

Tests Used in Diagnosing Dementia

This Update Sheet explains the more common tests and assessments doctors currently use to diagnose dementia. There is no one diagnostic test for Alzheimer's disease or for most other causes of dementia. Doctors use a number of different tests and assessments to determine whether symptoms fit certain criteria and to rule out other possible causes of these symptoms.

This sheet will help you to understand the process involved in diagnosing dementia. Those who are being assessed for dementia will find it helpful to be prepared for what, for some people, can be a long and emotionally difficult process.

For further information on the early signs of dementia and the importance of a correct diagnosis, see the *Diagnosing Dementia* Help Sheet.

Assessment

The first step towards a diagnosis is to talk to your doctor about your concerns. It is a good idea to take a close family member or friend along to the appointment to assist in providing additional information. It is also a good idea to take along a list of the memory changes and any other changes that have been concerning you, including when you first noticed them and how often you notice them. You should also take a list of the medications you are taking or bring your medications with you to the appointment.

Your doctor may assess you or may make a referral to a specialist doctor such as a geriatrician (a specialist in illnesses and disabilities in older people), a neurologist (a specialist in disorders of the brain and nerve pathways), or a

psychiatrist (a specialist in disorders of thinking, emotion and behaviour).

Assessment for dementia includes the following:

1. Personal history:

The doctor usually spends some time discussing your medical history and gathering information about your changes in memory and thinking.

2. Physical examination and laboratory tests:

The symptoms of dementia can be due to a number of other possible causes, such as vitamin deficiency, infection, metabolic disorders and side effects from drugs, which are often easily treated. Therefore, an

early step in diagnosing dementia is to rule out these causes through a physical examination, blood tests and urine tests.

Routine laboratory tests used in the diagnosis of dementia include:

- Blood tests to investigate:
 - Anaemia
 - Infection
 - Electrolyte balance (salt and water)
 - Liver function
 - Vitamin B12 deficiency
 - Thyroid function
 - Drug interactions and dosing problems
- Urine tests to investigate infection.

3. *Mental status evaluation and testing (Neuropsychological tests)*

Neuropsychological tests are used to measure and evaluate cognitive, or 'thinking', functions such as memory, concentration, visual-spatial awareness, problem solving, counting and language skills.

These tests are vital in the diagnosis of dementia and are often used to differentiate between types of dementia. They can also be used to assess mood and may help diagnose depression, which can cause symptoms similar to those of dementia. Neuropsychological testing is also commonly used to monitor the progression of Alzheimer's disease and other causes of dementia.

Special arrangements can be made for testing people whose first language is a language other than English or who have communication difficulties. Your doctor can give you advice about this.

Some of the commonly used neuropsychological tests include:

Mini-Mental Status Examination (MMSE)

This test is usually conducted by your doctor or specialist in his/her office and takes around 5 minutes to complete. The MMSE is the most common neuropsychological test for the screening of Alzheimer's disease and other causes of dementia. It assesses skills such as reading, writing, orientation and short-term memory.

You can expect to be asked a series of questions such as: "What day of the week is it?" and "What city are you in?" You will also be asked to complete mental tests such as subtracting from 100, spelling a word backwards, remembering three unconnected words and copying a diagram.

Brief Cognitive Rating Scale

This test is highly sensitive and can detect early changes in cognition. It can detect Mild Cognitive Impairment (MCI) as well as dementia. It is a structured interview assessing concentration, memory, behaviour, speech, mood, orientation and function. It takes around 45 minutes and is usually conducted

by your doctor or specialist in their office.

Alzheimer's Disease Assessment Scale-Cognitive (ADAS-Cog)

This 11-part test is more thorough than the MMSE and can be used for people with mild symptoms. It is considered the best brief examination for memory and language skills and is often used as a measure in clinical drug trials. It takes around 30 minutes and is usually conducted by a specialist in their office, or you may be referred to a psychologist for the test.

Cognitive testing

This involves a number of very sensitive psychometric instruments administered by a neuropsychologist (a psychologist who has been trained in the assessment of dementia and other disorders of higher mental function). A typical testing session will take between 1-2 hours and may be conducted over more than one visit.

A variety of tests will be used and these will be selected according to the educational level and mental ability of the person being tested. They may include tests of memory such as recall of a paragraph, tests of the ability to copy drawings or figures and tests of reasoning and comprehension.

Radiological tests

Standard X-rays may be taken and those who smoke will commonly require a chest X-ray to rule out

lung cancer, which may be causing a secondary brain tumour.

Brain imaging techniques:

Various brain-imaging techniques are sometimes used to show brain changes and to rule out other conditions such as tumour, infarcts (strokes – dead areas of brain tissue) and hydrocephalus (fluid on the brain); these include:

Computed tomography (CT or CAT) scan

This technique involves taking many X-rays from different angles in a very short period of time. These images are then used to create a 3-dimensional image of the brain. This technique is mainly used to rule out other causes of dementia such as stroke, brain tumour, multiple sclerosis or haemorrhage.

CT scans can show certain changes that are characteristic of Alzheimer's disease or other causes of dementia in its later stages such as a reduction in the size of the brain, referred to as atrophy.

Magnetic Resonance Imaging (MRI)

This technique uses powerful magnets and radiowaves to produce very clear 3-dimensional images of the brain. Currently MRI is the radiological test of choice. As well as ruling out treatable causes of dementia, MRI can reveal patterns of brain tissue loss, which

are characteristic of dementia and can be used to discriminate between different forms of dementia such as Alzheimer's disease and Fronto Temporal Lobar Degeneration.

Positron Emission Tomography (PET) and Single-Photon Emission Computerized Tomography (SPECT)

In both of these tests, a small amount of radioactive material is injected into the patient and detectors are placed on the brain to detect emissions. PET provides visual images of activity in the brain. SPECT is used to measure blood flow to various regions of the brain. In Australia, these techniques are usually only used in research.

Some questions you may wish to ask you doctor regarding tests used in diagnosing dementia.

- What tests will be conducted?
- Who will be performing the tests and how long will it take?
- Should I prepare for the tests in any way?
- Will any of the tests involve pain or discomfort?
- Will there be any cost involved?
- What follow-up will be necessary and who will follow up?
- How will I be informed of the test results and the diagnosis?

If you are diagnosed with dementia

Obtaining an early and accurate diagnosis can improve the quality of life for people with dementia. Talk to your doctor about treatment and ongoing assessment. Support and information is available through Alzheimer's Australia.

Thanks to Associate Professor David Ames for reviewing this material.

Further Information

A range of books and videos, Help Sheets and Update Sheets are available through Alzheimer's Australia in your State or Territory by contacting the National Dementia Helpline.

Help Sheets and Update Sheets, including any more recent information, can also be obtained on the internet at www.alzheimers.org.au