

# Cardiovascular Disease in Children: The Future Is Now

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Cardiovascular disease is a leading cause of morbidity and mortality worldwide [1], and an increasing body of evidence underscores the importance of foetal and paediatric programming for cardiovascular health and disease [1–3]. Fortunately, in recent years, the field of paediatric cardiology has witnessed an impressive increase in diagnostic and therapeutic possibilities.

A branch of paediatric cardiology deals with anatomical malformations and, with this respect, several advancements have emerged. First, following the major progresses in paediatric cardiac surgery in the second half of the last century [4], a plethora of interventional techniques have been established to efficiently address several structural problems without the need for open cardiac surgery and extracardiac circulation [4]. Second, recognising that perioperative survival is nowadays a quality criterium rather than an “achievement”, we now face the challenge of addressing middle- and long-term survival and morbidity, aiming at bringing this “congenital heart disease population” into their eighties in excellent health. This shifts the main focus of research from operative techniques to perioperative management and long-term continuous care, while requiring a thorough physiological, systemic paediatric and pharmacological understanding [5]. Third, novel echocardiographic techniques and progresses in cardiac MRI nowadays allow better assessment of systolic and diastolic function, synchrony, tissue characterisation and flow measurements, thus permitting detailed anatomical and functional assessments and, potentially, a more granular, personalised therapy.

A series of functional conditions is going to demand cardiological attention in the years to come. Genetic advances have opened new perspectives in the understanding of cardiomyopathies, rhythm disorders and blood vessel diseases. Pharmacological and interventional approaches, as well as pacemaker devices, are offering improved therapies to arrhythmias. Recent developments, including ABO-incompatible transplantation, donation after circulatory death, personalised immunosuppression and efforts in better understanding coronary allograft vasculopathy are advancing the field of heart transplantation. Recent, promising progresses in the pharmacotherapy of adult heart failure are going to be studied in children. In addition to strict cardiac conditions, such as myocarditis, pericarditis, cardiomyopathies or pulmonary hypertension, cardiovascular involvement in nephrological, oncological, haematological, neuromuscular, respiratory and metabolic (including diabetes mellitus) diseases is increasingly recognised [1,6]. The SARS-CoV-2 pandemic and the paediatric inflammatory multisystem syndrome are just recent examples of this “systemic nature” of contemporary paediatric cardiology. Furthermore, we are continuously raising our attention to cardiovascular health, from foetal life into adulthood [1,2]: perinatal conditioning, arterial hypertension, hypercholesterolemia, endothelial function and vascular health of solid-organ transplant recipients represent main challenges that need to be addressed [1–3,6].



Citation: Lava, S.A.G.

Cardiovascular Disease in Children: The Future Is Now. *Children* **2023**, *10*, 886. <https://doi.org/10.3390/children10050886>

Received: 6 May 2023

Accepted: 11 May 2023

Published: 15 May 2023



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In this Special Issue, dedicated to “Cardiovascular Disease in Children”, we are covering some of these aspects. From middle-term outcomes after anatomical surgery [7]; through application of percutaneous interventional techniques in rare paediatric syndromes [8]; vasovagal syncope [9]; the role of neonatal therapeutic hypothermia on QTc interval prolongation [10]; to echocardiography applications and perspectives [11,12]; inflammatory conditions such as Kawasaki disease in young infants and children [13] and multisystem inflammatory syndrome [12,14]; prevalence variations in arterial hypertension around the COVID-19 pandemic [15]; up to the exciting field of vascular health and cardiovascular biomarkers [16,17], we are inviting you on an inspiring journey.

**Funding:** This research received no external funding.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** Not applicable.

**Acknowledgments:** Sebastiano A. G. Lava is the current recipient of research grants from the Fonds de perfectionnement, Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland; Fondation SICPA, Prilly, Switzerland; Fondazione Ettore Balli, Bellinzona, Switzerland; Fondazione per il bambino malato della Svizzera italiana, Bellinzona, Switzerland; and Frieda Locher-Hofmann Stiftung, Zürich, Switzerland.

**Conflicts of Interest:** The author declares no conflict of interest with respect to this manuscript.

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