Eagle Eye – CT Head Reading in the ED

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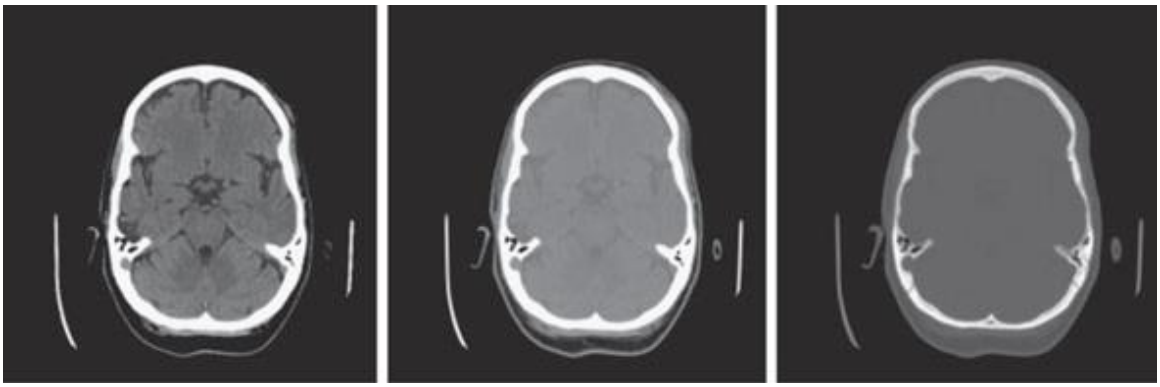
Mnemonic Approach to Reading CT Head

‘Blood **C**an **B**e **V**ery **B**ad’

Blood
Cisterns
Bone
Ventricles
Brain

Tool #1: The Importance of Windows

PACS windows (brain vs blood vs bone windows) can be utilized when attempting to differentiate blood from brain tissue from bone (calcium) on a CT head



Tool #2: The Importance of Time

Acute (<1wk) bleeding insult causes blood to show up white on a CT head

Subacute (1-6wks) bleeding insult causes blood to show up isodense with brain tissue

Chronic (>4wks) bledding insult causes blood to show up as dark grey (darker than brain tissue)

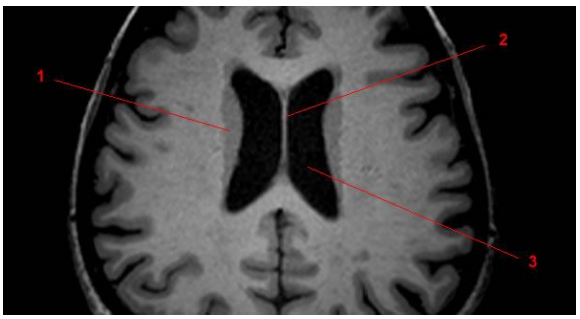
Tool #3: Subdural blood wraps around one cerebral hemisphere which can sometimes cause blood to appear only in the intercerebral hemisphere.

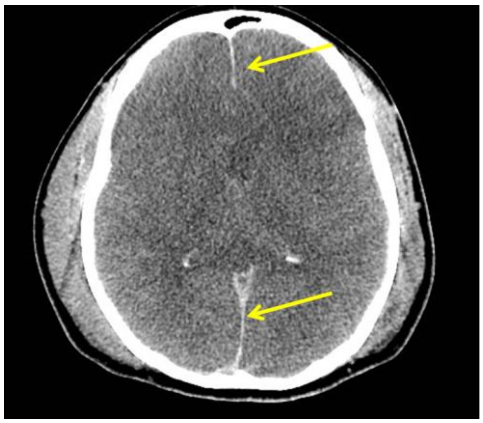
*Note that it is crescent shaped and does NOT cross the midline as apposed to epidural hematomas that are lens shaped and can cross the midline

Tool #4: How to measure midline shift (so you can talk to the neurosurgeon with confidence)

1. Draw a line between the 2 bony prominences from the frontal and occipital midline
2. Measure the distance from the line to a) septum pellucidum (#2 red line in image below) which divides the lateral ventricules and the falx (yellow arrows in image below)
3. Which ever one is longer is the midline shift

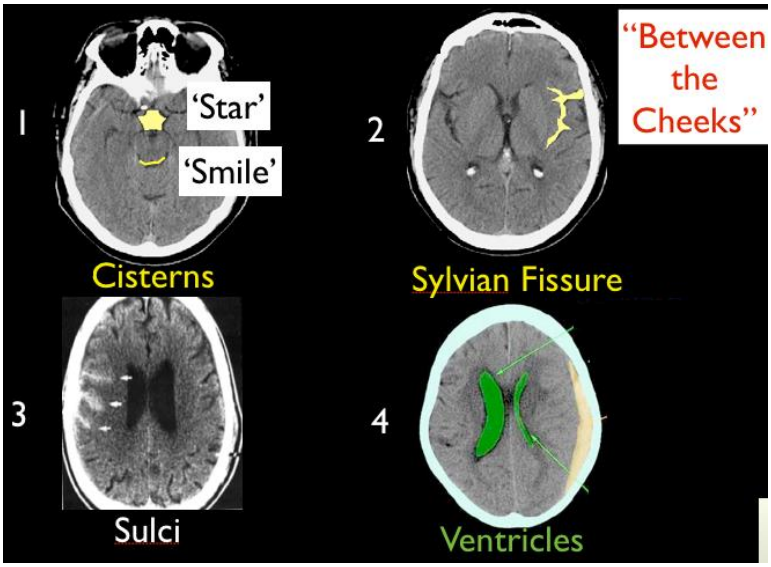
Note that >5mm shift of usually an indication for operative management





Tool #5: Subarachnoid Blood fills the black spaces (see image below)

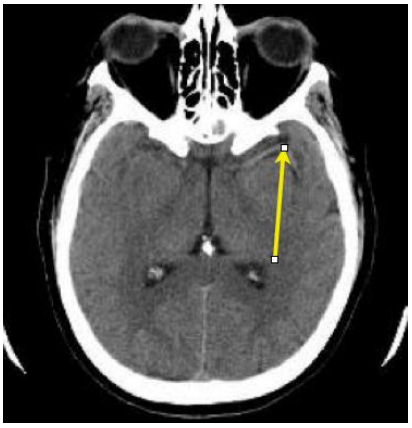
1. Cisterns – 'Smile & Star'
2. Sylvian Fissure – 'Between the cheeks' of the frontal and temporal lobes
3. Sulci – 'finger-like' projections
4. Ventricles



Tool #6: Early Signs of Ischemic Stroke

1. <u>Loss of Grey-White Differentiation</u>
   - Insular ribbon sign
   - Blurring of the Basal Ganglia
   - Blurring of the Sulci

2. <u>Hyperdense MCA sign</u> (see white line indicated by the yellow arrow below) which has a high specificity for a large MCE territory stroke with poor outcome

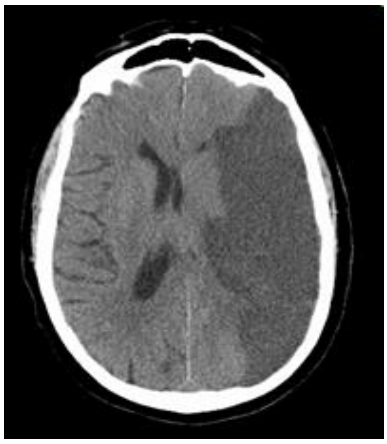


Tool #7: Cytotoxic Edema of Ischemic Stroke vs Vasogenic Edema of Neoplasm

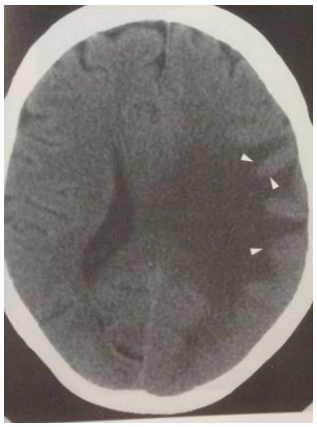
Ischemic stroke causes edema that follows a vascular distribution but does NOT respect gyri (see image on left below)

Neoplasms cause edema that does NOT respect a vascular distribution but does spare the gyri (see image on right below)

This is important as the ED management is very different



Cytotoxic Edema Stroke



Vasogenic Edema Neoplasm

Tool #8: Indications for CT with contrast

- Vasogenic edema or suspect mass
- Suspect cerebral venous thrombosis
- To differentiate traumatic cause from aneurismal cause of SAH
- Suspect carotid or vertetral artery dissection