

Section A: Central nervous system

Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
A01. Congenital disorders of the brain (For children see L01)	MRI	Indicated [B]	0	MRI is the best imaging modality for all malformations of the brain.
A02. Acute stroke	CT	Indicated [A]	⊕⊕	Modern treatment protocols require CT or MRI at the earliest possible time in all cases of suspected stroke in order to allow initiation of treatment as soon as possible. CT is generally preferred based on availability and because it can be obtained quickly, without MR safety screening. Most Canadian centres use CT as the primary modality for investigating acute stroke.
	MRI	Indicated [A]	0	Modern treatment protocols require CT or MRI at the earliest possible time in all cases of suspected stroke in order to allow initiation of treatment as soon as possible. MRI is a problem solving tool. It is particularly helpful in the evaluation of posterior fossa stroke.
	CTA	Specialized investigation [A]	⊕⊕	Urgent vascular imaging with CTA can help to guide patient management.
	MRA	Specialized investigation [B]	0	Urgent vascular imaging with MRA can help to guide patient management.
	SPECT or PET	Not Indicated	⊕⊕	Not indicated in the acute setting.
A03. Transient ischemic attack (TIA) (See also B09)	CTA	Indicated [A]	⊕⊕	Urgent vascular imaging should be performed in all cases of high-risk TIA.
	MRA	Indicated [B]	0	Urgent vascular imaging should be performed in all cases of high-risk TIA.
	US carotids	Indicated [B]	0	Ultrasound can be an effective tool for screening the cervical common carotid and proximal internal carotid arteries but does not offer information on intracranial circulation. It is operator-dependant. If intervention is planned, a confirmatory CTA, MRA or DSA is recommended.
	SPECT or PET	Not indicated	⊕⊕	Not indicated in the acute setting.
A04. Multiple sclerosis and other white matter disease	MRI	Indicated [A]	0	MRI is the best imaging modality for diagnosis and follow-up of multiple sclerosis and for investigating other forms of white matter disease.

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A05. Headache: acute, severe, “thunderclap”; suspect subarachnoid hemorrhage (SAH) (For children see L10)	CT	Indicated [B]	⊕⊕	CT should be obtained urgently.
	CTA	Specialized investigation [C]	⊕⊕	CTA should be used to identify an aneurysm or other vascular malformation if there is a subarachnoid hemorrhage.
	DSA	Specialized investigation	⊕⊕	DSA should be limited to solving problems where diagnostic problems persist after CTA.
A06. Headache: chronic / recurrent (See also B01) (For children see L09)	CT	Indicated in specific circumstances [B]	⊕⊕	<p>CT is an excellent modality to screen for significant intracranial pathology. In the absence of focal features imaging is not often helpful. The following features significantly increase the likelihood of finding a major abnormality and justify requesting diagnostic imaging:</p> <ul style="list-style-type: none"> Recent onset and rapidly increasing frequency and severity of headache Headache causing the patient to wake from sleep Associated dizziness, lack of coordination, tingling or numbness, new neurologic deficit New onset of a headache in a patient with a history of cancer or immunodeficiency <p>If imaging is indicated, CT can be used; however radiation is a consideration particularly for repeat examinations.</p>
	MRI	Indicated only in specific circumstances [C]	0	<p>In the absence of focal features imaging is not often helpful. The following features significantly increase the likelihood of finding a major abnormality and justify requesting diagnostic imaging:</p> <ul style="list-style-type: none"> Recent onset and rapidly increasing frequency and severity of headache Headache causing the patient to wake from sleep Associated dizziness, lack of coordination, tingling or numbness, new neurologic deficit New onset of a headache in a patient with a history of cancer or immunodeficiency <p>MRI provides more detailed images of the brain than CT.</p>
A07. Headache: low pressure	MRI	Specialized investigation [C]	0	In the presence of intermittent headache happening when upright and disappearing while recumbent, MRI is the best investigation. If there is a clinical indication for determining the site for a CSF leak, cisternography can be performed using MRI, CT or NM.
	CT	Specialized investigation [C]	⊕⊕	When MR is not available or contra-indicated, CT can be used.

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A08. Pituitary and juxtaseilar problems	MRI	Specialized investigation [B]	0	If vision is deteriorating the examination should be done as soon as possible. CT can be used if MRI is unavailable or contraindicated.
	SXR	Not indicated [C]	⊕	Patients who require investigation need MRI
A09. Posterior fossa signs	MRI	Indicated [A]	0	MRI is the imaging modality of choice.
	CT	Indicated [A]	⊕⊕	CT is an acceptable alternative if MRI is unavailable or contraindicated.
A10. Hydrocephalus, suspect shunt malfunction (For children see L04 – L05)	CT	Indicated [B]	⊕⊕	CT is appropriate for most cases.
	MRI	Indicated [B]	0	MRI is effective and has no radiation dose.
	XR of entire shunt tube	Indicated in specific circumstances [C]	⊕	If there is evidence of shunt malfunction on imaging, XR may be used to diagnose a break in the shunt tubing.
	NM	Indicated [C]	⊕	A radionuclide shunt study can evaluate shunt function.
A11. Middle or inner ear symptoms (including vertigo)	CT	Specialized investigation [B]	⊕⊕	Referral to a specialist should precede imaging, as these symptoms requires ENT, neurological, or neurosurgical expertise.
	MRI	Specialized investigation [B]	0	Referral to a specialist should precede imaging, as these symptoms requires ENT, neurological, or neurosurgical expertise.
A12. Sensorineural hearing loss	MRI	Specialized investigation [B]	0	Referral to a specialist should precede imaging.
A13. Dementia and memory disorders, first-onset psychosis	CT	Indicated	⊕⊕	CT is indicated to screen for common causes of these disorders.
	MRI	Specialized investigation [B]	0	This is the most sensitive and specific imaging modality to exclude treatable causes.
	PET	Specialized investigation [B]	⊕⊕	Brain FDG-PET is the most sensitive and specific imaging modality to detect and categorize dementia and memory disorders. It is especially recommended in cases of clinical doubt between Alzheimer's disease and fronto-temporal dementia. It can identify among patients presenting with mild cognitive impairment (MCI) which ones are at risk of conversion to Alzheimer's disease.

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A14. Acute visual loss: visual disturbances	XR	Not indicated [A]	⊕	
	MRI	Specialized investigation [A]	0	Specialist can diagnose many cases without imaging. However, if imaging is indicated, MRI is the best imaging modality.
	CT	Specialized investigation [A]	⊕⊕	CT may be used if MRI is unavailable or contraindicated.
A15. Epilepsy (adult) (For children see L07)	MRI	Specialized investigation [C]	0	Imaging is not required in patients with idiopathic generalized epilepsy. If imaging is clinically indicated, MRI is the modality of choice.

Impending guidelines:

A16 Movement disorder