

## Suspected neurological conditions: clinical questions

For questions on signs and symptoms, the committee wanted to consider any studies that determine whether a certain sign or symptom accompanying a main presenting symptom (for example hearing loss in the presence of dizziness) is indicative of a neurological condition that requires onward referral for a specialist assessment because the patient either has the condition at the time of presentation or is likely to develop it in the future. Therefore, measures of diagnostic accuracy including sensitivity, specificity, positive predictive value, negative predictive value, ROC, AUC were considered as the main outcomes of interest. However, the committee was aware that there was limited evidence available in this area and therefore also considered prognostic studies where a multivariate analysis was conducted and adjusted odds ratios for outcomes of interest were presented. Hence, some of the clinical questions were reviewed using a mix of diagnostic and prognostic strategies.

Chapter	Type of review	Review questions	Outcomes
5.3.1 Dizziness and vertigo in adults	Diagnostic and Prognostic	In adults and young people who present with dizziness or vertigo, what is the accuracy of accompanying signs and symptoms to support non-specialists in identifying neurological conditions?	<p><b>Main outcomes:</b></p> <ul style="list-style-type: none"> <li>• Sensitivity (%) and specificity (%)</li> <li>• Area under the ROC curve (AUROC) – measure of predictive accuracy</li> <li>• Positive/negative predictive value</li> </ul> <p><b>Other outcomes:</b></p> <ul style="list-style-type: none"> <li>• Adjusted odds ratios for the presence of the following conditions: <ul style="list-style-type: none"> <li>- central nervous system causes such as posterior circulation strokes and other (migraines, tumours)</li> <li>- peripheral vestibular disorders, including posterior semi-circular canal dehiscence, BPPV, and labyrinthitis</li> <li>- cardiovascular disorders (presyncope, postural hypotension)</li> <li>- functional disorders</li> <li>- vertebrobasilar insufficiency.</li> </ul> </li> </ul>
5.3.2 Dizziness and vertigo in adults	Diagnostic	Review question: In people with suspected (or under investigation for) new onset of vertigo or dizziness, is the HINTS (Head-Impulse—Nystagmus—Test-of-Skew) test effective in identifying whether there is a central	<p><b>Main outcomes:</b></p> <ul style="list-style-type: none"> <li>• Sensitivity (%) and specificity (%)</li> <li>• Area under the ROC curve (AUROC) – measure of predictive accuracy</li> </ul>

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		nervous system cause, as indicated by the reference standard, MRI?	<ul style="list-style-type: none"> <li>• Positive/negative predictive value</li> </ul>
5.4 atraumatic facial pain in adults	Diagnostic and Prognostic	In adults who present with atraumatic facial pain, what is the accuracy of accompanying signs and symptoms to support non-specialists in identifying suspected neurological conditions?	<p><b>Main outcomes:</b></p> <ul style="list-style-type: none"> <li>• Sensitivity (%) and specificity (%)</li> <li>• Area under the ROC curve (AUROC) – measure of predictive accuracy</li> <li>• Positive/negative predictive value</li> </ul> <p><b>Other outcomes:</b></p> <ul style="list-style-type: none"> <li>• Adjusted odds ratios for the presence of the following conditions: <ul style="list-style-type: none"> <li>- carotid and vertebral artery dissection</li> <li>- cluster headache</li> <li>- dental pain</li> <li>- max sinusitis</li> <li>- migraine facial pain</li> <li>- occipital neuralgia</li> <li>- temporal arteritis</li> <li>- tension headache</li> <li>- TMJ dysfunction</li> <li>- trigeminal neuralgia.</li> </ul> </li> </ul>
5.8.2 Memory tests in adults	Diagnostic	In adults under 40 with suspected (or under investigation for) memory failure, what is the negative predictive value of neuropsychological assessments in ruling out organic memory failure?	<p><b>Main outcomes:</b></p> <ul style="list-style-type: none"> <li>• Sensitivity (%) and specificity (%)</li> <li>• Area under the ROC curve (AUROC) – measure of predictive accuracy</li> <li>• Positive/negative predictive value</li> </ul>
5.10 Sensory symptoms such as tingling or numbness	Diagnostic and Prognostic	In adults who present with tingling or altered sensation in the body, what is the accuracy of accompanying signs and symptoms to support non-specialists in identifying suspected neurological conditions?	<p><b>Main outcomes:</b></p> <ul style="list-style-type: none"> <li>• Sensitivity (%) and specificity (%)</li> <li>• Area under the ROC curve (AUROC) – measure of predictive accuracy</li> <li>• Positive/negative predictive value</li> </ul> <p><b>Other outcomes:</b></p> <ul style="list-style-type: none"> <li>• Adjusted odds ratios for the presence of the following conditions: <ul style="list-style-type: none"> <li>- compression neuropathy (for example, carpal tunnel)</li> </ul> </li> </ul>

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			<ul style="list-style-type: none"> <li>syndrome and Meralgia parasthetica)</li> <li>- demyelination</li> <li>- drug toxicity – chemotherapy, alcohol, platinum-based drugs</li> <li>- functional (hyperventilation)</li> <li>- mononeuropathy multiplex</li> <li>- peripheral neuropathy</li> <li>- radiculopathy</li> <li>- seizures</li> <li>- small fibre neuropathy</li> <li>- TIAs</li> <li>- tethering of the spinal cord</li> </ul>
5.15 Tremor in adults	Diagnostic and Prognostic	In adults and young people who present with tremor, what is the accuracy of accompanying signs and symptoms to support non-specialists in identifying neurological conditions?	<p><b>Main outcomes:</b></p> <ul style="list-style-type: none"> <li>• Sensitivity (%) and specificity (%)</li> <li>• Area under the ROC curve (AUROC) – measure of predictive accuracy</li> <li>• Positive/negative predictive value</li> </ul> <p><b>Other outcomes:</b></p> <ul style="list-style-type: none"> <li>• Adjusted odds ratios for the presence of the following conditions: <ul style="list-style-type: none"> <li>- cerebellar tremors</li> <li>- drug-related tremors</li> <li>- dystonic tremor (task-specific tremor)</li> <li>- essential tremor</li> <li>- neuropathic tremor</li> <li>- parkinsonism</li> <li>- physiological tremor</li> <li>- primary orthostatic tremor</li> <li>- psychogenic tremors</li> <li>- thyroid disorder.</li> </ul> </li> </ul>
7.2 Blackouts and paroxysmal events in children	Diagnostic and Prognostic	In children and babies who present with paroxysmal events, what is the accuracy of accompanying signs and symptoms to support non-specialists in identifying suspected neurological conditions?	<p><b>Main outcomes:</b></p> <ul style="list-style-type: none"> <li>• Sensitivity (%) and specificity (%)</li> <li>• Area under the ROC curve (AUROC) – measure of predictive accuracy</li> <li>• Positive/negative predictive value</li> </ul> <p><b>Other outcomes:</b></p>

Chapter	Type of review	Review questions	Outcomes
			<ul style="list-style-type: none"> <li>• Adjusted odds ratios for the presence of the following conditions: <ul style="list-style-type: none"> <li>- behavioural (that is, temper tantrums, breath-holding attacks and emotional disorders)</li> <li>- cardiac disorders – long QT, left ventricular outflow obstruction</li> <li>- epilepsy</li> <li>- reflex anoxic seizures</li> <li>- vasovagal syncope or postural hypotension.</li> </ul> </li> </ul>
7.5 Headaches in children	Diagnostic and Prognostic	In children under 12 who present with headache, what is the accuracy of accompanying signs and symptoms to support non-specialists in identifying suspected neurological conditions?	<p><b>Main outcomes:</b></p> <ul style="list-style-type: none"> <li>• Sensitivity (%) and specificity (%)</li> <li>• Area under the ROC curve (AUROC) – measure of predictive accuracy</li> <li>• Positive/negative predictive value</li> </ul> <p><b>Other outcomes:</b></p> <ul style="list-style-type: none"> <li>• Adjusted odds ratios for the presence of the following conditions: <ul style="list-style-type: none"> <li>- brain tumour</li> <li>- chronic daily headaches</li> <li>- hydrocephalus</li> <li>- idiopathic intracranial hypertension</li> <li>- intracranial infection</li> <li>- migraine</li> <li>- nocturnal hypoventilation</li> <li>- raised intracranial pressure</li> <li>- sinusitis</li> <li>- venous sinus thrombosis.</li> </ul> </li> </ul>
7.6 head shape or size abnormalities in children	Diagnostic and Prognostic	In children and babies who present with abnormal head shape or size, what is the accuracy of accompanying signs and symptoms to support non-specialists in identifying neurological problems?	<p><b>Main outcomes:</b></p> <ul style="list-style-type: none"> <li>• Sensitivity (%) and specificity (%)</li> <li>• Area under the ROC curve (AUROC) – measure of predictive accuracy</li> <li>• Positive/negative predictive value</li> </ul> <p><b>Other outcomes:</b></p>

Chapter	Type of review	Review questions	Outcomes
			<ul style="list-style-type: none"> <li>• Adjusted odds ratios for the presence of the following conditions:               <ul style="list-style-type: none"> <li>- microcephaly</li> <li>- familial macrocephaly</li> <li>- hydrocephalus</li> <li>- positional plagiocephaly</li> <li>- single suture synostosis</li> <li>- multiple suture synostosis</li> <li>- syndromic synostosis</li> <li>- growing skull fracture</li> </ul> </li> </ul>
7.9 Motor developmental delay in children	Diagnostic	In children and infants under 10 years of age who present with motor developmental delay, is a creatine kinase (CK) test accurate in identifying whether muscular dystrophy is present as compared to no test (and as indicated by the reference standard, diagnosis at follow-up)?	<p><b>Main outcomes:</b></p> <ul style="list-style-type: none"> <li>• Sensitivity (%) and specificity (%)</li> <li>• Area under the ROC curve (AUROC) – measure of predictive accuracy</li> <li>• Positive/negative predictive value</li> </ul>