

Perspective Article

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Prof. Dasaad Mulijono: Pioneering the Use of Artificial Intelligence in Clinical Cardiology and Plant-Based Nutrition in Indonesia

Dasaad Mulijono*

Department of Cardiology, Bethsaida Hospital, Tangerang, Indonesia

***Corresponding author:** Dasaad Mulijono, Department of Cardiology,
Bethsaida Hospital, Tangerang, Indonesia

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Abstract

In an era defined by digital disruption and rising chronic disease burdens, Prof. Dasaad Mulijono stands as a transformative figure reshaping clinical cardiology through an unprecedented fusion of artificial intelligence (AI) and whole-food plant-based diet (WFPBD). At Bethsaida Hospital, Indonesia, Prof. Dasaad has engineered a paradigm shift—moving from reactive, procedure-heavy care to a predictive, precision-driven model that addresses the root causes of cardiovascular disease. This article documents how he operationalizes AI across the full continuum of care: from machine learning-guided risk stratification and intra-procedural decision support to post-intervention lifestyle optimization via NLP-powered coaching and real-time biomarker analytics.

His AI framework, integrated with advanced dietary protocols, enables not only disease management but also measurable regression of atherosclerosis and prevention of restenosis. Key innovations include neural network-based imaging interpretation, probabilistic decision modeling, AI-powered nutrition education, and litigation-proof documentation systems that enhance both clinical excellence and medico-legal defensibility. His approach leverages technology not to replace clinical intuition but to amplify compassion, standardize outcomes, and democratize high-quality care across resource-limited settings.

Prof. Dasaad's model is not a concept—it is a living, breathing clinical ecosystem where TMAO, nitric oxide (NO), computed tomography coronary angiography (CTCA), wearable data, and patient-reported outcomes converge in a digitally intelligent feedback loop. His pioneering work redefines what's possible in 21st-century cardiology: intelligent, integrative, cost-effective, and patient-empowering. In a world where cardiovascular disease remains the leading killer and healthcare inequality persists, his blueprint is both revolutionary and replicable. This is not just the future of cardiology—it is a moral imperative for global health systems still entrenched in outdated, expensive, and ethically fragile paradigms.

Keywords: Artificial Intelligence, Natural Language Processing, Clinical Decision Support Systems, Interventional Cardiology, Whole-Food Plant-Based Diet, Biomarker Analysis, Predictive Modelling, Litigation Risk Management, Digital Health, Bethsaida Hospital, Prof. Dasaad Mulijono, Indonesia

Introduction

Cardiovascular diseases (CVDs) account for nearly 18 million deaths globally each year, representing the leading cause of

mortality in both high- and low-income countries [1,2]. This burden is compounded by the prevalence of modifiable risk factors, particularly poor dietary patterns, sedentary lifestyles, and chronic

stress, which are often under-addressed in conventional cardiology. While significant advances have been made in interventional tools such as drug-coated balloons, drug-eluting stents, intravascular imaging (IVUS and OCT), and advanced pharmacotherapy, these technologies do not address the root causes of atherosclerosis and vascular dysfunction. Recurrent events, restenosis, and disease progression are still common, especially in patients who do not achieve significant lifestyle changes post-procedure [3-6].

To confront this challenge, Prof. Dasaad Mulijono has developed a dual-pronged strategy at Bethsaida Hospital in Indonesia: reversing the underlying pathology through structured plant-based dietary interventions and leveraging AI to guide, personalize, and optimize clinical decisions and interventional strategies. This model extends beyond symptom management to target the root of pathophysiology, utilizing state-of-the-art computational tools to ensure precision, predictability, and safety. AI is applied throughout Prof. Dasaad's practice - from patient intake and risk stratification to procedural planning, intraoperative guidance, post-procedural monitoring, lifestyle coaching, and long-term outcome prediction [7-11]. In addition to enhancing clinical performance and outcomes, AI provides robust medico-legal documentation and audit trails, which reduce litigation risks - a growing concern in modern medical practice [12-14]. His model serves as a blueprint for integrating AI within cardiology, not as a replacement for clinical judgment, but as a powerful augmentation of compassionate care, evidence-based medicine, and health system accountability. It presents an ethically grounded, technologically sophisticated, and clinically effective vision of 21st-century cardiology practice, particularly applicable to developing countries aiming to leapfrog traditional healthcare barriers using digital innovation.

Precision Lifestyle Medicine: AI-Guided WFPBD Care

At Bethsaida Hospital, Prof. Dasaad Mulijono has implemented a comprehensive WFPBD program aimed at addressing a broad spectrum of cardiometabolic conditions, including metabolic syndrome, obesity, type 2 diabetes, hypertension, hyperlipidaemia, coronary artery disease, and restenosis prevention [15-27]. The integration of AI significantly enhances the effectiveness of this lifestyle medicine model through multiple innovative layers:

Behavioural Prediction Models: Supervised machine learning algorithms - such as decision trees and random forests - are employed to forecast patient adherence by analysing patterns in dietary compliance, socioeconomic background, and psychographic profiling.

Personalized Meal Planning: AI systems trained on nutrient-density databases and individual metabolic parameters generate personalized meal plans tailored to each patient. These plans are continuously refined using real-time clinical data, including laboratory results and wearable-derived metrics such as heart rate variability and sleep quality.

24/7 Chatbot Coaching via NLP: An AI-powered chatbot acts as a continuous lifestyle support system, using NLP to detect patient

emotions and motivational cues. It delivers customized responses and escalates cases when necessary, enhancing patient engagement and adherence outside the clinic.

AI-Guided Biomarker Monitoring: An AI engine processes longitudinal tracking of biomarkers - particularly TMAO and NO - to evaluate biological responses and dietary compliance. These findings are triangulated with imaging data from CTCA, invasive coronary angiography, and clinical indicators to assess the progress of disease reversal.

AI in Interventional Cardiology: Procedural Precision through Data

In procedural cardiology, AI is integrated into multiple phases [28-36]:

Pre-Procedure Risk Stratification:

- Prof. Dasaad employs Bayesian networks and logistic regression models trained on a dataset of over 10,000 patients to assign probability scores for adverse outcomes (e.g., stent thrombosis, restenosis, periprocedural MI).
- These models help clinicians and patients decide whether to proceed with interventions based on quantified benefits vs. risk profiles.

Procedure Planning Support:

- AI offers case-based reasoning (CBR) through procedural simulation platforms. Given angiographic images and patient-specific hemodynamics, the system recommends the access site, balloon/stent selection, and sequence based on past successful cases with similar characteristics.
- Automated QCA (Quantitative Coronary Analysis) tools enhanced by convolutional neural networks (CNNs) interpret angiograms in real time, offering accurate lesion morphology and length calculations.

Intra-Procedural Monitoring:

- AI-integrated software assists pressure wire interpretation (FFR/iFR) by filtering noise and refining lesion significance.
- Predictive algorithms alert teams to hemodynamic instability or arrhythmogenic risks based on real-time vital data.

Clinical Decision-Making and Medicolegal Protection

AI functions as an objective arbiter in complex decision scenarios [12-14]:

CDSS Integration:

- A custom-built AI-CDSS developed in collaboration with data scientists integrates with the hospital's electronic health record (EHR). It provides clinicians with real-time suggestions based on guidelines from the American College of Cardiology

(ACC) and the European Society of Cardiology (ESC).

- b) Each recommendation is traceable and stored, documenting every decision.

Litigation Risk Reduction:

- a) In a litigious climate, Prof. Dasaad documents AI-supported decisions to demonstrate adherence to evidence-based practices.
- b) In adverse outcomes, algorithmic support and recorded probability scoring provide transparency, reduce biased claims, and support ethical decision-making.

Future Directions: The Road Ahead for AI in Cardiology

Prof. Dasaad envisions an even deeper integration of AI into daily cardiology practice [28-36]:

Real-Time AI Augmentation in Cath Lab:

- a) Augmented reality overlays powered by AI will guide

wire placement, stent deployment, and the management of complications.

- b) AI-powered robotic assistance for high-precision movements in complex percutaneous coronary intervention (PCI) cases.

Population-Level Prediction Tools:

- a) Predictive models that combine environmental, behavioural, genetic, and economic data to identify at-risk populations before disease onset.

AI-Powered Education Platforms:

- a) Continuous learning modules for junior cardiologists and nurses, with real-time case simulation and feedback using AI tutors.

Global Health Integration:

- a) Scalable, cloud-based AI models for remote hospitals with limited specialists, using telecardiology platforms enhanced by machine learning diagnostic assistance.



Figure 1

Conclusion

Prof. Dasaad Mulijono sets a new benchmark for global cardiovascular care by integrating AI with root-cause-based, lifestyle-focused medicine. His approach does not merely treat the manifestations of cardiovascular disease. Still, it directly addresses its etiological foundation - primarily diet and metabolic dysfunction - while harnessing AI's precision and scalability to optimize every level of clinical care. Through AI-powered predictive analytics, risk

stratification, real-time procedural guidance, and post-intervention lifestyle monitoring, Prof. Dasaad has created a closed-loop, data-driven ecosystem for cardiac care. Each patient benefits from personalized treatment plans informed by continuously updated datasets. At the same time, the clinical team is supported by intelligent systems that standardize decision-making, minimize errors, and document each step for auditability and medicolegal safety.

This hybrid model is particularly transformative for resource-constrained healthcare systems. Deploying scalable, cloud-based AI solutions and plant-based interventions that require minimal infrastructure empowers hospitals and clinicians in developing regions to achieve outcomes comparable to, or even exceeding, those in high-income countries. Moreover, this model re-centres the patient as an active agent of healing, guided by technology that supports rather than replaces human empathy and clinical wisdom. It shifts cardiology from a reactive, high-cost paradigm to a proactive, cost-effective, and ethically grounded discipline. The future of cardiology is not merely digital - it is intelligent, integrative, preventive, patient-centred, and legally secure. Through his pioneering work at Bethsaida Hospital, Prof. Dasaad Mulijono proves that this future is not theoretical - it is actionable, replicable, and urgently needed. His model offers a blueprint for what cardiology can be and what it must become in an era of growing chronic disease and global health disparities.

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