

The SickKids ACE Program curriculum can be categorized into six sections:

Assessment
& Diagnosis

Physiology
& Morphology

Treatment
& Management

Postoperative
Challenges

Subspecialty
Areas

Affective
Considerations



Assessment & Diagnosis

Cardiovascular Assessment

History & physical examination
Heart sounds & murmurs

Genetics & Syndromes

Screening & dysmorphology
Syndromes & cardiac anomalies
Family counselling

Neonatal Considerations

Preterm & term infants
Low birth weight infants
PPHN
Thermoregulation
Developmental care
Glucose management
Hyperbilirubinemia

Neurodevelopment

Fetal hemodynamics & brain development
Presurgical brain abnormalities
Ischemic brain injury
Stroke
Seizures & continuous EEG monitoring

Developmental disorders
Neuroprotective strategies
Positive touch & positioning
Oral feeding
Rehabilitation
Long-term outcomes

Nutrition

Nutritional assessment & intervention

Diagnostics

Echocardiography including fetal
Chest radiograph interpretation
Arterial blood gas
Serum lab testing
15-lead ECG, performing & interpreting
Cardiac MRI & CT
Angiography
Holter monitoring
Exercise stress test
6-minute walk test
T-wave alternans
Noninvasive cardiac output monitoring
Acuity based monitoring



Physiology & Morphology

Left-to-right shunt lesions

Atrial septal defect
Ventricular septal defect
Patent ductus arteriosus
Atrioventricular septal defect
Partial anomalous pulmonary venous drainage

Obstructive lesions

Pulmonary stenosis
Aortic stenosis
Coarctation of the aorta
Interrupted aortic arch

Cyanotic lesions

Dextro-transposition of the great arteries
Levo-transposition of the great arteries
Tetralogy of Fallot
Total anomalous pulmonary venous drainage

Tricuspid atresia
Pulmonary atresia +/- IVS
Hypoplastic left heart
Ebstein anomaly
Truncus arteriosus
Double outlet right ventricle
Heterotaxy syndrome

Valvular conditions

AV valve stenosis
Semilunar valve stenosis
AV valve regurgitation, mitral valve prolapse
Semilunar valve regurgitation

Other

Coronary artery anomalies
Cor triatriatum
Pulmonary vein stenosis
Vascular ring
Complex lesions & surgical repairs



Treatment & Management

Cardiac Catheterizations

Fetal interventions
Interventional procedures
Post procedural care

Pharmacology & Blood Administration

Principles of pharmacologic management
Vasoactive medications
Antiarrhythmics
Diuretics
Anticoagulants
Blood administration
Compatibilities and line management

Preoperative management

Preoperative tests
Anticoagulation
Patient & family preparation
Surgical site infection prevention
Antibiotic prophylaxis

Perioperative management

Anaesthesia
Cardiopulmonary bypass
Closed heart surgery repairs
Open heart surgery repairs
Deep hypothermic circulatory arrest
Continuous regional cerebral perfusion
Advanced hemodynamic monitoring



Postoperative Challenges

Postoperative complications

Low cardiac output state (LCOS)
Shock states
Infection risks in critical care
Tamponade
Diaphragmatic paralysis
Hyperglycemia
Acute kidney injury
Venous thrombosis
Vocal cord paralysis
Pleural effusions & chylothorax
Postpericardiotomy syndrome
Protein losing enteropathy
Residual lesions

Respiratory support

Respiratory assessment
Ventilation & perfusion mismatch
Airway anomalies
Mechanical ventilation
Lung-protective ventilation
Ventilation challenges in complex cardiac disease
Ventilator associated pneumonia
Early extubation
Non-invasive positive pressure ventilation
Heated high flow nasal cannula
RSV infection prophylaxis

Arrhythmias

Cardiac arrhythmias & ECG interpretation
Atrial tachycardias
Junctional ectopic tachycardia
Antiarrhythmic medications
Defibrillation, cardioversion & transcutaneous pacing
Electrophysiology studies & ablation
Temporary & permanent pacemakers
Implantable cardioverter defibrillators

Resuscitation

Resuscitation medications
Sternal opening, suspension, closure
Extracorporeal cardiopulmonary resuscitation
Therapeutic hypothermia after cardiac arrest
Neuroprotection & post arrest care
Physiologic monitoring trends in cardiac arrest
Team communication & error prevention
Pathologist & coroner roles
Simulation based education

Quality & safety in critical care

Understanding safety risks
Promoting safety behaviours
Preprocedural checklist



Affective Considerations

Transitioning to adult care

Living with congenital heart disease
Chronicity
Pregnancy & contraception
Long-term complications

Child & family support

Antenatal diagnosis
Family Counselling
Pre-procedural preparation
Family-centered care & learning plans

Legacy creation & palliative care
Strengthening partnerships

Ethical considerations

Ethical principles & dilemmas in cardiac critical care & paediatric cardiology
Moral distress

Artificial intelligence

Role of artificial intelligence in today's health care



Subspecialty Areas

Single ventricle

Anatomy & physiology
Single ventricle spectrum
Medical & surgical management
Pre & postoperative management
Stage I surgery: Norwood BTT shunt, Sano, Hybrid
Single Ventricle Reconstruction Trial
Necrotizing enterocolitis in high-risk patients
Home surveillance & monitoring
Stage II surgery: bidirectional Glenn anastomosis
Stage III surgery: Fontan
Ventricular repairs: 1, 2 or 1 ½
Ventilator-based manipulation of QP:QS
Anticoagulation

Cardiomyopathy

Evaluation & diagnosis
Genetics
Classifications
Diseases of the myocardium & sudden death
Dyssynchrony & cardiac resynchronization

Heart failure

Classifications & management
Pharmacological management
Management of the patient in critical care
Restrictive right ventricle & right ventricular failure
End stage heart failure & functional outcomes

Ventricular assist devices

Extracorporeal membrane oxygenation
Berlin Heart®
HeartMate 3TM
Rotaflow, Centrimag, Pedivas
Impella®
Anticoagulation
Managing emergencies

Transplantation

Indications & contraindications
Assessment & waiting
Surgical procedure
Medications & management
High risk transplants
Acute & long-term complications
Outcomes
Quality of life post-transplant

Pulmonary Hypertension

Classifications
Etiologies
Pharmacological management
Outcomes

Acquired Heart Disease

Infective endocarditis
Acute fulminant myocarditis
Pericarditis
Kawasaki disease
Acute rheumatic fever
Endocardial fibroelastosis

