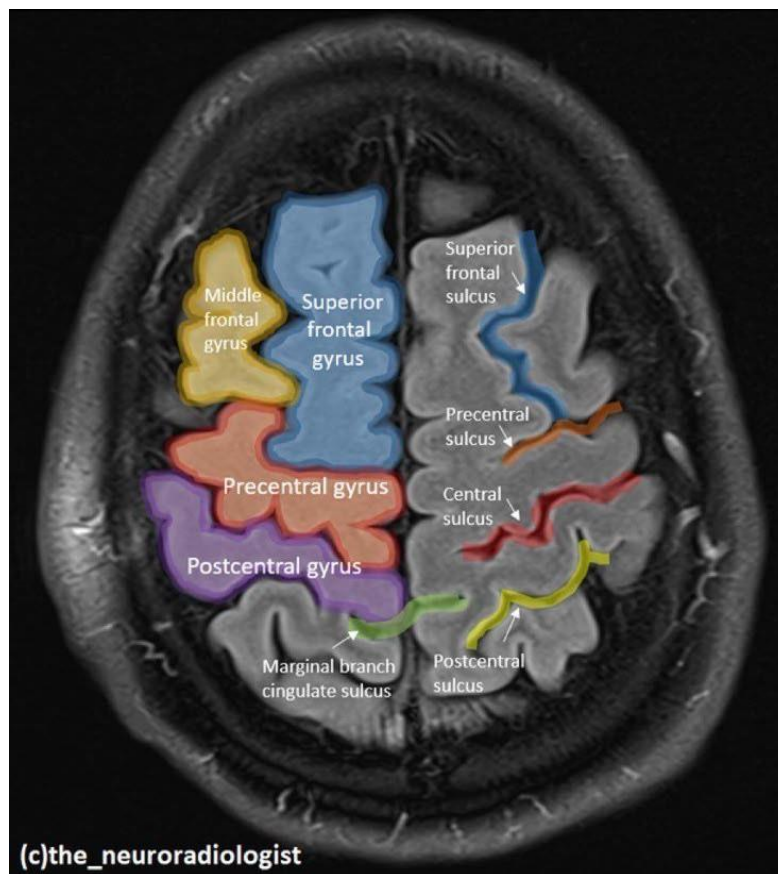


MRA

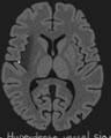
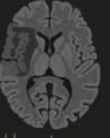
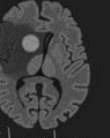
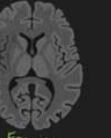
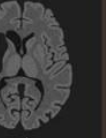
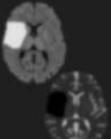
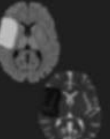
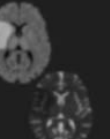
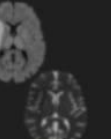
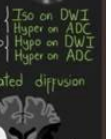
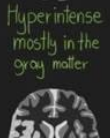
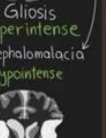
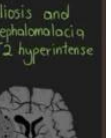
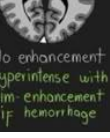
يُظهر تدفق الدم في نظام الأوعية الدموية في الدماغ يظهر ما إذا كان هناك أي تضيق أو انسداد في الأوعية الدموية.

GRADATION OF INTENSITY

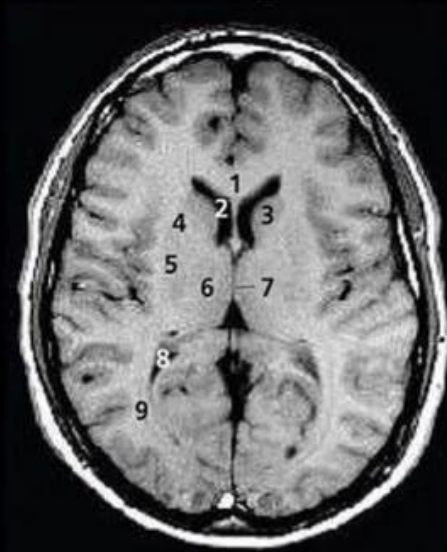
IMAGING						
CT SCAN	CSF	Edema	White Matter	Gray Matter	Blood	Bone
MRI T1	CSF	Edema	Gray Matter	White Matter	Cartilage	Fat
MRI T2	Cartilage	Fat	White Matter	Gray Matter	Edema	CSF
MRI T2 Flair	CSF	Cartilage	Fat	White Matter	Gray Matter	Edema



Imaging findings in ischemic stroke

	Onset	Hours	Days	Weeks	Months
Pathology	Dysfunction of the Na^+/K^+ ATPs Ionic and cytotoxic edema	Opening of the blood brain barrier Extravascular leakage Vasogenic edema	Immature collateral vessels and reperfusion 3-5 days Mass effect Hemorrhagic transformation	↑ macrophages and glial cells to remove dead tissue ↓ mass effect	Gliosis and encephalomalacia Volume loss Laminar necrosis
Non enhanced CT	 • Hyperdense vessel sign • Insular ribbon sign • Disappearance basal ganglia sign • Loss of GM/WM differentiation	 Hypodense Sulcal effacement	 ↑ hypodense Hazy borders	 Fogging phenomenon (5-10 days) Isodense cortex	 Hypodense
DWI	 Bright on DWI Dark on ADC Restricted diffusion	 Restricted diffusion	 ↓ ADC	 ADC pseudonormalization (10-15 days) Bright DWI due to T2 shine through	 Gliosis Encephalomalacia Facilitated diffusion
ADC	 Restricted diffusion	 Restricted diffusion	 ↓ ADC	 ADC pseudonormalization (10-15 days) Bright DWI due to T2 shine through	 Gliosis Encephalomalacia Facilitated diffusion
FLAIR	 Isointense May have subtle high signal	 Hyperintense mostly in the gray matter	 Hyperintense in both white and gray matter	 Hyperintense	 Gliosis Hyperintense Encephalomalacia Hypointense
T2	 Isointense May show loss of flow voids in a large vessel occlusion	 Hyperintense	 Hyperintense Hypointense if hemorrhage	 Hyperintense May have fogging phenomenon	 Gliosis and encephalomalacia are T2 hyperintense
SWI	 Normal signal May show early hemorrhagic transformation	 Normal signal	 Hemorrhagic transformation Petechial hemorrhage	 Normal signal ↓ hemorrhage size	 Chronic Microhemorrhages
Pre contrast T1	 Isointense	 Isointense	 Hypointense Hyperintense if hemorrhage	 ↑ Hypointense	 Hyperintense if there is laminar necrosis Hypointense
Post contrast T1	 No enhancement May show enhancement in partial infarct	 May show leptomeningeal or arterial enhancement	 No enhancement Hyperintense with rim enhancement if hemorrhage	 Gyriform enhancement #2-2-2 rule? Begins at 2 days Peaks at 2 weeks Disappears at 2 months	 Enhancement may persist up to 2 months

T1-weighted



CSF

Very black

Fat

White

Grey Matter

Dark grey

White Matter

Light grey

T2-weighted



Very white

Grey

Light grey

Dark grey

1: Corpus callosum

2: Lateral ventricle (ant. horn)

3: Caudate nucleus (head)

4: Internal capsule

5: Putamen

6: Thalamus

7: Third ventricle

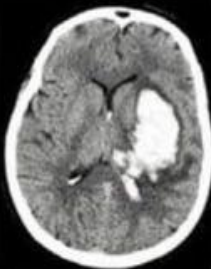
8: Lateral ventricle (post. horn)

9: Optic radiation

How to read a head CT

Blood

Blood is thicker than water, so denser than brain



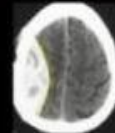
EPIdural

EPI=beside the DURA mater
=between the skull and dura mater

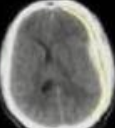
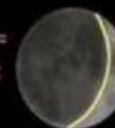
Blood can be....



Epidural = lentiform



Subdural = crescentic



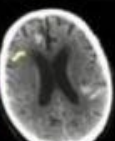
SUB-arachnoid

SUB=BELOW the arachnoid
=below both dura mater and arachnoid

SUBdural

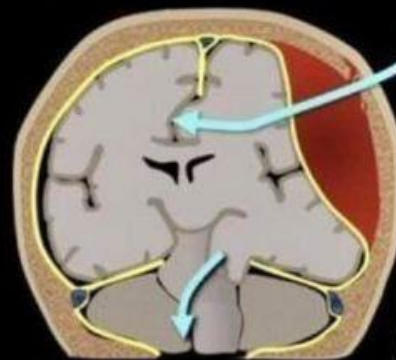
SUB=BELOW the DURA mater
=between the dura mater and arachnoid

Subarachnoid = curvilinear

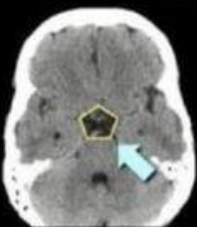


Mass effect

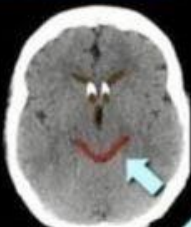
Blood pushes on the brain in an enclosed space



Subfalcine herniation



= Effacement of basilar cisterns
= loss of pentagon & smile



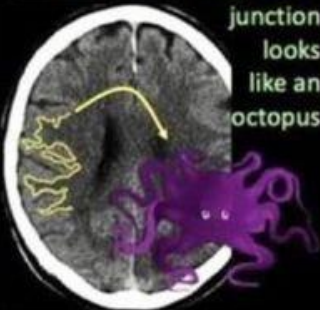
Transtentorial Herniation



= midline shift

Stroke

Gray-white junction looks like an octopus



Normal gray white junction has a clear divide



Stroke

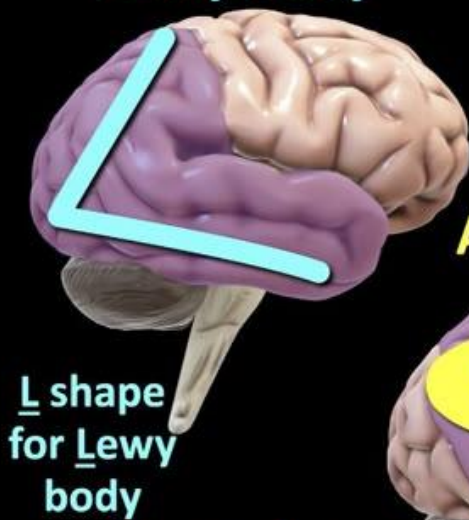
Gray matter



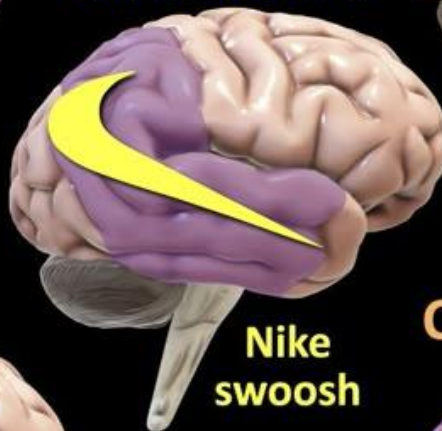
White matter gets smeared into gray matter

Dementia

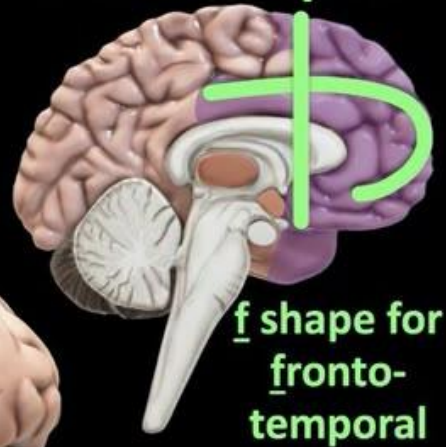
Lewy Body



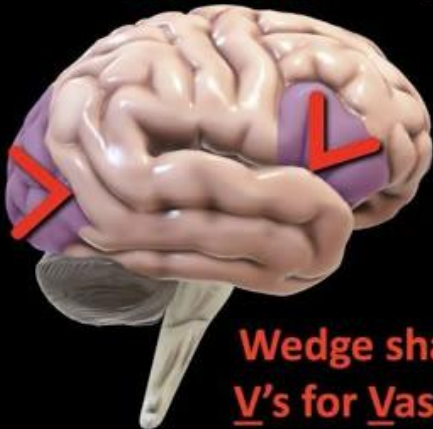
Alzheimer's



Frontotemporal



Vascular



**Posterior
Cortical Atrophy**

