**NH PEDIATRIC CARDIOLOGY FELLOWSHIP PROGRAM FOR FOREIGN NATIONALS**

NH Health City, in Bengaluru, India, is one of the largest and busiest Paediatric Cardiology Centers in the world.

We perform an average of 2500 Paediatric Open Heart Surgeries and 2000 catheter based interventions per year. The pediatric cardiac ICU has 84 beds and ECMO is performed for about 50-70 cases a year.

**Student eligiblity criteria is MD in Paediatrics / DNB or DM in Adult Cardiology or any other equivalent degree recognised by NMC from any other country.**

**The duration of course is minimum of 18 months.**

**The fellowship in Paediatric Cardiology will involve training / rotation in:**

1. Assessment of Paediatric Cardiology patients on Outpatient and Inpatient basis, with emphasis on detailed cardiovascular examination and differential diagnosis based on clinical examinations.

2. Training in transthoracic Echocardiography, for both Paediatric and adult congenital heart disease patients.

3. Training in Transesophageal echo, in outpatient setting, as well intraoperatively.

4. Understanding basics of Fetal Echo and antenatal counselling.

5. Reading ECGs systematically, reporting ECG and understanding basics of arrhythmia.

6. Managing patients on inpatient basis in postoperative cardiothoracic surgery patients and cardiac intervention patients.

7. Learning management of critical cardiac patients including postoperative cardiothoracic surgery patients, during rotations in Paediatric Cardiac Intensive Care. Understanding fundamentals of ECMO.

8. Observing management of patients Pre- and post- cardiac transplant.

9. Learning Management of special conditions such as Pulmonary hypertension and Heart failure.

10. Developing a basic understanding of and performing cardiac catheterization and Electrophysiology.

11. Learning basics of interpretation of Cardiac CT/MRI.

12. Participating in Academic activities and Research.

All of the above will be under the supervision of our Senior Consultants.

We have 9 Paediatric Cardiology Consultants and 6 Intensive Care and Four Cardiothoracic Surgical Consultants.

**PAEDIATRIC CARDIOLOGY OUTPATIENTS**

The Paediatric Outpatient is run 6 days a week and, on an average, we see 60-100 patients daily. This involves both new patients and follow up patients.

The fellows are expected to see all the new patients and take a detailed history and do a thorough cardiac examination. They will need to then document all of this in our digital system.

They are also taught about approach to these patients and plan baseline investigations and have differential diagnosis based on history and clinical examination.

They are then encouraged to follow up these patients and see them along with the Consultants to further clarify the diagnosis and learn about management.

They are taught interpreting the ECG and chest x-ray.

**INPATIENTS and ICU:**

The Paediatric Cardiac Intensive Care unit is one of the largest ICU Departments in the world. We have 84 critical care beds, 40 High dependency Care Beds. We also do 50-70 ECMO/year. During the rotation, they are taught about managing preoperative and postoperative patients in detail. They have to attend ward Rounds on a daily basis and manage ICU patients with Consultant support.

They learn in detail regarding ventilation/inotropes/ cardiac medications/ ICU echocardiography/ temporary pacemaker management etc. They are also taught about basics of ECMO circuit and management of patients on ECMO.

The units has 120 ward Beds. The fellows have to attend daily morning and afternoon ward Rounds, perform a thorough handover and discharge summaries for these patients.

They are expected to recognize emergencies, manage patients with chest drains and temporary pacing etc.

There also involved in arranging and managing the Multidisciplinary Team Meetings for some of these patients which are essential.

**ECHOCARDIOGRAPHY:**

We do 70-100 Paediatric/Adult Congenital heart disease echocardiography echocardiograms on a daily basis.

They have regular rotations in our Paediatric and Adult Congenital Echocardiography units.

They learn regarding the basics of echocardiography (sequential segmental approach) in Paediatric Cardiology patients and about performing adult echocardiography, which involves regional wall motion etc.

They learn to diagnose complex congenital heart defects, in both new and follow up patients. They have a very good exposure to adult congenital heart disease patients and to follow-up Paediatric Cardiology Patients.

They are also involved in doing on-call echocardiography for presurgical patients, performing echocardiography in postoperative cardiac and catheter-based procedures.

**ADVANNCED IMAGING (Foetal/3D & 4D/ Strain imaging / TEE)**

* FOETAL: The candidates are encouraged to attend foetal echocardiography which is done on a daily basis in our Foetal Medicine unit. This will help them in understanding the basics of foetal echocardiography and, more importantly, counselling these patients. They also learn regarding management of these patients especially as it requires Team work involving Obstetricians and gynaecologists/neonatologists etc. Interested candidates are encouraged to apply for non-invasive fellowship in our center if they want to learn further.
* 3D/4D and STRAIN imaging: Advanced imaging is performed on a daily basis and they are expected to learn bubble contrast echocardiography and strain imaging. Interested candidates are also encouraged to do advanced 3D/4D echocardiography.
* TEE: 10-15 TEE’s are done on daily basis. They get to learn (Hands on training) basics of transoesophageal echocardiography both in our Outpatient department and during their postings in Cardiac Catheter Lab/ and surgical postings.

**CARDIAC CATHETERISATION and INTERVENTIONS:**

We perform approximately 2000 Cardiac catheter based procedures per year.

This includes diagnostic cardiac catheterisation for complex congenital heart disease, Paediatric cardiac interventions including ASD/VSD/PDA device closures, balloon valvuloplasty etc.

They also get exposure to adult congenital heart disease, cardiac catheterisation and intervention, including structural intervention such as percutaneous pulmonary valve implantations , stenting of SVC, RVOT or PDA, reverse Pott shunt, Atrial Flow Regulator etc., and Hybrid procedures such as perventricular VSD device closure or interventional Fontan completion.

**ELECTROPHYSIOLOGY/PACING:**

Our Paediatric unit has two dedicated Paediatric/Adult Congenital Electrophysiologists.

Electrophysiology study and radiofrequency ablation, including 3D, is performed in Paediatric and Adult Congenital heart disease patients. They are expected to know basics of electrophysiology and cardiac conduction/arrhythmias.

The candidates are also taught about pacemakers (indications, selection of appropriate pacemaker, types of pacemaker and leads etc).

The candidates are encouraged to learn about ICDs and CRT therapies which is done on a routine basis in Paediatric and Adult Patients.

**SURGERY:**

We have a busy Surgical Programme and do 2500 Paediatric/adult congenital heart disease surgeries a year.

 Cardiac surgeries include high RACHS category surgeries, surgeries for newborns and those weighing < 5 kg, and Cardiac Transplants.

The training exposes them to Pre and post operative Surgical Care, intraoperative transoesophageal echocardiography etc.

**CT/MRI:**

250 CT and MRI are done per month in Paediatric and ACHD patients.

They also have rotations in CT/MRI department and are taught to identify cardiac structures and do basic interpretation of CT.

**HEART FAILURE and TRANSPLANT**

The unit has a specialist Heart Failure and Cardiac Transplant Team.

We perform nearly 15 Paediatric/Adult Congenital transplantations a year. They get to attend Heart Failure Clinics, Transplant Multidisciplinary Team Meetings etc.

They are encouraged to learn about pre-transplant assessment, post-transplant management etc.

**PULMONARY HYPERTENSION**

We have a dedicated Pulmonary hypertension team including respiratory / rheumatology consultants etc. They are encouraged to attend our Multidisciplinary Team Meetings and be involved in management of pulmonary hypertension patients in ward and Outpatients.

They get to learn regarding pharmacological management including advanced therapies such as percutaneous reverse Pott's shunt, AFR device and heart lung transplantation.

**ACAEDEMICS and RESEARCH:**

Weekly classes are conducted on echocardiography / clinical case discussion / cath. Meetings. They are expected to attend all of these and present cases. There is monthly Mortality Meeting, which is mandatory.

They are also supposed to attend and present in Journal club meetings, which are done fortnightly.

They have plenty of research opportunities at our high-volume center and thesis guides are happy to support them.

**COMMUNICATION / COUNSELLING**

* Taking consent for cardiac catheterisations, high risk admissions etc
* Tackling angry/agitated relatives
* Counselling of relatives of critically ill patients
* Breaking bad news.
* Attend counselling for organ donation with our Transplant Team

**PAEDIATRIC CARDIOLOGY TEAM**

1. **DR SHREESHA MAIYA** - Head of the department, Paediatric and Adult congenital Cardiologist, ELectrophysiologist.
2. **DR SURESH P V,** Consultant Pediatric & Adult Cardiologist
3. **Dr PRAKASH R,** Consultant Pediatric & Adult Congenital Cardiologist
4. **Dr SATHEESH S**, Pediatric/Adult Congenital Interventional Cardiologist
5. **Dr ATUL SURENDRA PRABHU**, Interventional Pediatric/Adult Congenital and Electrophysiologist
6. **DR SHASHIRAJ** , Consultant Pediatric Cardiologist/Clinical Lead for Heart Failure and Transplantation/Pulmonary Hypertension
7. **DR KIRAN V S,** Consultant Pediatric Cardiologist and Specialized in Advanced Echocardiography
8. **Dr MOHANTY SWETA HARISH**, Pediatric Cardiologist and Specialized in Advanced Echocardiography and Fetal Echocardiography
9. **DR DEEPIKA T**, Pediatric Cardiologist and Specialized in Advanced Echocardiography and Fetal Echocardiography.