An introduction to the cognitive tests

Consistency of diagnosis

One of the current challenges within dementia care is the large number of different points at which a patient may first present their condition within the healthcare system. This might be within a specialist clinic where the appropriate expertise and treatment is immediately available. More often, however, it may be during the treatment of an unrelated issue. For instance, this could be in an acute medical, surgical or orthopaedic setting where the focus is on the immediate treatment of their other condition(s) and discharge from hospital, not on their cognitive problems.

Having a wide range of services and a multidisciplinary team of health and social care professionals available to people with dementia should ensure that patients and their carers receive the best possible care and support. However, a team approach will need the foundation of a clearly defined care pathway. The design of this pathway needs to recognise that as the patient’s disease progresses, different services will be required.

The consensus statement ‘Delirious about dementia – towards better services for patients with cognitive impairment by Geriatricians’ recommends a cognitive screening algorithm that will help to provide a standard, reliable initial diagnosis (Figure 1). The widespread use of this algorithm should ensure a consistent, high level of diagnosis regardless of the point in the healthcare system the patient first presents their symptoms.

**COGNITIVE SCREENING ALGORITHM**

**All eligible patients in geriatric medical units**

- **MMSE <24/30 or CLOX1 <11**
  - Duration of cognitive impairment?
  - **Confusion Assessment Method (CAM)**
  - **Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE)**

- **MMSE ≥24/30 and CLOX1 ≥11**
  - Exit algorithm

**Delirium (acute confusional state)**

- **CAM +ve IQCODE -ve**
- **CAM +ve IQCODE +ve**
- **CAM -ve IQCODE +ve**

**Chronic impairment**

- **Delirium and chronic impairment**
  - Investigate and monitor:
    - Put test results and diagnoses of delirium and/or cognitive impairment in discharge summary
    - Refer to memory clinic or other specialist service

- **Investigation and monitoring**

- **Learn assessment: screen for depression, further background information, appropriate investigations according to BGS protocol**

- **Possible dementia syndrome requiring further assessment and management**

*Figure 1. Cognitive screening algorithm to be used by any medical professional*
This algorithm is designed for use by professionals and patients able to speak English fluently. Translations of the cognitive tests are sometimes available and these could be substituted with appropriate cut-off points. Alternatively, the principle of having a two-stage process, where stage one determines if the patient has cognitive impairment (including executive dysfunction), and stage two determines the nature and chronicity of any cognitive impairment detected, could be applied with appropriate, standardised tests.

**Why these tests were chosen**

During the assessment of a patient with suspected cognitive impairment, it will be important to gain a broad range of information from both the patient and someone who has regular, close contact with them, such as a family member or carer (formal or informal). This will enable a robust assessment of the patient to produce a thorough overview of their cognitive ability.

The algorithm recommends the use of four cognitive tests:

- **MMSE** – Mini Mental State Examination
- **CLOX1** – An Executive Clock Drawing Task
- **CAM (short version)** – Confusion Assessment Method
- **IQCODE (short version)** – Informant Questionnaire on Cognitive Decline in the Elderly.

These four tests have been chosen as together they produce a well-rounded profile of the patient’s cognitive ability. Collectively, the tests will gauge if there has been any recent change in the patient’s cognitive status, executive function and general level of ability to conduct regular, daily activities (Table 1).

The algorithm therefore offers a standardised method of screening that is recommended for use by all healthcare professionals to ensure that there is a consistent and high standard of practice in the diagnosis of cognitive impairment.

Table 2 gives a brief overview of each of the tests. Together, these tests can be used to create a comprehensive report of the patient’s condition, and help identify the presence and degree of any cognitive impairment.

**How to use the four tests**

As you will have seen from the previous section, the four tests rely on responses from the patient plus their carer, family member and/or staff. The four tests are available as assessment cards, with the exception of the MMSE. The assessment cards give instructions on how to perform each test.

To ensure accurate results are obtained, it is important to ensure that the correct environment is created. This is a formal assessment of cognition, which needs to be carried out sensitively, with the individual forewarned that they may not be able to answer some questions. Suggestions on how to create the correct environment are listed after Table 1.

<table>
<thead>
<tr>
<th>Test</th>
<th>Reason for inclusion</th>
</tr>
</thead>
</table>
| **MMSE**          | A widely-used cognitive test that comprehensively evaluates five functions of cognitive status:  
|                   | • orientation  
|                   | • registration  
|                   | • attention and calculation  
|                   | • recall  
|                   | • language  
| **CLOX1**         | Offers a good method of testing executive function, which cannot be gauged from the MMSE test alone  
| **CAM (short version)** | Gauges any recent change in the mental state of the patient from their carer, family member and/or staff. It also involves asking the patient a list of questions to assess:  
|                   | • inattention  
|                   | • disorganised thinking  
|                   | • level of consciousness  
| **IQCODE (short version)** | Assesses long-term cognitive decline, over months and years, from questions asked on everyday tasks to a carer, family member or friend  

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**Table 1. Rationale for inclusion of the four tests**
<table>
<thead>
<tr>
<th>Test</th>
<th>MMSE&lt;sup&gt;1,2&lt;/sup&gt;</th>
<th>CLOX&lt;sup&gt;1,4&lt;/sup&gt;</th>
<th>CAM (short version)&lt;sup&gt;5&lt;/sup&gt;</th>
<th>ICODE (short version)&lt;sup&gt;6,7&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject of the test</td>
<td>The patient</td>
<td>The patient</td>
<td>The patient plus their carer, family member and/or staff</td>
<td>The patient’s carer, family member or friend</td>
</tr>
<tr>
<td>Overview</td>
<td>A list of 11 questions that comprehensively test five functions of cognitive status: • orientation • registration • attention and calculation • recall • language</td>
<td>A test that asks the patient to draw a clock with hands pointing to the time of ‘1:45’. Specific elements of the drawing are then rated</td>
<td>The carer is asked if there is any acute change in mental state. The patient is then observed and asked a list of questions to gauge: • inattention • disorganised thinking • level of consciousness</td>
<td>A list of 16 questions about the patient’s ability to carry out a range of everyday tasks</td>
</tr>
<tr>
<td>What it assesses</td>
<td>Cognitive function</td>
<td>Executive function</td>
<td>Presence or absence of delirium or dementia and any acute change in mental state</td>
<td>Degree of decline in ability for a range of everyday tasks</td>
</tr>
<tr>
<td>Timing</td>
<td>5–10 minutes</td>
<td>5–10 minutes</td>
<td>5 minutes</td>
<td>10 minutes</td>
</tr>
<tr>
<td>What the test outcomes tell the healthcare professional</td>
<td>The lower the score, the greater the degree of cognitive impairment (the total possible score is 30)</td>
<td>The score reflects the patient’s level of executive control and function. Lower scores reflect greater impairment</td>
<td>Presence or absence of delirium/dementia</td>
<td>The higher the score, the greater the degree of dementia/delirium/cognitive impairment</td>
</tr>
<tr>
<td>Benefits</td>
<td>A very well-known and frequently used test</td>
<td>A standardised method of scoring that is simple to perform. Patient acceptance of the test is high as it does not rely on questions</td>
<td>Will help differentiate acute confusion from chronic confusion</td>
<td>Information can be gained without the presence of the patient</td>
</tr>
<tr>
<td>Any limitations</td>
<td>Does not assess executive function (CLOX1 is the test for this). For any section a patient is unable to complete due to a disability, it should be assumed that full points were obtained</td>
<td>Not easily performed on bed-ridden patients for whom the test may give false positive results</td>
<td>Most reliable outcomes in elderly populations</td>
<td>Relies on people who know the patient being able to monitor their daily activities</td>
</tr>
<tr>
<td>Degree of correlation between the test and the patient’s level of cognitive impairment</td>
<td>High</td>
<td>High</td>
<td>Variable – requires the support of other tests</td>
<td>High</td>
</tr>
<tr>
<td>Current level of familiarity with Geriatricians</td>
<td>High – this is a frequently used test</td>
<td>Average – although they will know some form of clock-drawing task</td>
<td>Low – but some may already use this test</td>
<td>Low – this is unlikely to be familiar to Geriatricians</td>
</tr>
</tbody>
</table>
Environment

- Where possible find a quiet room, which will allow privacy and dignity, for example place a ‘Do not disturb’ sign on the door.
- Ask the patient if they would like a carer, family member and/or staff to be present; if a carer or family member is present, ask them not to interrupt the assessment or to give prompts, for example by coughing.
- Ensure the patient has their hearing aid switched on, if applicable.
- Ensure the patient has no other impairments, such as visual, which may affect the validity of the results.
- Provide reassurance that there is no pass or fail.
- Ensure the lighting level is appropriate.
- Treat the test as a serious assessment (as you would an ECG, for example).
- Conduct the test in a clear, audible voice.
- Do not hurry the patient.

Scoring the tests

The assessment cards can be used to record your results during the test. The scores of each individual test must then also be transferred across to the patient’s cognitive assessment record form, which will become the record of each of the patient’s visits. Table 3 below shows how to interpret the scores obtained.

<table>
<thead>
<tr>
<th>Test</th>
<th>MMSE</th>
<th>CLOX1</th>
<th>CAM (short version)</th>
<th>IQCODE (short version)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive result</td>
<td>&lt;24</td>
<td>&lt;11</td>
<td>The presence of features 1 and 2, and either 3 or 4</td>
<td>≥3.44</td>
</tr>
</tbody>
</table>

Table 3. What constitutes a positive result?

Printable copies of the cognitive assessment cards (excluding the MMSE) and the cognitive assessment record form are available on the CD-ROM, ‘A practical toolkit’. All items within the toolkit are available from the homepage of the CD-ROM on the left-hand menu.

What next?

After a possible diagnosis of dementia has been reached, the case notes should be written in full and forwarded to the gatekeeper of the local case register system. Please refer to ‘Delirious about dementia – towards better services for patients with cognitive impairment by Geriatricians’ for further details on the care pathway structure, which has been developed to ensure best case management.

References


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