Test Definition: PTHFN

Parathyroid Hormone, Fine-Needle Aspiration Biopsy (FNAB)-Needle Wash

Overview

Useful For

Discriminating thyroid tissue from enlarged parathyroid glands

Facilitating parathyroid localization prior to surgery

An adjunct to cytology examination of fine-needle aspiration specimens to confirm or exclude presence of parathyroid tissue in the biopsied area.

Highlights

Measurement of parathyroid hormone (PTH) in fine-needle aspiration biopsy washings could be used to discriminate thyroid tissues from enlarged parathyroid glands and to facilitate parathyroid localization prior to surgery.

This test is best used as an adjunct to cytology examination to confirm or exclude the presence of parathyroid tissue in the biopsied area.

PTH values of 100 pg/mL and above are suggestive of the presence PTH-secreting tissue at the site biopsied or along the needle track.

Method Name

Electrochemiluminescence Immunoassay

NY State Available

Yes

Specimen

Specimen Type

Fine Needle Wash

Shipping Instructions

Send specimen frozen.

Necessary Information

The biopsied site of each specimen must be clearly identified in the Laboratory Information System and/or batch sheet.

Specimen Required

Patient Preparation: For 12 hours before specimen collection do not take multivitamins or dietary supplements containing biotin (vitamin B7), which is commonly found in hair, skin, and nail supplements and multivitamins.

Collection Container/Tube: Plain, plastic, screw-top tube
Specimen Volume: 1 to 1.5 mL
Collection Instructions:
1. Needle wash specimens for analysis should be collected in conjunction with cytology specimens.
2. Have saline available prior to start of procedure. Saline is the only acceptable solution for needle washings.
3. After each fine-needle aspiration biopsy (FNAB) has been collected and the material in the needle has been expelled onto a slide for cytologic analysis, attach the used FNAB needle to an empty syringe.
4. Draw between 0.10 mL and 0.25 mL of saline up through the needle until the saline starts to fill the hub of the needle or end of the syringe.
5. Expel this fluid back through the needle into a separate plastic aliquot tube. This is the needle washing used for analysis.
6. Repeat steps 2 through 4 for each needle pass of the same biopsied site and empty into the same tube, accumulating a total of 0.5 mL to 1.5 mL of fluid to send to the laboratory. (If more than 1 site is biopsied, see Additional Information)
7. Inspect specimen for visible blood or tissue contamination:
 a. If bloody, centrifuge specimen and transfer supernatant to a new plastic aliquot tube (5-mL standard tube) to send to laboratory. The supernatant, not the cellular material, is used for analysis.
 b. If specimen is clear, centrifugation is not necessary.
8. Freeze within 2 to 4 hours of collection.
Additional Information:
1. If more than 1 site is biopsied, each washing material should be submitted on a separate tube and under a different order number.
2. A minimum of 0.5 mL is required for testing; however, the total collection volume should not exceed 1.5 mL. Sample volumes outside these parameters may be rejected.
3. Do not send saline control. This test has been validated to rule-out saline matrix effect.

Specimen Minimum Volume

0.5 mL

Reject Due To

Gross hemolysis	Reject
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Fine Needle Wash	Frozen (preferred)	30 days	
	Refrigerated	4 hours	

Clinical & Interpretive

Clinical Information

Parathyroid hormone (PTH) is produced and secreted by the parathyroid glands, which are located along the posterior aspect of the thyroid gland. PTH analysis in rinse material obtained from fine-needle aspiration (FNA) biopsies has gained popularity to discriminate thyroid tissues from enlarged parathyroid glands as well as facilitate parathyroid localization prior to surgery. Various groups have reported on the utility of this technique with specificity of 91% to100% and sensitivity of 82% to 100%. Measuring PTH in the rinse material proves to be very useful in cases of nondiagnostic cytology. Comparing the results of the PTH rinse material with serum PTH is highly recommended. An elevated PTH in the serum could falsely elevate PTH in the washings if the rinse is contaminated with blood. In these cases, only PTH values significantly higher than the serum should be considered as true positive results.

Cytologic examination and measurement of PTH can be performed on the same specimen. To measure PTH, the FNA needle is rinsed with a small volume of normal saline solution immediately after a specimen for cytological examination has been expelled from the needle for a smear or CytoTrap preparation. Specimen collection is critical for the performance of the assay, and the needle should be rinsed with a minimal volume. Each FNA needle from a single biopsied area is washed with 0.1 to 0.5 mL of normal saline. The washes from a single area are pooled (final volume 0.5-1.5 mL). PTH levels are measured in the saline wash.

Reference Values

An interpretive report will be provided.

Interpretation

Parathyroid hormone (PTH) values less than 100 pg/mL suggest the biopsied site does not contain PTH-secreting tissue.

PTH values greater than or equal to 100 pg/mL are suggestive of the presence PTH-secreting tissue at the site biopsied or along the needle track. This result is dependent on accurate sampling and a total needle wash volume between 0.5 and 1.5 mL.

This test should be interpreted in the context of the clinical presentation, imaging, and cytology findings.

If the results are discordant with the clinical presentation, a sampling error at the time of the biopsy should be considered.

Cautions

Specimens should not be collected from patients receiving therapy with high biotin or vitamin B7 doses (ie, >5 mg/day) until at least 12 hours following the last biotin administration.

This test cannot distinguish between benign and malignant parathyroid tissue.

In some immunoassays, the presence of unusually high concentrations of analyte may result in a high-dose "hook" effect. This may result in a lower, or even normal, measured analyte concentration. If the reported result is inconsistent with the clinical presentation, the laboratory should be alerted for troubleshooting.

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. Rarely, the presence of antibodies to streptavidin or ruthenium can occur and may also interfere in this assay. Caution should be used in interpretation of results, and the laboratory should be alerted if the result does not correlate with the clinical

presentation.

Results are dependent on accurate sampling and a maximum needle wash volume of 1.5 mL or less.

While the needle washes from several distinct needle passes or aspirations from a single area should be pooled, biopsies from different areas should be submitted as separate specimens.

Clinical Reference

1. Bancos I, Grant CS, Nadeem S, et al. Risks and benefits of parathyroid fine-needle aspiration with parathyroid hormone washout. Endocr Pract. 2012;18(4):441-449
2. Ketha H, Lasho MA, Algeciras-Schimnich A. Analytical and clinical validation of parathyroid hormone (PTH) measurement in fine-needle aspiration biopsy (FNAB) washings. Clin Biochem. 2016;49(1-2):16-21
3. Trimboli P, D'Aurizio F, Tozzoli R, Giovanella L. Measurement of thyroglobulin, calcitonin, and PTH in FNA washout fluids. Clin Chem Lab Med. 2017;55(7):914-925

Performance

Method Description

The saline needle-wash specimen is analyzed with the Elecsys PTH reagent. The Roche cobas assay for determining intact parathyroid hormone (PTH) employs a sandwich test principle in which a biotinylated monoclonal antibody reacts with the N-terminal fragment (1-37) and a monoclonal antibody labeled with a ruthenium complex reacts with the C-terminal fragment (38-84). Application of a voltage to the electrode then induces chemiluminescent emission, which is measured by a photomultiplier. The antibodies used in this assay are reactive with epitopes in the amino acid regions 26-32 and 37-42.(Package insert: Elecsys PTH, Roche Diagnostics; 05/2023)

For all samples with high concentrations of PTH, a dilution series is performed. A linear dilution excludes hooking and most major interferences. Samples that contain low PTH concentrations are spiked with exogenous PTH to identify possible interferences that may cause a false-low result.

PDF Report

No

Day(s) Performed

Monday through Saturday

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 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

83970

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
PTHFN	PTH, FNAB, Needle Wash	88106-0

Result ID	Test Result Name	Result LOINC® Value
PTHF	PTH, FNAB, Needle Wash	88106-0
SITEA	Site	39111-0