74-year-old female with face/head/wrist pain after mechanical fall

Joseph Ryan, MD, PhD
Michael Baldwin, MD

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CT head without intravenous contrast

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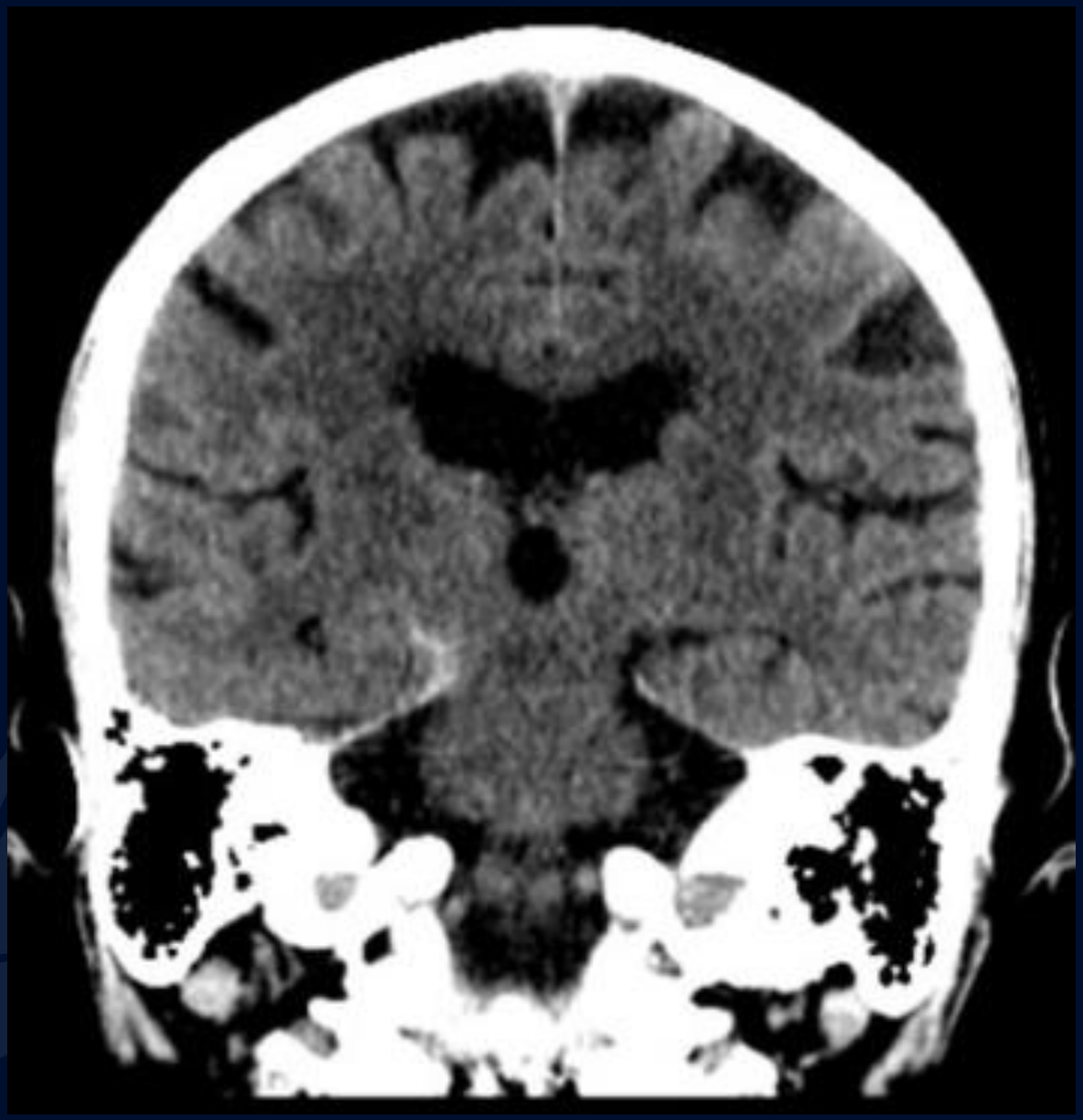

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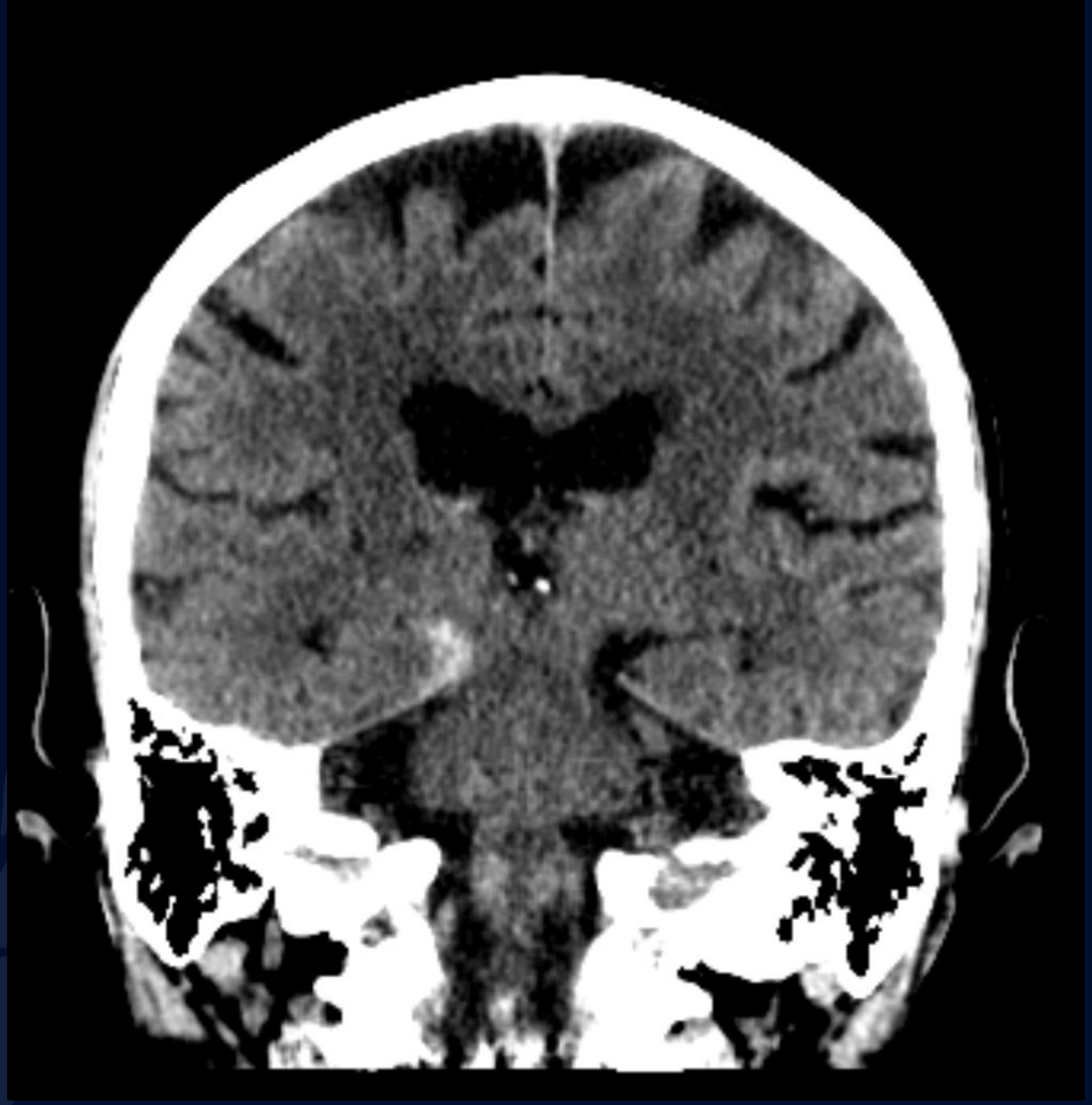

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Subarachnoid hemorrhage

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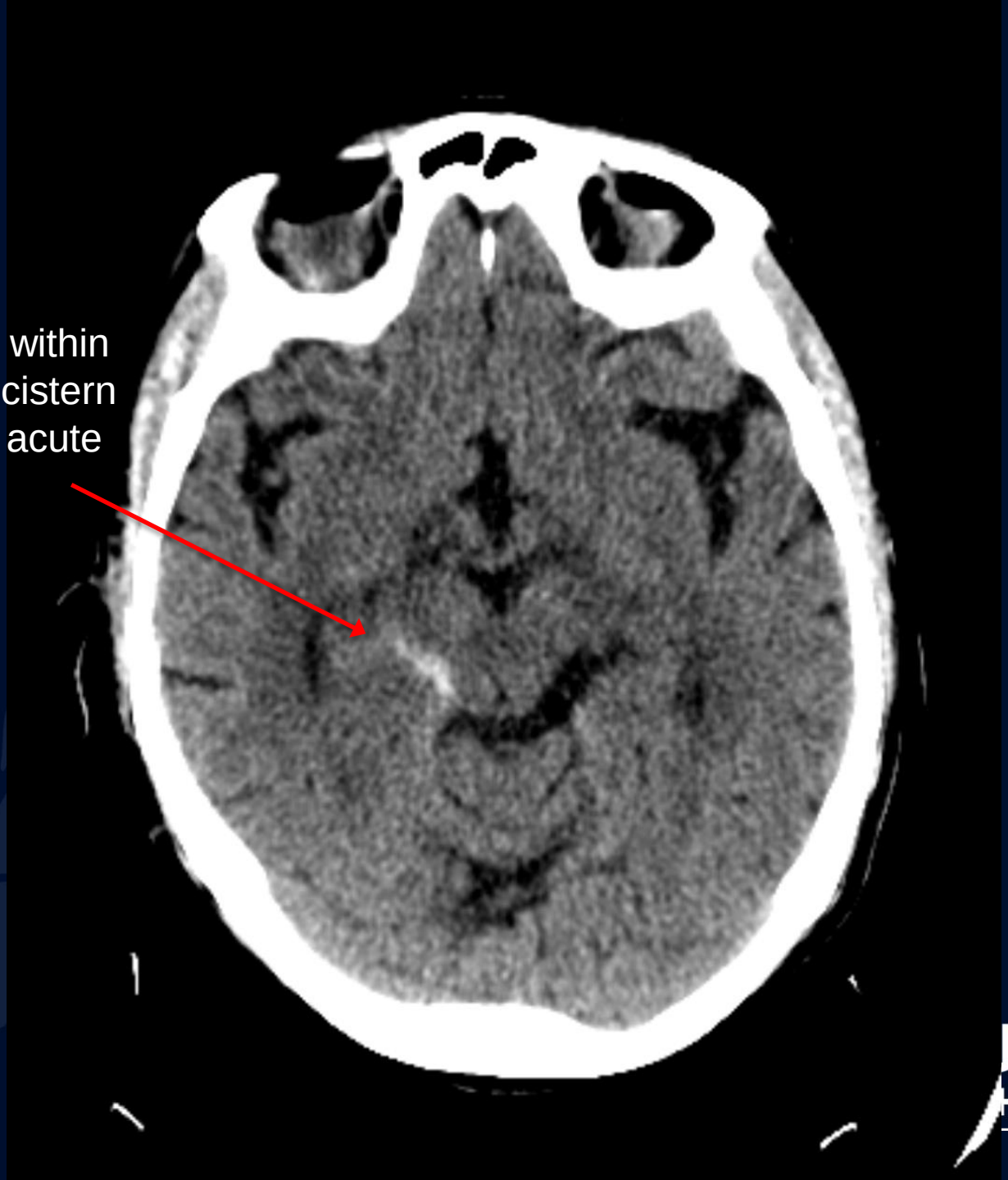
Hyperdensity within right ambient cistern representing acute blood



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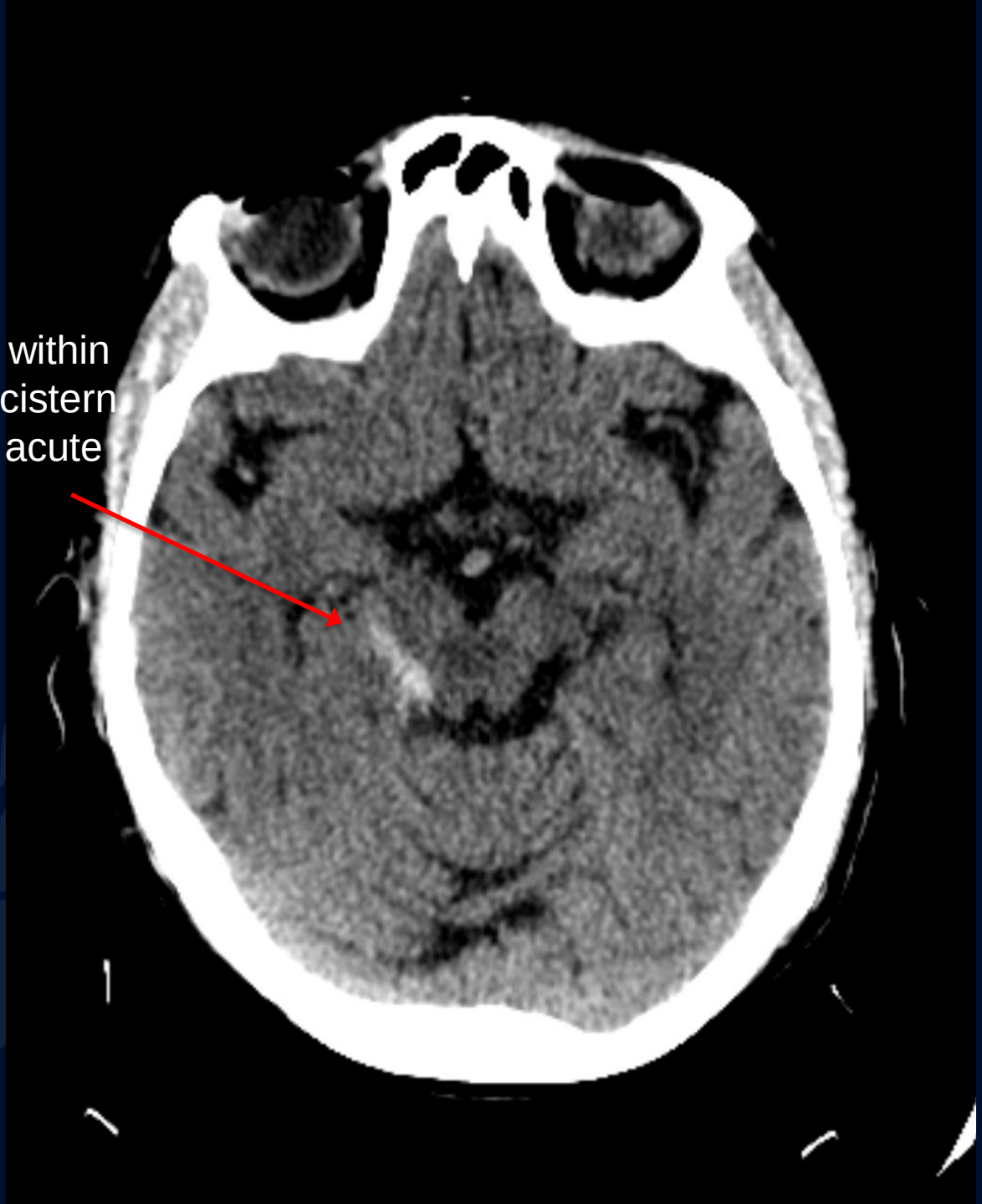

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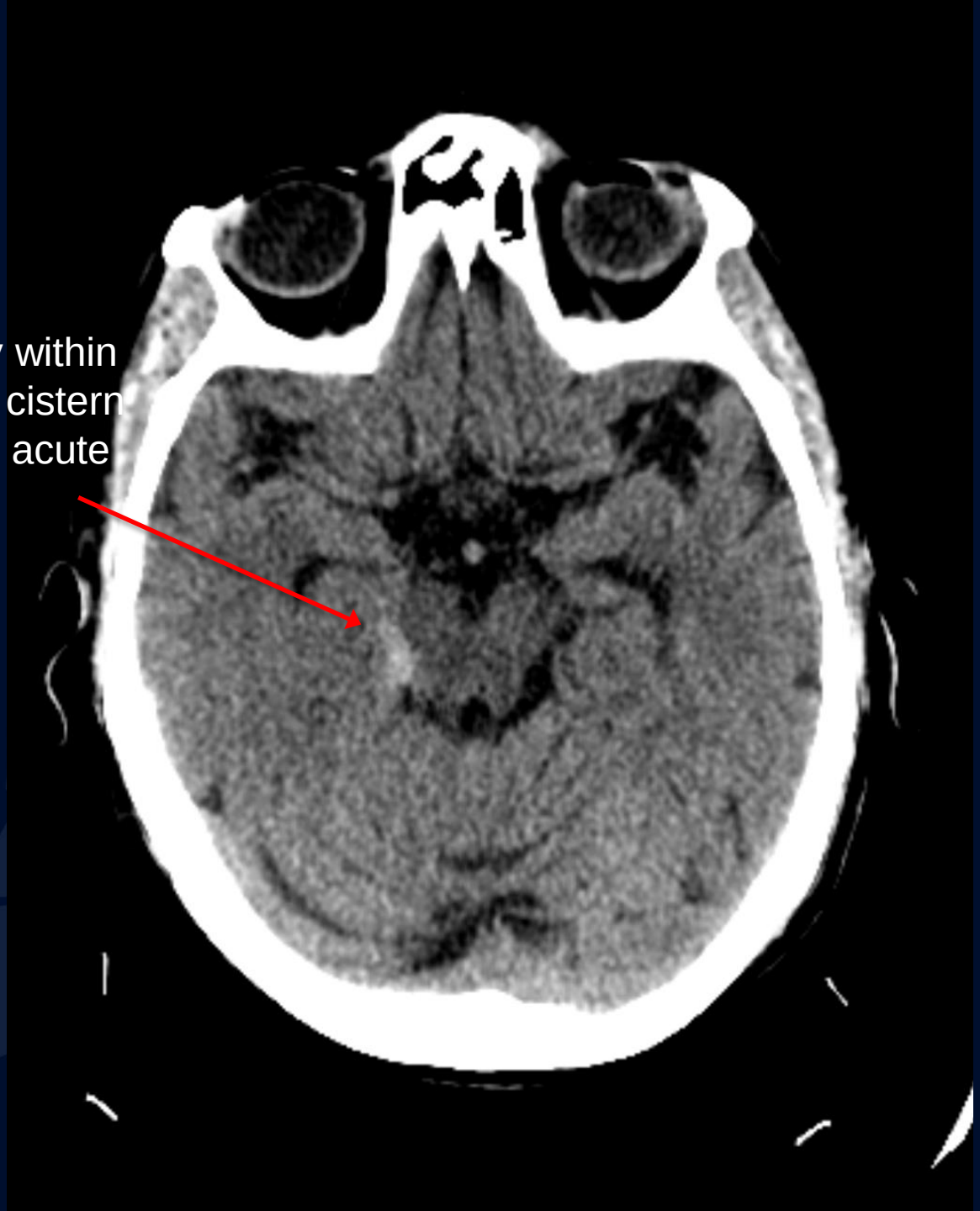
Hyperdensity within right ambient cistern representing acute blood



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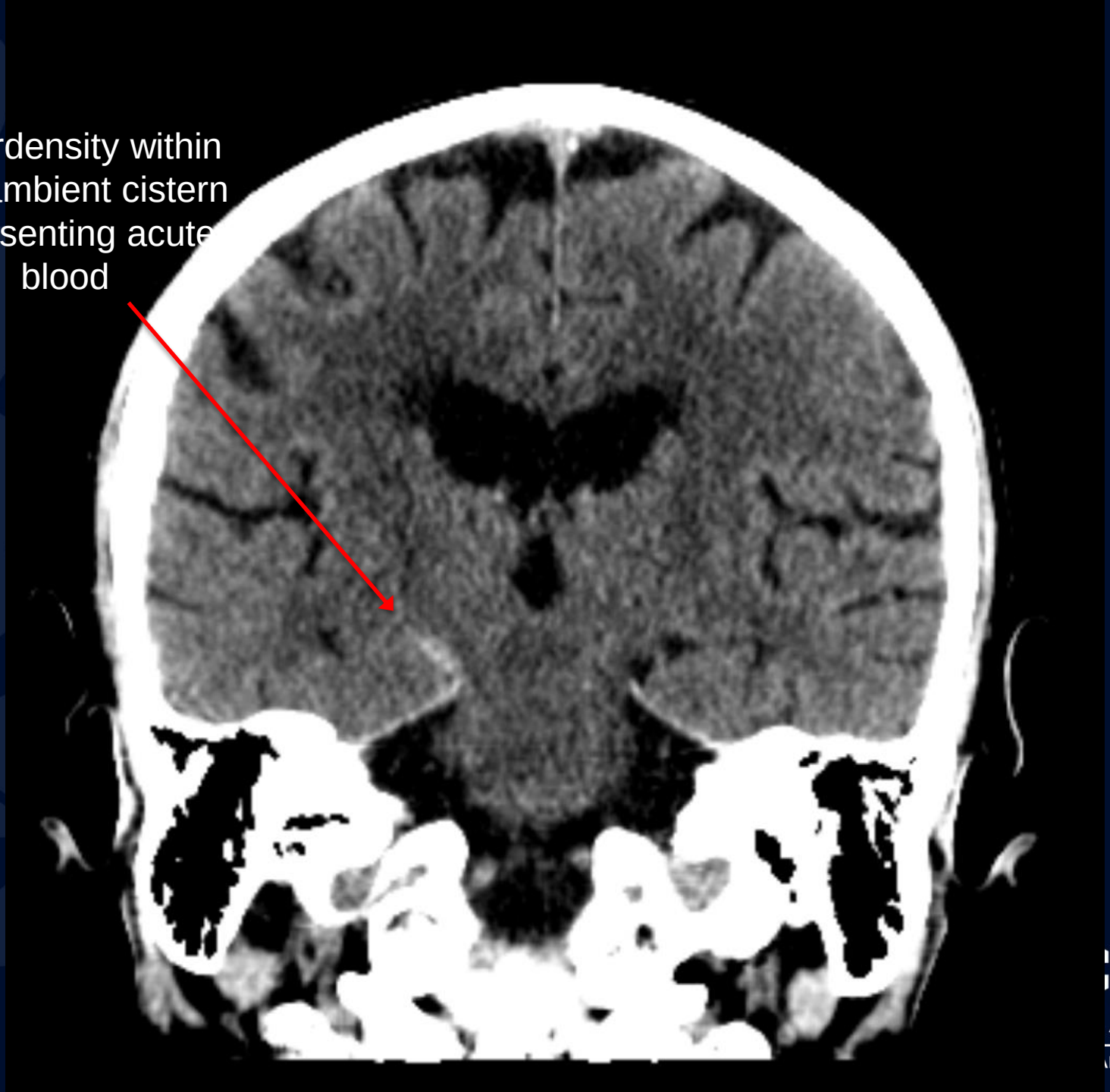

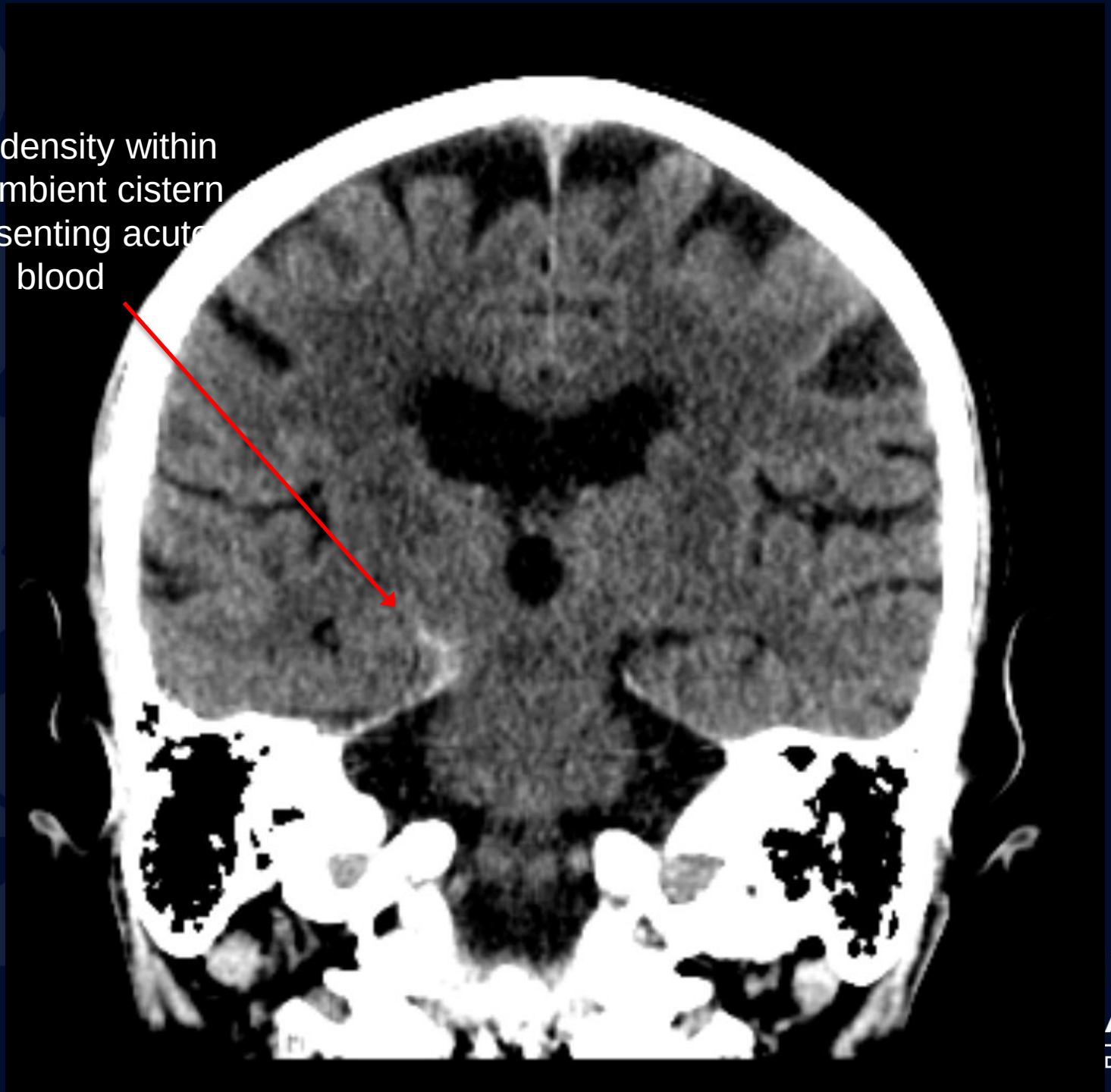

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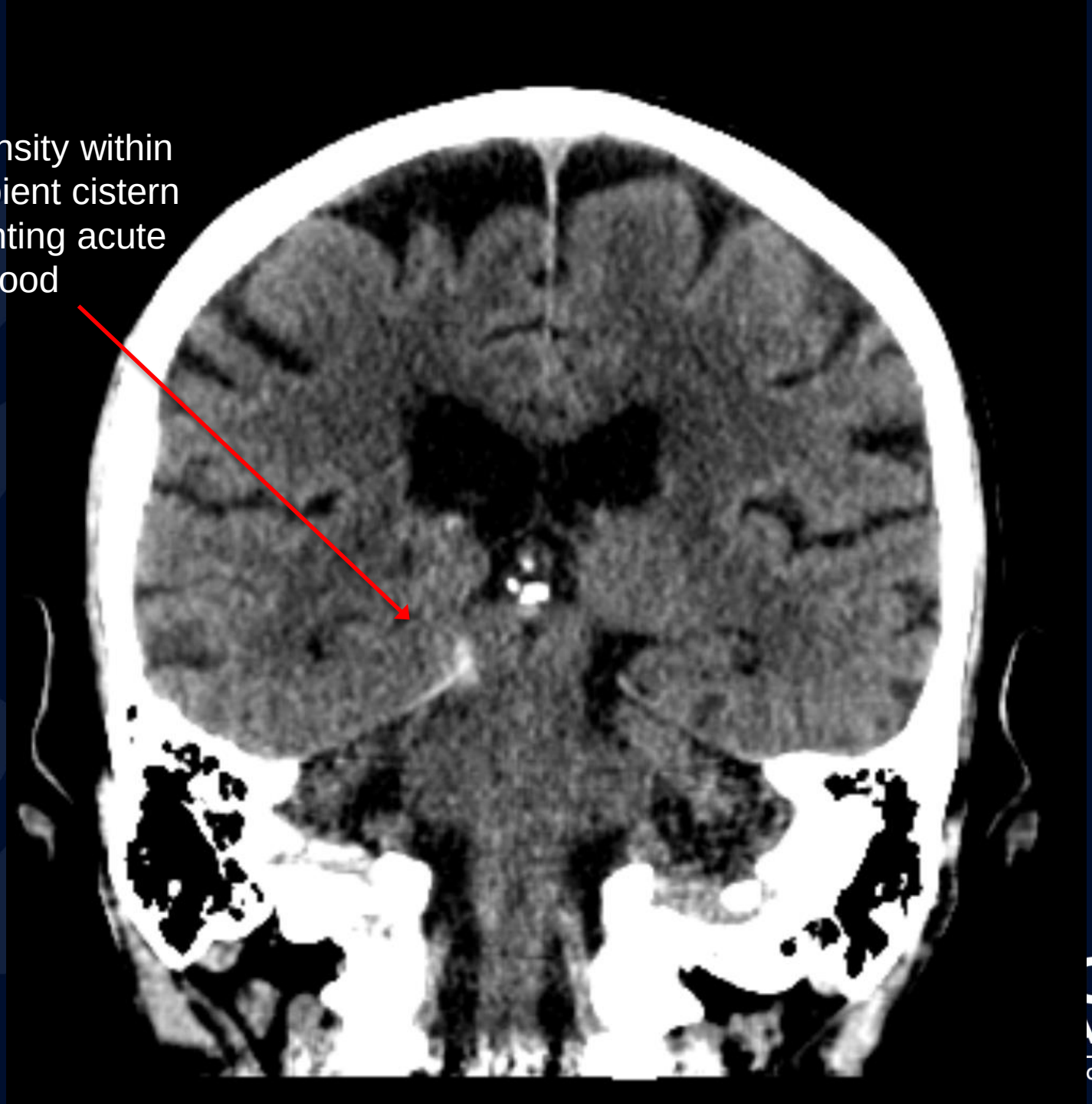
Hyperdensity within right ambient cistern representing acute blood

Background

- Extra-axial intracranial hemorrhage into the subarachnoid space
- Typical patient is older middle age (usually < 60 y/o)
- Risk factors: family history, HTN, EtOH, connective tissue disorders (ADPKD, Ehlers-Danlos, Marfan, NF-1), sex (female > male)
- Presentation: sudden onset, severe headache +/- photophobia +/- focal neuro deficits +/- altered consciousness
- 3 distinct patterns:
  - suprasellar cistern with diffuse peripheral extension
  - perimesencephalic and basal cisterns
  - isolated cerebral convexity
- Causes:
  - trauma
  - spontaneous (berry aneurysm most common, followed by perimesencephalic, then various other less common etiologies such as AVM, cerebral amyloid angiopathy, rupture mycotic aneurysm, dural AVF, etc.)

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Diagnosis

- Non-contrast head CT is typical imaging modality, although MRI is more sensitive and can better identify cause
- Amount of blood and timing determine CT sensitivity
- Subarachnoid blood is hyperintense on FLAIR imaging in the first ~12 hours
- SWI is very sensitive to blood products
- DWI is helpful to assess for hemorrhage-associated ischemia
- CT angiography and MR angiography are useful to determine cause of subarachnoid bleed
- DSA is the gold standard and can enable treatment

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Management

- Treatment is aimed at identifying and reversing the cause of bleeding, and managing the potential complications
- ICP monitoring and EVD placement for hydrocephalus
- Preventing cerebral vasospasm-induced delayed ischemia using hemodilution, hypertension, hypervolemia, calcium channel blockers, endovascular vasodilatory treatments and/or balloon angioplasty
- Prevention of electrolyte imbalances, coronary spasm, neurogenic pulmonary edma, and providing other supportive care, etc.

References

1) https://radiopaedia.org/articles/subarachnoid-haemorrhage
2) Van gijn J, Rinkel GJ. Subarachnoid haemorrhage: diagnosis, causes and management. Brain. 2001;124 (Pt): 249-78.
3) F.H.H. Linn, G.J.E. Rinkel, A. Algra, J. van Gijn. Incidence of Subarachnoid Hemorrhage. (1996) Stroke. 131 (24): e535.

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