NEUROLOGY

Your Partner in Alzheimer's

labcorp

Blood Biomarker Testing

ATN Profile (484400)

Labcorp's blood-based ATN Profile provides simple, non-invasive and objective evidence for Alzheimer's disease pathology using three well-researched biomarkers:

Category		
A	Beta-Amyloid 42/40 Ratio	Assess levels of pathologic change consistent with Alzheimer's disease
T	Phosphorylated Tau 181 (pTau181)	
N	Neurofilament Light Chain (NfL)	Assess disease severity by measuring neurodegeneration

Interpretation

Each ATN biomarker has a cutoff that indicates whether a patient's measured value is consistent with what is observed in amyloid PET positive Alzheimer's patients. For NfL, cutoffs are based on age ranges, as baseline measurable NfL levels increase with age (2,3). Each of the biomarkers is then given an indicator corresponding to consistent with (+) or not consistent with (-) Alzheimer's disease, respectively. This results in eight possible combinations of results, which align to three possible clinical scenarios: normal, AD continuum and non-AD dementia or neurodegenerative condition.

Profile	Clinical Summary	
A- T- N-	A normal beta-amyloid 42/40 ratio and normal concentrations of pTau181 and NfL were observed at this time. These results are not consistent with the presence of Alzheimer's-related pathology. Plasma findings may be less precise than CSF or PET. Additional assessments may be necessary. These tests are intended to be used only in the context of clinical care.	
A+ T- N-	A low beta-amyloid 42/40 ratio was observed. Normal concentrations of pTau181 and NfL were observed at this time. These results may be consistent with the presence of Alzheimer's-related pathology. Plasma findings may be less precise than CSF or PET. Additional assessments may be necessary. These tests are intended to be used only in the context of clinical care.	AD Continuum
A+ T+ N-	A low beta-amyloid 42/40 ratio and a high pTau181 concentration were observed. A normal NfL concentration was observed at this time. These results are consistent with the presence of Alzheimer's-related pathology. Plasma findings may be less precise than CSF or PET. Additional assessments may be necessary. These tests are intended to be used only in the context of clinical care.	
A+ T+ N+	A low beta-amyloid 42/40 ratio and a high pTau181 and NfL concentrations were observed at this time. These results are consistent with the presence of Alzheimer's-related pathology. Plasma findings may be less precise than CSF or PET. Additional assessments may be necessary. These tests are intended to be used only in the context of clinical care.	
A+ T- N+	A low beta-amyloid 42/40 ratio and a high NfL concentration were observed. A normal pTau181 concentration was observed at this time. These results may be consistent with the presence of Alzheimer's-related pathology and concomitant suspected non-AD pathological change. Plasma findings may be less precise than CSF or PET. Additional assessments may be necessary. These tests are intended to be used only in the context of clinical care.	
A- T+ N-	A high pTau181 concentration was observed. A normal beta-amyloid 42/40 ratio and normal concentration of NfL were observed at this time. These results are not consistent with the presence of Alzheimer's-related pathology, but may indicate pathology of another condition. Additional assessments may be necessary. These tests are intended to be used only in the context of clinical care.	
A- T+ N+	High pTau181 and NfL concentrations were observed. A normal beta-amyloid 42/40 ratio was observed at this time. These results are not consistent with the presence of Alzheimer's-related pathology, but may indicate pathology of another condition. Additional assessments may be necessary. These tests are intended to be used only in the context of clinical care.	
A- T- N+	A high NfL concentration was observed. A normal beta-amyloid 42/40 ratio and normal pTau181 concentration were observed at this time. These results are not consistent with the presence of Alzheimer's-related pathology, but may indicate pathology of another condition. Additional assessments may be necessary. These tests are intended to be used only in the context of clinical care.	

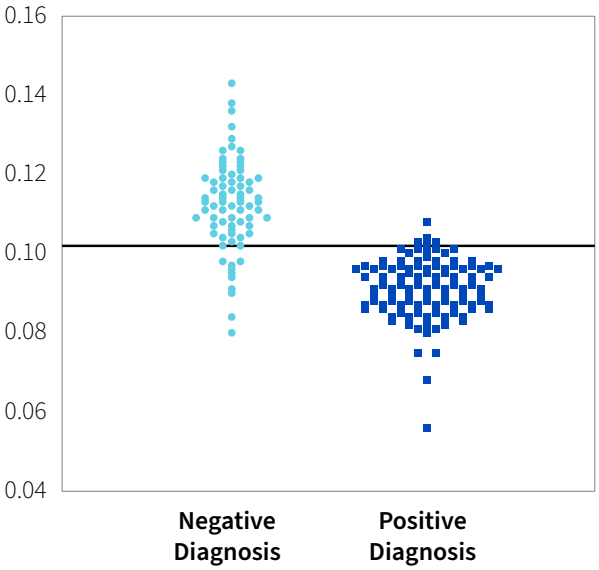
Having new Alzheimer's therapies is only half the battle. Tests to support diagnosis, treatment decisions and treatment monitoring are equally important. This is where Labcorp has answers. From apolipoprotein E (APOE) status to plasma beta-amyloid levels, Labcorp has a complete suite of tests to help you help your patients on their Alzheimer's journeys.

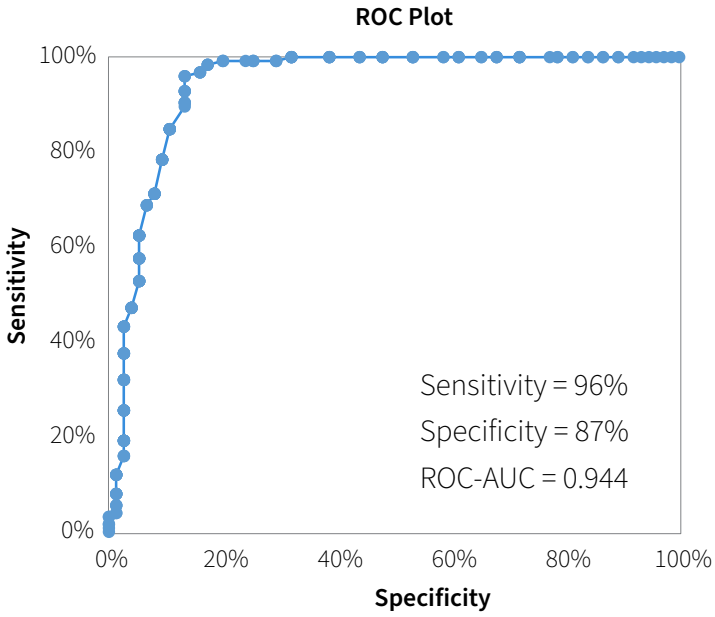
Individual Blood Biomarker Tests

Test Name	Test No.
Beta-Amyloid 42/40 Ratio, Plasma	**505725**
Phosphorylated Tau 181 (pTau181), Plasma	**483745**
Neurofilament Light Chain (NfL), Plasma	**140555**

Beta-Amyloid 42/40 Ratio Performance

The beta amyloid 42/40 ratio was clinically validated using 200 samples from a well-studied cohort in which all samples were characterized with patient age, sex, amyloid PET status, and clinical diagnosis.





Genetic and Cerebrospinal Fluid (CSF) Test Options

Beta-Amyloid 42/40 Ratio, CSF (505560)

Labcorp's CSF beta-amyloid test quantifies the amount of beta-amyloid 42 and 40 proteins in a (CSF) patient sample and computes the ratio, providing evidence that:

- Correlates to positron emission tomography (PET) scan results[3,4]
- Is a more accurate predictor than beta-amyloid 42 alone[5,6]

The beta-amyloid 42/40 ratio and pTau/beta-amyloid 42 ratio have been shown to be equally predictive of PET status.[7]

Note: This test requires the use of a special non-binding collection tube supplied by Labcorp. The sample must be collected directly into this special tube. The standard lumbar puncture kit tube cannot be used at any point. Please contact your Labcorp sales representative for these tubes.

APOE Genotyping Alzheimer's Risk (504040)

Labcorp's APOE test identifies and reports the patients specific APOE alleles including E4, to help determine risk for Alzheimer's or side effect risk while on immunotherapy treatments.

Early Onset Alzheimer's NGS Diagnostic Test (630557)

Detects pathogenic variants in the amyloid protein precursor (APP), presenilin 1 (PSEN1) and presenilin 2 (PSEN2) genes that cause autosomal dominant early onset Alzheimer's disease.

References

1. Hviid, C. V. B., Knudsen, C. S., & Parkner, T. (2020). Reference interval and preanalytical properties of serum neurofilament light chain in Scandinavian adults. *Scand J Clin Lab Invest*, 80(4), 291-295.
2. Khalil, M, et.al. (2020). Serum neurofilament light levels in normal aging and their association with morphologic brain changes. *Nat Commun*, 11(1), 812.
3. Palmqvist S, Zetterberg H, Mattsson N, et al. Detailed comparison of amyloid PET and CSF biomarkers for identifying early Alzheimer disease. *Neurology*. 2015;85:1-10.
4. Hansson O, Seibyl J, Stomrud E, et al. CSF biomarkers of Alzheimer's disease concord with amyloid-β PET and predict clinical progression: A study of fully automated immunoassays in BioFINDER and ADNI cohorts. *Alzheimer's & Dementia*. 2018;14(11):P1470-1481.
5. Lewczuk P, Matzen A, Blennow K, et al. Cerebrospinal Fluid Aβ42/40 Corresponds Better than Aβ42 to Amyloid PET in Alzheimer's Disease. *J Alzheimers Dis*. 2017;55(2):P813-822.
6. Baldeiras I, Santana I, Leitão MJ, et al. Addition of the Aβ42/40 ratio to the cerebrospinal fluid biomarker profile increases the predictive value for underlying Alzheimer's disease dementia in mild cognitive impairment. *Alzheimer's Research & Therapy*. 2018; 10,33.
7. Campbell, MR, et.al. (2021). P-tau/aβ42 and aβ42/40 ratios in csf are equally predictive of amyloid pet status. *Alzheimers Dement (Amst)*. 13(1), e12190.

Visit **labcorp.com/providers/neurology/neurodegenerative-diseases/alzheimers-disease** for additional Alzheimer's test information.

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