Test Definition: B2MU

Beta-2 Microglobulin, Random, Urine

Overview

Useful For

Evaluation of renal tubular damage

Monitoring exposure to cadmium and mercury

Method Name

Automated Chemiluminescent Immunometric Assay

NY State Available

Yes

Specimen

Specimen Type

Urine

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.
Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Container/Tube: Plastic, urine tube
Specimen Volume: 1.0 mL
Collection Instructions:
1. Patient should empty bladder.
2. Have patient drink at least 0.5 liters of water.
3. Within 1 hour, collect a random urine specimen.
4. Add 1 M sodium hydroxide (NaOH) as preservative to the collection. This preservative is intended to achieve an approximate pH of between 6 and 8.

Forms

If not ordering electronically, complete, print, and send a Renal Diagnostics Test Request (T830) with the specimen.

Specimen Minimum Volume

0.5mL

Reject Due To

Specimen with pH <6	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Urine	Frozen (preferred)	14 days	
	Refrigerated	48 hours	

Clinical & Interpretive

Clinical Information

Beta-2 microglobulin is a low-molecular-weight protein that forms the light chain component of class I histocompatibility (HLA: human leukocyte antigen) antigens. Because of its low molecular weight (11,800 daltons), 95% of free beta-2 microglobulin is rapidly eliminated by glomerular filtration. Proximal tubular cells then take up 99.9% of this filtered amount by endocytosis, after which degradation to amino acids occurs. Normal urinary excretion of beta-2 microglobulin is less than 370 micrograms per 24 hours; higher rates are interpreted as evidence of tubular dysfunction.

Increased urine levels are seen in proximal tubular renal damage due to a variety of causes including Wilson disease, Fanconi syndrome, untreated congenital galactosemia, nephrocalcinosis, cystinosis, chronic potassium depletion, interstitial nephritis, connective-tissue diseases such as rheumatoid arthritis and Sjogren syndrome. Occupational exposure to heavy metals such as cadmium and mercury could also lead to increase levels of beta-2 microglobulin in urine.

Reference Values

< or =300 mcg/L

Interpretation

Increased excretion is consistent with renal tubular damage.

Beta-2 microglobulin excretion is increased 100 to 1000 times the upper limit of the reference interval in cadmium-exposed workers.

Cautions

Degradation of beta-2 microglobulin occurs at pH less than 6.0. At the time of urine collection, 1M NaOH needs to be added as preservative to achieve a pH between 6 and 8.

For diagnostic purposes, the results obtained from this assay should always be used in combination with the clinical examination, patient medical history, and other findings.

Clinical Reference

1. Ikeda M, Ezaki T, Tsukahara T, et al. Threshold levels of urinary cadmium in relation to increases in urinary beta2-microglobulin among general Japanese populations. Toxicol Lett. 2003;137(3):135-141
2. Moriguchi J, Ezaki T, Tsukahara T, et al. Comparative evaluation of four urinary tubular dysfunction markers, with special references to the effects of aging and correction for creatinine concentration. Toxicol Lett. 2003;143(3):279-290
3. Stefanovic V, Cukuranovic R, Mitic-Zlatkovic M, Hall PW. Increased urinary albumin excretion in children from families with Balkan nephropathy. Pediatr Nephrol. 2002;17(11):913-916
4. Assounga AG. Beta 2 microglobulin in kidney failure: A review and an algorithm for renal replacement therapy. Saudi J

Kidney Dis Transpl. 2021;32(5):1214-1220. doi:10.4103/1319-2442.344740
5. Khanijou V, Zafari N, Coughlan MT, MacIsaac RJ, Ekinci EI. Review of potential biomarkers of inflammation and kidney injury in diabetic kidney disease. Diabetes Metab Res Rev. 2022;38(6):e3556. doi:10.1002/dmrr.3556

Performance

Method Description

Testing is performed on the Immulite 2000. The Immulite 2000 Beta-2 Microglobulin assay is a solid phase, 2-site chemiluminescent enzyme-labeled immunometric assay. The solid-phase bead is coated with an affinity-purified murine monoclonal anti-beta-2 antibody. The serum sample and alkaline phosphatase conjugated affinity-purified goat polyclonal anti-beta-2 antibody are incubated to bind beta-2 microglobulin into an antibody sandwich complex.

The chemiluminescent substrate, a phosphate ester of adamantyl dioxetane, in the presence of alkaline phosphatase produces light proportional to the concentration of the beta-2 microglobulin in the sample.(Package insert: IMMULITE 2000 Beta-2 Microglobulin. Siemens Healthcare Diagnostics; 03/15/2018)

PDF Report

No

Day(s) Performed

Monday, Wednesday, Friday

Report Available

1 to 3 days

Specimen Retention Time

2 weeks

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.

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CPT Code Information

82232

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
B2MU	Beta-2 Microglobulin, U	1953-9

Result ID	Test Result Name	Result LOINC® Value
B2MU	Beta-2 Microglobulin, U	1953-9