Elecsys® Anti-HAV IgM

Immunoassay for the qualitative detection of IgM antibodies against HAV

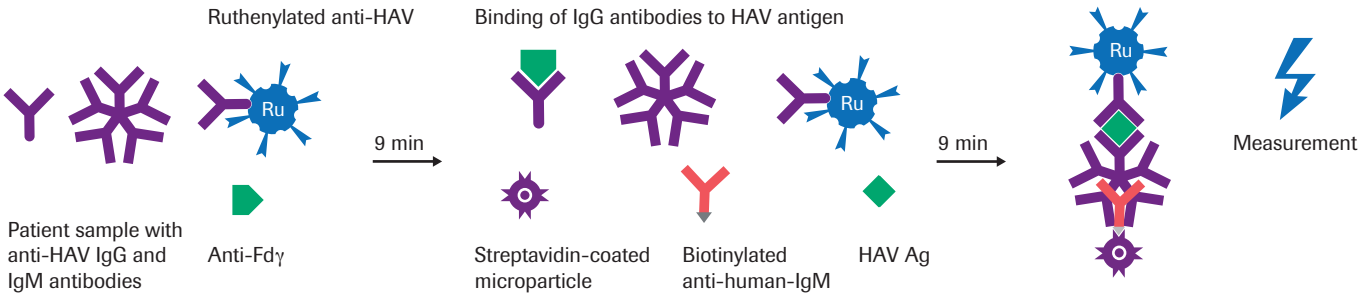
Summary

Hepatitis A is an acute, inflammatory liver disease caused by infection with the hepatitis A virus (HAV). HAV is a non-enveloped RNA virus in the family of picornaviruses. Of the 7 known genotypes, 4 can infect humans. Only one serotype of HAV has been documented[1-5].

Hepatitis A occurs sporadically and in epidemics worldwide, with around 1.4 million new HAV infections reported each year[3,4]. HAV is transmitted fecal-orally either by person-to-person contact or ingestion of contaminated food or water in regions of low hygienic standards. Cooked foods can transmit HAV if the temperature during food preparation is inadequate to inactivate the virus or if food is contaminated through infected food handlers[1,4-6]. HAV has only been linked with acute hepatitis, and most patients fully recover within two months after infection. Only 10 – 15 % of people infected will have prolonged or relapsed illness for up to 6 months. Anti-HAV IgM becomes detectable 5 – 10 days before onset of symptoms, peaks during the symptomatic period and becomes undetectable in 75 % of patients 3 – 6 months after infection, although anti-HAV IgM can also be detected in some patients for a longer period of time. Anti-HAV IgM antibodies develop only very rarely after vaccination. Assays to detect anti-HAV IgM antibodies are used in the differential diagnosis of acute hepatitis to determine a hepatitis A infection.[3,7-11]

Elecsys® Anti-HAV IgM is an immunoassay for the in vitro qualitative determination of IgM antibodies to HAV in human serum and plasma. The assay is used as an aid to detect an acute or recently acquired HAV infection.[12]

Test principle: µ-Capture assay (testing time: 18 minutes)



Step 1 (9 minutes):
10 µL/6 µL of the patient sample are automatically prediluted and incubated with Fdγ-reagent and murine monoclonal anti-HAV labeled with a ruthenium complex. The Fdγ-reagent blocks the paratopes of human IgG, which might otherwise interfere with the subsequent steps. The ruthenylated antibody does not participate in any reaction at this stage.

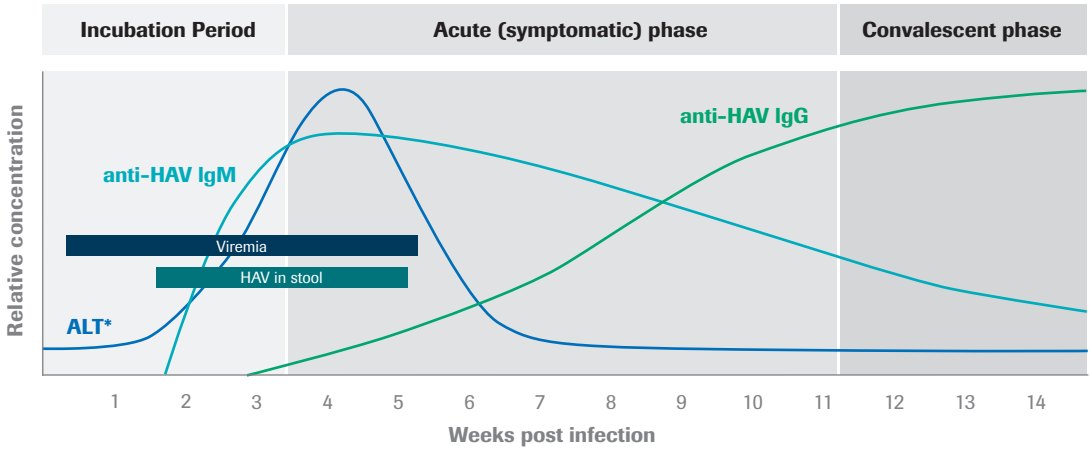
Step 2 (9 minutes):
Monoclonal biotinylated anti-h-IgM and HAV-antigen are added, together with streptavidin-coated paramagnetic microparticles. Immune complexes develop, centered with anti-HAV IgM, and these carry the ruthenium label as well as a microparticle.

Step 3 (measurement):
The reagent mixture is transferred to the measuring cell, where the microparticles are fixed to the electrode surface by magnetic action. The unbound substances are subsequently removed. Luminescence is then induced by applying a voltage and measured with a photomultiplier. The signal yield increases with increasing anti-HAV IgM titer.

Elecsys® Anti-HAV IgM assay characteristics[12]

Systems	**cobas e** 411 analyzer **cobas e** 601 / **cobas e** 602 modules	**cobas e** 402 / **cobas e** 801 analytical units
Testing time	18 minutes	
Test principle	µ-capture assay	
Calibration	2-point	
Interpretation	COI <1.0 = non-reactive COI ≥1.0 = reactive	
Traceability	Roche reference standard	
Sample material	Serum collected using standard sampling tubes or tubes containing separating gel. Li-heparin, Na-heparin, K_3-EDTA and Na-citrate plasma.	Serum collected using standard sampling tubes or tubes containing separating gel. Li-heparin, Na-heparin, K_2-EDTA, K_3-EDTA and Na-citrate plasma.
Sample volume	10 µL	6 µL
Onboard stability	8 weeks	16 weeks
Intermediate precision in positive samples	**cobas e** 411 analyzer: CV 2.7 – 5.4 % **cobas e** 601 / 602 modules: CV 5.0 – 7.9 %	CV 2.2 – 5.3 %
Relative sensitivity	Clinically characterized patients with acute HAV infection (N=211): 100 % (98.27 – 100 %*)	
Relative specificity	Blood donors (N=1,032): 100 % (99.64 – 100 %) Hospitalized patients, pregnant women, dialysis patients and drug addicts (N=280): 100 % (98.69 – 100 %)	

Hepatitis A infection: marker profile after natural infection[3,7-10,13]

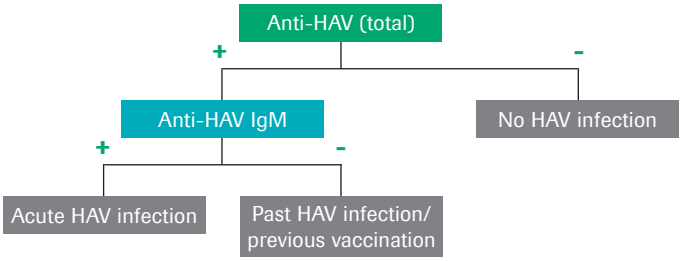


*alanine aminotransferase

Proposed algorithms for diagnosis of HAV infection

Unkown HAV immune status

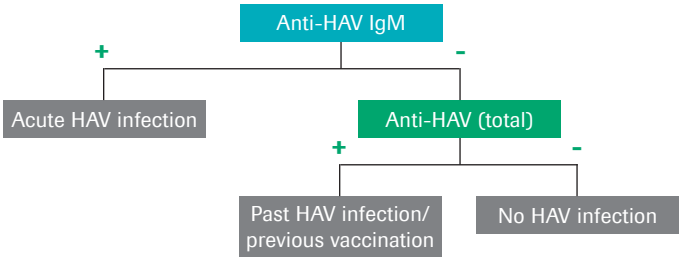
- The patient may have an acute or past HAV infection, or may not be immune
- Initial test – anti-HAV (total assay)



With this algorithm, all three possible outcomes can be identified by testing first with the anti-HAV (total) assay followed by the anti-HAV IgM assay if necessary. By contrast, an HAV IgG assay alone cannot identify or exclude acute infection; an HAV IgM test is also required.[10,14]

Suspected acute HAV infection

- The patient is exhibiting clinical symptoms
- Initial test – anti-HAV IgM assay



With this algorithm, all three possible outcomes can be clearly identified by testing first with the anti-HAV IgM assay followed by the anti-HAV (total) assay if necessary.[10,14,15]

Order information

Product	Material configuration	Material Number
Elecsys® Anti-HAV IgM[a)]	100 tests	04 854 977 190
Elecsys® Anti-HAV IgM[b)]	300 tests	07 026 773 190
PreciControl Anti-HAV IgM[a),b)]	16 × 0.67 mL	11 876 368 122
Diluent Universal[a)]	2 × 16 mL	11 732 277 122
Diluent Universal[a)]	2 × 36 mL	03 183 971 122
Diluent Universal[b)]	45.2 mL	07 299 001 190

*a) On **cobas e** 411 analyzer, **cobas e** 601 / **cobas e** 602 modules, b) On **cobas e** 402 / **cobas e** 801 analytical units*

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