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Historical reviews

# The history and future of cardiology: from the heartbeats of the past to the challenges of the future

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The history and future of cardiology: the pulses of the past and the challenges of the future

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**SUMMARY**

This article concisely addresses the history of cardiology as one of the most dynamic and transformative branches of medicine, tracing its origins back to antiquity. It presents the case of Cuba and the development of this specialty in the province of Granma, primarily in Bayamo and Manzanillo. Special emphasis is placed on the advances in science and technology and the importance of training professionals in this field.

**Keywords:** History of medicine; Cardiology; Cardiovascular diagnostic techniques; Medical education.

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**ABSTRACT**

This article concisely addresses the history of cardiology as one of the most dynamic and transformative branches of medicine, referring to its history dating back to ancient times. It presents the case of Cuba and the development of this specialty in the province of Granma, primarily in Bayamo and Manzanillo. Special emphasis is placed on the advances in science and technology and the importance of training professionals in this field.

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## Introduction

Cardiology, one of the most dynamic and transformative branches of medicine, has come a long

way from its first anatomical descriptions to becoming a highly technological and multidisciplinary specialty. Its history is also the history of medical progress: the transition from the empirical observation of the pulse to the comprehensive understanding of the electrical, structural, and molecular mechanisms of the heart. (1)

The origins of cardiology can be traced back to antiquity. In Egypt and Greece, the importance of the heart as a vital center was recognized, although it was attributed more philosophical and spiritual than physiological functions. It was William Harvey, in 1628, who revolutionized medicine with his description of blood circulation, establishing the foundations of modern cardiovascular physiology. Subsequently, Marey's discoveries regarding blood pressure, Riva-Rocci's invention of the sphygmomanometer, and Einthoven's introduction of the electrocardiogram at the beginning of the 20th century marked milestones that allowed for the formal birth of cardiology as a clinical discipline. (2)

## Development

In Latin America, and particularly in Cuba, cardiology was consolidated during the first half of the 20th century, driven by pioneering figures who promoted the formation of specialized services and university education. On September 11, 1937, they founded the Cuban Society of Cardiology, followed by the establishment of the Institute of Cardiology and Cardiovascular Surgery in 1966, under the direction of Professor Alberto Hernández Cañero, considered the father of Cuban cardiology. From this institution, the integration of clinical care, teaching, and research was promoted, training generations of cardiologists who extended specialized care to all provinces. (3)

Since then, provincial cardiology services, such as those at the Celia Sánchez Manduley Provincial Clinical Surgical Hospital in Manzanillo and the Carlos Manuel de Céspedes Provincial General Hospital in Bayamo, have made a decisive contribution to the early diagnosis, timely treatment

and follow-up of cardiovascular diseases in the community.

Over the last few decades, cardiology has undergone a technological and conceptual revolution. The introduction of multimodality in cardiac imaging allows for a more precise assessment of the heart's function, structure, and perfusion. Three-dimensional echocardiography, cardiac computed tomography, and, above all, cardiac magnetic resonance imaging have become indispensable tools for the diagnosis of structural, ischemic, and infiltrative heart disease, providing valuable prognostic information. (4)

The introduction of percutaneous transluminal angioplasty marked a turning point in the management of ischemic heart disease. This technique revolutionized the treatment of acute myocardial infarction and coronary artery disease, reducing mortality and improving patients' quality of life. Its application is not limited to acute rescue but is integrated into preventive strategies, prognosis optimization, and is complemented by drug-eluting stents and antithrombotic therapies, within a modern, multimodal approach. (5)

In addition to the above, new techniques for studying myocardial strain allow the detection of subclinical alterations in contractility and accurately predict early ventricular dysfunction, which constitutes an invaluable prognostic tool in the evaluation of patients at risk of cardiotoxicity, ischemia, or cardiomyopathies. (6)

In parallel, modern electrophysiology has reached an extraordinary level of development. Implantable pacemakers and automatic defibrillators revolutionized the prevention of sudden death and the management of complex arrhythmias, while advanced radiofrequency ablation or cryotherapy techniques, guided by three-dimensional mapping systems, have made it possible to cure or control rhythm disorders with a precision unimaginable just a few decades ago. (7)

Today, the specialty faces new challenges: population aging, the epidemic of metabolic diseases, the interaction between the heart and other organs in conditions such as kidney failure or cancer, and the need to incorporate artificial intelligence and personalized medicine into clinical decision-making. These transformations demand an integrative and ethical vision that preserves the

humanistic essence of the cardiologist amidst the increasing technicality of medical practice. (8)

These innovations demand a new generation of cardiologists. The new specialists must be well-rounded professionals, with expertise in clinical practice, technology, and research, capable of interpreting images, performing complex procedures, managing implantable devices, and, at the same time, maintaining a humane and empathetic relationship with the patient. The training of this 21st-century cardiologist requires a solid scientific foundation, critical thinking, communication skills, and a commitment to public health. (9)

In Cuba, the aforementioned advances are being gradually assimilated, thanks to the dedication of our professionals and the institutional effort to maintain continuous updating and postgraduate training. Despite limitations in technological and economic infrastructure, the Cuban health system has managed to sustain modern cardiology, based on prevention, equity, and professional excellence. (10)

Looking to the future, cardiology is projected to become increasingly integrated between basic science, clinical practice, and genomics; between biology and genetic engineering; and between prevention and therapeutic innovation. Artificial intelligence applied to cardiac imaging, telecardiology, predictive risk models, and the rise of cardio-oncology promise an even more precise, preventive, and personalized specialty.

## Final considerations

The history of Cuban cardiology is, in short, a story of vocation, science, and service. Every new technology, every incorporated technique, every cardiologist trained, represents another step in the defense of life. The future of the specialty will depend on our ability to maintain the balance between scientific advancement and the humanistic essence that has always distinguished Cuban cardiologists: serving the heart, from the heart.

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## Conflict of interest

The author declares that there are no financial, personal, or professional conflicts of interest that may have influenced the performance or interpretation of the results of this study.

## Authorship contribution

Conceptualization:Luis German Ramirez Dominguez.

Formal analysis:Luis German Ramirez Dominguez.

Investigation:Luis German Ramirez Dominguez

Writing – review and editing:Luis German Ramirez Dominguez

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