

Is it MODY?

5 Things to Know About the Newest Diabetes Testing from Endocrine Sciences and LabCorp

What is MODY?

Maturity-Onset Diabetes of the Young (MODY) is a form of monogenic diabetes—diabetes that results from a change or mutation in a single gene.¹ The Centers for Disease Control and Prevention (CDC) estimates that more than 30 million Americans suffer from diabetes.² MODY makes up about 1% of diabetes cases, affecting approximately 300,000 patients in the US.¹ Most people diagnosed with MODY have impaired insulin secretion and typically experience onset before they are 25 years old. Diagnosed individuals also typically are not obese, but often do have a family history of early onset diabetes.³ The four most common forms of MODY are caused by mutations in *HNF1A* (MODY3), *GCK* (MODY2), *HNF4A* (MODY1), and *HNF1B* (MODY5).^{1,3,4}

What are the benefits of MODY screening?

Up to 95% of MODY cases in the US may be misdiagnosed as Type 1 or Type 2 diabetes.^{1,5} Accurate diagnosis enables appropriate treatment.^{1,3} Depending on the form of MODY, patients may be able to switch from potentially painful and expensive insulin injections to an oral medication, which is typically less expensive and may be a more appealing option to some patients.¹ In addition to optimizing treatment, correctly diagnosing MODY can assist in diagnosing other affected family members and predicting the prognosis of the disease.³ A specific MODY diagnosis can also explain symptoms other than hyperglycemia and allow for increased surveillance of associated complications.³

The American Diabetes Association says that appropriately testing for MODY diabetes “enables a cost-effective, often cost-saving, genetic diagnosis that is increasingly supported by health insurance.”³ As illustrated in the table below, determining the specific type of MODY allows for the provision of personalized, precision medicine—improving patient care and reducing health care costs.

Type of Diabetes	Disease Characteristics	Possible First-Line Treatment
Type 1	Auto-immune related insulin deficiency	Insulin injections ¹
Type 2	Insulin resistance	Metformin ¹
MODY2 (GCK)	Stable fasting blood glucose ³	Treatment typically not required ³
MODY3 (HNF1A)	Decreased insulin secretion over time; lowered renal threshold for glucosuria ³	Low dose, oral sulfonylureas ³
MODY1 (HNF4A)	Decreased insulin secretion over time ³	Low dose, oral sulfonylureas ³
MODY5 (HNF1B)	Variable presentation, developmental renal disease (typically cystic); genitourinary abnormalities; pancreas atrophy; hyperuricemia; gout; diabetes ^{3,6,7}	Metformin, if renal function allows; may require insulin; monitor kidney and liver function ⁸

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Who should be screened for MODY?

- Patients who are or were diagnosed with diabetes in youth or early adulthood, but do not display characteristics consistent with either type 1 or type 2 diabetes, including³:
 - Test negative for diabetes-associated autoantibodies
 - Are not obese and/or do not have a sedentary lifestyle
 - Have stable, mild fasting hyperglycemia at diagnosis
 - Have stable HbA1c at diagnosis
- Patients who have a strong family history of diabetes not characteristic of Type 1 or Type 2 diabetes in successive generations

How do I order MODY testing through LabCorp?

Test Name	Test No.	Specimen Requirements
MODY Genetic Profile	504603	3 mL whole blood in lavender EDTA tube

Please contact your local sales representative for additional ordering information, or contact LabCorp's Endocrine Hotline at 877-436-3056. Technical consultation is available through endocrine experts.

How can I learn more about MODY and other new tests?

LabCorp's new Meet the Maker Q&A series provides insights and explores frequently asked questions on assay developments with LabCorp's industry leading scientists. Lead scientist Toni Prezant discusses MODY's clinical significance and what its results mean for patients. To see the first installment, go to <https://www.labcorp.com/meet-maker-mody>

References

1. Kleinberger JW, Pollin TI. Undiagnosed MODY: Time for action. *Curr Diab Rep*. 2015 December; 15(12):110.
2. Centers for Disease Control and Prevention. National Diabetes Statistics Report, 2017: Estimates of diabetes and its burden in the United States. 2017. <https://www.cdc.gov/diabetes/pdfs/data/statistics/national-diabetes-statistics-report.pdf>. Accessed May 1, 2019.
3. American Diabetes Association. 2. Classification and Diagnosis of Diabetes: Standards of Medical Care in Diabetes—2019. *Diabetes Care*. 2019;42(Supplement 1):S13-S28. doi:10.2337/dc19-S002
4. Naylor R, Knight Johnson A, del Gaudio D. Maturity-Onset diabetes of the young overview. In: Adam MP, Ardinger HH, Pagon RA, et al., eds. *GeneReviews*®. Seattle (WA): University of Washington, Seattle; 1993. <http://www.ncbi.nlm.nih.gov/books/NBK500456/>. Accessed May 1, 2019.
5. Pihoker C, Gilliam LK, Ellard S, et al. Prevalence, characteristics and clinical diagnosis of maturity onset diabetes of the young due to mutations in HNF1A, HNF4A, and glucokinase: Results from the SEARCH for diabetes in youth. *J Clin Endocrinol Metab*. 2013;98(10):4055-4062. doi:10.1210/jc.2013-1279
6. Nagano C, Morisada N, Nozu K, et al. Clinical characteristics of HNF1B-related disorders in a Japanese population. *Clin Exp Nephrol*. 2019. doi:10.1007/s10157-019-01747-0
7. Edghill EL, Stals K, Oram RA, Shepherd MH, Hattersley AT, Ellard S. HNF1B deletions in patients with young-onset diabetes but no known renal disease. *Diabet Med*. 2013;30(1):114-117. doi:10.1111/j.1464-5491.2012.03709.x
8. Juszczak A, Pryse R, Schuman A, Owen KR. When to consider a diagnosis of MODY at the presentation of diabetes: Aetiology matters for correct management. *Br J Gen Pract*. 2016;66(647):e457-459. doi:10.3399/bjgp16X685537

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