BIBLIOGRAPHIC INFORMATION SYSTEM

Journal Full Title: Journal of Biomedical Research & Environmental Sciences

Journal NLM Abbreviation: J Biomed Res Environ Sci

Journal Website Link: https://www.jelsciences.com

Journal ISSN: 2766-2276

Category: Multidisciplinary

Subject Areas: Medicine Group, Biology Group, General, Environmental Sciences

Topics Summation: 133

Issue Regularity: Monthly

Review Process: Double Blind

Time to Publication: 21 Days

Indexing catalog: IndexCopernicus ICV 2022: 88.03 | GoogleScholar | View more

Publication fee catalog: Visit here

DOI: 10.37871 (CrossRef)

Plagiarism detection software: iThenticate

Managing entity: USA

Language: English

Research work collecting capability: Worldwide

Organized by: SciRes Literature LLC

IndexCopernicus ICV 2022: 83.03

Manuscript should be submitted in Word Document (.doc or .docx) through

Online Submission

form or can be mailed to support@jelsciences.com

Vision: Journal of Biomedical Research & Environmental Sciences main aim is to enhance the importance of science and technology to the scientific community and also to provide an equal opportunity to seek and share ideas to all our researchers and scientists without any barriers to develop their career and helping in their development of discovering the world.

JOURNAL OF BIOMEDICAL RESEARCH & ENVIRONMENTAL SCIENCES
ISSN: 2766-2276
SUBJECT AREA(S): CARDIOVASCULAR DISEASES | CLINICAL CARDIOLOGY | NUTRITION | THERAPEUTICS
DOI: 10.37871

PERSPECTIVE ARTICLE

Harnessing Nutrition to Prevent Coronary Recoil in Drug-Coated Balloon Angioplasty: Insights from Bethsaida Hospital

Dasaad Mulijono[1-3]*

[1]Department of Cardiology, Bethsaida Hospital, Tangerang, Indonesia
[2]Indonesian College of Lifestyle Medicine, Indonesia
[3]Department of Cardiology, Faculty of Medicine, Prima University, Medan, Indonesia

Abstract

The success of Drug-Coated Balloon (DCB) angioplasty hinges critically on effectively preventing coronary artery recoil, an acute elastic response that threatens procedural efficacy and long-term vessel patency. While technical approaches remain foundational, emerging evidence reveals dietary intervention as a pivotal, yet significantly undervalued strategy. At Bethsaida Hospital, under the visionary leadership of Prof. Dasaad Mulijono, implementing a whole-food, plant-based dietary regimen before DCB procedures has profoundly decreased acute recoil incidence. Remarkably, this dietary approach has yielded a restenosis rate of only 2%, marking one of the lowest recorded outcomes in Indonesia. Such compelling data underscore the potential of dietary modification, particularly emphasizing foods rich in Nitric Oxide (NO) precursors and antioxidants, as a potentially revolutionary adjunctive therapy in interventional cardiology. Given these provocative findings, further rigorous investigations are urgently required to confirm the robustness and broad applicability of these transformative dietary interventions.

Introduction

DCB angioplasty represents an innovative, minimally invasive procedure increasingly adopted in contemporary cardiovascular care for the treatment of Coronary Artery Disease (CAD). At the same time, DCB techniques offer substantial advantages, including reduced stent-related complications and favourable long-term outcomes; however, challenges such as acute elastic recoil persist, compromising procedural success and vessel patency. Acute recoil refers to the immediate, elastic response of the arterial wall following balloon deflation, which can potentially lead to suboptimal lumen expansion and an increased risk of restenosis [1-7].

Traditionally, procedural and pharmacological measures—such as meticulous lesion preparation, optimal balloon sizing, and the use of adjunctive pharmacotherapy—have dominated clinical strategies aimed at preventing recoil [8-10]. However, recent clinical insights suggest that dietary intervention, especially the incorporation of foods rich in NO precursors and antioxidants, presents an innovative and powerful approach to mitigating this issue. NO, a crucial vasodilator produced

***Corresponding author(s)**

Dasaad Mulijono, Department of Cardiology, Bethsaida Hospital, Tangerang, Indonesia

Email: mulijonodasaad@yahoo.com

DOI: 10.37871/jbres2158

Submitted: 26 June 2025

Accepted: 10 August 2025

Published: 11 August 2025

Keywords

- Coronary recoil
- Drug-coated balloon
- Angioplasty
- Dietary intervention
- Vasodilation
- Nitric oxide
- Whole-food plant-based diet
- Endothelial function
- Bethsaida hospital
- Prof. Dasaad Mulijono

Scan Me

How to cite this article: Mulijono D. Harnessing Nutrition to Prevent Coronary Recoil in Drug-Coated Balloon Angioplasty: Insights from Bethsaida Hospital. J Biomed Res Environ Sci. 2025 Aug 11; 6(8): 1026-1032. doi: 10.37871/jbres2158, Article ID: JBRES2158, Available at: https://www.jelsciences.com/articles/jbres2158.pdf

endogenously within endothelial cells, facilitates arterial relaxation, decreases vascular resistance, and contributes significantly to arterial compliance. Enhancing endothelial NO bioavailability through diet can condition coronary vessels, improving their responsiveness to angioplasty-induced mechanical stress [11-18].

At Bethsaida Hospital, pioneering efforts led by Prof. Dasaad Mulijono have integrated comprehensive, Whole-Food Plant-Based Diet (WFPBD) interventions as an integral part of patient preparation for DCB angioplasty. Preliminary outcomes from this strategy have demonstrated remarkable success, significantly reducing acute recoil episodes and achieving one of the lowest restenosis rates in the region. This article explores the underlying mechanisms and clinical implications of dietary interventions in preventing coronary recoil, highlighting the need for broader recognition and further research into this promising adjunctive therapy.

General Strategies for Preventing Acute Recoil

Preventing coronary artery recoil following DCB angioplasty is crucial to ensure optimal vessel patency and achieve the best clinical outcomes. Here are strategies commonly employed:

Adequate lesion preparation [19-21];

- **Predilatation:** Use of semi-compliant or non-compliant balloons to prepare lesions effectively.
- **Scoring or Cutting Balloons:** Enhances lesion compliance and reduces elastic recoil by creating controlled dissections.

Proper balloon sizing and inflation [20,22-23];

- **Appropriate Balloon Diameter:** Choose balloons matched carefully to the vessel diameter, typically a balloon-to-artery ratio between 1.0 to 1.1.
- **Inflation Pressure and Duration:** Inflating the balloon at adequate pressures (typically around 10–14 atm) and sustaining inflation for at least 30–60 seconds helps stabilize plaque modifications and drug delivery.

Use of DCBs with effective drug formulation [24-27];

- **Paclitaxel-coated balloons:** Paclitaxel stabilizes vascular remodelling, reduces smooth muscle cell proliferation, and may indirectly limit recoil through enhanced vascular healing.

Imaging guidance [28-31];

- **Intravascular Ultrasound (IVUS) or Optical Coherence Tomography (OCT):** These imaging modalities help optimize balloon sizing, accurately assess the lesion, and ensure sufficient plaque modification and dilation.

Adjunctive pharmacological therapy [32-34];

- **Vasodilators:** Intracoronary nitro-glycerine administered before balloon angioplasty reduces coronary spasm and acute recoil.
- **Calcium Channel Blockers:** Intracoronary calcium channel blockers can help prevent vessel spasm and recoil.

Meticulous technique [10,35-37];

- Slow and controlled balloon inflation and deflation minimize trauma and recoil.

Avoidance of overstretching [38-40];

- Excessive dilation or high-pressure inflation may cause overstretch injury and subsequently lead to recoil.

Combination strategies [41-45];

- In challenging lesions (heavy calcification, fibrosis, or elastic plaques), use combined lesion preparation techniques, such as rotational atherectomy or orbital atherectomy and intravascular lithotripsy (IVL), before DCB application.

Post-procedural medical management [46-48];

- Dual Antiplatelet Therapy (DAPT) and optimization of lipid profile and inflammation reduction (statins, ezetimibe, or PCSK9 inhibitors).
- Lifestyle intervention, notably a WFPBD, which reduces inflammation and promotes vessel healing.

Patient's mood stabilization [49-51];

- Psychological stabilization (e.g., music therapy during the procedure) has been hypothesized to help minimize vasospasm and acute recoil by reducing sympathetic stress response.

Dietary Mechanisms Preventing Coronary Recoil

The vasodilatory effect of dietary interventions is primarily mediated through NO, a potent endogenous vasodilator that plays a crucial role in maintaining vascular health. Leafy greens and beets contain nitrates, converted in vivo to NO, relaxing coronary arteries and reducing vasospasm and recoil risk. Garlic's active compound allicin further augments endothelial NO production. Similarly, polyphenols in dark chocolate, berries, and pomegranates significantly enhance endothelial function, stabilize arterial walls, and reduce oxidative stress, contributing directly to minimizing recoil. Citrulline from watermelon is converted to arginine, a precursor to NO, bolstering arterial dilation. Curcumin in turmeric and catechins in green tea also potentiate NO synthesis, providing additional vascular protective effects. Please refer to table 1.

The integration of these dietary components before angioplasty can condition the endothelium, improve vascular compliance, and mitigate acute elastic recoil, ultimately enhancing short- and long-term procedural outcomes.

Clinical Experience at Bethsaida Hospital

At Bethsaida Hospital, under the leadership of Prof. Dasaad Mulijono, we have established a comprehensive, multidisciplinary approach for patients undergoing DCB angioplasty. This includes meticulous lesion preparation employing semi-compliant or non-compliant balloon predilatation and scoring or cutting balloons to enhance lesion compliance and reduce elastic recoil mechanically. Pharmacologically, intracoronary vasodilators, such as nitro-glycerine and calcium channel blockers, are routinely used to minimize vasospasm and reduce the risk of recoil. Additionally, we integrate advanced imaging techniques, including IVUS and OCT, to optimize balloon sizing, lesion assessment, and plaque modification.

Crucially, our approach emphasizes dietary interventions with a structured WFPBD regimen initiated before the procedure. This dietary preparation has significantly contributed to a marked reduction in acute recoil episodes compared to patients maintaining conventional diets. Remarkably, this holistic approach has yielded a restenosis rate of as low as 2%, one of the lowest rates recorded nationally. Although these clinical outcomes are highly encouraging, further comprehensive and controlled studies are necessary to solidify and expand upon these findings.

Clinical Implications and Recommendations

Prioritizing dietary interventions as part of the preparation for DCB angioplasty has the potential to transform procedural outcomes. A carefully structured pre-procedural diet incorporating nitrate-rich vegetables, polyphenol-dense fruits, omega-3 seeds, and antioxidant-rich teas can significantly reduce recoil events. Coupled with traditional procedural techniques such as adequate lesion preparation and optimal balloon sizing, dietary approaches provide a comprehensive strategy to enhance clinical results.

Limitations and Barriers in Adopting Whole-Food Plant-Based Diets

Despite growing scientific support for Whole-Food Plant-Based Diets (WFPBDs) in preventing and reversing chronic diseases, several limitations and barriers hinder their widespread adoption. Culturally, many populations—especially in meat-centric societies—associate health and status with animal-based foods, making the transition to a plant-based lifestyle a socially challenging endeavor. Economically, although plant-based staples like

Table 1: Food that mitigates acute recoil post-DCB angioplasty.

FOOD	Examples and Active Components	Vascular Effects or Mechanism
Leafy Green Vegetables	Spinach, kale, Swiss chard (rich in nitrates)	Nitrates are converted into NO, a potent vasodilator.
Beets	High nitrate content	Enhancing NO production causes vasodilation and improves endothelial function.
Garlic	Allicin and Sulphur compounds	Increases endothelial NO production and reduces vascular resistance
Dark Chocolate/ Cocoa	Flavonoids (epicatechin)	Increase NO bioavailability
Berries	Strawberries, blueberries, raspberries. Active compounds: anthocyanins and flavonoids	Boosts NO synthesis, reduces arterial stiffness, and improves endothelial function
Pomegranates	Rich in antioxidants and polyphenols	Stimulates NO production, leading to vasodilatation and reducing vascular inflammation.
Watermelon	Citrulline is converted to arginine	Enhances oxidative stress and supports NO production, resulting in vasodilatation
Turmeric	Curcumin	Enhances endothelial function, reduces oxidative stress, supports NO production, resulting in vasodilatation
Green Tea	Catechins (epigallocatechin gallate, EGCG)	Improves endothelial function, increases NO, and reduces vascular inflammation
Omega-3 Rich Seeds	Flaxseeds, Chia seeds, hemp seeds	Omega-3 fatty acids support endothelial function and enhance NO availability
Citrus Fruits	Oranges, grapefruits, lemons (active component is vitamin C and flavonoids)	Enhances endothelial NO production and improves vascular health

legumes and grains are affordable, the perception that healthy plant-based eating is expensive persists, primarily when influenced by commercialized vegan products. Knowledge gaps among healthcare providers further exacerbate the problem, as most medical education lacks robust training in nutrition, leading to limited guidance and support for patients. Additionally, psychological dependence on comfort foods and emotional eating often ties individuals to high-fat, sugary, or animal-derived meals. Accessibility to diverse and appealing plant-based options remains another hurdle in regions with limited availability or culinary innovation. Lastly, misinformation propagated through media, industry lobbying, or anecdotal counterexamples can distort public perception, delaying acceptance and trust in evidence-based plant-based nutrition. Overcoming these barriers requires systemic education, supportive environments, and culturally sensitive approaches [52-55].

Conclusion

Dietary interventions rich in vasodilatory and antioxidant-rich foods represent a vital yet underrecognized strategy in interventional cardiology, particularly in preventing coronary recoil post-DCB angioplasty. Bethsaida Hospital's experience demonstrates the substantial benefits achievable by integrating a meticulously structured WFPBD regimen alongside advanced mechanical and pharmacological approaches. Such holistic interventions can significantly reduce acute recoil events, substantially lower restenosis rates, and improve overall vessel patency and patient outcomes. Encouraging broader adoption of these comprehensive dietary strategies within the cardiovascular community is essential. Further rigorous, controlled studies are warranted to conclusively validate these promising results and facilitate the integration of nutritional interventions as standard practice in angioplasty procedures, reinforcing the critical importance of lifestyle medicine in cardiovascular care.

Author Contributions

D.M.; Conceptualization, writing, review, and editing.

Funding

This research received no external funding.

Institutional Review Board Statement

Not applicable.

Informed Consent Statement

Not applicable.

Data Availability Statement

Data are contained within the article.

Conflict of Interest

The authors declare no conflict of interest.

References

1. Muramatsu T, Kozuma K, Tanabe K, Morino Y, Ako J, Nakamura S, Yamaji K, Kohsaka S, Amano T, Kobayashi Y, Ikari Y, Kadota K, Nakamura M; Task Force of the Japanese Association of Cardiovascular Intervention, Therapeutics (CVIT). Clinical expert consensus document on drug-coated balloon for coronary artery disease from the Japanese Association of Cardiovascular Intervention and Therapeutics. Cardiovasc Interv Ther. 2023 Apr;38(2):166-176. doi: 10.1007/s12928-023-00921-2. Epub 2023 Feb 27. PMID: 36847902; PMCID: PMC10020262.
2. Korjian S, McCarthy KJ, Larnard EA, Cutlip DE, McEntegart MB, Kirtane AJ, Yeh RW. Drug-Coated Balloons in the Management of Coronary Artery Disease. Circ Cardiovasc Interv. 2024 May;17(5):e013302. doi: 10.1161/CIRCINTERVENTIONS.123.013302. Epub 2024 May 21. PMID: 38771909..
3. Lazar FL, Onea HL, Olinic DM, Cortese B. A 2024 scientific update on the clinical performance of drug-coated balloons. AsiaIntervention. 2024 Feb 29;10(1):15-25. doi: 10.4244/AIJ-D-23-00010. PMID: 38425817; PMCID: PMC10900242.
4. Camaj A, Leone PP, Colombo A, Vinayak M, Stone GW, Mehran R, Dangas G, Kini A, Sharma SK. Drug-Coated Balloons for the Treatment of Coronary Artery Disease: A Review. JAMA Cardiol. 2025 Feb 1;10(2):189-198. doi: 10.1001/jamacardio.2024.4244. PMID: 39714903.
5. Expert Writing Committee of the Chinese Expert Consensus on Clinical Applications of Drug-Coated Balloon (2nd Edition); Ge JB, Chen YD. Chinese expert consensus on the clinical application of drug-coated balloon (2nd Edition). J Geriatr Cardiol. 2024 Feb 28;21(2):135-152. doi: 10.26599/1671-5411.2024.02.001. PMID: 38544494; PMCID: PMC10964015.
6. Wang L, Li X, Li T, Liu L, Wang H, Wang C. Novel application of drug-coated balloons in coronary heart disease: A narrative review. Front Cardiovasc Med. 2023 Mar 2;10:1055274. doi: 10.3389/fcvm.2023.1055274. PMID: 36937937; PMCID: PMC10017483.
7. Kundu A, Moliterno DJ. Drug-Coated Balloons for In-Stent Restenosis-Finally Leaving Nothing Behind for US Patients. JAMA. 2024 Mar 26;331(12):1011-1012. doi: 10.1001/jama.2024.0813. PMID: 38460158.
8. Tervo J, Kärkkäinen JM, Rissanen TT. Technical success, clinical efficacy, and insight into the causes of restenosis after the percutaneous coronary intervention of de novo coronary artery lesions using a paclitaxel-coated balloon with citrate ester excipient. Front Cardiovasc Med. 2022 Oct 31;9:1012473. doi: 10.3389/fcvm.2022.1012473. PMID: 36386336; PMCID: PMC9662788.
9. Yamamoto T, Ishii T, Ishida A. Impact of post physiological assessment after treatment for de novo coronary lesions using drug-coated balloons. Int J Cardiol. 2022 Sep 15;363:11-19. doi: 10.1016/j.ijcard.2022.06.009. Epub 2022 Jun 6. PMID: 35680055.
10. Marchetta M, Sasso S, Paragliola V, Maffi V, Chiricolo G, Massaro G, Russo G, Benedetto D, Muscoli S, Colonna G, Mandurino-Mirizzi A, Cortese B, Sangiorgi GM, Andò G. Leaving Nothing Behind: Expanding the Clinical Frontiers of Drug-Coated Balloon Angioplasty in Coronary Artery Disease. J Cardiovasc Dev Dis. 2025 May 5;12(5):176. doi: 10.3390/jcdd12050176. PMID: 40422946; PMCID: PMC12112498.
11. Rafieian-Kopaei M, Setorki M, Doudi M, Baradaran A, Nasri H. Atherosclerosis: process, indicators, risk factors and new hopes. Int J Prev Med. 2014 Aug;5(8):927-46. PMID: 25489440; PMCID: PMC4258672.
12. Gusev E, Sarapultsev A. Atherosclerosis and Inflammation: Insights from the Theory of General Pathological Processes. Int J Mol Sci. 2023 Apr 26;24(9):7910. doi: 10.3390/ijms24097910. PMID: 37175617; PMCID: PMC10178362.
13. Ornish D, Scherwitz LW, Billings JH, Brown SE, Gould KL, Merritt TA, Sparler S, Armstrong WT, Ports TA, Kirkeeide RL, Hogeboom C, Brand RJ. Intensive lifestyle changes for reversal of coronary heart disease. JAMA. 1998 Dec 16;280(23):2001-7. doi: 10.1001/jama.280.23.2001. Erratum in: JAMA 1999 Apr 21;281(15):1380. PMID: 9863851.
14. Esselstyn CB Jr, Gendy G, Doyle J, Golubic M, Roizen MF. A way to reverse CAD? J Fam Pract. 2014 Jul;63(7):356-364b. PMID: 25198208.
15. Tuso P, Stoll SR, Li WW. A plant-based diet, atherogenesis, and coronary artery disease prevention. Perm J. 2015 Winter;19(1):62-7. doi: 10.7812/TPP/14-036. Epub 2014 Nov 24. PMID: 25431999; PMCID: PMC4315380.
16. Mehta P, Tawfeeq S, Padte S, Sunasra R, Desai H, Surani S, Kashyap R. Plant-based diet and its effect on coronary artery disease: A narrative review. World J Clin Cases. 2023 Jul 16;11(20):4752-4762. doi: 10.12998/wjcc.v11.i20.4752. PMID: 37583985; PMCID: PMC10424050.
17. Peña-Jorquera H, Cid-Jofré V, Landaeta-Díaz L, Petermann-Rocha F, Martorell M, Zbinden-Foncea H, Ferrari G, Jorquera-Aguilera C, Cristi-Montero C. Plant-Based Nutrition: Exploring Health Benefits for Atherosclerosis, Chronic Diseases, and Metabolic Syndrome-A Comprehensive Review. Nutrients. 2023 Jul 21;15(14):3244. doi: 10.3390/nu15143244. PMID: 37513660; PMCID: PMC10386413.
18. Salehin S, Rasmussen P, Mai S, Mushtaq M, Agarwal M, Hasan SM, Salehin S, Raja M, Gilani S, Khalife WI. Plant Based Diet and Its Effect on Cardiovascular Disease. Int J Environ Res Public Health. 2023 Feb 14;20(4):3337. doi: 10.3390/ijerph20043337. PMID: 36834032; PMCID: PMC9963093.

19. Shin ES, Ann SH, Jang MH, Kim B, Kim TH, Sohn CB, Choi BJ. Impact of Scoring Balloon Angioplasty on Lesion Preparation for DCB Treatment of Coronary Lesions. J Clin Med. 2023 Sep 28;12(19):6254. doi: 10.3390/jcm12196254. PMID: 37834898; PMCID: PMC10573989.

20. Bonaventura K, Schwefer M, Yusof AKM, Waliszewski M, Krackhardt F, Steen P, Ocaranza R, Zuhdi AS, Bang LH, Graf K, Böck U, Chin K. Systematic Scoring Balloon Lesion Preparation for Drug-Coated Balloon Angioplasty in Clinical Routine: Results of the PASSWORD Observational Study. Adv Ther. 2020 May;37(5):2210-2223. doi: 10.1007/s12325-020-01320-2. Epub 2020 Apr 9. PMID: 32274746; PMCID: PMC7467461.

21. Uskela S, Eranti A, Kärkkäinen JM, Rissanen TT. Drug-coated balloon-only strategy for percutaneous coronary intervention of de novo left main coronary artery disease: the importance of proper lesion preparation. Front Med. 2023 Feb;17(1):75-84. doi: 10.1007/s11684-022-0950-1. Epub 2022 Dec 23. PMID: 36562952.

22. Ueno K, Morita N, Kojima Y, Kondo H, Takahashi H, Minatoguchi S, Higuchi S, Ando Y, Esaki M. Efficacy of Low-Pressure Inflation of Oversized Drug-Coated Balloon for Coronary Artery Disease. J Interv Cardiol. 2020 Dec 27;2020:6615988. doi: 10.1155/2020/6615988. PMID: 33447166; PMCID: PMC7781681.

23. Arslani K, Jeger R. Drug-coated Balloons for Small Coronary Disease-A Literature Review. Curr Cardiol Rep. 2021 Oct 14;23(11):173. doi: 10.1007/s11886-021-01586-0. PMID: 34648080; PMCID: PMC8516758.

24. Shin D, Singh M, Shlofmitz E, Scheller B, Latib A, Kandzari DE, Zaman A, Mylotte D, Dakroub A, Malik S, Sakai K, Jeremias A, Moses JW, Shlofmitz RA, Stone GW, Ali ZA. Paclitaxel-coated versus sirolimus-coated balloon angioplasty for coronary artery disease: A systematic review and meta-analysis. Catheter Cardiovasc Interv. 2024 Sep;104(3):425-436. doi: 10.1002/ccd.31154. Epub 2024 Jul 24. PMID: 39044661.

25. Cortese B, Caiazzo G, Di Palma G, De Rosa S. Comparison Between Sirolimus- and Paclitaxel-Coated Balloon for Revascularization of Coronary Arteries: The SIRPAC (SIRolimus-PAClitaxel) Study. Cardiovasc Revasc Med. 2021 Jul;28:1-6. doi: 10.1016/j.carrev.2021.04.013. Epub 2021 Apr 17. PMID: 33888418; PMCID: PMC8373518.

26. Zhou Y, Hu Y, Zhao X, Chen Z, Li C, Ma L, Liu Z, Zhou H, Zang X, Zhang X, Zhang G, Cui Z, Liu Y, Han S, Wu L, Shi H, Jiang J, Qian J, Lu H, Ge J. Sirolimus-coated versus paclitaxel-coated balloons for bifurcated coronary lesions in the side branch: the SPACIOUS trial. EuroIntervention. 2025 Mar 17;21(6):e307-e317. doi: 10.4244/EIJ-D-24-00742. PMID: 40091874; PMCID: PMC11891925.

27. Scheller B, Mangner N, Jeger RV, Afan S, Mahfoud F, Woitek FJ, Fahrni G, Schwenke C, Schnorr B, Kleber F. A randomised trial of sirolimus- versus paclitaxel-coated balloons for de novo coronary lesions. EuroIntervention. 2024 Nov 4;20(21):e1322-e1329. doi: 10.4244/EIJ-D-23-00868. PMID: 39492703; PMCID: PMC11522860.

28. Liu Y, Zhang B, Lv H, Zhu Y, Zhou X, Zhu H, Guo L. Drug-Coated Balloon for de-novo Coronary Artery Lesions Exceeding 2.5 mm in Diameter: Optical Coherence Tomography Analysis and Clinical Follow-Up. Int J Gen Med. 2024 Jan 22;17:225-236. doi: 10.2147/IJGM.S451329. PMID: 38283074; PMCID: PMC10812136.

29. Gao XF, Ge Z, Kong XQ, Chen X, Han L, Qian XS, Zuo GF, Wang ZM, Wang J, Song JX, Lin L, Pan T, Ye F, Wang Y, Zhang JJ, Chen SL; ULTIMATE Ⅱ Investigators. Intravascular Ultrasound vs Angiography-Guided Drug-Coated Balloon Angioplasty: The ULTIMATE Ⅱ Trial. JACC Cardiovasc Interv. 2024 Jul 8;17(13):1519-1528. doi: 10.1016/j.jcin.2024.04.014. Epub 2024 Jun 5. PMID: 38842991.

30. Alfonso F, Kundu A. Intracoronary Imaging to Guide Drug-Coated Balloon Angioplasty: Ready for Primetime? JACC Cardiovasc Interv. 2024 Jul 8;17(13):1529-1532. doi: 10.1016/j.jcin.2024.04.024. Epub 2024 Jun 5. PMID: 38842996.

31. Alfonso F, Cortese B. Is intravascular ultrasound needed to optimize drug-coated balloon angioplasty results? Eur Heart J. 2024 Nov 8;45(42):4542-4543. doi: 10.1093/eurheartj/ehae621. PMID: 39319641.

32. Kawai T, Watanabe T, Yamada T, Morita T, Furukawa Y, Tamaki S, Kawasaki M, Kikuchi A, Seo M, Nakamura J, Tachibana K, Kida H, Sotomi Y, Sakata Y, Fukunami M. Coronary vasomotion after treatment with drug-coated balloons or drug-eluting stents: a prospective, open-label, single-centre randomised trial. EuroIntervention. 2022 Jun 3;18(2):e140-e148. doi: 10.4244/EIJ-D-21-00636. PMID: 34757917; PMCID: PMC9904379.

33. Arita Y, Fukui T, Ogasawara N. Slow-flow phenomenon after drug-coated balloon angioplasty for lower-extremity arteries is associated with lack of prescribing of calcium channel blockers. Indian Heart J. 2023 Jan-Feb;75(1):82-85. doi: 10.1016/j.ihj.2023.01.005. Epub 2023 Jan 10. PMID: 36638886; PMCID: PMC9986730.

34. Her AY, Kim B, Ahn SH, Park Y, Cho JR, Jeong YH, Shin ES. Long-Term Clinical Outcomes of Drug-Coated Balloon Treatment for De Novo Coronary Lesions. Yonsei Med J. 2023 Jun;64(6):359-365. doi: 10.3349/ymj.2022.0633. PMID: 37226562; PMCID: PMC10232998.

35. Basavarajaiah S, Kalkat H, Bhatia G, Cortese B. How to perform a successful drug-coated balloon angioplasty? Tips and tricks. Catheter Cardiovasc Interv. 2023 Dec;102(7):1238-1257. doi: 10.1002/ccd.30851. Epub 2023 Nov 10. PMID: 37948409.

36. Mullasari SA, Subban V. Drug-coated balloons - a promising technology that needs more understanding! AsiaIntervention. 2025 Mar 20;11(1):12-13. doi: 10.4244/AIJ-E-25-00001. PMID: 40114737; PMCID: PMC11905107.

37. Kim S, Kang DO, Her AY, Song WH, Shin ES. Drug-coated balloon-based percutaneous coronary intervention in de novo coronary artery disease and tips for procedural success. J Cardiovasc Interv. 2024;3(4):190-198.

38. Her AY, Shin ES, Bang LH, Nuruddin AA, Tang Q, Hsieh IC, Hsu JC,

Kiam OT, Qiu C, Qian J, Ahmad WAW, Ali RM. Drug-coated balloon treatment in coronary artery disease: Recommendations from an Asia-Pacific Consensus Group. Cardiol J. 2021;28(1):136-149. doi: 10.5603/CJ.a2019.0093. Epub 2019 Sep 30. PMID: 31565793; PMCID: PMC8105061.

39. Rosenberg M, Waliszewski M, Krackhardt F, Chin K, Wan Ahmad WA, Caramanno G, Milazzo D, Nuruddin AA, Liew HB, Maskon O, Bento A, Macia JC, Frey N. Drug Coated Balloon-Only Strategy in De Novo Lesions of Large Coronary Vessels. J Interv Cardiol. 2019 Feb 3;2019:6548696. doi: 10.1155/2019/6548696. PMID: 31772539; PMCID: PMC6739788.

40. Sato Y, Kuntz SH, Surve D, Jinnouchi H, Sakamoto A, Cornelissen A, Virmani R, Kolodgie F, Finn AV. What are the Pathological Concerns and Limitations of Current Drug-coated Balloon Technology? Heart Int. 2019 Oct 11;13(1):15-22. doi: 10.17925/HI.2019.13.1.15. PMID: 36275500; PMCID: PMC9524611.

41. Florek K, Bartoszewska E, Biegała S, Klimek O, Malcharczyk B, Kübler P. Rotational Atherectomy, Orbital Atherectomy, and Intravascular Lithotripsy Comparison for Calcified Coronary Lesions. J Clin Med. 2023 Nov 23;12(23):7246. doi: 10.3390/jcm12237246. PMID: 38068298; PMCID: PMC10707420.

42. Allan M, Vickers D, Pitney M, Jepson N. Rotational Atherectomy Combined with Drug Coated-Balloons for in-Stent Restenosis. Cardiovasc Revasc Med. 2019 Jul;20(7):559-562. doi: 10.1016/j.carrev.2018.08.019. Epub 2018 Aug 25. PMID: 30217627.

43. Umeh CA, Kaur H, Paknoosh S, Ganjian B, Samreen I, Rainee K, Cheng M, Rastogi A, Gupta R. Intravascular lithotripsy in coronary arteries: a review of case reports. Egypt Heart J. 2024 Sep 7;76(1):121. doi: 10.1186/s43044-024-00555-6. PMID: 39243292; PMCID: PMC11380655.

44. Mitsui K, Lee T, Miyazaki R, Hara N, Nagamine S, Nakamura T, Terui M, Okata S, Nagase M, Nitta G, Watanabe K, Kaneko M, Nagata Y, Nozato T, Ashikaga T. Drug-coated balloon strategy following orbital atherectomy for calcified coronary artery compared with drug-eluting stent: One-year outcomes and optical coherence tomography assessment. Catheter Cardiovasc Interv. 2023 Jul;102(1):11-17. doi: 10.1002/ccd.30689. Epub 2023 May 20. PMID: 37210618.

45. Zhao Y, Wang P, Zheng Z, Shi Y, Liu J. Comparison of intravascular lithotripsy versus rotational atherectomy for the treatment of severe coronary artery calcification. BMC Cardiovasc Disord. 2024 Jun 19;24(1):311. doi: 10.1186/s12872-024-03965-1. PMID: 38898393; PMCID: PMC11186212.

46. Corballis NH, Wickramarachchi U, Vassiliou VS, Eccleshall SC. Duration of dual antiplatelet therapy in elective drug-coated balloon angioplasty. Catheter Cardiovasc Interv. 2020 Nov;96(5):1016-1020. doi: 10.1002/ccd.28632. Epub 2019 Dec 4. PMID: 31797532.

47. Zhang Y, Zhang X, Dong Q, Chen D, Xu Y, Jiang J. Duration of Dual Antiplatelet Therapy After Implantation of Drug-Coated Balloon. Front Cardiovasc Med. 2021 Dec 1;8:762391. doi: 10.3389/fcvm.2021.762391. PMID: 34926613; PMCID: PMC8671702.

48. Gao C, Zhu B, Ouyang F, Wen S, Xu Y, Jia W, Yang P, He Y, Zhong Y, Zhou Y, Guo Z, Shen G, Ma L, Xu L, Xue Y, Hu T, Wang Q, Liu Y, Zhang R, Liu J, Jiang Z, Xia J, Garg S, van Geuns RJ, Capodanno D, Onuma Y, Wang D, Serruys P, Tao L; REC-CAGEFREE II Investigators. Stepwise dual antiplatelet therapy de-escalation in patients after drug coated balloon angioplasty (REC-CAGEFREE II): multicentre, randomised, open label, assessor blind, non-inferiority trial. BMJ. 2025 Mar 31;388:e082945. doi: 10.1136/bmj-2024-082945. Erratum in: BMJ. 2025 Apr 8;389:r694. doi: 10.1136/bmj.r694. PMID: 40164448; PMCID: PMC11955879.

49. Chlan L. Effectiveness of a music therapy intervention on relaxation and anxiety for patients receiving ventilatory assistance. Heart Lung. 1998 May-Jun;27(3):169-76. doi: 10.1016/s0147-9563(98)90004-8. PMID: 9622403.

50. Bensimon M, Shaul S, Div S, Sandler L, Teitelbaum A. Patient-centered Approach in Closed Psychiatric Wards: The Curative Power of Relaxing Music Chosen by Patients. Isr J Psychiatry. 2018;55(2):52-57. PMID: 30351282.

51. Hanser SB. Music therapy in cardiac health care: current issues in research. Cardiol Rev. 2014 Jan-Feb;22(1):37-42. doi: 10.1097/CRD.0b013e318291c5fc. PMID: 23535529.

52. Rickerby A, Green R. Barriers to Adopting a Plant-Based Diet in High-Income Countries: A Systematic Review. Nutrients. 2024 Mar 14;16(6):823. doi: 10.3390/nu16060823. PMID: 38542734; PMCID: PMC10975979.

53. Viroli G, Kalmpourtzidou A, Cena H. Exploring Benefits and Barriers of Plant-Based Diets: Health, Environmental Impact, Food Accessibility and Acceptability. Nutrients. 2023 Nov 8;15(22):4723. doi: 10.3390/nu15224723. PMID: 38004117; PMCID: PMC10675717.

54. Alcorta A, Porta A, Tárrega A, Alvarez MD, Vaquero MP. Foods for Plant-Based Diets: Challenges and Innovations. Foods. 2021 Feb 1;10(2):293. doi: 10.3390/foods10020293. PMID: 33535684; PMCID: PMC7912826.

55. Fehér A, Gazdecki M, Véha M, Szakály M, Szakály Z. A comprehensive review of the benefits of and the barriers to the switch to a plant-based diet. Sustainability. 2020;12:4136.