phantomx

Article Number
50-01

HEAD PHANTOM STROKE / BLEED

Age Category	Adult
Body Region	Head
Target Modality	CT
Diagnostic Features	Infarction, hemorrhage



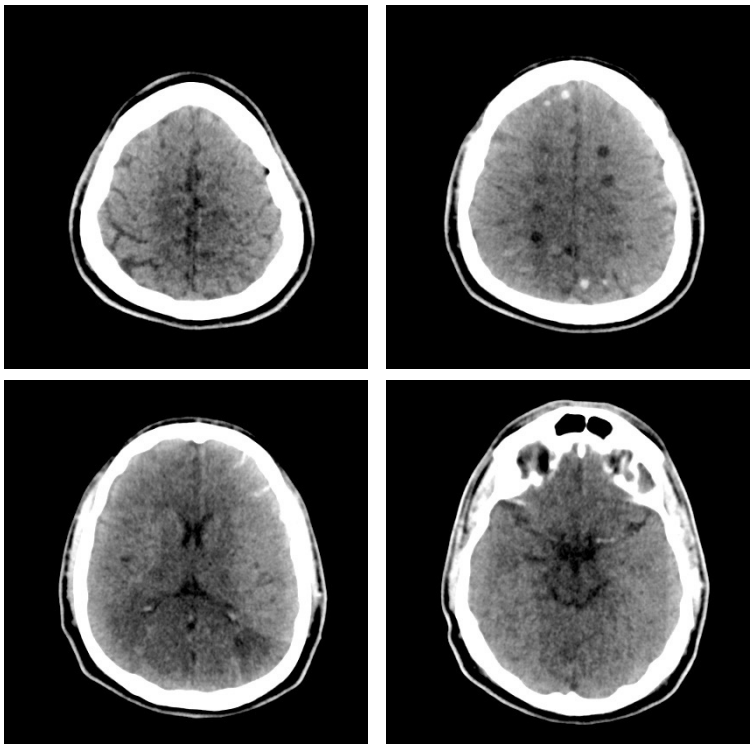
This phantom simulates a head with stroke and bleeding patterns. It covers the vertex to the foramen magnum.

Stroke patterns include signs of early infarction (hyperdense middle cerebral artery, disappearing basal ganglia), acute and subacute watershed infarcts, and lacunar infarctions of varying ages.

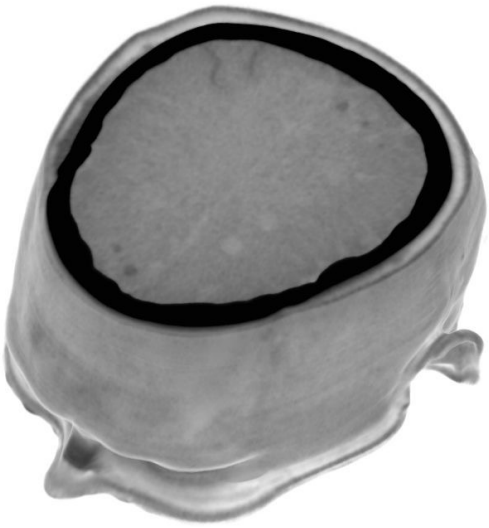
Bleeding patterns include subarachnoid hemorrhage, subdural hemorrhage of varying ages, intraventricular hemorrhage, and intracerebral hemorrhage.

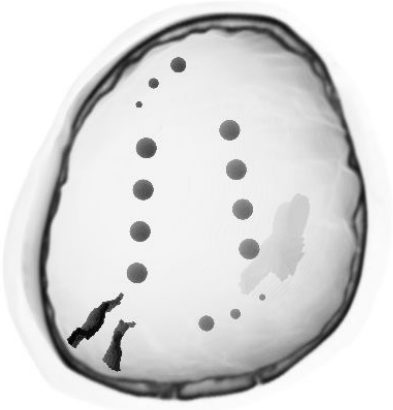
The phantom can be used in CT (including CBCT) to evaluate and optimize imaging performance and AI-enabled diagnosis. It is also suited for training purposes.

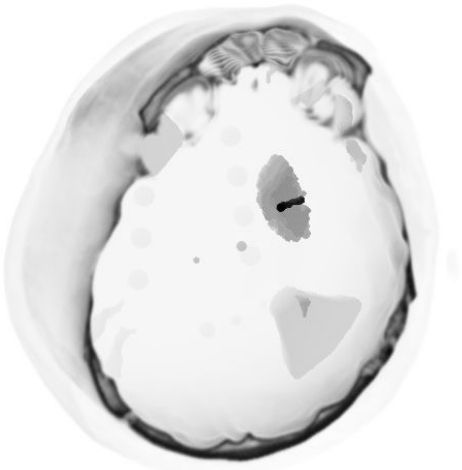
The phantom provides a detailed and realistic simulation of common brain pathologies, soft and bone tissues. Air voids are filled with a cellulose-polymer composite of approx. -160 HU.



HEAD PHANTOM STROKE / BLEED







Specifications

Size	Approx. 190 x 210 x 147 mm 7.5 × 8.3 × 5.8 in
Weight	Approx. 2640 g 5.8 lb
Base material	Cellulose-polymer composite
Optimal tube voltage	120 kVp [cf page 6] - adaptable upon request -

Diagnostic features

Stroke

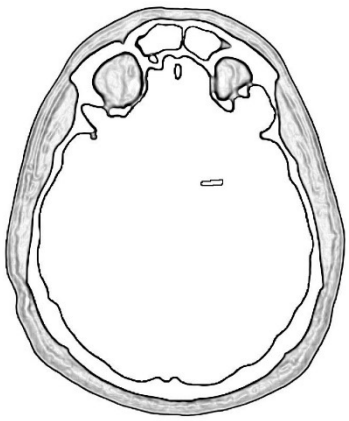
- Hyperdense middle cerebral artery [MCA] and disappearing basal ganglia on the left side
- Watershed infarcts in middle/posterior [MCA/PCA] and anterior/middle cerebral artery [ACA/MCA] territories
- 8 lacunar infarcts of varying ages

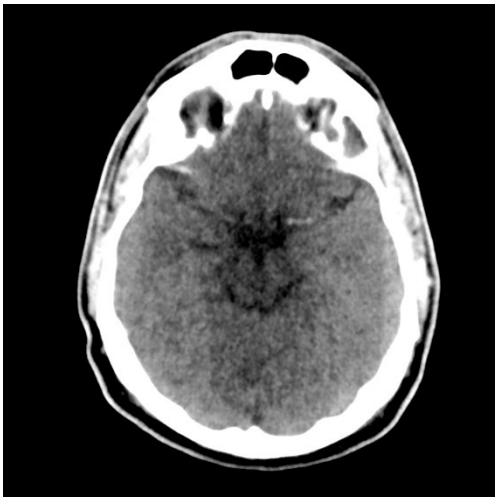
Hemorrhage

- Subarachnoid hemorrhage [2 territories]
- Subdural hemorrhage of varying ages [3 territories]
- Intraventricular hemorrhage [left lateral ventricle]
- Intracerebral hemorrhage [2 thalamic, 6 subcortical]

HEAD PHANTOM STROKE / BLEED

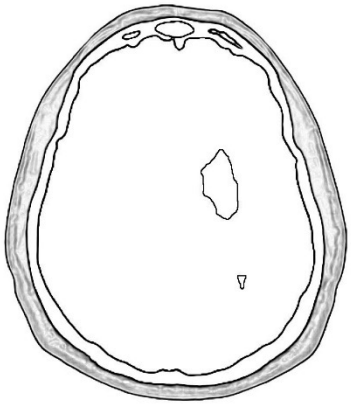
Infarction
- *Hyperdense middle cerebral artery (MCA), left side*

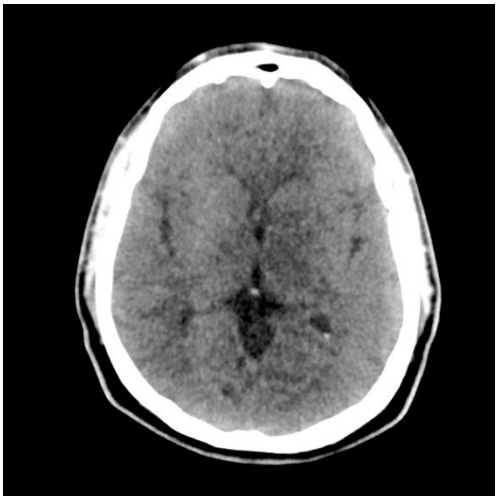




Infarction
- *Disappearing basal ganglia, left side*

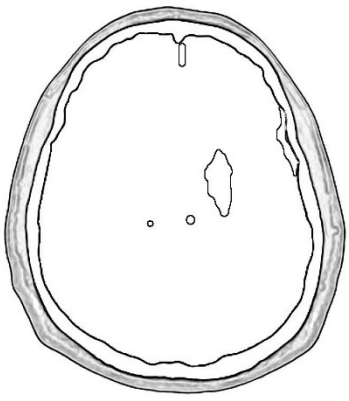
Hemorrhage
- *Intraventricular hemorrhage, left side*

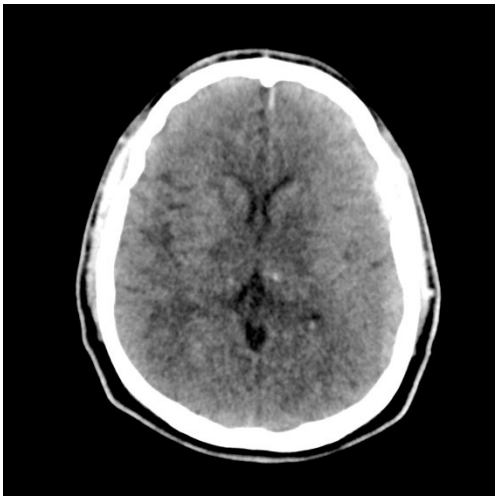




Infarction
- *Disappearing basal ganglia, left side*

Hemorrhage
- *Thalamic hemorrhage, spherical, diameter: 2.5 mm (right side), 4 mm (left side)*
- *Acute subdural hemorrhage (left frontal and parafalcine)*

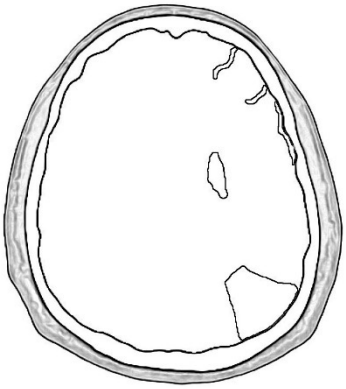


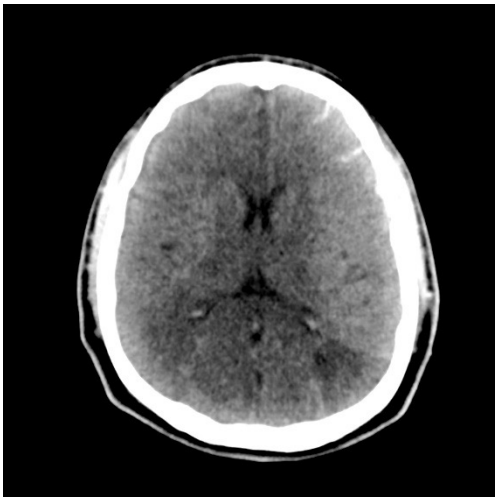


HEAD PHANTOM STROKE / BLEED

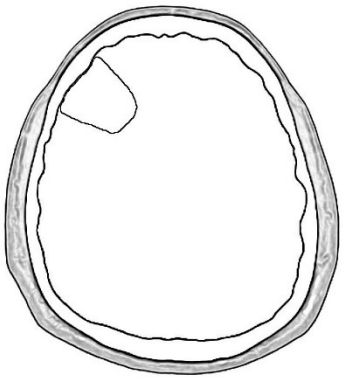
Infarction
- *Disappearing basal ganglia, left side*
- *Subacute watershed infarct MCA/PCA, left side*

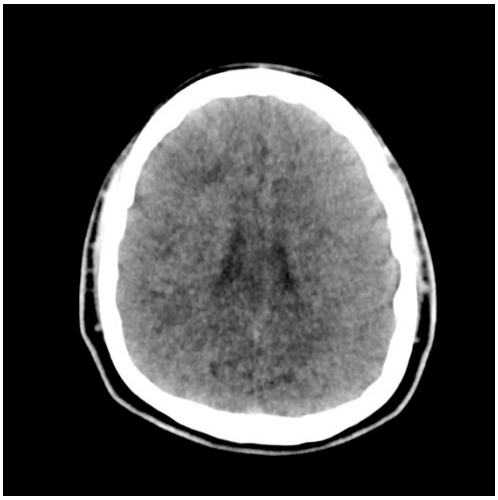
Hemorrhage
- *Acute subarachnoid hemorrhage, left frontal*



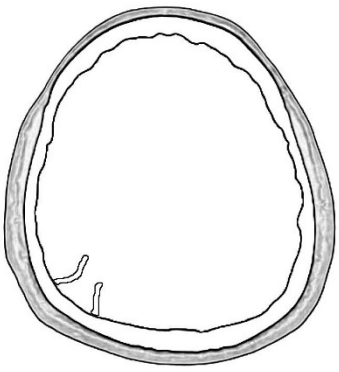


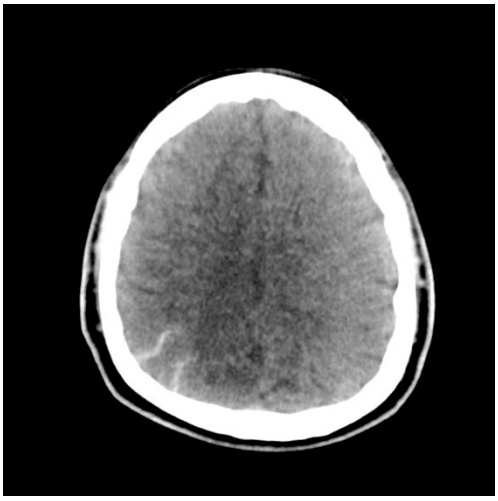
Infarction
- *Acute watershed infarct ACA/MCA, right side*





Hemorrhage
- *Acute subarachnoid hemorrhage, right parietal*





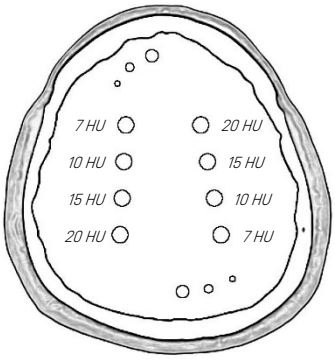
HEAD PHANTOM STROKE / BLEED

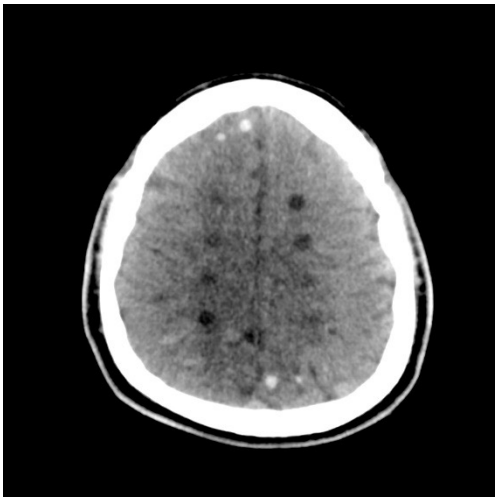
Infarction

- *Lacunar infarcts, spherical, diameter: 8 mm, nominal contra to 20 HU*

Hemorrhage

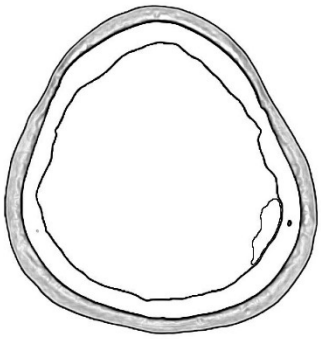
- *Acute intracerebral hemorrhage, spherical, diameter: 2.5, 4 and 6 mm*

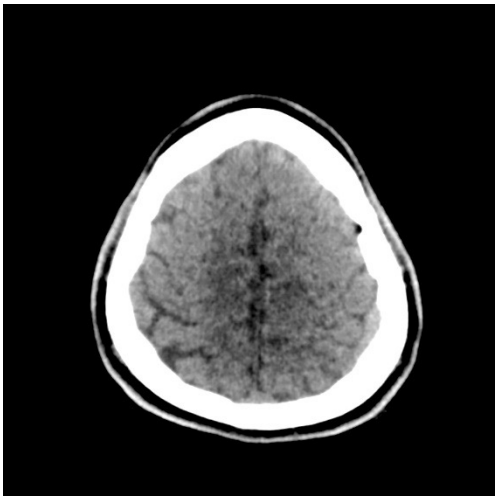




Hemorrhage

- *Subacute subdural hemorrhage, left parietal*



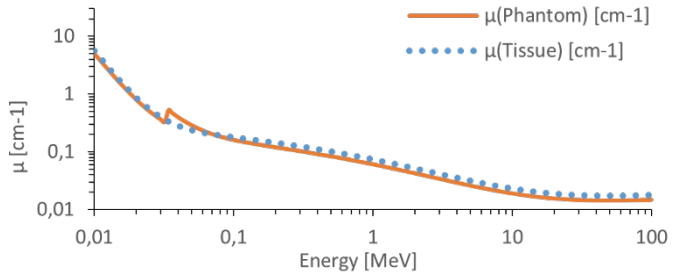


HEAD PHANTOM STROKE / BLEED

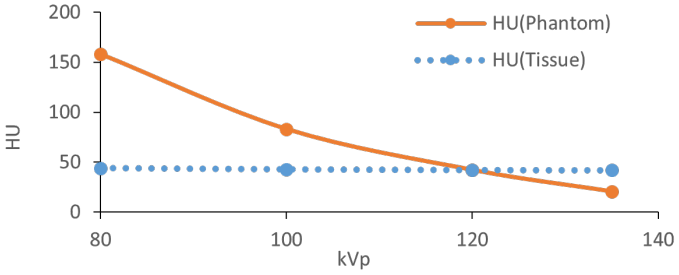
Attenuation properties

Soft Tissue

Linear attenuation coefficients [cm^{-1}] (calculated)

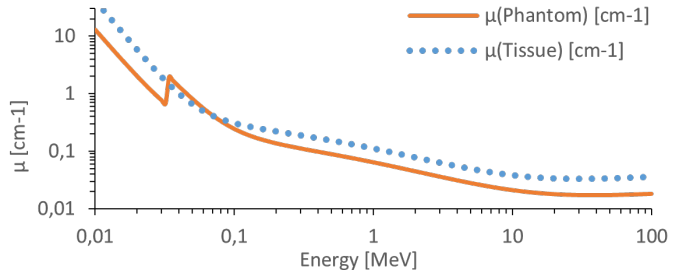


Hounsfield units (calculated)

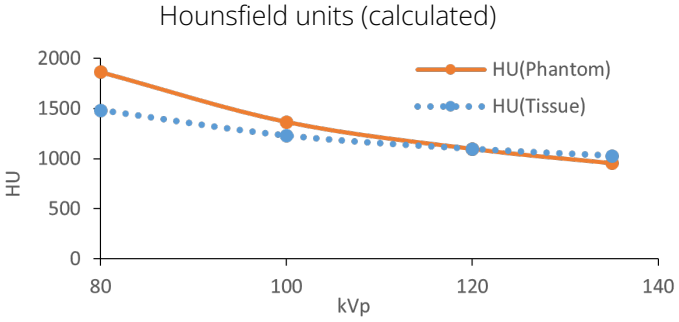


Bone Tissue

Linear attenuation coefficients [cm^{-1}] (calculated)



Hounsfield units (calculated)



Tissue Reference: Woodard HQ, White DR. The composition of body tissues. Br J Radiol. 1986.

General indications

- The phantom is made of a cellulose-polymer composite material with properties similar to hardwood. If handled carefully, it will last a long time.
- The phantom is coated with a protective layer. If the protective layer is undamaged, the phantom can be cleaned using a damp cloth (water or mild detergent).
- Protect from direct sunlight.
- Maintain a storage temperature of 10 °C to 30 °C. If the phantom is exposed to temperatures below -10 °C or above 45 °C, it can be severely damaged.
- The phantom is not equipped for dose measurements with dosimeters and it is not suited for material characterization with dual energy CT.
- The phantom is not certified as medical device.
- Air voids are filled with cellulose-polymer composite of approx. -160 HU.
- Handle with care to prevent injury or damage.
- If external damage is observed, it is recommended to consult PhantomX.

Lesion contrast

Lesion contrast can vary based on protocol settings, including dose and reconstruction algorithm, as well as the chosen measurement method.

To measure lesion contrast, it is recommended to define volumes of interest (VOIs) that encompass most of the lesion and adjacent tissue. Edges of the lesion should be avoided, and measurements should be averaged across multiple scans to improve reliability, given the inherent noisiness of low-contrast measurements.

The VOI should cover at least one-third of the lesion volume, and the VOI for adjacent tissue should be equal to or larger than the lesion volume.

HKMedQC
Wellcome Technology Co., Limited
Email:ivylin@hkmedqc.com
web:http://www.hkmedqc.com
19H Maxgrand plaza,No.3 Tai Yau Street, San Po Kong,Kowloon,hk