

## Overview

### Useful For

Confirming the diagnosis of dentatorubral-pallidoluysian atrophy (DRPLA) for symptomatic patients

Predictive testing for individuals with a family history of DRPLA and a documented expansion in the *ATN1* gene in an affected family member

### Special Instructions

- [Informed Consent for Genetic Testing](#)
- [Molecular Genetics: Neurology Patient Information](#)
- [Informed Consent for Genetic Testing \(Spanish\)](#)

### Method Name

Polymerase Chain Reaction (PCR)

### NY State Available

Yes

## Specimen

### Specimen Type

Varies

### Specimen Required

**Specimen Type:** Whole blood

**Patient Preparation:** A previous bone marrow transplant from an allogenic donor will interfere with testing. For instructions for testing patients who have received a bone marrow transplant, call 800-533-1710.

**Container/Tube:**

**Preferred:** Lavender top (EDTA) or yellow top (ACD)

**Acceptable:** None

**Specimen Volume:** 3 mL

**Collection Instructions:**

1. Invert several times to mix blood.
2. Send whole blood specimen in original tube. **Do not aliquot.**

**Additional Information:**

1. Specimens are preferred to be received within 4 days of collection. Extraction will be attempted for specimens received after 4 days, and DNA yield will be evaluated to determine if testing may proceed.
2. To ensure minimum volume and concentration of DNA is met, the preferred volume of blood must be submitted. Testing may be canceled if DNA requirements are inadequate.

**Forms**

1. **New York Clients-Informed consent is required.** Document on the request form or electronic order that a copy is on file. The following documents are available:

-[Informed Consent for Genetic Testing](#) (T576)

-[Informed Consent for Genetic Testing \(Spanish\)](#) (T826)

2. [Molecular Genetics: Neurology Patient Information](#)

3. If not ordering electronically, complete, print, and send a [Neurology Specialty Testing Client Test Request](#) (T732) with the specimen.

**Specimen Minimum Volume**

See Specimen Required

**Reject Due To**

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

**Specimen Stability Information**

| Specimen Type | Temperature         | Time | Special Container |
|---------------|---------------------|------|-------------------|
| Varies        | Ambient (preferred) |      |                   |
|               | Refrigerated        |      |                   |
|               | Frozen              |      |                   |

**Clinical & Interpretive****Clinical Information**

Dentatorubral-pallidoluysian atrophy (DRPLA) is a rare autosomal dominant neurodegenerative disorder characterized by ataxia, choreoathetosis, dementia, and psychiatric disturbance in adults and ataxia, myoclonus, seizures, and progressive intellectual deterioration in children. Characteristic neuropathologic observations include degeneration of the dentatorubral and pallidoluysian systems of the central nervous system.

The prevalence of DRPLA depends on the geographic and ethnic origin of the population being studied. DRPLA was first described in a European individual without a family history of the disorder; however, it is predominantly found as an inherited condition and is most prevalent in Japan (0.2-0.7 per 100,000). Although rare, DRPLA has been identified in other populations, including Europe and North America.

Dentatorubral-pallidoluysian atrophy is caused by an expansion of a CAG trinucleotide repeat in the *ATN1* gene. This trinucleotide repeat is polymorphic in the general population, with the number of repeats ranging from 6 to 35. Affected individuals, have 48 or greater CAG repeats. Repeat sizes between 35 and 47 are associated with incomplete penetrance and a milder clinical phenotype. As with other trinucleotide repeat disorders, anticipation is frequently observed, and larger CAG expansions are associated with earlier onset and a more severe and rapid clinical course. More marked expansion may occur with paternal transmission.

**Reference Values**

---

Normal alleles: 7-35 CAG repeats

Abnormal alleles: 49-93 CAG repeats

An interpretive report will be provided.

### Interpretation

The interpretive report includes an overview of the findings as well as the associated clinical significance.

### Cautions

For predictive testing, it is important to first document the presence of CAG-repeat amplification in the *ATN1* gene in an affected family member to confirm that molecular expansion is the underlying mechanism of disease in the family.

It is strongly recommended that patients undergoing predictive testing receive genetic counseling both prior to testing and after results are available.

Predictive testing of an asymptomatic child is not recommended.

Test results should be interpreted in the context of clinical findings, family history, and other laboratory data. Errors in test interpretation may occur if the provided information is inaccurate or incomplete.

The absence of an expansion in the *ATN1* gene does not eliminate the diagnosis of other inherited neurodegenerative disorders that have overlapping clinical features with dentatorubral-pallidolusian atrophy, such as Huntington disease or spinocerebellar ataxias.

### Supportive Data

Method validation involved comparative studies with other laboratories and testing 50 individuals from the general population (anonymous blood donors) and 48 patients with cerebellar ataxia. In each case, the distribution of observed repeat sizes closely correlated with previously reported values (ie, similar range and frequencies of specific repeat sizes). Sequencing of 2 specimens confirmed accuracy of CAG repeat numbers compared with estimations based on the size of polymerase chain reaction products.

### Clinical Reference

1. Ikeuchi T, Onodera O, Oyake M, Koide R, Tanaka H, Tsuji S. Dentatorubral-pallidolusian atrophy (DRPLA): close correlation of CAG repeat expansions with the wide spectrum of clinical presentations and prominent anticipation. *Semin Cell Biol.* 1995;6(1):37-44
2. Tsuji S. Dentatorubral-pallidolusian atrophy: clinical aspects and molecular genetics. *Ad Neurol.* 2002;89:231-239
3. Carroll LS, Massey TH, Wardle M, Peall KJ. Dentatorubral-pallidolusian atrophy: An update. *Tremor Other Hyperkinet Mov (N Y).* 2018;8:577
4. Prades S, Melo de Gusmao C, Grimaldi S, Shiloh-Malawsky Y, Felton T, Houlden H. DRPLA. In: Adam MP, Feldman J, Mirzaa GM, Pagon RA, Wallace SE, Amemiya A, eds. *GeneReviews* [Internet]. University of Washington, Seattle; 1999. Updated September 21, 2023. Accessed November 14, 2024. Available at <https://www.ncbi.nlm.nih.gov/books/NBK1491/>

## Performance

### Method Description

A polymerase chain reaction-based assay is used to amplify across the region of the *ATN1* gene containing the CAG repeats. Assay products are separated by capillary electrophoresis and are sized by comparison with an internal size standard. (Dorschner MO, Barden D, Stephens K. Diagnosis of five spinocerebellar ataxia disorders by multiplex amplification and capillary electrophoresis. *J Mol Diag.* 2002;4(2):108-113)

### PDF Report

No

### Day(s) Performed

Tuesday

### Report Available

14 to 21 days

### Specimen Retention Time

Whole blood: 2 weeks (if available); Extracted DNA: 3 months

### Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Main Campus

## Fees & Codes

### Fees

- Authorized users can sign in to [Test Prices](#) for detailed fee information.
- Clients without access to Test Prices can contact [Customer Service](#) 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact [Customer Service](#).

### Test Classification

This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

### CPT Code Information

81177-ATN1 (ataxin 2) (eg, denatatorubral-pallidoluyysian atrophy) gene analysis, evaluation to detect abnormal (eg, expanded) alleles

### LOINC® Information

| Test ID | Test Order Name     | Order LOINC® Value |
|---------|---------------------|--------------------|
| DRPL    | DRPLA Gene Analysis | 49631-5            |

## Test Definition: DRPL

Dentatorubral-Pallidoluysian Atrophy (DRPLA)

Gene Analysis, Varies

---

| Result ID | Test Result Name | Result LOINC® Value |
|-----------|------------------|---------------------|
| 53234     | Result Summary   | 50397-9             |
| 53235     | Result           | 49631-5             |
| 53236     | Interpretation   | 69047-9             |
| 53237     | Specimen         | 31208-2             |
| 53238     | Source           | 31208-2             |
| 53239     | Released By      | 18771-6             |