Overview

Useful For
Detection of acute hepatitis C virus (HCV) infection before the appearance of HCV antibodies in serum (ie, <2 months from exposure)

Detection and confirmation of chronic HCV infection

Quantification of HCV RNA in serum of patients with chronic HCV infection (HCV antibody-positive)

Monitoring disease progression in chronic HCV infection and response to antiviral therapy

Determining cure and detection of relapse after completion of antiviral therapy

Highlights
A reflex test for serum specimens that are hepatitis C Virus (HCV) antibody screen-reactive for diagnosis of chronic hepatitis C.

This test is appropriate for diagnosis of acute hepatitis C in high-risk or immunosuppressed individuals who may be negative for HCV antibodies.

This test can be used to establish a baseline HCV viral load before initiating antiviral therapy for chronic hepatitis C.

This test can be used to monitor response and progress during antiviral therapy for chronic hepatitis C.

This test is appropriate for confirming a sustained virologic response and detecting a relapse of hepatitis C after completion of antiviral therapy.

Testing Algorithm
The following algorithms are available in Special Instructions:

- Chronic Hepatitis C Treatment and Monitoring Algorithm: Direct Antiviral Antigen (DAA) Combination

- Hepatitis C: Testing Algorithm for Screening and Diagnosis

Special Instructions
- Hepatitis C: Testing Algorithm for Screening and Diagnosis
- Chronic Hepatitis C Treatment and Monitoring Algorithm: Direct Antiviral Agent (DAA) Combination

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

NY State Available
Yes

Specimen

Specimen Type
Serum SST
Advisory Information
For detection and quantification of HCV RNA in serum before, during, and after antiviral therapy for chronic hepatitis C.

Shipping Instructions
1. Freeze serum immediately, and ship specimen frozen on dry ice only.
2. If shipment will be delayed for more than 24 hours, freeze serum at -20 to -80 degrees C (up to 84 days) until shipment on dry ice.

Specimen Required
Supplies: Aliquot Tube, 5 mL (T465)

Collection Container/Tube: Serum gel

Submission Container/Tube: Polypropylene vial (T465)

Specimen Volume: 1.5 mL

Collection Instructions:
1. Centrifuge blood collection tube per collection tube manufacturer’s instructions.
2. Pour off serum into aliquot tube.

Forms
If not ordering electronically, complete, print, and send 1 of the following forms with the specimen:

- General Request (T239)
- Gastroenterology and Hepatology Client Test Request (T728)

Specimen Minimum Volume
0.8 mL

Reject Due To

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<tr>
<td>Gross lipemia</td>
<td>OK</td>
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<tr>
<td>Gross icterus</td>
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Specimen Stability Information

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<td>Serum SST</td>
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<tr>
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Clinical and Interpretive

Clinical Information

Of all individuals infected with hepatitis C virus (HCV), about 75% of them will develop chronic hepatitis C, with ongoing viral replication in the liver and detectable HCV RNA in serum or plasma, eventually resulting in cirrhosis. The remaining 25% of the infected individuals recover from the infection without evidence of viral replication or presence of detectable HCV RNA in serum or plasma. Chronic HCV infection can be cured at variable success rates with either combined interferon-alpha and ribavirin therapy or interferon-free combination of direct-acting antiviral (DAA) agents.

The antiviral response rates correlate with pretreatment serum or plasma HCV RNA levels (viral load) and the HCV genotype found in the infected individuals. The optimal duration of combined interferon and ribavirin therapy can be determined from the patient's pretreatment viral load and HCV genotype. Clinical trial studies indicated that a decrease in HCV RNA levels of more than 2 log IU/mL at 4 weeks or 12 weeks of therapy is predictive of an increased chance of achieving a sustained virologic response (defined as undetectable HCV RNA levels in serum 6 months after completing antiviral therapy). Despite receiving longer duration of antiviral therapy (48 weeks versus 24 weeks), patients with chronic infection due to HCV genotypes 1 and 4 generally have less favorable sustained virologic response rates (40%-50%) than those infected with genotypes 2 and 3 (>80%). Due to the necessary prolonged duration (typically 24 to 48 week duration) and low cure rates of such antiviral therapy, interferon-based therapy has been supplanted with potent interferon-free DAA combination therapy now.

Cure rates, as defined by sustained virologic response (SVR), of over 90% are observed among HCV-infected patients treated with interferon-free DAA combinations that are of shorter duration of treatment (eg, 8 or 12 weeks) than those of interferon-based therapy. Current guidelines for antiviral therapy of chronic hepatitis C recommend quantitative testing for HCV RNA in serum or plasma before initiating antiviral therapy, at 4 weeks of therapy, and at 12 weeks after completion of therapy. HCV RNA level of below 25 IU/mL in serum or plasma at 12 weeks after ending therapy is the therapeutic goal and indicates an SVR is achieved. Quantitative HCV RNA testing can be considered at the end of therapy and at 24 weeks or later after completion of antiviral therapy.

The following algorithms are available in Special Instructions:

- Chronic Hepatitis C Treatment and Monitoring Algorithm: Direct Antiviral Antigen (DAA) Combination
- Hepatitis C: Testing Algorithm for Screening and Diagnosis

Reference Values

Undetected

Interpretation

This assay has a result range of 15 to 100,000,000 IU/mL (1.18 log to 8.00 log IU/mL) for quantification of hepatitis C virus (HCV) RNA in serum.

An "Undetected" result indicates that the HCV is absent in the patient's serum specimen.

A result of "<15 IU/mL (<1.18 log IU/mL)" indicates that HCV RNA is detected, but the HCV RNA level present cannot be quantified accurately below this lower limit of quantification of this assay. When clinically indicated, follow-up testing with this assay is recommended in 1 to 2 months. To assess response-guided therapy eligibility, an "Undetected" result is required, and a result of "<15 IU/mL mL (<1.18 log IU/mL)" should not be considered equivalent to an "Undetected" result.
A quantitative result expressed in IU/mL and log IU/mL indicates the degree of active HCV viral replication in the patient. Monitoring HCV RNA levels over time is important to assess disease progression and/or monitoring a patient's response to anti-HCV therapy.

A result of \( >100,000,000 \text{ IU/mL} (\text{>8.00 log IU/mL}) \) indicates the presence of active HCV viral replication, and the HCV RNA level present cannot be quantified accurately above this upper limit of quantification of this assay.

An "Inconclusive" result reported with a comment indicates that testing failed, likely due to presence of inhibitory substances in the submitted serum specimen. A new specimen should be collected for retesting.

**Cautions**

Except for immunocompromised patients or patients with suspected acute hepatitis, laboratory evaluation of hepatitis C virus (HCV) infection status should begin with HCV serologic testing, including testing for the presence of HCV antibodies (see Hepatitis C: Testing Algorithm for Screening and Diagnosis in Special Instructions.). A diagnosis of chronic HCV infection should not be based solely on the presence of detectable or quantifiable HCV RNA in a single serum specimen.

An "Undetected" HCV RNA test result with a "Reactive" HCV antibody screen result may be due to 1) a false-reactive HCV antibody screen result; 2) resolved or past HCV infection; or 3) transient low viremia (ie, episodic viral replication) of active HCV infection. To distinguish between the first 2 conditions, another HCV antibody test (eg, HCCAD / Hepatitis C Virus Antibody Screen for Cadaveric or Hemolyzed Specimens, Serum) can be requested. To distinguish between the latter 2 conditions, patients should be retested for HCV RNA in 1 to 2 months, as clinically indicated.

**Clinical Reference**

1. de Leuw P, Sarrazin C, Zeuzem S: How to use virological tools for the optimal management of chronic hepatitis C. Liver Int 2011;31 Suppl 1:3-12


**Performance**

**Method Description**

The cobas hepatitis C virus (HCV) assay is an FDA-approved, in vitro nucleic acid amplification test for the quantification of HCV RNA in human serum 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 highly conserved 5' noncoding region of the HCV genome and generates amplification products that are detected and quantified in real-time with 2 sequence-specific TaqMan probes. A non-HCV 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 HCV 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 HCV RNA in a patient's serum sample is determined by a ratio of the intensity of the fluorescent dye from the cleaved HCV target sequence probes and that from the RNA QS target probe detected throughout the PCR process. (Package insert: cobas HCV-Quantitative nucleic acid test for use on the cobas 6800/8800 Systems; Roche Molecular Systems, Inc., Branchburg,
Test Definition: HCVQN
HCV RNA Detect/Quant, S

NJ; Doc rev. 1.0, 10/2015

PDF Report
No

Day(s) and Time(s) Test Performed
Monday through Saturday; 7 a.m.-4 p.m.

Analytic Time
Monday through Thursday, 1 day; Friday and Saturday, 3 days

Maximum Laboratory Time
3 days

Specimen Retention Time
2 months

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 cleared or approved by the U.S. Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information
87522

LOINC® Information

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