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MAYO CLINIC LABORATORIES

Test Definition: CEA

Carcinoembryonic Antigen (CEA), Serum

Overview

Useful For

Monitoring colorectal cancer and selected other cancers such as medullary thyroid carcinoma

May be useful in assessing the effectiveness of chemotherapy or radiation treatment

This test is **not useful for** screening the general population for undetected cancers.

Method Name

Immunoenzymatic Assay

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Patient Preparation: For 12 hours before specimen collection, patient **should not** take multivitamins or dietary supplements (eg, hair, skin, and nail supplements) containing biotin (vitamin B7).
Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 0.6 mL Serum
Collection Instructions:
1. Within 2 hours of collection, centrifuge the specimen.
2. For serum gel tubes, serum may sit on gel refrigerated but must be aliquoted within 7 days.
3. For red top tubes, aliquot serum into a plastic vial within 2 hours of collection.

Forms

If not ordering electronically, complete, print, and send an Oncology Test Request (T729) with the specimen.

Specimen Minimum Volume

Serum: 0.5 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	7 days	
	Frozen	90 days	

Clinical & Interpretive

Clinical Information

Carcinoembryonic antigen (CEA) is a glycoprotein normally found in embryonic entodermal epithelium.

Increased levels may be found in patients with primary colorectal cancer or other malignancies including medullary thyroid carcinoma and breast, gastrointestinal tract, liver, lung, ovarian, pancreatic, and prostatic cancers.

Serial monitoring of CEA should begin prior to therapy to verify post therapy decrease in concentration and to establish a baseline for evaluating possible recurrence. Levels generally return to normal within 1 to 4 months after removal of cancerous tissue.

Reference Values

Nonsmokers: < or =3.0 ng/mL
Some smokers may have elevated CEA, usually <5.0 ng/mL.
Serum markers are not specific for malignancy, and values may vary by method.

Interpretation

Grossly elevated carcinoembryonic antigen (CEA) concentrations (>20 ng/mL) in a patient with compatible symptoms are strongly suggestive of the presence of cancer and suggest metastasis.

Most healthy subjects (97%) have values less than or equal to 3.0 ng/mL.

After removal of a colorectal tumor, the serum CEA concentration should return to normal by 6 weeks, unless there is residual tumor.

Increases in test values over time in a patient with a history of cancer suggest tumor recurrence.

Cautions

The concentration of carcinoembryonic antigen (CEA) in serum should not be used to screen asymptomatic individuals for neoplastic disease, and the diagnostic efficacy of CEA measurements in high-risk groups has not been established.

Single values of CEA are less informative than changes assessed over time.

Carcinoembryonic antigen values are method-dependent; therefore, the same method should be used to serially monitor patients.

Do not interpret serum CEA levels as absolute evidence of the presence or the absence of malignant disease. Use serum CEA in conjunction with information from the clinical evaluation of the patient and other diagnostic procedures.

Some patients who have been exposed to animal antigens, either in the environment or as part of treatment or imaging procedures, may have circulating antianimal antibodies present. These antibodies may interfere with the assay reagents to produce unreliable results.

Clinical Reference

1. Sturgeon C. Tumor markers. In: Rifai N, Horvath AR, Wittwer CT, eds: Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. 6th ed. Elsevier; 2018:436-478
2. Locker, GY, Hamilton S, Harris J, et al. ASCO 2006 update of recommendations for the use of tumor markers in gastrointestinal cancer. J Clin Oncol. 2006;24:5313-5327
3. Moertel CG, Fleming TR, Macdonald JS, et al. An evaluation of the carcinoembryonic antigen (CEA) test for monitoring patients with resected colon cancer. JAMA. 1993;270:943-947

Performance

Method Description

Instrument used is Beckman Coulter UniCel DXI 800. The Access carcinoembryonic antigen (CEA) assay is a 2-site immunoenzymatic sandwich assay using 2 mouse monoclonal anti-CEA antibodies (MAb) that react with different epitopes of CEA. A sample is added to a reaction vessel, along with the first anti-CEA MAb-alkaline phosphatase conjugate and the second anti-CEA Mab bound to paramagnetic particles. The incubation is followed by a magnetic separation and washing. The chemiluminescent substrate Lumi-Phos 530 is added to the vessel and light generated by the reaction is measured with a luminometer. The light production is proportional to the concentration of CEA in the sample. The amount of analyte in the sample is determined by means of a stored, multipoint calibrator curve.(Package insert: Access CEA. Beckman Coulter; 05/2020)

PDF Report

No

Day(s) Performed

Monday through Friday

Report Available

1 to 3 days

Specimen Retention Time

14 days

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Superior Drive

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 has been cleared, approved, or is exempt by the US 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

82378

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
CEA	Carcinoembryonic Ag (CEA), S	83085-1

Result ID	Test Result Name	Result LOINC® Value
CEA	Carcinoembryonic Ag (CEA), S	83085-1