



Dementia Evaluation: Lab Testing

This material is provided by UCSF Weill Institute for Neurosciences as an educational resource for patients.



UCSF Weill Institute for Neurosciences
Memory and Aging Center

How do lab tests help with my diagnosis?

Certain blood tests can help evaluate for treatable conditions that may be contributing to changes in thinking or memory.

What lab tests will my provider order?

Your provider will review any existing lab tests you have had done and may order some new tests. There are certain blood tests that are recommended for anyone with changes in thinking or memory and others that are performed on an individual basis, according to your own personal medical history and risk factors. Below are some of the most common blood tests ordered as part of a diagnostic evaluation for someone with changes in thinking or memory.

CBC (complete blood count)

This lab test measures the numbers of white blood cells (WBCs, which fight infection), red blood cells (RBCs, which carry oxygen), and platelets (plts, which help blood clot) that are present in your blood. Hemoglobin (hgb) and hematocrit (hct) are measures of RBC quantity and function. A CBC also measures certain characteristics of your red blood cells such as their size, color, and ability to carry oxygen.

Interpretation

WBC (white blood cells) abnormalities may indicate infection
RBC (red blood cells) contain Hemoglobin (hgb) and hematocrit (hct) and are measures of red blood cell quantity and function.
 Lower levels may indicate anemia, that can cause fatigue and thinking difficulties.

CMP (comprehensive metabolic panel)

This measures your electrolyte levels (sodium, potassium, chloride, bicarbonate), glucose level, kidney (renal) function, and liver (hepatic) function. Certain electrolyte or glucose abnormalities, kidney failure and liver failure can all cause impairments in thinking or memory.

Interpretation

Sodium (Na) is a measure of the amount of sodium in the blood.
Glucose levels affect the amount of sugar available in your cells and abnormal levels may cause confusion.
Bicarbonate (HCO₃) may indicate an abnormal blood pH (too acidic or too alkaline), which can be caused by a variety of conditions.
High creatinine (Cr) and blood urea nitrogen (BUN) indicate kidney impairment or dehydration.
Liver function tests (LFTs) indicate the function of the liver. These tests may include albumin, INR and bilirubin.

Thyroid stimulating hormone (TSH)

TSH is a screening test for thyroid abnormalities. An overactive or underactive thyroid gland can cause impairments in thinking or memory. If your TSH is abnormal, additional testing to confirm thyroid dysfunction may be ordered depending on your individual scenario.

Interpretation

High TSH indicates an underactive thyroid (“hypothyroidism”)
Low TSH indicates an overactive thyroid (“hyperthyroidism”)

Vitamin B12

Vitamin B12 deficiency is common, particularly with increasing age, and can cause a variety of symptoms including cognitive and/or psychiatric symptoms. It can also cause anemia (low blood cell count), imbalance and numbness/tingling in the toes. If your blood level of vitamin B12 is borderline, your doctor may order an additional lab test called methylmalonic acid (MMA), which is an indirect measure of the amount of functional B12 you have in your system. A high MMA level indicates insufficient B12.

Interpretation

Low B12 level indicates vitamin B12 deficiency
High MMA indicates vitamin B12 deficiency

RPR (rapid plasma reagin)

Screening test for syphilis, a sexually-transmitted infection. Left untreated, syphilis can eventually infect the nervous system, termed “neurosyphilis”, and cause dementia. Syphilis is rare in the modern era but it is very treatable with antibiotics and therefore your doctor may choose to screen for this condition. It is important to note that because RPR is a screening test, it is designed to be highly sensitive (in order words, it is unlikely to be falsely negative) but could produce false positive test results. Therefore, if your RPR comes back positive, further testing will be undertaken to confirm the results.

Interpretation

“Non-reactive” is a negative result, meaning that syphilis is very unlikely
“Reactive” is a positive result, typically meaning that you need tests to confirm if you have syphilis

HIV (human immunodeficiency virus)

HIV can cause changes in thinking or memory either as a direct result of the infection or due to “opportunistic infections” that occur because HIV has weakened the body’s immune system.

Interpretation

“Non-reactive” is a negative result, meaning that HIV is very unlikely
“Reactive” is a positive result, typically meaning that you need tests to confirm if you have HIV

Resources

Alzheimer’s Association – Laboratory Evaluation of Dementia: [alz.org/national/documents/LabEvaluDementiaTable.pdf](https://www.alz.org/national/documents/LabEvaluDementiaTable.pdf)

Family Caregiver Alliance: [caregiver.org](https://www.caregiver.org)

National Institutes of Health: [nih.gov](https://www.nih.gov)

Research: [clinicaltrials.gov](https://www.clinicaltrials.gov)