

CHECKLISTS FOR NEURODIAGNOSIS

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A focused differential diagnosis begins with: 1) identifying the abnormality (“lesion”); 2) accurate localization of the lesion; 3) analysis of the lesion morphology; and, 4) noting secondary effects of the lesion (edema, herniation, etc.)

Intracranial lesion locations must be separated into intraaxial (neural parenchyma) and extraaxial. Locations are often sub-categorized:

■ Anatomic Locations

– Sagittal Images

- Sup. Sag. Sinus
- Corpus Callosum
- Sella Region
- Clivus

– Axial Images

- Skull, Epi/Sub Dural
- SAS
- Cortical Gray Matter
- White Matter
- Deep Gray Matter
- Ventricles

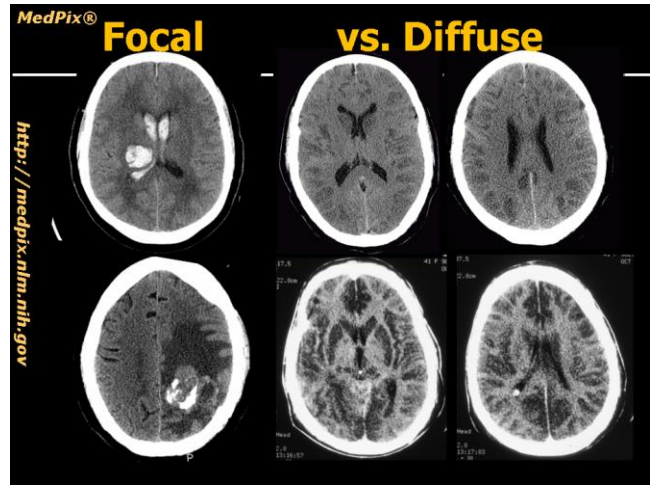
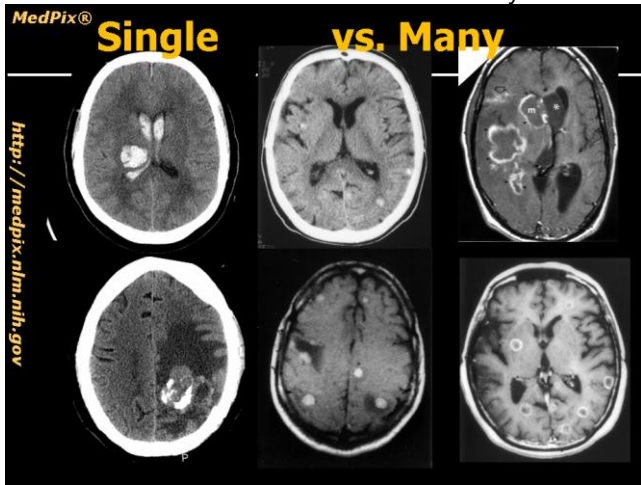
Lesion morphology maybe classified by:

- Morphologic Features
 - Mass Effect
 - Yes, proportional
 - Less than expected
 - No mass effect
 - Abnormal WM Signal
 - Vasogenic Edema
 - Demyelination
 - Infiltrating neoplasm
 - Enhancing Ring Lesion
 - Necrotic Neoplasm
 - Reactive (e.g. abscess)
 - Fluid or Inflammatory

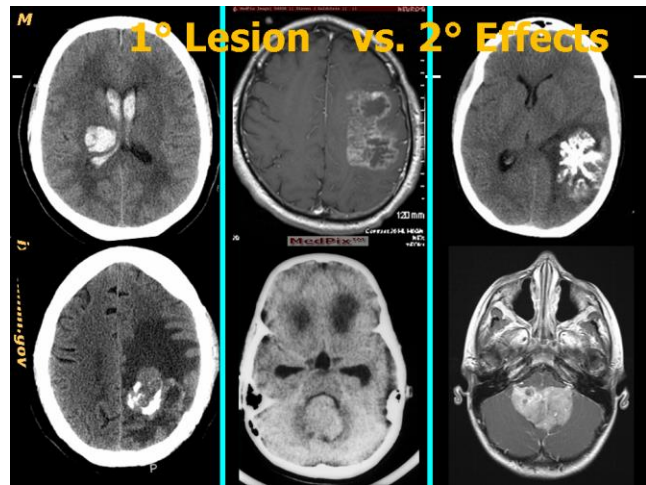
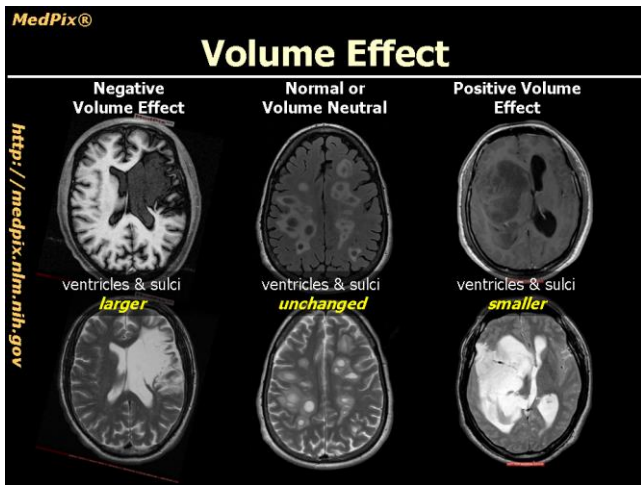
We are all familiar with the value of clinical history – especially the duration of symptoms and signs; and, the rapidity of onset of those symptoms and signs. Similarly, there are tools for differential diagnosis of images:

- Number and Distribution of Lesions
 - Single Lesions
 - Multiple Lesions
 - Random distribution
 - Gray Matter localization
 - White Matter localization
 - Complex locations

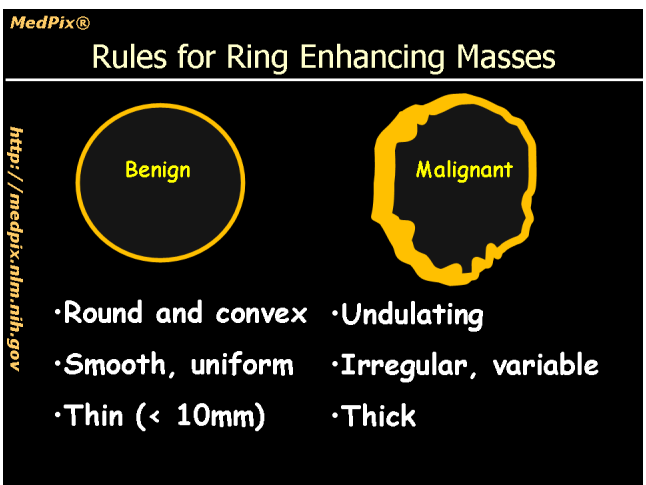
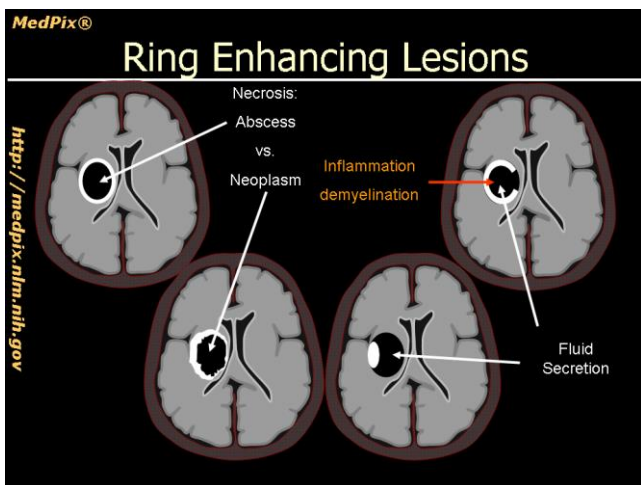
- Diffuse abnormality



Another analysis – similar to sorting clinical history – is comparing lesion volume with overall mass-effect; and, noting secondary effects like “vasogenic edema”, mass-effect, herniation and shift.

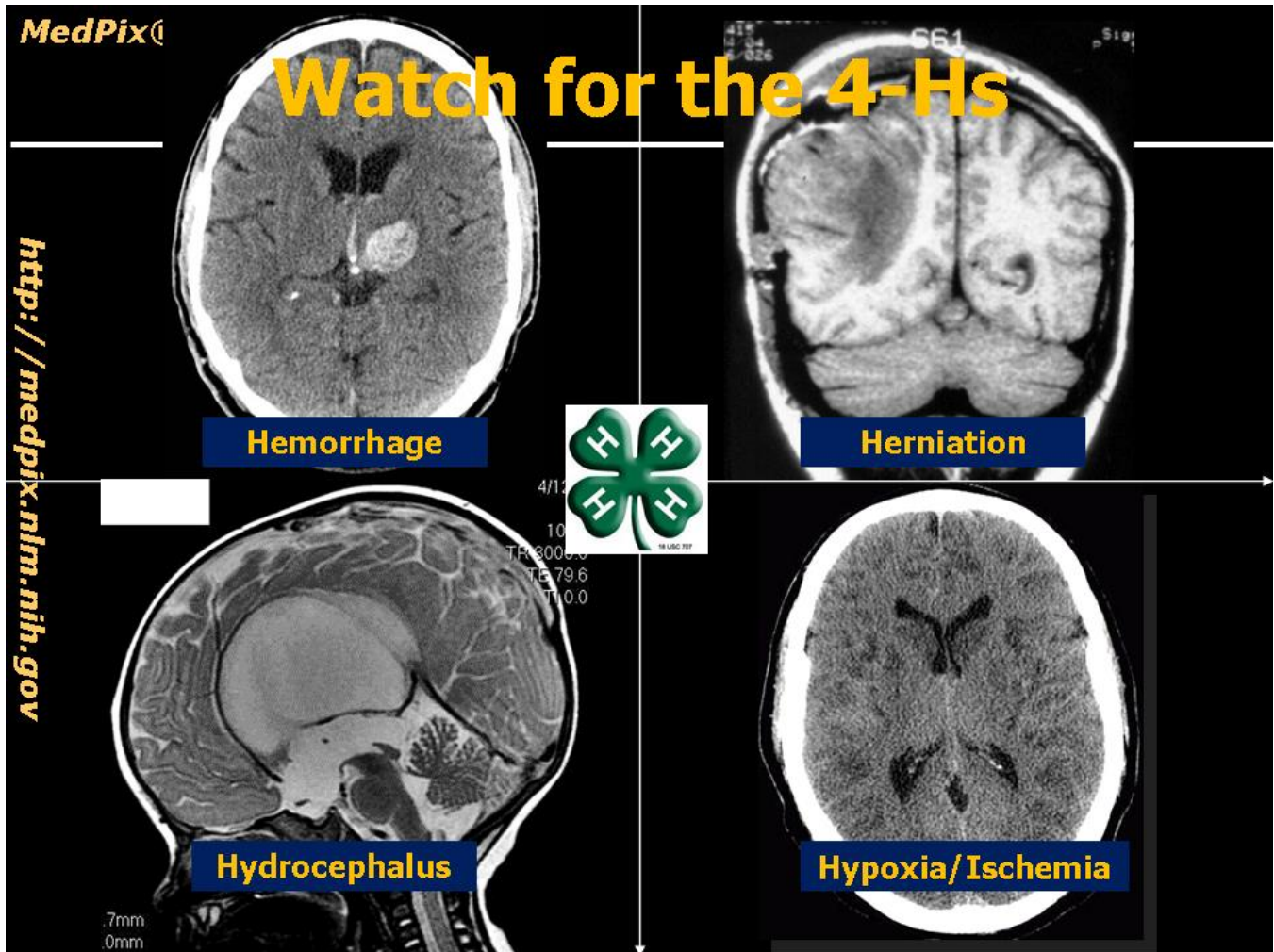


Lesion morphology is another tool for differential diagnosis. Lesions may be homogeneous or heterogeneous. Contrast-enhancement may be solid, “necrotic”, “cystic with nodule”, or form an “open-ring” or “horseshoe”.



Lastly – and certainly not least – we must learn to recognize life-threatening image findings that require urgent treatment – either surgical (decompression, ventricular drainage) or medical (hyperventilation, osmotic agents, corticosteroids). These urgent findings are often called the “Four H’s”:

- Hemorrhage
 - Herniation (and shift)
 - Hydrocephalus
 - Hypoxia and Hinfarction
- } Mass Effect



Suggest References