

**Heart University and Children's HeartLink  
Pediatric and Congenital Cardiac Care in Resource-Limited Settings  
Lecture Series**

**1. Need**

While congenital heart disease tends to have similar birth prevalence, its burden is higher in low-resource areas compared to that in high-income countries. Advances in pediatric cardiac services have made survival and good long-term outcomes for most children born with CHD a distinct achievement in recent years. Yet, thousands of children born in lower-resourced settings do not have access to these services, resulting in early mortality and morbidity because they often present late and frequently suffer from poor nutrition, infections, and other comorbidities, which present challenges to their treatment not present in high-income countries. In addition, the relatively higher investment that is needed in training pediatric cardiac specialists, development of infrastructure and access to medicines, supplies and equipment, has prevented many countries from developing these vital services, which makes them inaccessible to most.

- 2. Goal:** To develop a series of lectures focused on the specifics and challenges of management of pediatric and congenital heart disease in resource-limited settings that can supplement pediatric and congenital cardiac education around the world.

**3. Audience**

- Trainees in pediatric cardiology, pediatric cardiac surgery, intensive care
- General cardiologists with an interest in pediatric cardiology
- Pediatricians involved in care of children with heart disease.

- 4. Format of lectures:** 45-60 minutes recordings with a short lecture followed by Q and A and discussion between speaker(s) and moderator and specific objectives detailed for each topic.

**5. Editorial Board:**

- RK Kumar
- Justin Tretter
- Jonathan Windram
- Bistra Zheleva
- Geetha Kandavello
- Sandra Matos
- Babar Hasan
- Liesl Zuhlke
- Gillian Henry
- Mark Lewin
- Craig Sable
- Preeti Ramachandran
- Colin McMahon

## 6. Topics and Learning objectives

Talks marked in Asterisk have already been recorded and are available on [HeartUniversity.org](http://HeartUniversity.org).

Lecture topic	Learning Objectives
1. Introduction*	<ol style="list-style-type: none"> <li>1. Why is there a need for separate content for low-resource settings?               <ol style="list-style-type: none"> <li>a. Burden of Pediatric heart disease in low-and middle-income countries (LMICs)?</li> <li>b. Health system challenges and resource constraints?</li> <li>c. Pediatric heart disease profile in LMICs</li> </ol> </li> <li>2. Target audience: Who will benefit and why?</li> <li>3. How is the LMIC content going to be organized in this module?</li> </ol>
2. General principles of delivering care with limited resources*	<ol style="list-style-type: none"> <li>1. To systematically introduce the concept that delivering pediatric heart care in the face of resource limitations</li> <li>2. Examine the challenges and suggest solutions</li> <li>3. Specific examples of innovation and success stories</li> </ol>
3. Global Burden of Pediatric Heart Disease	<ol style="list-style-type: none"> <li>1. Introduction to the Global Burden of Disease study</li> <li>2. Methodology and caveats in the data</li> <li>3. Global burden estimates of major categories of pediatric heart disease               <ul style="list-style-type: none"> <li>• CHD</li> <li>• RHD</li> <li>• Kawasaki Disease and other conditions</li> </ul> </li> </ol>
4. Late Presentation in CHD 1: Pulmonary Hypertension*	<ul style="list-style-type: none"> <li>• Background and conceptual framework</li> <li>• Operability in CHD-PAH: Principles and guidelines</li> <li>• Case Studies</li> </ul>
5. Eisenmenger Syndrome*	<ul style="list-style-type: none"> <li>• Definition and core concepts</li> <li>• Diagnostic Evaluation</li> <li>• Management Principles</li> </ul>
6. Late presentation in CHD 2: cyanotic heart disease*	<ul style="list-style-type: none"> <li>• Epidemiological background</li> <li>• Neurological and neurodevelopmental consequences of chronic hypoxia</li> <li>• Cardiac consequences of long-standing hypoxia</li> <li>• Erythrocytosis and its effects on other organ systems</li> <li>• Management challenges of late presenting cyanotic heart disease and suggested solutions</li> <li>• Illustrative case studies</li> </ul>

7. Late Presentation in CHD 3: newborn heart disease	<ul style="list-style-type: none"> <li>• Epidemiological background: Why do neonates present late?</li> <li>• Duct dependent systemic circulation: Specific challenges from reduced organ perfusion</li> <li>• Cyanotic conditions: Impact of hypoxic insults</li> <li>• Specific challenges with late presenting transposition</li> <li>• Illustrative case studies</li> </ul>
8. Late presentation in CHD 4: Adults with CHD in resource-limited settings	<ul style="list-style-type: none"> <li>• Who constitutes Adult CHD / GUCH in low resource economies</li> <li>• What are key challenges?</li> <li>• How should we approach them?</li> <li>• How can a dedicated multidisciplinary ACHD service be established given the resource constraints?</li> </ul>
9. Common comorbidities: Undernutrition and Infections	<ul style="list-style-type: none"> <li>• Problem statement (prevalence, severity, special features)</li> <li>• Impact on congenital heart surgery outcomes</li> <li>• Approach to specific challenges</li> <li>• Case studies</li> </ul>
10. Rheumatic Heart Disease-I*	<ul style="list-style-type: none"> <li>• Etiology and Pathogenesis</li> <li>• Contemporary Epidemiology</li> <li>• Diagnosis: The Revised Jones criteria</li> <li>• Illustrative case examples and Vignettes of RF</li> </ul>
11. Rheumatic Heart Disease-II*	<ul style="list-style-type: none"> <li>• RHD: Pathology and Echocardiographic Correlates</li> <li>• Management Principles of RHD</li> <li>• Prevention of RF and RHD</li> <li>• Global Challenges</li> </ul>
12. Multidisciplinary teamwork and the role of pediatric cardiologist on a multidisciplinary team	<ul style="list-style-type: none"> <li>• Constituents of the modern pediatric heart team</li> <li>• General principles of working together in a multidisciplinary team</li> <li>• Ensuring effective communication among team members Barriers to cohesive team dynamics and specific strategies</li> </ul>
13. Catheter interventions with limited resources	<ul style="list-style-type: none"> <li>• Why are catheter procedures expensive? What are the elements that increase costs</li> <li>• Specific strategies that enable cost reduction while ensuring patient safety</li> </ul>
14. Pediatric heart surgery in resource-limited settings	<ul style="list-style-type: none"> <li>• Core principles: Patient selection, reducing cost of consumables; strategies in OR; Fast tracking</li> <li>• Specific challenges in implementing cost reduction strategies</li> </ul>
15. Establishing a pediatric cardiac intensive care unit in resource-limited settings	<ul style="list-style-type: none"> <li>• The need for a dedicated PCICU</li> <li>• Physical structure</li> <li>• Infrastructure and equipment</li> <li>• Personnel</li> <li>• Systems</li> <li>• Sustainability</li> </ul>

16. Developing formal training pathways for pediatric cardiac professionals in resource-limited settings	<ul style="list-style-type: none"> <li>• Expected attributes</li> <li>• Structure of the training program</li> <li>• Required theoretical foundation</li> <li>• Essential practical skills</li> <li>• Mentorship after completion of training</li> </ul>
a. Cardiac Surgery	
b. Pediatric Cardiology	
c. Intensive Care	
17. Health System Challenges in pediatric Cardiac care in resource-limited settings	<ul style="list-style-type: none"> <li>• Care continuum of congenital and rheumatic heart diseases</li> <li>• Specific limitations at every level</li> <li>• Interventions that work</li> <li>• Case studies</li> </ul>
18. Developing a national/regional newborn CHD screening program	<ul style="list-style-type: none"> <li>• Rationale</li> <li>• Screening modalities: Strengths and limitations</li> <li>• Specific challenges and potential solutions</li> </ul>
19. Integrating pediatric heart care into models of universal health coverage	<ul style="list-style-type: none"> <li>• Rationale</li> <li>• Essential elements</li> <li>• Challenges in delivering pediatric heart care under the framework of UHC</li> <li>• Lessons from the Sri Lankan and Kerala Experience</li> </ul>
20. Sustainability in Pediatric Cardiac Care: A global challenge	<p>Most significant threats to sustaining quality and numbers</p> <ul style="list-style-type: none"> <li>• Antibiotic resistance</li> <li>• Availability of Key Professionals <ul style="list-style-type: none"> <li>• Nursing</li> <li>• Intensivists</li> <li>• Surgeons</li> </ul> </li> <li>• Economic viability <ul style="list-style-type: none"> <li>• Rising costs of care</li> <li>• Poor compensation from public insurance</li> </ul> </li> </ul> <p>Extent of the problem and specific solutions</p> <ul style="list-style-type: none"> <li>• Barriers to research</li> <li>• Developing a culture that encourages research</li> <li>• Building robust systems within institution</li> <li>• Multi institutional databases</li> <li>• Building research networks for multicenter studies</li> </ul>
21. Developing Research Capacity in resource-limited settings	
22. Innovative solutions to challenges of practicing in resource-limited settings	<p>Principles that govern successful, scalable and sustainable innovations</p> <p>Lessons from illustrative case studies</p>