

The Weill Cornell Headache Appropriate Use Criteria (AUC) addresses fifteen clinical conditions common to patients presenting with Headache and makes recommendations to optimize diagnostic effectiveness.

Common Clinical Conditions – Headache	
0	Not headache, Syncope, Stroke, Sinusitis or Trauma
1	Head Trauma, Evidence of Bleeding or Injury on Imaging
2	Head Trauma, Loss of Consciousness - Amnesia, Head Trauma Feature #1
3	Head Trauma, more than 24 hours ago
4	Head Trauma, no Loss of Consciousness - Amnesia, plus one Serious Head Trauma Feature #2
5	Head Trauma, Penetrating Injury or Glasgow Coma Scale less than 15
6	Headache, Abscess Known or Suspected
7	Headache, Aneurysm Known or Suspected
8	Headache, Cancer Known or Suspected
9	Headache, Cerebral Venous Thrombus Known or Suspected
10	Headache, Arteriovenous Malformation (AVM) Known or Suspected
11	Headache, Meningitis Known or Suspected
12	Headache, Plus Serious Headache Features (Nexus Criteria)
13	Sinusitis Known or Suspected
14	Stroke, Known, Suspected or New Onset
15	Syncope

The Headache AUC is activated when a user orders one of the following sixteen Advanced Imaging Procedures.

Advanced Imaging Procedures	
1	CT Head without Contrast
2	CT Head with Contrast
3	CT Head with and without Contrast
4	MR Brain without Contrast
5	MR Brain with Contrast
6	MR Brain with and without Contrast
7	MRA Brain with Contrast
8	MRA Brain without Contrast
9	MRA Neck with Contrast
10	MRA Neck without Contrast
11	MRV Brain with Contrast
12	MRV Brain without Contrast
13	MRV Brain with and without Contrast
14	CTA Neck
15	CTA Head
16	CTV Head

The Headache AUC recommends one of the following sixteen Imaging Procedures based on the clinical condition.

Recommended Imaging Procedures	
1	CT Head without Contrast
2	CT Head with Contrast
3	CT Head with and without Contrast
4	MR Brain without Contrast
5	MR Brain with Contrast
6	MR Brain with and without Contrast
7	MRA Brain with Contrast
8	MRA Brain without Contrast
9	MRA Neck with Contrast
10	MRA Neck without Contrast
11	MRV Brain with Contrast
12	MRV Brain without Contrast
13	MRV Brain with and without Contrast
14	CTA Neck
15	CTA Head
16	CTV Head

Additional Clinical Information – Head Trauma and Serious Headache Features

The Headache AUC logic utilizes twenty-nine additional clinical indications categorized as;
 Serious Head Trauma Features #1, Serious Head Trauma Features #2 and, Serious Headache Features.

Serious Head Trauma Features #1 with Loss of Consciousness or Amnesia

Serious Head Trauma Features #1	
1	Headache
2	Vomiting
3	Age >60
4	Intoxication
5	Short-Term Memory Loss
6	Evidence of Trauma above Clavicle
7	Seizure
8	GCS<15
9	Focal Neurological Deficit
10	Coagulopathy

Serious Head Trauma Features #2 without Loss of Consciousness or Amnesia

Serious Head Trauma Features #2	
1	Focal Neurological Deficit
2	Severe Headache
3	Vomiting
4	Age 65+
5	Hemotympanum
6	Raccoon Eyes
7	Battle's Sign
8	Glasgow Coma Scale (GCS) greater than 15
9	Coagulopathy
10	Dangerous mechanism (Fall > 3 feet, fall > 5 stairs, ejection from motor vehicle, pedestrian struck)

Serious Headache Features

Other Serious Headache Features	
1	Focal Neurologic Deficit
2	Altered Mental Status or Altered Cognitive Function
3	Sudden Onset Severe Headache (Thunderclap)
4	Chronic Headache with New Features
5	Occipital-Nuchal Pain
6	Headache Progressing in Severity
7	Signs of Increased Intracranial Pressure (i.e., Papilledema)
8	Headache Worse with Valsalva Maneuver
9	Headache Awakening Patient from Sleep

Logic Tables

The following Clinical Condition Logic Tables provide the Headache AUC logic for each clinical condition.
 The logic incorporates prior imaging studies and contraindications where applicable.

Key

Value	Score
Blank	No Score Assigned
0	AUC Not Applicable – Allows User to Proceed with Original Order
1	Inappropriate
2	Contact Radiology
3	Appropriate
4	Appropriate Preferred

Condition 0 – Not Headache, Syncope, Stroke, Sinusitis or Trauma, AUC Not Applicable

Condition	CT Head w	CT Head wo	CT Head wwo	MR Brain w	MR Brain wo	MR Brain wwo	MRA Brain w	MRA Brain wo	MRA Neck w	MRA Neck wo	MRV Brain w	MRV Brain wo	MRV Brain wwo	CTA Neck	CTA Head	CTV Head	Reference
Not headache, syncope, stroke, sinusitis or trauma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	LBP

Condition 1 - Head Trauma, Evidence of Bleeding or Injury on Imaging

Condition	Contraindications	CT Head w	CT Head wo	CT Head wwo	MR Brain w	MR Brain wo	MR Brain wwo	MRA Brain w	MRA Brain wo	MRA Neck w	MRA Neck wo	MRV Brain w	MRV Brain wo	MRV Brain wwo	CTA Neck	CTA Head	CTV Head	Reference
Head Trauma, Evidence of Bleeding or Injury on Imaging		1	4	1	1	3	1	1	1	1	1	1	1	1	1	1	1	LBP
Head Trauma, Evidence of Bleeding or Injury on Imaging	MR	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

Condition 2 - Head Trauma, Loss of Consciousness - Amnesia, Head Trauma Feature #1

Condition	Priors	Contraindications	CT Head w	CT Head wo	CT Head wwo	MR Brain w	MR Brain wo	MR Brain wwo	MRA Brain w	MRA Brain wo	MRA Neck w	MRA Neck wo	MRV Brain w	MRV Brain wo	MRV Brain wwo	CTA Neck	CTA Head	CTV Head	Reference
Head Trauma, LOC-Amnesia, 1+ Serious HT Feature #1			1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1, LBP
Head Trauma, LOC-Amnesia, 1+ Serious HT Feature #1	CT		1	4	1	1	3	1	1	1	1	1	1	1	1	1	1	1	
Head Trauma, LOC-Amnesia, 1+ Serious HT Feature #1	CT	MR	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Head Trauma, LOC-Amnesia, 1+ No Serious HT Feature #1			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

Condition 3 – Head Trauma, more than 24 hours ago

Condition	CT Head w	CT Head wo	CT Head wwo	MR Brain w	MR Brain wo	MR Brain wwo	MRA Brain w	MRA Brain wo	MRA Neck w	MRA Neck wo	MRV Brain w	MRV Brain wo	MRV Brain wwo	CTA Neck	CTA Head	CTV Head	Reference
Head Trauma, >24 hours	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	LBP

Condition 4 – Head Trauma, no Loss of Consciousness - Amnesia, plus one Serious Head Trauma Feature #2

Condition	Priors	Contraindications	CT Head w	CT Head wo	CT Head wwo	MR Brain w	MR Brain wo	MR Brain wwo	MRA Brain w	MRA Brain wo	MRA Neck w	MRA Neck wo	MRV Brain w	MRV Brain wo	MRV Brain wwo	CTA Neck	CTA Head	CTV Head	Reference
Head Trauma, No LOC-Amnesia 1+ Serious HT Feature #2			1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4, LBP
Head Trauma, No LOC-Amnesia, 1+ Serious HT Feature #2	CT		1	4	1	1	3	1	1	1	1	1	1	1	1	1	1	1	
Head Trauma, No LOC-Amnesia 1+ Serious HT Feature #2	CT	MR	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Head Trauma, No LOC-Amnesia No Serious HT Feature #2			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

Condition 5 – Head Trauma, Penetrating Injury or Glasgow Coma Scale less than 15

Condition	Contraindications	CT Head w	CT Head wo	CT Head wwo	MR Brain w	MR Brain wo	MR Brain wwo	MRA Brain w	MRA Brain wo	MRA Neck w	MRA Neck wo	MRV Brain w	MRV Brain wo	MRV Brain wwo	CTA Neck	CTA Head	CTV Head	Reference
Head Trauma, Penetrating or GCS<15		1	4	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1, 2, 3
Head trauma, Penetrating or GCS<15	MR	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

Condition 6 – Headache, Abscess, Known or Suspected

Condition	Contraindications	CT Head w	CT Head wo	CT Head wwo	MR Brain w	MR Brain wo	MR Brain wwo	MRA Brain w	MRA Brain wo	MRA Neck w	MRA Neck wo	MRV Brain w	MRV Brain wo	MRV Brain wwo	CTA Neck	CTA Head	CTV Head	Reference
HA, Abscess Known or Suspected		1	4	3	1	3	4	1	1	1	1	1	1	1	1	1	1	LBP
HA, Abscess Known or Suspected	GAD	1	4	3	1	4	1	1	1	1	1	1	1	1	1	1	1	
HA, Abscess Known or Suspected	MR	1	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	
HA, Abscess Known or Suspected	IOD	1	4	1	1	3	4	1	1	1	1	1	1	1	1	1	1	
HA, Abscess Known or Suspected	GAD IOD	1	4	1	1	3	1	1	1	1	1	1	1	1	1	1	1	
HA, Abscess Known or Suspected	MR IOD	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

Condition 7 – Headache, Aneurysm, Known or Suspected

Condition	Contraindications	CT Head w	CT Head wo	CT Head wwo	MR Brain w	MR Brain wo	MR Brain wwo	MRA Brain w	MRA Brain wo	MRA Neck w	MRA Neck wo	MRV Brain w	MRV Brain wo	MRV Brain wwo	CTA Neck	CTA Head	CTV Head	Reference
HA, Aneurysm		1	4	1	1	4	1	1	4	1	1	1	1	1	1	4	1	LBP
HA, Aneurysm	MR	1	4	1	1	1	1	1	1	1	1	1	1	1	1	4	1	
HA, Aneurysm	IOD	1	4	1	1	4	1	1	4	1	1	1	1	1	1	1	1	
HA, Aneurysm	MR IOD	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

Condition 8 – Headache, Cancer, Known or Suspected

Condition	Contraindications	CT Head w	CT Head wo	CT Head wwo	MR Brain w	MR Brain wo	MR Brain wwo	MRA Brain w	MRA Brain wo	MRA Neck w	MRA Neck wo	MRV Brain w	MRV Brain wo	MRV Brain wwo	CTA Neck	CTA Head	CTV Head	Reference
Cancer Known or Suspected		1	4	4	1	3	4	1	1	1	1	1	1	1	1	1	1	LBP
Cancer Known or Suspected	GAD	1	4	4	1	3	1	1	1	1	1	1	1	1	1	1	1	
Cancer Known or Suspected	MR	1	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	
Cancer Known or Suspected	IOD	1	4	1	1	3	4	1	1	1	1	1	1	1	1	1	1	
Cancer Known or Suspected	GAD IOD	1	4	1	1	3	1	1	1	1	1	1	1	1	1	1	1	
Cancer Known or Suspected	MR IOD	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

Condition 9 – Headache, Cerebral Venous Thrombus, Known or Suspected

Condition	Contraindications	CT Head w	CT Head wo	CT Head wwo	MR Brain w	MR Brain wo	MR Brain wwo	MRA Brain w	MRA Brain wo	MRA Neck w	MRA Neck wo	MRV Brain w	MRV Brain wo	MRV Brain wwo	CTA Neck	CTA Head	CTV Head	Reference
Cerebral Venous Thrombus		1	4	1	1	4	1	1	1	1	1	4	4	1	1	1	4	LBP
Cerebral Venous Thrombus	GAD	1	4	1	1	4	1	1	1	1	1	1	4	1	1	1	4	
Cerebral Venous Thrombus	MR	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	4	
Cerebral Venous Thrombus	IOD	1	4	1	1	4	1	1	1	1	1	4	4	1	1	1	1	
Cerebral Venous Thrombus	GAD IOD	1	4	1	1	4	1	1	1	1	1	1	4	1	1	1	1	
Cerebral Venous Thrombus	MR IOD	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

Condition 10 – Headache, Arteriovenous Malformation (AVM), Known or Suspected

Condition	Contraindications	CT Head w	CT Head wo	CT Head wwo	MR Brain w	MR Brain wo	MR Brain wwo	MRA Brain w	MRA Brain wo	MRA Neck w	MRA Neck wo	MRV Brain w	MRV Brain wo	MRV Brain wwo	CTA Neck	CTA Head	CTV Head	Reference
AVM Known or Suspected		1	4	1	1	4	3	1	4	1	1	1	1	1	1	4	1	LBP
AVM Known or Suspected	GAD	1	4	1	1	4	1	1	4	1	1	1	1	1	1	4	1	
AVM Known or Suspected	MR	1	4	1	1	1	1	1	1	1	1	1	1	1	1	4	1	
AVM Known or Suspected	IOD	1	4	1	1	4	3	1	4	1	1	1	1	1	1	1	1	
AVM Known or Suspected	GAD IOD	1	4	1	1	4	1	1	4	1	1	1	1	1	1	1	1	
AVM Known or Suspected	MR IOD	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

Condition 11 – Meningitis, Known or Suspected

Condition	Contraindications	CT Head w	CT Head wo	CT Head wwo	MR Brain w	MR Brain wo	MR Brain wwo	MRA Brain w	MRA Brain wo	MRA Neck w	MRA Neck wo	MRV Brain w	MRV Brain wo	MRV Brain wwo	CTA Neck	CTA Head	CTV Head	Reference
Meningitis Known or Suspected		1	4	3	1	3	4	1	1	1	1	1	1	1	1	1	1	LBP
Meningitis Known or Suspected	GAD	1	4	3	1	4	1	1	1	1	1	1	1	1	1	1	1	
Meningitis Known or Suspected	MR	1	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	
Meningitis Known or Suspected	IOD	1	4	1	1	3	4	1	1	1	1	1	1	1	1	1	1	
HA, Meningitis Known or Suspected	GAD IOD	1	4	1	1	3	1	1	1	1	1	1	1	1	1	1	1	
Meningitis Known or Suspected	MR IOD	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

Condition 12 – Headache, Serious Headache Features

Condition	Contraindications	CT Head w	CT Head wo	CT Head wwo	MR Brain w	MR Brain wo	MR Brain wwo	MRA Brain w	MRA Brain wo	MRA Neck w	MRA Neck wo	MRV Brain w	MRV Brain wo	MRV Brain wwo	CTA Neck	CTA Head	CTV Head	Reference
HA, Serious Feature		1	4	1	1	4	3	1	1	1	1	1	1	1	1	1	1	5, LBP
HA, Serious Feature	GAD	1	4	1	1	4	1	1	1	1	1	1	1	1	1	1	1	
HA, Serious Feature	MR	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
No Serious Feature		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

Condition 13 – Sinusitis, Known or Suspected

Condition	CT Head w	CT Head wo	CT Head wwo	MR Brain w	MR Brain wo	MR Brain wwo	MRA Brain w	MRA Brain wo	MRA Neck w	MRA Neck wo	MRV Brain w	MRV Brain wo	MRV Brain wwo	CTA Neck	CTA Head	CTV Head	Reference
Sinusitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	LBP

Condition 14 – Stroke, Known, Suspected or New Onset

Condition	CT Head w	CT Head wo	CT Head wwo	MR Brain w	MR Brain wo	MR Brain wwo	MRA Brain w	MRA Brain wo	MRA Neck w	MRA Neck wo	MRV Brain w	MRV Brain wo	MRV Brain wwo	CTA Neck	CTA Head	CTV Head	Reference
Stroke	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	LBP

Condition 15 - Syncope

Condition	Contraindications	CT Head w	CT Head wo	CT Head wwo	MR Brain w	MR Brain wo	MR Brain wwo	MRA Brain w	MRA Brain wo	MRA Neck w	MRA Neck wo	MRV Brain w	MRV Brain wo	MRV Brain wwo	CTA Neck	CTA Head	CTV Head	Reference
Syncope, age 60+		1	4	1	1	4	1	1	1	1	1	1	1	1	1	1	1	2, 4, 7, 8
Syncope, age < 60, neuro exam abnormal		1	4	1	1	4	1	1	1	1	1	1	1	1	1	1	1	
Syncope, age < 60, neuro exam abnormal	MR	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Syncope, age < 60, neuro exam normal		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

Sources

The Headache AUC has been developed by Weill Cornell Medicine utilizing the following published eight sources and local best practices (LBP).

No.	Source
1	Wahid Bouida, MD et al. Ann Emerg Med. 2013 May;61(5):521-7. https://www.annemergmed.com/article/S0196-0644(12)01201-2
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4	Jagoda et al. Annals of Emergency Medicine 2008 52(6) 714 https://www.ncbi.nlm.nih.gov/pubmed/22921164
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6	Avoid CT of the head in asymptomatic adult patients in the emergency department with syncope, insignificant trauma, and a normal neurologic evaluation. ACEP, Choosing Wisely October 24, 2014. http://www.choosingwisely.org/clinician-lists/american-college-emergency-physicians-ct-scans-of-head-for-emergency-department-patients-with-minor-head-injury/
7	Mitsunaga MM, Yoon HC. Head CT Scans in the Emergency department for Syncope and Dizziness. AJR 2015; 204:24-28. https://www.ajronline.org/doi/10.2214/AJR.14.12993
8	Grossman SA, Fischer C, Bar JL et al. The yield of head CT in syncope: a pilot study. Intern Eremg Med 2007; 2:46-49. https://link.springer.com/article/10.1007/s11739-007-0010-5
LBP	Weill Cornell Medicine Local Best Practice