

## Reimbursement Policy

### Cardiovascular Disease Risk Assessment

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#### I. Policy Description

Cardiovascular risk assessment comprises the means and processes to predict the probability of developing a cardiovascular disease. These are a group of tests and health factors that have been proven to indicate a person's chance of having a cardiovascular event such as a heart attack or stroke.

Tests typically used to assess cardiovascular risk include lipid profiles or panels, biomarkers, and cardiovascular risk panels.

For guidance concerning lipid screening in individuals under 18 years of age, please refer to AHS-G2042-Pediatric Preventive Screening.

For guidance concerning homocysteine testing for indications other than cardiovascular disease, please refer to AHS-M2141-Testing of Homocysteine Metabolism-Related Conditions and AHS-G2014-Vitamin B12 and Methylmalonic Acid Testing.

Terms such as male and female are used when necessary to refer to sex assigned at birth.

#### II. Indications and/or Limitations of Coverage

Application of coverage criteria is dependent upon an individual's benefit coverage at the time of the request. Specifications pertaining to Medicare and Medicaid can be found in the "Applicable State and Federal Regulations" section of this policy document.

- 1) For individuals 18 years of age or older, lipid panel testing (see Note 1) **MEETS COVERAGE CRITERIA** under **any** of the following conditions:
  - a) To screen for cardiovascular disease (CVD) risk:
    - i) Every 4 years for individuals ages 18 to 79 years.
    - ii) Annually for individuals at increased risk for cardiovascular disease (as defined by 2013 ACC/AHA Pooled Cohort Equations (PCEs) to calculate 10-year risk of CVD events [see Note 2]).
  - b) Annually for individuals at an increased risk of dyslipidemia due to **any** of the following conditions:
    - i) Obesity or metabolic syndrome
    - ii) Nephrotic syndrome

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- iii) Hypothyroidism
  - iv) Hyperthyroidism
  - v) Pancreatitis
  - vi) Diabetes
  - vii) Chronic kidney disease
  - viii) Cushing syndrome
  - ix) Pregnancy
  - x) Cholestatic liver disease
  - xi) Lipid metabolism disorders, such as Gaucher disease in adults
- c) For individuals who are about to begin or who are currently receiving statin therapy, at the following intervals:
- i) To establish baseline levels before initiating statin therapy.
  - ii) Every four to twelve weeks after initiation or change of therapy.
  - iii) Annually when no medication changes have occurred.
- d) Annually for individuals on a long-term drug therapy that requires lipid monitoring (e.g., Accutane, anti-psychotics).
- e) For HIV positive individuals who are about to begin or who are currently receiving antiretroviral therapy (ART), at the following intervals:
- i) To establish baseline levels before initiating ART.
  - ii) Every one to three months after initiation or change of therapy.
  - iii) Every six to twelve months when no medication changes have occurred.
- 2) Measurement of apolipoprotein B (apoB) **MEETS COVERAGE CRITERIA** for **any** of the following situations:
- a) For individuals with hypertriglyceridemia.
  - b) For individuals with diabetes mellitus.
  - c) For individuals with obesity or metabolic syndrome.
  - d) For individuals with other dyslipidemias (such as very low LDL-C).
  - e) For individuals who are on lipid therapy.
  - f) For individuals who are suspected to have familial dysbetalipoproteinemia or familial combined hyperlipidemia.
- 3) For individuals 18 years of age or older, measurement of lipoprotein a (Lp(a)) once per lifetime **MEETS COVERAGE CRITERIA**.
- 4) For individuals for whom a risk-based treatment decision is uncertain (after quantitative risk assessment using ACC/AHA PCEs to calculate 10-year risk of CVD events [see Note 2]), testing for C-reactive protein with the high-sensitivity method (hs-CRP) **MEETS COVERAGE CRITERIA** at the following frequency:
- a) For initial screening, two measurements at least two weeks apart.
  - b) If the initial screen was abnormal, follow-up screening is allowed up to once per year.

*The following does not meet coverage criteria due to a lack of available published scientific literature confirming that the test(s) is/are required and beneficial for the diagnosis and treatment of an individual's illness.*

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- 5) For all other cardiovascular disease risk assessments not described above, testing for CRP **DOES NOT MEET COVERAGE CRITERIA.**
- 6) For CVD risk assessment and stratification in the outpatient setting, measurement of high-sensitivity cardiac troponin T (hs-cTnT) **DOES NOT MEET COVERAGE CRITERIA.**
- 7) For CVD risk assessment screening, evaluation, and management, homocysteine testing **DOES NOT MEET COVERAGE CRITERIA.**
- 8) For CVD risk assessment, measurement of novel lipid and non-lipid biomarkers (e.g., apolipoprotein AI, apolipoprotein E, B-type natriuretic peptide, cystatin C, fibrinogen, leptin, LDL subclass, HDL subclass) **DOES NOT MEET COVERAGE CRITERIA.**
- 9) Other than simple lipid panels (see Note 1), CVD risk panels consisting of multiple individual biomarkers intended to assess CVD **DO NOT MEET COVERAGE CRITERIA.**
- 10) For CVD risk assessment, measurement of serum intermediate density lipoproteins **DOES NOT MEET COVERAGE CRITERIA.**
- 11) For CVD risk assessment, measurement of lipoprotein-associated phospholipase A2 (Lp-PLA2) **DOES NOT MEET COVERAGE CRITERIA.**
- 12) For all situations, measurement of long-chain omega-3 fatty acids in red blood cell membranes, **DOES NOT MEET COVERAGE CRITERIA.**
- 13) All other tests for assessing CVD risk **DO NOT MEET COVERAGE CRITERIA.**

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### NOTES:

**Note 1:** A simple lipid panel is generally composed of the following lipid markers:

- Total cholesterol
- HDL cholesterol
- LDL cholesterol
- Triglycerides

Certain calculated ratios, such as the total/HDL cholesterol may also be reported as part of a simple lipid panel.

Other types of lipid testing (i.e., apolipoproteins, lipid particle number or particle size, lipoprotein [a]) are not considered to be components of a simple lipid profile.

**Note 2:** 2013 ACC/AHA Guideline on the Assessment of Cardiovascular Risk (Goff et al., 2014): Risk factors include gender, age, race, smoking, hypertension, diabetes, total cholesterol, high- and low-density lipoprotein cholesterol. A race- and sex-specific PCE ASCVD Risk Estimator is available at:

[https://tools.acc.org/ldl/ascvd\\_risk\\_estimator/index.html#!/calculate/estimator/](https://tools.acc.org/ldl/ascvd_risk_estimator/index.html#!/calculate/estimator/).

The 2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA Guideline on the Management of Blood Cholesterol affirms that “the PCE is a powerful tool to predict population risk, but it has limitations when applied to individuals.” Hence a clinician-patient risk discussion can individualize risk status based on PCE, but with the inclusion of

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additional risk-enhancing factors. These additional factors may include:

- A family history of premature ASCVD (males, age <55 y; females, age <65 y)
- Primary hypercholesterolemia (LDL-C, 160–189 mg/dL [4.1–4.8 mmol/L]; non-HDL-C 190–219 mg/dL [4.9–5.6 mmol/L])
- Metabolic syndrome (increased waist circumference, elevated triglycerides [ $>150$  mg/dL], elevated blood pressure, elevated glucose, and low HDL-C [ $<40$  mg/dL in men;  $<50$  in women mg/dL] are factors; tally of 3 makes the diagnosis)
- Chronic kidney disease (eGFR 15–59 mL/min/1.73 m<sup>2</sup> with or without albuminuria; not treated with dialysis or kidney transplantation)
- Chronic inflammatory conditions such as psoriasis, RA, or HIV/AIDS
- History of premature menopause (before age 40 y) and history of pregnancy-associated conditions that increase later ASCVD risk such as preeclampsia
- High-risk race/ethnicities (eg, South Asian ancestry)
- Lipid/biomarkers: Associated with increased ASCVD risk
- Persistently elevated, primary hypertriglyceridemia ( $\geq 175$  mg/dL)
- Elevated high-sensitivity C-reactive protein ( $\geq 2.0$  mg/L)
- Elevated Lp(a): A relative indication for its measurement is family history of premature ASCVD. An Lp(a)  $\geq 50$  mg/dL or  $\geq 125$  nmol/L constitutes a risk-enhancing factor especially at higher levels of Lp(a)
- Elevated apoB  $\geq 130$  mg/dL: A relative indication for its measurement would be triglyceride  $\geq 200$  mg/dL. A level  $\geq 130$  mg/dL corresponds to an LDL-C  $\geq 160$  mg/dL and constitutes a risk-enhancing factor
- ABI  $<0.9$

### III. Applicable State and Federal Regulations

DISCLAIMER: If there is a conflict between this Policy and any relevant, applicable government policy for a particular member [e.g., Local Coverage Determinations (LCDs) or National Coverage Determinations (NCDs) for Medicare and/or state coverage for Medicaid], then the government policy will be used to make the determination. For the most up-to-date Medicare policies and coverage, please visit the Medicare search website: <https://www.cms.gov/medicare-coverage-database/search.aspx>. For the most up-to-date Medicaid policies and coverage, visit the applicable state Medicaid website.

#### Food and Drug Administration (FDA)

Many labs have developed specific tests that they must validate and perform in house. These laboratory-developed tests (LDTs) are regulated by the Centers for Medicare and Medicaid (CMS) as high-complexity tests under the Clinical Laboratory Improvement Amendments of

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1988 (CLIA '88). LDTs are not approved or cleared by the U. S. Food and Drug Administration; however, FDA clearance or approval is not currently required for clinical use.

### IV. Applicable CPT/HCPCS Procedure Codes

CPT	Code Description
80061	Lipid panel
81599	Unlisted multianalyte assay with algorithmic analysis
82172	Apolipoprotein, each
82465	Cholesterol, serum or whole blood, total
82610	Cystatin C
83090	Homocysteine
83695	Lipoprotein (a)
83698	Lipoprotein-associated phospholipase A2 (Lp-PLA2)
83700	Lipoprotein, blood; electrophoretic separation and quantitation
83701	Lipoprotein, blood; high resolution fractionation and quantitation of lipoproteins including lipoprotein subclasses when performed (eg, electrophoresis, ultracentrifugation)
83704	Lipoprotein, blood; quantitation of lipoprotein particle number(s) (eg, by nuclear magnetic resonance spectroscopy), includes lipoprotein particle subclass(es), when performed
83718	Lipoprotein, direct measurement; high density cholesterol (HDL cholesterol)
83719	Lipoprotein, direct measurement; VLDL cholesterol
83721	Lipoprotein, direct measurement; LDL cholesterol
83722	Lipoprotein, direct measurement; small dense LDL cholesterol
83880	Natriuretic peptide
84478	Triglycerides
84484	Troponin, quantitative
84512	Troponin, Qualitative
84999	Unlisted chemistry procedure
85384	Fibrinogen; activity
85415	Fibrinolytic factors and inhibitors; plasminogen activator
86140	C-reactive protein
86141	C-reactive protein; high sensitivity (hsCRP)
0019M	Cardiovascular disease, plasma, analysis of protein biomarkers by aptamer based microarray and algorithm reported as 4-year likelihood of coronary event in high-risk populations

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CPT	Code Description
	Proprietary test: SOMAmer® Lab/Manufacturer: SomaLogic
0052U	Lipoprotein, blood, high resolution fractionation and quantitation of lipoproteins, including all five major lipoprotein classes and subclasses of HDL, LDL, and VLDL by vertical auto profile ultracentrifugation Proprietary test: VAP Cholesterol Test Lab/Manufacturer: VAP Diagnostics Laboratory, Inc
0308U	Cardiology (coronary artery disease [CAD]), analysis of 3 proteins (high sensitivity [hs] troponin, adiponectin, and kidney injury molecule-1 [KIM-1]), plasma, algorithm reported as a risk score for obstructive CAD Proprietary test: HART CAD® Lab/Manufacturer: Atlas Genomics
0309U	Cardiology (cardiovascular disease), analysis of 4 proteins (NT-proBNP, osteopontin, tissue inhibitor of metalloproteinase-1 [TIMP-1], and kidney injury molecule-1 [KIM-1]), plasma, algorithm reported as a risk score for major adverse cardiac event Proprietary test: HART CVE® Lab/Manufacturer: Atlas Genomics
0377U	Cardiovascular disease, quantification of advanced serum or plasma lipoprotein profile, by nuclear magnetic resonance (NMR) spectrometry with report of a lipoprotein profile (including 23 variables) Proprietary test: Liposcale® Lab/Manufacturer: CIMA Sciences, LLC
0415U	Cardiovascular disease (acute coronary syndrome [ACS]), IL-16, FAS, FASLigand, HGF, CTACK, EOTAXIN, and MCP-3 by immunoassay combined with age, sex, family history, and personal history of diabetes, blood, algorithm reported as a 5-year (deleted risk) score for ACS Proprietary test: SmartHealth Vascular Dx™ Lab/Manufacturer: Morningstar Laboratories, LLC

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*Procedure codes appearing in Medical Policy documents are included only as a general reference tool for each policy. They may not be all-inclusive.*

### V. Evidence-based Scientific References

AACE. (2021). Consensus Statement by The American Association Of Clinical Endocrinologists And American College Of Endocrinology On The Management Of Dyslipidemia And

## Reimbursement Policy

- Prevention Of Cardiovascular Disease Algorithm – 2020 Executive Summary.  
<https://pro.aace.com/pdfs/lipids/CS-2020-0490.pdf>
- Aberg, J. A., Gallant, J. E., Ghanem, K. G., Emmanuel, P., Zingman, B. S., & Horberg, M. A. (2014). Primary Care Guidelines for the Management of Persons Infected With HIV: 2013 Update by the HIV Medicine Association of the Infectious Diseases Society of America. *Clinical Infectious Diseases*, 58(1), e1-e34. <https://doi.org/10.1093/cid/cit665>
- ACC. (2018). 2018 Guideline on the Management of Blood Cholesterol.  
<https://www.acc.org/~media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Guidelines/2018/Guidelines-Made-Simple-Tool-2018-Cholesterol.pdf>
- ADA. (2020). *Standards of Medical Care in diabetes—2020*.  
[https://care.diabetesjournals.org/content/43/Supplement\\_1](https://care.diabetesjournals.org/content/43/Supplement_1)
- ADA. (2021a). *Children and Adolescents: Standards of Medical Care in Diabetes—2021*. Retrieved 12/30/2020 from [https://care.diabetesjournals.org/content/44/Supplement\\_1/S180](https://care.diabetesjournals.org/content/44/Supplement_1/S180)
- ADA. (2021b). *Standards of Medical Care in diabetes—2021, Chapter 10*. Retrieved 12/30/2020 from [https://care.diabetesjournals.org/content/44/Supplement\\_1/S125](https://care.diabetesjournals.org/content/44/Supplement_1/S125)
- ADA. (2023). 10. Cardiovascular Disease and Risk Management: Standards of Care in Diabetes—2024. *Diabetes Care*, 47(Supplement\_1), S179-S218.  
<https://doi.org/10.2337/dc24-S010>
- AHA. (2024). 2024 Heart Disease and Stroke Statistics Update Fact Sheet At-a-Glance.  
[https://www.heart.org/-/media/PHD-Files-2/Science-News/2/2024-Heart-and-Stroke-Stat-Update/2024-Statistics-At-A-Glance-final\\_2024.pdf](https://www.heart.org/-/media/PHD-Files-2/Science-News/2/2024-Heart-and-Stroke-Stat-Update/2024-Statistics-At-A-Glance-final_2024.pdf)
- Akçay, M., & Yuksel, S. (2019). Isotretinoin-associated possible Kounis syndrome: A case report and a review of other cardiovascular side effects reported in the literature. *Türk Kardiyol Dern Ars*, 47(4), 324-328. <https://doi.org/10.5543/tkda.2018.67055> (Isotretinoin ile ilişkili olası Kounis sendromu: Olgu sunumu ve diğer kardiyovasküler yan etkilerin literatür derlemesi.)
- Alan, S., Unal, B., & Yildirim, A. (2016). Premature ventricular contractions associated with isotretinoin use. *An Bras Dermatol*, 91(6), 820-821. <https://doi.org/10.1590/abd1806-4841.20165138>
- Antonopoulos, A. S., Angelopoulos, A., Papanikolaou, P., Simantiris, S., Oikonomou, E. K., Vamvakaris, K., Koumpoura, A., Farmaki, M., Trivella, M., Vlachopoulos, C., Tsioufis, K., Antoniades, C., & Tousoulis, D. (2022). Biomarkers of Vascular Inflammation for Cardiovascular Risk Prognostication: A Meta-Analysis. *JACC Cardiovasc Imaging*, 15(3), 460-471. <https://doi.org/10.1016/j.jcmg.2021.09.014>
- Arnett, D. K., Blumenthal, R. S., Albert, M. A., Buroker, A. B., Goldberger, Z. D., Hahn, E. J., Himmelfarb, C. D., Khera, A., Lloyd-Jones, D., McEvoy, J. W., Michos, E. D., Miedema, M. D., Munoz, D., Smith, S. C., Jr., Virani, S. S., Williams, K. A., Sr., Yeboah, J., & Ziaeian, B. (2019). 2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation*, 140(11), e596-e646.  
<https://doi.org/10.1161/cir.0000000000000678>

## Reimbursement Policy

ASCP. (2016). *American Society for Clinical Pathology*.

<http://www.choosingwisely.org/clinician-lists/american-society-clinical-pathology-expanded-lipid-panels-to-screen-for-cardiovascular-disease/>

Beauchemin, M., Geguchadze, R., Guntur, A. R., Nevola, K., Le, P. T., Barlow, D., Rue, M., Vary, C. P. H., Lary, C. W., Motyl, K. J., & Houseknecht, K. L. (2019). Exploring mechanisms of increased cardiovascular disease risk with antipsychotic medications: Risperidone alters the cardiac proteomic signature in mice. *Pharmacol Res*, *152*, 104589.

<https://doi.org/10.1016/j.phrs.2019.104589>

Bibbins-Domingo, K., University of California, S. F., Grossman, D. C., Group Health Research Institute, S., Washington, Curry, S. J., University of Iowa, I. C., Davidson, K. W., Columbia University, N. Y., New York, Epling, J. W., State University of New York Upstate Medical University, S., García, F. A. R., Pima County Department of Health, T., Arizona, Gillman, M. W., Harvard Medical School and Harvard Pilgrim Health Care Institute, B., Massachusetts, Now with the National Institutes of Health, B., Maryland (was not affiliated with the National Institutes of Health while a member of the USPSTF), Kemper, A. R., Duke University, D., North Carolina, Krist, A. H., Fairfax Family Practice Residency, F., Virginia, . . . Austin, U. o. T. a. (2017). Statin Use for the Primary Prevention of Cardiovascular Disease in Adults: US Preventive Services Task Force Recommendation Statement. *Jama*, *316*(19), 1997-2007. <https://doi.org/10.1001/jama.2016.15450>

Boekholdt, S. M., Hovingh, G. K., Mora, S., Arsenault, B. J., Amarenco, P., Pedersen, T. R., LaRosa, J. C., Waters, D. D., DeMicco, D. A., Simes, R. J., Keech, A. C., Colquhoun, D., Hitman, G. A., Betteridge, D. J., Clearfield, M. B., Downs, J. R., Colhoun, H. M., Gotto, A. M., Jr., Ridker, P. M., . . . Kastelein, J. J. (2014). Very low levels of atherogenic lipoproteins and the risk for cardiovascular events: a meta-analysis of statin trials. *J Am Coll Cardiol*, *64*(5), 485-494. <https://doi.org/10.1016/j.jacc.2014.02.615>

Bosch, J., Gerstein, H. C., Dagenais, G. R., Diaz, R., Dyal, L., Jung, H., Maggiono, A. P., Probstfield, J., Ramachandran, A., Riddle, M. C., Ryden, L. E., & Yusuf, S. (2012). n-3 fatty acids and cardiovascular outcomes in patients with dysglycemia. *N Engl J Med*, *367*(4), 309-318. <https://doi.org/10.1056/NEJMoa1203859>

Cao, J., Nomura, S. O., Steffen, B. T., Guan, W., Remaley, A. T., Karger, A. B., Ouyang, P., Michos, E. D., & Tsai, M. Y. (2019). Apolipoprotein B discordance with low-density lipoprotein cholesterol and non-high-density lipoprotein cholesterol in relation to coronary artery calcification in the Multi-Ethnic Study of Atherosclerosis (MESA). *J Clin Lipidol*. <https://doi.org/10.1016/j.jacl.2019.11.005>

Catapano, A. L., Graham, I., De Backer, G., Wiklund, O., Chapman, M. J., Drexel, H., Hoes, A. W., Jennings, C. S., Landmesser, U., Pedersen, T. R., Reiner, Z., Riccardi, G., Taskinen, M. R., Tokgozoglu, L., Verschuren, W. M. M., Vlachopoulos, C., Wood, D. A., Zamorano, J. L., & Cooney, M. T. (2016). 2016 ESC/EAS Guidelines for the Management of Dyslipidaemias. *Eur Heart J*, *37*(39), 2999-3058. <https://doi.org/10.1093/eurheartj/ehw272>

CDC. (2023). *LSP: Lipids Standardization Program*.

<https://wwwn.cdc.gov/dlldata/lspds/pdf/UserManual.pdf>

## Reimbursement Policy

- CDC. (2024a, 04/24/2024). *Cardiovascular Disease Biomarker Standardization Programs*. <https://www.cdc.gov/clinical-standardization-programs/php/cvd/>
- CDC. (2024b, 05/15/2024). *Heart Disease Risk Factors*. <https://www.cdc.gov/heart-disease/risk-factors/>
- Chiesa, S. T., Charakida, M., Georgiopoulos, G., Roberts, J. D., Stafford, S. J., Park, C., Mykkänen, J., Kähönen, M., Lehtimäki, T., Ala-Korpela, M., Raitakari, O., Pietiäinen, M., Pussinen, P., Muthurangu, V., Hughes, A. D., Sattar, N., Timpson, N. J., & Deanfield, J. E. (2022). Glycoprotein Acetyls: A Novel Inflammatory Biomarker of Early Cardiovascular Risk in the Young. *J Am Heart Assoc*, *11*(4), e024380. <https://doi.org/10.1161/jaha.121.024380>
- Chou, R., Dana, T., Blazina, I., Daeges, M., Bougatsos, C., & Jeanne, T. L. (2016). Screening for Dyslipidemia in Younger Adults: A Systematic Review for the U.S. Preventive Services Task Force. *Ann Intern Med*, *165*(8), 560-564. <https://doi.org/10.7326/m16-0946>
- CMS. (2005). *Lipid Testing* <https://www.cms.gov/medicare-coverage-database/view/ncd.aspx?NCDId=102>
- Colucci, W., & Chen, H. H. (2024, 3/11/2024). *Natriuretic peptide measurement in heart failure*. <https://www.uptodate.com/contents/natriuretic-peptide-measurement-in-heart-failure>
- Cosentino, F., Grant, P. J., Aboyans, V., Bailey, C. J., Ceriello, A., Delgado, V., Federici, M., Filippatos, G., Grobbee, D. E., Hansen, T. B., Huikuri, H. V., Johansson, I., Jüni, P., Lettino, M., Marx, N., Mellbin, L. G., Östgren, C. J., Rocca, B., Roffi, M., . . . Group, E. S. C. S. D. (2020). 2019 ESC Guidelines on diabetes, pre-diabetes, and cardiovascular diseases developed in collaboration with the EASD: The Task Force for diabetes, pre-diabetes, and cardiovascular diseases of the European Society of Cardiology (ESC) and the European Association for the Study of Diabetes (EASD). *European Heart Journal*, *41*(2), 255-323. <https://doi.org/10.1093/eurheartj/ehz486>
- Crea, F., Morrow, David. (2023, 4/21/2023). *C-reactive protein in cardiovascular disease*. <https://www.uptodate.com/contents/c-reactive-protein-in-cardiovascular-disease>
- de Oliveira Otto, M. C., Wu, J. H., Baylin, A., Vaidya, D., Rich, S. S., Tsai, M. Y., Jacobs, D. R., Jr., & Mozaffarian, D. (2013). Circulating and dietary omega-3 and omega-6 polyunsaturated fatty acids and incidence of CVD in the Multi-Ethnic Study of Atherosclerosis. *J Am Heart Assoc*, *2*(6), e000506. <https://doi.org/10.1161/jaha.113.000506>
- De Stefano, A., Mannucci, L., Tamburi, F., Cardillo, C., Schinzari, F., Rovella, V., Nistico, S., Bennardo, L., Di Daniele, N., & Tesouro, M. (2019). Lp-PLA2, a new biomarker of vascular disorders in metabolic diseases. *Int J Immunopathol Pharmacol*, *33*, 2058738419827154. <https://doi.org/10.1177/2058738419827154>
- Di Angelantonio, E., Sarwar, N., Perry, P., Kaptoge, S., Ray, K. K., Thompson, A., Wood, A. M., Lewington, S., Sattar, N., Packard, C. J., Collins, R., Thompson, S. G., & Danesh, J. (2009). Major lipids, apolipoproteins, and risk of vascular disease. *Jama*, *302*(18), 1993-2000. <https://doi.org/10.1001/jama.2009.1619>
- Ford, I., Shah, A. S., Zhang, R., McAllister, D. A., Strachan, F. E., Caslake, M., Newby, D. E., Packard, C. J., & Mills, N. L. (2016). High-Sensitivity Cardiac Troponin, Statin Therapy, and

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Risk of Coronary Heart Disease. *J Am Coll Cardiol*, 68(25), 2719-2728.

<https://doi.org/10.1016/j.jacc.2016.10.020>

Garber, A. J., Handelsman, Y., Grunberger, G., Einhorn, D., Abrahamson, M. J., Barzilay, J. I., Blonde, L., Bush, M. A., DeFronzo, R. A., Garber, J. R., Garvey, W. T., Hirsch, I. B., Jellinger, P. S., McGill, J. B., Mechanick, J. I., Perreault, L., Rosenblit, P. D., Samson, S., & Umpierrez, G. E. (2020). CONSENSUS STATEMENT BY THE AMERICAN ASSOCIATION OF CLINICAL ENDOCRINOLOGISTS AND AMERICAN COLLEGE OF ENDOCRINOLOGY ON THE COMPREHENSIVE TYPE 2 DIABETES MANAGEMENT ALGORITHM – 2020 EXECUTIVE SUMMARY. *Endocrine Practice*, 26(1), 107-139. <https://doi.org/10.4158/CS-2019-0472>

Garg, P. K., McClelland, R. L., Jenny, N. S., Criqui, M. H., Greenland, P., Rosenson, R. S., Siscovick, D. S., Jorgensen, N., & Cushman, M. (2015). Lipoprotein-associated phospholipase A2 and risk of incident cardiovascular disease in a multi-ethnic cohort: The multi ethnic study of atherosclerosis. *Atherosclerosis*, 241(1), 176-182.

<https://doi.org/10.1016/j.atherosclerosis.2015.05.006>

Genova Diagnostics. (2023). *Cardio Check*. <https://www.gdx.net/core/sample-reports/Cardio-Check-Sample-Report.pdf>

Gibson, M., Morrow, D. (2024, 4/17/2024). *Elevated cardiac troponin concentration in the absence of an acute coronary syndrome*. <https://www.uptodate.com/contents/elevated-cardiac-troponin-concentration-in-the-absence-of-an-acute-coronary-syndrome>

Goff, D. C., Jr., Lloyd-Jones, D. M., Bennett, G., Coady, S., D'Agostino, R. B., Sr., Gibbons, R., Greenland, P., Lackland, D. T., Levy, D., O'Donnell, C. J., Robinson, J. G., Schwartz, J. S., Shero, S. T., Smith, S. C., Jr., Sorlie, P., Stone, N. J., & Wilson, P. W. (2014). 2013 ACC/AHA guideline on the assessment of cardiovascular risk: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *J Am Coll Cardiol*, 63(25 Pt B), 2935-2959. <https://doi.org/10.1016/j.jacc.2013.11.005>

Greenland, P., Alpert, J. S., Beller, G. A., Benjamin, E. J., Budoff, M. J., Fayad, Z. A., Foster, E., Hlatky, M. A., Hodgson, J. M., Kushner, F. G., Lauer, M. S., Shaw, L. J., Smith, S. C., Jr., Taylor, A. J., Weintraub, W. S., Wenger, N. K., Jacobs, A. K., Anderson, J. L., Albert, N., . . . Yancy, C. W. (2010). 2010 ACCF/AHA guideline for assessment of cardiovascular risk in asymptomatic adults: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *J Am Coll Cardiol*, 56(25), e50-103.

<https://doi.org/10.1016/j.jacc.2010.09.001>

Grundty, S. M., Stone Neil, J., Bailey Alison, L., Beam, C., Birtcher Kim, K., Blumenthal Roger, S., Braun Lynne, T., de Ferranti, S., Faiella-Tommasino, J., Forman Daniel, E., Goldberg, R., Heidenreich Paul, A., Hlatky Mark, A., Jones Daniel, W., Lloyd-Jones, D., Lopez-Pajares, N., Ndumele Chiadi, E., Orringer Carl, E., Peralta Carmen, A., . . . Yeboah, J. (2018). 2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA Guideline on the Management of Blood Cholesterol: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation*, 139(25), e1082-e1143. <https://doi.org/10.1161/CIR.0000000000000625>

## Reimbursement Policy

- Güler, E., Babur Güler, G., Yavuz, C., & Kızıllırmak, F. (2015). An unknown side effect of isotretinoin: pericardial effusion with atrial tachycardia. *Anatol J Cardiol*, *15*(2), 168-169. <https://pubmed.ncbi.nlm.nih.gov/25625453/>
- HeartLab, C. (2023). *The Science*. Retrieved 03/07/2023 from <https://www.clevelandheartlab.com/providers/the-science/>
- Howell, S., Yarovova, E., Khwanda, A., & Rosen, S. D. (2019). Cardiovascular effects of psychotic illnesses and antipsychotic therapy. *Heart*, *105*(24), 1852-1859. <https://doi.org/10.1136/heartjnl-2017-312107>
- Hwang, Y. C., Ahn, H. Y., Han, K. H., Park, S. W., & Park, C. Y. (2017). Prediction of future cardiovascular disease with an equation to estimate apolipoprotein B in patients with high cardiovascular risk: an analysis from the TNT and IDEAL study. *Lipids Health Dis*, *16*(1), 158. <https://doi.org/10.1186/s12944-017-0549-8>
- Itakura, H., Yokoyama, M., Matsuzaki, M., Saito, Y., Origasa, H., Ishikawa, Y., Oikawa, S., Sasaki, J., Hishida, H., Kita, T., Kitabatake, A., Nakaya, N., Sakata, T., Shimada, K., Shirato, K., & Matsuzawa, Y. (2011). Relationships between plasma fatty acid composition and coronary artery disease. *J Atheroscler Thromb*, *18*(2), 99-107. <https://doi.org/10.5551/jat.5876>
- Jaffe, A. (2024, 4/17/2024). *Troponin testing: Analytical considerations*. <https://www.uptodate.com/contents/troponin-testing-analytical-considerations>
- Januzzi, J. L., Jr., Ahmad, T., Mulder, H., Coles, A., Anstrom, K. J., Adams, K. F., Ezekowitz, J. A., Fiuzat, M., Houston-Miller, N., Mark, D. B., Piña, I. L., Passmore, G., Whellan, D. J., Cooper, L. S., Leifer, E. S., Desvigne-Nickens, P., Felker, G. M., & O'Connor, C. M. (2019). Natriuretic Peptide Response and Outcomes in Chronic Heart Failure With Reduced Ejection Fraction. *J Am Coll Cardiol*, *74*(9), 1205-1217. <https://doi.org/10.1016/j.jacc.2019.06.055>
- Jellinger, P. S., Handelsman, Y., Rosenblit, P. D., Bloomgarden, Z. T., Fonseca, V. A., Garber, A. J., Grunberger, G., Guerin, C. K., Bell, D. S. H., Mechanick, J. I., Pessah-Pollack, R., Wyne, K., Smith, D., Brinton, E. A., Fazio, S., & Davidson, M. (2017). AMERICAN ASSOCIATION OF CLINICAL ENDOCRINOLOGISTS AND AMERICAN COLLEGE OF ENDOCRINOLOGY GUIDELINES FOR MANAGEMENT OF DYSLIPIDEMIA AND PREVENTION OF CARDIOVASCULAR DISEASE. *Endocr Pract*, *23*(Suppl 2), 1-87. <https://doi.org/10.4158/ep171764.appgl>
- Jepsen, A.-M. K., Langsted, A., Varbo, A., Bang, L. E., Kamstrup, P. R., & Nordestgaard, B. G. (2016). Increased Remnant Cholesterol Explains Part of Residual Risk of All-Cause Mortality in 5414 Patients with Ischemic Heart Disease. *Clinical Chemistry*, *62*(4), 593. <https://doi.org/10.1373/clinchem.2015.253757>
- Joshi, P. H., Khokhar, A. A., Massaro, J. M., Lirette, S. T., Griswold, M. E., Martin, S. S., Blaha, M. J., Kulkarni, K. R., Correa, A., Ralph B. D'Agostino, S., Jones, S. R., Toth, P. P., & Group, t. L. I. C. L. S. (2016). Remnant Lipoprotein Cholesterol and Incident Coronary Heart Disease: The Jackson Heart and Framingham Offspring Cohort Studies. <https://doi.org/10.1161/JAHA.115.002765>

## Reimbursement Policy

- Karadag, A. S., Gumrukcuoglu, H. A., Gunes Bilgili, S., Ozkol, H. U., Ertugrul, D. T., Simsek, H., Sahin, M., & Calka, O. (2012). Does isotretinoin therapy have any effects on electrocardiography, heart rate and blood pressure? *J Dermatolog Treat*, 23(3), 168-171. <https://doi.org/10.3109/09546634.2010.546831>
- Kilicaslan, E. E., Karakilic, M., & Erol, A. (2019). The Relationship between 10 Years Risk of Cardiovascular Disease and Schizophrenia Symptoms: Preliminary Results. *Psychiatry Investig*, 16(12), 933-939. <https://doi.org/10.30773/pi.2019.0063>
- Kongpakwattana, K., Ademi, Z., Chaiyasothi, T., Nathisuwan, S., Zomer, E., Liew, D., & Chaiyakunapruk, N. (2019). Cost-Effectiveness Analysis of Non-Statins Lipid-Modifying Agents for Secondary Cardiovascular Disease Prevention Among Statin-Treated Patients in Thailand. *Pharmacoeconomics*, 37(10), 1277-1286. <https://doi.org/10.1007/s40273-019-00820-6>
- Kuwahara, K., Nakagawa, Y., & Nishikimi, T. (2018). Cutting Edge of Brain Natriuretic Peptide (BNP) Research - The Diversity of BNP Immunoreactivity and Its Clinical Relevance. *Circ J*, 82(10), 2455-2461. <https://doi.org/10.1253/circj.CJ-18-0824>
- Lamprea-Montealegre, J. A., Staplin, N., Herrington, W. G., Haynes, R., Emberson, J., Baigent, C., & de Boer, I. H. (2020). Apolipoprotein B, Triglyceride-Rich Lipoproteins, and Risk of Cardiovascular Events in Persons with CKD. *Clin J Am Soc Nephrol*, 15(1), 47-60. <https://doi.org/10.2215/cjn.07320619>
- Lee, Y. H., Scharnitz, T. P., Muscat, J., Chen, A., Gupta-Elera, G., & Kirby, J. S. (2016). Laboratory Monitoring During Isotretinoin Therapy for Acne: A Systematic Review and Meta-analysis. *JAMA Dermatol*, 152(1), 35-44. <https://doi.org/10.1001/jamadermatol.2015.3091>
- Li, N., & Wang, J. A. (2005). Brain natriuretic peptide and optimal management of heart failure. *J Zhejiang Univ Sci B*, 6(9), 877-884. <https://pubmed.ncbi.nlm.nih.gov/16130189/>
- Liu, G., Dong, M., Ma, S., Fu, L., Xiao, Y., Zhong, L., & Geng, J. (2019). Serum leptin is associated with first-ever ischemic stroke, lesion size and stroke severity in a Chinese cohort. *Neurol Res*, 41(2), 125-131. <https://doi.org/10.1080/01616412.2018.1544399>
- LPSC. (2010). Lipoprotein-associated phospholipase A2 and risk of coronary disease, stroke, and mortality: collaborative analysis of 32 prospective studies. *The Lancet*, 375(9725), 1536-1544. [https://doi.org/10.1016/S0140-6736\(10\)60319-4](https://doi.org/10.1016/S0140-6736(10)60319-4)
- Mach, F., Baigent, C., Catapano, A. L., Koskinas, K. C., Casula, M., Badimon, L., Chapman, M. J., De Backer, G. G., Delgado, V., Ference, B. A., Graham, I. M., Halliday, A., Landmesser, U., Mihaylova, B., Pedersen, T. R., Riccardi, G., Richter, D. J., Sabatine, M. S., Taskinen, M. R., . . . Wiklund, O. (2019). 2019 ESC/EAS Guidelines for the management of dyslipidaemias: lipid modification to reduce cardiovascular risk. *Eur Heart J*. <https://doi.org/10.1093/eurheartj/ehz455>
- MacNamara, J., Eapen, D. J., Quyyumi, A., & Sperling, L. (2015). Novel biomarkers for cardiovascular risk assessment: current status and future directions. *Future Cardiol*, 11(5), 597-613. <https://doi.org/10.2217/fca.15.39>

## Reimbursement Policy

- Maners, J., Gill, D., Pankratz, N., & Tang, W. (2019). Abstract P106: Genetically Determined Fibrinogen, Gamma Prime Fibrinogen and Risk of Venous Thromboembolism and Ischemic Stroke: Evidence From Mendelian Randomization. *American Heart Association*.  
[https://doi.org/10.1161/circ.139.suppl\\_1.P106](https://doi.org/10.1161/circ.139.suppl_1.P106)
- Mark, D. B., Cowper, P. A., Anstrom, K. J., Sheng, S., Daniels, M. R., Knight, J. D., Baloch, K. N., Davidson-Ray, L., Fiuzat, M., Januzzi, J. L., Jr., Whellan, D. J., Piña, I. L., Ezekowitz, J. A., Adams, K. F., Cooper, L. S., O'Connor, C. M., & Felker, G. M. (2018). Economic and Quality-of-Life Outcomes of Natriuretic Peptide-Guided Therapy for Heart Failure. *J Am Coll Cardiol*, 72(21), 2551-2562. <https://doi.org/10.1016/j.jacc.2018.08.2184>
- Mehta, A., Virani, S. S., Ayers, C. R., Sun, W., Hoogeveen, R. C., Rohatgi, A., Berry, J. D., Joshi, P. H., Ballantyne, C. M., & Khera, A. (2020). Lipoprotein(a) and Family History Predict Cardiovascular Disease Risk. *J Am Coll Cardiol*, 76(7), 781-793.  
<https://doi.org/10.1016/j.jacc.2020.06.040>
- Mohler, E. R., 3rd, Ballantyne, C. M., Davidson, M. H., Hanefeld, M., Ruilope, L. M., Johnson, J. L., & Zalewski, A. (2008). The effect of darapladib on plasma lipoprotein-associated phospholipase A2 activity and cardiovascular biomarkers in patients with stable coronary heart disease or coronary heart disease risk equivalent: the results of a multicenter, randomized, double-blind, placebo-controlled study. *J Am Coll Cardiol*, 51(17), 1632-1641.  
<https://doi.org/10.1016/j.jacc.2007.11.079>
- Morita, S. Y. (2016). Metabolism and Modification of Apolipoprotein B-Containing Lipoproteins Involved in Dyslipidemia and Atherosclerosis. *Biol Pharm Bull*, 39(1), 1-24.  
<https://doi.org/10.1248/bpb.b15-00716>
- Moyer, V. A. (2013). Screening for primary hypertension in children and adolescents: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med*, 159(9), 613-619. <https://doi.org/10.7326/0003-4819-159-9-201311050-00725>
- Mozaffarian, D. (2023, 12/05/2023). *Fish oil: Physiologic effects and administration*.  
<https://www.uptodate.com/contents/fish-oil-and-marine-omega-3-fatty-acids>
- Newman, C. B., Blaha, M. J., Boord, J. B., Cariou, B., Chait, A., Fein, H. G., Ginsberg, H. N., Goldberg, I. J., Murad, M. H., Subramanian, S., & Tannock, L. R. (2020). Lipid Management in Patients with Endocrine Disorders: An Endocrine Society Clinical Practice Guideline. *The Journal of Clinical Endocrinology & Metabolism*, 105(12), 3613-3682.  
<https://doi.org/10.1210/clinem/dgaa674>
- NICE. (2023). Cardiovascular disease: risk assessment and reduction, including lipid modification. <https://www.nice.org.uk/guidance/ng238>
- O'Malley, P. G., Arnold, M. J., Kelley, C., Spacek, L., Buelt, A., Natarajan, S., Donahue, M. P., Vagichev, E., Ballard-Hernandez, J., Logan, A., Thomas, L., Ritter, J., Neubauer, B. E., & Downs, J. R. (2020). Management of Dyslipidemia for Cardiovascular Disease Risk Reduction: Synopsis of the 2020 Updated U.S. Department of Veterans Affairs and U.S. Department of Defense Clinical Practice Guideline. *Ann Intern Med*, 173(10), 822-829.  
<https://doi.org/10.7326/m20-4648>

## Reimbursement Policy

- Pearson, G. J., Thanassoulis, G., Anderson, T. J., Barry, A. R., Couture, P., Dayan, N., Francis, G. A., Genest, J., Grégoire, J., Grover, S. A., Gupta, M., Hegele, R. A., Lau, D., Leiter, L. A., Leung, A. A., Lonn, E., Mancini, G. B. J., Manjoo, P., McPherson, R., . . . Wray, W. (2021). 2021 Canadian Cardiovascular Society Guidelines for the Management of Dyslipidemia for the Prevention of Cardiovascular Disease in Adults. *Can J Cardiol*, 37(8), 1129-1150. <https://doi.org/10.1016/j.cjca.2021.03.016>
- Pearson, T. A., Mensah, G. A., Alexander, R. W., Anderson, J. L., Cannon, R. O., 3rd, Criqui, M., Fadl, Y. Y., Fortmann, S. P., Hong, Y., Myers, G. L., Rifai, N., Smith, S. C., Jr., Taubert, K., Tracy, R. P., Vinicor, F., Centers for Disease, C., Prevention, & American Heart, A. (2003). Markers of inflammation and cardiovascular disease: application to clinical and public health practice: A statement for healthcare professionals from the Centers for Disease Control and Prevention and the American Heart Association. *Circulation*, 107(3), 499-511. <https://doi.org/10.1161/01.cir.0000052939.59093.45>
- Pieters, M., Ferreira, M., de Maat, M. P. M., & Ricci, C. (2020). Biomarker association with cardiovascular disease and mortality - The role of fibrinogen. A report from the NHANES study. *Thromb Res*, 198, 182-189. <https://doi.org/10.1016/j.thromres.2020.12.009>
- Pignone, M. P. (2024, 06/27/2024). *Low-density lipoprotein cholesterol-lowering therapy in the primary prevention of cardiovascular disease*. <https://www.uptodate.com/contents/management-of-elevated-low-density-lipoprotein-cholesterol-ldl-c-in-primary-prevention-of-cardiovascular-disease>
- Pile, H. D., & Sadiq, N. M. (2019). Isotretinoin. In *StatPearls*. StatPearls Publishing. <https://www.ncbi.nlm.nih.gov/pubmed/30247824>
- Polwiartek, C., Kragholm, K., Schjerning, O., Graff, C., & Nielsen, J. (2016). Cardiovascular safety of antipsychotics: a clinical overview. *Expert Opin Drug Saf*, 15(5), 679-688. <https://doi.org/10.1517/14740338.2016.1161021>
- Reklou, A., Katsiki, N., Karagiannis, A., & Athyros, V. (2020). Effects of Lipid Lowering Drugs on Arterial Stiffness: One More Way to Reduce Cardiovascular Risk? *Curr Vasc Pharmacol*, 18(1), 38-42. <https://doi.org/10.2174/1570161117666190121102323>
- Reyes-Soffer, G., Ginsberg, H. N., Berglund, L., Duell, P. B., Heffron, S. P., Kamstrup, P. R., Lloyd-Jones, D. M., Marcovina, S. M., Yeang, C., Koschinsky, M. L., American Heart Association Council on Arteriosclerosis, T., Vascular, B., Council on Cardiovascular, R., Intervention, & Council on Peripheral Vascular, D. (2022). Lipoprotein(a): A Genetically Determined, Causal, and Prevalent Risk Factor for Atherosclerotic Cardiovascular Disease: A Scientific Statement From the American Heart Association. *Arterioscler Thromb Vasc Biol*, 42(1), e48-e60. <https://doi.org/10.1161/ATV.0000000000000147>
- Rizos, E. C., Ntzani, E. E., Bika, E., Kostapanos, M. S., & Elisaf, M. S. (2012). Association between omega-3 fatty acid supplementation and risk of major cardiovascular disease events: a systematic review and meta-analysis. *Jama*, 308(10), 1024-1033. <https://doi.org/10.1001/2012.jama.11374>
- Robinson, J. G., Williams, K. J., Gidding, S., Boren, J., Tabas, I., Fisher, E. A., Packard, C., Pencina, M., Fayad, Z. A., Mani, V., Rye, K. A., Nordestgaard, B. G., Tybjaerg-Hansen, A.,

## Reimbursement Policy

- Douglas, P. S., Nicholls, S. J., Pagidipati, N., & Sniderman, A. (2018). Eradicating the Burden of Atherosclerotic Cardiovascular Disease by Lowering Apolipoprotein B Lipoproteins Earlier in Life. *J Am Heart Assoc*, 7(20), e009778. <https://doi.org/10.1161/jaha.118.009778>
- Rosenson, R. (2022, 10/14/2022). *Measurement of blood lipids and lipoproteins*. <https://www.uptodate.com/contents/measurement-of-blood-lipids-and-lipoproteins>
- Rosenson, R. (2023, 10/23/2023). *Lipoprotein classification, metabolism, and role in atherosclerosis*. <https://www.uptodate.com/contents/lipoprotein-classification-metabolism-and-role-in-atherosclerosis>
- Rosenson, R., & Durrington, P. (2024, 05/01/2024). *HDL cholesterol: Clinical aspects of abnormal values*. <https://www.uptodate.com/contents/hdl-cholesterol-clinical-aspects-of-abnormal-values>
- Rosenson, R., Stein, J., & Durrington, P. (2024, 02/07/2024). *Lipoprotein(a)*. <https://www.uptodate.com/contents/lipoprotein-a-and-cardiovascular-disease>
- Rosenson, R. S., Smith, C. Christopher, Bauer, Kenneth A. (2023, 11/07/2023). *Overview of homocysteine*. <https://www.uptodate.com/contents/overview-of-homocysteine>
- Rosenson, R. S., & Stafforini, D. M. (2012). Modulation of oxidative stress, inflammation, and atherosclerosis by lipoprotein-associated phospholipase A2. *J Lipid Res*, 53(9), 1767-1782. <https://doi.org/10.1194/jlr.R024190>
- Rosenzweig, J. L., Bakris, G. L., Berglund, L. F., Hivert, M. F., Horton, E. S., Kalyani, R. R., Murad, M. H., & Verges, B. L. (2019). Primary Prevention of ASCVD and T2DM in Patients at Metabolic Risk: An Endocrine Society\* Clinical Practice Guideline. *J Clin Endocrinol Metab*. <https://doi.org/10.1210/jc.2019-01338>
- Rotella, F., Cassioli, E., Calderani, E., Lazzeretti, L., Raghianti, B., Ricca, V., & Mannucci, E. (2020). Long-term metabolic and cardiovascular effects of antipsychotic drugs. A meta-analysis of randomized controlled trials. *Eur Neuropsychopharmacol*. <https://doi.org/10.1016/j.euroneuro.2019.12.118>
- Rule, A., Glassock, Richard. (2022, 08/11/2022). *The aging kidney*. <https://www.uptodate.com/contents/the-aging-kidney>
- Sandhu, P. K., Musaad, S. M., Remaley, A. T., Buehler, S. S., Strider, S., Derzon, J. H., Vesper, H. W., Ranne, A., Shaw, C. S., & Christenson, R. H. (2016). Lipoprotein Biomarkers and Risk of Cardiovascular Disease: A Laboratory Medicine Best Practices (LMBP) Systematic Review. *J Appl Lab Med*, 1(2), 214-229. <https://doi.org/10.1373/jalm.2016.021006>
- Sarnak, M., Gibson, Michael, Henrich, William. (2023, 05/16/2023). *Chronic kidney disease and coronary heart disease*. <https://www.uptodate.com/contents/chronic-kidney-disease-and-coronary-heart-disease>
- Siscovick, D. S., Barringer, T. A., Fretts, A. M., Wu, J. H., Lichtenstein, A. H., Costello, R. B., Kris-Etherton, P. M., Jacobson, T. A., Engler, M. B., Alger, H. M., Appel, L. J., & Mozaffarian, D. (2017). Omega-3 Polyunsaturated Fatty Acid (Fish Oil) Supplementation and the Prevention of Clinical Cardiovascular Disease: A Science Advisory From the

## Reimbursement Policy

- American Heart Association. *Circulation*, 135(15), e867-e884.  
<https://doi.org/10.1161/cir.0000000000000482>
- Suphir, K. (2006). Lipoprotein-associated phospholipase A2, vascular inflammation and cardiovascular risk prediction. *Vasc Health Risk Manag*, 2(2), 153-156.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1994000/>
- Superko, H. R., Superko, A. R., Lundberg, G. P., Margolis, B., Garrett, B. C., Nasir, K., & Agatston, A. S. (2014). Omega-3 Fatty Acid Blood Levels Clinical Significance Update. *Curr Cardiovasc Risk Rep*, 8(11). <https://doi.org/10.1007/s12170-014-0407-4>
- Suthahar, N., Meems, L. M. G., van Veldhuisen, D. J., Walter, J. E., Gansevoort, R. T., Heymans, S., Schroen, B., van der Harst, P., Kootstra-Ros, J. E., van Empel, V., Mueller, C., Bakker, S. J. L., & de Boer, R. A. (2020). High-Sensitivity Troponin-T and Cardiovascular Outcomes in the Community: Differences Between Women and Men. *Mayo Clin Proc*, 95(6), 1158-1168. <https://doi.org/10.1016/j.mayocp.2020.01.017>
- Tang, O., Matsushita, K., Coresh, J., Hoogeveen, R. C., Windham, B. G., Ballantyne, C. M., & Selvin, E. (2020). High-Sensitivity Cardiac Troponin I for Risk Stratification in Older Adults. *J Am Geriatr Soc*. <https://doi.org/10.1111/jgs.16912>
- Tedeschi-Reiner, E., Strozzi, M., Skoric, B., & Reiner, Z. (2005). Relation of atherosclerotic changes in retinal arteries to the extent of coronary artery disease. *Am J Cardiol*, 96(8), 1107-1109. <https://doi.org/10.1016/j.amjcard.2005.05.070>
- Thompson, M. A., Horberg, M. A., Agwu, A. L., Colasanti, J. A., Jain, M. K., Short, W. R., Singh, T., & Aberg, J. A. (2020). Primary Care Guidance for Persons With Human Immunodeficiency Virus: 2020 Update by the HIV Medicine Association of the Infectious Diseases Society of America. *Clinical Infectious Diseases*, 73(11), e3572-e3605.  
<https://doi.org/10.1093/cid/ciaa1391>
- Thorne. (2024). *Your Wellness In Your Hands*. Retrieved 07/05/2024 from <https://www.wellnessfx.com/>
- Tomcsányi, J., Somló, M., Bózsik, B., Frész, T., & Nagy, E. (2018). [The value of early repeated N-terminal pro-B-type natriuretic peptide measurement in acute heart failure]. *Orv Hetil*, 159(25), 1009-1012. <https://doi.org/10.1556/650.2018.31095> (Az N-terminális pro-B natriuretikus peptid mérésének korai ismétlése akut szívelégtelenség miatt hospitalizált betegekben.)
- Trompet, S., Packard, C. J., & Jukema, J. W. (2018). Plasma apolipoprotein-B is an important risk factor for cardiovascular disease, and its assessment should be routine clinical practice. *Curr Opin Lipidol*, 29(1), 51-52. <https://doi.org/10.1097/mol.0000000000000476>
- USPSTF. (2015). Screening for abnormal blood glucose and type 2 diabetes mellitus: U.s. preventive services task force recommendation statement. *Ann Intern Med*, 163(11), 861-868.  
<https://doi.org/10.7326/M15-2345>
- USPSTF. (2018a). Risk assessment for cardiovascular disease with nontraditional risk factors: Us preventive services task force recommendation statement. *Jama*, 320(3), 272-280.  
<https://doi.org/10.1001/jama.2018.8359>

## Reimbursement Policy

- USPSTF. (2018b). Screening for Cardiovascular Disease Risk With Electrocardiography: US Preventive Services Task Force Recommendation Statement. *Jama*, 319(22), 2308-2314. <https://doi.org/10.1001/jama.2018.6848>
- USPSTF. (2020). *High Blood Pressure in Children and Adolescents: Screening*. <https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/blood-pressure-in-children-and-adolescents-hypertension-screening>
- USPSTF. (2021). *Hypertension in Adults: Screening*. <https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/hypertension-in-adults-screening>
- Varbo, A., Benn, M., & Nordestgaard, B. G. (2014). Remnant cholesterol as a cause of ischemic heart disease: evidence, definition, measurement, atherogenicity, high risk patients, and present and future treatment. *Pharmacol Ther*, 141(3), 358-367. <https://doi.org/10.1016/j.pharmthera.2013.11.008>
- Varbo, A., Benn, M., Tybjaerg-Hansen, A., Jorgensen, A. B., Frikke-Schmidt, R., & Nordestgaard, B. G. (2013). Remnant cholesterol as a causal risk factor for ischemic heart disease. *J Am Coll Cardiol*, 61(4), 427-436. <https://doi.org/10.1016/j.jacc.2012.08.1026>
- Visseren, F. L. J., Mach, F., Smulders, Y. M., Carballo, D., Koskinas, K. C., Bäck, M., Benetos, A., Biffi, A., Boavida, J.-M., Capodanno, D., Cosyns, B., Crawford, C., Davos, C. H., Desormais, I., Di Angelantonio, E., Franco, O. H., Halvorsen, S., Hobbs, F. D. R., Hollander, M., . . . Group, E. S. D. (2021). 2021 ESC Guidelines on cardiovascular disease prevention in clinical practice: Developed by the Task Force for cardiovascular disease prevention in clinical practice with representatives of the European Society of Cardiology and 12 medical societies With the special contribution of the European Association of Preventive Cardiology (EAPC). *European Heart Journal*, 42(34), 3227-3337. <https://doi.org/10.1093/eurheartj/ehab484>
- Whelton, P. K., Carey, R. M., Aronow, W. S., Casey, D. E., Jr., Collins, K. J., Dennison Himmelfarb, C., DePalma, S. M., Gidding, S., Jamerson, K. A., Jones, D. W., MacLaughlin, E. J., Muntner, P., Ovbigele, B., Smith, S. C., Jr., Spencer, C. C., Stafford, R. S., Taler, S. J., Thomas, R. J., Williams, K. A., Sr., . . . Wright, J. T., Jr. (2018). 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: Executive Summary: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Hypertension*, 71(6), 1269-1324. <https://doi.org/10.1161/hyp.0000000000000066>
- Willeit, P., Ridker, P. M., Nestel, P. J., Simes, J., Tonkin, A. M., Pedersen, T. R., Schwartz, G. G., Olsson, A. G., Colhoun, H. M., Kronenberg, F., Drechsler, C., Wanner, C., Mora, S., Lesogor, A., & Tsimikas, S. (2018). Baseline and on-statin treatment lipoprotein(a) levels for prediction of cardiovascular events: individual patient-data meta-analysis of statin outcome trials. *Lancet*, 392(10155), 1311-1320. [https://doi.org/10.1016/s0140-6736\(18\)31652-0](https://doi.org/10.1016/s0140-6736(18)31652-0)
- Wilson, D. P., Jacobson, T. A., Jones, P. H., Koschinsky, M. L., McNeal, C. J., Nordestgaard, B. G., & Orringer, C. E. (2019). Use of Lipoprotein(a) in clinical practice: A biomarker whose

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- time has come. A scientific statement from the National Lipid Association. *J Clin Lipidol*, 13(3), 374-392. <https://doi.org/10.1016/j.jacl.2019.04.010>
- Wilson, P. (2024a, July 23). *Atherosclerotic cardiovascular disease risk assessment for primary prevention in adults*. <https://www.uptodate.com/contents/atherosclerotic-cardiovascular-disease-risk-assessment-for-primary-prevention-in-adults-our-approach>
- Wilson, P. (2024b, June 27). *Overview of the possible risk factors for cardiovascular disease*. <https://www.uptodate.com/contents/overview-of-possible-risk-factors-for-cardiovascular-disease>
- Wilson, P. W. F., Jacobson, T. A., Martin, S. S., Jackson, E. J., Le, N. A., Davidson, M. H., Vesper, H. W., Frikke-Schmidt, R., Ballantyne, C. M., & Remaley, A. T. (2021). Lipid measurements in the management of cardiovascular diseases: Practical recommendations a scientific statement from the national lipid association writing group. *Journal of Clinical Lipidology*, 15(5), 629-648. <https://doi.org/10.1016/j.jacl.2021.09.046>
- Wong, N. D., Budoff, M. J., Ferdinand, K., Graham, I. M., Michos, E. D., Reddy, T., Shapiro, M. D., & Toth, P. P. (2022). Atherosclerotic cardiovascular disease risk assessment: An American Society for Preventive Cardiology clinical practice statement. *Am J Prev Cardiol*, 10, 100335. <https://doi.org/10.1016/j.ajpc.2022.100335>
- Yang, H., Guo, W., Li, J., Cao, S., Zhang, J., Pan, J., Wang, Z., Wen, P., Shi, X., & Zhang, S. (2017). Leptin concentration and risk of coronary heart disease and stroke: A systematic review and meta-analysis. *PLoS One*, 12(3), e0166360. <https://doi.org/10.1371/journal.pone.0166360>
- Zane, L. T., Leyden, W. A., Marqueling, A. L., & Manos, M. M. (2006). A population-based analysis of laboratory abnormalities during isotretinoin therapy for acne vulgaris. *Arch Dermatol*, 142(8), 1016-1022. <https://doi.org/10.1001/archderm.142.8.1016>