

Overview

Useful For

Diagnosis of HIV-1 infection in pregnant individuals with acute or early HIV-1 infection

Quantifying plasma HIV-1 RNA levels (viral load) in pregnant individuals living with HIV-1:

- Before initiating anti-HIV-1 drug therapy (baseline viral load)
- Who may have developed HIV-1 drug resistance while on anti-HIV-1 therapy
- Who may be noncompliant with anti-HIV-1 drug therapy

Monitoring HIV-1 disease progression before or during antiretroviral drug therapy in pregnant individuals

Testing Algorithm

The following algorithms are available in Special Instructions:

[-HIV Testing Algorithm \(Fourth-Generation Screening Assay\), Including Follow-up of Reactive Rapid Serologic Test Results](#)

[-HIV Treatment Monitoring Algorithm](#)

[-HIV Prenatal Testing Algorithm, Including Follow-up of Reactive Rapid Serologic Test Results](#)

Special Instructions

- [HIV Treatment Monitoring Algorithm](#)
- [HIV Testing Algorithm \(Fourth-Generation Screening Assay\), Including Follow-up of Reactive Rapid Serologic Test Results](#)
- [HIV Prenatal Testing Algorithm, Including Follow-up of Reactive Rapid Serologic Test Results](#)

Method Name

Real-Time Reverse Transcription-Polymerase Chain Reaction (RT-PCR)

NY State Available

Yes

Specimen

Specimen Type

Plasma EDTA

Ordering Guidance

For detection and quantification of HIV-1 RNA in plasma before and during antiretroviral therapy in pregnant individuals only. For nonpregnant individuals, order HIVQN / HIV-1 RNA Detection and Quantification, Plasma.

Shipping Instructions

1. Ship specimen frozen on dry ice.

2. If shipment will be delayed for >24 hours, freeze plasma specimen at -20 to -80 degrees C until shipment on dry ice.

Specimen Required

Supplies: Aliquot Tube, 5 mL (T465)

Collection Container/Tube: Lavender top (EDTA)

Submission Container/Tube: Plastic vial

Specimen Volume: 1.5 mL

Collection Instructions:

1. Centrifuge blood collection tube and aliquot plasma into plastic vial per collection tube manufacturer's instructions(eg, centrifuge and aliquot within 2 hours of collection for BD Vacutainer tubes).

2. Freeze aliquoted plasma for shipment.

Specimen Minimum Volume

0.8 mL

Reject Due To

| | |
|-----------------|----|
| Gross hemolysis | OK |
| Gross lipemia | OK |
| Gross icterus | OK |

Specimen Stability Information

| Specimen Type | Temperature | Time | Special Container |
|---------------|--------------------|---------|-------------------|
| Plasma EDTA | Frozen (preferred) | 84 days | |
| | Refrigerated | 6 days | |

Clinical and Interpretive

Clinical Information

Currently, 2 types of HIV, HIV type 1 (HIV-1) and HIV type 2 (HIV-2), are known to infect humans. HIV-1 has been isolated from patients with AIDS, AIDS-related complex, and asymptomatic infected individuals at high-risk for AIDS. Accounting for more than 99% of HIV infection in the world, HIV-1 is transmitted by sexual contact, by exposure to infected blood or blood products, from an infected pregnant woman to fetus in utero or during birth, or from an infected mother to infant via breast-feeding. HIV-2 has been isolated from infected patients in West Africa and it appears to be endemic only in that region. However, HIV-2 also has been identified in individuals who have lived in West Africa or had sexual relations with individuals from that geographic region. HIV-2 is similar to HIV-1 in its morphology, overall genomic structure, and ability to cause AIDS.

Multiple clinical studies of plasma HIV-1 viral load (expressed as HIV-1 RNA copies/mL of plasma) have shown a

clear relationship of HIV-1 RNA copy number to stage of HIV-1 disease and efficacy of anti-HIV-1 therapy. Quantitative HIV-1 RNA level in plasma (ie, HIV-1 viral load) is an important surrogate marker in assessing the risk of disease progression and monitoring response to anti-HIV-1 drug therapy in the routine medical care of HIV-1-infected patients.

Reference Values

Undetected

Interpretation

[This assay has a plasma HIV-1 RNA quantification result range of 20 to 10,000,000 copies/mL \(1.30-7.00 log copies/mL\).](#)

An "Undetected" result indicates that the assay was unable to detect HIV-1 RNA in the plasma specimen tested.

A result of "<20 copies/mL" indicates that HIV-1 RNA is detected, but the level present is less than the lower quantification limit of this assay. Due to the increased sensitivity of this assay, patients with previously low or undetectable HIV-1 viral load may show increased or detectable viral load with this assay. However, the clinical implications of a viral load less than 20 copies/mL remain unclear. Possible causes of such a result include very low plasma HIV-1 viral load present (eg, in the range of 1-19 copies/mL), very early HIV-1 infection (ie, <3 weeks from time of infection), or absence of HIV-1 infection (ie, false-positive).

A result of ">10,000,000 copies/mL" with the result comment of "HIV-1 RNA level is >10,000,000 copies/mL (>7.00 log copies/mL). This assay cannot accurately quantify HIV-1 RNA above this level" indicates that HIV-1 RNA is detected, but the level present is above the upper quantification limit of this assay.

For the purpose of monitoring patient's response to antiretroviral therapy, the United States Department of Health and Human Services Panel on Antiretroviral Guidelines for Adults and Adolescents defines virologic failure as a confirmed viral load of above 200 copies/mL, which eliminates most cases of viremia resulting from isolated blips or assay variability. Confirmed viral load rebound (ie, >200 copies/mL) on 2 separate tests obtained at least 2 to 4 weeks apart should prompt a careful evaluation of patient's tolerance of current drug therapy, drug-drug interactions, and patient adherence.

Cautions

This test is not licensed by the FDA as a screening test for HIV-1 infection in donors of blood, human cells, tissues, or tissue products.

A single HIV-1 viral load test result should not be used as the sole criterion in guiding therapeutic decisions and intervention in the clinical care of HIV-1-infected patients. Viral load results should be correlated with patient symptoms, clinical presentation, and CD4 cell count. Due to the inherent variability in the assay, physiologic variation and concurrent illnesses in the infected patients, less than 100-fold (<2 log) changes in plasma HIV-1 viral load should not be considered to be significant changes.

Viral load results of less than 20 copies/mL do not necessarily indicate absence of HIV-1 viral replication. Inhibitory substances may be present in the plasma specimen, leading to negative or falsely low HIV-1 RNA results. Improper specimen collection or storage may lead to negative or falsely lower plasma viral load results.

Although this commercial HIV-1 viral load assay is optimized for quantification of plasma viral load in HIV-1 infection due to HIV-1 groups M (subtypes A to H) and O strains, results generated from HIV-1 group O strains may be discordant (> or =0.5 log copies/mL) with those obtained from other commercially available HIV-1 viral load assays. The assay is not reliable for quantifying plasma viral loads in infection caused by HIV-1 group N and HIV-2 strains.

ACD-plasma specimens are not optimal for HIV-1 viral load testing because such plasma specimens show HIV-1

RNA levels that are approximately 15% lower than those collected in tubes containing EDTA. Plasma specimens stored frozen in plasma preparation tubes (PPT) are not suitable for HIV-1 viral load testing due to falsely high viral load results from release of intracellular HIV-1 nucleic acids (DNA and RNA) during the freezing process.

Clinical Reference

1. Centers for Disease Control and Prevention and Association of Public Health Laboratories. Laboratory testing for the diagnosis of HIV infection: Updated recommendations. June 27, 2014. Available at <http://stacks.cdc.gov/view/cdc/23447>
2. Gunthard HF, Saag MS, Benson CA, et al: Antiretroviral drugs for treatment and prevention of HIV infection in adults: 2016 recommendations of the International Antiviral Society-USA Panel. JAMA. 2016 Jul 12;316(2):191-210
3. Panel on Treatment of Pregnant Women with HIV Infection and Prevention of Perinatal Transmission: Recommendations for the Use of Antiretroviral Drugs in Pregnant Women with HIV Infection and Interventions to Reduce Perinatal HIV Transmission in the United States. US Department of Health and Human Services. October 26, 2016. Updated February 10, 2021. Accessed May 13, 2021. Available at <https://clinicalinfo.hiv.gov/en/guidelines/perinatal/whats-new-guidelines>

Performance

Method Description

The cobas HIV-1 assay is an FDA-approved, in vitro nucleic acid amplification test for the quantification of HIV-1 RNA in human plasma using the cobas 6800 System or cobas 8800 System for fully automated viral nucleic acid extraction (generic silica-based capture technique) and automated amplification and detection of the viral nucleic acid sequence. This PCR assay amplifies sequences within the *gag* gene and LTR region of the HIV-1 genome and generates amplification products that are detected and quantified in real-time with 2 sequence-specific TaqMan probes. A non-HIV armored RNA quantitation standard (RNA-QS) is introduced into each specimen during sample preparation to serve as internal control for nucleic acid extraction and PCR amplification / detection processes. Fluorescent reporter dye-labeled TaqMan probes hybridized to the complementary HIV-1 target sequences and RNA-QS sequence undergo hydrolysis during PCR amplification step to generate fluorescent signal detected in 2 different dye channels. Concentration of the HIV-1 RNA in a patient's plasma sample is determined by a ratio of the intensity of the fluorescent dye from the cleaved HIV-1 target sequence probes and that from the RNA-QS target probe detected throughout the PCR process. (Package insert: cobas HIV-1-Quantitative nucleic acid test for use on the cobas 6800/8800 Systems; Roche Molecular Systems, Inc., Branchburg, NJ. Doc rev. 1.0, 01/2016)

PDF Report

No

Day(s) Performed

Monday through Saturday

Report Available

1 to 3 days

Specimen Retention Time

60 days

Performing Laboratory Location

Rochester

Fees and 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 Regional Manager. For assistance, contact [Customer Service](#).

Test Classification

This test has been modified from the manufacturer's instructions. Its performance characteristics were determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

87536

LOINC® Information

| Test ID | Test Order Name | Order LOINC Value |
|---------|------------------------------------|-------------------|
| HIQNP | HIV-1 RNA Detect/Quant Prenatal, P | 70241-5 |

| Result ID | Test Result Name | Result LOINC Value |
|-----------|------------------------------------|--------------------|
| 65567 | HIV-1 RNA Detect/Quant Prenatal, P | 70241-5 |