

HEAD PHANTOM STROKE / BLEED

Age
Category

Adult

Body
Region

Head

Target
Modality

CT

Diagnostic
Features

Infarction,
hemorrhage

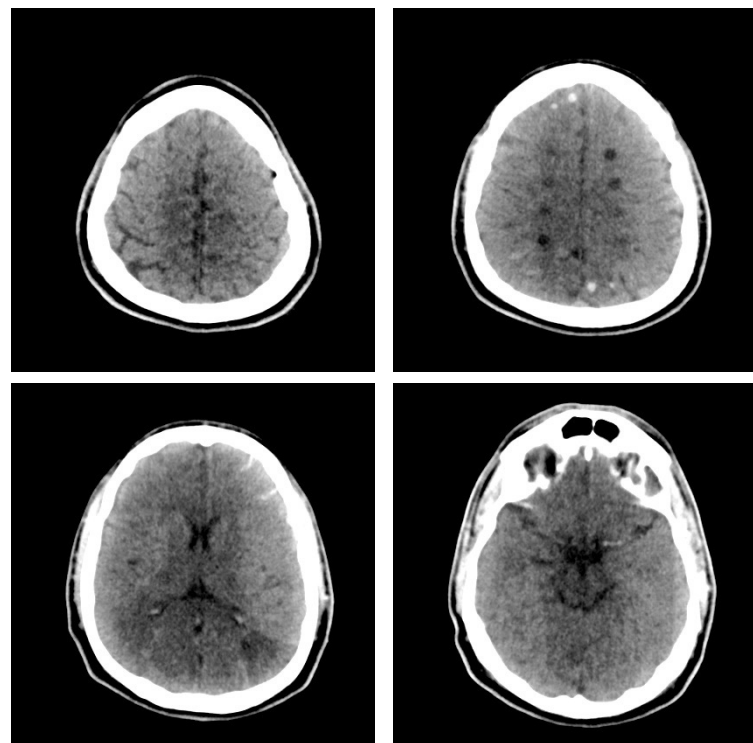
This phantom simulates a head with stroke and bleeding patterns. It covers the vertex to the foramen magnum.

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.

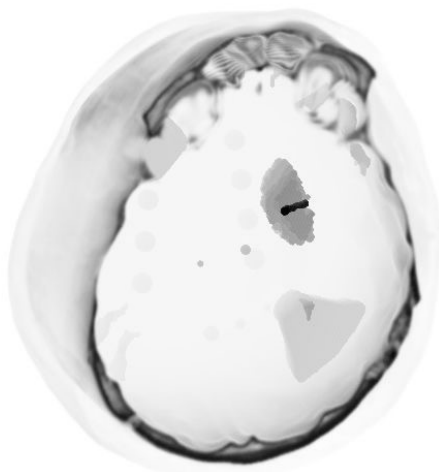
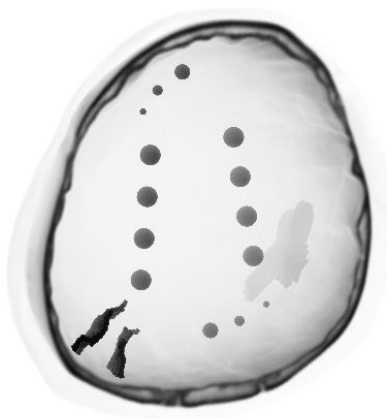
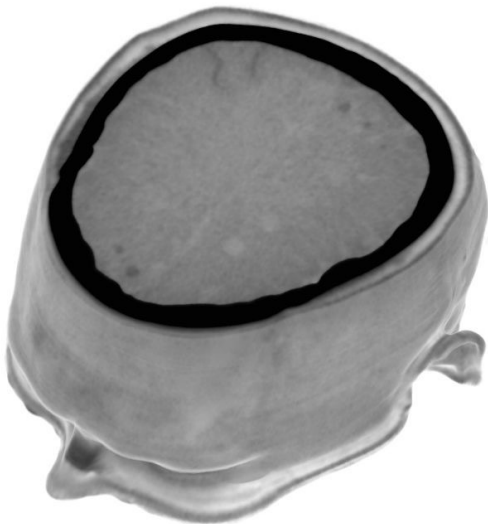
Bleeding patterns include subarachnoid hemorrhage, subdural hemorrhage of varying ages, intraventricular hemorrhage, and intracerebral hemorrhage.

The phantom can be used in CT (including CBCT) to evaluate and optimize imaging performance and AI-enabled diagnosis.

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.



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Specifications

Size	Approx. 190 x 210 x 147 mm 7.5 x 8.3 x 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

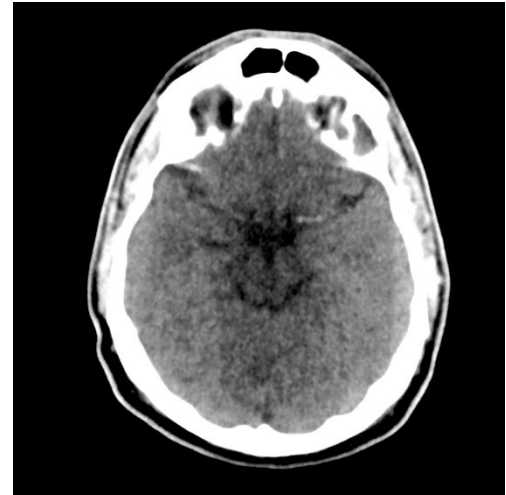
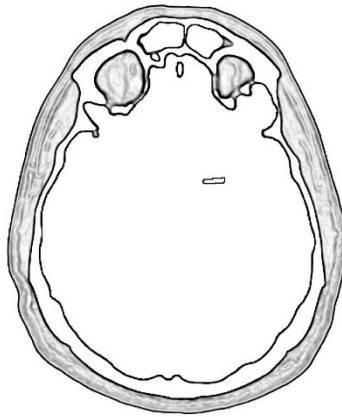
- Subarachnoid hemorrhage (2 territories)
- Subdural hemorrhage of varying ages (3 territories)
- Intraventricular hemorrhage (left lateral ventricle)
- Intracerebral hemorrhage (2 thalamic, 6 subcortical)

For more information visit
www.phantomx.de

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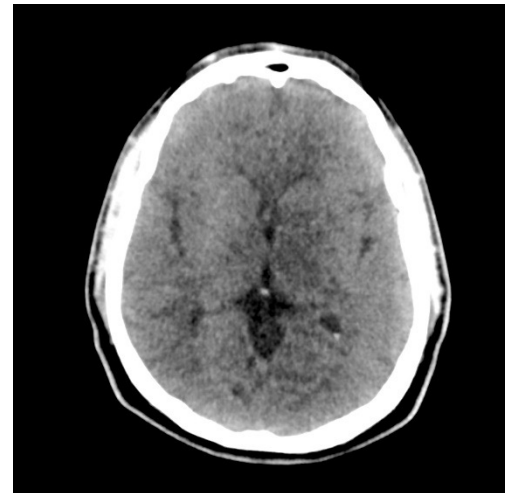
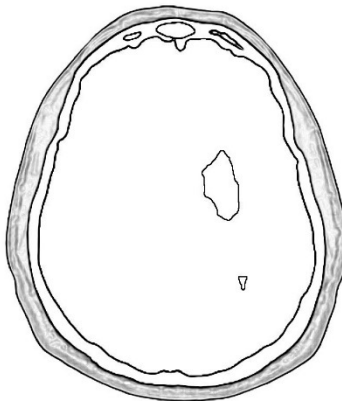
Infarction

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



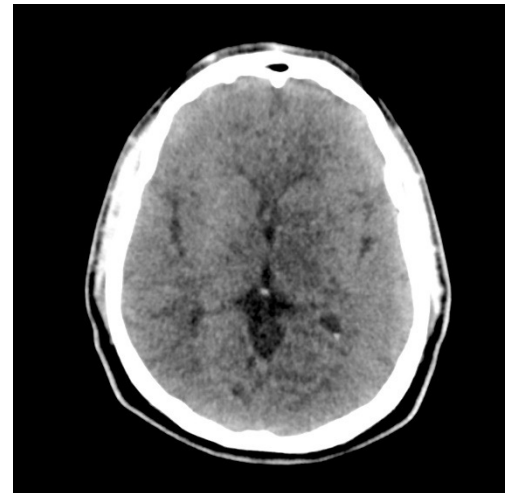
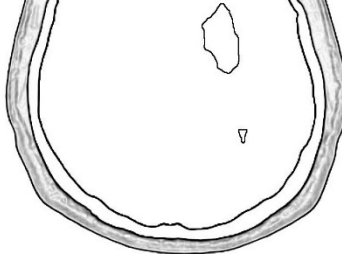
Infarction

- *Disappearing basal ganglia, left side*



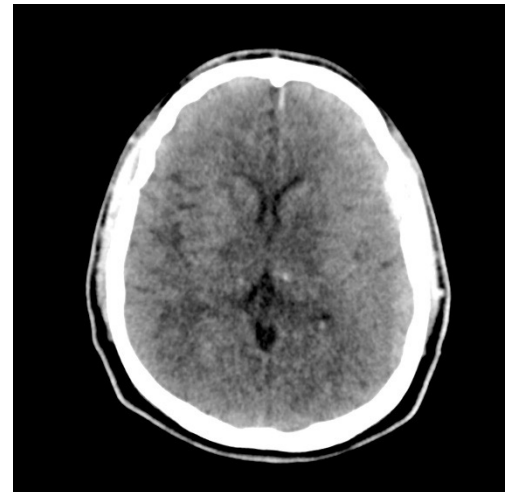
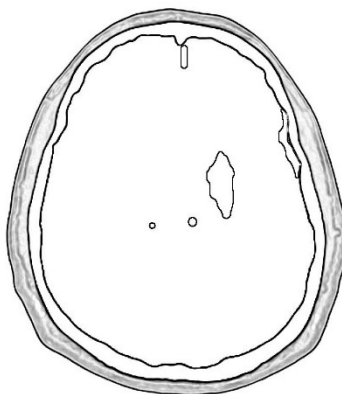
Hemorrhage

- *Intraventricular hemorrhage, left side*



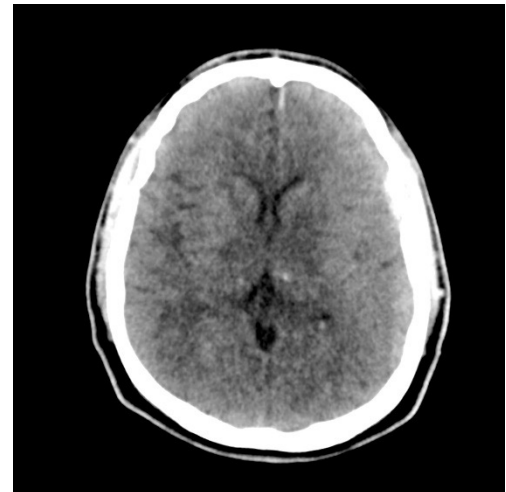
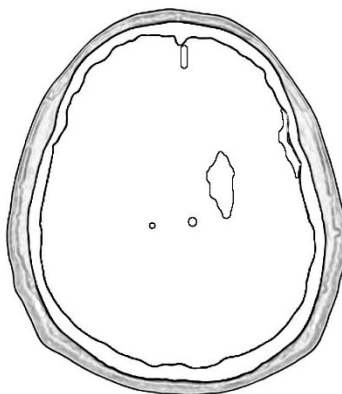
Infarction

- *Disappearing basal ganglia, left side*



Hemorrhage

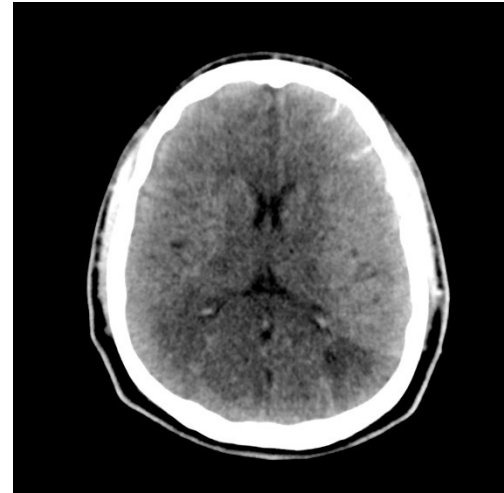
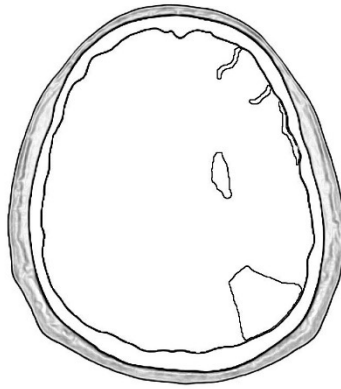
- *Thalamic hemorrhage, spherical, diameter: 2.5 mm (right side), 4 mm (left side)*
- *Acute subdural hemorrhage (left frontal and parafalcine)*



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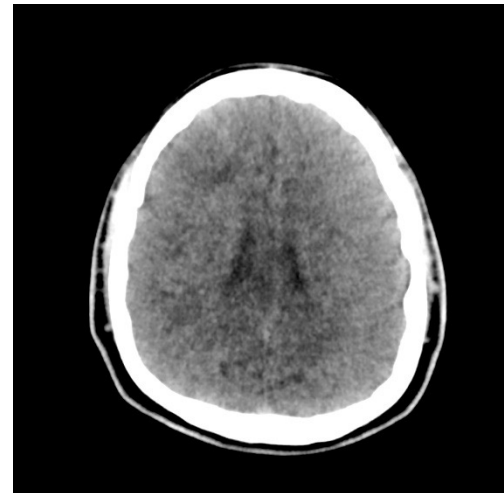
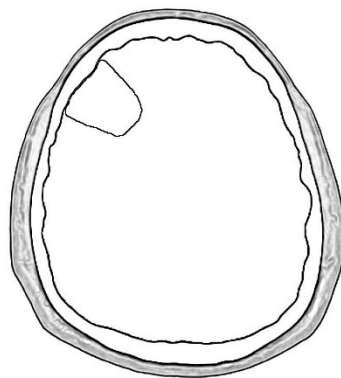
Infarction

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



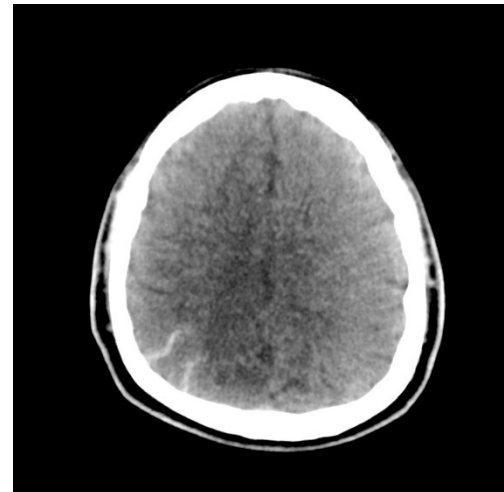
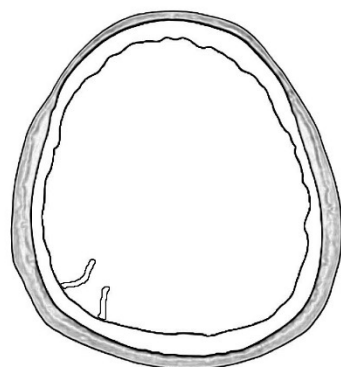
Hemorrhage

- *Acute subarachnoid hemorrhage, left frontal*



Infarction

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



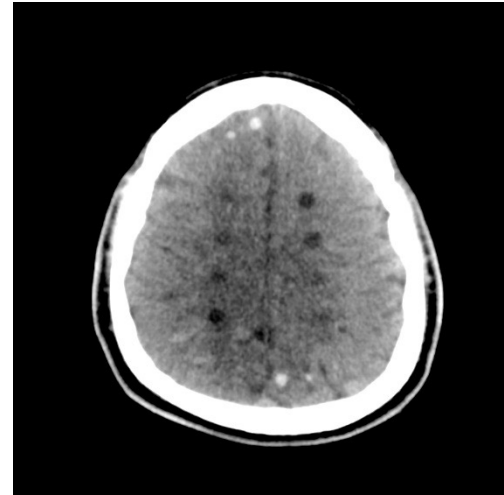
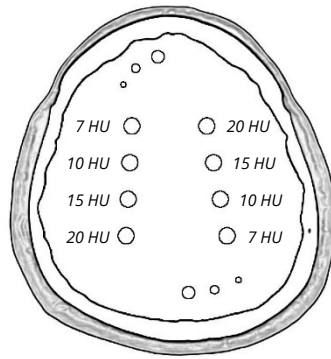
Hemorrhage

- *Acute subarachnoid hemorrhage, right parietal*

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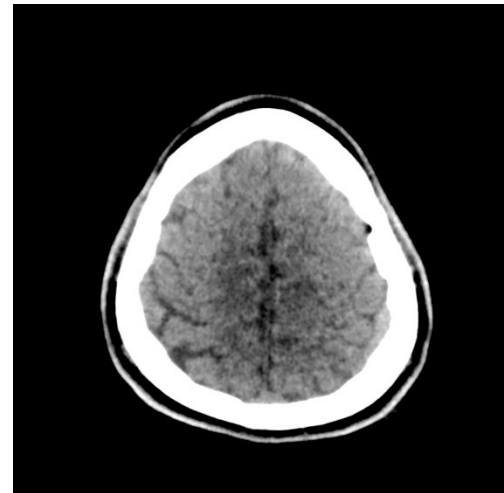
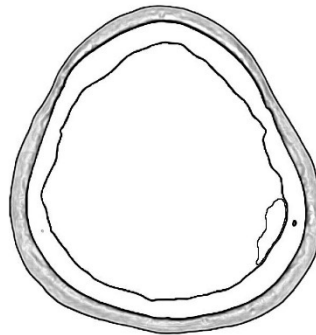
Infarction

- *Lacunar infarcts, spherical, diameter: 8 mm, nominal contrast: 7 to 20 HU*



Hemorrhage

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



Hemorrhage

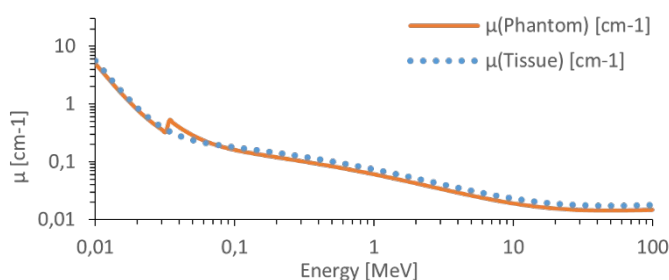
- *Subacute subdural hemorrhage, left parietal*

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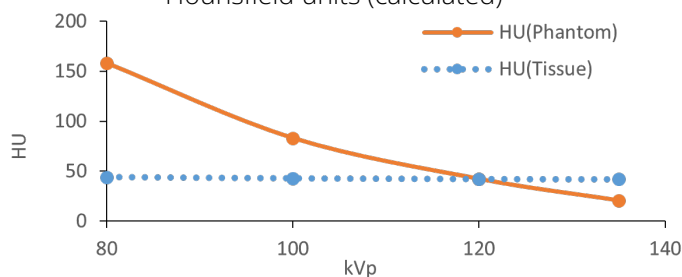
Attenuation properties

Soft Tissue

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

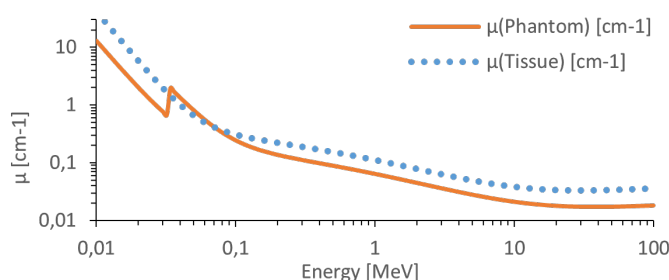


Hounsfield units (calculated)

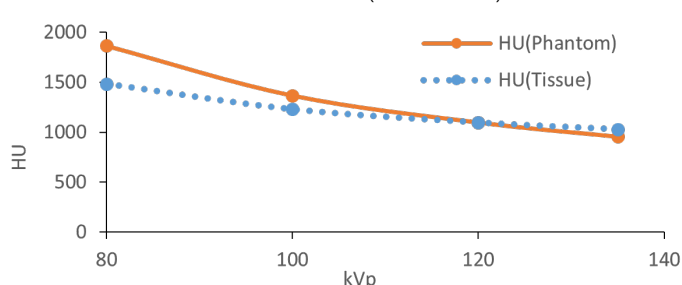


Bone Tissue

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.