- **Syllabus**

- *FETAL CIRCULATION & CHANGES AFTER BIRTH*
  OBJECTIVE
  Understand physiology of fetal circulation, normal values and the clinical relevance to neonatal surgery and preoperative management.

KNOWLEDGE
Physiology of fetal circulation and changes at birth

Normal values in neonatal life
Manipulation of neonatal circulation in congenital heart disease Diagnosis and Management of Persistent Fetal Circulation

CLINICAL SKILLS

Stabilisation of the newborn with congenital heart disease

Interpretation of echo findings
Manipulation of the newborn circulation on the PICU Management of Persistent Fetal Circulation

NEONATAL AND INFANT PHYSIOLOGY

Understand fundamental neonatal physiology and the differences from older children and adults

KNOWLEDGE
Biochemical, Haematological and immunological Characteristics

Normal circulatory physiology (values, volumes etc) Nutritional and thermoregulatory requirements Neurodevelopment and brain protection Changes in all the above during infancy Pharmacology in neonates and infants

CLINICAL SKILLS
Interpretation of clinical signs and lab tests

Stabilisation of the newborn circulation 3 4 Safe prescribing, drug dosing and infusion rates 3 4

PAEDIATRIC INTENSIVE CARE

OBJECTIVE

To have a broad understanding of the differences between paediatric and adult intensive care. Understand the principles of PICU management in congenital heart disease.

KNOWLEDGE
Differences between paediatric and adult intensive care

Stabilisation of the sick child
Ventilation of neonates and children
Invasive and non-invasive monitoring
Management of fluid balance and nutrition including TPN Pharmacology
Resuscitation of neonates and children

CLINICAL SKILLS

Indications and referral to PICU

Stabilisation of the sick child
Interpretation of invasive monitoring
Basic Life Support – neonates and children
Fluid management, nutrition and prescribing Management of parents and families in the PICU

TECHNICAL SKILLS

Arterial and central venous access

Intercostal drainage
Peritoneal dialysis
Emergency chest opening post-op

MORPHOLOGY AND SEQUENTIAL SEGMENTAL ANALYSIS

OBJECTIVE

Comprehensive understanding of the morphology of congenital heart disease and the principle of sequential segmental analysis

KNOWLEDGE
Detailed anatomy of the normal heart

Morphology of congenital heart disease Principal of Sequential Segmental Analysis Concepts of isomerism, situs and topology

CLINICAL SKILLS

Application of morphology and classification in the interpretation of echo, angiography and CT/MRI

RISK STRATIFICATION AND DATA COLLECTION

OBJECTIVE

Understand risk stratification systems in congenital heart disease, national requirements for data collection, validation and quality assurance.

KNOWLEDGE Minimum data sets.

Nationally collected and reported data
Common risk assessment systems – RACHS and ARISTOTLE Problems of risk stratification in congenital heart disease Standard setting, quality assurance systems and mechanisms

of managing poor performance

CLINICAL SKILLS
Familiarity with data collection systems

Interpretation of risk Interpretation of CUSUM analysis

ATRIAL SEPTAL DEFECTS

OBJECTIVE

To diagnose, treat and manage atrial septal defects in children, including all aspects of operative repair.

KNOWLEDGE
Anatomy of the atrial septum

Classification of septal defects and associated lesions
Physiological implications of septal defects
Natural history and complications

Indications for surgical and interventional defect repair
Current methods for surgical repair including techniques for sinus venous defects, management of bilateral SVC, unroofed SVC and coronary sinus defects. Minimally invasive techniques and alternative surgical incisions and approaches.

CLINICAL SKILLS

Diagnose and assess a patient with atrial septal defect

Interpret echocardiographic and CT/MRI assessment of the anatomy
Manage postoperative course, recognise and manage common complications
TECHNICAL SKILLS

Repair of Secundum ASD

Repair of Sinus Venosus ASD & correction of Partial Anomalous Pulmonary Venous Drainage

Repair of Coronary Sinus ASD Management of Unroofed Coronary Sinus
Retrieval of dislodged ASD device

Note: Management of Primum ASD is covered under 'Atrio-ventricular septal defect'

PATENT DUCTUS ARTERIOSUS

OBJECTIVE

Understand fetal circulation and the physiological consequences of persistent PDA and associated lesions. Understand neonatal and infant management including medical treatment and indications for surgery. Surgical techniques and approaches.

KNOWLEDGE
Anatomy and physiology of PDA

Medical management including management of the premature newborn
Indications and timing of surgical closure

CLINICAL SKILLS

Diagnose and assess patents with PDA

Assessment of the premature newborn and definition of failed medical management

Interpret echo and angiographic findings
Manage post-operative course and common complications

TECHNICAL SKILLS

Ligation of PDA via thoracotomy in premature infants

Ligation/division of PDA via thoracotomy in older infants Ligation of PDA via sternotomy

COARCTATION AND INTERRUPTED AORTIC ARCH

OBJECTIVE

Understand morphology of coarction, hypoplastic aortic arch, interrupted arch and associated conditions. Physiology of the condition, age at presentation and pre- operative assessment and stabilisation. Management, including role of interventional cardiology and surgical repair techniques.

KNOWLEDGE

Anatomy and physiology of CoA, Hypoplastic aortic arch and Interruption 3 4 Spectrum of presentation and preoperative management and stabilisation 3 4 Associated conditions 3 4 Indications for catheter and surgical intervention 3 4 Surgical techniques 3 4 Management of post-operative course and common complications 3 4 CLINICAL SKILLS

Diagnose and assess patients with CoA, Hypoplastic arch and Interruption 3 4

Interpret echo, angiographic and CT/MRI findings
Manage post-operative course and common complications TECHNICAL SKILLS
CoA repair via thoracotomy
Extended end to end anastomosis

Subclavian flap repair
Repair of hypoplastic arch via sternotomy

Repair of Aortic Interruption
Repair of CoA in children and adults (interposition graft and patch techniques) Late complications of CoA repair 2 3

(false aneurysm and aorto-bronchial/enteric fistulae)

AORTIC VALVE DISEASE

OBJECTIVE

Understand morphology and physiology of aortic valve disease in neonates, infants and children. Role of cardiological intervention and surgical repair. Treatment of aortic valve disease including surgical repair and replacement techniques

KNOWLEDGE

Morphology and classification of aortic valve disease

Spectrum of presentation and clinical assessment
Associated conditions
Indications for trans-catheter and surgical intervention
Range of surgical repair and replacement techniques Management of operative course and common complications

CLINICAL SKILLS

Diagnose and assess patients with aortic valve disease

Interpret echo and angiographic findings
Assess operative and interventional options and timing of intervention
Application of surgical techniques
Management of operative course and common complications

TECHNICAL SKILLS

Aortic valvotomy

Prosthetic aortic valve replacement Ross Procedure (pulmonary autograft)
Aortic valve repair
Valve Sparing Root Procedure
Aortic Root Replacement

SUB-AORTIC STENOSIS

OBJECTIVE

Understand morphological spectrum of Sub-Aortic Stenosis and associated conditions. Indications for intervention and the timing and application of surgical repair.

KNOWLEDGE

Morphology and classification of Sub-Aortic Stenosis

Spectrum of presentation and indication for intervention Application of surgical techniques

Management of operative course and common complications CLINICAL SKILLS

Diagnose and assess patients with Sub-Aortic Stenosis

Interpret echo and angiographic findings
Application of surgical techniques
Management of operative course and common complications

TECHNICAL SKILLS

Sub-Aortic resection

Morrow Procedure
Konno and Ross-Konno techniques

SUPRA-AORTIC STENOSIS

OBJECTIVE

Understand morphology and spectrum of Supra-Aortic stenosis. Indications and surgical techniques of repair.

KNOWLEDGE
Morphology and physiology of Supra-Aortic Stenosis

Indications for intervention and surgical techniques Management of operative course and common complications

CLINICAL SKILLS

Diagnose and assess patients with Supra-Aortic Stenosis

Interpret echo and angiographic findings
Application of surgical techniques
Management of operative course and common complications

TECHNICAL SKILLS

Y-Shaped Patch Repair of Supra-Aortic Stenosis Brom Repair (three patch technique)

CONGENITAL MITRAL VALVE DISEASE

OBJECTIVE

Diagnose and manage the complete range of congenital MV anomalies and dysplasia. Understand assessment and associated lesions. Role and indications for intervention.

KNOWLEDGE
Range of anatomical variants and associated conditions

Modes and age of presentation
Assessment and indications for intervention Choice of valve repairs and replacements Post-operative management and follow-up

CLINICAL SKILLS

Diagnose and assess patients Mitral disease

Interpret echo and angiographic findings
Management of associated conditions
Application of surgical repair techniques
Management of operative course and common complications

TECHNICAL SKILLS

Mitral valvotomy

Supra-mitral membrane resection Mitral valve repair techniques Mitral valve replacement

TOTAL ANOMALOUS PULMONARY VENOUS DRAINAGE

OBJECTIVE

Diagnose, manage and treat all forms of TAPVD. Understand principles of assessment and preoperative stabilisation. Indications and Operative techniques of repair.

KNOWLEDGE
Morphological classification and pathophysiology

Assessment and diagnosis. Associated conditions. Pre-operative stabilisation.
Indications and timing of surgery
Post-operative management

Follow-up and late complications CLINICAL SKILLS

Interpretation of echo and CT/MRI findings

Pre-operative stabilisation and management
Choices and timing of surgical repair
Management of operative course and common complications

TECHNICAL SKILLS

Repair of Supra-cardiac TAPVD

Repair of Cardiac TAPVD Repair of Infra-cardiac TAPVD Sutureless techniques Redo-TAPVD repair

VENTRICULAR SEPTAL DEFECTS

OBJECTIVE

To diagnose, treat and manage ventricular septal defects in children, including all aspects of operative repair.

KNOWLEDGE

Anatomy of the ventricular septum Classification of VSDs and associated lesions

Physiological implications of VSDs
Natural History and Complications

Indications for surgical and interventional repair
Current methods for repair, materials and surgical approaches,

including techniques for multiple VSDs

CLINICAL SKILLS

Diagnose and assess patients of different ages with VSD

Interpret echo and angiographic assessment
Manage postoperative course, recognise and mange common complications

TECHNICAL SKILLS

Repair of Perimembranous VSDs

Repair of muscular VSDs
Repair of Doubly-Committed VSDs Repair of Multiple VSDs

ATRIO-VENTRICULAR SEPTAL DEFECTS

OBJECTIVE

To diagnose, treat and manage all variants of Atrioventricular Septal defect (AVSD) including operative techniques.

KNOWLEDGE

Morphological classification and common variants

Natural history and timing of intervention
Physiology and associated conditions
Indications for surgical repair
Methods of repair, choice of technique and repair materials Follow-up and late complications

CLINICAL SKILLS

Diagnose and assess patients with all varieties of AVSD

Interpret echo and angiographic findings
Manage post-operative course, recognise and manage common complication

TECHNICAL SKILLS

Repair of partial AVSD

Repair of intermediate AVSD
Repair of Complete AVSD (two-patch technique) Repair of Complete AVSD (one-patch technique) AV valve repair techniques

FALLOT'S TETRALOGY

OBJECTIVE

To diagnose, treat and manage all variants of Fallot's Tetralogy including operative techniques and staged approach.

KNOWLEDGE

Morphology and anatomy including common variants

Natural history and timing of intervention
Neonatal management of cyanosis
Physiology and morphological correlates
Indications for interventional and surgical treatment Peri-operative management including restrictive physiology Follow-up and late complications

CLINICAL SKILLS

Diagnose and assess patients with all varieties of Fallot's tetralogy

Interpret echo and angiographic findings
Plan appropriate intervention
Manage post-operative course, recognise and manage common complications

TECHNICAL SKILLS

Blalock-Taussig Shunt and Central shunts

Repair of Tetralogy of Fallot Management of anomalous LAD Creation of monocusp valve

PULMONARY ATRESIA WITH VSD

OBJECTIVE

Understand the morphology and physiology of pulmonary atresia VSD including complex variants with major aorto-pulmonary collaterals (MAPCAs). Management of all aspects of the condition including indications for surgery and operative techniques

KNOLWEDGE

Morphology and associated conditions

Physiology and pre-operative assessment
Timing of intervention and early palliation
Surgical techniques
Management of post-operative care, recognise and manage complications

Staged repair and follow-up surveillance CLINICAL SKILLS

Diagnose and assess patients with PA/VSD

Assess pre-operative investigations including assessment of MAPCAs
Surgical techniques and perioperative strategies
Management of post-operative care and common complications

TECHNICAL SKILLS Palliative shunts

Direct PA- Aortic shunts (Mee Procedure) Surgical repair of PA/VSD
Unifocalisation of MAPCAs
Complete repair of PA/VSD/MAPCAs

PULMONARY ATRESIA WITH INTACT VENTRICULAR SEPTUM

OBJECTIVE

Understand morphology and spectrum of the condition with emphasis on the assessment for biventricular, 1
1/2 and Fontan-type repair. Indications and timing of intervention and the techniques
of surgical repair and palliation.

KNOWLEGDE

Morphology and spectrum of the condition and the physiological correlates
Timing of intervention and management strategies Management of the newborn and palliative strategies

Relevance of RV-dependent coronary circulation Post-operative management and common complications

CLINICAL SKILLS

Diagnose and assess patients with all variants of PA/IVS

Interpret echo and angiographic findings
Surgical techniques and operative strategies
Management of post-operative care and common complications

TECHNICAL SKILLS

Shunt procedures

RV-Overhaul procedure 1 1⁄2 -type Repair Biventricular Repair

TRANSPOSITION OF THE GREAT ARTERIES

OBJECTIVE

Understand morphology and physiology of common (d-) transposition of the great arteries (TGA) and associated lesions. Management of all aspects of the condition including preoperative stabilisation and techniques for surgical repair.

KNOWLEDGE

Morphology and associated conditions

Physiology and pre-operative stabilisation
Timing of intervention and management of late presentation Investigation and diagnosis
Surgical techniques
Management of post-operative course, recognise and mange complications
Follow-up and late complications

CLINICAL SKILLS

Diagnose and assess patients with all variants of d-TGA

Interpret echo and angiographic findings
Surgical techniques and operative strategies
Management of post-operative care and common complications

TECHNICAL SKILLS

Balloon atrial septostomy

Arterial switch procedure
Arterial switch and VSD closure Arterial switch, VSD and arch repair
Management of intramural coronaries

TRANSPOSITION OF THE GREAT ARTERIES WITH VSD AND PULMONARY STENOSIS/ATRESIA

OBJECTIVE

Understand morphology and physiology of TGA/VSD/PS or PA and associated lesions. Management of all aspects of the condition including preoperative stabilisation and techniques for surgical repair.

KNOWLEDGE

Morphology and timing of intervention

Physiology and pre-operative stabilisation
Timing of intervention
Investigation and diagnosis

Surgical techniques for repair
Management of post-operative course, recognise and manage complications

CLINICAL SKILLS

Diagnose and assess patients with TGA/VSD/PS or PA

Interpret echo, angiographic and CT/MRI investigations Plan operative strategies
Applications of Surgical techniques
Manage post-operative course and common complications

TECHNICAL SKILLS

Arterial shunts and RV-PA conduits

Rasttelli procedure
REV procedure
Nikaidoh Procedure
Reoperations for conduit replacement

DOUBLE-OUTLET RIGHT VENTRICLE (DORV)

OBJECTIVE

Understand morphology and physiology of DORV and associated conditions including relationship with spectrum of Fallot's tetralogy. Interpret intra-cardiac anatomy and strategies of surgical repair.

KNOWLEDGE

Morphology and spectrum of anatomical sub-types

Physiology and indication for repair/palliation
Recognition of morphology inappropriate for biventricular repair Timing of intervention
Surgical techniques for repair
Management of post-operative course, recognise and manage complications

CLINICAL SKILLS

Diagnose and assess patients with DORV

Interpret echo, angiographic and CT/MRI investigations Applications of Surgical techniques
Manage post-operative course and common complications

TECHNICAL SKILLS

Repair of DORV and DORV/Fallot spectrum

Trans-ventricular repair with or without conduit Kawashima repair
REV repair

VASCULAR RINGS

OBJECTIVE

To diagnose, treat and manage all types of vascular ring and recognise associated oesophageal and airway problems.

KNOWLEDGE

Anatomy of vascular rings

Classification and associated lesions
Modes of presentation & diagnosis Indications & methods for surgical repair Management of associated airway problems

CLINICAL SKILLS

Diagnosis and assessment

Interpretation of CT/MRI, Ba swallow, bronchoscopy and angiography
Manage postoperative course, recognise and manage complications

TECHNICAL SKILLS

Division of Double Aortic Arch Correction of Pulmonary artery sling

Aortopexy and tracheopexy procedures

ARTERIAL SHUNTS

OBJECTIVE

Understand indications and management of all types of systemic-pulmonary artery shunts, including surgical approaches and techniques.

KNOWLEDGE
Types of shunt and surgical approaches
Choice of size, position and open vs closed Understand alternative strategies and the staged

nature of managing the underlying condition Management of post-operative physiology

CLINICAL SKILLS

Indications and decision making

Interpretation of echo and angiographic findings Management of post-operative physiology

TECHNICAL SKILLS

Modified Blalock-Taussig Shunt via sternotomy

Modified Blalock-Taussig Shunt via thoracotomy Central shunt
Taking down shunts at reoperation

CAVO-PULMONARY SHUNT

OBJECTIVE

Understand indications and management of cavo-pulmonary (Glenn) shunts including surgical approaches and techniques.

KNOWLEDGE

Physiology of the cavo-pulmonary circulation

Indications and morphological correlates Different techniques and surgical strategies Management of post-operative physiology

CLINICAL SKILLS

Indications and decision making

Interpretation of echo and angiographic data Management of post-operative physiology

TECHNICAL SKILLS

Bidirectional Glenn (cavo-pulmonary shunt)

Bilateral shunts Hemi-Fontan

FONTAN CIRCULATION

OBJECTIVE

Understand physiology of the Fontan circulation, anatomical and haemodynamic indications. Familiarity with surgical variants, bypass techniques, post-operative management and late problems of the Fontan physiology.

KNOWLEDGE

Physiology of the Fontan circulation

Indications and morphological correlates
Different techniques and surgical strategies Pre-operative assessment
Post-operative management and common complications Physiology of the Fontan state and natural history

CLINICAL SKILLS

Indications and decision making

Interpretation of echo and angiographic data Management of post-operative physiology Management of early and late complications

TECHNICAL SKILLS

Bypass strategies and cannulation

Extracardiac Total Cavo-Pulmonary Connection (TCPC) Lateral tunnel TCPC
Conversion Fontan-TCPC

HYPOPLASTIC LEFT HEART SYNDROME

OBJECTIVE

Diagnose, treat and manage HLHS and its anatomical variants. Understand stabilisation, pre- and post- operative management of the Norwood procedure. Surgical techniques and options.

KNOWLEDGE

Anatomy of HLHS and anatomical variants including borderline left ventricle
Physiology of post-natal stabilisation
Pre-operative management

Role and indications for hybrid procedures
Post-operative management of the Norwood physiology Timing and plan of staged repair and inter-stage monitoring

CLINICAL SKILLS

Assessment of the newborn with HLHS

Echo interpretation and assessment of borderline LV Pre-operative intervention and stabilisation
Post-operative management, manipulation of the Norwood

circulation on PICU and management of common complications

TECHNICAL SKILLS Atrial septectomy

Classical Norwood Procedure
Norwood procedure with RV-PA conduit Hybrid Norwood Procedure
Comprehensive stage II Hybrid procedure

AORTO-PULMONARY WINDOW

OBJECTIVE

Understand morphological classification and underlying physiology. Recognise associated lesions. Clinical management including pre-operative stabilisation and operative techniques of repair.

KNOWLEDGE

Morphological classification and associated conditions

Physiology and indications for intervention
Stabilisation of the neonate
Operative strategy and repair technique
Management of operative course and common complications

CLINICAL SKILLS

Indications and decision making

Interpretation of echo and angiographic data
Management of post-operative physiology
Management of operative course and common complications

TECHNICAL SKILLS

Repair of Aorto-Pulmonary Window Management of Associated Lesions

TRUNCUS ARTERIOSUS

OBJECTIVE

To diagnose, treat and manage the condition, recognise the common morphological variants and associated lesions. Understand concepts and techniques of surgical repair.

KNOWLEDGE

Anatomy of the lesion, Van Praagh and Collis/Edwards classifications

Pathophysiology and preoperative stabilisation
Strategies and techniques of surgical repair including choice or use of conduit

Management of post-operative physiology
Late management of conduit replacement and the truncal valve.

CLINICAL SKILLS Interpret echo findings

Preoperative assessment and stabilisation Operative techniques and bypass strategies

TECHNICAL SKILLS

Bypass Strategy

Repair of Truncus Arteriosus
Repair of Truncus/Interruption Repair of Truncus/Non-confluent PAs
Repair of Truncal Valve

ANOMALOUS LEFT CORONARY ARTERY FROM PULMONARY ARTERY (ALCAPA)

OBJECTIVE

To diagnose, treat and manage the condition. Understand physiology and age at presentation. Techniques and timing of surgical repair.

KNOWLEDGE
Anatomy and common variants

Physiology and influence on age and mode of presentation
Pathophysiology and preoperative stabilisation
Management of post-operative course and common complications Late management and follow-up

CLINICAL SKILLS

Interpret echo findings and conformation of diagnosis

Preoperative assessment and stabilisation
Use and indications of ECLS
Application of Operative techniques and cardioplegia strategy

TECHNICAL SKILLS

Myocardial protection

ALCAPA repair by coronary transfer Tacheuchi procedure
Coronary grafting in children

EXTRA CORPOREAL MEMBRANE OXYGENATION (ECMO) / EXTRA CORPOREAL LIFE SUPPORT (ECLS)

OBJECTIVE

Understand principles of ECMO, indications and management in neonates and children

KNOWLEDGE

Indications and physiology

Alternatives to ECMO and conventional PICU management Principles of ECMO circuit, components and design Options and choice of cannulation Differences and Indications of VA and VV ECMO Management of the circuit and trouble-shooting Management of complications

Indications and management of weaning CLINICAL SKILLS

Clinical assessment and decision making for VV and VA ECMO

Choice of cannulation and circuit design Management of the neonate and child on ECMO Circuit trouble-shooting and daily management
Indications and Supervision of weaning Transport on ECMO

TECHNICAL SKILLS

Cannulation for VV and VA in neonate and child Conversion of VV to VA and vice versa
Open chest cannulation
Change of Oxygenator

Decannulation

MECAHNICAL CIRCUALTORY ASSIST (LVAD/RVAD/BIVAD)

OBJECTIVE

Understand indications for mechanical circulatory assist as a salvage procedure, pre- operative stabilisation and as a bridge to transplantation. Understand principles of commonly used devices and indications for each. Routine management of patients supported by these devices and common complications.

KNOWLEDGE

Basic and applied physiology of ventricular assist

Varieties and options available for LVAD or BiVAD Indications for use of VAD
Management of patient on VAD and common complications Role of bridge to transplant and recovery

Awareness of new devices and devices under trial CLINICAL SKILLS

Application of criteria and indications for VAD

Choice of device and circuit design
Management of the patient on VAD
Conversion of LVAD to BiVAD or ECLS
Device trouble-shooting and management of complications Bridging to transplantation and recovery

TECHNICAL SKILLS

Implantation of VAD

Implantation of BiVAD Explanation of VAD

TRANSPLANTATION - Optional Module

By the end of sub-specialty training the trainee will be able to:

- *Apply the principles of heart and lung transplantation in children including indications, assessment, operative procedures and post-operative management including immunosuppression*

- *Describe the specific issues of transplantation in Adults with Congenital Heart Disease (ACHD)*

KNOWLEDGE

Describe
Indications for heart, lung and heart-lung transplantation

Assess
Retrieval and donor assessment Manage

Management and stabilisation of severe heart failure in children
Selection and listing for transplantation. Pre transplant work-up.

Operative planning and procedures
Post-operative management and immunosuppression
Late complications, chronic rejection and re-transplantation Psychological issues in children and adolescents

MECHANICAL CIRCULATORY ASSIST (LVAD/RVAD/BIVAD) Role of bridge to transplant and recovery

Learning opportunities

- Postgraduate teaching and discussion sessions

- Multi-disciplinary meetings

- External conferences and seminars

  Sources of evidence
  CBD
  PBA
  Audit / Research / Project

  CLINICAL SKILLS

  Manage:
  Management and stabilisation of acute and chronic heart failure
  Assessment for listing

Application of bridging devices
Immunosuppression protocols and regimens Coordination of retrieval and list management Post-operative management and common complications

MECAHNICAL CIRCUALTORY ASSIST (LVAD/RVAD/BIVAD)
Bridging to transplantation and recovery

Learning opportunities

- Supervised clinical practice, primarily in a hospital, wards, clinics or theatre.

- Management of specific clinical cases

- Assessment of new patients and review/follow up existing patients

TECHNICAL SKILLS

Assess
Retrieval and donor organ assessment Manage
Orthotopic heart transplantation
Single lung and double-lung transplantation Heart-lung transplantation

Learning opportunities

- Supervised theatre training lists on selected patients covering consent, pre- operative planning and preparation, operative sills and post operative management, adhering to protocols and patient-safety.

- Intensive Care

* Transplantation is covered in the general syllabus and examination and trainees should already have a strong basic level of knowledge. Further experience in such a super-specialised area is optional rather than mandatory.

TRACHEAL SURGERY

OBJECTIVE
Understand the spectrum of congenital tracheal anomalies and associated conditions. Diagnose and manage each condition. Indications and techniques of repair.

KNOWLEDGE

Morphological classification and associated conditions Diagnosis and investigation

Indications for intervention and surgery Pre-operative stabilisation
Role of bronchoscopy and bronchography Choice of operative techniques

Role of stem-cell technology CLINICAL SKILLS

Interpretation of investigations

Indication and planning of interventions
Role of functional assessment and stenting
Repair of associated lesions
Post-operative management and common complications Long-term follow-up and assessment

TECHNICAL SKILLS

Local Resection and anastomosis

Slide Tracheal Repair
Patch Repair Techniques and tracheoplasty Bronchoplasty
Reoperations

PRINCIPLES OF ADULT CONGENITAL HEART DISEASE

OBJECTIVE

Understand the spectrum of conditions in Adult Congenital Heart Disease Surgery and the physiological implications of the residua and sequelae of previous surgery. Understand the issues of multiple redo surgery,

implications of surgery in young adults and natural history of underlying conditions.

KNOWLEDGE

Physiology of Congenital Heart Disease presenting in adulthood

Residua and Sequelae of surgery in childhood
Investigation of adults with congenital heart disease
Choice of procedures and conduits/prostheses in young adults Role of interventional cardiology
Indications for surgery

CLINICAL SKILLS

Assessment of the young adult

Interpretation of echo, CT and MRI in congenital heart disease Post-operative management in adult intensive care

PULMONARY VALVE REPLACEMENT

OBJECTIVE

Understand the aetiology of pulmonary regurgitation in adult congenital heart disease. Assessment of the right ventricle, indications for surgery and the timing and choice of valve replacement.

KNOWLEDGE

Physiology of pulmonary regurgitation and sequelae of Fallot

repair and pulmonary valvotomy in childhood
Assessment of the right ventricle and indications for intervention Role and indications of percutaneous valve replacement
Timing of valve replacement and choice of prosthesis Management of associated lesions including arrhythmias

CLINICAL SKILLS

Assessment of pulmonary regurgitation

Interpretation of echo and MRI findings
Use and Interpretation of exercise testing
Management of post-operative course and common complications

TECHNICAL SKILLS

Redo sternotomy with a dilated Right Ventricle

Pulmonary Valve Replacement
RVOT patching and placation of the dilated RVOT Concomitant Tricuspid Valve Repair

RIGHT VENTRICLE-PULMONARY ARTERY CONDUIT REPLACEMENT IN THE ADULT

OBJECTIVE

Understand the underlying morphology and indications for original conduit. Assessment of conduit degeneration and indications for replacement. Techniques for replacement and choice of conduit.

KNOWLEDGE

Underlying morphology and conduit type used in childhood

Assessment of conduit deterioration
Indications for re-intervention and surgery
Choice of conduit and procedure
Management of associated lesions
Post-operative management and common complications

CLINICAL SKILLS

Interpretation of echo, angio and MRI/CT

Apply indications for surgery and role of catheter intervention Assessment of associated conditions
Choice of conduit
Management of post-operative course and common complications

TECHNICAL SKILLLS

Redo sternotomy and femoral cannulation

Conduit replacement
Repair of associated conditions (branch pulmonary artery stenosis)

ASD CLOSURE IN THE ADULT

Understand assessment of the adult with atrial septal defect, morphological subtypes and indications for surgical and interventional closure. Focus on concomitant arrhythmia management and assessment of the right ventricle and tricuspid valve.

KNOWLEDGE Morphological classification

Clinical and physiological assessment
Indications for surgical and interventional closure Associated right heart failure, tricuspid regurgitation and arrhythmias
Post-operative management and common complications

CLINICAL SKILLS
Interpretation of echo, angio and MRI

Pre-operative assessment
Operative techniques and choice of patch material
Management of post-operative course and common complications

TECHNICAL SKILLS

Repair of secundum ASD in the adult

Repair of Sinus Venosus ASD
Management of Partial Anomalous Pulmonary Venous Drainage Repair of Coronary Sinus ASD +/- Unroofed Coronary Sinus Repair of Partial AVSD

FONTAN CONVERSION SURGERY

OBJECTIVE

Understand the history of the Fontan procedure and the late complications of the atrio-pulmonary connection. Patient assessment and indications for

conversion to TCPC. Operative technique and importance of arrhythmia management.

KNOWLEDGE
Iterations of the Fontan circulation

Complications of the APC and indications for conversion Operative techniques and arrhythmia management Post-operative course and common complications

CLINICAL SKILLS

Interpretation of echo, angio and MRI

Planning operative strategy Management of post-operative course

TECHNICAL SKILLS

Redo Sternotomy in the Fontan

Fontan Conversion
Maze technique and epicardial pacing

TRANSPLANTATION IN ADULTS WITH CONGENITAL HEART DISEASE

OBJECTIVE

OPTIONAL MODULE

Understand specific issues of transplantation in ACHD.

KNOWLEDGE

Underlying conditions and physiologies associated with heart failure in ACHD
Issues of reoperation and antigen load
Outcomes compared to non-ACHD

Management of pulmonary hypertension pre and post transplant
Anatomical considerations in complex conditions
Psychological issues in transplant in young adults

CLINICAL SKILLS

Assessment of heart failure

Criteria and indication for listing
Pre-operative planning
Management of immunosuppression and pulmonary hypertension Post-operative management and common complications

TECHNICAL SKILLS

Donor management and retrieval

Orthotopic Heart transplantation
Anatomical techniques for abnormal venous anatomy