



Neuroradiology

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Classification of Head CT After Trauma

Grading system for brain injury based on cistern compression and midline shift

Diffuse Injury Grade	CT Appearance	Mortality
I	Normal intracranial appearance	9.6%
II	Basal cisterns present. Midline shift <5mm. No lesions.	13.5%
III	Basal cisterns compressed or absent. Midline shift <5mm. No lesions >25cc.	34%
IV	Midline shift >5mm. No lesions >25cc.	56.2%

Hounsfield Units Scale

Table with radiodensity measurements of important structures on CT scan

Basic Densities	Hounsfield Units	
Air at STP	-1000	Hounsfield basic density
Water	0	Hounsfield basic density
Fat	-60 to -120	Hounsfield basic density
Compact Bone	+1000	Hounsfield basic density
Cranial Structures		
Brain (Grey Matter)	+30 to +40	
Brain (White Matter)	+20 to +35	

Cerebral edema	+10 to +14	
CSF	+5	
Cranial Bone	+600	
Blood clot	+75 to +80	Acute SDH, EDH, SAH; Hct<23% → isodense to brain
Enhanced vessels	+90 to +100	

MRI Abbreviations

Abbreviation	Description
T1WI	Spin-lattice relaxation time – expresses realignment time of tissue's proton spin
T2WI	Spin-spin relaxation time – time constant for transverse magnetization decay (true T2)
T2*	Observed time constant of transverse magnetization decay (observed T2)
TR	Repetition time
TE	Echo time
TI	Inversion time
FLAIR	Fluid-attenuated inversion recovery
FSE	Fast spin echo
STIR	Short TI inversion recovery

Temporal Changes in Signal Characteristics for Blood on MRI

Time	T1 Weighted Image	T2 Weighted Image
Acute	Gray	Black
Subacute	White	White

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