Test Definition: MRDMM

Multiple Myeloma MRD by Flow, BM

Overview

Useful For

Detection of low level (minimal residual disease) myeloma cells after therapy

Highlights

High-sensitivity flow cytometry test for detection of minimal residual myeloma cells, post treatment

Adopted EuroFlow guidelines and Cytognos software

Sensitivity of 10(-5) or better, depending on the antigenic profile of abnormal plasma cells

Method Name

Immunophenotyping for Minimal Residual Disease (MRD)

NY State Available

Yes

Specimen

Specimen Type

Bone Marrow

Advisory Information

MRDMM should be ordered when monitoring Multiple Myeloma patients after treatment. This test should not be ordered on known relapsing patients or at diagnosis, see PCPRO / Plasma Cell DNA Content and Proliferation, Bone Marrow or MSMRT / Mayo Algorithmic Approach for Stratification of Myeloma and Risk-Adapted Therapy Report if indicated for these situations.

Shipping Instructions

It is recommended that specimens arrive within 48 hours of draw.Â Draw and package specimen as close to shipping time as possible.Â

Necessary Information

1. Include patient's disease state (untreated, treated, monoclonal gammopathy of undetermined significance, stable).

2. Indicate if patient is on anti-CD38 therapy.

3. Provide Immunofix information if available.

Specimen Required

Specimen Type: Redirected bone marrow

Container/Tube:

Preferred: Yellow top (ACD)

Acceptable: Lavender top (EDTA)

Specimen Volume: 4 mL

Forms

If not ordering electronically, complete, print, and send a Hematopathology/Cytogenetics Test Request (T726) with the specimen.

Specimen Minimum Volume

2 mL

Reject Due To

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Bone Marrow	Ambient (preferred)	72 hours	
	Refrigerated	72 hours	

Clinical and Interpretive

Clinical Information

Multiple myeloma is an incurable malignant neoplasm of plasma cells. One of the best prognostic factors in multiple myeloma is the level of minimal residual disease post chemotherapy or autologous stem cell transplantation. The greater depth of the response (less malignant cells present), the longer time to progression and overall survival.(1)

Reference Values

An interpretive report will be provided.

This test will be processed as a laboratory consultation. An interpretation of the immunophenotypic findings and correlation with the previous patient history will be provided by a hematopathologist for every case.

Interpretation

The interpretation of the test is done by an evaluating automated and manually gated populations to isolate abnormal plasma cells. If there is an abnormal plasma cell population (cluster of 20 cells or more), then the result is minimal residual disease (MRD)-positive, with the percentage of abnormal plasma cells out of total analyzed events. If no abnormal population is found, then the result will be interpreted as MRD-negative.

Cautions

There are situations in which current gating strategies are insufficient to identify abnormal plasma cells. This can occur if the abnormal plasma cells do not phenotypically differ from normal plasma cells. In addition, in patients who have undergone therapeutic antibody treatment (anti-CD38, for example), decreased antigen expression on plasma cells may interfere with the gating strategy.

Clinical Reference

1. Martinez-Lopez J, Lahuerta JJ, Pepin F, et al: Prognostic value of deep sequencing method for minimal residual disease detection in multiple myeloma. Blood. 2014 May 15;123(20):3073-3079

2. Rawstron AC, Child JA, de Tute RM, et al: Minimal residual disease assessed by multiparameter flow cytometry in

multiple myeloma: impact on outcome in the medical research council myeloma IX Study. J Clin Oncol 2013 Jul 10;31(20):2540-2547

3. Roschewski M, Stetler-Stevenson M, Yuan C, et al: Minimal residual disease: What are the minimum requirements? J Clin Oncol 2014 32(5): 475-476

4. Rawstron AC, Orfao A, Beksac M, et al: Report of the European Myeloma Network on multiparametric flow cytometry in multiple myeloma and related disorders. Haematologica 2008 Mar;93(3): 431-438

5. Stetler-Stevenson M, Paiva B, Stoolman L, et al: Consensus guidelines for myeloma minimal residual disease sample staining and data acquisition. Cytometry B Clin Cytom 2016 Jan;90(1):26-30 doi: 10.1002/cyto.b.21249

Performance

Method Description

Flow cytometric immunophenotyping for minimal residual disease of bone marrow is performed using the following antibodies:

Tube 1: CD138, CD27, CD38, CD56, CD45, CD19, CD117, and CD81.

Tube 2: CD138, CD27, CD38, CD56, CD45, CD19, cyKappa, and cyLambda.

Abnormal plasma cell populations are detected through demonstrating CD38 (multiepitope) and CD138 positivity along with immunoglobulin light chain restriction (ie, the presence of either predominately kappa or predominately lambda light chains) and abnormality of CD56, CD117, CD27, CD81, CD19 and/or CD45 expression.

The percentage of clonal plasma cells estimated by flow cytometry is affected by specimen processing and antigen loss with specimen aging. Minimal residual disease reporting is affected by sample volume and cellularity.(Unpublished Mayo method)

PDF Report

No

Day(s) and Time(s) Test Performed

Specimens are processed Monday through Sunday.

Results reported Monday through Friday.

Analytic Time

2 days

Maximum Laboratory Time

4 days

Specimen Retention Time

14 days

Performing Laboratory Location

Rochester

Fees and 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 Regional Manager. For assistance, contact Customer Service.

Test Classification

This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Code Information

88184-Flow Cytometry; first cell surface, cytoplasmic or nuclear marker

88185 x 9-Flow Cytometry; additional cell surface, cytoplasmic or nuclear marker

88188-Flow Cytometry Interpretation, 9 to 15 Markers

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
MRDMM	Multiple Myeloma MRD by Flow, BM	93022-2

Result ID	Test Result Name	Result LOINC Value
CK146	% Minimal Residual Disease (MRD)	93021-4
CK147	% Normal Plasma Cells (of total PC)	93020-6
CK148	Non-Aggregate Events	38257-2
CK149	Total Plasma Cell Events	93019-8
CK150	Poly PC Events	93018-0
CK151	Abnormal PC Events	93017-2
CK152	Final Diagnosis	74226-2