10 Things *NOT* to Miss on Head CT

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Normal brain parenchymal developmental changes - Age related
Normal brain parenchymal developmental changes - Age related
Ventricles and extra-axial spaces changes - Age related
Ventricles and extra-axial spaces
4th ventricle and basal cisterns
Brain parenchymal changes: diffuse

White cerebellar sign
Diffuse cerebral edema
Effaced ventricles

6w

Non accidental trauma
Brain parenchymal changes: diffuse

White cerebellar sign
Diffuse cerebral edema
Effaced ventricles

Non accidental trauma
Brain parenchymal changes: diffuse

6w

White cerebellar sign
Diffuse cerebral edema
Effaced ventricles

Don’t miss it!

Non accidental trauma
Brain parenchymal changes: diffuse

2y/o choked on balloon
Brain parenchymal changes: diffuse

Severe diffuse hypoxic ischemic injury

...same patient
Brain parenchymal changes: diffuse

Severe diffuse hypoxic ischemic injury

same patient
Brain parenchymal changes: diffuse

Non accidental trauma
Brain parenchymal changes: diffuse

..same patient
Brain parenchymal changes: diffuse

same patient
Brain parenchymal changes: focal

Morning HA, getting worse since 1 week.
Brain parenchymal changes: focal

Morning HA, getting worse since 1 week.
Brain parenchymal changes: focal

..same patient

Focal parenchymal lesion mass effect, perilesional edema

Brain abscess
Brain parenchymal changes: focal

14y s/p renal transplant with meningitis

**West Nile virus encephalitis**

Diffuse cerebral edema, focal hypoattenuation basal ganglia, and hydrocephalus
Brain parenchymal changes: focal

14y s/p renal transplant with meningitis

**West Nile virus encephalitis**

Diffuse cerebral edema, focal hypoattenuation basal ganglia, and hydrocephalus
Brain parenchymal changes: focal

West Nile virus encephalitis
Diffuse cerebral edema, focal hypoattenuation basal ganglia, and hydrocephalus
Ventricles and extra-axial spaces
Ventricles and extra-axial spaces

Diffuse cerebral edema

Diabetic ketoacidosis
Enlarged cerebral sulci diffusely
Decreased cerebral parenchymal volume
AML & ALL

Ventricles and extra-axial spaces
3y Subdural hematomas with mild mass effect

Ventricles and extra-axial spaces
4

Ventrices and extra-axial spaces
Enlarged subarachnoid spaces

Developmentally normal
Young child < 2y
Benign enlargement of the subarachnoid spaces
Developmentally normal child

Ventricles and extra-axial spaces
Enlarged subarachnoid spaces

Macrocrania
Ventricles and extra-axial spaces
Enlarged subarachnoid spaces

Bilateral subdural fluid collections
Bilateral subdural fluid collections

Ventricles and extra-axial spaces
Enlarged subarachnoid spaces
...same patient

Bilateral enlarging subdural fluid collections

Non-accidental trauma
Ventricles and extra-axial spaces: 4th ventricle
Multifocal parenchymal lesions, cerebral and cerebellar edema and hydrocephalus.
Posterior reversible encephalopathy syndrome (PRES)

Multifocal cerebellar parenchymal lesions, edema, herniation

Ventricles and extra-axial spaces: 4th ventricle

...same patient
Posterior reversible encephalopathy syndrome (PRES)

Ventricles and extra-axial spaces: 4th ventricle

12/6

...same patient follow up
Improved hydrocephalus, resolved cerebellar herniation
6m
Right subdural collection and left subpial hemorrhage

Ventricles and extra-axial spaces: Hemorrhage

F/u
5 Ventricles and extra-axial spaces: Hemorrhage

Subpial Hemorrhage

Don't miss it!
6

Sutures and fontanelles – 0 d
Sutures and fontanelles – 0d
6

Bony structures – 3m
Bony structures – 3m
Sutures and fontanelles – 3m
Sutures and fontanelles – 3m
Sutures and fontanelles – 2y
6 Sutures and fontanelles – 2y
Sutures and fontanelles – 8y
Sutures and fontanelles – 8y
Sutures and fontanelles – suture variants

15d

19d
Sutures and fontanelles – accessory bones
Fractures

5m

Don’t miss it!
6 Fractures

“Ping pong” fracture
Depressed fracture with small epidural hematoma
Fractures

Giant leptomeningeal cyst

...same patient
Fractures

Diastatic left lambdoid suture
Diastatic left lambdoid suture
Fractures

...same patient

Venous sinus thrombosis
Fractures

...same patient

Venous sinus thrombosis
Midline abnormalities

Aqueductal stenosis
Left thalamic/tectal mass
Midline abnormalities

11y

Aqueductal stenosis

No mass
Midline abnormalities

Colloid cyst
17y with severe HA, no visual impairment

Hemorrhagic Rathke’s cleft cyst
Vessels

Newborn 0d

Normal venous sinuses
Normal venous sinuses
Normal venous sinuses
Vessels: pending venous sinus thrombosis

18y with 1 week of headache
Vessels: pending venous sinus thrombosis

18y with protein S deficiency

Venous sinus thrombosis
Paranasal sinuses/Mastoids/Skull base:

Acute sinusitis

13y
Paranasal sinuses-Mastoids-Skull base

Intracranial complications
Paranasal sinuses-Mastoids-Skull base

Infarcts and cerebral abscesses
Paranasal sinuses-Mastoids-Skull base

15y
Paranasal sinuses - Mastoids - Skull base

..same patient
Paranasal sinuses-Mastoids-Skull base

Clival chordoma
Craniocervical junction (CCJ)
Craniocervical junction (CCJ)
Craniocervical junction (CCJ)
Craniocervical junction (CCJ)

7y s/p MVA

7y normal
Craniocervical junction (CCJ)

7y s/p MVA

Don't miss it!

Craniocervical dissociation (ligamentous injury)
7y s/p MVA

Craniocervical dissociation (ligamentous injury)
Bonus
* Bonus

7y

Don't miss it!
10 Things **NOT** to miss on Head CT

1. Diffuse parenchymal changes
2. Focal parenchymal changes
3. Extra axial spaces: neonate to adult
4. Enlarged subarachnoid spaces/ subdurals: NAT
5. Extra axial spaces: 4th ventricle and cisterns- hemorrhage
6. Bones: calvarial sutures, fontanelles, accessory bones and FRACTURES
7. Midline structures and abnormalities
8. Vessels: Newborns to teenagers: VST and aneurysm
9. Paranasal sinuses- Mastoids- Skull base
10. Craniocervical junction