

The University of Arizona Pediatric Residency Program

Primary Goals for Rotation

Cardiology

1. **GOAL:** Understand the role of the pediatrician in preventing cardiovascular diseases, and in counseling and screening individuals at risk for these diseases.
2. **GOAL:** Distinguish normal from abnormal cardiovascular signs and symptoms.
3. **GOAL:** Evaluate, treat, and/or refer patients with presenting signs and symptoms that suggest a cardiovascular disease process.
4. **GOAL:** Diagnose and manage patients with common cardiovascular conditions that generally do not require referral.
5. **GOAL:** Recognize, provide initial management of, and refer patients with cardiovascular conditions that generally require referral.
6. **GOAL:** Understand the general pediatrician's role in diagnosis and management of congenital heart disease in children.
7. **GOAL:** Understand the general pediatrician's role in diagnosis and management of acquired heart disease in children.
8. **GOAL:** Understand the general pediatrician's role in diagnosis and management of hypertension in children.
9. **GOAL:** Understand key principles related to the use of cardiovascular drugs.
10. **GOAL:** Demonstrate high standards of professional competence while working with patients under the care of a subspecialist.

1. GOAL: Understand the role of the pediatrician in preventing cardiovascular diseases, and in counseling and screening individuals at risk for these diseases.

A. Offer cardiovascular risk prevention counseling to all patients and parents and routinely screen for cardiovascular disease to identify individuals at increased risk.

1. Identify risk factors and provide information to patients and families regarding atherosclerotic heart disease and hypertension (family history or genetic predisposition to heart disease, lifestyle issues such as weight control, diet, exercise, and tobacco use).
2. Provide regular screening for prevention of heart disease and hypertension (regular monitoring and plotting of BMI, cholesterol and lipid screening as indicated, and periodic blood pressure measurement).

B. Provide cardiovascular preventive counseling to parents and patients with specific cardiac diseases about:

1. Indications, duration, and appropriate antibiotic regimens for bacterial endocarditis prophylaxis
2. Indications and appropriate antibiotic treatment for rheumatic fever prophylaxis
3. Routine influenza and pneumococcal immunization in children with cardiac disease

2. GOAL: Distinguish normal from abnormal cardiovascular signs and symptoms.

A. Describe normal perinatal circulation and changes at birth and during the first year of life.

B. Describe age-related changes in heart rate and blood pressure, including normal ranges from birth through adolescence.

C. Explain the mechanism for the production of heart sounds and murmurs and differentiate between physiologic (normal, functional or innocent) and pathologic heart murmurs.

D. Explain the findings on history and physical examination that suggest congenital heart disease or cardiovascular disease needing further evaluation and treatment.

E. Interpret clinical and laboratory tests to identify cardiovascular disease, including: pulse and blood pressure monitoring, chest X-ray interpretation, pulse oximetry, hyperoxia test, electrocardiography, ECG monitoring reports and echocardiography reports.

F. Describe the principles of electrocardiography, including normal voltages and rhythms. Differentiate normal from abnormal rhythms and voltages that suggest cardiovascular disease.

3. GOAL: Evaluate, treat, and/or refer patients with presenting signs and symptoms that suggest a cardiovascular disease process.

A. Create a strategy to determine if the following presenting signs and symptoms are caused by a cardiovascular disease process, and determine if the patient should be treated or needs referral to a subspecialist.

1. Shortness of breath
2. Chest pain
3. Cyanosis
4. Syncope
5. Wheezing
6. Apparent life threatening event
7. Failure to thrive
8. Exercise intolerance
9. Unexplained tachypnea, dyspnea
10. Palpitations
11. Abnormal heart sounds

4. GOAL: Diagnose and manage patients with common cardiovascular conditions that generally do not require referral.

A. Diagnose, explain and manage the following cardiovascular conditions:

1. Tachycardia related to fever
2. Peripheral pulmonic stenosis
3. Functional (innocent) heart murmur
4. Small, hemodynamically insignificant and closing VSD
5. Small, hemodynamically insignificant and closing PDA within the neonatal period
6. Musculoskeletal chest pain
7. Mild hypertension
8. Premature atrial contractions
9. Benign premature ventricular contractions

5. GOAL: Recognize, provide initial management of, and refer patients with cardiovascular conditions that generally require referral.

A. Identify, explain, provide initial management and refer the following cardiovascular conditions:

1. Hypertension, moderate and severe
2. Supraventricular tachycardia
3. Bradycardia
4. Congestive heart failure
5. Cardiovascular collapse
6. Cardiovascular syncope
7. Chest pain associated with exercise
8. Pathologic heart murmurs
9. Congenital heart disease for initial diagnosis and followup

B. Identify the role and general scope of practice of pediatric cardiologists; recognize situations where children benefit from the skills of specialists trained in the care of children; and work effectively with these professionals in the care of children with congenital heart disease and other cardiovascular disease processes.

6. GOAL: Congenital Heart Disease. Understand the general pediatrician's role in diagnosis and management of congenital heart disease in children.

A. Describe the presenting symptoms, signs/physical findings, pathophysiology, treatment and prognosis for the following congenital cardiovascular conditions:

1. Ventricular septal defect
2. Atrial septal defect
3. Tetralogy of Fallot
4. Patent ductus arteriosus
5. Coarctation of the aorta
6. Transposition of great vessels
7. Tricuspid atresia
8. Pulmonary atresia
9. Hypoplastic left heart
10. Aortic stenosis
11. Pulmonic stenosis
12. Total anomalous pulmonary venous return
13. Mitral valve prolapse
14. Truncus Arteriosus
15. Atrioventricular canal

B. Describe the association of congenital heart disease with the following genetic syndromes:

1. Down's syndrome
2. Marfan syndrome
3. VACTERL association
4. Trisomy 13
5. Trisomy 18
6. Williams syndrome
7. Turner syndrome
8. Chromosome 22 microdeletion (i.e., Velocardial facial, DiGeorge syndrome)

7. GOAL: Understand the general pediatrician's role in diagnosis and management of acquired heart disease in children.

A. Describe the presenting signs and symptoms, physical findings, pathophysiology, treatment and prognosis for the following acquired cardiovascular conditions:

1. Supraventricular tachycardia
2. Myocarditis/cardiomyopathy
3. Kawasaki disease
4. Acute rheumatic fever
5. Bacterial endocarditis
6. Essential hypertension
7. Long QT Syndrome
8. Complete atrioventricular block
9. Ventricular tachycardia

8. GOAL: Hypertension. Understand the general pediatrician's role in diagnosis and management of hypertension in children.

- A. Classify a patient with hypertension as to severity according to current national guidelines, e.g., mild, moderate or severe.
- B. Develop a diagnostic plan for a child with hypertension that accounts for severity of the condition, including recognition and management of hypertensive emergencies.
- C. Manage a patient with hypertension using a step-wise approach that includes the role of diet, exercise, weight control and medications.
- D. Compare the commonly used antihypertensive drugs, considering indications and contraindications for use, mechanism of action and side effects.
- E. Identify the indicators for a cardiology or nephrology referral in a child with hypertension.

9. GOAL: Understand key principles related to the use of cardiovascular drugs.

- A. Identify the indications, contraindications, mechanism of action and side effects of the commonly used cardiovascular drugs (antiarrhythmic, chromotropes, inotropes, diuretics, vasodilator, vasopressors).

10. GOAL: Demonstrate high standards of professional competence while working with patients under the care of a subspecialist.

- A. **Competency 1: Patient Care.** Provide family-centered patient care that is development- and age-appropriate, compassionate, and effective for the treatment of health problems and the promotion of health.
 - 1. Use a logical and appropriate clinical approach to the care of patients presenting for specialty care, applying principles of evidence-based decision-making and problem-solving.
 - 2. Describe general indications for subspecialty procedures and interpret results for families.
- B. **Competency 2: Medical Knowledge.** Understand the scope of established and evolving biomedical, clinical, epidemiological and social-behavioral knowledge needed by a pediatrician; demonstrate the ability to acquire, critically interpret and apply this knowledge in patient care.
 - 1. Acquire, interpret and apply the knowledge appropriate for the generalist regarding the core content of this subspecialty area.
 - 2. Critically evaluate current medical information and scientific evidence related to this subspecialty area and modify your knowledge base accordingly.
- C. **Competency 3: Interpersonal Skills and Communication.** Demonstrate interpersonal and communication skills that result in information exchange and partnering with patients, their families and professional associates.
 - 1. Provide effective patient education, including reassurance, for a condition(s) common to this subspecialty area.
 - 2. Communicate effectively with primary care and other physicians, other health professionals, and health-related agencies to create and sustain information exchange and teamwork for patient care.
 - 3. Maintain accurate, legible, timely and legally appropriate medical records, including referral forms and letters, for subspecialty patients in the outpatient and inpatient setting.

<p>D. Competency 4: Practice-based Learning and Improvement. Demonstrate knowledge, skills and attitudes needed for continuous self-assessment, using scientific methods and evidence to investigate, evaluate, and improve one's patient care practice.</p>
<p>1. Identify standardized guidelines for diagnosis and treatment of conditions common to this subspecialty area and adapt them to the individual needs of specific patients.</p>
<p>2. Identify personal learning needs related to this subspecialty; systematically organize relevant information resources for future reference; and plan for continuing acquisition of knowledge and skills.</p>
<p>E. Competency 5: Professionalism. Demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to diversity.</p>
<p>1. Demonstrate personal accountability to the well-being of patients (e.g., following up on lab results, writing comprehensive notes, and seeking answers to patient care questions).</p>
<p>2. Demonstrate a commitment to carrying out professional responsibilities.</p>
<p>3. Adhere to ethical and legal principles, and be sensitive to diversity.</p>
<p>F. Competency 6: Systems-based Practice. Understand how to practice high-quality health care and advocate for patients within the context of the health care system.</p>
<p>1. Identify key aspects of health care systems as they apply to specialty care, including the referral process, and differentiate between consultation and referral.</p>
<p>2. Demonstrate sensitivity to the costs of clinical care in this subspecialty setting, and take steps to minimize costs without compromising quality.</p>
<p>3. Recognize and advocate for families who need assistance to deal with systems complexities, such as the referral process, lack of insurance, multiple medication refills, multiple appointments with long transport times, or inconvenient hours of service.</p>
<p>4. Recognize one's limits and those of the system; take steps to avoid medical errors.</p>
<p>Procedures</p>
<p>A. GOAL: Technical and therapeutic procedures. Describe the following procedures, including how they work and when they should be used; competently perform those commonly used by the pediatrician in practice.</p>
<p>1. Cardioversion/defibrillation</p>
<p>B. GOAL: Diagnostic and screening procedures. Describe the following tests or procedures, including how they work and when they should be used; competently perform those commonly used by the pediatrician in practice.</p>
<p>1. ECG: emergency interpretation</p>
<p>2. ECG: perform</p>
<p>3. Monitoring interpretation: Holter</p>
<p>4. Radiologic interpretation: chest X-ray</p>

Adapted From

Kittredge, D., Baldwin, C. D., Bar-on, M. E., Beach, P. S., Trimm, R. F. (Eds.). (2004). APA Educational Guidelines for Pediatric Residency. Ambulatory Pediatric Association Website. Available online: www.ambpeds.org/egweb.