International Journal of
Molecular Sciences

MDPI

Editorial

Special Issue "New Trends in Diabetes, Hypertension and Cardiovascular Diseases: 3rd Edition"

Yutang Wang [1,*] and Dianna J. Magliano [2]

[1] Discipline of Life Science, Institute of Innovation, Science and Sustainability, Federation University Australia, Ballarat, VIC 3350, Australia
[2] Diabetes and Population Health, Baker Heart and Diabetes Institute, Melbourne, VIC 3004, Australia
* Correspondence: yutang.wang@federation.edu.au

1. Introduction

Cardiovascular disease (CVD) encompasses a broad spectrum of conditions affecting the heart and blood vessels [1–5]. It remains the leading cause of death globally, responsible for approximately 19.8 million deaths in 2022—accounting for 32% of the total global mortality [6]. Beyond its profound health impact, CVD also imposes a significant economic burden. In the United States alone, annual costs were estimated at USD 393 billion in 2020, with projections reaching USD 1.49 trillion by 2050 [7,8]. These figures highlight the urgent need for cost-effective strategies to promote cardiovascular health, reduce healthcare expenditures, and improve population outcomes [8,9].

Most CVD cases are regarded preventable through the modification of behavioral and environmental risk factors [6]. Major contributors include unhealthy dietary patterns [10–12], tobacco use [13,14], excessive alcohol consumption [15], physical inactivity [16,17], obesity [18], and exposure to polluted air [19,20]. These findings suggest that implementing behavioral change programs targeting these modifiable factors could play a critical role in reducing the burden of CVD. For instance, dietary interventions that emphasize a healthy eating pattern [21], rich in fruits and vegetables [22], and low in saturated fats [23], sodium, cholesterol [24], processed meats [25], and trans fats [26], may significantly lower CVD risk. Additionally, regular physical activity is another key strategy for CVD prevention [27,28].

Despite the availability of various behavioral modification programs, medications, and surgical interventions [21,29–31], CVD continues to be the leading cause of morbidity and mortality. This underscores the importance of further investigating the pathogenesis of CVD and developing novel therapies and therapeutic agents [32–35], leveraging cellular [36], tissue [37], and animal models [38–41].

According to the World Health Organization, hypertension affects 33% of the adult population, with 44% of individuals unaware of their condition [42]. Additionally, 14% of adults aged ≥18 years are living with diabetes, and 59% of diabetic adults aged ≥30 years are not receiving medication for their condition [43]. Both hypertension and diabetes are independent risk factors for CVD [44–47]. Therefore, controlling blood pressure and blood glucose levels is essential for reducing CVD risk [48–50].

According to the latest Global Burden of Disease (GBD) study [51], high blood pressure, particulate matter pollution, and high blood glucose are the top three risk factors contributing to the global disease burden. The Disability-Adjusted Life Year (DALY), an age-standardized metric combining years of life lost due to premature death and years lived with disability, is commonly used to assess overall health burden [52,53]. High blood

check for updates

Received: 20 October 2025
Accepted: 29 October 2025
Published: 29 October 2025

Citation: Wang, Y.; Magliano, D.J. Special Issue "New Trends in Diabetes, Hypertension and Cardiovascular Diseases: 3rd Edition". *Int. J. Mol. Sci.* **2025**, *26*, 10536. https://doi.org/10.3390/ijms262110536

Copyright: © 2025 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).

pressure, particulate matter pollution, and high blood glucose account for 8.4%, 8.2%, and 5.8% of total DALYs, respectively [51]. Therefore, controlling blood pressure and blood glucose levels would significantly improve the population health.

Triglycerides are also recognized as a risk factor for hypertension [54,55], diabetes [56], and CVD [57,58]. Consequently, lowering circulating triglyceride levels may further contribute to CVD risk reduction [59,60].

2. Contribution of This Special Issue to the Field of Research

This Special Issue features five review articles [61–65] and three original research papers [66–68], collectively showcasing recent advances in the fields of diabetes, hypertension, and CVD. These contributions provide valuable insights into ongoing progress and emerging trends across these domains (Table 1). Together, the articles address a broad spectrum of topics, including the following:

- Risk factors, such as the role of gut microbiota [61,68];
- Disease pathogenesis, encompassing mechanisms like macrophage activation [63], sympathetic nervous system stimulation [65], and genetic influences [67];
- Therapeutic targets, including aldehyde dehydrogenase 2 [62] and apurinic/apyrimidinic endonuclease 1 [64]; and;
- Treatment strategies, such as the application of docetaxel [66].

Readers are encouraged to explore these articles to gain a deeper understanding of the findings and their implications for future research and clinical practice.

Table 1. Summary of the eight articles in this Special Issue.

References	Title	Authors	Main Finding
Reviews			
[61]	Shared Risk Factors and Molecular Mechanisms Between Aortic Stenosis and Atherosclerosis: A Rationale for Therapeutic Repositioning	Cinezan C, Magureanu DC, Hiceag ML, et al.	This article examines the shared risk factors and molecular mechanisms of aortic stenosis and atherosclerosis. It reveals that both diseases are driven by age, hypertension, hyperlipidemia, and diabetes, and involve chronic inflammation, endothelial dysfunction, oxidative stress, lipid accumulation, and calcific remodeling.
[62]	ALDH2 Enzyme Deficiency in Diabetic Cardiomyopathy	Hsieh Y-W, Lee A-S, Sung K-T, et al.	This study reviews the molecular basis of how ALDH2 enzyme deficiency contributes to diabetic cardiomyopathy. The article highlights promising therapeutic strategies, including the use of ALDH2 activators and SGLT2 inhibitors, to mitigate disease progression.
[63]	Tissue-Resident Macrophages in Cardiovascular Diseases: Heterogeneity and Therapeutic Potential	An T, Guo M, Wang Z, et al.	This article explores the origin, diversity, and roles of cardiac resident macrophages in cardiovascular conditions such as myocardial infarction, heart failure, atherosclerosis, and hypertension. It emphasizes the therapeutic potential of targeting specific macrophage subtypes to modulate disease outcomes.

Table 1. *Cont.*

References	Title	Authors	Main Finding
[64]	From DNA Repair to Redox Signaling: The Multifaceted Role of APEX1 (Apurinic/Apyrimidinic Endonuclease 1) in Cardiovascular Health and Disease	Yuan H-H, Yin H, Marincas M, et al.	This study highlights the role of APEX1 in maintaining cardiovascular homeostasis through regulation of innate immunity. The findings suggest APEX1 as a novel therapeutic target for treating various cardiovascular diseases.
[65]	Neuroimmune Interactions and Their Role in Immune Cell Trafficking in Cardiovascular Diseases and Cancer	Wang Y, Anesi JC, Panicker IS, et al.	This article outlines key molecular pathways activated by sympathetic nervous system stimulation and their impact on immune cell migration. It proposes that inhibiting sympathetic activity could be a viable therapeutic approach for both cardiovascular disease and cancer.
Original research articles			
[66]	Low-Dose Docetaxel Is Effective in Reducing Atherogenic Lipids and Atherosclerosis	Choi HY, Ruel I, Choi S, et al.	This study investigates the effect of docetaxel, a compound that enhances high-density lipoprotein biogenesis, on atherosclerosis in apolipoprotein E-deficient mice. The study shows that docetaxel reduces dyslipidemia-induced atherosclerosis, supporting its potential as an HDL-targeted therapy.
[67]	The Genetic Variants Influencing Hypertension Prevalence Based on the Risk of Insulin Resistance as Assessed Using the Metabolic Score for Insulin Resistance (METS-IR)	Shine B-K, Choi J-E, Park Y-J, et al.	This article utilizes data from the Korean Genome and Epidemiology Study and identifies six genetic loci significantly associated with hypertension. It reveals distinct genetic patterns across metabolic profiles, highlighting the interplay between metabolic status and genetic predisposition.
[68]	Gut Microbiota and Metabolic Alterations Associated with Heart Failure and Coronary Artery Disease	Yafarova AA, Dementeva EV, Zlobovskaya OA, et al.	This study assesses the role of gut microbiota in cardiovascular disease, identifying microbial features linked to coronary artery disease and heart failure. The findings underscore complex host–microbiome interactions that may influence cardiovascular health and disease progression.

ALDH2, Aldehyde dehydrogenase 2; APEX1, apurinic/apyrimidinic endonuclease 1; HDL, high-density lipoprotein; SGLT2, sodium-glucose cotransporter 2.

3. Concluding Remarks

This Special Issue presents recent advancements in the research areas of diabetes, hypertension, and CVD. We hope these findings will contribute meaningfully to reducing the morbidity and mortality associated with these conditions. Emerging approaches such as machine learning [69,70], precision medicine [71,72], and early biomarker identification [73,74], along with the implementation of lifestyle modification strategies for CVD prevention in the general population [75,76], represent promising directions for future research and risk reduction.

Author Contributions: Y.W. prepared the manuscript. Y.W. and D.J.M. revised the manuscript. All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. Dalakoti, M.; Lin, N.H.Y.; Yap, J.; Cader, A.; Dipanker, P.; Lee, D.; Raja Shariff, R.E.; Cuenza, L.; Honda, S.; Malis, V.; et al. Primary Prevention of Cardiovascular Disease in Asia: Challenges: A Narrative Review. *JACC Adv.* **2025**, *4*, 101670. [CrossRef] [PubMed]
2. Joynt Maddox, K.E.; Elkind, M.S.V.; Aparicio, H.J.; Commodore-Mensah, Y.; de Ferranti, S.D.; Dowd, W.N.; Hernandez, A.F.; Khavjou, O.; Michos, E.D.; Palaniappan, L.; et al. Forecasting the Burden of Cardiovascular Disease and Stroke in the United States Through 2050-Prevalence of Risk Factors and Disease: A Presidential Advisory From the American Heart Association. *Circulation* **2024**, *150*, e65–e88. [CrossRef] [PubMed]
3. Gornik, H.L.; Aronow, H.D.; Goodney, P.P.; Arya, S.; Brewster, L.P.; Byrd, L.; Chandra, V.; Drachman, D.E.; Eaves, J.M.; Ehrman, J.K.; et al. 2024 ACC/AHA/AACVPR/APMA/ABC/SCAI/SVM/SVN/SVS/SIR/VESS Guideline for the Management of Lower Extremity Peripheral Artery Disease: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *Circulation* **2024**, *149*, e1313–e1410. [CrossRef]
4. Razavi, A.C.; Troy, A.L.; Patel, J.; Mehta, L.S.; Spitz, J.A.; Lloyd-Jones, D.; Whelton, S.P.; Johansen, M.C.; Blumenthal, R.S. Future of Stroke Prevention: 7 Updates in the 2024 AHA/ASA Primary Prevention of Stroke Guideline. *JACC Adv.* **2025**, *4*, 101724. [CrossRef]
5. Jackman, K.A.; Brait, V.H.; Wang, Y.; Maghzal, G.J.; Ball, H.J.; McKenzie, G.; De Silva, T.M.; Stocker, R.; Sobey, C.G. Vascular expression, activity and function of indoleamine 2,3-dioxygenase-1 following cerebral ischaemia-reperfusion in mice. *Naunyn Schmiedebergs Arch. Pharmacol.* **2011**, *383*, 471–481. [CrossRef] [PubMed]
6. World Health Organisation. Cardiovascular Diseases (CVDs). Available online: https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds) (accessed on 17 October 2025).
7. Joynt Maddox, K.E. Health Economics of Cardiovascular Disease in the United States. *Circulation* **2024**, *150*, 419–421. [CrossRef]
8. Kazi, D.S.; Elkind, M.S.V.; Deutsch, A.; Dowd, W.N.; Heidenreich, P.; Khavjou, O.; Mark, D.; Mussolino, M.E.; Ovbiagele, B.; Patel, S.S.; et al. Forecasting the Economic Burden of Cardiovascular Disease and Stroke in the United States Through 2050: A Presidential Advisory From the American Heart Association. *Circulation* **2024**, *150*, e89–e101. [CrossRef]
9. Roth, G.A.; Mensah, G.A.; Johnson, C.O.; Addolorato, G.; Ammirati, E.; Baddour, L.M.; Barengo, N.C.; Beaton, A.Z.; Benjamin, E.J.; Benziger, C.P.; et al. Global Burden of Cardiovascular Diseases and Risk Factors, 1990-2019: Update From the GBD 2019 Study. *J. Am. Coll. Cardiol.* **2020**, *76*, 2982–3021. [CrossRef]
10. Chen, W.; Zhang, S.; Hu, X.; Chen, F.; Li, D. A Review of Healthy Dietary Choices for Cardiovascular Disease: From Individual Nutrients and Foods to Dietary Patterns. *Nutrients* **2023**, *15*, 4898. [CrossRef]
11. Han, F.; Li, W.; Duan, N.; Hu, X.; Yao, N.; Yu, G.; Qu, J. Relationship Between Salt Intake and Cardiovascular Disease. *J. Clin. Hypertens.* **2025**, *27*, e70078. [CrossRef]
12. Yao, Y.; Huang, V.; Seah, V.; Kim, J.E. Impact of Quantity and Type of Dietary Protein on Cardiovascular Disease Risk Factors Using Standard and Network Meta-analyses of Randomized Controlled Trials. *Nutr. Rev.* **2025**, *83*, e814–e828. [CrossRef]
13. Kondo, T.; Nakano, Y.; Adachi, S.; Murohara, T. Effects of Tobacco Smoking on Cardiovascular Disease. *Circ. J.* **2019**, *83*, 1980–1985. [CrossRef] [PubMed]
14. Pistilli, M.; Howard, V.J.; Safford, M.M.; Lee, B.K.; Lovasi, G.S.; Cushman, M.; Malek, A.M.; McClure, L.A. Association of secondhand tobacco smoke exposure during childhood on adult cardiovascular disease risk among never-smokers. *Ann. Epidemiol.* **2019**, *32*, 28–34.e21. [CrossRef]
15. Gupta, S.; Ahimsadasan, N.; Dalsania, K.; Jing, L.; Waraich, H.; Gupta, K.; Kaminska, M.; Balamane, S.; Garcia-Zamora, S.; Miranda-Arboleda, A.F.; et al. Alcohol and Cardiovascular Disease. *Am. J. Cardiol.* **2025**, *in press*. [CrossRef]
16. Oldridge, N.B. Economic burden of physical inactivity: Healthcare costs associated with cardiovascular disease. *Eur. J. Cardiovasc. Prev. Rehabil.* **2008**, *15*, 130–139. [CrossRef]
17. Fletcher, G. Physical inactivity as a risk factor for cardiovascular disease. *Am. J. Med.* **1999**, *107*, 10s–11s. [CrossRef] [PubMed]
18. Dina, C.; Tit, D.M.; Radu, A.; Bungau, G.; Radu, A.F. Obesity, Dietary Patterns, and Cardiovascular Disease: A Narrative Review of Metabolic and Molecular Pathways. *Curr. Issues Mol. Biol.* **2025**, *47*, 440. [CrossRef] [PubMed]
19. Ejaz, Z.H.; Maya, M.F.; Kazim, F.; Amir Ali, Z.; Akber Ali, N.; Khoja, A. Impact of climate change and air pollution on cardiovascular disease: A systematic review and meta-analysis protocol. *JRSM Cardiovasc. Dis.* **2025**, *14*, 20480040251380392. [CrossRef]
20. Islam, F.; Nukala, S.K.; Shrestha, P.; Badgery-Parker, T.; Foo, F. Air pollution and cardiovascular disease: A systematic review of the effects of air pollution, including bushfire smoke, on cardiovascular disease. *Am. Heart J. Plus* **2025**, *54*, 100546. [CrossRef]

21. Arnett Donna, K.; Blumenthal Roger, S.; Albert Michelle, A.; Buroker Andrew, B.; Goldberger Zachary, D.; Hahn Ellen, J.; Himmelfarb Cheryl, D.; Khera, A.; Lloyd-Jones, D.; McEvoy, J.W.; et al. 2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease: Executive Summary. *J. Am. Coll. Cardiol.* **2019**, *74*, 1376–1414. [CrossRef]
22. Estruch, R.; Ros, E.; Salas-Salvadó, J.; Covas, M.I.; Corella, D.; Arós, F.; Gómez-Gracia, E.; Ruiz-Gutiérrez, V.; Fiol, M.; Lapetra, J.; et al. Primary prevention of cardiovascular disease with a mediterranean diet supplemented with extra-virgin olive oil or nuts. *N. Engl. J. Med.* **2018**, *378*, e34. [CrossRef]
23. Wang, Y.; Fang, Y.; Witting, P.K.; Charchar, F.J.; Sobey, C.G.; Drummond, G.R.; Golledge, J. Dietary fatty acids and mortality risk from heart disease in US adults: An analysis based on NHANES. *Sci. Rep.* **2023**, *13*, 1614. [CrossRef]
24. Cook, N.R.; Cutler, J.A.; Obarzanek, E.; Buring, J.E.; Rexrode, K.M.; Kumanyika, S.K.; Appel, L.J.; Whelton, P.K. Long term effects of dietary sodium reduction on cardiovascular disease outcomes: Observational follow-up of the trials of hypertension prevention (TOHP). *BMJ* **2007**, *334*, 885. [CrossRef]
25. Yang, Q.; Zhang, Z.; Gregg, E.W.; Flanders, W.D.; Merritt, R.; Hu, F.B. Added Sugar Intake and Cardiovascular Diseases Mortality Among US Adults. *JAMA Intern. Med.* **2014**, *174*, 516–524. [CrossRef]
26. Kiage, J.N.; Merrill, P.D.; Robinson, C.J.; Cao, Y.; Malik, T.A.; Hundley, B.C.; Lao, P.; Judd, S.E.; Cushman, M.; Howard, V.J.; et al. Intake of trans fat and all-cause mortality in the Reasons for Geographical and Racial Differences in Stroke (REGARDS) cohort1234. *Am. J. Clin. Nutr.* **2013**, *97*, 1121–1128. [CrossRef]
27. Ekelund, U.; Steene-Johannessen, J.; Brown, W.J.; Fagerland, M.W.; Owen, N.; Powell, K.E.; Bauman, A.; Lee, I.M. Does physical activity attenuate, or even eliminate, the detrimental association of sitting time with mortality? A harmonised meta-analysis of data from more than 1 million men and women. *Lancet* **2016**, *388*, 1302–1310. [CrossRef]
28. Hamer, M.; Chida, Y. Walking and primary prevention: A meta-analysis of prospective cohort studies. *Br. J. Sports Med.* **2008**, *42*, 238–243. [CrossRef] [PubMed]
29. Jain, R.; Stone, J.A.; Agarwal, G.; Andrade, J.G.; Bacon, S.L.; Bajaj, H.S.; Baker, B.; Cheng, G.; Dannenbaum, D.; Gelfer, M.; et al. Canadian Cardiovascular Harmonized National Guideline Endeavour (C-CHANGE) guideline for the prevention and management of cardiovascular disease in primary care: 2022 update. *CMAJ* **2022**, *194*, e1460–e1480. [CrossRef] [PubMed]
30. Cowie, M.R.; Lam, C.S.P. Remote monitoring and digital health tools in CVD management. *Nat. Rev. Cardiol.* **2021**, *18*, 457–458. [CrossRef]
31. American Heart Association. Types of Heart Medications. Available online: https://www.heart.org/en/health-topics/heart-attack/treatment-of-a-heart-attack/cardiac-medications (accessed on 2 September 2025).
32. Figtree, G.A.; Broadfoot, K.; Casadei, B.; Califf, R.; Crea, F.; Drummond, G.R.; Freedman, J.E.; Guzik, T.J.; Harrison, D.; Hausenloy, D.J.; et al. A Call to Action for New Global Approaches to Cardiovascular Disease Drug Solutions. *Circulation* **2021**, *144*, 159–169. [CrossRef] [PubMed]
33. Khakoo, A.Y.; Yurgin, N.R.; Eisenberg, P.R.; Fonarow, G.C. Overcoming Barriers to Development of Novel Therapies for Cardiovascular Disease: Insights From the Oncology Drug Development Experience. *JACC Basic Transl. Sci.* **2019**, *4*, 269–274. [CrossRef] [PubMed]
34. Davidson, M.H.; Hsieh, A.; Dicklin, M.R.; Maki, K.C. The Imperative to Enhance Cost-Effectiveness for Cardiovascular Therapeutic Development. *JACC Basic Transl. Sci.* **2024**, *9*, 1029–1040. [CrossRef] [PubMed]
35. Hong, C.C. The grand challenge of discovering new cardiovascular drugs. *Front. Drug Discov.* **2022**, *2*, 1027401. [CrossRef]
36. Lippi, M.; Stadiotti, I.; Pompilio, G.; Sommariva, E. Human Cell Modeling for Cardiovascular Diseases. *Int. J. Mol. Sci.* **2020**, *21*, 6388. [CrossRef]
37. Thomas, D.; Choi, S.; Alamana, C.; Parker, K.K.; Wu, J.C. Cellular and Engineered Organoids for Cardiovascular Models. *Circ. Res.* **2022**, *130*, 1780–1802. [CrossRef]
38. Wang, Y.; Panicker, I.S.; Anesi, J.; Sargisson, O.; Atchison, B.; Habenicht, A.J.R. Animal Models, Pathogenesis, and Potential Treatment of Thoracic Aortic Aneurysm. *Int. J. Mol. Sci.* **2024**, *25*, 901. [CrossRef]
39. Kwan, E.; Ghafoori, E.; Good, W.; Regouski, M.; Moon, B.; Fish, J.M.; Hsu, E.; Polejaeva, I.A.; MacLeod, R.S.; Dosdall, D.J.; et al. Diffuse functional and structural abnormalities in fibrosis: Potential structural basis for sustaining atrial fibrillation. *Heart Rhythm* **2025**, *22*, 1820–1828. [CrossRef]
40. Le Lay, J.E.; Du, Q.; Mehta, M.B.; Bhagroo, N.; Hummer, B.T.; Falloon, J.; Carlson, G.; Rosenbaum, A.I.; Jin, C.; Kimko, H.; et al. Blocking endothelial lipase with monoclonal antibody MEDI5884 durably increases high density lipoprotein in nonhuman primates and in a phase 1 trial. *Sci. Transl. Med.* **2021**, *13*, eabb0602. [CrossRef]
41. van Doorn, E.C.H.; Amesz, J.H.; Sadeghi, A.H.; de Groot, N.M.S.; Manintveld, O.C.; Taverne, Y.J.H.J. Preclinical Models of Cardiac Disease: A Comprehensive Overview for Clinical Scientists. *Cardiovasc. Eng. Technol.* **2024**, *15*, 232–249. [CrossRef]
42. World Health Organisation. Hypertension. Available online: https://www.who.int/news-room/fact-sheets/detail/hypertension (accessed on 20 October 2025).
43. World Health Organization. Diabetes. Available online: https://www.who.int/news-room/fact-sheets/detail/diabetes (accessed on 20 October 2025).

44. Li, Z.; Kang, S.; Kang, H. Development and validation of nomograms for predicting cardiovascular disease risk in patients with prediabetes and diabetes. *Sci. Rep.* **2024**, *14*, 20909. [CrossRef] [PubMed]
45. Wang, Y. Postprandial Plasma Glucose Measured from Blood Taken between 4 and 7.9 h Is Positively Associated with Mortality from Hypertension and Cardiovascular Disease. *J. Cardiovasc. Dev. Dis.* **2024**, *11*, 53. [CrossRef]
46. Wang, Y. Stage 1 hypertension and risk of cardiovascular disease mortality in United States adults with or without diabetes. *J. Hypertens.* **2022**, *40*, 794–803. [CrossRef]
47. Wang, Y.; Fang, Y. Postabsorptive homeostasis model assessment for insulin resistance is a reliable biomarker for cardiovascular disease mortality and all-cause mortality. *Diabetes Epidemiol. Manag.* **2021**, *6*, 100045. [CrossRef]
48. Marx, N.; Federici, M.; Schütt, K.; Müller-Wieland, D.; Ajjan, R.A.; Antunes, M.J.; Christodorescu, R.M.; Crawford, C.; Di Angelantonio, E.; Eliasson, B. 2023 ESC Guidelines for the management of cardiovascular disease in patients with diabetes: Developed by the task force on the management of cardiovascular disease in patients with diabetes of the European Society of Cardiology (ESC). *Eur. Heart J.* **2023**, *44*, 4043–4140. [CrossRef]
49. McEvoy, J.W.; McCarthy, C.P.; Bruno, R.M.; Brouwers, S.; Canavan, M.D.; Ceconi, C.; Christodorescu, R.M.; Daskalopoulou, S.S.; Ferro, C.J.; Gerdts, E.; et al. 2024 ESC Guidelines for the management of elevated blood pressure and hypertension: Developed by the task force on the management of elevated blood pressure and hypertension of the European Society of Cardiology (ESC) and endorsed by the European Society of Endocrinology (ESE) and the European Stroke Organisation (ESO). *Eur. Heart J.* **2024**, *45*, 3912–4018. [CrossRef]
50. Unger, T.; Borghi, C.; Charchar, F.; Khan, N.A.; Poulter, N.R.; Prabhakaran, D.; Ramirez, A.; Schlaich, M.; Stergiou, G.S.; Tomaszewski, M.; et al. 2020 International Society of Hypertension Global Hypertension Practice Guidelines. *Hypertension* **2020**, *75*, 1334–1357. [CrossRef]
51. GBD 2023 Disease and Injury and Risk Factor Collaborators. Burden of 375 diseases and injuries, risk-attributable burden of 88 risk factors, and healthy life expectancy in 204 countries and territories, including 660 subnational locations, 1990–2023: A systematic analysis for the Global Burden of Disease Study 2023. *Lancet* **2025**, *406*, 1873–1922. [CrossRef] [PubMed]
52. World Bank Group. The Disability-Adjusted Life Year (DALY) Definition, Measurement and Potential Use (English). Available online: https://documents.worldbank.org/en/publication/documents-reports/documentdetail/482351468764408897/the-disability-adjusted-life-year-daly-definition-measurement-and-potential-use (accessed on 20 October 2025).
53. Devleesschauwer, B.; Havelaar, A.H.; Maertens de Noordhout, C.; Haagsma, J.A.; Praet, N.; Dorny, P.; Duchateau, L.; Torgerson, P.R.; Van Oyen, H.; Speybroeck, N. DALY calculation in practice: A stepwise approach. *Int. J. Public Health* **2014**, *59*, 571–574. [CrossRef]
54. Szili-Torok, T.; Xu, Y.; de Borst, M.H.; Bakker, S.J.L.; Tietge, U.J.F. Normal Fasting Triglyceride Levels and Incident Hypertension in Community-Dwelling Individuals Without Metabolic Syndrome. *J. Am. Heart Assoc.* **2023**, *12*, e028372. [CrossRef] [PubMed]
55. Tomita, Y.; Sakata, S.; Arima, H.; Yamato, I.; Ibaraki, A.; Ohtsubo, T.; Matsumura, K.; Fukuhara, M.; Goto, K.; Kitazono, T. Relationship between casual serum triglyceride levels and the development of hypertension in Japanese. *J. Hypertens.* **2021**, *39*, 677–682. [CrossRef] [PubMed]
56. Wang, Y. Triglycerides, Glucose Metabolism, and Type 2 Diabetes. *Int. J. Mol. Sci.* **2025**, *26*, 9910. [CrossRef]
57. Wang, Y. Higher fasting triglyceride predicts higher risks of diabetes mortality in US adults. *Lipids Health Dis.* **2021**, *20*, 181. [CrossRef]
58. Aberra, T.; Peterson, E.D.; Pagidipati, N.J.; Mulder, H.; Wojdyla, D.M.; Philip, S.; Granowitz, C.; Navar, A.M. The association between triglycerides and incident cardiovascular disease: What is "optimal"? *J. Clin. Lipidol.* **2020**, *14*, 438–447.e433. [CrossRef] [PubMed]
59. Scherer, D.J.; Nicholls, S.J. Lowering triglycerides to modify cardiovascular risk: Will icosapent deliver? *Vasc. Health Risk Manag.* **2015**, *11*, 203–209. [CrossRef]
60. Farnier, M.; Zeller, M.; Masson, D.; Cottin, Y. Triglycerides and risk of atherosclerotic cardiovascular disease: An update. *Arch. Cardiovasc. Dis.* **2021**, *114*, 132–139. [CrossRef]
61. Cinezan, C.; Magureanu, D.C.; Hiceag, M.L.; Rus, C.B.; Ilias, I.T.; Bogdan, I.D.; Buzle, A.M.; Cozma, A. Shared Risk Factors and Molecular Mechanisms Between Aortic Stenosis and Atherosclerosis: A Rationale for Therapeutic Repositioning. *Int. J. Mol. Sci.* **2025**, *26*, 8163. [CrossRef] [PubMed]
62. Hsieh, Y.-W.; Lee, A.-S.; Sung, K.-T.; Chen, X.-R.; Lai, H.-H.; Chen, Y.-F.; Chien, C.-Y.; Yeh, H.-I.; Chen, C.-H.; Hung, C.-L. ALDH2 Enzyme Deficiency in Diabetic Cardiomyopathy. *Int. J. Mol. Sci.* **2025**, *26*, 5516. [CrossRef]
63. An, T.; Guo, M.; Wang, Z.; Liu, K. Tissue-Resident Macrophages in Cardiovascular Diseases: Heterogeneity and Therapeutic Potential. *Int. J. Mol. Sci.* **2025**, *26*, 4524. [CrossRef] [PubMed]
64. Yuan, H.-H.; Yin, H.; Marincas, M.; Xie, L.-L.; Bu, L.-L.; Guo, M.-H.; Zheng, X.-L. From DNA Repair to Redox Signaling: The Multifaceted Role of APEX1 (Apurinic/Apyrimidinic Endonuclease 1) in Cardiovascular Health and Disease. *Int. J. Mol. Sci.* **2025**, *26*, 3034. [CrossRef]

65. Wang, Y.; Anesi, J.C.; Panicker, I.S.; Cook, D.; Bista, P.; Fang, Y.; Oqueli, E. Neuroimmune Interactions and Their Role in Immune Cell Trafficking in Cardiovascular Diseases and Cancer. *Int. J. Mol. Sci.* **2025**, *26*, 2553. [CrossRef]
66. Choi, H.Y.; Ruel, I.; Choi, S.; Iatan, I.; Choi, S.; Lee, J.-Y.; Genest, J. Low-Dose Docetaxel Is Effective in Reducing Atherogenic Lipids and Atherosclerosis. *Int. J. Mol. Sci.* **2025**, *26*, 1484. [CrossRef]
67. Shine, B.-K.; Choi, J.-E.; Park, Y.-J.; Hong, K.-W. The Genetic Variants Influencing Hypertension Prevalence Based on the Risk of Insulin Resistance as Assessed Using the Metabolic Score for Insulin Resistance (METS-IR). *Int. J. Mol. Sci.* **2024**, *25*, 12690. [CrossRef]
68. Yafarova, A.A.; Dementeva, E.V.; Zlobovskaya, O.A.; Sheptulina, A.F.; Lopatukhina, E.V.; Timofeev, Y.S.; Glazunova, E.V.; Lyundup, A.V.; Doludin, Y.V.; Kiselev, A.R.; et al. Gut Microbiota and Metabolic Alterations Associated with Heart Failure and Coronary Artery Disease. *Int. J. Mol. Sci.* **2024**, *25*, 11295. [CrossRef]
69. Javaid, A.; Zghyer, F.; Kim, C.; Spaulding, E.M.; Isakadze, N.; Ding, J.; Kargillis, D.; Gao, Y.; Rahman, F.; Brown, D.E.; et al. Medicine 2032: The future of cardiovascular disease prevention with machine learning and digital health technology. *Am. J. Prev. Cardiol.* **2022**, *12*, 100379. [CrossRef]
70. Subramani, S.; Varshney, N.; Anand, M.V.; Soudagar, M.E.M.; Al-Keridis, L.A.; Upadhyay, T.K.; Alshammari, N.; Saeed, M.; Subramanian, K.; Anbarasu, K.; et al. Cardiovascular diseases prediction by machine learning incorporation with deep learning. *Front. Med.* **2023**, *10*, 1150933. [CrossRef]
71. Saba, L.; Maindarkar, M.; Johri, A.M.; Mantella, L.; Laird, J.R.; Khanna, N.N.; Paraskevas, K.I.; Ruzsa, Z.; Kalra, M.K.; Fernandes, J.F.E.; et al. UltraAIGenomics: Artificial Intelligence-Based Cardiovascular Disease Risk Assessment by Fusion of Ultrasound-Based Radiomics and Genomics Features for Preventive, Personalized and Precision Medicine: A Narrative Review. *Rev. Cardiovasc. Med.* **2024**, *25*, 184. [CrossRef]
72. Sethi, Y.; Patel, N.; Kaka, N.; Kaiwan, O.; Kar, J.; Moinuddin, A.; Goel, A.; Chopra, H.; Cavalu, S. Precision Medicine and the future of Cardiovascular Diseases: A Clinically Oriented Comprehensive Review. *J. Clin. Med.* **2023**, *12*, 1799. [CrossRef]
73. Wang, Y.; Fang, Y.; Magliano, D.J.; Charchar, F.J.; Sobey, C.G.; Drummond, G.R.; Golledge, J. Fasting triglycerides are positively associated with cardiovascular mortality risk in people with diabetes. *Cardiovasc. Res.* **2023**, *119*, 826–834. [CrossRef]
74. Filipovic, M.G.; Luedi, M.M. Cardiovascular Biomarkers: Current Status and Future Directions. *Cells* **2023**, *12*, 2647. [CrossRef]
75. van Trier, T.J.; Mohammadnia, N.; Snaterse, M.; Peters, R.J.G.; Jørstad, H.T.; Bax, W.A. Lifestyle management to prevent atherosclerotic cardiovascular disease: Evidence and challenges. *Neth. Heart J.* **2022**, *30*, 3–14. [CrossRef]
76. Kris-Etherton, P.M.; Sapp, P.A.; Riley, T.M.; Davis, K.M.; Hart, T.; Lawler, O. The Dynamic Interplay of Healthy Lifestyle Behaviors for Cardiovascular Health. *Curr. Atheroscler. Rep.* **2022**, *24*, 969–980. [CrossRef] [PubMed]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.