MAYO CLINIC LABORATORIES

Test Definition: INHA

Inhibin A, Tumor Marker, Serum

Overview

Useful For

Aiding in the diagnosis of patients with granulosa cell tumors of the ovary when used in combination with inhibin B

Monitoring of patients with granulosa cell tumors and epithelial mucinous-type tumors of the ovary known to secrete inhibin A

Method Name

Immunoenzymatic Assay

NY State Available

Yes

Specimen

Specimen Type

Serum

Ordering Guidance

For the initial evaluation of patients suspected of having a granulosa cell tumor of the ovary, order INHAB / Inhibin A and B, Tumor Marker, Serum. If the results of the profile show that either inhibin A or B are elevated, consider monitoring the patient with the individual tests, INHA / Inhibin A, Tumor Marker, Serum or INHB / Inhibin B, Serum.

Specimen Required

Supplies: Sarstedt Aliquot Tube 5 mL (T914)
Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 0.6 mL
Collection Instructions: Centrifuge and aliquot serum into a plastic vial.

Forms

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

Specimen Minimum Volume

0.5 mL

Reject Due To

Gross	Reject

hemolysis	
Gross lipemia	OK
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	14 days	
	Ambient	7 days	
	Frozen	90 days	

Clinical & Interpretive

Clinical Information

Inhibins are heterodimeric protein hormones secreted by granulosa cells of the ovary and Sertoli cells of the testis. They selectively suppress secretion of pituitary follicle stimulating hormone and have local paracrine actions in the gonads. The inhibins consist of a dimer of 2 homologous subunits, an alpha subunit and either a beta A or beta B subunit, to form inhibin A and inhibin B, respectively.

In female individuals, inhibin A is primarily produced by the dominant follicle and corpus luteum; whereas inhibin B is predominantly produced by small developing follicles. Serum inhibin A and B levels fluctuate during the menstrual cycle. At menopause, with the depletion of ovarian follicles, serum inhibin A and B decrease to very low or undetectable levels.

Ovarian cancer is classified into 3 types: epithelial, stromal sex cord, and germ cell tumors. Epithelial ovarian tumors account for 90% of cases and are further subdivided into serous (70%), mucinous (10%-15%), and endometrioid (10%-15%) types. Granulosa cell tumors represent the majority of the stromal sex cord tumors, which account for 2% to 5% of all ovarian tumors.

Elevations of serum inhibin A and B are detected in some patients with granulosa cell tumors. Inhibin A elevations have been reported in approximately 70% of granulosa cell tumors. In these patients, inhibin A levels tend to show a 6-fold to 7-fold increase over the reference range value. The frequency of elevated levels varies amongst studies, likely due to the different specificities of the antibodies used in the immunoassays.

Inhibin A also appears to be a suitable marker for epithelial tumors of the mucinous type with about 20% of cases having elevated inhibin A levels. In contrast, inhibin is not a very good marker in nonmucinous epithelial tumors. At best, total inhibin is elevated in 15% to 35% of nonmucinous epithelial ovarian cancer cases.

Inhibin seems to be complementary to cancer antigen 125 (CA 125) as an ovarian cancer marker. CA 125 is not as good of a tumor marker for mucinous and granulosa ovarian cell tumors. Inhibin shows a better performance in those 2 types of ovarian cancer.

The majority of studies for inhibin A and B as ovarian cancer markers have been limited to postmenopausal women where the levels for both proteins are normally very low. Inhibin A has limited utility as an ovarian cancer marker in

premenopausal women, where circulating levels are higher and fluctuate throughout the menstrual cycle and, therefore, are difficult to interpret.

Reference Values

Males: <5.0 pg/mL

Females
<11 years: <5.0 pg/mL
11-17 years: <98 pg/mL
Premenopausal: <98 pg/mL
Postmenopausal: <5.0 pg/mL

Interpretation

Inhibin A levels are elevated in approximately 70% of patients with granulosa cell tumors and in approximately 20% of patients with epithelial ovarian tumors. A normal inhibin A level does not rule out a mucinous or granulosa ovarian cell tumor. Testing for inhibin B in these cases might be informative as a higher proportion of mucinous or granulosa ovarian cell tumors will have an elevated inhibin B level. Consider ordering INHAB / Inhibin A and B, Tumor Marker, Serum.

For monitoring of patients with known ovarian cancer, inhibin A levels decrease shortly after surgery. Elevations of inhibin A after treatment are suggestive of residual, recurrent, or progressive disease. In patients with recurrent disease, inhibin A elevation seems to be present earlier than clinical symptoms. Patients in remission show normal levels of inhibin A.

Cautions

Inhibin values fluctuate during the menstrual cycle. Inhibin levels in premenopausal women should be interpreted with caution.

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

Tumor markers are not specific for malignancy and values may vary by testing methodology. The same method should be used to serially monitor patients.

In rare cases, some individuals can develop antibodies to mouse or other animal antibodies (often referred to as human anti-mouse antibodies [HAMA] or heterophile antibodies), which may cause interference in some immunoassays. Caution should be used in interpretation of results and the laboratory should be alerted if the result does not correlate with the clinical presentation.

Clinical Reference

1. Mom CH, Engelen MJA, Willemse PHB, et al. Granulosa cell tumors of the ovary: the clinical value of serum inhibin A and B levels in a large single center cohort. Gynecol Oncol. 2007;105(2):365-372
2. Robertson DM, Pruysers E, Jobling T. Inhibin as a diagnostic marker for ovarian cancer. Cancer Lett. 2007;249(1):14-17
3. Jamieson S, Fuller PJ. Management of granulosa cell tumour of the ovary. Curr Opin Oncol. 2008;20(5):560-564
4. 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
5. Yarbrough ML, Stout M, Gronowski AM. Pregnancy and its disorders. In: Rifai N, Horvath AR, Wittwer CT, eds. Tietz

Textbook of Clinical Chemistry and Molecular Diagnostics. 6th ed. Elsevier; 2018:1655-1696
6. Makanji Y, Zhu J, Mishra R, et al. Inhibin at 90: from discovery to clinical application, a historical review. Endocr Rev. 2014;35(5):747-794. doi:10.1210/er.2014-1003
7. Walentowicz P, Krintus M, Sadlecki P, et al. Serum inhibin A and inhibin B levels in epithelial ovarian cancer patients. PLoS One. 2014;9(3):e90575. doi:10.1371/journal.pone.0090575

Performance

Method Description
The assay is performed using a Beckman Coulter Unicel DXI 800. The Access Inhibin A assay is a sequential 2-step immunoenzymatic ("sandwich'') assay. Sample is added to a reaction vessel and incubated with paramagnetic particles coupled with anti-inhibin A monoclonal antibody. Excess sample and reagents are removed, and anti-inhibin A monoclonal antibody-alkaline phosphatase conjugate is then added to a reaction mixture. After incubation, unbound materials are washed away. Antibody-analyte complex is detected by addition of the chemiluminescent substrate. The light production is directly proportional to the concentration of inhibin A in the sample.(Package insert: Access Inhibin A. Beckman Coulter Inc; 10/2023)

PDF Report
No

Day(s) Performed
Monday through Saturday

Report Available
1 to 3 days

Specimen Retention Time
3 months

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 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

86336

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
INHA	Inhibin A, Tumor Marker, S	23883-2

Result ID	Test Result Name	Result LOINC® Value
INHA	Inhibin A, Tumor Marker, S	23883-2